# PYGMY KILLER WHALE (*Feresa attenuata*): Western North Atlantic Stock

## STOCK DEFINITION AND GEOGRAPHIC RANGE

The pygmy killer whale is distributed worldwide in tropical and subtropical waters (Jefferson et al. 1994). However, sightings of this species in the western North Atlantic are extremely rare and stranding records are also sparse, probably due to the natural rarity of the species (Baird 2018; Braulik 2018). In the western North Atlantic, strandings are recorded from primarily South Carolina and Georgia, with two from North Carolina and one from Massachusetts, and there have been two sightings during NMFS vessel surveys from 1992 to 2016. In the Hawaiian Islands, there is evidence for limited movement of individuals and for island-associated populations (Baird 2018), and the author suggested it is likely that there is population structure within the species elsewhere. Pygmy killer whales in the western North Atlantic are managed separately from those in the northern Gulf of Mexico. Although there have been no directed studies of the degree of demographic independence between the two areas, this management structure is consistent with evidence for population structure in other areas (Baird 2018) and is further supported because the two stocks occupy distinct marine ecoregions (Spalding et al. 2007; Moore and Merrick 2011). Due to the paucity of sightings in the western North Atlantic, there are insufficient data to determine whether the western North Atlantic stock comprises multiple demographically independent populations. Additional morphological, acoustic, genetic, and/or behavioral data are needed to further delineate population structure within the western North Atlantic and across the broader geographic area. Because there are confirmed sightings within waters of Canada and the Bahamas, this is likely a transboundary stock (e.g., Halpin et al. 2009; Dunn 2013; Harris 2015; Figure 1).

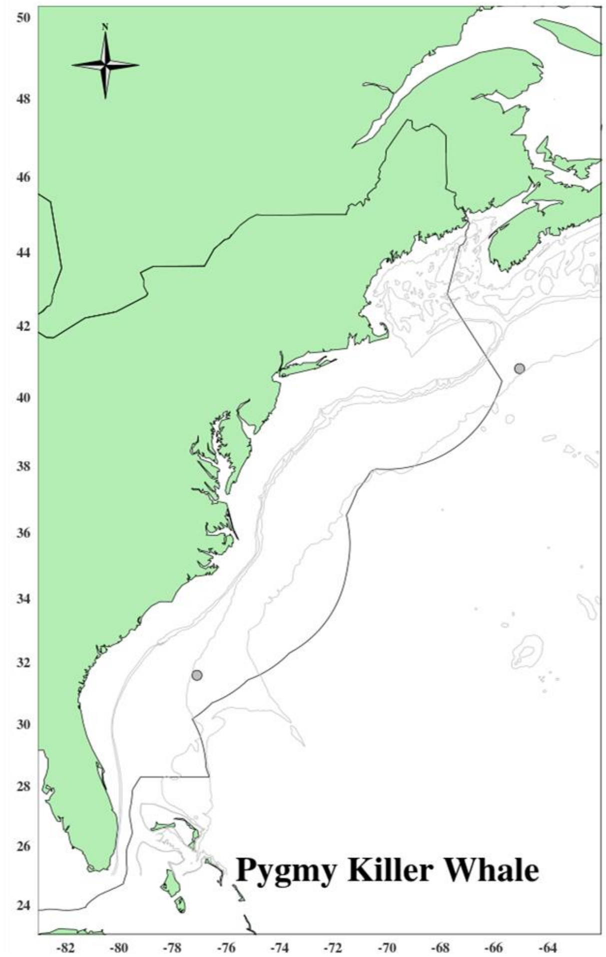


***Figure 1. Distribution of pygmy killer whale sightings from NEFSC and SEFSC shipboard (circles) and aerial (squares) surveys during 1992, 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010, 2011, 2013, 2016, and 2021. Isobaths are the 100-m, 200-m, 1,000-m and 4,000-m depth contours. The darker line indicates the U.S. EEZ.***

## POPULATION SIZE

The number of pygmy killer whales off the U.S. Atlantic coast is unknown since they were rarely seen in any surveys. A single group of six pygmy killer whales was sighted in waters ~1500 m deep off Georgia during a 1992 NMFS winter vessel survey (Hansen et al. 1994), and a single pygmy killer whale was sighted in waters ~4000 m deep far offshore of Long Island, New York, during a 2013 NMFS summer vessel survey (NEFSC and SEFSC 2013). Abundances have not been estimated from these single sightings. However, there has been at least one additional sighting of pygmy killer whales off Massachusetts (Halpin et al. 2009; Kenney 2013). Several cruises—a winter 2002 cruise (NMFS 2002), a summer 2005 cruise (NMFS 2005), a summer 2016 cruise (NEFSC and SEFSC 2016), and a summer 2021 cruise (NEFSC and SEFSC 2022)—each had one or two sightings of pygmy killer or melon-headed whales (identity was not confirmed), and these groups were recorded off Cape Hatteras or off the North

Carolina/South Carolina border.

### Minimum Population Estimate

Present data are insufficient to calculate a minimum population estimate for this stock (Table 1).

### Current Population Trend

There are insufficient data to determine the population trends for this stock because no estimates of population size are available.

## CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. For purposes of this assessment, the maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive history (Barlow et al. 1995).

## POTENTIAL BIOLOGICAL REMOVAL

Potential Biological Removal level (PBR) is the product of the minimum population size, one-half the maximum productivity rate, and a recovery factor (MMPA Sec. 3.16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is unknown. The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP), is assumed to be 0.5 because this stock is of unknown status. PBR for the western North Atlantic stock of pygmy killer whales is unknown (Table 1).

***Table 1. Best and minimum abundance estimates for the western North Atlantic pygmy killer whale (*Feresa attenuata*) with Maximum Productivity Rate ($R_{max}$), Recovery Factor ($F_r$) and PBR.***

| $N_{est}$ | CV $N_{est}$ | $N_{min}$ | $F_r$ | $R_{max}$ | PBR |
|---|---|---|---|---|---|
| Unknown | - | Unknown | 0.5 | 0.04 | Unknown |

## ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Total annual estimated human-caused mortality and serious injury to this stock during 2017–2021 was presumed to be zero, as there were no reports of mortalities or serious injuries to pygmy killer whales in the western North Atlantic. This species is rare and as a result the likelihood of observing a take is very low. Survey effort and observer effort are insufficient to effectively estimate takes for this species.

### Fishery Information

There is one commercial fishery that could potentially interact with this stock in the Atlantic Ocean, the Category I Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline fishery (Appendix III). Pelagic swordfish, tunas and billfish are the target species of the longline fishery. Percent observer coverage (percentage of sets observed) for this fishery in the Atlantic for each year during 2017–2021 was 11, 10, 10, 9, and 8, respectively. There were no observed mortalities or serious injuries to pygmy killer whales by this fishery in the Atlantic Ocean during 2017–2021 (Garrison and Stokes 2020a; 2020b; 2021; 2023a; 2023b). Detailed fishery information is reported in Appendix III.

There has historically been some take of this species in small cetacean fisheries in the Caribbean (Caldwell and Caldwell 1971).

## STATUS OF STOCK

Pygmy killer whales are not listed as threatened or endangered under the Endangered Species Act, and the Western North Atlantic stock is not considered strategic under the Marine Mammal Protection Act. No fishery-related mortality or serious injury has been observed during recent years; however, because this stock is rare, it is unknown whether total fishery-related mortality and serious injury can be considered insignificant and approaching the zero mortality and serious injury rate. The status of pygmy killer whales in the western U.S. Atlantic EEZ relative to optimum sustainable population is unknown. There are insufficient data to determine the population trends for this species.

## OTHER FACTORS THAT MAY BE AFFECTING THE STOCK

### Strandings

During 2017–2021, four pygmy killer whales were reported stranded along the U.S. East Coast (NOAA National Marine Mammal Health and Stranding Response Database unpublished data, accessed 13 October 2022 (Southeast Region) and 18 September 2022 (Northeast Region)). One stranding occurred in Georgia in 2018, and the remaining three occurred in South Carolina in 2020. Evidence of human interaction was detected for one of the strandings (pushed out to sea by members of the public), and for the remaining three strandings, it could not be determined if there was evidence of human interaction.

Stranding data underestimate the extent of human and fishery-related mortality and serious injury because not all of the marine mammals that die or are seriously injured in human interactions wash ashore, or, if they do, they are not all recovered (Peltier et al. 2012; Wells et al. 2015; Carretta et al. 2016). In particular, shelf and slope stocks in the western North Atlantic are less likely to strand than nearshore coastal stocks. Additionally, not all carcasses will show evidence of human interaction, entanglement or other fishery-related interaction due to decomposition, scavenger damage, etc. (Byrd et al. 2014). Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of human interaction.

### Habitat Issues

Anthropogenic sound in the world's oceans has been shown to affect marine mammals, with vessel traffic, seismic surveys, and active naval sonars being the main anthropogenic contributors to low- and mid-frequency noise in oceanic waters (e.g., Nowacek et al. 2015; Gomez et al. 2016; NMFS 2018). The long-term and population consequences of these impacts are less well-documented and likely vary by species and other factors. Impacts on marine mammal prey from sound are also possible (Carroll et al. 2017), but the duration and severity of any such prey effects on marine mammals are unknown.

The chronic impacts of contaminants (polychlorinated biphenyls [PCBs] and chlorinated pesticides [DDT, DDE, dieldrin, etc.]) on marine mammal reproduction and health are of concern (e.g., Schwacke et al. 2002; Jepson et al. 2016; Hall et al. 2018), but research on contaminant levels for this stock is lacking.

Climate-related changes in spatial distribution and abundance, including poleward and depth shifts, have been documented in or predicted for plankton species and commercially important fish stocks (Nye et al. 2009; Pinsky et al. 2013; Poloczanska et al. 2013; Grieve et al. 2017; Morley et al. 2018) and cetacean species (e.g., MacLeod 2009; Sousa et al. 2019). There is uncertainty in how, if at all, the changes in distribution and population size of cetacean species may interact with changes in distribution of prey species and how the ecological shifts will affect human impacts to the species.

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