ATLANTIC WHITE-SIDED DOLPHIN (*Lagenorhynchus acutus*): Western North Atlantic Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

White-sided dolphins are found in temperate and sub-polar waters of the North Atlantic, primarily in continental shelf waters to the 100-m depth contour. In the western North Atlantic the species inhabits waters from central West Greenland to North Carolina (about 35˚N) and perhaps as far east as 29˚W in the vicinity of the mid-Atlantic Ridge (Evans 1987; Hamazaki 2002; Doksaeter *et al.* 2008; Waring *et al.* 2008). Distribution of sightings, strandings and incidental takes suggest the possible existence of three stock units: Gulf of Maine, Gulf of St. Lawrence and Labrador Sea stocks (Palka *et al.* 1997). Evidence for a separation between the population in the southern Gulf of Maine and the Gulf of St. Lawrence population comes from a virtual absence of summer sightings along the Atlantic side of Nova Scotia. This was reported in Gaskin (1992), is evident in Smithsonian stranding records, in Canadian/west Greenland bycatch data (Stenson *et al.* 2011) and was obvious during abundance surveys conducted in the summers of 1995, 1999 and 2004, which covered waters from Virginia to the Gulf of St. Lawrence and during the Canadian component of the Trans-North Atlantic Sighting Survey survey in the summer of 2007 (Lawson and Gosselin 2009). White-sided dolphins were seen frequently in Gulf of Maine waters and in waters at the mouth of the Gulf of St. Lawrence, but only a relatively few sightings were recorded between these two regions.

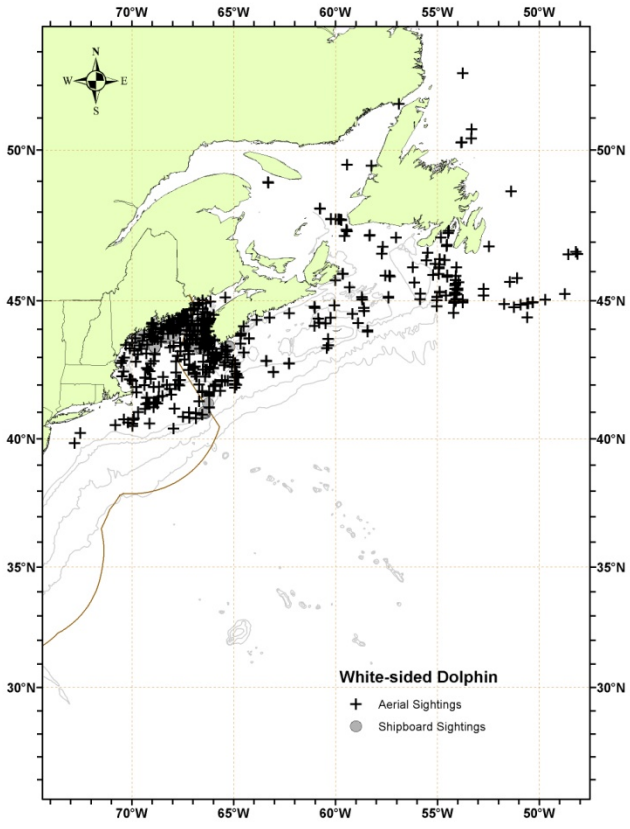

Figure 1. *Distribution of white-sided dolphin sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010, and 2011, and DFO's 2007 TNASS survey. Isobaths are the 100-m, 1000-m and 4000-m depth contours.*

The Gulf of Maine population of white-sided dolphins is most common in continental shelf waters from Hudson Canyon (approximately 39˚N) on to Georges Bank, and in the Gulf of Maine and lower Bay of Fundy. Sighting data indicate seasonal shifts in distribution (Northridge *et al.* 1997). During January to May, low numbers of white-sided dolphins are found from Georges Bank to Jeffreys Ledge (off New Hampshire), with even lower numbers south of Georges Bank, as documented by a few strandings collected on beaches of Virginia to South Carolina. From June through September, large numbers of white-sided dolphins are found from Georges Bank to the lower Bay of Fundy. From October to December, white-sided dolphins occur at intermediate densities from southern Georges Bank to southern Gulf of Maine (Payne and Heinemann 1990). Sightings south of Georges Bank, particularly around Hudson Canyon, occur year round but at low densities. The Virginia and North Carolina observations appear to represent the southern extent of the species' range during the winter months. On 4 May 2008 a stranded 17-year old male white-sided dolphin with severe pulmonary distress and reactive lymphadenopathy stranded in South Carolina (Powell *et al.* 2011). In the absence of additional strandings or sightings, this stranding seems to be an out-of-range anomaly. The seasonal spatial distribution of this species appears to be changing during the last few years. These spatial-temporal patterns are currently being investigated to document the magnitude of these apparent changes.

Recent stomach content analysis of both stranded and incidentally caught white-sided dolphins in U.S. waters determined that the predominant prey were silver hake (*Merluccius bilinearis*), spoonarm octopus (*Bathypolypus*

bairdii), and haddock (*Melanogrammus aeglefinus*). Sand lances (*Ammodytes* spp.) were only found in the stomach of one stranded white-sided dolphin . Seasonal variation in diet was indicated; pelagic Atlantic herring (*Clupea harengus*) was the most important prey in summer, but was rare in winter (Craddock *et al.* 2009).

POPULATION SIZE

Abundance estimates of white-sided dolphins from various portions of their range are available from: spring, summer and autumn 1978–1982; July–September 1991–1992; June–July 1993; July–September 1995; July–August 1999; August 2002; June–July 2004; August 2006; July–August 2007; and July–August 2011. The best available current abundance estimate for white-sided dolphins in the western North Atlantic stock is the result of the 2011 survey: 48,819 (CV= 0.61). .

Earlier abundance estimates

Please see Appendix IV for earlier abundance estimates.

Recent surveys and abundance estimates

An abundance estimate of 17,594 (CV=0.30) white-sided dolphins was generated from an aerial survey conducted in August 2006 that surveyed 10,676 km of trackline in the region from the 2000-m depth contour on the southern edge of Georges Bank to the upper Bay of Fundy and to the entrance of the Gulf of St. Lawrence. Data were collected using the Hiby circle-back line-transect method (Hiby 1999) and analyzed accounting for *g(0)* and biases due to school size and other potential covariates (Palka 2005). The value of g(0) was derived from the pooled 2002, 2004 and 2006 aerial survey data (Table 1; NMFS 2006).

An abundance estimate of 24,422 (CV=0.49) white-sided dolphins was generated from the Canadian Trans-North Atlantic Sighting Survey in July–August 2007. This aerial survey covered waters from northern Labrador to the Scotian Shelf, providing full coverage of the Atlantic Canadian coast (Lawson and Gosselin 2009). The abundance estimates from this survey have been corrected for perception and availability bias, when possible. In general this involved correcting for perception bias using mark-recapture distance sampling (MRDS), and correcting for availability bias using dive/surface times, as reported in the literature, and the Laake (1997) analysis method (Lawson and Gosselin 2011).

An abundance estimate of 48,819 (CV=0.61) white-sided dolphins was generated from a shipboard and aerial survey conducted during June–August 2011 (Palka 2012). The aerial portion that contributed to the abundance estimate covered 5,313 km of tracklines that were over waters north of New Jersey from the coastline to 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 3,107 km of tracklines that were in waters offshore of central Virginia to Massachusetts (waters that were deeper than the 100-m depth contour out to beyond the U.S. EEZ). Both sighting platforms used a double-platform data collection procedure, which allows estimation of abundance corrected for perception bias of the detected species (Laake and Borchers, 2004). Estimation of the abundance was based on the independent observer approach assuming point independence (Laake and Borchers 2004) and calculated using the MRDS option in the computer program Distance (version 6.0, release 2, Thomas *et al.* 2009).

No white-sided dolphins were detected in the aerial and ship abundance surveys that were 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 the double-platform methodology searching with 25x bigeye binoculars. A total of 4,445 km of tracklines were surveyed, yielding 290 cetacean sightings.

Table 1. Summary of recent abundance estimates for western North Atlantic stock of white-sided dolphins (*Lagenorhynchus acutus*). 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
Aug 2006	S. Gulf of Maine to upper Bay of Fundy to Gulf of St. Lawrence	17,594	0.30
Jul-Aug 2007	N. Labrador to Scotian Shelf	24,422	0.49
Jun-Aug 2011	Central Virginia to lower Bay of Fundy	48,819	0.61

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 the western North Atlantic stock of white-sided dolphins is 48,819 (CV=0.61). The minimum population estimate for these white-sided dolphins is 30,403.

Current Population Trend

A trend analysis has not been conducted for this stock. The statistical power to detect a trend in abundance for this stock is poor due to the relatively imprecise abundance estimates and long survey interval. For example, the power to detect a precipitous decline in abundance (i.e., 50% decrease in 15 years) with estimates of low precision (e.g., CV > 0.30) remains below 80% (alpha = 0.30) unless surveys are conducted on an annual basis (Taylor *et al.* 2007).

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. Life history parameters that could be used to estimate net productivity include: calving interval is 2-3 years; lactation period is 18 months; gestation period is 10-12 months and births occur from May to early August, mainly in June and July; length at birth is 110 cm; length at sexual maturity is 230-240 cm for males, and 201-222 cm for females; age at sexual maturity is 8-9 years for males and 6-8 years for females; mean adult length is 250 cm for males and 224 cm for females (Evans 1987); and maximum reported age for males is 22 years and for females, 27 years (Sergeant *et al.* 1980).

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 life history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential Biological Removal (PBR) is the product of 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 30,403. The maximum productivity rate is 0.04, the default value for cetaceans. The recovery factor, which accounts for endangered, depleted, threatened, or stocks of unknown status relative to optimum sustainable population (OSP) is assumed to be 0.5 because the CV of the average mortality estimate is less than 0.3 and the status of the stock relative to OSP is unknown (Wade and Angliss 1997). PBR for the western North Atlantic stock of white-sided dolphin is 304.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Total annual estimated average fishery-related mortality or serious injury to this stock during 2007–2011 was 116 (CV=0.16) white-sided dolphins (Table 2).

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

Detailed fishery information is reported in Appendix III.

Earlier Interactions

NMFS observers in the Atlantic foreign mackerel fishery reported 44 takes of Atlantic white-sided dolphins incidental to fishing activities in the continental shelf and continental slope waters between March 1977 and December 1991 (Waring *et al.* 1990; NMFS unpublished data). Of these animals, 96% were taken in the Atlantic mackerel fishery. This total included 9 documented takes by U.S. vessels involved in joint-venture (JV) fishing operations in which U.S. captains transferred their catches to foreign processing vessels. No incidental takes of

white-sided dolphins were observed in the Atlantic mackerel JV fishery when it was observed in 1998.

During 1991 to 1998, two white-sided dolphins were observed taken in the Atlantic pelagic drift gillnet fishery, both in 1993. Estimated annual fishery-related mortality and serious injury (CV in parentheses) was 4.4 (.71) in 1989, 6.8 (.71) in 1990, 0.9 (.71) in 1991, 0.8 (.71) in 1992, 2.7 (0.17) in 1993 and 0 in 1994, 1995, 1996, and 1998. There was no fishery during 1997 and the fishery was permanently closed in 1999.

A U.S. JV mid-water (pelagic) trawl fishery was conducted during 2001 on Georges Bank from August to December. No white-sided dolphins were incidentally captured. Two white-sided dolphins were incidentally captured in a single mid-water trawl during foreign fishing operations (TALFF). During TALFF fishing operations all nets fished by the foreign vessel are observed. The total mortality attributed to the Atlantic herring JV and TALFF mid-water trawl fisheries in 2001 was two animals.

The mid-Atlantic gillnet fishery occurs year round from New York to North Carolina and has been observed since 1993. One white-sided dolphin was observed taken in this fishery during 1997. None were observed taken in other years. The estimated annual mortality (CV in parentheses) attributed to this fishery was 0 for 1993 to 1996, 45 (0.82) for 1997, 0 for 1998 to 2001, unknown in 2002 and 0 in 2003-2011.

Three white-sided dolphins were observed taken in northeast mid-water paired trawls. Estimated annual fishery-related mortalities (CV in parentheses) were unknown in 2001–2002, 22 (0.97) in 2003, 0 in 2004, 9.4 (1.03) in 2005, and 0 in 2006 - 2011.

U.S.

Northeast Sink Gillnet

Estimated annual white-sided dolphin mortalities (CV in parentheses) attributed to the Northeast sink gillnet fishery were 49 (0.46) in 1991, 154 (0.35) in 1992, 205 (0.31) in 1993, 240 (0.51) in 1994, 80 (1.16) in 1995, 114 (0.61) in 1996 (Bisack 1997), 140 (0.61) in 1997, 34 (0.92) in 1998, 69 (0.70) in 1999, 26 (1.00) in 2000, 26 (1.00) in 2001, 30 (0.74) in 2002, 31 (0.93) in 2003, 7 (0.98) in 2004, 59 (0.49) in 2005, and 41 (0.71) in 2006. New serious injury criteria were applied to all observed interactions retroactive back to 2007 (Waring *et al*. in prep). Estimated fishery-related serious injury and mortality were 0 in 2007, 81 (0.57) in 2008, 0 in 2009, 66 (0.90) in 2010, and 18 (0.43) in 2011 (Table 2; Orphanides 2013). Average annual estimated fishery-related mortality during 2007–2011 was 33 white-sided dolphins per year (0.46; Table 2).

Northeast Bottom Trawl

White-sided dolphin mortalities documented between 1991 and 2006 in the Northeast bottom trawl fishery were 1 during 1992, 0 in 1993, 2 in 1994, 0 in 1995-2001, 1 in 2002, 12 in 2003, 16 in 2004, 47 in 2005, and 4 in 2006. New serious injury criteria were applied to all observed interactions retroactive back to 2007 (Waring *et al*. in prep). Total observed serious injury and mortality were 2 in 2007, 3 in 2008, 31 in 2009, 10 in 2010 and 47 in 2011 (Table 2). Estimated annual fishery-related mortalities (CV in parentheses) were 110 (0.97) in 1992, 0 in 1993, 182 (0.71) in 1994, 0 in 1995–1999, 137 (0.34) in 2000, 161 (0.34) in 2001, 70 (0.32) in 2002, 216 (0.27) in 2003, 200 (0.30) in 2004, 213 (0.28) in 2005, and 40 (0.50) in 2006. Estimated fishery-related serious injury and mortality were 29 (0.66) in 2007, 17 (0.57) in 2008, 152 (0.27) in 2009, 43 (0.31) in 2010, and 125 (0.20) in 2011. The 2007–2011 average mortality attributed to the Northeast bottom trawl was 73 animals (0.15; Table 2).

Mid-Atlantic Mid-water Trawl Fishery (Including Pair Trawl)

In March 2005, five white-sided dolphins were observed taken in paired trawls targeting mackerel that were off Virginia. In February 2006, three animals were observed taken in mackerel paired mid-water trawls north of Hudson Canyon. In March 2007, an animal was observed taken in a mackerel single mid-water trawl near Hudson Canyon. In January and February 2008 three animals were observed in herring single mid-water trawls north of Hudson Canyon. In March 2009 an animal was observed in a pair trawl targeting mackerel south of Hudson Canyon. No white-sided dolphin interactions with this fishery were observed in 2010 or in 2011. Due to small sample sizes, the ratio method was used to estimate the bycatch rate (observed white-sided dolphin takes per observed hours the gear was in the water) for each year, where the paired and single mid-Atlantic mid-water trawls were pooled and only hauls that targeted herring and mackerel were used. The VTR herring and mackerel data were used to estimate the total effort in the bycatch estimate (Palka, pers. comm.). Estimated annual fishery-related mortalities (CV in parentheses) were unknown in 2001-2002, 0 in 2003, 22 (0.99) in 2004, 58 (1.02) in 2005, 29 (0.74) in 2006, 12 (0.98) in 2007, 15 (0.73) in 2008, 4 (0.92) in 2009, and 0 in 2010 and 2011. (Table 2; Palka pers. comm.). The average annual estimated fishery-related mortality during 2007-2011 was 6 (0.53; Table 2).

Mid-Atlantic Bottom Trawl Fishery

One white-sided dolphin incidental take was observed in 1997, resulting in a mortality estimate of 161 (CV=1.58) animals. No takes were observed from 1998 through 2004 or in 2006 or 2008–2011; one take was observed in 2005 and 2 in 2007. New serious injury criteria were applied to all observed interactions retroactive back to 2007. There were no observed serious injuries of white-sided dolphins in the Mid-Atlantic region. Estimated annual fishery-related mortalities (CV in parentheses) were 27 (0.17) in 2000, 27 (0.19) in 2001, 25 (0.17) in 2002, 31 (0.25) in 2003, 26 (0.20) in 2004, 38 (0.29) in 2005, 3 (0.53) in 2006, 2 (1.03) in 2007, 1 (0.70) in 2008, 5 (0.34) in 2009, 2 (0.45) in 2010, and 8 (0.28) in 2011. The 2007–2011 average mortality attributed to the mid-Atlantic bottom trawl fishery was 4 animals (0.20; Table 2).

Table 2. Summary of the incidental mortality of white-sided dolphins (*Lagenorhynchus acutus*) by commercial fishery including the years sampled, the type of data used , the annual observer coverage, the serious injuries and mortalities recorded by on-board observers, the estimated annual serious injury and mortality, the estimated CV of the combined annual mortality and the mean annual mortality (CV in parentheses).

Fishery	Years	Data Type [a]	Observer Coverage [b]	Observed Serious Injury	Observed Mortality	Estimated Serious Injury	Estimated Mortality	Estimated Combined Mortality	Estimated CVs	Mean Combined Annual Mortality
Northeast Sink Gillnet[d]	07-11	Obs. Data Weighout Trip Logbook	.07, .05, .04, .17, .19	0, 0, 0, 1, 0	0, 4, 0, 6, 5	0, 5, 0, 4, 1	0, 76, 0, 62, 17	0, 81, 0, 66,18	0, .57, 0, .90, .43	33 (0.46)
Northeast Bottom Trawl[c]	07-11	Obs. Data Trip Logbook	.06, .08, .09, .16, .26	0, 0, 0, 0, 2	2, 3, 31, 10, 45	1, 0, 3, 1, 3	28, 17, 149, 42, 122	29, 17, 152, 43, 125	.66, .57, .27, .31, .20	73 (0.15)
Mid-Atlantic Mid-water Trawl - Including Pair Trawl	07-11	Obs. Data Weighout Trip Logbook	.039, .133, .132, .25, .41	0, 0, 0, 0, 0	1, 3, 1, 0, 0	0, 0, 0, 0, 0	12, 15, 4, 0, 0	12, 15, 4, 0, 0	.98, .73, .92, 0, 0	6 (0.53)
Mid-Atlantic Bottom Trawl[c]	07-11	Obs. Data Trip Logbook	.03, .03, .05, .06, .08	0, 0, 0, 0, 0	2, 0, 0, 0, 0	0, 0, 0, 0, 0	2, 1, 5, 2, 8	2, 1, 5, 2, 8	1.03, .70, .34, .45, .28	4 (0.20)
Total										116(0.16)

a Observer data (Obs. Data), used to measure bycatch rates, are collected within the Northeast Observer Program and At-sea Monitoring Program. NEFSC collects seafood dealer landings data (Weighout) that are used as a measure of total effort in the Northeast gillnet fishery. Mandatory Vessel Trip Report (VTR) (Trip Logbook) data are used to determine the spatial distribution of fishing effort in the sink gillnet, bottom trawl and mid-water trawl fisheries. In addition, the Trip Logbooks are the primary source of the measure of total effort (tow duration) in the mid-water and bottom trawl fisheries.

b Observer coverage is defined as the ratio of observed to total metric tons of fish landed and the ratio of observed to total trips for the gillnet and bottom trawl fisheries, respectively. Beginning in May 2010 total observer coverage reported for bottom trawl and gillnet gear includes samples collected from the at-sea monitoring program in addition to traditional observer coverage through the Northeast Fisheries Observer Program (NEFOP).

c NE and MA bottom trawl mortality estimates reported for 2007-2011 are a product of generalized additive model estimated bycatch rates (utilizing observer data collected from 2006 to 2011 and effort collected from the respective year, 2007-2011.

d After 1998, a weighted bycatch rate was applied to effort from both pingered and non-pingered hauls within the stratum where white-sided dolphins were observed taken. During the years 1997, 1999, 2001, 2002, and 2004, respectively, there were 2, 1, 1, 1, and 1 observed white-sided dolphins taken on pingered trips. No takes were observed on pinger trips during 1995, 1996, 1998, 2000, 2005 through 2007. Three of the 2008 takes were on non-pingered hauls and the fourth take was recorded as pinger condition unknown. Of the six 2010 observed takes, 4 were in pingered nets and 2 in non-pingered nets. Four of the 2011 takes were in pingered nets.

CANADA

There is little information available that quantifies fishery interactions involving white-sided dolphins in Canadian waters. Two white-sided dolphins were reported caught in groundfish gillnet sets in the Bay of Fundy

during 1985 to 1989, and 9 were reported taken in West Greenland between 1964 and 1966 in the now non-operational salmon drift nets (Gaskin 1992). Several (number not specified) were also taken during the 1960s in the now non-operational Newfoundland and Labrador groundfish gillnets. A few (number not specified) were taken in an experimental drift gillnet fishery for salmon off West Greenland which took place from 1965 to 1982 (Read 1994).

Hooker *et al.* (1997) summarized bycatch data from a Canadian fisheries observer program that placed observers on all foreign fishing vessels operating in Canadian waters, on 25-40% of large Canadian fishing vessels (greater than 100 feet long), and on approximately 5% of smaller Canadian fishing vessels. Bycaught marine mammals were noted as weight in kilos rather than by the numbers of animals caught. Thus the number of individuals was estimated by dividing the total weight per species per trip by the maximum recorded weight of each species. During 1991 through 1996, an estimated 6 white-sided dolphins were observed taken. One animal was from a longline trip south of the Grand Banks (43º 10'N 53º 08'W) in November 1996 and the other 5 were taken in the bottom trawl fishery off Nova Scotia in the Atlantic Ocean; 1 in July 1991, 1 in April 1992, 1 in May 1992, 1 in April 1993, 1 in June 1993 and 0 in 1994 to 1996.

Estimation of small cetacean bycatch for Newfoundland fisheries using data collected during 2001 to 2003 (Benjamins *et al.* 2007) indicated that, while most of the estimated 862 to 2,228 animals caught were harbor porpoises, a few were white-sided dolphins caught in the Newfoundland nearshore gillnet fishery and offshore monkfish/skate gillnet fisheries.

Herring Weirs

During the last several years, one white-sided dolphin was released alive and unharmed from a herring weir in the Bay of Fundy (A. Westgate, pers. comm.). Due to the formation of a cooperative program between Canadian fishermen and biologists, it is expected that most dolphins and whales will be able to be released alive. Fishery information is available in Appendix III.

Other Mortality

U.S.

During 2007-2011 there were 202 documented Atlantic white-sided dolphin strandings on the U.S. Atlantic coast (Table 3). Forty-two of these animals were released alive. Human interaction was indicated in 12 records during this period. Of these, two were classified as fishery interactions.

Mass strandings involving up to a hundred or more animals at one time are common for this species. The causes of these strandings are not known. Because such strandings have been known since antiquity, it could be presumed that recent strandings are a normal condition (Gaskin 1992). It is unknown whether human causes, such as fishery interactions and pollution, have increased the number of strandings. In an analysis of mortality causes of stranded marine mammals on Cape Cod and southeastern Massachusetts between 2000 and 2006, Bogomolni *et al.* (2010) found 69% (46 of 67) of stranded white-sided dolphins were involved in mass-stranding events with no significant findings, and 21% (14 of 67) were classified as disease related.

An Unusual Mortality Event was declared in 2008 due to a relatively high number of strandings between January and April 2008, from New Jersey to North Carolina. Five white-sided dolphins were involved in this event (http://www.nmfs.noaa.gov/pr/health/mmume/midatlantic2008.htm, accessed 19 April 2011).

Stranding data probably underestimate the extent of fishery-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 fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interaction.

CANADA

Small numbers of white-sided dolphins have been hunted off southwestern Greenland and they have been taken deliberately by shooting elsewhere in Canada (Reeves *et al.* 1999). The Nova Scotia Stranding Network documented whales and dolphins stranded on the coast of Nova Scotia during 1991 to 1996 (Hooker *et al.* 1997). Researchers with Dept. of Fisheries and Oceans, Canada documented strandings on the beaches of Sable Island during 1970 to 1998 (Lucas and Hooker 2000). Sable Island is approximately 170 km southeast of mainland Nova Scotia. White-sided dolphins stranded at nearly all times of the year on the mainland and on Sable Island. On the mainland of Nova Scotia, a total of 34 stranded white-sided dolphins was recorded between 1991 and 1996: 2 in 1991 (August and October), 26 in July 1992, 1 in Nov 1993, 2 in 1994 (February and November), 2 in 1995 (April and August) and 2 in 1996 (October and December). During July 1992, 26 white-sided dolphins stranded on the Atlantic side of Cape Breton. Of these, 11 were released alive and the rest were found dead. Among the rest of the Nova Scotia

strandings, one was found in Minas Basin, two near Yarmouth and the rest near Halifax. On Sable Island, 10 stranded white-sided dolphins were documented between 1991 and 1998; all were males, 7 were young males (< 200 cm), 1 in January 1993, 5 in March 1993, 1 in August 1995, 1 in December 1996, 1 in April 1997 and 1 in February 1998.

Whales and dolphins stranded between 1997 and 2009 on the coast of Nova Scotia as recorded by the Marine Animal Response Society and the Nova Scotia Stranding Network are as follows (Table 3): 0 white-sided dolphins stranded in 1997 to 2000, 3 in September 2001 (released alive), 5 in November 2002 (4 were released alive), 0 in 2003, 19-24 in 2004 (15-20 in October (some (unspecified) were released alive) and 4 in November were released alive), 0 in 2005, and 1 in 2006, 8-10 in 2007 (all but 3 released alive), 3 (one released alive) in 2008, 4 (3 released alive) in 2009, 2 in 2010, and 6 (2 released alive) in 2011 (T. Wimmer, pers. comm.).

White-sided dolphins recorded by the Whale Release and Strandings Program in Newfoundland and Labrador are as follows: 1 animal (released alive) in 2004, 1 in 2005 (dead), 3 in 2006 (all dead), 1 in 2007 (released alive) 2 in 2008 (one released alive and one dead), 3 (all dead) in 2009, 2 (one released alive and one dead) in 2010, and 0 in 2011 (Ledwell and Huntington 2004; 2006; 2007; 2008; 2009; 2010; 2011, 2012).

Table 3. White-sided dolphin (*Lagenorhynchus acutus*) reported strandings along the U.S. and Canadian Atlantic coast, 2007-2011.

Area						**Total**
	2007	2008	2009	2010	2011	
Maine	1	1	1	1	2	6
New Hampshire	0	0	1	0	0	1
Massachusetts[a,b]	18	33	22	50	42	165
Rhode Island	0	0	1	0	1	2
Connecticut	0	1	1	0	0	2
New York[c]	5	1	3	1	0	10
New Jersey	0	0	2	0	1	3
Delaware	0	0	1	0	1	2
Maryland	0	1	0	0	1	2
Virginia	0	1	0	0	0	1
North Carolina	1	3	1	0	1	6
South Carolina[b]	0	1	0	0	0	1
Georgia	0	0	0	0	1	1
TOTAL US	**25**	**42**	**33**	**52**	**50**	**202**
Nova Scotia	9	3	4	2	6	24
Newfoundland and Labrador	1	2	3	2	0	8
GRAND TOTAL	35	47	40	56	56	234

[a] Records of mass strandings in Massachusetts during this period are: January 2007 - 9 animals (3 released

alive); September 2007 - 3 animals; January 2008 -17 animals, February 2008 - 3 animals (2 released alive); September 2009 - 3 events of 2, 3 and 4 animals (all but 1 released alive); April 2009 - 3 animals (all released alive); March 2010 - 7 animals (one dead calf, 6 adults released alive), 16 animals (5 dead, 11 released alive) and 3 animals (one released alive); April 2010 - 2 animals (released alive); July 2010 - 2 animals (released alive); March 2011 - 4 animals (2 released alive), 2 animals (released alive) .

[b] In 2006, 1 animal from Massachusetts was classified as having signs of fishery interaction. In 2008, 2 animals from Massachusetts and one from South Carolina were classified as human interactions. In 2009, the 4 animals that mass-stranded in September and were released alive, as well as a March stranding that a bystander had attempted to rescue were classified at human interactions. In 2010, 2 animals in Massachusetts were classified as human interactions, one of them a fishery interaction. In 2011, one animal was classified as human interaction due to post-mortem mutilation.

[c] Records of mass strandings in New York during this period are: September 2007 - 3 animals.

STATUS OF STOCK

White-sided dolphins 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 Proections Act.. The 2007–2011 estimated average annual human related mortality does not exceed PBR. The total U.S. fishery-related mortality and serious injury for this stock is not less than 10% of the calculated PBR and, therefore, cannot be considered to be insignificant and approaching zero mortality and serious injury rate. The status of white-sided dolphins, relative to OSP, in the U.S. Atlantic EEZ is unknown. A trend analysis has not been conducted for this species.

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