

River Herring (RH) Technical Expert Working Group (TEWG)

<http://www.greateratlantic.fisheries.noaa.gov/protected/riverherring/tewg/index.html>

Fisheries Subgroup

DRAFT UPDATE: Data Gaps and Conservation Ideas

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2015 Update

Introduction

The focus of this group is to consider the impacts from state and federal fisheries range-wide and identify fisheries-related data gaps and conservation ideas for the TEWG. There are other subgroups identifying data gaps and conservation ideas about other issues/threats for river herring (e.g. habitat, climate change - see the above website for additional information). The initial work of the Fisheries Subgroup has been twofold: 1) identify fisheries-related river herring (alewife and blueback herring) data gaps and ideas to fill those data gaps where appropriate; and 2) identify potential fisheries-related conservation ideas for river herring (RH). Addressing fisheries-related data gaps (i.e. uncertainty in catches¹) will assist future attempts to accurately assess the state of RH populations and assist in identifying the scale of RH catches for conservation considerations. Generating conservation ideas could lead to additional ways to control catch of RH, which is likely to be an important part of overall RH conservation.

Since the TEWG cannot utilize consensus, at this time this document is a non-prioritized list of ideas from members of the Fisheries Subgroup, which may or may not be held in common by multiple group members. The group may utilize non-consensus methods to prioritize issues at a later time. The current ideas reflect an overarching need to enhance catch information from all fisheries to better understand impacts range-wide. This document also incorporates data gaps identified previously (e.g., NOAA Fisheries, Councils) and will continue to be updated to reflect ongoing subgroup and TEWG discussions, monitoring of the identified data gaps and conservation ideas, and developments in the state of our knowledge about river herring abundance, behavior, and distribution.

¹ For the purposes of this document, catch refers to all catch (targeted or incidental). Catch may be retained/landed or discarded. The word bycatch is generally avoided because it has a variety of common and legal usages which can lead to confusion.

The original issues identified by the Subgroup are in boxes, followed by updates and potential follow-ups.

I. Data Gaps – Focuses on catch (the relationship between catch and impact on stocks would be the primary domain of the TEWG Stock Status Subgroup)

Recreational U.S.

-There are no comprehensive angler use and harvest survey techniques for use by Atlantic states with open or future fisheries to assess recreational harvest of RH.

UPDATE: ASMFC is organizing a River Herring Data Collection Standardization Meeting in the coming months. NOAA Fisheries has provided additional financial support to the Commission to convene this meeting.

POTENTIAL FOLLOW-UPS: This should be flagged for ASMFC as a possible topic for the River Herring Data Collection Standardization Meeting or a later meeting. It may also be useful to develop a quick reference on U.S. and Canadian catch regulations.

-Because of limitations of Marine Recreational Information Program (MRIP) sampling, data are not generally collected in areas where recreational RH catch is most likely to occur (upper portions of tidal rivers). Given the current restrictions on recreational RH catch, this may not be considered a priority problem, but it could become a larger issue if recreational catch restrictions are relaxed and catches increase.

-It is unclear if recreational fishing of RH in reservoirs should be monitored/regulated because they may affect overall populations if some downstream escapement occurs. Likewise, managers might want/need monitoring of whether catch of RH below reservoirs is coming from anadromous or generally land-locked populations.

UPDATE: This is the ACCSP standard for sampling locations: The upstream boundary for the saltwater intercept survey shall be the freshwater/saltwater legal boundary of the state and integrated with site registry coverage for seasonality. MRIP does have an interactive site register where people can flag potentially important fishing sites that are not currently sampled: <http://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/site-register>. The new MRIP mail survey, which goes to both a universal address sample frame as well as a licensed angler frame (they are combined in a statistically appropriate manner for dual frames) may facilitate the exploration of additional information being gathered further upriver. License-based surveys are not possible in Canada as no saltwater license exists in the DFO Maritimes region.

POTENTIAL FOLLOW-UPS: *Discuss possible projects with MRIP staff in 2016 for potential 2017 MRIP funding.*

-The lack of Wave 1 (Jan-Feb) recreational sampling may be a data gap depending on RH migration patterns.

UPDATE: Wave 1 sampling occurs in the South Atlantic through North Carolina. The ACCSP standards have recommended the following: Implementation of monthly data collection is prioritized for May through October but may vary regionally to maximize the ability to monitor annual landings within the year. Collection of catch data in January and February shall be performed annually from Maryland to Florida. Collection of data along the remaining coast (Massachusetts to Delaware) shall be evaluated by the states for need every 5 years based on expected magnitude and recent trends in the effort data. Adding Wave 1 sampling north of North Carolina is a resource/policy prioritization issue – no methodological research is needed. A previous MRIP study led by Jason Didden (<https://www.st.nmfs.noaa.gov/mdms/public/finalReport.jsp?ReportID=1119>) did note that in general for good annual catch information, it may be more efficient to get more precision in waves with more effort/catch rather than some information in Wave 1 given the relatively low Wave 1 catch.

POTENTIAL FOLLOW-UPS: *Discuss possible projects with MRIP staff in 2016 for potential 2017 MRIP funding.*

-Any recreational sampling could have species identification issues (whether self-reported or via samplers).

UPDATE: Samplers would typically not cut open an angler's fish to ID it and river herring generally need to be cut open for positive species identification (although recent work suggests even this is not 100% REFERENCE?). Many river herring that are kept by U.S. anglers would likely be used for live bait, which means that they won't be cutting them up either. River herring are not as commonly used live in Canada.

POTENTIAL FOLLOW-UPS: Development of identification techniques that are easily used in the field? A molecular test would be more definitive but also costly.

-It is uncertain how state sustainability plans should address monitoring provisions.

UPDATE: None

POTENTIAL FOLLOW-UPS: Get update from ASMFC next revision.

Commercial U.S.

-Historical RH catch data are likely incomplete and generally not separated by species. Being able to associate accurate catches by water body and species (and maybe gear) is likely to be important for future assessment and conservation activities.

-Species identification is an issue for all RH catch data except recent observer/port sampling data.

-Biological data from catches should be collected in a systematic manner.

UPDATE: ASMFC is hosting a River Herring Data Collection Standardization Meeting in the coming months. NOAA Fisheries has provided additional financial support to the Commission to convene this meeting.

Trevor Avery (Canada) has been leading the analysis of RH data across eastern North America compiled from several reliable sources. The work is slow, but ongoing. It may be useful information and certainly fits with data collection moving forward (e.g. monitoring stations, repositories, etc.).

POTENTIAL FOLLOW-UPS: These should be flagged for ASMFC as possible topics for the River Herring Data Collection Standardization Meeting or a separate meeting.

-There is uncertainty regarding the consequences of interactions with ocean/coastal fisheries and populations in the rivers (this is a cross over issue with Stock Status Subgroup).

-The inability (so far) to associate ocean/coastal catch to natal rivers makes it difficult to prioritize conservation actions related to catch (retained or discarded). There is ongoing research on this topic.

UPDATE: This hinges both on the genetics work and general stock assessment work, both of which are ongoing. The group funded by ASMFC earlier this year (MDMF, UCSC, UMass, etc) to further our ability to assign bycatch to regions and better understand the interactions between populations and fishing related mortality made good progress in 2015. The DMF-SMAST program, in cooperation with the commercial fleet, covered the fishery for providing samples. Additionally, project partners networked with biologists and researchers across the entire range of both species (Canada and USA) to gather new baseline samples. The baseline for each species will now be tripled from the previous level. Hopefully improved coverage and the move to a more powerful molecular marker (Single Nucleotide Polymorphism aka SNP) will allow more certain and spatially refined assignment of population origin for river herring caught in the ocean.

Initial genetics research used 15 microsatellites to understand the spatial scale of population genetic structure among alewife and blueback herring spawning runs in the US. That work (i.e., Palkovacs et al. 2014) revealed that most rivers support genetically distinguishable populations that are nested within multiple regional genetic stocks. The same suite of microsatellites were recently used to identify the source of river herring bycatch, but could only confidently assign bycatch to regional genetic stock (Hasselman et al. *CJFAS-Accepted*). Management of river herring requires the capacity to identify the source of marine caught specimens on a finer spatial scale – ideally to river of origin. The development of 96 SNPs for alewife and blueback herring (Baetscher et al. *in prep*) represents a valuable increase in the number of markers available for this task, and the inclusion of spawning populations from across both species' geographic distribution will increase coverage and hopefully improve our ability to assign marine caught specimens to their population of origin.

POTENTIAL FOLLOW-UPS: Track ongoing research and ensure collaboration among individuals who are doing research and those who can collect useful samples. Are additional samples needed from anywhere? Would developing a recreational and/or commercial fisheries sampling program aid in providing samples to those investigating genetic differences between river systems or other data collection needs?

-Current levels of observer/port sampling do not result in accurate/precise estimates of catch (especially discards) across all gear types.

-Electronic monitoring for RH catch (tied to retention, slippage and dockside monitoring) may be an appropriate approach but has not been tested in the relevant fleets.

-There is uncertainty about the ability of current portside sampling programs to continue given their current funding sources, but portside sampling is likely to be an efficient way to monitor RH catch in fisheries that retain most of their catch.

UPDATE: Both Councils (NEFMC and MAFMC) are working on an Industry Funded Monitoring Joint Omnibus Amendment that may result in higher observer coverage in the Atlantic herring and mackerel fisheries. The Amendment contains options for at sea observers/monitors as well as portside/electronic monitoring. The Councils will be reviewing an environmental assessment prior to public hearings at their upcoming Council meetings (September for NEFMC and October for MAFMC). See <http://www.mafmc.org/actions/observer-funding-omnibus> for details.

See <http://www.umassd.edu/smast/bycatch/> for information on the SMAST port sampling work that is part of their river herring avoidance program. SMAST is pursuing Atlantic herring research set asides (RSA) to fund ongoing monitoring.

POTENTIAL FOLLOW-UPS: Consider how monitoring may inform better understanding of river herring life history/migration. Consider requiring full river herring retention on small mesh bottom trawls to facilitate port-side monitoring.

-Observer effects may create problems with interpreting observer data from fisheries that interact with RH.

UPDATE: It is very hard to pin down/eliminate observer effect, though increasing sampling should minimize the impact of observer effect bias in any estimates. The 2011 SBRM review (<http://www.nefsc.noaa.gov/publications/crd/crd1227/>) found little evidence of systematic bias in vessel behavior between observed and unobserved trips.

POTENTIAL FOLLOW-UPS: Discuss with NEFSC if additional observer effect research has occurred.

- Slippage (discarding on observed trips before catch is observed) may create problems with interpreting observer data from fisheries that interact with RH. The Councils have taken recent actions to monitor and reduce slippage.

UPDATE: The MAFMC's (mackerel) slippage-minimization framework action has become final: <http://www.mafmc.org/actions/msb-framework-9>. There is a proposed rule for the NEFMC (Atl. Herring): <https://www.federalregister.gov/articles/2015/08/27/2015-21146/fisheries-of-the-northeastern-united-states-atlantic-herring-fishery-framework-adjustment-4>.

Vessels carrying an observer with a limited access Atlantic mackerel (Tier 1, 2, and 3) and/or a longfin squid/butterfish moratorium permit cannot slip their catch except for one of the following reasons: 1) safety concern; 2) mechanical failure, including gear damage; or 3) excessive catch of spiny dogfish. For vessels carrying an observer with a limited access Atlantic mackerel permit, if catch is slipped for one of the reasons listed above, the vessel operator must move and remain 15 nautical miles from where the slippage event occurred. If the catch was slipped for any other reason, the vessel operator must immediately terminate the fishing trip and return to port. Vessels must complete, sign, and submit a Released Catch Affidavit following any slippage event. (<http://www.greateratlantic.fisheries.noaa.gov/regs/infodocs/msbinfosheet.pdf>)

POTENTIAL FOLLOW-UPS: Summarize slippage information in future revisions.

-Electronic reporting (tow-by-tow similar to study fleet) may have applicability for RH catch monitoring and/or predicting areas of high RH availability.

-Studies to date have not conclusively determined if spatial/temporal patterns in incidental RH catch may make “hot spot” avoidance practicable, and have not incorporated environmental variables than may help predict areas of high RH availability

UPDATE:

Electronic reporting of tow-by-tow information has been implemented in the MA DMF/ SMAST river herring avoidance program. Currently, all enrolled vessels are required to have a BTVessel equipped laptop installed, which provides a template to rapidly report tow level information at-sea to river herring avoidance program administrators. Vessels are required to report catch and location information for 85% of all tows and 100% of NEFOP observed tows.

Also, NMFS Greater Atlantic Region funded a Northeast Fisheries Science Center (NEFSC) project to use environmental data collected as part of the NEFSC bottom trawl survey to model marine habitat preferences for alewife, blueback herring, and Atlantic herring. Habitat preferences were associated with bottom temperature, bottom salinity, depth, solar position, and region of the Northwest Atlantic Ocean. The NEFSC’s models will be coupled with oceanographic forecast models, and model accuracy will be evaluated through directed sampling with the cooperative research fleet. The ultimate project goal is to develop a river herring/ Atlantic herring overlap forecast tool for use by the Atlantic herring fishery to minimize incidental river herring catches (ongoing testing and grant applications).

In 2011, depth information was used to help mid-water trawl fishermen avoid alosine bycatch in the southern portion of Atlantic herring Management area 1A (Bethoney, 2012). Mid-water trawl effort and target species catch was equally distributed over fishing grounds (30 m to 130 m), but alosine bycatch was concentrated at depths shallower than 75 m. The mean tow depth of participating vessels in this area was significantly deeper than 73m (100m, one-tailed, one-sample t-test, $t_{15} = 3.71$ $P = .01$) and greater than in two of three previous years (ANOVA with Tukey's post hoc test $F_{3,91} = 4.60$ $P_s < .02$, except 2009 vs. 2011 $P = .10$, Bethoney 2013). No high bycatch events were observed and similar results have been repeated in subsequent years. (SMAST 2015).

Turner et al 2015 (ICES Journal of Marine Science) have investigated environmental variables for RH occurrence in the trawl survey.

POTENTIAL FOLLOW-UPS: Consider presentation to the Fisheries Subgroup on the Turner et al 2015 analysis as more information is available following the presentation at

the September 2015 TEWG meeting. Evaluate utility of study fleet data (including bottom temperature data) for predicting river herring availability/bycatch avoidance. Consider if other models may tease additional insights out of existing data sets.

-Some mixed (bait) landings likely had and still have an unreported RH portion. Maine's directed river herring fishery (100s of metric tons) is harvested for lobster bait each year. It is difficult to find/report river herring in herring for lobster bait.

UPDATE: None

POTENTIAL FOLLOW-UPS: Get update for next revision.

-The final disposition/recording of NJ/MA incidental catch allowance landings (must river herring be discarded or personally used in NJ?) is unclear.

-A variety of factors may impact the decision to discard (e.g. market forces or regulations), which can affect the appropriate measures to address discarding.

UPDATE: None

POTENTIAL FOLLOW-UPS: In the next revision, clarify state regulations/monitoring regarding what happens to river herring landed under the bycatch allowances. Make sure that any regulatory actions thoughtfully consider why interactions and/or discarding are occurring and what the effects of possible responses may be.

-State fisheries are generally less represented in observer data and this could potentially impact catch estimates.

UPDATE: None

POTENTIAL FOLLOW-UPS: In the next revision, determine the procedures for reporting incidental catch in state fisheries.

Canada

-Some data exist for some areas but a literature search and greater interaction with Canada is needed to fully establish the extent of existing Canadian RH fisheries data, and by extension the relevant data gaps. Data gaps identified for the U.S. may likely extend to Canada such as the need to associate ocean/coastal catch to natal rivers.

UPDATE: Jamie Gibson, Fisheries and Oceans Canada, presented an “Overview of river herring in the Maritime Provinces” at the December 2014 TEWG meeting (http://www.greateratlantic.fisheries.noaa.gov/protected/riverherring/tewg/river_herring_overview_final.pdf). Fisheries and Oceans Canada will be invited to the River Herring Data Collection Standardization Meeting.

POTENTIAL FOLLOW-UPS: Use contacts (Jamie Gibson/Darren Porter/Trevor Avery) to further develop Canadian information and describe ongoing Canadian monitoring and research efforts.

II. Fishery-Related Conservation Ideas

General U.S.

-Add river herring as stocks in the Atlantic herring and mackerel fisheries and ensure full federal conservation and management under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

UPDATE: The MAFMC is scheduled to review its decision not to manage river herring and shad as directly managed stocks in October 2016, and the NEFMC is scheduled to do the same by January 2018. At this point both Councils are taking a complementary approach with ASMFC and the TEWG.

POTENTIAL FOLLOW-UPS: Track Council actions and any legal decisions.

Recreational U.S.

- Current/future recreational catch levels under state sustainability plans are unlikely to be problematic if properly monitored.

UPDATE: None

POTENTIAL FOLLOW-UPS: Evaluate if there are potential benefits to opening up some runs to develop additional information? Could the states/ASMFC identify those systems with the best likelihood of being named “sustainable” under the ASMFC FMP? Develop a summary of states with sustainability plans (in place or pending).

Commercial U.S

- Consider applicability of full retention rules for fisheries that have RH incidental catch.*
- Consider applicability of port-side sampling for RH monitoring (for fleets where RH are maintained).*
- Establish a Federal Portside Sampling Program.*
- Complete the Omnibus Industry-Funded Observer Coverage Amendment. For fleets that interact with river herring, some sub-group members mentioned higher (up to 100%) observer coverage is needed, other members indicated that 100% coverage is necessary for the mid-water trawl fleets, and other members believe that SBRM coverage, coupled with a shoreside monitoring program would be adequate.*

UPDATE: Both Councils (NEFMC and MAFMC) are working on an Industry Funded Monitoring Joint Omnibus Amendment that may result in higher observer coverage in the Atlantic herring and mackerel fisheries. The Amendment contains options for at sea observers/monitors as well as portside/electronic monitoring. The Councils will be reviewing an environmental assessment prior to public hearings at their upcoming Council meetings (September for NEFMC and October for MAFMC). See <http://www.mafmc.org/actions/observer-funding-omnibus> for details. It has been challenging so far to come up with options that increase monitoring and appear to be feasible financially for industry.

POTENTIAL FOLLOW-UPS: Evaluate relationship between potential electronic monitoring/portside monitoring and slippage issues. Consider consistency between current protocols for slippage with observers and potential issues with slippage and port side monitoring.

-Restrict commercial fishing effort in times and areas when it can be linked to stock decline/ impediments to recovery.

-Precautionary restrictions on incidental interactions should be considered on a case-by-case basis until stock status and catch can be more closely associated.

UPDATE: No such linkages have yet been established. Due to the inter-annual variability in river herring distribution the Councils have to date pursued a capping approach and rejected time/area closures.

POTENTIAL FOLLOW-UPS: Support any relevant Council/ASMFC actions.

-Continue/expand voluntary RH catch avoidance programs (<http://www.umassd.edu/smast/bycatch/>, <http://www.squidtrawlnetwork.com/river-herring-avoidance-maps/>).

UPDATE: SMAST, MADMF and Cornell will provide updates at the September 2015 TEWG meeting. Priority for Council Research/RSA programs.

POTENTIAL FOLLOW-UPS: Support such programs when feasible.

-Test potential for gear or other fishing behavior modifications to reduce incidental RH catch. Examples include researching possible vertical segregation of river herring in the water column and observing fish behavior in/near fishing gears. Any potential projects should fully evaluate the current literature to determine/justify the likely fruitfulness of such studies.

UPDATE: See temperature investigations above.

POTENTIAL FOLLOW-UPS: Encourage and track relevant research.

Canada

- Additional collaboration with Canadian entities is needed to develop potential conservation ideas related to catch of RH in Canada.

UPDATE: Jamie Gibson, Fisheries and Oceans Canada, presented an “Overview of river herring in the Maritime Provinces” at the December 2014 TEWG meeting (http://www.greateratlantic.fisheries.noaa.gov/protected/riverherring/tewg/river_herring_overview_final.pdf). **Other??**

POTENTIAL FOLLOW-UPS: Use contacts (Jamie Gibson/Darren Porter/Trevor Avery) to further develop Canadian information and describe ongoing Canadian monitoring and research efforts.