FALSE KILLER WHALE (*Pseudorca crassidens*): Western North Atlantic Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The false killer whale is distributed worldwide throughout warm temperate and tropical oceans (Jefferson *et al.* 2008). This species is usually sighted in offshore waters but in some cases inhabits waters closer shore (e.g., Hawaii, Baird *et al.* 2013). Sightings of this species in the northern Gulf of Mexico (i.e., U.S. Gulf of Mexico) occur in oceanic waters, primarily in the eastern Gulf (Mullin and Fulling 2004; Maze-Foley and Mullin 2006). While records from the U.S. western North Atlantic have been uncommon, the combination of sighting, stranding and bycatch records indicates that this species routinely occurs in the western North Atlantic. False killer whales have been sighted in U.S. Atlantic waters from southern Florida to Maine (Schmidly 1981). There are periodic records (primarily stranding) from southern Florida to Cape Hatteras dating back to 1920 (Schmidly 1981). Most of the records are from the southern half of Florida and include a mass stranding in 1970 that may have numbered as many as 175 individuals (Caldwell *et al.* 1970; Schmidly 1981).

The western North Atlantic population is being considered a separate stock for management purposes, although there is currently no information to differentiate this stock from the northern Gulf of Mexico stock(s). While it may be a unique situation, false killer whales that inhabit U.S. waters around the Hawaiian Islands are made up of two genetically identifiable populations (i.e., near-shore island and pelagic; Chivers *et al.* 2007) and the near-shore population is a distinct population segment (Oleson *et al.* 2010). Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation in the western North Atlantic.

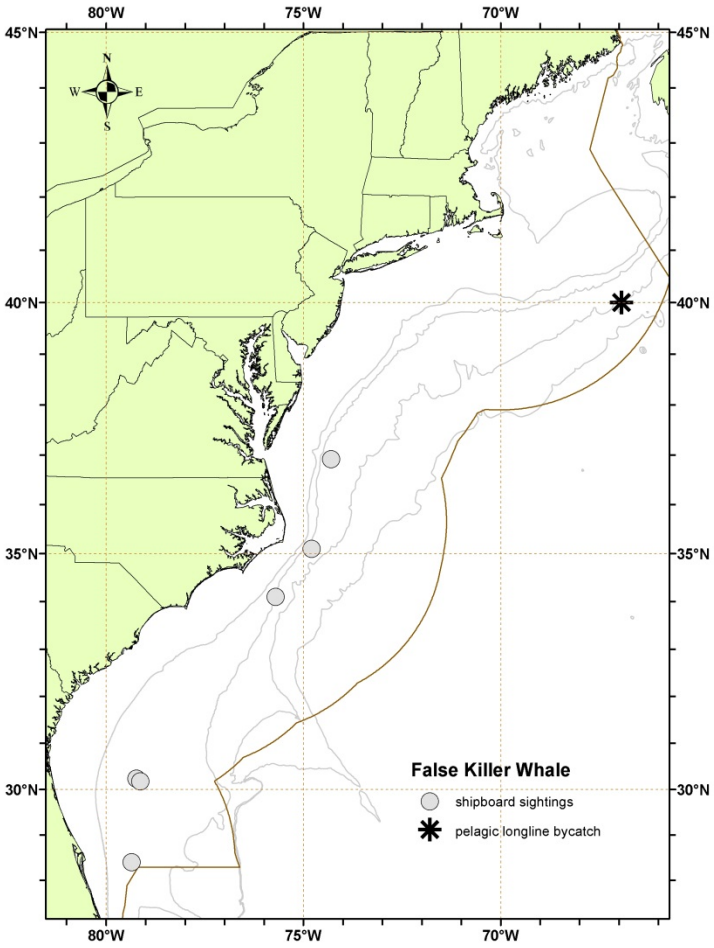

Figure 1. *Distribution of false killer whale sightings from NEFSC and SEFSC vessel surveys during 1992, 1995, 2006 and 2011. Also shown is the location of a 2011 interaction with the pelagic longline fishery. Isobaths are the 100-m, 1,000-m and 4,000- m depth contours, and the dark line is U.S. EEZ.*

POPULATION SIZE

The best available abundance estimate for western North Atlantic false killer whales is 442 (CV=1.06; Table 1). This estimate is from summer 2011 surveys covering waters from central Florida to the lower Bay of Fundy. Sightings of this species have not occurred or have been rare during any given survey, and hence this is the first abundance estimate ever made for U.S. Atlantic waters.

Recent surveys and abundance estimates

There were no sightings of false killer whales during aerial and shipboard surveys conducted during June-August 2011 from central Virginia to the lower Bay of Fundy. The aerial portion covered 6,850 km of tracklines over waters north of New Jersey between the coastline and the 100-m depth contour through the U.S. and Canadian Gulf of Maine and up to and including the lower Bay of Fundy. The shipboard portion covered 3,811 km of tracklines between central Virginia and Massachusetts in waters deeper than

the 100-m depth contour out to beyond the U.S. EEZ. Both sighting platforms used a double-platform data collection procedure.

An abundance estimate of 442 (CV=1.06; Table 1) false killer whales based on one sighting of approximately 11 animals was generated from a shipboard survey conducted concurrently (June-August 2011) in waters between central Virginia and central Florida. This shipboard survey included shelf-break and inner continental slope waters deeper than the 50-m depth contour within the U.S. EEZ. The survey employed two independent visual teams searching with 25x bigeye binoculars. A total of 4,445 km of tracklines was surveyed, yielding 290 cetacean sightings. The majority of sightings occurred along the continental shelf break with generally lower sighting rates over the continental slope. Estimation of the abundance was based on the independent observer approach assuming point independence (Laake and Borchers 2004) and calculated using the mark-recapture distance sampling option in the computer program Distance (version 6.0, release 2, Thomas *et al.* 2009).

Table 1. Summary of abundance estimates for the western North Atlantic false killer whale *(Pseudorca crassidens)* by month, year, and area covered during each abundance survey, and resulting abundance estimate (N_{best}) and coefficient of variation (CV).

Month/Year	Area	N_{best}	CV
Jun-Aug 2011	central Virginia to lower Bay of Fundy	0	0
Jun-Aug 2011	central Florida to central Virginia	442	1.06
Jun-Aug 2011	central Florida to lower Bay of Fundy (COMBINED)	442	1.06

Minimum Population Estimate

The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normally distributed best abundance estimate. This is equivalent to the 20th percentile of the log-normal distribution as specified by Wade and Angliss (1997). The best estimate of abundance for false killer whales is 442 (CV=1.06). The minimum population estimate for false killer whales is 212.

Current Population Trend

There are insufficient data to determine population trends for this stock.

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 (PBR) is the product of minimum population size, one half the maximum net productivity rate, and a recovery factor (MMPA Sec. 3. 16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is 212. 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 false killer whale stock is 2.1.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Total annual estimated fishery-related mortality and serious injury to this stock during 2008-2012 is unknown.

New Serious Injury Guidelines

NMFS updated its serious injury designation and reporting process, which uses guidance from previous serious injury workshops, expert opinion, and analysis of historic injury cases to develop new criteria for distinguishing serious from non-serious injury (Angliss and DeMaster 1998, Andersen *et al*. 2008, NOAA 2012). NMFS defines serious injury as an "*injury that is more likely than not to result in mortality*". Injury determinations for stock assessments revised in 2013 or later incorporate the new serious injury guidelines, based on the most recent 5-year period for which data are available.

Fishery Information

The commercial fishery that could potentially interact with this stock in the Atlantic Ocean is the Category I Atlantic Ocean, Caribbean, Gulf of Mexico large pelagic longline fishery (Appendix III). Pelagic swordfish, tunas and billfish are the targets of the longline fishery. During 2008-2012, 1 interaction with this fishery was observed during quarter 3 of 2011, and involved a false killer whale entangled and released alive, presumed not to be seriously injured (Garrison *et al.* 2009; Garrison and Stokes 2010; Garrison and Stokes 2012a,b; Garrison and Stokes 2013).

Other Mortality

There was 1 reported stranding of a false killer whale in the U.S. Atlantic Ocean during 2008-2012 (NOAA National Marine Mammal Health and Stranding Response Database unpublished data, accessed 30 September 2013 (SER) and 11 November 2013 (NER)). This stranding occurred off North Carolina during 2009 and was classified as a fishery interaction due to longline markings. Historically, there have been intermittent false killer whale strandings. From 1990 through 2007, the following false killer whale strandings occurred: 1 animal in 2002 in North Carolina; 2 in Florida in 1997; 1 in Massachusetts in 1997; 1 in Georgia in 1996; and 1 in Florida in 1995. Stranding data probably underestimate the extent of human-related mortality and serious injury because all of the marine mammals that die or are seriously injured may not wash ashore, nor will all of those that do wash ashore necessarily show signs of entanglement or other human interactions. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of human interactions.

STATUS OF STOCK

Western North Atlantic false killer whales are not listed as threatened or endangered under the Endangered Species Act. However, because the abundance of the Western North Atlantic stock is small and relatively few mortalities and serious injuries would exceed PBR, the NMFS considers this to be a strategic stock. Insufficient information is available to determine whether the total fishery-related mortality and serious injury for this stock is insignificant and approaching a zero mortality and serious injury rate. The status of false killer whales in the U.S. EEZ relative to OSP is unknown. There are insufficient data to determine population trends for this stock.

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