FMP	**NORTHEAST MULTISPECIES (GROUNDFISH)**
STOCK(S)	**Georges Bank Haddock**
LAST ASSESSMENT	**2022 Fall Management Track**

Assessment Model, Terminal Year	Description of Assessment Model	Overfishing?/ Overfished?	In Rebuilding Program?	OFL	ABC/ABC CR	ACL	ACT
WHAM, 2021	State Space	No/No	No	114,925 mt in FY2022	Total ABC 88,856 mt and US ABC 81,383 mt in FY2022	75,381 mt in FY2022	N/A for groundfish

	MSY/OY	AMs	Discards	State Waters
Multispecies groundfish fishery, frequently caught with less abundant species like cod. Surges in stock abundance and quotas are driven by strong year classes, creating a boom and bust cycle. The current assessment shows the stock leaving the boom phase and heading in the bust direction. Transboundary EGB haddock managment unit co-managed by the U.S. and Canada.	MSY = 25,494 mt	Inseason closures and lb-lb for commercial groundfish fishery; lb-lb payback for midwater trawl fishery	47.6 mt in FY2021	0.9 mt in FY2021

Availability of Biological and Assessment Data	*Updated data since last assessment:* survey (2021 NEFSC spring and fall survey - no surveys in 2020) and fisheries (commercial catches - US and Canadian) data
Recent Performance Against Harvest Control Rule	Percent of total ACL caught: 11.5% in FY2018, 9.6% in FY2019, 5.2% in FY2020, and 4.0% in FY2021.
Current Management Program	For GB haddock, the total ABC is reduced by the amount of the Canadian quota for the Eastern GB management unit. The Total ACL is divided between several sub-ACLs and sub-components. The commercial sub-ACL is further divided between the sector sub-ACL and the common pool sub-ACL. The majority of commercial permits particpate in sectors, fishing under quotas. The common pool operates under days-at-sea, with trip limits and trimester TACs controlling catch. The herring mid-water trawl fleet receives a sub-ACL. State waters and the other sub-components round out the final components of the total ACL. Landings and discards from all fisheries count against the applicable sub-ACL and total ACL, which are monitored throughout the year. Accountability measures can be triggered if overages occur under certain conditions for components with sub-ACLs. Eastern GB haddock is jointly managed with Canada under the United States/Canada Resource Sharing Understanding. Each year, the Transboundary Management Guidance Committee (TMGC) and Steering Committee (SC) recommends a shared quota for Eastern GB haddock based on the most recent stock information and the TMGC's harvest strategy. The shared quotas are allocated between the United States and Canada based on a formula that considers historical catch (10-percent weighting) and the current resource distribution (90-percent weighting).
Variablity in Catch/Revenues?	*Commercial Groundfish Revenue for EGB haddock (2020$):* $1.0 million in FY2018, $1.2 million in FY2019, $1.0 million in FY2020; $1.2 million 5-year average; *WGB haddock (2020$):* $7.9 million in FY2018, $9.2 million in FY2019, $12.3 million in FY2020; $7.8 million 5-year average *EGB haddock ex-vessel price/lb (2020$/lb):* $0.96/lb in FY2018, $0.97/lb in FY2019, $0.98/lb in FY2020; $1.04/lb 5-year average; *WGB haddock (2020$/lb):* $0.99/lb in FY2018, $1.08/lb in FY2019,$1.10/lb in FY2020; $1.10/lb 5-year average *Total groundfish landings:* 44.28 million pounds in FY2018, 42.66 million pounds in FY2019, 50.66 million pounds in FY2020 *Total GB haddock catch (landings + discards):* 5,324.3 mt in FY2018, 5,323.4 mt in FY2019, 6,513.3 mt in FY2020, 3,119.7 mt in FY2021 WGB haddock makes up the majority of catches.
Data - Vessels, Permits, Dealers, Processors, Employment	FY 2020: 876 commercial groundfish permitted vessels, of those 590 vessels which received revenue from any species on a declared groundfish trip and 197 vessels with revenue from groundfish. 99 dealers reported buying groundfish.
% Food, % Recreational	95% of the US ABC is allocated to the commericial fishery. There is no recreational sub-ACL.
Fishing Communities	The top 5 ports based on the Groundfish-Specific Commercial Engagement Indicator (2004-2020) are Gloucester, MA; New Bedford, MA; Boston, MA; Narragansett, RI; and Portland, ME.
Other Economic/Social Factors	*ACE lease prices modeled using a hedonic price model from inter-sector leases for FY2017-2021:* ACE lease prices are reported as $0 across FY2017-2021.
Major Sources of Scientific Uncertainty	Sources of uncertainty include dynamics in the plus group (particularly with the 2013 year class), the magnitude of the 2020 and 2021 year classes, and future assumptions about weights and selectivity at age.
Major Sources of Management Uncertainty	The default management uncertainty buffer of 5% is applied to the commercial fishery.
How is the probability of overfishing addressed?	In 2021 the SSC reviewed updated information on GB haddock to consider whether adjustments to the OFL and ABC recommendations were needed, and based on this recommended that the FY2022 OFL and ABC recommendations should be maintained.
What is the consequence of overfishing?	Reduction in biomass, yield, and net economic benefits over long-term.
How are expected net benefits to the Nation currently measured/evaluated?	Yield (mt and $)
Interactions with Other Fisheries/Stocks, Bycatch Issues	The herring midwater trawl fleet receives a sub-ACL of 1-2% (currently 2%) of the US ABC for GB haddock. Haddock is frequently caught with less abundant groundfish species like cod.
Ecosystem Considerations: Trophic Interactions	Haddock have a varied diet consisting of polychaetes, crustaceans, mollusks, echinoderms, and fish. Fish are more important for larger individuals.
Ecosystem Considerations: Habitat	Haddock are found in moderate depths in Georges Bank. Haddock prefer gravel, pebbles, clay, broken shells, and smooth hard sand, particularly smooth areas between rocky patches (Klein-MacPhee 2002). These habitat types are common on Georges Bank, and less prevalent in the Gulf of Maine, which helps explain the increased abundance of haddock on Georges Bank (Brodziak 2005). Haddock do not make extensive migrations, but prefer deeper waters in the winter and tend to move shoreward in summer. Closures in place in the GB area include the GB Dedicated Habitat Research Area, Closed Area II, and a seasonal closure area.
Ecosystem Considerations: Climate	Haddock are considered to have low vulnerability to climate change (high climate exposure risk and low biological sensitivity).

Other Important Considerations/Notes	Weights at age for catch and SSB that were predicted from a Gaussian Markov Random Field (GMRF) model, rather than a recent 2 year average, were used as recommend by the Peer Review Panel. These GMRF weights at age predicted a slightly greater increase in weights at age in later years of projections (with large uncertainty bounds), and consequently produced larger estimates of catch and SSB in 2022-2025 compared to projections using a two year average for weights at age. The GB haddock stock shows a broad age structure, and broad spatial distribution. This stock has produced several exceptionally strong year classes in the last 20 years, leading to record high SSB in the last decade. As the strong year classes age out of the population, abundance has returned to levels last observed in the early 2000s, which could potentially lead to an increase in weights at age as growth is released from density-dependent pressures. Catches in recent years have been well below the total quota (US+Canada), but projected catch levels will be substantially less than recent quotas due to declining abundance and the combined effect of re-estimated Canadian weights at age and a re-estimated length-based calibration for the NEFSC Albatross IV : H.B.Bigelow vessels.