

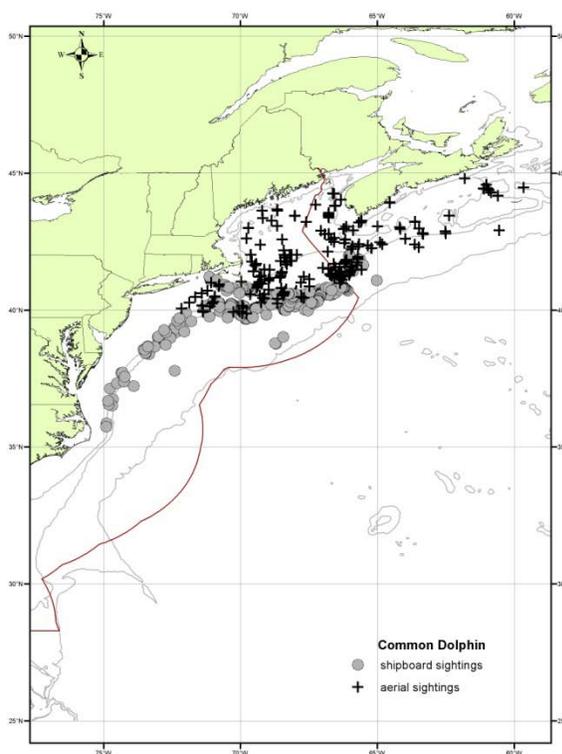
## SHORT-BEAKED COMMON DOLPHIN (*Delphinus delphis delphis*): Western North Atlantic Stock

### STOCK DEFINITION AND GEOGRAPHIC RANGE

The common dolphin may be one of the most widely distributed species of cetaceans, as it is found world-wide in temperate and subtropical seas. In the North Atlantic, common dolphins occur over the continental shelf along the 100-2000-m isobaths and over prominent underwater topography and east to the mid-Atlantic Ridge (29°W) (Doksaeter *et al.* 2008; Waring *et al.* 2008). The species is less common south of Cape Hatteras, although schools have been reported as far south as the Georgia/South Carolina border (32°N) (Jefferson *et al.* 2009). In waters off the northeastern USA coast, common dolphins are distributed along the continental slope and are associated with Gulf Stream features (CETAP 1982; Selzer and Payne 1988; Waring *et al.* 1992; Hamazaki 2002). They occur from Cape Hatteras northeast to Georges Bank (35° to 42°N) during mid-January to May (Hain *et al.* 1981; CETAP 1982; Payne *et al.* 1984). Common dolphins move onto Georges Bank and the Scotian Shelf from mid-summer to autumn. Selzer and Payne (1988) reported very large aggregations (greater than 3,000 animals) on Georges Bank in autumn. Common dolphins are occasionally found in the Gulf of Maine (Selzer and Payne 1988), more often in the last few years (Figure 1). Migration onto the Scotian Shelf and continental shelf off Newfoundland occurs during summer and autumn when water temperatures exceed 11°C (Sergeant *et al.* 1970; Gowans and Whitehead 1995).

Westgate (2005) tested the proposed one-population-stock model using a molecular analysis of mitochondrial DNA (mtDNA), as well as a morphometric analysis of cranial specimens. Both genetic analysis and skull morphometrics failed to provide evidence ( $p > 0.05$ ) of more than a single population in the western North Atlantic, supporting the proposed one-stock model. However, when western and eastern North Atlantic common dolphin mtDNA and skull morphology were compared, both the cranial and mtDNA results showed evidence of restricted gene flow ( $p < 0.05$ ) indicating that these two areas are not panmictic. Cranial specimens from the two sides of the North Atlantic differed primarily in elements associated with the rostrum. These results suggest that common dolphins in the western North Atlantic are composed of a single panmictic group whereas gene flow between the western and eastern North Atlantic is limited (Westgate 2005; 2007).

There is a peak in parturition during July and August with an average birth day of 28 July. Gestation lasts about 11.7 months and lactation lasts at least a year. Given these results western North Atlantic female common dolphins are likely on a 2-3 year calving interval. Females become sexually mature earlier (8.3 years and 200 cm) than males (9.5 years and 215 cm) as males continue to increase in size and mass. There is significant sexual dimorphism present with males being on average about 9% larger in body length (Westgate 2005; Westgate and Read 2007).



**Figure 1.** Distribution of common dolphin sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1998, 1999, 2002, 2004, 2006, 2007, 2010 and 2011. Isobaths are the 100-m, 1000-m and 4000-m depth contours.

## POPULATION SIZE

Several abundance estimates are available for common dolphins from selected regions for selected time periods. The current best abundance estimate for common dolphins off the U.S. or Canadian Atlantic coast is the result of the 2011 survey—67,191 (CV=0.29).

An abundance estimate of 90,547 (CV=0.244) common dolphins was obtained from a line-transect sighting survey conducted during 12 June to 4 August 2004 by a ship and plane that surveyed 10,761 km of trackline in waters north of Maryland (38°N) (Table 1; Palka 2006). Shipboard data were collected using the two-independent-team line-transect method and analyzed using the modified direct-duplicate method (Palka 1995) accounting for biases due to school size and other potential covariates, reactive movements (Palka and Hammond 2001), and  $g(0)$ , the probability of detecting a group on the trackline. Aerial 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).

An abundance estimate of 30,196 (CV=0.537) common dolphins was derived from a shipboard survey of the U.S. Atlantic outer continental shelf and continental slope (water depths > 50 m) between Florida and Maryland (27.5 and 38° N latitude) conducted during June–August, 2004 (Table 1). The survey employed two independent visual teams searching with 25x bigeye binoculars. Survey effort was stratified to include increased effort along the continental shelf break and Gulf Stream front in the mid-Atlantic. The survey included 5,659 km of trackline, and accomplished a total of 473 cetacean sightings. Sightings were most frequent in waters north of Cape Hatteras, North Carolina along the shelf break. Data were corrected for visibility bias ( $g(0)$ ) and group-size bias and analyzed using line-transect distance analysis (Palka 1995; Buckland *et al.* 2001; Palka 2006).

An abundance estimate of 84,000 (CV=0.36) common dolphins was obtained from an aerial survey conducted in August 2006 which covered 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 (Table 1; Palka pers. comm.).

An abundance estimate of 173,486 (CV=0.55) common dolphins was generated from the Canadian Trans North Atlantic Sighting Survey in July–August 2007 (Lawson and Gosselin 2009). This aerial survey covered area from northern Labrador to the Scotian Shelf, providing full coverage of the Atlantic Canadian coast. 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 in 2011).

An abundance estimate of 67,191 (CV=0.29) common dolphins was generated from a shipboard and aerial survey conducted during June–August 2011 (Palka 2012). The aerial portion that contributed to the estimate covered 5,313 km of tracklines that were over waters north of New Jersey and shallower than 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 North Carolina to Massachusetts (waters that were deeper than the 100-m depth contour out to beyond the U.S. EEZ). Both sighting platforms used a two-simultaneous team 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 mark-recapture distance sampling (MRDS) option in the computer program Distance (version 6.0, release 2, Thomas *et al.* 2009).

Please see appendix IV for a summary of abundance estimates, including earlier estimates and survey descriptions. As recommended in the GAMMS Workshop Report (Wade and Angliss 1997), estimates older than eight years are deemed unreliable and should not be used for PBR determinations.

Table 1. Summary of abundance estimates for western North Atlantic short-beaked common dolphin. 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 2004	Maryland to Bay of Fundy	90,547	0.24
Jun-Aug 2004	Florida to Maryland	30,196	0.54
Jun-Aug 2004	Florida to Bay of Fundy (COMBINED)	120,743	0.23
Aug 2006	S. Gulf of Maine to upper Bay of Fundy to Gulf of St. Lawrence	84,000	0.36
July-Aug 2007	N. Labrador to Scotian Shelf	173,486	0.29
Jul-Aug 2011	North Carolina to lower Bay of Fundy	67,191	0.29

#### 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 common dolphins is 67,191 animals (CV=0.29) derived from the 2011 surveys. The minimum population estimate for the western North Atlantic common dolphin is 52,893.

#### Current Population Trend

A trend analysis has not been conducted for this species.

#### 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 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 52,893 animals. The maximum productivity rate is 0.04, the default value for cetaceans. The recovery factor is 0.5, the default value for stocks of unknown status relative to optimum sustainable population (OSP), and because the CV of the average mortality estimate is less than 0.3 (Wade and Angliss 1997). PBR for the western North Atlantic stock of common dolphin is 529.

#### ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Total annual estimated average fishery-related mortality or serious injury to this stock during 2006–2010 was 164 (CV=0.12) common dolphins.

#### Fishery information

Detailed fishery information is reported in Appendix III.

#### Earlier Interactions

For more details on the historical fishery interactions prior to 1999 see Waring *et al.* (2007).

In the Atlantic pelagic longline fishery between 1990 and 2007, 20 common dolphins were observed hooked and

released alive.

The estimated fishery-related mortality of common dolphins attributable to the *Loligo* squid portion of the Southern New England/mid-Atlantic Squid, Mackerel, Butterfish Trawl fisheries was 0 between 1997-1998 and 49 in 1999 (CV=0.97). After 1999 this fishery is included as a component of the mid-Atlantic bottom trawl fishery.

In the Atlantic mackerel portion of the Southern New England/mid-Atlantic Squid, Mackerel, Butterfish Trawl fisheries, the estimated fishery-related mortality was 161 (CV=0.49) animals in 1997 and 0 in 1998 and 1999. However, the estimates in both the mackerel and *Loligo* fisheries should be viewed with caution due to the extremely low (<1%) observer coverage. After 1999 this fishery is included as a component of the mid-Atlantic bottom trawl and mid-Atlantic mid-water trawl fisheries.

There was one observed take in the Southern New England/mid-Atlantic Bottom Trawl fishery reported in 1997. The estimated fishery-related mortality for common dolphins attributable to this fishery was 93 (CV=1.06) in 1997 and 0 in 1998 and 1999. After 1999 this fishery is included as a component of the mid-Atlantic bottom trawl fishery.

### **Northeast Sink Gillnet**

In 1990, an observer program was started by NMFS to investigate marine mammal takes in the Northeast sink gillnet fishery (Appendix III). Bycatch in the northern Gulf of Maine occurs primarily from June to September, while in the southern Gulf of Maine, bycatch occurs from January to May and September to December. Four common dolphins were observed taken in northeast sink gillnet fisheries in 2005, one in 2006, one in 2007, two in 2008, 3 in 2009, and 4 in 2010. The estimated annual fishery-related mortality and serious injury attributable to the northeast sink gillnet fishery (CV in parentheses) was 0 in 1995, 63 in 1996 (1.39), 0 in 1997, 0 in 1998, 146 in 1999 (0.97), 0 in 2000-2004, 5 (0.80) in 2005, 20 (1.05) in 2006, 11 (0.94) in 2007, 34 (0.77) in 2008, 43 (0.77) in 2009, and 42 (0.94) in 2010. The 2006–2010 average annual mortality attributed to the northeast sink gillnet was 30 animals (CV=0.42).

A study of the effects of two different hanging ratios in the bottom-set monkfish gillnet fishery on the bycatch of cetaceans and pinnipeds was conducted by NEFSC in 2009 and 2010 with 100% observer coverage. Commercial fishing vessels from Massachusetts and New Jersey were used for the study, which took place south of the Harbor Porpoise Take Reduction Team Cape Cod South Management Area (south of 40° 40') in February, March and April. Researchers purposely picked an area of historically high bycatch rates in order to have a chance of finding a significant difference. Eight research strings of fourteen nets each were fished and 159 hauls were completed during the course of the 2009-2010 study. Results showed that while a 0.33 mesh performed better at catching commercially important finfish than a 0.50 mesh, there was no statistical difference in cetacean or pinniped bycatch rates between the two hanging ratios. One common dolphin was caught in this study south of New England in 72 hauls during 2009 and one animal was caught in 72 hauls during the 2010 experiment in the Northeast (A.I.S., Inc. 2010). These 2 takes are included in Table 2.

### **Mid-Atlantic Gillnet**

Two common dolphins were observed taken in 1995, 1996, and 1997, and no takes were observed from 1998 to 2005. One common dolphin was taken in an observed trip during 2006, none were observed in 2007 – 2009, and 10 takes were observed in 2010. Using the observed takes, the estimated annual mortality (CV in parentheses) attributed to this fishery was 7.4 in 1995 (0.69), 43 in 1996 (0.79), 16 in 1997 (0.53), 0 in 1998-2005, 11 (1.03) in 2006, 0 in 2007 – 2009, and 31 (0.65) in 2010. Average annual estimated fishery-related mortality attributable to this fishery during 2006–2010 was 8.4 (CV=0.55) common dolphins (Table 2). A study of the effects of tie-downs and bycatch rates of Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) in both control and experimental gillnet gear operating in Statistical Area 612 (off NY and NJ) between 14 November 2010 and 18 December 2010 had 100% observer coverage. This experimental fishery captured 7 common dolphins and two unidentified dolphins, (unidentified due to lack of photos) during this time period (Fox *et al.* 2011). These 7 takes are included in Table 2.

### **Northeast Bottom Trawl**

This fishery is active in New England waters in all seasons. One common dolphin was observed taken in 2002, 3 in 2004, 5 in 2005, 1 in 2006, 3 in 2007, 1 in 2008, 5 in 2009 and 9 in 2010 (Table 2). The estimated annual fishery-related mortality and serious injury attributable to the northeast bottom trawl fishery (CV in parentheses) was 27 in 2000 (0.29), 30 (0.30) in 2001, 26 (0.29) in 2002, 26 (0.29) in 2003, 26 (0.29) in 2004, 32 (0.28) in 2005, 25 in 2006, 24 (0.28) in 2007, 17 (0.29) in 2008, 19 (0.30) in 2009, and 17 (0.28) in 2010. The 2006–2010 average annual mortality attributed to the northeast bottom trawl was 20 animals (CV=0.13).

**Mid-Atlantic Bottom Trawl**

Three common dolphins were observed taken in mid-Atlantic bottom trawl fisheries in 2000, 2 in 2001, 9 in 2004, 15 in 2005, 14 in 2006, 0 in 2007, 1 in 2008, 12 in 2009, and 2 in 2010 (Table 2). The estimated annual fishery-related mortality and serious injury attributable to the northeast bottom trawl fishery (CV in parentheses) was 93 in 2000 (0.26), 103 (0.27) in 2001, 87 (0.27) in 2002, 99 (0.28) in 2003, 159 (0.30) in 2004, 141 (0.29) in 2005, 131 (0.28) in 2006, 66 (0.27) in 2007, 108 (0.28) in 2008, 104 (0.29) in 2009 and 104 (0.29) in 2010. The 2006–2010 average annual mortality attributed to the mid-Atlantic bottom trawl was 103 animals (CV=0.13).

**Northeast Mid-water Trawl Fishery (Including Pair Trawl)**

A short-beaked common dolphin mortality was observed in this fishery in 2010 (Table 2) but an expanded bycatch estimate has not been calculated since the observed takes are so rare.

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

The first year a short-beaked common dolphin mortality had been observed in this fishery was in 2007. This animal was taken in the same haul as an Atlantic white-sided dolphin. Due to small sample sizes, the bycatch rate model used the 2003 to September 2007 observed mid-water trawl data, including paired and single, and northeast and mid-Atlantic mid-water trawls (Palka, pers. comm.). The model that best fit these data was a Poisson logistic regression model that included latitude and bottom depth as significant explanatory variables, where soak duration was the unit of effort. The resultant estimated annual fishery-related mortality and serious injury (CV in parentheses) was 3.2 (0.70) for 2007. The 2006–2010 average annual mortality attributed to the mid-Atlantic mid-water trawl was 0.6 (0.70) animals.

**Pelagic Longline**

In 2009, a common dolphin mortality was observed in the pelagic longline fishery, mid-Atlantic Bight fishing area (Garrison and Stokes 2010). The expanded estimate (CV in parentheses) for common dolphin bycatch attributed to this fishery was 8.5 (1.0) for 2009. The 2006–2010 average annual mortality was 1.7 (1.0).

Table 2. Summary of the incidental mortality of short-beaked common dolphins (*Delphinus delphis delphis*) by commercial fishery including the years sampled (Years), the type of data used (Data Type), the annual observer coverage (Observer Coverage), the mortalities recorded by on-board observers (Observed Mortality), the estimated annual mortality (Estimated Mortality), the estimated CV of the annual mortality (Estimated CVs) and the mean annual mortality (CV in parentheses).

Fishery <sup>a</sup>	Years	Data Type <sup>b</sup>	Observer Coverage <sup>c</sup>	Observed Serious Injury	Observed Mortality	Estimated Serious Injury	Estimated Mortality	Estimated Combined Mortality	Estimated CVs	Mean Annual Mortality
Northeast Sink Gillnet	06-10	Obs. Data, Trip Logbook, Allocated Dealer Data	.04, .07, .05, .04, .17	0, 0, 0, 0, 0	1, 1, 2, 3, 4	0, 0, 0, 0, 0	20, 11, 34, 43, 42	20, 11, 34, 43, 42	1.05, .94, .77, .77, .94	30 (.42)
Mid-Atlantic Gillnet <sup>e</sup>	06-10	Obs. Data, Trip Logbook, Allocated Dealer Data	.04, .06, .03, .03, .04	0, 0, 0, 0, 0	1, 0, 0, 0, 10	0, 0, 0, 0, 0	11, 0, 0, 0, 31	11, 0, 0, 0, 31	1.03, 0, 0, 0, .65	8.4 (.55)

Mid-Atlantic Mid-water Trawl - Including Pair Trawl	06-10	Obs. Data Weighout Trip Logbook	.089, .039, .13, .13, .25	0, 0, 0, 0, 0	0, 1, 0, 0, 0	0, 0, 0, 0, 0	0, 3.2, 0, 0, 0	0, 3.2, 0, 0, 0	0, .70, 0, 0, 0, 0	0.6 (.70)
Northeast Mid-water Trawl - Including Pair Trawl	06-10	Obs. Data Weighout Trip Logbook	.031, .08, .199, .42, .54	0, 0, 0, 0, 0	0, 0, 0, 0, 1	0, 0, 0, 0, 0	0, 0, 0, 0, na	0, 0, 0, 0, na	0, 0, 0, 0, na	na
Northeast Bottom Trawl <sup>d</sup>	06-10	Obs. Data Dealer Data VTR Data	.06, .06, .08, .09, .16	0, 0, 0, 0, 0	1, 3, 1, 5, 9	0, 0, 0, 0, 0	25, 24, 17, 19, 17	25, 24, 17, 19, 17	.28, .28, .29, .30, .28	20 (.13)
Mid-Atlantic Bottom Trawl <sup>d</sup>	06-10	Obs. Data Dealer	.02, .03, .03, .05, .06	0, 0, 0, 0, 0	14, 0, 1, 12, 2	0, 0, 0, 0, 0	131, 66, 108, 104, 104	131, 66, 108, 104, 104	.28, .27, .28, .29, .29	103 (.13)
Pelagic Longline <sup>b</sup>	06-10	Obs. Data Logbook	.07, .07, .07, .10, .08	0, 0, 0, 0, 0	0, 0, 0, 1, 0	0, 0, 0, 0, 0	0, 0, 0, 8.5, 0	0, 0, 0, 8.5, 0	0, 0, 0, 1.0, 0	1.7 (1.0)
TOTAL										164 (.12)
<p>a. The fisheries listed in Table 2 reflect new definitions defined by the proposed List of Fisheries for 2005 (FR Vol. 69, No. 231, 2004). The 'North Atlantic bottom trawl' fishery is now referred to as the 'Northeast bottom trawl.' The Illex, Loligo and Mackerel fisheries are now part of the 'mid-Atlantic bottom trawl' and 'mid-Atlantic midwater trawl' fisheries.</p> <p>b. Observer data (Obs. Data), used to measure bycatch rates, are collected within the Northeast Fisheries Observer Program. NEFSC collects landings data (Dealer reported data) which are used as a measure of total landings and mandatory Vessel Trip Reports (VTR) (Trip Logbook) that are used to determine the spatial distribution of landings and fishing effort.</p> <p>c. The observer coverages for the Northeast sink gillnet fishery are ratios based on tons of fish landed. North Atlantic bottom trawl mid-Atlantic bottom trawl, and mid-Atlantic mid-water trawl fishery coverages are ratios based on trips. Total observer coverage reported for bottom trawl gear and gillnet gear in the year 2010 includes only samples collected from traditional fisheries observer, but not the fishery monitors. In the Northeast region 437 and 658 bottom trawl trips were sampled by observers and monitors, respectively. In the mid-Atlantic region, 661 and 75 bottom trawl trips were sampled by observers and monitors, respectively. Monitor trips will be incorporated next year, for 2011, the first full year of monitor coverage.</p> <p>d. NE and MA bottom trawl mortality estimates reported for 2007-2010 are a product of GLM estimated bycatch rates (utilizing observer data collected from 2000 to 2005; Rossman 2010) and the respective annual fishing effort (2007-2010). Because of this pooling, years with no observed mortality may still have a calculated estimate. The methods used in Rossman 2010 are scheduled to be updated during 2012-2013 to reflect data collected during the latest five year (2006-2010) period. 2010 estimates include only takes observed by traditional fishery observers. Observed takes do not include those observed by fishery 'monitors' and so are not incorporated into 2010 bycatch estimation.</p> <p>e. One common dolphin was incidentally caught in 2009 and one in 2010 as part of a NEFSC hanging ratio study to examine the impact of gillnet hanging ratio on harbor porpoise bycatch. Seven common dolphins were caught in another research study in 2010. These animals are included in the observed interactions and added to the total estimates, though these interactions and their associated fishing effort were not included in bycatch rate calculations.</p>										

## CANADA

Between January 1993 and December 1994, 36 Spanish deep water trawlers, covering 74 fishing trips (4,726 fishing days and 14,211 sets), were observed in NAFO Fishing Area 3 (off the Grand Banks) (Lens 1997). A total of 47 incidental catches were recorded, which included one common dolphin. The incidental mortality rate for common dolphins was 0.007/set.

### Other Mortality

Two common dolphins were reported as incidental mortalities in NEFSC Atlantic herring monitoring activities in 2004. In 2007, one common dolphin was reported taken in a NEFSC spring bottom trawl survey.

From 2006 to 2010, 469 common dolphins were reported stranded between Maine and Florida (Table 3). The total includes mass stranded common dolphins in Massachusetts during 2006 (a total of 65 in 10 events), 2007 (a total of 23 in 5 separate events), 2008 (one event of 5 animals and one of 2 animals), 2009 (a total of 26 in 6 events) and 2010 (a total of 30 in 8 events). Eighteen animals in 2006, 2 animals in 2007, 2 animals in 2008, 5 animals in 2009 and 11 animals in 2010 were released or last sighted alive. Human interactions were indicated on one of the 2007 New York mortality records and one of the 2006 Virginia mortality records. In 2008, seven common dolphins had indications of human interactions, four which were fishery interactions. In 2009, six common dolphins had indications of human interaction, 3 of which were classified as fishery interactions. In 2010, 7 animals were classified as human interactions, 3 of which were fishery interactions (all Massachusetts mass-stranded animals) and 2 of which (Rhode Island) involved animals last sighted free-swimming. An Unusual Mortality Event (UME) was declared in 2008 due to a relatively high number of strandings between January and April 2008, from New Jersey to North Carolina. Twenty-seven common dolphins were involved in this event (<http://www.nmfs.noaa.gov/pr/health/mmume/midatlantic2008.htm> accessed 19 April 2011). In Bogomolni's 2010 analysis of mortality causes of stranded marine mammals on Cape Cod and southeastern Massachusetts between 2000 and 2006, 61% of stranded common dolphins were involved in mass-stranding events, and 37% of all the common dolphin stranding mortalities were disease related (Bogomolni 2010).

Four common dolphin strandings (6 individuals) were reported on Sable Island, Nova Scotia from 1996 to 1998 (Lucas and Hooker 1997; 2000). The Marine Animal Response Society of Nova Scotia reported one common dolphin stranded in 2008, one in 2009 and one (released alive) in 2010 (Tonya Wimmer, pers. comm.).

STATE	2006	2007	2008	2009	2010	TOTALS
Maine	0	1	0	0	1	2
Massachusetts <sup>a</sup>	100	65	19	53	71	308
Rhode Island <sup>c</sup>	2	4	3	6	7	22
New York <sup>b,c</sup>	3	23	2	7	9	44
New Jersey <sup>c</sup>	2	4	9	6	14	35
Delaware <sup>c</sup>	0	0	2	4	0	6
Maryland	0	0	2	2	0	4
Virginia <sup>c</sup>	1	4	20	2	5	32
North Carolina <sup>c</sup>	2	0	1	7	6	16
TOTALS	110	101	58	87	113	469

a. Massachusetts mass strandings (2006 - 2,2,3,4,4,3,9,10,14, and 14; 2007 - 9,2,4,6,2; 2008 - 5 and 2; 2009 - 2,3,3,4,6,8, 2010 - 2,2,3,3,3,4,5,8).

b. One common dolphin was released alive from a pound net in 2006 in New York. Twenty (12 dead, 8 rescued; one of the mortalities classified as human interaction) animals were involved in a mass stranding in Suffolk county in 2007. Seven animals were involved in 2 mass stranding events in March 2009 (six euthanized, 1 died at site, 2 had signs of fishery interaction). In addition, in 2008 3 animals were relocated from the Nansmond River.

c. One 2006 mortality in Virginia and one 2007 mortality in New York were reported as having human interactions. Seven records were reported with signs of human interaction in 2008 - 3 from Virginia, 1 from Massachusetts, one from North Carolina, and one from Delaware. Of these, 4 were fishery interactions. Six human interaction cases were reported in 2009 (2 Massachusetts, 3 Rhode Island, 1 New York), 3 of which were classified as fishery interactions (2 in Rhode Island and one in Massachusetts). Seven HI cases were reported in 2010 (4 mortalities in MA, 2 released alive in RI, and 1 mortality in NJ), 2 of which (MA) were classified as fishery interactions.

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.

#### **STATUS OF STOCK**

The 2006–2010 average annual human-related mortality does not exceed PBR; therefore, this is not a strategic stock. 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 short-beaked common dolphins, relative to OSP, in the U.S. Atlantic EEZ is unknown. There are insufficient data to determine the population trends for this species. The species is not listed as threatened or endangered under the Endangered Species Act.

#### **REFERENCES CITED**

- AIS, Inc. 2010. The effects of hanging ratio on marine mammal interactions and catch retention of commercially important finfish species. NOAA Contract No. EA133F-08-CN-0240 Final report: 28 pp. <http://nefsc.noaa.gov/publications/reports/EA133F08CN0240.pdf>.
- Barlow, J., S.L. Swartz, T.C. Eagle and P.R. Wade 1995. U.S. marine mammal stock assessments: Guidelines for preparation, background, and a summary of the 1995 assessments. NOAA Tech. Memo. NMFS-OPR-6. 73 pp.
- Bogomolni, A.L., K.R. Pugliares, S.M. Sharp, K. Patchett, C.T. Harry, J.M. LaRocque, K.M. Touhey and M. Moore 2010. Mortality trends of stranded marine mammals on Cape Cod and southeastern Massachusetts, USA, 2000 to 2006. *Diseases of Aquatic Organisms* 88:143-155.
- Buckland, S.T., D.R. Anderson, K.P. Burnham, J.L. Laake, D L. Borchers and L. Thomas 2001. Introduction to distance sampling: estimating abundance of biological populations. Oxford University Press. 432 pp.
- CETAP 1982. A characterization of marine mammals and turtles in the mid- and North Atlantic areas of the U.S. outer continental shelf, final report, Cetacean and Turtle Assessment Program, University of Rhode Island. Bureau of Land Management, Washington, DC. #AA551-CT8-48: 576.
- Doksater, L., E. Olsen, L. Nottestad and A. Ferno. 2008. Distribution and feeding ecology of dolphins along the mid-Atlantic Ridge between Iceland and the Azores. *Deep Sea Research II* 55:243-253.
- Fox D.A., K. Wark, J.L. Armstrong and L.M. Brown. 2011. Gillnet configurations and their impact on Atlantic sturgeon and marine mammal bycatch in the New Jersey monkfish fishery: year 1. [Final report; 30p.] NOAA NMFS Contract No. EA133F-10-RQ-1160.
- Garrison, L.P. and L. Stokes. 2010. Estimated bycatch of marine mammals and sea turtles in the U.S. Atlantic pelagic longline fleet during 2009. NOAA Tech. Memo. NMFS-SEFSC-607. 56 pp.
- Gowans, S. and H. Whitehead 1995. Distribution and habitat partitioning by small odontocetes in the Gully, a submarine canyon on the Scotian Shelf. *Can. J. Zool.* 73: 1599-1608.

- Hain, J.H.W., R.K. Edel, H.E. Hays, S.K. Katona and J.D. Roanowicz 1981. General distribution of cetaceans in the continental shelf waters of the northeastern United States. *In: A characterization of marine mammals and turtles in the mid- and north Atlantic areas of the US outer continental shelf*. BLM. AA551-CT8-48: 1-345.
- Hamazaki, T. 2002. Spatiotemporal prediction models of cetacean habitats in the mid-western North Atlantic Ocean (from Cape Hatteras, No. Carolina, USA to Nova Scotia, Canada). *Mar. Mamm. Sci.* 18(4): 920-939.
- Hiby, L. 1999. The objective identification of duplicate sightings in aerial survey for porpoise. Pages 179-189 *in: G. W. Garner, S. C. Amstrup, J. L. Laake et al., (eds.) Marine mammal survey and assessment methods*. Balkema, Rotterdam.
- Jefferson, T.A., D. Fertl, J. Bolanos-Jimenez and A.N. Zerbini. 2009. Distribution of common dolphins (*Delphinus* spp.) in the western North Atlantic: a critical re-examination. *Mar. Biol.* 156:1109-1124.
- Laake, J.L. and D.L. Borchers 2004. Methods for incomplete detection at distance zero, *In: Advanced distance sampling*, edited by S.T. Buckland, D.R. Andersen, K.P. Burnham, J.L. Laake and L. Thomas, pp. 108-189, Oxford University Press, New York.
- Lawson, J. W. and J.-F. Gosselin 2008. Distribution and preliminary abundance estimates for cetaceans seen during Canada's Marine Megafauna Survey - A component of the 2007 TNASS. *Can. Sci. Advisory Sec. Res. Doc.* 208/nm. 33 pp.
- Lawson, J.W. and J.-F. Gosselin. 2011. Fully-corrected cetacean abundance estimates from the Canadian TNASS survey. Working Paper 10. National Marine Mammal Peer Review Meeting. Ottawa, Can. 28 pp.
- Lens, S. 1997. Interactions between marine mammals and deep water trawlers in the NAFO regulatory area. *ICES [Int. Council. Explor. Sea] C.M.* 1997/Q:08. 10 pp.
- Lucas, Z.N. and S.K. Hooker 1997. Cetacean strandings on Sable Island, Nova Scotia, 1990-1996. *International Whaling Commission SC/49/06* 10 pp.
- Lucas, Z.N. and S.K. Hooker 2000. Cetacean strandings on Sable Island, Nova Scotia, 1970-1998. *Can. Field-Nat.* 114(1): 46-61.
- Palka, D.L. 1995. Abundance estimate of Gulf of Maine harbor porpoise. *Rep. Int. Whal. Comm. (Special Issue)* 16: 27-50.
- Palka, D.L. 2005. Aerial surveys in the northwest Atlantic: estimation of  $g(0)$ . *Proceedings of a Workshop on Estimation of  $g(0)$  in Line-Transect Surveys of Cetaceans*, European Cetacean Society's 18th Annual Conference; Kolmården, Sweden; Mar. 28, 2004.
- Palka, D.L. 2006. Summer abundance estimates of cetaceans in US North Atlantic Navy Operating Areas. *Northeast Fish. Sci. Cent. Ref. Doc.* 06-03. 41 pp.  
<http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0603/crd0603.pdf>
- Palka, D.L. 2012. Cetacean abundance estimates in US northwestern Atlantic Ocean waters from summer 2011 line transect survey. *Northeast Fish. Sci. Cent. Ref. Doc.* 12-29. 37 pp.  
<http://www.nefsc.noaa.gov/nefsc/publications/crd/crd1229/>
- Palka, D.L. and P.S. Hammond 2001. Accounting for responsive movement in line transect estimates of abundance. *Can. J. Fish. Aquat. Sci.* 58: 777-787.
- Payne, P.M., L.A. Selzer. and A.R. Knowlton. 1984. Distribution and density of cetaceans, marine turtles and seabirds in the shelf waters of the northeast U.S., June 1980 - Dec. 1983, based on shipboard observations. *National Marine Fisheries Service, Woods Hole. NA81FAC00023.* 245 pp.
- Rossmann, M.C. 2010. Estimated bycatch of small cetaceans in northeast US bottom trawl fishing gear during 2000-2005. *J. Northwest Fish. Sci.* 42: 77-101.
- Selzer, L. A. and P. M. Payne 1988. The distribution of white-sided (*Lagenorhynchus acutus*) and common dolphins (*Delphinus delphis*) vs. environmental features of the continental shelf of the northeastern United States. *Mar. Mamm. Sci.* 4(2): 141-153.
- Sergeant, D.E., A.W. Mansfield and B. Beck 1970. Inshore records of cetacea for eastern Canada, 1949-68. *J. Fish. Res. Board Can* 27: 1903-1915.
- Thomas L, J.L. Laake, E. Rexstad, S. Strindberg, F.F.C. Marques, S.T. Buckland, D.L. Borchers, D.R. Anderson, K.P. Burnham, M.L. Burt, S.L. Hedley, J.H. Pollard, J.R.B. Bishop and T.A. Marques. 2009. Distance 6.0. Release 2. [Internet]. University of St. Andrews (UK): Research Unit for Wildlife Population Assessment. Available from: <http://www.ruwpa.st-and.ac.uk/distance/>
- Wade, P.R. and R.P. Angliss 1997. Guidelines for assessing marine mammal stocks: Report of the GAMMS Workshop April 3-5, 1996, Seattle, Washington. *NOAA Tech. Memo. NMFS-OPR-12.* 93 pp.

- Waring, G.T., C.P. Fairfield, C. M. Ruhsam and M. Sano 1992. Cetaceans associated with Gulf Stream Features off the Northeastern USA Shelf. ICES [Int. Counc. Explor. Sea] C.M. 1992/N:12.
- Waring, G.T., E. Josephson, C.P. Fairfield and K. Maze-Foley, eds. 2007. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments – 2006. NOAA Tech. Memo. NMFS-NE-201.
- Waring, G.T., L. Nottestad, E. Olsen, H. Skov and G. Vikingsson. 2008. Distribution and density estimates of cetaceans along the mid-Atlantic Ridge during summer 2004. *J. of Cet. Res. and Manag.* 10(2):137-146.
- Westgate, A.J. 2005. Population structure and life history of short-beaked common dolphins (*Delphinus delphis*) in the North Atlantic. Ph.D thesis. Nicholas School of the Environment and Earth Sciences. Beaufort, NC, Duke University.
- Westgate, A.J. 2007. Geographic variation in cranial morphology of short-beaked common dolphins (*Delphinus delphis*) from the North Atlantic. *J. Mamm.* 88(3): 678-688.
- Westgate, A.J. and A.J. Read 2007. Reproduction in short-beaked common dolphins (*Delphinus delphis*) from the western North Atlantic. *Mar. Biol.* 150: 1011-1024.