Mid-Atlantic Fishery Management Council
Five Year (2012-2016) Research Plan
Draft

The Magnuson Stevens Reauthorization Act of 2006 requires that each Council, with the assistance of its Scientific and Statistical Committee (SSC), develop a five-year research priority plan. To facilitate this process, the Mid-Atlantic Fishery Management Council (MAFMC) examined the research needs which have been identified in numerous stock assessments, Council FMP/Amendment documents and through the Council's Research Set Aside Program. In addition, the NE portion of the NMFS Strategic Plan for Fisheries Research and the research needs list which formed the basis for proposed changes to marine recreational fisheries statistics in the US as part of the Marine Recreational Information Program were evaluated. The Council, in consultation with its SSC, identified the top research needs for each of its managed species based on documented research needs contained in the sources described above. In addition, the Council and SSC identified research needs common to all species which are of high priority to address future assessment and fishery management needs.

General Research and Information Needs

- Collect accurate size and age composition of commercial and recreational catch (especially the discarded component of the catch) to develop catch at age matrices for all managed stocks; estimate mortality of discards by gear type
- Implement novel supplemental surveys to derive fishery independent indices of abundance (where appropriate; see species specific needs below)
- Develop assessment models to support fishery management control rules for data poor stocks (i.e., use fishery dependent data)
- Build the regional capacity within governmental agencies and academia to undertake management strategy evaluations of MAFMC managed stocks to evaluate management performance
- Develop bio-economic models to support fishery management
- Establish a framework for risk analysis of alternative harvest policies
- Incorporate ecosystem level data (predator/prey interactions, trophic dynamics, etc.) into single and multi-species assessment and management models
- Investigate effects of climate change on ecosystems and fisheries they support
- Review and improve capacity for social and economic impact analyses, including updated data on fisheries organization and structure, participation, community linkages; for regular FMP work and at scales appropriate for ecosystem-based management
- Quantify uncertainty in biological reference points

Species Specific Research Needs

Bluefish: 1) Evaluate amount and length frequency of discards from the commercial and recreational fisheries, 2) collect data on size and age composition of the fisheries by gear type and statistical are, 3) initiate fishery-dependent and fishery-independent sampling of

offshore populations of bluefish during the winter months (consider migration, seasonal fisheries, and unique selectivity patterns resulting in the bimodal partial recruitment pattern; consider if the migratory pattern results in several recruitment events); and 4) develop bluefish index surveys (proof of concept), including abundance/biomass trend estimates for the offshore populations in winter.

Tilefish: 1) investigate the effects of hook size and other fishing practices (i.e., bait type soak time, etc.) on catchability of tilefish in the longline fishery, 2) collect data on spatial distribution and population size structure and, 3) explore the influence of water temperature and other environmental factors on the trend in the commercial fishery CPUE index of stock abundance.

Surfclams: 1) develop a forward-projecting, age-structured stock assessment model based estimate of abundance and investigate model formulations that accommodate spatial heterogeneity, 2) consider using year-, region- or episodic natural mortality rates, 3) consider the potential impacts of climate change on the natural mortality of the surfclam resource given recent trends, 4) determine factors that control recruitment success in surf clams (i.e., predation or environmental factors), and 5) determine how much of Georges Bank is suitable habitat for surfclams, and if depletion and selectivity experiments done in the mid-Atlantic are applicable to the Georges Bank region.

Ocean Quahog: 1) Carry out simulations to determine optimum proxies for Fmsy and Bmsy in ocean quahogs, given their unusual biological characteristics, 2) improve estimates of biological parameters for age, growth (particularly of small individuals), and maturity for ocean quahogs in both the EEZ and in Maine waters, 3) investigate model formulations that accommodate spatial heterogeneity and 4) Additional age and growth studies are required to determine if extreme longevity (e.g. 400 years) is typical or unusual and to refine estimates of natural mortality. Similarly, additional age and growth studies over proper geographic scales could be used to investigate temporal and spatial recruitment patterns.

Summer flounder: 1) expand the collection of otoliths on an ongoing basis to include all components of the catch-at-age matrix, particularly for fish larger than 60 cm (~7 years; could provide a better indicator of stock productivity), 2) conduct inter-lab aging calibration studies between NEFSC and state agencies. 3) develop a reference collection of summer flounder scales and otoliths to facilitate future quality control of summer flounder production aging, 4) collect information on overall fecundity for the stock (egg condition and production) to serve as an indicator of stock productivity, 5) investigate trends in sex ratios and mean lengths and weights of summer flounder in state agency surveys catches, 6) evaluate selectivity patterns in trawl gear as a function of mesh size, and 7) evaluate current summer flounder management measures, especially in the recreational fishery as they relate to sex specific mortality.

Black sea bass: 1) evaluate alternative indices of stock abundance, 2) validate ageing methods (scales v. otoliths) and initiate routine aging of black sea bass in survey collections to investigate the magnitude of year effects, 3) tagging studies should be

initiated to obtain return rates over longer periods, 4) at -sea samples need to be obtained to improve understanding of the timing of sex change over years in order to study the potential influence of population size on sex switching (may have implications for overfishing BRPs), 5) evaluate management approaches appropriate for species with protogynous life histories, and 6) conduct stock identification research to identify population subgroups and the extent of mixing.

Scup: 1) evaluate indices of stock abundance, 2) expand age sampling of scup from commercial and recreational catches, with special emphasis on the acquisition of large specimens, 3) conduct biological studies to investigate factors affecting annual availability of scup to research surveys and maturity schedules, 4) improve estimates of discards and discard mortality for commercial and recreational fisheries and, 5) explore the utility of incorporating ecological relationships, predation, and oceanic events that influence scup population size on the continental shelf and its availability to the resource survey into the assessment model.

Atlantic mackerel: 1) explore patterns in consumption as an additional index of abundance, 2) collaborate with industry to explore the spatial and temporal pattern and variability in catch to evaluate issues of abundance and availability.

The SSC also endorsed the following research recommendations developed during the 2010 TRAC Assessment: 1) explore opportunities for the development of alternative indices of abundance, 2) attempt to develop estimates of total stock abundance, 3) initiate broad scale international egg surveys covering potential spawning habitat that is consistently representative of the total stock area, including the shelf break. Investigate potential to conduct work in cooperation with commercial fishing industry (priority: high, long term), 4) explore spatial distribution of stock relative to the mixing of the northern and southern 'contingents' of mackerel i.e. tagging, genetics, chemical assay, microchemistry of otoliths (priority: high, medium-long term), 5) explore influence of environmental factors on spatial distribution of the stock e.g. rate of mixing and distribution of stock relative to the survey area (high priority, short term),6) extend predation estimates to include DFO data and entire predator spectrum (marine mammals, highly migratory species), 7) examine methodology for incorporating consumption estimates in the assessment, 8) quantify the magnitude of additional sources of mortality in Canada including the bait fishery, recreational catch and discards (high priority; short term), 9) exploration of bottom trawl characteristics for catchability of mackerel ,10) participate with industry in investigating the contemporary overlap of survey stock area, commercial fishery, and mackerel distribution and explore historical databases for the same purpose to better understand interpretation of abundance indices (survey, cpue) (medium term), 11) collaborate with industry to investigate alternative sampling gear (i.e. jigging) to survey adult abundance (long term), 12) explore MARMAP database relative to spatial distribution of survey indices, 13) investigate alternative assessment models that incorporate spatial structure (i.e. northern and southern contingents, different age groups), 14) explore alternative assessment models that incorporate covariates, and 15) initiate a technical TRAC WG in order to advance and monitor progress of research recommendations.

Butterfish: 1) explore the utility of incorporating ecological relationships, predation, and oceanic events that influence butterfish population size on the continental shelf and its availability to the resource survey into the assessment model, 2) explore the use of an age-based model or other approaches for future assessments, and 3) a study of growth, morphometrics, distribution and other biological attributes of inshore and offshore components of the butterfish population should be conducted.

Illex: 1) collect demographic information on growth, mortality, reproduction by sex, season, and cohort, 2) consider a length-based assessment with a sub-annual time step, undertaking cooperative research with the fishing industry, 3) expand investigations into oceanographic correlates with trends in recruitment and abundance, 4) investigate range and range dynamics at depths >185 m., 5) refine between-vessel survey calibration estimate for *Illex* and consider a size-based calibration 6) analyze the change in availability of *Illex* to the survey and fishery, resulting from long-term changes in climate or other oceanographic factors and, 7) consider an *Illex* index standardization for the NEFSC trawl survey.

Loligo: 1) explore alternative weightings of semi-annual surveys other than simple averaging, 2) expand age and growth studies to better estimate average growth patterns and to discern seasonal productivity/catchability patterns, 3) improve the spatial resolution, coverage and accuracy of commercial catch data and 4) explore the utility of incorporating ecological relationships, predation, and oceanic events that influence *Loligo* population size on the continental shelf and its availability to the resource survey into the assessment model.

Spiny Dogfish: 1) Quantify the consumption pattern of dogfish, 2) revise the assessment model to investigate the effects of stock abundance, sex ratio and size of pups on birth rate, and first year survival of pups, 3) initiate a large scale [international] tagging program consisting of conventional external tags, data storage tags, and satellite pop-up tags to help clarify movement patterns and migration rates, 4) investigate the distribution of spiny dogfish beyond the depth range of current NEFSC trawl surveys, possibly using experimental research or supplemental surveys, 5) initiate aging studies for spiny dogfish age structures (e.g., fin spines) obtained from all sampling programs (include additional age validation and age structure exchanges), and conduct an aging workshop for spiny dogfish, encouraging participation by NEFSC, NCDMF, Canada DFO, other interested state agencies, academia, and other international investigators with an interest in dogfish aging (US and Canada Pacific Coast, ICES), 6) investigate population genetic structure with emphasis on identifying discreet breeding populations and the extent of mixing, 7) quantify the male contribution to broods to evaluate the impact of distribution on mating systems, 8) evaluate temporal and taxonomic variability in spiny dogfish diets and distributions to evaluate potential ecosystem and economic impacts of management decisions for spiny dogfish, and 9) understand the reasons behind the decline of Canadian landings to include interactions between market and biological processes.

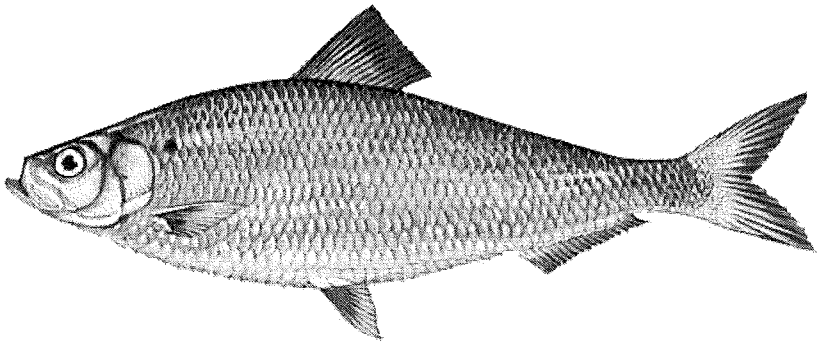
NRDC

THE EARTH'S BEST DEFENSE

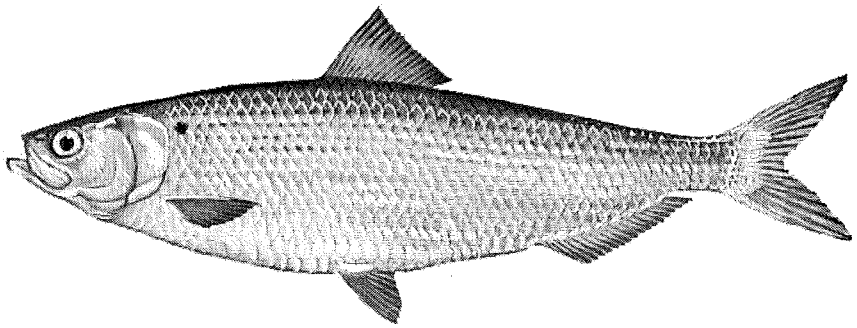
Before the Secretary of Commerce

Petition to List Alewife (*Alosa pseudoharengus*) and Blueback Herring (*Alosa aestivalis*) as Threatened Species and to Designate Critical Habitat

Alewife (*Alosa pseudoharengus*)



Blueback Herring (*Alosa aestivalis*)



Source: U.S. Fish and Wildlife Service

August 1, 2011

EXECUTIVE SUMMARY

This is a petition to list the alewife (*Alosa pseudoharengus*) and the blueback herring (*Alosa aestivalis*) each as a threatened species throughout all or a significant portion of its range pursuant to the federal Endangered Species Act ("ESA"). In the alternative, the National Marine Fisheries Service ("NMFS") should designate distinct population segments ("DPSs") of alewives and blueback herring as specified in this petition and list each DPS as a threatened species.

Alewives and blueback herring (collectively known as "river herring") were once highly abundant in coastal waters, rivers and streams of the eastern United States. From 1950 through 1970, total commercial landings of alewives and blueback herring in Atlantic coastal states averaged more than 50 million pounds per year. Most Atlantic coastal streams and rivers were inhabited by one or both of the species. In the larger rivers, spawning runs could reach well into the millions of individual fish – according to one historical account, three quarters of a *billion* river herring were landed from the Potomac River in 1832.

Populations of alewives and blueback herring are now a tiny fraction of their historical abundance. Overall coastal landings of alewives and blueback herring have averaged a little more than a million pounds over the last decade, a decline of more than 98 percent from the 1950 to 1970 average. In many rivers and streams, including several of the most historically important, river herring populations are either collapsed or entirely extirpated. In most of the others, populations are extremely depleted. Particularly alarmingly, declines have continued or even accelerated over the last decade in many cases. For example:

- On the Maine-Canada border, the run of alewife in the St. Croix River, which once numbered over two million counted fish in a single year, has been at or near zero in recent years and is considered collapsed.

- In New Hampshire's Taylor River, what had been the state's largest river herring run dropped by 97 percent between just 2000 and 2003 and has continued to decline.

- The alewife count in two of Massachusetts' most important remaining river herring runs, in the Monument and Mattapoisett Rivers, dropped almost 85 and 95 percent, respectively, between just 2000 and 2010.

- The huge blueback herring run in the Connecticut River, which averaged 5.4 million fish annually from 1981 to 1995, dropped to just over one million fish per year on average from 1996 to 2001, and then to just over 300,000 fish per year on average between 2002 and 2008 – an overall decline of almost 95 percent. In 2009, seven years after Connecticut instituted a fishing moratorium, state officials still described river herring stocks as "very low with no signs of an imminent recovery."

- The river herring fisheries of Chesapeake Bay and its tributaries – historically the country's largest – have been virtually eliminated, with landings in Virginia, Maryland, and from the Potomac River down 99 percent or more from their 1950 to 1970 averages.

In the Susquehanna River, which drains into Chesapeake Bay, blueback herring passed by the Conowingo Dam East fish passage dropped from almost 285,000 counted fish in 2001 to just 4 fish in 2010.

- By 2007, river herring landings from North Carolina's Albemarle Sound and its tributaries – which once rivaled those from Chesapeake Bay – had dropped by 98 percent or more, prompting the state to close its river herring fisheries. Since that time, North Carolina catch rates for bluebacks and alewives from independent gill net surveys have not shown any meaningful improvement in the populations.

- In South Carolina, the alewife is considered extirpated.

Alewives and blueback herring are imperiled by the present and threatened destruction, modification, and curtailment of their habitat and range; by overutilization for commercial, recreational, and scientific purposes; by predation and disease; by the insufficiency of existing regulatory authorities, laws, and policies; and by other natural and manmade factors. Existing stressors that most endanger the survival of alewives and blueback herring include fishing-related mortality, water pollution, dams, and dredging. In addition, recent studies indicate that global warming is already harming certain alewife and blueback herring subpopulations and will become an increasingly significant stressor in the future, including by exacerbating harmful water quality conditions and increasing flooding. Without substantial mitigation and management of these stressors, the alewife and the blueback herring are likely to become endangered and eventually extinct throughout all or significant portions of their ranges.

NMFS should list the alewife and the blueback herring each as a threatened species as a whole. The alewife and the blueback herring are unitary species likely to become endangered within the foreseeable future throughout all or significant portions of their ranges, including rivers in Maine, New Hampshire, Massachusetts, Connecticut, the Chesapeake Bay and its tributaries, and many coastal river systems in the Carolinas.

If NMFS does not list the alewife and the blueback herring each as a threatened species as a whole, the agency should designate four DPSs of alewife and three DPSs of blueback herring as threatened as follows: Central New England DPS of alewives, Long Island Sound DPS of alewives, Chesapeake Bay DPS of alewives, and Carolina DPS of alewives; Central New England DPS of blueback herring, Long Island Sound DPS of blueback herring, and Chesapeake Bay DPS of blueback herring. These DPSs encompass fish that originate from a river within the DPS and include the marine range of such fish.

The Central New England DPSs for alewives and for blueback herring would include the Winnicut River, Exeter River, Cocheco River, Taylor River, Oyster River, and Lamprey River in New Hampshire, and the Parker River in Massachusetts. These DPSs should be listed as threatened species because they are likely to become endangered within the foreseeable future throughout all or significant portions of this range, including as a result of fishing-related mortality, dams, dredging and blasting, water pollution, and global warming.

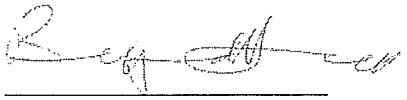
The Long Island Sound DPSs for alewives and for blueback herring would include the Monument River, Nemasket River, and Mattapoisett River in Massachusetts, the Nonquit River and Gilbert-Stuart River in Rhode Island, and the Shetucket River, Farmington River, Connecticut River, Naugatuck River, and Mianus River in Connecticut. These DPSs should be listed as threatened species because they are likely to become endangered within the foreseeable future throughout all or significant portions of this range, including as a result of fishing-related mortality, dams, dredging and blasting, water pollution, and global warming.

The Chesapeake Bay DPSs for alewives and blueback herring would include the Bay itself, and the Nanticoke, Potomac, Susquehanna, Rappahannock, York, and James Rivers. These DPSs should be listed as threatened species because they are likely to become endangered within the foreseeable future throughout all or significant portions of this range, including as a result of fishing-related mortality, dams, dredging and blasting, water pollution, and global warming.

The Carolina DPS for alewives would include the Chowan River and Albemarle Sound, Roanoke River, Pamlico Sound/Pamlico, Tar and Neuse Rivers, and Cape Fear River in North Carolina and the Winyah Bay (including the Waccamaw, Pee Dee, and Sampit rivers), Santee River, and Cooper River in South Carolina. This DPS should be listed as a threatened species because it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, including as a result of fishing-related mortality, dams, dredging and blasting, water pollution, and global warming.

can be no reasonable dispute that the available information indicates that listing the two species or the requested DPSs as threatened may be warranted.

NMFS must promptly make a positive initial finding on the petition as required by 16 U.S.C. § 1533(b)(3)(A).



Bradford H. Sewell
Senior Attorney

Date: This 1st day of August 2011

Petitioner also requests that critical habitat be designated for alewife and for blueback herring concurrently with listing, pursuant to 16 U.S.C. § 1533(a)(3)(A) and 50 C.F.R. § 424.12.

I. Petitioner

NRDC is a national, non-profit environmental organization with more than 1.2 million members and online activists nationwide, including more than 373,000 members and activists in the Atlantic coastal states. In these Atlantic coastal states, NRDC actively works to improve the management of marine and estuarine resources. NRDC's members regularly visit alewife habitat and blueback herring habitat for recreational and related purposes, seek to view both alewives and blueback herring in the wild, and are concerned about the drastic decline in each species' numbers and each species' risk of extinction. NRDC can be contacted in New York City at 40 West 20th Street, New York, NY 10011, (212) 727-2700.

II. Specific Requested Actions

Petitioner requests that NMFS:

A. List alewife as threatened.

B. List blueback herring as threatened.

C. In the alternative, designate and list as threatened the following DPSs: Central New England, Long Island Sound, Chesapeake Bay, and Carolina DPSs for alewives; Central New England, Long Island Sound, and Chesapeake Bay DPSs for blueback herring; or, alternatively, NMFS should conduct its own DPS analysis and list the DPSs that meet the legal criteria.

D. Designate critical habitat for alewives and all identified DPSs of alewives.

E. Designate critical habitat for blueback herring and for all identified DPSs of blueback herring.

III. NMFS must issue an initial finding that this petition "presents substantial scientific or commercial information indicating that the petitioned action may be warranted."

NMFS must make this initial finding "[t]o the maximum extent practicable, within 90 days after receiving the petition." *See* 16 U.S.C. § 1533(b)(3)(A).

Petitioner need not demonstrate that listing is warranted; rather, Petitioner must only present information demonstrating that such listing may be warranted. While Petitioner believes that the best available science demonstrates that listing the alewife and the blueback herring or, alternatively, listing each of the requested DPSs as a threatened species is in fact warranted, there

NOTICE OF PETITION

Hon. Gary Locke
Secretary
U.S. Department of Commerce
1401 Constitution Ave. NW
Washington, DC 20230

Jane Lubchenco
Under Secretary of Commerce for Oceans &
Atmosphere & National Oceanic and
Atmospheric Administration ("NOAA")
Administrator
U.S. Department of Commerce
1401 Constitution Avenue, NW
Washington, DC 20230

Eric C. Schwaab
Asst. Administrator for Fisheries
NOAA
1315 East-West Highway, Building 3
Silver Spring, MD 20910

PETITIONER:

Natural Resources Defense Council
40 West 20th Street
New York, NY 10011
Tel: (212) 727-2700

The Petitioner Natural Resources Defense Council ("NRDC" or "Petitioner") hereby formally petitions the Secretary of the United States Department of Commerce ("Secretary"),[1] pursuant to 5 U.S.C. § 553(e) and 50 C.F.R. § 424.14, to list the alewife (*Alosa pseudoharengus*) and the blueback herring (*Alosa aestivalis*) each as threatened species under the Endangered Species Act, 16 U.S.C. §§ 1531, *et seq*. In the alternative, Petitioner petitions the Secretary to delineate four DPSs of alewives and three DPSs of blueback herring as described in the attached petition and to list them as follows: the Central New England, Long Island Sound, Chesapeake Bay and Carolina DPSs for alewife should be listed as threatened species; and the Central New England, Long Island Sound, and Chesapeake Bay DPSs for blueback herring should be listed as threatened species.

[1] Pursuant to the 1974 NMFS-U.S. Fish and Wildlife Service policy, NMFS should be the lead agency reviewing this petition.

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 111024651–1650–01]

RIN 0648–XA739

Listing Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition To List Alewife and Blueback Herring as Threatened Under the Endangered Species Act

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: 90-day petition finding; request for comments.

SUMMARY: We, NMFS, announce a 90-day finding for a petition to list alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) as threatened under the Endangered Species Act and to designate critical habitat concurrent with a listing. We find that the petition presents substantial scientific information indicating the petitioned action may be warranted. Accordingly, we will conduct a review of the status of alewife and blueback herring, collectively referred to as river herring, to determine if the petitioned action is warranted. To ensure that the review is comprehensive, we solicit information pertaining to this species from any interested party.

DATES: Information related to this petition finding must be received by January 3, 2012.

ADDRESSES: You may submit comments, identified by the RIN 0648–XA739, by any of the following methods:

- *Electronic Submissions:* Submit all electronic public comments via the Federal eRulemaking Portal *http//www.regulations.gov*. Follow the instructions for submitting comments.
- *Mail or hand-delivery:* Assistant Regional Administrator, NMFS, Northeast Regional Office, 55 Great Republic Drive, Gloucester, MA 01930.

All comments received are a part of the public record and will generally be posted to *http://www.regulations.gov* without change. All Personal Identifying Information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit Confidential Business Information or otherwise sensitive or protected information.

NMFS will accept anonymous comments. Attachments to electronic comments will be accepted in Microsoft Word, Excel, WordPerfect, or Adobe PDF file formats only.

The petition and other pertinent information are also available electronically at the NMFS Web site at *http://www.nero.noaa.gov/prot_res/CandidateSpeciesProgram/RiverHerringSOC.htm*.

FOR FURTHER INFORMATION CONTACT: Kim Damon-Randall, NMFS, Northeast Regional Office (978) 282–8485 or Marta Nammack, NMFS, Office of Protected Resources (301) 713–1401.

SUPPLEMENTARY INFORMATION:

Background

On August 5, 2011, we, the National Marine Fisheries Service (NMFS), received a petition from the Natural Resources Defense Council (NRDC), requesting that we list alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) each as threatened throughout all or a significant portion of their range under the Endangered Species Act (ESA). In the alternative, they requested that NMFS designate distinct population segments (DPS) of alewife and blueback herring as specified in the petition (Central New England (CNE), Long Island Sound (LIS), Chesapeake Bay (CB) and Carolina for alewives, and CNE, LIS, and CB for blueback herring). The petition contains information on the two species, including the taxonomy; historical and current distribution; physical and biological characteristics of the species' habitat and ecosystem relationships; population status and trends; and factors contributing to the species' decline. NRDC also included information regarding the possible DPSs of alewife and blueback herring as described above. The petition addresses the five factors identified in section 4(a)(1) of the ESA: (1) Present or threatened destruction, modification, or curtailment of habitat or range; (2) over-utilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or man-made factors affecting the species' continued existence.

ESA Statutory Provisions and Policy Considerations

Section 4(b)(3)(A) of the ESA (16 U.S.C. 1533(b)(3)(A)) requires that we make a finding as to whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating the petitioned action may be warranted. ESA implementing regulations define substantial information as the amount of information that would lead a reasonable person to believe the measure proposed in the petition may be warranted (50 CFR 424.14(b)(1)). In determining whether substantial information exists for a petition to list a species, we take into account several factors, including information submitted with, and referenced in, the petition and all other information readily available in our files. To the maximum extent practicable, this finding is to be made within 90 days of the receipt of the petition (16 U.S.C. 1533(b)(3)(A)), and the finding is to be published promptly in the **Federal Register**. If we find that a petition presents substantial information indicating that the requested action may be warranted, section 4(b)(3)(A) of the ESA requires the Secretary of Commerce (Secretary) to conduct a review of the status of the species. Section 4(b)(3)(B) requires the Secretary to make a finding as to whether the petitioned action is warranted within 12 months of the receipt of the petition. The Secretary has delegated the authority for these actions to the NOAA Assistant Administrator for Fisheries.

The ESA defines an endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range (ESA section 3(6))." A threatened species is defined as a species that is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (ESA section 3(19))." As stated previously, under section 4(a)(1) of the ESA, a species may be determined to be threatened or endangered as a result of any one of the following factors: (1) Present or threatened destruction, modification, or curtailment of habitat or range; (2) over-utilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or manmade factors affecting its continued existence. Listing determinations are made solely on the basis of the best scientific and commercial data available, after conducting a review of the status of the species and taking into account efforts made by any state or foreign nation to protect such species.

Under the ESA, a listing determination can address a species, subspecies, or a DPS of a vertebrate species (16 U.S.C. 1532 (16)). NRDC presents information in the petition proposing that DPSs of alewife and blueback herring are present in the United States and indicating that it may be appropriate to divide the population

into DPSs of alewife and blueback herring as specified in the petition. If we find that listing at the species level is not warranted, we will determine whether any populations of these species meet the DPS policy criteria, and if so, whether any DPSs are endangered or threatened under the ESA.

Life History of Alewife and Blueback Herring

Alewife and blueback herring are collectively referred to as "river herring." Due to difficulties in distinguishing between the species, they are often harvested together in commercial and recreational fisheries, and managed together by the Atlantic States Marine Fisheries Commission (ASMFC). Throughout this finding, where there are similarities, they will be collectively referred to as river herring, and where there are distinctions they will be identified by species.

River herring can be found along the Atlantic coast of North America, from the maritime provinces of Canada to the southeastern United States (Mullen *et al.,* 1986; Shultz *et al.,* 2009). The coastal ranges of the two species overlap, with blueback herring found in a greater and more southerly distribution ranging from Nova Scotia down to the St. John's River, Florida; and alewife found in a more northerly distribution, from Labrador and Newfoundland to as far south as South Carolina, though the extreme southern range is a less common occurrence (Collette and Klein-MacPhee, 2002; ASMFC, 2009a; Kocik *et al.,* 2009). Adults are most often found at depths less than 100 m (328 ft) in waters along the continental shelf (Neves, 1981; ASMFC, 2009a; Shultz *et al.,* 2009).

River herring have a deep and laterally compressed body, with a small, pointed head with relatively large eyes, and a lower jaw that protrudes further than the upper jaw (Collette and Klein-MacPhee, 2002). The dorsal fin is small and slightly concave, pelvic fins are small, pectorals are moderate and low on the body, and the caudal fin is forked (Collette and Klein-MacPhee, 2002).

The coloring varies, ranging from dark blue and bluish green to grayish green and bluish gray dorsally; and silvery with iridescence in shades of green and violet on the sides and abdomen. In adults, there is often a dusky spot that is located at eye level on both sides behind the margin of the gill cover. The colors of alewife are thought to change in shade according to substrate as the fish migrates upstream, and sea run fish are thought to have a golden cast to their coloring (Collette and Klein-MacPhee, 2002).

Blueback herring and alewife are similar in appearance; however, there are some distinguishable characteristics: Eye diameter and the color of the peritoneum. The eye diameter with alewives is relatively larger than that of blueback herring. In blueback herring, the snout length is generally the same as the eye diameter; however with alewives, the snout length is smaller than the diameter of the eye (Collette and Klein-MacPhee, 2002). In alewives, the peritoneum is generally pale/light gray or pinkish white, whereas the peritoneum in blueback herring is generally dark colored and either brown or black, and sometimes spotted (Collette and Klein-MacPhee, 2002; ASMFC, 2009a).

River herring are anadromous, meaning that they migrate up coastal rivers in the spring from the marine environment, to estuarine and freshwater rivers, ponds, and lake habitats to spawn (Collette and Klein-MacPhee, 2002; ASMFC, 2009a; Kocik *et al.,* 2009). They are highly migratory, pelagic, schooling species, with seasonal spawning migrations that are cued by water temperature (Collette and Klein-MacPhee, 2002; Schultz, 2009). Depending upon temperature, blueback herring typically spawn from late March through mid-May. However, they have been documented spawning in the southern parts of their range as early as December or January, and as late as August in the northern range (ASMFC, 2009a). Alewives generally migrate earlier than other alosine fishes, but have been documented spawning as early as February to June in the southern portion of their range, and as late as August in the northern portion of the range (ASMFC, 2009a). It is thought that river herring return to their natal rivers for spawning, and do exhibit natal homing. However, colonization of streams where river herring have been extirpated has been documented; therefore, some effective straying does occur (ASMFC, 2009a).

Throughout their life cycle, river herring use many different habitats ranging from the ocean, up through estuaries and rivers, to freshwater lakes and ponds. The substrate preferred for spawning varies greatly and can include substrates consisting of gravel, detritus, and submerged aquatic vegetation. Blueback herring prefer swifter moving waters than alewife (ASMFC, 2009a). Nursery areas can include freshwater and semi-brackish waters; however, little is known about their habitat preference in the marine environment (Meadows, 2008; ASMFC, 2009a).

Analysis of Petition and Information Readily Available in NMFS Files

In the following sections, we use the information presented in the petition and in our files to: (1) Describe the distribution of alewife and blueback herring; and (2) evaluate whether alewife and blueback herring are at abundance levels that would lead a reasonable person to conclude that listing under the ESA may be warranted due to any of the five factors listed under section 4(a)(1) of the ESA.

Abundance

The NRDC asserts that alewife and blueback herring populations have suffered dramatic declines over the past 4 decades (ASMFC, 2008). The NRDC cites the ASMFC as stating that alewife and blueback herring harvest averaged almost 43 million pounds (19,504 metric tons (mt)) per year from 1930 to 1970. NRDC also cites ASMFC (2008) in stating that peak harvest occurred in the late 1940s and early 1950s and was highest in Virginia and North Carolina. The NRDC notes that commercial landings of river herring began declining sharply coastwide in the 1970s. However, ASMFC (2009a) reports that 140 million pounds (63,503 mt) of river herring were commercially landed in 1969, marking the peak in river herring catch; this is a discrepancy from what is stated in the petition. From the peak landings in 1969, landings declined to a point where domestic landings recently (2000–2007) exceeded only 2 million pounds (907 mt) yearly (ASMFC, 2009a). Declines in catch per unit effort (CPUE) have also been observed in two rivers for blueback herring and for alewife, and declining trends in CPUE for the combined species were also observed in two out of three rivers examined (ASMFC, 2009a).

ASMFC (2009a) also reports declines in abundance through run size estimates for river herring combined, as well as for individual species of alewife and blueback herring. Abundance declined in seven out of fourteen rivers in New England from the late 1960s to 2007, with no obvious signs of recovery; however, since 2004, there have been some signs of recovery in five out of fourteen rivers (ASMFC, 2009a). Coastwide declines have been observed, particularly in southern New England (Davis and Schultz *et al.,* 2009). In the Connecticut River the number of blueback herring passing Holyoke Dam declined from 630,000 in 1985 to a low of 21 in 2006 (Schultz *et al.,* 2009).

habitat, reduce bycatch, or mitigate other threats to river herring, and therefore provides inadequate protection for the species. The NRDC notes that there are Federal protections that may benefit river herring which are intended for other anadromous species such as Atlantic salmon and shortnose sturgeon; however, it asserts that any benefits from these protections are minor and insufficient to fully protect river herring.

Other Natural or Manmade Factors Affecting Its Existence

The petition describes other natural or manmade factors that may be affecting river herring, including invasive species, impingement, entrainment, and water temperature alterations. The petition states that invasive species may threaten food sources for alewives and blueback herring. ASMFC (2008) describes the negative effect zebra mussel introduction to the Hudson River had on phytoplankton and zooplankton, and subsequently water quality. According to ASMFC (2008), a decrease in both micro and macro zooplankton as well as phytoplankton improved water clarity and increased shallow water zoobenthos by 10 percent. Early life stages of river herring feed on zooplankton as well as phytoplankton (ASMFC, 2008). Strayer *et al.* (2004) hypothesized that the introduction of this invasive species created competition for availability of the preferred food source of early life stages of river herring, and found that larval river herring abundance decreased with increased zebra mussel presence. Thus, according to the petition, invasive species introduction and subsequent water quality changes which may affect plankton abundance can decrease the abundance of early life stages of river herring.

As described previously, the petition asserts that various life stages of river herring may be impinged or entrained through water intake structures from commercial, agricultural, or municipal operations. These intake structures alter flow, and may cause direct mortality to various life stages of river herring if they are impinged or entrained by the intake. In addition, aside from direct mortality, the petition asserts that intakes alter flow, which can affect water quality, temperature, substrate, velocity, and stream width and depth. NRDC suggests that these alterations can affect spawning migrations as well as spawning and nursery habitat, which could pose a significant threat to river herring.

Petition Finding

Based on the above information, which indicates ongoing multiple threats to both species as well as potential declines in both species throughout their ranges, and the criteria specified in 50 CFR 424.14(b)(2), we find that the petition presents substantial scientific and commercial information indicating that the petitioned action concerning alewife and blueback herring may be warranted. Under section 4(b)(3)(A) of the ESA, this positive 90-day finding requires NMFS to commence a status review of the species. During our status review, we will review the best available scientific and commercial information, including the effects of threats and ongoing conservation efforts on both species throughout their ranges. Alewife and blueback herring are now considered to be candidate species (69 FR 19976; April 15, 2004). Within 12 months of the receipt of the petition (August 5, 2011), we will make a finding as to whether listing alewife and/or blueback herring as endangered or threatened is warranted, as required by section 4(b)(3)(B) of the ESA. If listing these species is not warranted, we will determine whether any populations of these species meet the DPS policy criteria (61 FR 4722; February 7, 1996), and if so, whether any DPSs are endangered or threatened under the ESA. If listing either species (or any DPS) is warranted, we will publish a proposed listing determination and solicit public comments before deciding whether to publish a final determination to list them as endangered or threatened under the ESA.

References Cited

A complete list of the references used in this finding is available upon request (see **ADDRESSES**).

Information Solicited

To ensure the status review is based on the best available scientific and commercial data, we solicit information pertaining to alewife and blueback herring. Specifically, we solicit information in the following areas: (1) Historical and current distribution and abundance of these species throughout their ranges; (2) population status and trends; (3) any current or planned activities that may adversely impact these species, especially as related to the five factors specified in section 4(a)(1) of the ESA and listed above; (4) ongoing efforts to protect and restore these species and their habitat; and (5) any biological information (life history, morphometrics, genetics, etc.) on these species. We request that all information be accompanied by: (1) Supporting documentation such as maps and bibliographic references; and (2) the submitter's name, address, and any association, institution, or business that the person represents.

Peer Review

On July 1, 1994, NMFS, jointly with the U.S. Fish and Wildlife Service, published a series of policies regarding listings under the ESA, including a policy for peer review of scientific data (59 FR 34270). OMB issued its Final Information Quality Bulletin for Peer Review on December 16, 2004. The Bulletin became effective on June 16, 2005, and generally requires that all "influential scientific information" and "highly influential scientific information" disseminated on or after that date be peer reviewed. The intent of the peer review policy is to ensure that decisions are based on the best scientific and commercial data available. Independent peer reviewers will be selected to review the status review report from the academic and scientific community, tribal and other Native American groups, Federal and state agencies, the private sector, and public interest groups.

Authority: 16 U.S.C. 1531 *et seq.*

Dated: October 27, 2011.

John Oliver,

Deputy Assistant Administrator for Operations, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 622

[Docket No. 100217095–1652–02]

RIN 0648–AY56

Fisheries of the Caribbean, Gulf of Mexico, and South Atlantic; Reef Fish Fishery of the Gulf of Mexico; Amendment 32

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Proposed rule; request for comments.

SUMMARY: NMFS proposes to implement management measures described in Amendment 32 to the Fishery Management Plan for the Reef Fish

on bycatch and incidental catch, asserting that most of these sources are likely to underestimate the amount of bycatch that occurs.

The NRDC cites Lessard and Bryan (2011) in stating that the majority of bycatch of river herring is taken with mid-water otter paired trawls, and that catch with this gear type appears to be increasing from 2000–2008, with an estimation of around 500,000 to 2.5 million pounds (227 to 1,134 mt) of river herring caught annually as bycatch. In addition, the NRDC asserts that the Atlantic herring and Atlantic mackerel fisheries are increasing their use of single and pair mid-water trawls, and are using larger, more efficient nets, increasing the effort and efficiency in this fishery. The petition further outlines specific overharvesting issues within the Damariscotta, Hudson, Delaware, Potomac, Chowan, Santee-Cooper, and the St. John's Rivers, as well as Chesapeake Bay and Albermarle Sound.

Predation and Disease

The NRDC identifies predation and disease as another threat facing river herring. Citing the Maine Department of Marine Resources (ME DMR) (2003), NRDC states that river herring may be preyed upon by striped bass, bluefish, tuna, cod, haddock, halibut, American eel, brook trout, rainbow trout, brown trout, lake trout, landlocked salmon, smallmouth bass, largemouth bass, pickerel, pike, white and yellow perch, seabirds, bald eagle, osprey, great blue heron, gulls, terns, cormorants, seals, whales, otter, mink, fox, raccoon, skunk, weasel, fisher, and turtles. It asserts that the decline of some populations of river herring is due to increased predation, citing ASMFC (2008) as noting a concern with increasing striped bass abundance, and identifying predation by striped bass as contributing significantly to the decline of river herring in some rivers. Additionally, many species of cormorants along the coast are increasing in abundance, and predation on alosines by cormorants has been increasing, although Dalton *et al.* (2009) suggested that the double-crested cormorant is not believed to pose an immediate threat to the recovery of alewife in Connecticut.

According to the NRDC, significant cumulative mortality can occur with viral hemorrhagic septicemia, which is a viral infection known to infect certain anadromous fish, including river herring. Additionally, NRDC asserts that when levels of suspended solids are present during spawning, alewife eggs are significantly more likely to contract a naturally occurring fungus infection.

Inadequacy of Existing Regulatory Mechanisms

The NRDC states that state and Federal regulatory mechanisms are insufficient and contributing to drastic declines in river herring populations that continue throughout all or a significant portion of the species' ranges. Due to difficulties in distinguishing between the species, alewife and blueback herring are managed together by the ASMFC as river herring. NRDC states that ASMFC has the authority to develop and issue interstate fishery management plans (FMP) for fisheries administered by the state agencies and will coordinate management with Federal waters.

According to NRDC, ASMFC adopted an amendment to the coast-wide FMP for American shad and river herring in 2009, to specifically address the declining river herring populations coastwide. The petition asserts that this amendment is not likely to protect river herring sufficiently, as it "does not require, and is not likely to result in, adequate measures to reduce significant incidental catch and bycatch/bycatch mortality of these species, particularly in federal waters." NRDC also asserts that this amendment does not address non-fishing stressors on river herring sufficiently. The petition further states that four states have already had prohibitions on the harvest of river herring in place, and even with this prohibition on all harvest, these states have continued to see declines.

The petition notes that river herring are not subject to the requirements and protections of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) because they are not currently managed under an FMP as a stock, and therefore, are not federally managed in regard to overfishing and depleted stocks under the MSA. Even though river herring are caught and sold as bycatch, and FMPs are meant to minimize bycatch, the NRDC asserts that any provisions in FMPs meant to address bycatch of river herring have proven to be ineffective and inadequate. NRDC further asserts that bycatch reporting is inadequate and limited and that there are currently no FMPs under the MSA that specifically address bycatch and bycatch mortality of river herring.

The NRDC notes that currently the Mid-Atlantic Fisheries Management Council (MAFMC) is developing two amendments to two separate FMPs that include proposals for improving the monitoring of bycatch of river herring in these fisheries; however, it asserts that it was unknown whether the bycatch monitoring measures for river herring would be included in the final amendment.

NRDC also indicates that under the MSA or the Atlantic Coast Fisheries Act, NMFS has the potential to initiate emergency rulemaking or other actions to reduce bycatch of river herring in small mesh fisheries, but has declined to do so thus far. NRDC further notes that NMFS has declined to take emergency rulemaking actions for bycatch of river herring in small-mesh fisheries in New England and the Mid-Atlantic.

Federally managed stocks are required to have essential fish habitat (EFH) designated under the MSA; however, since river herring are not considered a federally managed stock under the MSA, EFH has not been designated for this species. A provision under the 1996 amendments to the MSA provides for comments from regional councils on activities that may affect anadromous fish habitat; however, the NRDC asserts that this provision has not provided any significant modifications to activities affecting anadromous fish habitat.

In addition to fisheries, the petition indicates that Federal laws and regulations have also failed to protect river herring and their habitat from threats such as poor water quality, dredging, and altered water flows. The petition briefly describes the Clean Water Act (CWA), the Federal Power Act (FPA), and the Anadromous Fish Conservation Act, and identifies where these regulations present inadequacies that are failing to protect river herring. NRDC notes that the CWA should limit discharge of pollutants into navigable waters and that some progress has been made in terms of industrial sources. NRDC also concludes that the CWA has not "adequately regulated nutrients and toxic pollutants originating from non-point sources." In addition, some permits for dredging and excavation require permitting from the Army Corps of Engineers, and NRDC notes that these may benefit river herring through placing restrictions on the timing and location of activities in river herring habitats. The FPA allows for protection of fish and wildlife that may be affected by hydroelectric facilities. As mentioned previously, NRDC asserts that fish passage at hydroelectric facilities can be inefficient, and the dams themselves affect water flow which can pose a significant threat to river herring. Thus, according to NRDC, FPA protections for river herring are inadequate. The NRDC further states that the Anadromous Fish Conservation Act does not require any measures for river herring that would improve

ESA Section 4(a)(1) Factors

Present or Threatened Destruction, Modification or Curtailment of Habitat or Range

In the petition, the NRDC states that habitat alterations, loss of habitat, and impaired water quality have contributed to the decline of river herring since colonial times. NRDC further states that climate change now poses an increasing threat as well. NRDC states that dams and turbines block access to spawning and foraging habitat, may directly injure or kill passing fish, and change water quality through alterations in flow and temperature, which NRDC asserts is significantly impacting river herring. NRDC cites ASMFC (2009b) which indicates that flow variations caused by dams, particularly hydropower dams, can displace eggs as well as disrupt migration patterns, which will adversely affect the survival and productivity of all life stages of river herring as well as other anadromous fish. ASMFC (2009b) indicates that increased flows at dams with fishways can also adversely affect the upstream migration of adults, impeding their ability to make it up through the fishway, as well as the downstream migration of juveniles, causing an early downstream migration and higher flows through sluiceways resulting in mortality. According to NRDC, dams have caused river herring to lose access to significant portions of their spawning and foraging habitat. In addition to altering flow and changing environmental parameters such as temperature and turbidity, NRDC indicates that dams, particularly hydropower dams, cause direct mortality to various life stages of river herring through entrainment and impingement in turbines, and changing water pressures. In addition, NRDC states that turbines used in tidal hydroelectric power plants may impact river herring with each tidal cycle as the fish migrate through the area.

Dredging and blasting were also identified by NRDC as significant threats to river herring. The petition cites ASMFC (2009b), asserting that increased suspended sediment, changes in water velocities, and alteration of substrates through dredging can directly impact river herring habitat. In addition, NRDC asserts that these operations may affect migration patterns and spawning success, and they can directly impact gill tissues, producing near fatal effects (NMFS, 1998; ASMFC, 2009b).

The NRDC also asserts that water quality poses a significant threat to river herring through changes in water temperature and flow, introduction of toxic pollutants, discharge, erosion, and nutrient and chemical run-off (ASMFC, 2009b). NRDC states that "poor water quality alone can significantly impact an entire population of alewife or blueback herring." ASMFC (2008) notes that significant declines in dissolved oxygen (DO) levels in the Delaware River during the 1940s and 1950s from heavy organic loading made portions of the river during the warmer months of the year uninhabitable to river herring. ASMFC (2008, 2009a) indicates that river herring abundance is significantly affected by low DO and hypoxic conditions in rivers and that these conditions may also prevent spawning migrations.

River herring susceptibility to toxic chemicals and metals was also identified by NRDC as a threat to the species. The NRDC asserts that river herring are subjected to contaminants through their habitat, which may be contaminated with dioxins, polychlorinated aromatic hydrocarbons, organophosphate and organochlorine pesticides, polychlorinated biphenyls, and other hydrocarbon compounds, as well as toxic metals. Citing ASMFC (1999), the NRDC states that because of industrial, residential, and agricultural development, heavy metal and various types of organic chemical pollution has increased in nearly all estuarine waters along the Atlantic coast, including river herring spawning and nursery habitat. NRDC asserts that these contaminants can directly impact fish through reproductive impairment, reduced survivorship of various life stages, and physiological and behavioral changes (ASSRT, 2007; 75FR 61872).

The NRDC also identified climate change as a threat to river herring habitat. According to NRDC, the spatial distribution, migration, and reproduction of alewife may be affected through rising water temperatures caused by climate change. Citing the International Panel on Climate Change (IPCC) (2001), NRDC states that fish larvae and juveniles may have a high sensitivity to water temperature and suggests that headwaters and rivers may be more vulnerable; thus, the effects of climate change may be more significant to anadromous species, which utilize a multitude of habitats. According to ASMFC (2009b), as water temperatures rise, the upstream spawning migration of alewife declines, and will mostly cease once temperatures have risen above 21 degrees Celsius. In addition to increasing water temperatures, climate change may affect river herring through increased precipitation that may affect rivers and estuaries along the coast. Citing Kerr *et al.* (2009), the NRDC reports that a 10 percent increase in annual precipitation is expected in the Northeast United States from 1990 to 2095 and that precipitation has already increased 8 percent over the past 100 years (Markham and Wake, 2005). As increased water flows may affect anadromous fish migration, increased precipitation and the potential for flooding in rivers due to climate change may pose a significant threat to river herring (Limburg and Waldman, 2009).

Overutilization for Commercial, Recreational, Scientific or Education Purposes

The NRDC identified direct harvest, bycatch, and incidental catch as significant threats to river herring. River herring were historically fished through inshore fisheries, and constitute one of the oldest fisheries in North America (Haas-Castro, 2006). Commercial landings of river herring reached nearly 34,000 metric tons (mt) in the 1950s, but in the 1970s, landings fell below 4,000 mt. According to ASMFC (2008), foreign commercial exploitation of river herring in the 1960s led to drastic declines in abundance of river herring. Annual commercial landings over the past decade have varied from 137 mt to 931 mt, and 90 percent of this catch was typically harvested by Maine, North Carolina, and Virginia fisheries (Haas-Castro, 2006). Historically, river herring were targeted for food, bait and fertilizer purposes; however, they are currently most often used for bait in commercial fisheries (Collette and Klein-MacPhee, 2002). The NRDC contends that declines in river herring abundance are greatly affected by commercial overharvest, noting that direct harvest of river herring currently takes place in Maine, New Hampshire, New York, New Jersey, some rivers in Delaware, Maryland, Virginia, and South Carolina.

Bycatch and incidental catch were also identified by NRDC as resulting in significant mortality of river herring, stating that this catch occurs in both state and Federal waters. NRDC asserts that the anadromous life history of river herring presents the potential for increased bycatch due to the species schooling behavior at congregation sites throughout different portions of migration. Citing Lessard and Bryan (2011), NRDC indicates that "hot spots" of bycatch and incidental catch have been found in the winter between Cape Cod and Cape Hatteras, in the spring with blueback herring in the southern region, and in the fall in the Gulf of Maine and Georges Bank. The NRDC states that a variety of sources including landings records, log books, portside sampling efforts, and the NMFS observer program provide information