
HABITAT HOTLINE ATLANTIC

Atlantic States Marine Fisheries Commission

Fall/Winter 2008, Volume XV, Number 3



A Sneak Peak at Diadromous Habitat

Release of ASMFC Habitat Management Series #9

In January 2009, the Commission will publish the ninth document in its Habitat Management Series entitled, *Atlantic Coast Diadromous Fish Habitat: A Review of Utilization, Threats, Recommendations for Conservation, and Research Needs*, by Karen E. Greene, Jennifer L. Zimmerman, and R. Wilson Laney. While the document is going through the publication process, we thought we would give you a glance at its contents. Excerpts from the introduction for the publication follow:



General Background

The Atlantic States Marine Fisheries Commission (hereafter referred to as ASMFC or the Commission) is the principal agency responsible for the management of many diadromous fish species in state waters...

...ASMFC coordinates interstate fishery management plans for seven diadromous fish species. Of these

seven species, striped bass, Atlantic sturgeon, American shad, hickory shad, alewife, and blueback herring are anadromous; the only ASMFC-managed catadromous species is American eel. Throughout their life history, diadromous fishes occupy a broad range of rivers, bays, and estuaries from Florida to Canada, as well as the Atlantic Ocean. All diadromous fish share the common need for fresh, estuarine, and marine waters at various stages in their development. Some of these species, such as the alosines, share similar life history characteristics and range of habitat as well...

...All Atlantic coast states are impacted by numerous threats to their natural resources; diadromous fish species are particularly vulnerable because they utilize both coastal and inland habitat during portions of their life history. Poor water quality, altered habitat, blocked access, suboptimal conditions, and invasive species are just a few of the conditions that jeopardize many fish. According to the ASMFC Five-Year Strategic Plan (2009-2013), the loss and degradation of nearshore marine and estuarine fish habitat is a significant factor affecting the long-term sustainability of the nation's fisheries. Diadromous fish species occupy these habitats during a critical period in their life history; it is therefore imperative that fisheries managers provide coordinated management of these areas...

(continued on page 2)



(continued from page 1)



Ecological Significance of Diadromous Fish Species

Diadromous fish have historically played a critical ecological role throughout the range of their habitats. For example, in freshwater, adult shad and river herring returning to spawn are assumed to be food for other fish, reptiles (e.g., snakes and turtles), birds (e.g., ospreys, green herons, eagles, cormorants), and mammals (e.g., mink). Egg, larval, and juvenile shad and river herring may also be consumed by both vertebrate and invertebrate predators in freshwater, estuarine, and nearshore environments. Shad and river herring, which spend several years in the marine environment growing to maturity, bring a significant source of nutrient input to freshwater and estuarine environments. In a second example, American eel are preyed upon by a variety of fish, mammals, and birds, including mink, raccoon, striped bass, and bald eagles. As American eel can contribute up to 25% of the biomass in individual systems, they may be a very important part of the food web. In a third example, documented freshwater predators of Atlantic sturgeon include gar and sea lamprey, and in marine waters, Atlantic sturgeon may be preyed upon by birds, seals, sharks, and other fish.

In addition, semelparous American shad in south Atlantic coastal rivers were a significant food source before their decline. Furthermore, adult blueback herring are commonly preyed upon by striped bass. Although striped bass populations were once depleted, they have now fully recovered; this increased predation may have contributed to a decline in blueback herring abundance in the Connecticut River since 1992. In recent years, predation on alewife and blueback herring by double-crested cormorants staging near the entrance to fishways has increased dramatically in Rhode Island rivers. Predation by otters and herons has also increased in the same area, but to a lesser extent.

Additionally, diadromous fish have historically been a significant food source for human consumption. The American shad is responsible for saving George Washington's army from starvation at Valley Forge during the winter of 1778. The spring American shad run up the Schuylkill River was so plentiful that thousands of fish were netted with each haul, providing enough fish to feed the starving soldiers. Another species, American eel, was once an important food source to Native Americans and early European settlers due to their high nutritional value. They are considered to have the highest nutritional value of fish. In addition, Atlantic sturgeon have been a valuable resource since pre-colonial times. This species was often used by Native Americans, as evidenced by remains at archeological sites. Atlantic sturgeon were harvested as early as the 1600's by colonists, and were the primary cash crop in Jamestown before tobacco. Their leather was used for clothing and bookbinding, and swim bladders were used for carriage windows and to make gelatin for jellies, wine, beer, and glue. Atlantic sturgeon were also used as fertilizer for plants and fuel for steam-powered vessels. In the 1870's, a major fishery was established for caviar, and within a hundred years, the fishery had completely collapsed.



Most American shad stocks are at historically low levels, and landings have plummeted from a peak of 30,000 metric kg at the turn of the century to a low of 0.6 million kg in 1996. Hickory shad, whose meat is bony and regarded as inferior to American shad, but is prized for its roe, has supported minor commercial fisheries. It is highly sought after by sport fishermen when adults ascend rivers and tributaries during their spawning run, and numbers of fish and landings have increased significantly in recent years. For American eel, landings in the United States have fallen from a high of 1.8 million pounds in 1985 to a low of 641,000 pounds in 2002. For Atlantic sturgeon, in the late

1800's a caviar fishery was established, and by 1890, harvest peaked at approximately 3350 mt (7 million lbs), which lead to a significant reduction in population size. By 1901, landings were 10% of the former peak at 295 mt. Further reductions in populations occurred in the 1970's and 1990's, with landings in the 1990s averaging 84.2 mt. As a result, in 1998, the ASMFC initiated a 40-year commercial fishing moratorium.

Document Content

This document is the most comprehensive compilation of habitat information to date on Commission-managed diadromous species. The primary focus of this document is on inshore and nearshore habitats along the Atlantic coast for all life stages of the included species, but offshore habitat is also discussed. In contrast with the catadromous American eel, the six anadromous species discussed spawn in fresh or brackish waters and spend a portion of their juvenile/sub-adult life stage in freshwater and/or brackish waters. However, American eel spawn in saltwater; following an oceanic larval stage, they migrate to fresh or brackish waters to grow to maturity. Inland and coastal waters provide critical habitat for spawning, growth, feeding, and in some cases, residential habitat for diadromous fish species. Thus, impacts to these areas are likely to have consequences for species that rely on these areas.

In 1998, the Commission published the *ASMFC Guidance for the Development of FMP and Source Document Habitat Sections* (since revised in the *2008 ASMFC Habitat Program Operational Procedures Manual*), which served as the primary guide for preparation of this document. Currently, Commission FMPs and FMP amendments contain varying degrees of habitat information, including habitat-related management objectives and recommendations. Therefore, this document will serve as a tool for fisheries managers to amend existing FMPs to include the most current and comprehensive habitat information.

The Commission's FMP guidance document indicates that the best available information and data should be

used in the development of habitat sections, including, but not limited to, peer reviewed literature, gray literature, personal communication with knowledgeable professionals, and unpublished information with adequate citations. In accordance with this directive, this document has utilized many available sources, including state, federal, and private sources to cover the major sections required for FMPs. Furthermore, maps were developed using a GIS interface that provide a comprehensive source of spawning habitat information for

Commission-managed anadromous species (see DVD supplement).

The authors of this document mined existing data sources that identified confirmed or suspected habitats, and those that were deemed important or essential (see text of this document as well as tables included on supplemental DVD). Many new studies have been conducted in recent years, including physical, chemical, and ecological requirements, and are included in this document. Information about the condition of existing habitat has been assessed in some areas, as well as recommendations for reversing impacts or preserving the status quo.

In addition, all Atlantic coastal states submitted a State Wildlife Action Plan (SWAP) to the U.S. Fish and Wildlife Service in 2005. The purpose of the State Wildlife Grants Program is to provide federal dollars to every state and territory to support conservation efforts to prevent wildlife from becoming endangered. The amount of information on diadromous fish species varies within individual SWAPs, but collectively, this represents a significant amount of data that was not previously available before



(continued on page 4)



publication of this document. Inclusion of this information provides fish habitat managers with additional resources to identify and protect important habitats.

Unfortunately, we still lack a complete understanding of what habitats are essential to a given species, what the effects of anthropogenic activities are on habitat, and what can be done to mitigate these impacts. This document attempts to address some of these concerns. By identifying all known and suspected habitat, habitat managers can begin to piece together the full range of habitat that each species occupies. Information about physical, chemical, and ecological requirements may help managers to delineate essential habitat for each species at various life history stages. Where information exists on present condition of habitat, managers can predict the fate of resident species. Finally, recommendations for conservation and restoration can be developed to ensure that there will be adequate habitat for all diadromous fish species.

For more information, or a copy of the full publication including spawning areas DVD, please contact:

Jessie Thomas-Blate
Habitat Coordinator
Phone: (202) 289-6400
Email: JThomas@asmfc.org



Check Out the Rest of the ASMFC Habitat Management Series!!

Stephan, C. D., and T. E. Bigford. 1997. *Atlantic Coastal Submerged Aquatic Vegetation: A Review of its Ecological Role, Anthropogenic Impacts, State Regulation, and Value to Atlantic Coastal Fish Stocks* (ASMFC Habitat Management Series #1).

Summary: This document presents four important technical papers which review: (1) the ecological value of SAV; (2) SAV regulation by the Atlantic coast states; (3) anthropogenic impacts to SAV; and (4) the importance of SAV to fish stocks managed by ASMFC. The document also outlines seven recommendations regarding SAV policy and management.

Stephan, C. D., and K. Beidler. 1997. *Management of Atlantic Coastal Marine Fish Habitat: Proceedings of a Workshop for Habitat Managers* (ASMFC Habitat Management Series #2).

Summary: This document is a collection of papers presented at a workshop that gave state and federal fish and habitat managers an opportunity to expand their tool chest for the protection of fish habitat. Formal presentations covered topics from identifying the links between habitat and fisheries impacts to a review of existing/creative tools for habitat management.

Stephan, C. D., W. J. Goldsborough, J. H. Dunnigan, and P. A. Sandifer. 1997. *Submerged Aquatic Vegetation Policy* (ASMFC Habitat Management Series #3).

Summary: Based on literature reviews and policy research conducted under the auspices of the ASMFC Habitat Committee, submerged aquatic vegetation (SAV) was found to be significantly important to many ASMFC-managed species, and afforded different degrees of protection up and down the coast. This policy was developed to communicate the need for conservation of coastal SAV resources, and highlight state and Commission-based activities for implementation of a coastal SAV conservation and enhancement program.

Stephan, C. D., R. L. Peuser, and M. S. Fonseca. 2000. *Evaluating Fishing Gear Impacts to Submerged Aquatic Vegetation and Determining Mitigation Strategies* (ASMFC Habitat Management Series #5).

Summary: The Submerged Aquatic Vegetation (SAV) Policy directed the Commission to develop technical guidelines and standards to objectively determine fishing gear impacts to SAV, and develop standard mitigation strategies. Certain specific characteristics of SAV are reviewed in the document, since these characteristics may influence SAV susceptibility to damage or loss from fishing gear impacts. The characteristics of concern include: (1) light requirements; (2) asexual reproductive structures (also called growing tips or meristems); (3) reproductive structures (flowers and seeds); and (4) ability to recover from disturbance or injury. An additional factor that can affect SAV susceptibility to physical damage is the substrate type in which the SAV is found. The document also discusses above and below-ground impacts of fishing gear on SAV, and mitigation strategies.

Greene, K. 2002. *Beach Nourishment: A Review of the Biological and Physical Impacts* (ASMFC Habitat Management Series #7).

Summary: This paper aims to review the current level of knowledge regarding impacts of beach nourishment (as of 2002), and to identify areas where information is lacking. This paper outlines the basic issues surrounding beach nourishment: (1) coastal erosion and possible management approaches; (2) how beach nourishment is carried out; (3) federal and state activities; (4) the environmental effects at the mine site and the target beach; (5) research needs; and (6) recommendations for improving monitoring studies. This paper also reviews major studies that have concluded insignificant impacts of beach nourishment, with a brief discussion of the findings. Those beach nourishment studies that have found the effects to be more serious, or non-beach nourishment studies and laboratory experiments whose results suggest potential impacts, are discussed in greater detail. This information provides states with a basic understanding of what beach nourishment is, the level of each state's involvement (as of 2002), and how these activities are affecting the marine and beach environment. Finally, this paper serves to educate the general public and provide sources that can be further examined to gain an in-depth knowledge of beach nourishment.

Coen, L. D., and R. E. Grizzle. 2007. *The Importance of Habitat Created by Molluscan Shellfish to Managed Species along the Atlantic Coast of the United States* (ASMFC Habitat Management Series #8).

Summary: This document outlines the ecological services provided by various species of shellfish found along the Atlantic coast, including: (1) reef-forming species; (2) aggregations of living shellfish; (3) dead shell accumulations; and (4) cultured ground. It also discusses the four characteristics of shellfish habitat-hard substrate, vertical structure, food, and water quality regulation-that result in a significant enhancement of overall habitat value for many species of Atlantic shelf, coastal, and estuarine waters. The known status of important habitat-creating shellfish species is covered, in addition to the relation of these habitats to ASMFC-managed species. Finally, management issues and research needs are discussed, including a list of recommended future research.

Electronic copies of the documents listed above can be found at: <http://www.asmfc.org/educationOutreach.htm>. For hard copies, or for more information, please contact:

Jessie Thomas-Blate, Habitat Coordinator

Phone: (202) 289-6400

Email: JThomas@asmfc.org

Atlantic States Marine Fisheries Commission
1444 Eye Street, N.W., 6th Floor
Washington D.C. 20005

Return Service Requested

HABITAT HOTLINE ATLANTIC

Jessie Thomas-Blate
Editor

Funded by



Any portion of this newsletter may be reproduced locally with credit given to the Atlantic States Marine Fisheries Commission Habitat Program.

Printed on 100% Recycled Paper Using Vegetable-Based Ink

IN THE NEWS

IUCN Red List: Status of the World's Marine Species Released

In October 2008, the International Union for Conservation of Nature issued *The 2008 Review of the IUCN Red List of Threatened Species*TM. This list is long established as the world's most comprehensive information source on the global conservation status of plants and animals. The list this year was released at the IUCN World Conservation Congress in Barcelona, Spain. Each section explores a different aspect or biodiversity realm of the IUCN Red List, including: The IUCN Red List: a key conservation tool; Freshwater biodiversity: a hidden resource under threat; Status of the world's marine species; Broadening the coverage of biodiversity assessment; Species susceptibility to climate change impacts; and The Mediterranean: a biodiversity hotspot under threat.

Approximately 1,500 new marine species were added to The List this year, including all of the world's known species of sharks and rays, groupers, and reef-building corals. The IUCN hopes to complete over 20,000 Red List assessments for marine species by 2012. They are working with Old Dominion University to accomplish this great task.

For an electronic copy of the Status of the World's Marine Species, please visit: http://cmsdata.iucn.org/downloads/status_of_the_world_s_marine_species.pdf.

AVEDA Launches Plastic Cap Recycling Program

Aveda found that a majority of plastic bottle caps do not get recycled today. Often these caps end up as litter or trash, showing up in landfills and beaches or migrating into our rivers and oceans. You can be part of the solution by joining *Recycle Caps with Aveda*. In this program, caps are collected at stores and schools and then sent by Aveda to their recycler where the material is recycled into new caps and containers.

The program accepts caps that are rigid polypropylene plastic, sometimes noted with a 5 in the chasing arrows recycling symbol. This includes caps that twist on with a threaded neck such as caps on shampoo, water, soda, milk and other beverage bottles, flip top caps on tubes and food product bottles (such as ketchup and mayonnaise), laundry detergents, and some jar lids, such as peanut butter. Excluded from collection are pharmaceutical lids and non-rigid lids such as yogurt lids, tub lids (margarine, cottage cheese), and screw on lids that are not rigid.

Join the *Recycle Caps with Aveda* campaign. Bring your plastic caps into an Aveda Store and feel great knowing that they will be repurposed into new Aveda packaging and kept from entering our waterways and harming wildlife.