

TEWG Habitat Subgroup White Paper
April 6, 2015
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Habitat Subgroup Charge: Consider the impacts from various factors affecting river herring habitat including, but not limited to, connectivity (e.g., fish passage), water quality/quantity, and appropriate habitat characteristics.

Members: Over 40 river herring habitat experts representing maritime Canada and the US Atlantic coastal states, Federal government, Tribes, academia, hydropower industry, fisheries and environmental organizations, participate in the subgroup. The information provided below reflects individual expert opinion and not consensus of the group.

http://www.greateratlantic.fisheries.noaa.gov/protected/riverherring/tewg/habitat/tewg_habitat_subgroup_071514.pdf

Summary of Process and Outcomes: To date the Habitat Subgroup has met 3 times, in April, August and November 2014, and focused on refinement of threats and priorities for applied research and monitoring to fill key data gaps.

Research Priorities: Since a great deal of research and monitoring has been undertaken in the years since the 2009 ASMFC Diadromous Fish Habitat Compendium (http://www.asmfc.org/files/Habitat/HMS9_Diadromous_Habitat_2009.pdf) was published, the subgroup decided that identification of key research needs and data gaps required a more thorough understanding of current and recently completed research. A spreadsheet template was developed to compile information from members about geographies and topics of current work (http://www.greateratlantic.fisheries.noaa.gov/protected/riverherring/tewg/habitat/TEWG_Habitat_Subgroup_Watershed_Characteristics_10_15_14.xlsx).

With more complete information on ongoing work provided in the spreadsheet, the group discussed the research priorities document as compiled by NOAA staff from existing management documents (dated 5/31/14).

<http://www.greateratlantic.fisheries.noaa.gov/protected/riverherring/tewg/tewgresearchdocumentfinal.pdf>

Of research priorities previously identified, a relatively large number of studies throughout the region are currently investigating aspects of in-stream productivity; few current studies were identified for acoustic tagging, estuary habitat use, and novel detection techniques. Of data gaps previously identified, estuary habitat use and effects of nonpoint pollution/landuse are being investigated to some extent in southern New England and the Mid-Atlantic.

River herring distribution and habitat use in the southern portion of the range, as well as oceanic distribution and habitat use, remains a significant gap. There is a need to compile all the data available regarding oceanic distribution, from NEAMAP, SEAMAP, NMFS NEFSC Trawl Survey, and Cooperative Winter Tagging Cruise databases.

Additional topics of interest for further discussion and compilation into a habitat-specific research needs document include: mortality at dams; habitat use in estuaries, particularly the role of structure, e.g.,

SAV, shellfish beds; effects of land use on habitat; and novel detection techniques such as eDNA to determine distribution/abundance. Comparative studies at locations across the range could be particularly valuable, as could a coordinated monitoring strategy along the East Coast that is comparable between regions.

Threats: Members provided input on which framework is best to identify the threats facing river herring. The spreadsheet showing threats by region developed by the NOAA Status Review Team (SRT) during the listing decision process is a useful starting point to which additional information can be added

(http://www.greateratlantic.fisheries.noaa.gov/protected/riverherring/tewg/habitat/pdf_of_river_herring_threats_assessment_ranking_sheet_blank.pdf)

In particular there is interest in adding more detailed information about sources of stress to help focus conservation and restoration actions. Some examples of threats that need further consideration include reduction of freshwater habitat due to sea level rise or water abstraction for other uses; toxic exposure from legacy contaminants, ocean energy development and exploration and effects of urbanization and shoreline hardening.

Consideration of mitigation measures that have proven effective, and potential mitigation measures for threats which have not yet materialized, i.e., offshore oil and gas exploration, including seismic testing, is also warranted.

Related Tools and Plans: Throughout the course of subgroup discussions we have noted resources that could serve as examples or provide tools to benefit river herring habitat recovery. Other species of conservation concern, such as the suite of diadromous fishes that occurs along the Atlantic Coast, and Federally listed Pacific salmon species, offer helpful models and tools to consider.

Barrier Data/Prioritization

- Aquatic connectivity prioritization for the US Atlantic coast, by 3 subregions: <https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/freshwater/stream/Pages/default.aspx>
- Road-stream crossing survey data from 6 US northeast states is available here: http://www.streamcontinuity.org/cdb2/search_crossings.cfm; North Atlantic Aquatic Connectivity Collaborative (NAACC) has a project scheduled for completion in Fall 2016 to develop a common road crossing survey protocol across the North Atlantic LCC, expand the database, and incorporate culverts into a new version of the NE Aquatic Connectivity project/web-based decision support tool
- A subcommittee member is looking into obtaining geolocations of culverts and dams on streams and rivers in New Brunswick and Nova Scotia

Watershed-based Restoration Plans for River Herring

In 2014 the Atlantic Coast Fish Habitat Partnership (ACFHP) and The Nature Conservancy received funding from the National Fish and Wildlife Foundation's (NFWF) to develop habitat restoration priorities for river herring in select watersheds along the Atlantic Coast. These watersheds included the Chesapeake Bay, Gilbert Stuart (Narrow) River in Rhode Island, the Connecticut, Hudson, and Delaware Rivers, and the Santee-Cooper system. Chesapeake Bay is a key focal area and in May 2014 ACFHP and The Nature Conservancy hosted a 2-day river herring experts workshop in Annapolis,

MD. In each of the other priority geographies the project team has employed a variety of formats to gather information from river herring experts including: webinars, a panel discussion at a regional fisheries conference, individual outreach to state fisheries biologists and others, and a review of current literature and reports. Major categories of restoration needs identified include upstream and downstream passage barriers, water quality, water quantity/flow alteration, and excessive predation (especially related to passage barriers). Many members of the TEWG contributed to this project. Final report: <http://www.atlanticfishhabitat.org/planningresources/publications/>.

- The Habitat Blueprint is NOAA's strategy to integrate habitat conservation throughout the agency, focus efforts in priority areas, and leverage internal and external collaborations to achieve measurable benefits within key habitats such as rivers, coral reefs, and wetlands. Within each of the NOAA regions, there has been effort to form habitat focus areas. There were a series of nominations made for the Greater Atlantic Region (GAR) that were reviewed and scored based on NOAA's goals for this initiative. The Penobscot River in Maine and the Choptank River in Maryland were selected to be the focus areas for the GAR.

The Delmarva/Choptank River Habitat Focus Area

The Delmarva/Choptank River is one of ten Habitat Focus Areas that has been selected as part of NOAA's Habitat Blueprint Framework.

The Delmarva/Choptank River Habitat Focus Area, which includes the Choptank and Little Choptank Rivers, is located on Maryland's Eastern Shore. The Choptank River, with headwaters in Delaware, is the longest river on the Delmarva Peninsula. This area is a treasured part of the Chesapeake Bay ecosystem with habitat for spawning river herring. NOAA Restoration Center, as part of the Choptank Habitat Focus Area efforts, will explore removal of fish blockages in the Choptank River at priority locations identified through the Chesapeake Fish Passage Prioritization tool. The tool can be found at: http://maps.tnc.org.s3-website-uswest1.amazonaws.com/EROF_ChesapeakeFPP/. **The**

Penobscot River Habitat Focus Area

The Penobscot River is one of ten Habitat Focus Areas that has been selected as part of NOAA's Habitat Blueprint Framework.

NOAA has two broad goals for the Penobscot River Habitat Focus Area:

- Restore multiple diadromous fish populations and protect fish habitat
- Improve the prey base for offshore fish species, including groundfish in the Gulf of Maine

NOAA has worked with many partner organizations on several restoration projects throughout the Penobscot watershed. This work has already resulted in major improvements in habitat quality and fish abundances for many species, including alewife and blueback herring. The potential to build off previous work and to leverage existing partnerships to restore and protect ecologically important fish habitats, threatened and endangered species, and species of concern such as alewife and blueback herring, made

the Penobscot River an ideal Habitat Focus Area under NOAA's Habitat Blueprint Framework.

NOAA will address these goals through several targeted objectives:

- Identify priority areas for fish passage and habitat protection to increase access of diadromous fish to habitat
- Remove dams, replace culverts, and construct fishways
- Continue pre- and post-monitoring of dam removal and other restoration projects to assess impacts on fish populations and water quality
- Provide accurate and timely ecological forecasts and forecasts for river-based recreational activities
- Communicate the benefits of habitat restoration and protection to fish populations, water quality, recreation, and the resiliency of coastal communities

Other Species Conservation/Recovery/Monitoring Plans and Projects

- Central California Coho salmon recovery plan Detailed Threats assessment methodology by life stage, http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/north_central_california_coast/central_california_coast_coho/ccc_coho_salmon_esu_recovery_plan_vol_i_sept_2012.pdf
- Towards a comprehensive strategy to recover river herring on the Atlantic seaboard: lessons from Pacific salmon <http://icesjms.oxfordjournals.org/cgi/reprint/fst130?ijkey=Dh381woe2LvEAsd&keytype=ref>
- State of Salmon <http://www.stateofsalmon.wa.gov/>
- Salmon Snapshots <http://www.casalmon.org/>
- Pacific Fish Trax <http://www.pacificfishtrax.org/>
- Conservation Strategy for the New England Cottontail --identifies specific areas for recovery, habitat size/condition and goal for number of individuals rangewide and by focus area. (http://www.newenglandcottontail.org/sites/default/files/research_documents/conservation_strategy_final_12-3-12.pdf)

Cross-Cutting Subgroup Issues: The following cross-cutting subgroups issues were discussed and will be further considered by the TEWG and its Ecosystem Integration Committee.

- Link freshwater habitat productivity and ocean mortality (Stock Assessment Subgroup)
- Climate change influences key habitat characteristics at all life stages
- Current impacts such as water withdrawals may worsen with climate change (Climate Change Subgroup)