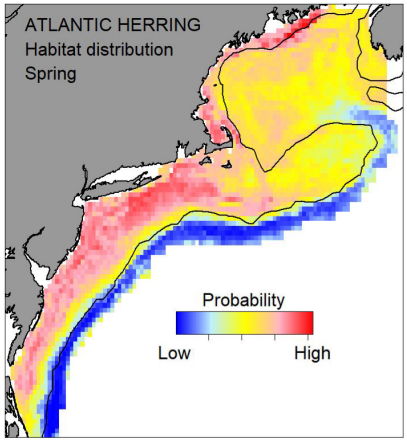
Atlantic herring (*Clupea harengus*) Snapshot Ecosystem & Socioeconomic Profile

Summer 2024

This is a short-form update to the full Ecosystem and Socioeconomic Profile [1] highlighting the recent status of environmental and ecological factors. Atlantic herring is an important and valuable New England stock fished primarily by commercial vessels for use as bait (for lobster). The stock is currently overfished but not subject to overfishing.



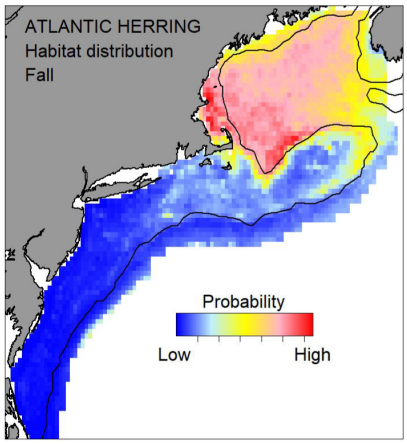


Figure source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/ecosystems/fisheries-habitat-northeast-us-shelf-ecosystem

Recent highlights

2025 Research Track Stock Assessment

- Explored a recruitment index from seabird diet data [2]
- Developed indicators of predation by haddock [3], food availability [4], and temperatures experienced by larvae [5] to test as ecosystem covariates for recruitment but none significantly improved the model [6]

Fishing community observations [7]

- Market processes: increased reliance on menhaden due to declining and inconsistent herring catch, reduced quotas, higher fuel prices, river herring bycatch
- Ecological concerns: warming, changing zooplankton and forage base, haddock predation, altered predator-prey interactions

Commercial Fishery

- Reduced participation, particularly of larger vessels
- Broader market impacts include switch to alternative sources like frozen herring and menhaden

Management

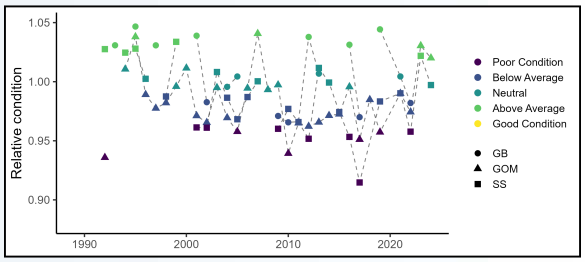
- Still in a period of substantially reduced catch limits
- Frequently changing ABC and sub-ACLs across the 4 management areas
- Several extensions and revisions to the target rebuilding date, currently 2031

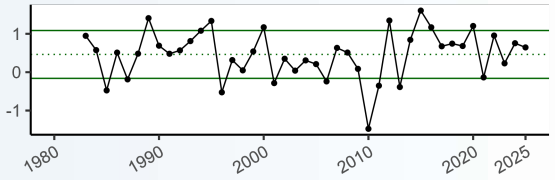
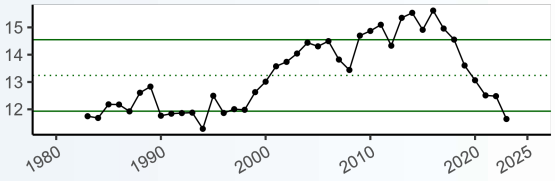
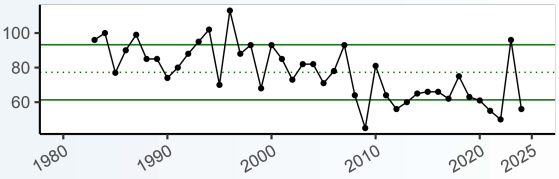
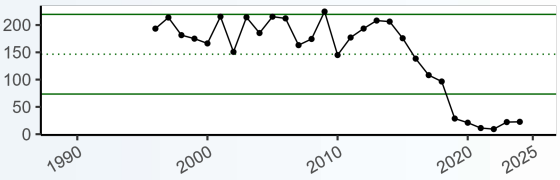
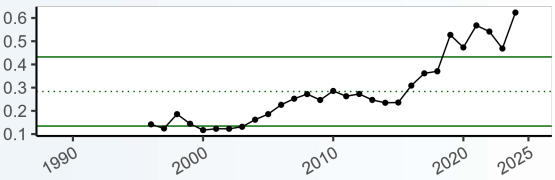
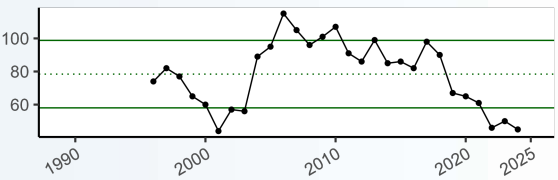
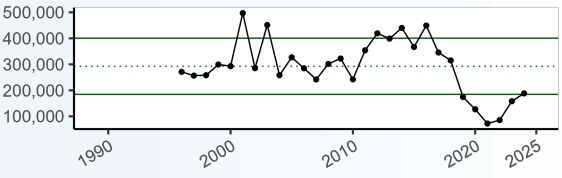
Ecosystem

- Age 3+ adults migrate to the Gulf of Maine for summer/fall spawning.
- Haddock predation on eggs is decreasing
- Development depends on appropriately sized zooplankton prey at the right time in lifecycle; zooplankton communities are changing
- Warming increases herring larval encounters with stressful or lethal surface temperature

NEW ENGLAND RISK POLICY SUMMARY (PLACEHOLDER)

- What type of information is useful to summarize here?
  - –Risks to meeting management objectives
  - –Compile existing risk indicators relevant to the stock
  - –Sources of management and model uncertainty
- Some capacity to develop our own risk indicators and/or provide additional context based on other ecosystem risk indicators
- Is there other information related to stock-level risk that should go here?



Indicator Units	Status In 2024	Implications	Time Series
Winter NAO (Index)	WinterNAO anomalies have been positive in 2024 and 2025	NAO phases impact oceanographic properties of water entering the Gulf of Maine. Easily updatable, data publicly available [8]. Could be replaced by other indices of climate variability or SOE indicators (such as Gulf Stream Index)	
Haddock Predation (Index)	Declining predation on herring eggs	Lower egg predation favors strong year classes. Tailored indicator developed by Micah Dean at MADMF for the RTSA. Alternative indicator:haddock SSB from the stock assessment model	
Optimal larval temperature duration (# of days)	Short duration of optimal larval temperature in fall 2024	Unsuitable conditions for larvae. Easily updatable, data publicly available. Based on larval thermal limits and OISST data, using herring spatial footprint.	
Commercial Landings (millions of lbs)	Well below average	Commercial landings remained relatively static compared to 2023 and are slightly higher than 2020-2022 quantities; however, landings are still well below the historical average as well as the standard deviation from the mean.	
Average Price per lb. (2024 $/lb)	Well above average	Ex-vessel price was well above the historical average in 2024. Given no notable uptick in landings, this increase may be driven in part by supply constraints, particularly for Area A1 which had a 92.1% of its quota landed by December of 2024 [9].	
Active Vessels (# of vessels)	Well below average	The number of active vessels in the herring fishery declined from 2023 to 2024, following an overall decreasing trend since 2017, suggesting overall negative implications for fishing fleet diversity and resilience.	
Average Vessel Revenue (2024 $)	Below average	The average revenue per vessel from herring landings increased slightly from 2023 and has continued a positive trend since 2021. This is most likely due to a lower number of vessels in the fleet and potential increases in effort from those remaining in the fishery to maintain relatively consistent landings relative to previous years.	

* The y-axis units are included in the "Indicator" column of the table. In all figures, the dashed line represents the time series mean, and the solid green lines indicate ± 1 standard deviation. Commercial data were derived from the commercial dealer database hosted at the Greater Atlantic Regional Office. All dollar values have been adjusted to 2024 real dollars.

We welcome your observations! Please contact northeast.ecosystem.highlights@noaa.gov with any on-the-water insights or changes observed in the Atlantic herring fishery and nefsc.esp.leads@noaa.gov with questions or comments on the information presented in this report.

References

1.A. Molina (2025) Atlantic herring Ecosystem and Socioeconomic Profile Trade-offs in the use of a seabird diet-derived recruitment index for the assessment of Atlantic herring in the Northeast U.S.

2.D. Micah (2025) Development of a haddock predation index as a recruitment covariate in the Atlantic herring stock assessment model

3.S. Gaichas (2024).Working Paper: Developing zooplankton indices in VAST food availability

4.A. Molina (2025) Temperature Threshold Indicators

5.S. Gaichas & J. Deroba (2024) Working Paper: Recruitment covariate testing in WHAM

6.J. Cournane (2024) ATLANTIC HERRING RESEARCH TRACK WORKING GROUP STAKEHOLDER ENGAGEMENT SESSION

7.Center, C. P. (2024). North Atlantic Oscillation, Climate Prediction Center, National Centers for Environmental Predictions, NOAA [data set]. https://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/nao.shtml

8.https://apps-garfo.fisheries.noaa.gov/quota-monitoring/atlantic-herring/archive-herring//2024-12-14_qm_herring.html