
ASMFC Habitat Management Series # 4

**Guidance for the Development of ASMFC
Fishery Management Plan Habitat Sections
and Source Documents**

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Guidance for the Development of ASMFC Fishery Management Plan Habitat Sections and Source Documents

INTRODUCTION

Background

This guidance was prepared to serve as a reference for fishery management plan (FMP) writers during the drafting of habitat sections for Atlantic States Marine Fisheries Commission FMPs or FMP amendments. The purpose of the guidance is to outline the desired subject matter, format, and amount of detail necessary for these habitat sections to be useful tools for fishery and habitat managers in the conservation of marine fish habitat. Habitat managers have documented the need for regional habitat information on managed species (Stephan and Biedler 1997). This information is necessary in order for habitat managers to make informed decisions on coastal development projects and other activities that affect fish habitat. The Commission has determined that providing this information to habitat managers is one of the most effective actions the Commission can take to help conserve fish habitat. Questions regarding this guidance should be addressed to the ASMFC Habitat Program (Appendix 2).

Fisheries management planning within the Commission is implemented by the Interstate Fisheries Management Program (ISFMP). The ISFMP has included the protection of habitat as one of its standards for the development of fisheries management plans (ASMFC 1995a). In October 1994, the ISFMP Policy Board approved the basic elements of a habitat section for inclusion in Commission FMPs (ASMFC 1994). An outline and accompanying narrative were prepared around four main sections:

1. Description of Habitat;
2. Identification and Distribution of Essential Habitat;
3. Present Conditions of Habitats and Essential Habitats; and
4. Recommendations and/or Requirements for Habitat Conservation/Restoration.

This served as the basis for preparation of habitat sections for FMPs including striped bass amendment #5 (ASMFC 1995b) and weakfish amendment #3 (Lockhart et al. 1996).

In October 1996, the Magnuson-Stevens Fishery Conservation and Management Act integrated federal habitat protection mandates with fisheries management. The Act required that fishery management councils identify “essential fish habitat” (EFH) for all species under federal management. Any federal agencies proposing projects within EFH would then be required to consult with the National Marine Fisheries Service as to the impacts of those projects on EFH. These mandates applied only to federally managed species, and not to species solely under the management of interstate fisheries management commissions.

Since federal and interstate fisheries management are intertwined for many species, the Commission took a long, hard look at the issues associated with identification of EFH, and considered the implications of the EFH initiative on Commission FMPs and managed species. The Commission chose to work as closely with NMFS and the councils on this issue as it was capable (Laney et al. 1997; Stephan et al. 1998). The Commission based its decision on its desire for: 1) improved habitat protection for managed species; 2) equivalent habitat protection for both federally and state managed species; 3) minimization of confusion for resource managers and the general public through consistency in habitat protection approaches; and 4) fiscal responsibility.

The Commission chose to adopt EFH designations prepared by the councils for any species managed jointly or in association with the councils, such as bluefish, scup, summer flounder, herring, and black sea bass. For species solely under Commission management, the Commission chose to identify all habitat and Habitat Areas of Particular Concern for each species under management, but chose to refrain from identification of EFH for the current time. The basis for the final decision included limitations imposed by fiscal resources and the lack of consultation requirements for any EFH designated solely by the Commission. Additional information about these decisions and the decision process can be found in Stephan et al. (1998).

The present document follows the Commission's 1994 outline and narrative, supplemented by information from the guidance documents prepared by the National Marine Fisheries Service on Essential Fish Habitat implementation, pursuant to the Magnuson-Stevens Act of 1996. For species under sole jurisdiction of the ASMFC, this document is the primary guide for plan preparation. For species managed jointly by the councils and Commission, NMFS guidance and regulations (DOC 1997) must be used as well.

FMP and Source Document Development

The ISFMP Charter (ASMFC 1995a) requires that FMPs developed by the Commission be concise and focus on fisheries management actions. Background synthesis information is included in the FMP source document. It is anticipated that most of the information developed under this guidance will be included in source documents. Elements which should be included directly in the FMP include: 1) identification of habitats and designation of Habitat Areas of Particular Concern (summarized from Sections I-II); 2) identification of significant habitat degradation issues (summarized from Section III); 3) recommendations/requirements for habitat conservation or enhancement (Section IV); and 4) research needs (Section V). Habitat information appropriate for the source document may be included in the fisheries management source document, or published as a separate habitat document. In this guidance, all habitat information used for FMP development will be referred to as information for "habitat section" preparation, rather than designated for inclusion in either FMPs or source documents.

The best available information and data should be used in development of the habitat sections. Statements should be supported by citations, which are listed in a "literature cited" section. In the absence of/in addition to peer reviewed literature, gray literature (state or federal technical reports, PhD dissertations or Masters theses) and personal communication with knowledgeable professionals should be sought, utilized, and cited as well. This includes, but is not limited to, that body of biological, environmental, and ecological data concerning habitats and their function and value, provided that the methods of collecting such information are clearly described and are generally accepted as scientifically valid. Data may come from state, federal, or private databases. If original unpublished information from the author is available (such as the calculations provided in the winter flounder plan (Howell et al. 1992) relating stock size and estuary size), then this information should be included, with any necessary explanation about the materials and methods which were applied.

In many cases, such as the determination of how much habitat is necessary to support a given population size, there will likely be insufficient information upon which to draw conclusions. This should be clearly stated, in order to show that the information was sought but unavailable, and to identify the issue as a research need. Identified research needs should be included in the section specifying research needs (Section V).

SECTION I. DESCRIPTION OF HABITAT

This section should describe the habitats, including the associated biological community, which are typically used by the species. Habitats should be classified by life stage to include spawning, egg/larvae, juvenile, sub-adult, and adult resident and migratory habitats.

Description and identification of habitats should be accomplished with maps and figures as well as in narrative form. Overall range maps are appropriate. General descriptions of the functional habitat types which the species uses should be drawn from Appendix 1, along with a description (written and/or figures) of distribution of these habitats. General migratory pathways should be identified. Some states have classified/identified areas of important habitat attributes and/or functions for fish/shellfish such as "Outstanding Florida Waters" and "Aquatic Preserves" in Florida, and "Primary Nursery Areas" and "Outstanding Resource Waters" in North Carolina. These areas have significance in the states' permitting programs, and should be integrated here if they overlap with habitat where the species is found. Seasonality of the species should also be addressed.

Information on biological, ecological, physical, and chemical habitat variables should be included in this section. Ecological variables include the biological community upon which the species depends or with which the species is associated. Characteristics such as substrate preference, dissolved oxygen levels, temperature, salinity and other pertinent variables should be identified. If habitat "dependence" (as discussed in Laney 1997) has not been

documented, then habitat utilization or association should be presented in this section. Where possible, documented linkages between habitat and species production should be described.

Approaches

A number of approaches have been used to identify species specific marine fish habitat. Approaches should be combined in order to present the best information with the widest geographic coverage, on a local scale.

Species distribution and/or relative abundance as indicated by fishery independent surveys has been proposed as a surrogate for habitat preference (Schreiber and Gill 1995; Lockhart et al. 1996; DOC 1997). This approach is useful; however, it is limited by the geographic and technical bounds of the fishery independent survey. It should be augmented by additional information.

Important habitats for managed species have also been identified by local technical experts (Mid-Atlantic Fishery Management Council 1991; National Marine Fisheries Service et al. In prep.). Peer reviewed information of this type, including a review of relative abundance and distribution data, has been assembled for most Atlantic estuaries by the National Ocean Service (Jury et al. 1994; Stone et al. 1994; Nelson et al. 1991).

In most cases, species specific information is not available for all local habitats. In these instances, alternative information should be presented. Examples of alternative information include habitat suitability modeling, identification of usable habitats, and presentation of information for similar species. The limitations of each of these approaches should be clearly stated. Use with other approaches should be considered.

A method recently applied to marine habitats which may have more significant use in the future is habitat suitability (HSI) modeling (Christensen et al. 1997). This methodology includes the identification of specific habitat variables which are significant to the distribution of the species. The coexistence of these variables can then be identified regionally and used to predict species presence in areas where species distribution is unknown. HSI modeling is limited by both the number of developed and tested models and the geographic range over which the assumptions are valid.

The identification of usable habitats is similar to habitat suitability modeling; however the process is much less refined. It simply includes the regional identification of all habitat types which are known to be used by the species or with which the species is associated in other regions.

Finally, for species for which a paucity of information exists, identification of habitats used by similar species (i.e. species of the same genus or with similar life history characteristics) should be used as a surrogate.

Maps should be included which reflect the information discussed above. The use of GIS is encouraged. Coordination with other ASMFC programs, NMFS Office of Habitat Conservation, National Ocean Service Strategic Environmental Assessments Division, and federal fishery management councils is vital in the development of habitat related GIS databases. (For further information, see the list of contacts included in Appendix 2.)

Section Elements and Format

1. A narrative description of important habitats (Appendix 1), including the elements discussed above. Information should be presented using the following outline:

- I. Description of Habitats (including residence and migration routes)
 - A. Spawning Habitat
 - B. Eggs & Larvae Habitat
 - C. Juvenile
 - D. Sub-Adult Habitat
 - E. Adult

2. Maps describing local and regional habitats, migratory routes and species range.

3. A matrix modeled after Table 1, which includes any significant environmental factors affecting the species, with citations for all information included (from Fahay et al. 1998, and Schreiber and Gill 1995).

Table 1. Significant environmental, temporal, and spatial factors affecting distribution of each of the species' life history stages.

Life Stage	Time of Year	Location	Temperature	Depth (m)	Salinity	Substrate	Estuarine Use	Notes
Spawning Adults								
Eggs/Larvae								
Juvenile								
Sub-Adult								
Adults								

SECTION II. IDENTIFICATION AND DISTRIBUTION OF HABITAT AREAS OF PARTICULAR CONCERN

Habitat Areas of Particular Concern, or HAPCs, are described in the Essential Fish Habitat Interim Final Rule (DOC 1997) as areas within Essential Fish Habitat (EFH) which satisfy one or more of the following criteria: 1) provide important ecological function; 2) are sensitive to human-induced environmental degradation; 3) are susceptible to coastal development activities; or 4) are considered to be rarer than other habitat types. Descriptions of EFH are not currently being included in Commission FMPs. The definition of HAPCs is therefore modified to be areas within the species' habitat which satisfy one or more of the aforementioned criteria.

A HAPC is a subset of the "habitats" described in Section I, and could include spawning habitat (e.g., particular river miles or river reaches for striped bass populations), nursery habitat for larvae, juveniles and subadults, and/or some amount of foraging habitat for mature adults. HAPCs are geographic locations which are particularly critical to the survival of a species. Determination of the amount of habitats (spawning, nursery, sub-adult, adult residence and adult migration routes) described in Section I which should be classified as HAPCs may be difficult. The intent of this section is to identify areas which are unequivocally essential to the species, since all used habitats have already been identified in Section I.

Examples of HAPCs include: any habitat necessary for the species during the developmental stage at which the production of the species is most directly effected (Langton et al. 1996); spawning sites for anadromous species; benthic areas where herring eggs are deposited; primary nursery areas (NCDMF 1991); submerged aquatic vegetation in instances when species are determined to be "dependent" upon it (Laney 1997); and inlets such as those located between the Atlantic Ocean and bays or sounds, which are the only areas available for providing ingress by larvae spawned offshore to their estuarine nursery areas.

The extent of HAPCs for a species may depend on the current stock size and/or the stock size for which a species Management Board and Technical Committee establishes targets. Given the current state of knowledge with regard to the relationship between habitat and production of individual species, this information is not likely to be available for many species. One of the species for which a relationship between nursery area and production has been demonstrated to a limited degree is winter flounder (Howell et al. 1992).

If known, the historical extent of HAPCs should also be included in this section, in order to establish a basis for Section III. Use of Geographic Information Systems is encouraged to depict the historical and current extent of HAPCs, and determine the amount of loss/degradation, which will assist in targeting areas for potential restoration.

SECTION III. PRESENT CONDITIONS OF HABITATS AND HABITAT AREAS OF PARTICULAR CONCERN

This section should include, to the extent the information is available, quantitative information on the amount of habitat and H.A.P.C which is presently available for the species, and information on current habitat quality. Reasons for reduction in areal extent (either current or historical), should be addressed, for example, “dam construction has eliminated twenty percent of historical spawning habitat.” Appendix 2 identifies sources of information appropriate for this section.

All current threats to the species’ habitat should be discussed in this section. Examples of threats are given in Table 2. If known, relative impacts from these activities should be identified and prioritized. For example, hydrological alterations and their impacts are a high priority for anadromous species. These may include freshwater inflow/diversions; changes in flows due to hydropower, flood control, channel modifications, or surface/aquifer withdrawals; and saltwater flow changes due to reductions in freshwater inflows or deepening of navigation channels, which facilitate upstream salinity increases. Threats should also be assessed for their effect on the ability to recreationally and commercially harvest, consume, and market the species.

Table 2. Potential sources of adverse impacts to riverine, inshore and offshore fish habitats and their estimated degree of average impact. The degree of impact may vary considerably locally or regionally. Inshore areas include estuaries; H=High impact, M=Medium Impact, and L=Low impact (after NEFMC Technical Team, In prep.).

THREATS	Riverine	Inshore	Offshore
CHEMICAL			
Oil/Petroleum	M	M	M
Heavy Metals	M	M	M
Nutrients	H	H	L
Pesticides	M	M	L
Herbicides/Fungicides	M	M	L
Acid	M	M	
Chlorine	M	M	L
Thermal	M	M	
Metabolic/Food Waste	M	M	L
Suspended Particles	M	M	L

THREATS	Riverine	Inshore	Offshore
CHEMICAL (cont.)	(cont.)	(cont.)	(cont.)
Radioactive Wastes	L	M	M
Greenhouse Gases	M	M	L
BIOLOGICAL			
Exotic Species	M	M	M
Nuisance/Toxic Algae	L	H	M
Pathogens	M	M	M
PHYSICAL			
Channel Dredging	M	H	

Dredge & Fill	M	H	
Marina/Dock Construction	M	H	
Vessel Activity	L	H	L
Bulkheads	M	M	
Seawalls/Groins/Jetties		M	
Tidal Restriction	M	H	
Dams	H	M	
Water Diversion	H	M	
Deforestation	H	M	
Gravel/Mineral Mining	M	M	M
Oil/Gas Mining	L	M	M
Peat Mining	M		
Debris	M	M	M
Dredge Disposal	L	M	M

This section will serve as a basis for the development of recommended or required actions to protect the species' habitat, which will be outlined in Section IV. For example, the effectiveness of water quality standards should be reviewed in this section. If they are ineffective or inappropriate at protecting water quality at a level appropriate to assure the productivity and health of the species, then a recommendation should be included under the recommendations section (Section IV) for improvement of water quality standards.

Section Format

This section should include a subsection for each type of habitat from Appendix 1 which was identified in Section I. The following outline should be used:

Section III.

A. Habitat Type I

1. Estimates of habitat quantity and any changes over time, such as but not limited to areal extent and trends over time; availability to the species and changes in availability; etc.
2. Description of habitat quality and any changes over time, such as but not limited to water quality; functional ability of wetlands, etc.
3. Description of current threats, including:
 - a. What is the magnitude of the impact, especially in light of the use by the species?
 - b. What is the length in time of the impact and does it occur when the habitat is used by the species?
 - c. Are the impacts irreversible?
 - d. How can the impacts be avoided, minimized, or mitigated? (This information will be especially important for Section IV)
 - e. Estimates of cumulative and secondary impacts to the habitat.
4. Any affects of degradation or loss of this habitat on the ability to harvest and/or market the species

B. Habitat Type II (etc...)

SECTION IV. RECOMMENDATIONS AND/OR REQUIREMENTS FOR FISH HABITAT CONSERVATION/RESTORATION

Information from previous sections, including EFH (for joint Commission/council plans), HAPCs and other known habitat used by the species, should all be considered in crafting recommendations/requirements for fish habitat conservation and restoration. This will ensure protection of all values and benefits of habitat for fisheries, and aid in making decisions on setting priorities for fish habitat restoration. This section of the plan should integrate the discussion from Sections I, II, and III in developing the recommendations/requirements for habitat conservation/restoration. These recommendations/requirements should come from an assessment of the qualitative and quantitative information on habitat, the health of the stock, and the status of the fishery.

Recommendations/requirements should be directed to the state marine fisheries agency, since these are the agencies involved in development of fishery management plans. Often the objective of habitat related recommendations/requirements will be carried out by another entity such as a state water quality agency. In these cases, the recommendation/requirement should be worded so that it directs the state marine fisheries agency to either communicate the recommendation/requirement to the other entity, or, to the best of its ability, ensure that the other entity meets the recommended/required objective. The recommendation/requirement must be clearly stated and may require substantial explanation in order to facilitate its implementation, especially when the objective may be met by another entity.

FMP recommendations and requirements differ in that requirements are mandatory actions under the Atlantic Coastal Fishery Cooperative Management Act (P.L. 103-206 et. seq.), which result in penalties if not implemented. At the date of this writing, only one habitat related requirement has been included in a Commission FMP. This requirement mandates that state marine fisheries agencies communicate with their appropriate state agency regarding dredging impacts to juvenile winter flounder. An example of an issue which is appropriate to address as an FMP requirement is a significant impact to a H.A.P.C. from fishing gear. Further guidance is currently being prepared on the issue of fishing gear impacts to habitat. ISFMP staff species coordinators (Appendix 2) should be consulted for further information on the use of required measures in FMPs, and the appropriateness of habitat related requirements which may be considered for inclusion in this section.

Section Elements

A number of habitat related recommendations are listed below which may be appropriate for many FMPs and should be considered for inclusion in the habitat section. These recommendations should be considered in addition to the species specific recommendations which should be identified from Sections I-III.

1. State marine fisheries agencies should identify state permitting and planning agencies which regulate those activities identified in Section III as likely to adversely affect H.A.P.C.s and habitats, either by destruction of habitat or degradation of quality. The marine fisheries agency should work with the relevant permitting or planning agency in each state to develop permit conditions and planning considerations to avoid or mitigate adverse impacts on H.A.P.C.s or other habitats necessary to sustain the species. Standard permit conditions and model policies that contain mitigation techniques should be developed. The development of Memoranda of Understanding (MOUs) with other state agencies are recommended for joint review of projects and planning activities to ensure that habitat protections are adequately incorporated.

For example, dredging windows should be established to avoid impacts to susceptible life stages. Dredging windows should be coordinated to ensure practical opportunities for permitted dredging to take place.

2. When it is expected that impacts will occur from an activity described in Section III, but probably not above some *de minimus* level, prohibition of the activity may not be warranted, but the marine fisheries agency should request that the appropriate agency consider requiring application of Best Management Practices for the activity.

3. State marine fisheries agencies should coordinate with state water quality agencies and state coastal zone management agencies to ensure that Clean Water Act Section 319 nonpoint source control plans and Coastal Zone Act Reauthorization Amendment Section 6217 coastal nonpoint source control plans are developed and implemented

so as to minimize adverse impacts of nonpoint source pollution on the species. In particular, marine fisheries agencies should consider whether areas merit designation as critical coastal areas under state 6217 programs (nonpoint source pollution control under the Coastal Zone Management Act amendments of 1990) due to water quality impacts to fish habitat, and should provide input to the 6217 lead agencies

4. State marine fisheries agencies should coordinate with appropriate state agencies to strengthen compliance with NPDES or SPDES permits.
5. State marine fisheries agencies should work with state coastal zone management agencies to determine whether:
1) additional state policies for habitat protection should be adopted under the state coastal management program; 2) additional federal activities should be added to the state coastal management programs list of activities subject to state consistency review; and 3) the state is fully utilizing the Coastal Zone Management Act federal consistency process for protection of fish habitats.
6. When states have identified habitat restoration as a need, state marine fisheries agencies should coordinate with other agencies to ensure that habitat restoration plans are developed, and funding is actively sought for plan implementation and monitoring.
7. State marine fisheries agencies should coordinate with and provide input to the state water quality agency in development and updating of the Clean Water Act section 303(d) list (priority list of water not meeting state water quality standards). In addition, state marine fisheries agencies should review the adequacy of water quality standards to protect the species of concern and should participate in the triennial review of the state water quality standards.
8. State marine fisheries agencies should review oil spill prevention and response plans for preventing accidental release and recommending prioritized response in H.A.P.C.s.
9. State marine fisheries agencies should work closely with the appropriate Coast Guard District Office in the development, amendment, and implementation of areawide oil spill contingency plans.
10. State marine fisheries agencies should work closely with water quality agencies in the development or revision of river basin plans to identify degraded or threatened resources and recommend preventative, remedial or mitigation measures.
11. State marine fisheries agencies should work with the appropriate agencies to develop contaminated sediment remediation plans or active sediment pollution prevention programs for areas with or susceptible to sediment contamination.
12. State marine fisheries agencies should coordinate with appropriate National Estuary Program (NEP) committees to ensure that NEP Comprehensive Coastal Management Plans (CCMPs) identify and implement habitat protection and restoration needs.

SECTION V. INFORMATION NEEDS/RECOMMENDATIONS FOR FUTURE HABITAT RESEARCH

This section should contain any recommendations, preferably in priority order, for research which the ASMFC views as necessary for the sound management of the species and its habitat. This may include basic life history information which will result in the more complete identification of the habitat requirements of the species for all life stages; tagging studies for determination of migratory pathways and habitat use patterns; as well as other habitat related information. Recommendations should be developed by reviewing sections I-IV, and identifying topics requiring further information.

Research recommendations should provide for the comprehensive identification of the habitat requirements of the species or species assemblages that define the interrelationship between the species, its environment and potentially perturbing natural and human activities. Research is encouraged at an appropriate spatial and temporal scale that is directed at determining and reasonably predicting the impacts of natural and human activities on H.A.P.C.s. The habitat research plan of the National Marine Fisheries Service (Thayer, Thomas and Koski, 1996)

may be a useful reference, since it provides a framework to conduct coastal and estuarine research, and, most importantly, transfers results to those management components involved in permit reviews and development of habitat sections of FMPs.

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APPENDIX 1

Coastal Atlantic Habitat Types

This appendix identifies and defines Atlantic habitat types after Cowardin et al. (1979).

APPENDIX 2

Resources for Further Information

CONTACTS¹: This portion of the appendix lists names and addresses of individuals and organizations expected to be contacted most frequently for further information.

ASMFC Habitat Program

Habitat Coordinator
1444 Eye St., NW, 6th Floor
Washington, DC 20005
202/289-6400 Robin Peuser
978/281-9397 Dianne Stephan
Contacts for state, federal, and local habitat protection programs; general habitat information; information on specific issues affecting fish habitat; and specific information for interpreting this guidance (Robin Peuser or Dianne Stephan).

ASMFC Research and Statistics Program

Director of Research and Statistics
1444 Eye St., NW, 6th Floor
Washington, DC 20005
202/289-6400
Information on state fisheries sampling programs (Jeff Brust) and cooperative coastwide fisheries databases either under development or currently available (Lisa Kline).

National Marine Fisheries Service (NMFS), Office of Habitat Conservation

1315 East West Highway
Silver Spring, MD 20910
301/713-2325
Information on essential fish habitat (Lee Crockett); development of national GIS habitat database (Chris Perle); and federal programs affecting fish habitat (Susan-Marie Stedman)

NMFS Northeast Regional Office, Habitat Conservation Division

1 Blackburn Drive
Gloucester, MA 01930
978/281-9332
Information on regional habitat issues and federal permitting agencies for the states of Maine south through Virginia (Pete Colosi).

NMFS Southeast Regional Office, Habitat Conservation Division

9721 Executive Center Drive, N.
St. Petersburg, FL 33701-2432
813/570-5317
Information on regional habitat issues and federal permitting for the states of North Carolina through Florida (Andy Mager).

National Ocean Service ORCA/SEA Division

N/ORCA14, SSMC4, 9th Floor
1305 East-West Highway
Silver Spring, MD 20910
301/713-3000 x-189
Information on estuarine distribution of managed and other species and GIS applications. (Dr. Mark Monaco).

RESOURCES: The following portion of the appendix will list data and literature sources which may be helpful in preparing FMP habitat sections. In the following tables, increasing numbers of “x”s indicate an increasing value in the quality or quantity of information available from that source. Names and addresses of individuals in state and federal agencies may be obtained from ASMFC’s Habitat Manager’s Database (Greene et al. in prep.) which is currently being developed.

¹Contact information is current as of 6/98.

APPENDIX 2
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APPENDIX 2
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