



NOAA

CHESAPEAKE BAY OFFICE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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Menhaden

Atlantic menhaden—*Brevoortia tyrannus*—constitute the largest landings, by volume, along the Atlantic Coast. They rank second in the United States for landings behind only pollock on the West Coast, Alaska.

Menhaden are a major source of omega-3 fatty acids, which have been shown to cut risks of heart disease and possibly other diseases, such as Alzheimer's.

Menhaden play an important role in the Bay's ecosystem as both a forage fish for striped bass, weakfish, bluefish, and predatory birds such as osprey and eagles as well as serving as a filter feeder because they feed on phytoplankton and zooplankton at various life stages.



Fish Facts

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Status

Biomass: While the stock of menhaden is not considered overfished, overfishing has occurred in 32 of the past 54 years, but it was not occurring during the previous nine years of assessment data (1999-2007). Based upon the 2008 data, overfishing was occurring.

Biological Reference Points: Established November 2011. The [Atlantic State Marine Fisheries Commission](#) adopted new threshold and target fishing mortality rates based upon Maximum Spawning Potential (MSP). The new threshold and target levels equates to a MSP of 15% and 30%, respectively. With these newly adopted fishing mortality reference points, the fishing mortality threshold is set at $F=1.32$ and the target is set at $F=0.62$.

Overfishing: Based on the revised 2009 Atlantic menhaden stock assessment and the new fishing mortality threshold, overfishing is occurring. Fishing mortality in 2008 (the latest year in the assessment) is estimated at 2.28.

Overfished: Based on the current reference point to evaluate stock condition (fecundity, or FEC), Atlantic menhaden are not considered overfished.

Fishing and habitat: Atlantic menhaden are primarily caught via purse seine in the commercial fishery. Omega Protein is the only commercial reduction fishery along the Atlantic Coast. The bait fishery for menhaden has become increasingly important from North Carolina to New England. The purse seine is highly effective and has little to no effect on habitat. Cast nets are also used for limited bait catch in the recreational sector.

By-catch: The menhaden fishery is one the of most selective, and effective fisheries, with a small by-catch. Atlantic croaker is the principal species caught as by-catch and is considered insignificant.



Aquaculture: Menhaden aquaculture is nonexistent, but menhaden products are used in aquaculture of other fish. Reduction of menhaden yields three products: fish meal, fish oil, and fish solubles. The fish aquaculture industry depends heavily on fish meal to improve feed efficiency and produce maximum growth rates. Crude fish oil is used in foreign aquaculture, while refined fish oils are used as a nutrition supplement for people. Fish solubles are used to fortify fish meal and increase nutrition in the aquaculture industry.

Related NOAA Resources

[FishWatch](#)

Also of Interest

[Chesapeake Bay Program](#)

[Atlantic States Marine Fisheries Commission](#)

Science and Management

The Atlantic menhaden fishery is managed by the [Atlantic States Marine Fisheries Commission \(ASMFC\)](#), which tracks and regulates harvest under its Interstate Fishery Management Plan for Menhaden. In October 2006, ASMFC limited menhaden harvest for the reduction fishery in the Chesapeake Bay to a five-year annual cap of 109,020 metric tons. This cap remains in place today and additional restrictions are likely given the new reference points (2011).

During the 2010 Atlantic menhaden benchmark stock assessment, the Peer Review Panel noted that menhaden population abundance had declined steadily and recruitment had been low since the last peak observed in the early 1980s. Over the period of known exploitation, menhaden recruitment appears to be independent of fishing mortality and spawning stock biomass, indicating environmental factors may be the defining factor in the production of good year classes. If menhaden recruitment is largely environmentally driven, adoption of the new reference points (MSP approach) may not result in better recruitment. However, there is a possibility that the stock may be able to take greater advantage of favorable environmental conditions if a larger percentage of spawning adults remain in the population.

The NOAA Chesapeake Bay Office provides objective science to support regional management of Atlantic menhaden, and has funded a variety of research projects to determine menhaden abundance in the Bay; estimate menhaden removal by predation; determine the flux of menhaden between the estuarine and coastal systems; and understand larval recruitment dynamics in the Chesapeake Bay and waters of the mid-Atlantic. The Center for Independent Experts recently reviewed the NOAA Chesapeake Bay Office's menhaden research program and submitted reports authored by experts from [Australia](#), [Canada](#), and [Great Britain](#).

Life History and Habitat

Life history, including information on habitat, growth, feeding, and reproduction of a species, is important because it affects how a fishery is managed.

Geographic range: The Atlantic menhaden is found in coastal and estuarine waters from Nova Scotia to northern Florida.

Habitat: Menhaden are common in all salinities of the Chesapeake Bay, swimming in large schools close to the water's surface during the spring, summer, and fall. Throughout the spring, the schools stratify by size and age along the coast so that by the summer, younger and smaller fish are found in the Chesapeake Bay and south while the older, larger fish are distributed to the north.

Life Span: Can live up to 10 to 12 years.

Food: Menhaden feed on both phytoplankton and zooplankton. In their well-nourished state, these filter-feeding fish are referred to as fatbacks or bunkers.



SL (1.6-7.3 in).

Growth Rate: Larvae of 10-34 mm TL (0.4-1.3 in) appear in the Chesapeake Bay in large numbers during May and June, with a smaller influx in November. The larvae use the brackish waters and freshwaters as nursery areas. Here, they metamorphose into juveniles and grow rapidly. By the fall, the young menhaden quadruple in size to reach 40-185 mm

Maximum Size: Approximately 15".

Reproduction: Sexual maturity begins just before age three; these fish spawn from March to May, and again in September and October.

Migrations: The menhaden return to the shelf waters off the Bay ready to spawn (March-May). The young of the year leave the estuary in late fall and join the schools in southward migration. During the fall and early winter, most menhaden migrate south to the North Carolina capes, where they remain until March and early April.

Predators: Menhaden serve as prey for many fish and sea birds. A large crustacean parasite also commonly feeds off of the menhaden, attaching to the fish's mouth, thus giving menhaden another nickname: bugfish.

Commercial and Recreational Interest: Commercial.

Distinguishing Characteristics: Moderately compressed body; silvery in color with a distinct black shoulder spot behind their gill opening.

Role in the Ecosystem

Menhaden form a critical link between the lower and upper levels of the Chesapeake Bay food web, because they are a key forage species for fish such as striped bass, weakfish, and

bluefish and are filter feeders, grazing on planktonic organisms such as algae and zooplankton. Menhaden is the only forage species in the Chesapeake Bay that is also a major commercial fishery—the species is the largest fishery, by volume, in the Chesapeake Bay. More pounds of menhaden are landed each year than of any other fish in the United States other than pollock.

Menhaden is considered unfit for human food consumption due to its small size and high oil content, but the modern purse seine reduction fishery grinds menhaden into fish meal and oil for use as an ingredient in pet foods, livestock and aquaculture feeds, and various industrial products. East Coast landings of menhaden have ranged from 300,000 to 400,000 metric tons annually since the mid-1970s. Most of that catch comes from estuaries including the Chesapeake Bay and near-shore coastal waters, which are fished with a variety of gear, most commonly purse seines and pound nets. The purse-seine fishery for menhaden is extremely clean, resulting in less than one tenth of one percent by-catch of other species.

Did You Know?

Native Americans in precolonial America called the fish 'munnawhatteaug,' which means 'fertilizer.'

Menhaden are probably the fish that the indigenous tribes urged the Pilgrims to plant along with their corn as fertilizer.

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