HARBOR SEAL (*Phoca vitulina concolor*): Western North Atlantic Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The harbor seal is found in all nearshore waters of the North Atlantic and North Pacific Oceans and adjoining seas above about 30ºN (Burns 2009; Desportes *et al*. 2010). In the western North Atlantic, they are distributed from the eastern Canadian Arctic and Greenland south to southern New England and New York, and occasionally to the Carolinas (Mansfield 1967; Boulva and McLaren 1979; Katona *et al.* 1993; Gilbert and Guldager 1998; Baird 2001;Desportes *et al*. 2010). Stanley *et al.* (1996) examined worldwide patterns in harbor seal mitochondrial DNA, which indicate that western and eastern North Atlantic harbor seal populations are highly differentiated. Further, they suggested that harbor seal females are only regionally philopatric, thus population or management units are on the scale of a few hundred kilometers. High philopatry has been reported in other North Atlantic populations (Goodman 1998; Andersen and Olsen 2010). Although the stock structure of the western North Atlantic population is unknown, it is thought that harbor seals found along the eastern U.S. and Canadian coasts represent one population (Temte *et al.* 1991; Andersen and Olsen 2010). In U.S. waters, breeding and pupping normally occur in waters north of the New Hampshire/Maine border, although breeding occurred as far south as Cape Cod in the early part of the twentieth century (Temte *et al.* 1991; Katona *et al.* 1993).

Harbor seals are year-round inhabitants of the coastal waters of eastern Canada and Maine (Katona *et al*. 1993), and occur seasonally along the southern New England to New Jersey coasts from September through late May (Schneider and Payne 1983; Barlas 1999; Schroeder 2000; deHart 2002). In recent years small numbers of seals (<50) have established winter haul-out sites in the Chesapeake Bay and near Oregon Inlet North Carolina (Todd Pusser, pers. comm. June 2011; Virginia Institute of Marine Science - http://www.vims.edu/bayinfo/faqs/marine_mammal.php, accessed 14 February, 2013). Scattered sightings and strandings have been recorded as far south as Florida (NMFS unpublished data). A general southward movement from the Bay of Fundy to southern New England waters occurs in autumn and early winter (Rosenfeld *et al.* 1988; Whitman and Payne 1990; Barlas 1999; Jacobs and Terhune 2000). A northward movement from southern New England to Maine and eastern Canada occurs prior to the pupping season, which takes place from mid-May through June along the Maine Coast (Richardson 1976; Wilson 1978; Whitman and Payne 1990; Kenney 1994; deHart 2002). Earlier research identified no pupping areas in southern New England (Payne and Schneider 1984; Barlas 1999); however, more recent anecdotal reports suggest that some pupping is occurring at high-use haulout sites off Manomet, Massachusetts and the Isles of Shoals. The overall geographic range throughout coastal New England has not changed significantly during the last century (Payne and Selzer 1989).

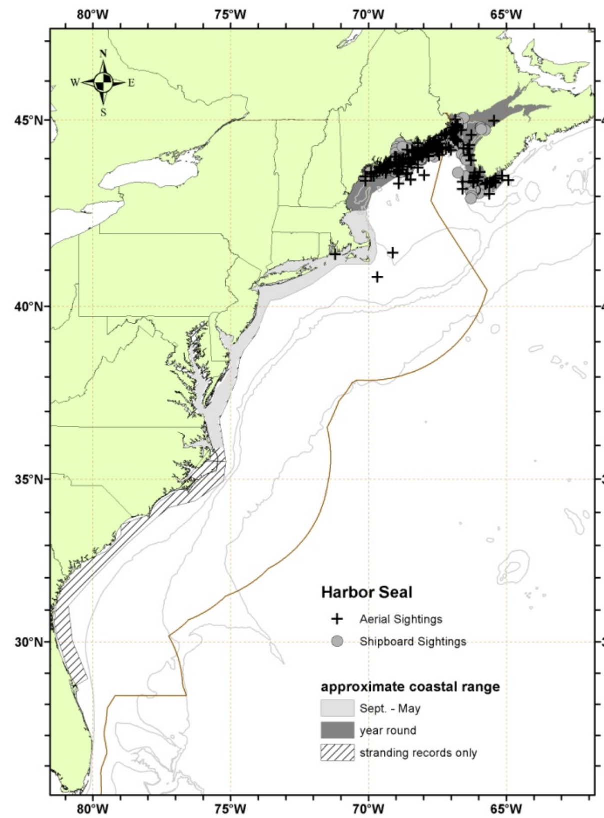

Figure 1. *Approximate coastal range of harbor seals, and distribution of harbor seal sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010, and 2011. Isobaths are the 100-m, 1000-m, and 4000-m depth contours.*

Prior to the spring 2001 live-capture and radio-tagging of adult harbor seals, it was believed that the majority of seals moving into southern New England and mid-Atlantic waters were subadults and juveniles (Whitman and Payne 1990; Katona *et al.* 1993). The 2001 study established that adult animals also made this migration. Seventy-five percent (9/12) of the seals tagged in March in Chatham Harbor were detected at least once during the May/June 2001 abundance survey along the Maine coast (Gilbert *et al.* 2005; Waring *et al.* 2006). Similar findings were made in spring 2011 and 2012 work.

POPULATION SIZE

Coast-wide aerial surveys along the Maine coast were conducted in May/June 1981, 1986, 1993, 1997, 2001, and 2012 during pupping (Gilbert and Stein 1981; Gilbert and Wynne 1983, 1984; Kenney 1994; Gilbert and Guldager 1998; Gilbert *et al.* 2005; Waring *et al*., in press). However, estimates older than eight years are deemed unreliable (Wade and Angliss 1997), and should not be used for PBR determinations. The 2001 survey, conducted in May/June, included replicate surveys and radio-tagged seals to obtain a correction factor for animals not hauled out. The 2012 survey was designed (Waring *et al*., in press) to sample bay units using a single aircraft, though it also included a radio-tracking aircraft and obtained a correction factor. The corrected estimates (pups in parenthesis) for 2001 and 2012, respectively, were 99,340 (23,722) and 75,834 (23,830) (Table 1). The 2001 observed count of 38,014 was 28.7% greater than the 1997 count, whereas the 2012 corrected estimate was 24% lower than the 2001 estimate. In addition, the Coefficient of Variation of the 2012 estimate is 0.153 compared to 0.091in 2001.

Although the 2012 population estimate is not significantly different from the 2001 estimate, there are four possible reasons for the perceived decline: First, the 2012 estimate may be biased by erroneous assumptions about seal distribution. The 2012 estimate was based on a sample of areas along part of the coast, while the 2001 estimate was based on counts along the entire coast. Second, the correction factor was different in the two surveys, being 2.54 in 2001 and 2.33 in 2012. Third, not all seals were in the study area during the survey period, and fourth, the population is no longer growing and has, in fact, declined.

Canadian scientists counted 3,500 harbor seals during an August 1992 aerial survey in the Bay of Fundy (Stobo and Fowler 1994), but noted that the survey was not designed to obtain a population estimate. The Sable Island population was the largest in eastern Canada in the late 1980s, however the number drastically declined in the late 1990s (Baird 2001). Similarly, pup production declined on Sable Island from 600 in 1989 to around a dozen pups or fewer by 2002 (Baird 2001; Bowen *et al.* 2003). A decline in the number of juveniles and adults did not occur immediately, but a decline was observed in these age classes as a result of the reduced number of pups recruiting into the older age classes (Bowen *et al*. 2003). Possible reasons for this decline may be increased use of the island by gray seals and increased predation by sharks (Stobo and Lucas 2000; Bowen *et al.* 2003). Helicopter surveys have also been flown to count hauled-out animals along the coast and around small islands in parts of the Gulf of St. Lawrence and the St. Lawrence estuary. In the estuary, surveys were flown in June 1995, 1996, and 1997, and in August 1994, 1995, 1996, and 1997; different portions of the Gulf were surveyed in June 1996 and 2001 (Robillard *et al.* 2005). Changes in counts over time in sectors that were flown under similar conditions were examined at nine sites that were surveyed in June and in August. Although all slopes were positive, only one was significant, indicating numbers are likely stable or increasing slowly. Overall, the June surveys resulted in an average of 469 (SD=60, N=3) hauled-out animals, which is lower than the average count of 621 (SD=41, N=3) hauled-out animals flown under similar conditions in August. Aerial surveys in the Gulf of St. Lawrence resulted in counts of 467 animals in 1996 and 423 animals in 2001 for a different area (Robillard *et al*. 2005). Further, approximately 200 harbor seals breed in the Grand Barachois on the islands of S. Pierre and Miquelon (France) off the southern coast of Newfoundland. This population has been declining since the mid 1980s, when there might have been more than 900 harbor seals there, due to disturbance by tourists and natural alterations of the tidal sand flats of the haul-out area (J. Lawson, pers. comm., DFO, St. Johns, Newfoundland, 21 March 2013).

Table 1. Summary of abundance estimates for the western North Atlantic harbor seal. 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
May/June 2012	Maine coast	75,834(23,830)	0.15

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 long-normal distribution as specified by Wade and Angliss (1997). The best estimate of abundance for harbor seals is 75,834 (CV=0.15). The minimum population estimate is 66,884 based on corrected available counts along the Maine coast in 2012.

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

A reliable estimate of the maximum net productivity rate is currently unavailable for this population.*et al* For purposes of this assessment, the maximum net productivity rate was assumed to be 0.12. This value is based on theoretical modeling showing that pinniped populations may not grow at rates much greater than 12% 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 66,884 animals. The maximum productivity rate is 0.12, the default value for pinnipeds. The recovery factor (F_R) 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 harbor seals is 2,006.

ANNUAL HUMAN-CAUSED SERIOUS INJURY AND MORTALITY

For the period 2008-2012 the total human caused mortality and serious injury to harbor seals is estimated to be 441 per year. The average was derived from two components: 1) 431 (CV=0.12; Table 2) from the 2008-2012 observed fishery; and 2) 10 from average 2008-2012 non-fishery-related, human interaction stranding and direct interaction mortalities (NMFS unpublished data).

Researchers and fishery observers have documented incidental mortality in several fisheries, particularly within the Gulf of Maine (see below). An unknown level of mortality also occurred in the mariculture industry (i.e., salmon farming), and by deliberate shooting (NMFS unpublished data). Between, 2008 and 2012, there are 3 records of harbor seals and 2 of unidentified seals with evidence of gunshot wounds in the Northeast Regional Office Marine Mammal Stranding Network database. In 2001, one harbor seal was killed as a result of entrainment in the intake pipes of the Seabrook New Hampshire power plant.

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 given in Appendix III.

U.S.

Northeast Sink Gillnet:

Annual estimates of harbor seal bycatch in the Northeast sink gillnet fishery reflect seasonal distribution of the species and of fishing effort. The fishery has been observed in the Gulf of Maine and in southern New England (Williams 1999; NMFS unpublished data). Williams (1999) aged 261 harbor seals caught in this fishery from 1991 to 1997, and 93% were juveniles (i.e., less than four years old). Estimated annual mortalities (CV in parentheses) from this fishery were 92 in 2007, 242 (0.41) in 2008, 513 (0.28) in 2009, 540 (0.25) in 2010, 343 (0.19) in 2011, and 252 (0.26) in 2012 (Table 2; Orphanides 2013, Hatch and Orphanides 2014). The stratification design used is the same as that for harbor porpoise (Bravington and Bisack 1996). There were 14, 6, 8, 5, 9, and 6 unidentified seals observed during 2008-2012, respectively. Since 1997, unidentified seals have not been prorated to a species. This is consistent with the treatment of other unidentified mammals that do not get prorated to a specific species. Average annual estimated fishery-related mortality and serious injury to this stock attributable to this fishery during 2008-2012 was 378 harbor seals (CV=0.13; Table 2).

Mid-Atlantic Gillnet

A study on 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. Eight research strings of fourteen nets each were fished, and 159 hauls were completed during the course of the 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. Four harbor seals (3 in mid-Atlantic gillnet and 1 in NE gillnet) were caught in this project during 2010 (AIS 2010).

Two harbor seals were observed taken in 2008, 2 in 2009, 9 in 2010, 2 in 2011, and 0 in 2012. Using the observed and experimental takes, the estimated annual mortality (CV in parentheses) attributed to this fishery was 88 (0.74) in 2008, 47 (0.68) in 2009, 89 (0.39) in 2010, 21 (0.67) in 2011, and 0 in 2012 (Table 2; Orphanides 2013, Hatch and Orphanides 2014). Average annual estimated fishery-related mortality and serious injury attributable to this fishery during 2008-2012 was 49 (CV =0.33) harbor seals (Table 2).

Northeast Bottom Trawl

No harbor seal mortalities were observed in 2008-2010, 3 were observed in 2011, and 1 in 2012 (Table 2). TThe average annual fishery-related mortality and serious injury for 2008-2012 is calculated as 2.4 (0.5) animals.

Mid-Atlantic Bottom Trawl

One harbor seal mortality was observed in this fishery in 2009, one in 2010 and 3 in 2012 (Table 2). The average annual fishery-related mortality and serious injury for 2008-2012 is calculated as 11.6 (0.59) animals.

Northeast Mid-water Trawl Fishery (Including Pair Trawl)

One harbor seal mortality was observed in this fishery in 2009, 2 in 2010 and 1 in 2012 (Table 2). The resultant estimated annual fishery-related mortality and serious injury (CV in parentheses) was 1.3 (0.81) in 2009 but an extended bycatch rate has not been calculated for 2010. Until this bycatch estimate can be developed, the average annual fishery-related mortality and serious injury for 2008-2012 is calculated as 0.9 animals (3 animals +1.3 animals/5 years).

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

A harbor seal mortality was observed in this fishery in 2010. An expanded bycatch estimate has not been generated. Until this bycatch estimate can be developed, the average annual fishery-related mortality and serious injury for 2008-2012 is calculated as 0.2 animals (1 animal/5 years).

Gulf of Maine Atlantic Herring Purse Seine Fishery

The Gulf of Maine Atlantic Herring Purse Seine Fishery is a Category III fishery. This fishery was not observed until 2003. No mortalities have been observed, but 11 harbor seals were captured and released alive in 2004, 4 in 2005, 1 in 2008, none in 2007 or 2009-2010, 3 in 2011 and 1 in 2012. In addition, 5 seals of unknown species were captured and released alive in 2004, 2 in 2005, 1 in 2007, and none in 2009-2010, 8 in 2011, and 0 in 2012. This fishery was not observed in 2006. Further, one harbor seal and two unknown species in were designated as serious injuries/mortalities in 2011, based on fisheries monitoring logs (Waring *et al*. 2015). An expanded bycatch estimate has not been generated. Until this bycatch estimate can be developed, the average annual fishery-related mortality and serious injury for 2008-2012 is calculated as 0.2 animals (1 animal/5 years).

CANADA

Currently, scant data are available on bycatch in Atlantic Canada fisheries due to a lack of observer programs (Baird 2001). An unknown number of harbor seals have been taken in Newfoundland, Labrador, Gulf of St. Lawrence and Bay of Fundy groundfish gillnets, Atlantic Canada and Greenland salmon gillnets, Atlantic Canada cod traps, and in Bay of Fundy herring weirs (Read 1994; Cairns *et al.* 2000). Furthermore, some of these mortalities (e.g., seals trapped in herring weirs) are the result of direct shooting under nuisance permits.

Table 2. Summary of the incidental mortality of harbor seals (*Phoca vitulina concolor*) by commercial fishery including the years sampled (Years), the number of vessels active within the fishery (Vessels), 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	Years	Data Type [a]	Observer Coverage [b]	Observed Serious Injury[e]	Observed Mortality	Estimated Serious Injury	Estimated Mortality	Estimated Combined Mortality	Estimated CVs	Mean Annual Mortality
Northeast [c] Sink Gillnet	08-12	Obs. Data, Weighout, Logbooks	.05, .04, .17, .19, .15	0, 0, 0, 0, 0	9, 21, 71, 91, 37	0, 0, 0, 0, 0	242, 513, 540, 343, 252	242, 513, 540, 343, 252	.41, .28, .25, .19, .26	378 (0.13)
Mid-Atlantic Gillnet	08-12	Obs. Data, Weighout	.03, .03, .04, .02, .02	0, 0, 0, 0, 0	2, 2, 9, 2, 0	0, 0, 0, 0, 0	88, 47, 89, 21, 0	88, 47, 89, 21, 0	.74, .68, .39, .67, 0	49 (0.33)
Northeast Bottom Trawl [d]	08-12	Obs. Data, Weighout	.08, .09, .16, .26, .17	0, 0, 0, 0, 0	0, 0, 0, 3, 1	0, 0, 0, 0, 0	0, 0, 0, 9, 3	0, 0, 0, 9, 3	0, 0, 0, .58, 1	2.4 (0.5)
Mid-Atlantic Bottom Trawl	08-12	Obs. Data Dealer	.03. .05, .06, .08, .05	0, 0, 0, 0, 0	0, 1 ,1, 0, 3	0, 0, 0, 0, 0	1, 24, 11, 0, 23	1, 24, 11, 0, 23	0, .92, 1.1, 0, 1	11.6 (0.59)
Northeast Mid-water Trawl - Including Pair Trawl	08-12	Obs. Data Weighout Trip Logbook	.199, .42, .53, .41, .45	0, 0, 0, 0, 0	0, 1, 2, 0, 1	0, 0, 0, 0, 0	0, 1.3, na, 0, na	0, 1.3, na, 0, na	0, .81, na, 0, na	0.9 (.81)
Mid-Atlantic Mid-water Trawl - Including Pair Trawl	08-12	Obs. Data Weighout Trip Logbook	.13, .13, .25, .41, .21	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, 0, 0	0.2 (na)[d]
Herring Purse Seine	08-12	Obs. Data	.12, .21, .12 .33, .17	0, 0, 0, 1, 0	0, 0, 0, 0, 0	0, 0, 0, na, 0	0, 0, 0, 0, 0	0, 0, 0, na, 0	0, 0, 0, na, 0	0.2 (na)
TOTAL										431 (0.12)

[a] Observer data (Obs. Data) are used to measure bycatch rates, and the data are collected within the Northeast Fisheries Observer Program. NEFSC collects landings data (Weighout), and total landings are used as a measure of total effort for the sink gillnet fishery. Mandatory logbook (Logbook) data are used to determine the spatial distribution of fishing effort in the Northeast sink gillnet fishery.

[b] The observer coverages for the Northeast sink gillnet fishery and the mid-Atlantic gillnet fisheries are ratios based on tons of fish landed and coverages for the northeast bottom trawl are ratios based on trips. Total observer coverage reported for bottom trawl gear and gillnet gear in the year 2010 and 2011 includes samples collected from traditional fisheries observers in addition to fishery monitors through the Northeast Fisheries Observer Program (NEFOP).

[c] Since 1998, takes from pingered and non-pingered nets within a marine mammal time/area closure that required pingers, and takes from pingered and non-pingered nets not within a marine mammal time/area closure were pooled. The pooled bycatch rate was weighted by the total number of samples taken from the stratum and used to estimate the mortality. In 2008 - 2012, respectively, 0, 8, 23, 32 and 12 takes were observed in nets with pingers. In 2008 – 2012, respectively, 9, 13, 48, 59, and 25 takes were observed in nets without known pingers.

[d] Fishery related bycatch rates for years 2008-2012 were estimated using an annual stratified ratio-estimator. These estimates replace the 2008-2010 annual estimates reported in the 2013 stock assessment report that were generated using a different method.

[e] Analyses of bycatch mortality attributed to the mid-water trawl fisheries for 2010 – 2012 have not been generated. f. Serious injuries were evaluated for the 2008–2012 period using new guidelines and include both at-sea monitor and traditional observer data (Waring *et al.* 2014, 2015)

Other Mortality

Canada: Aquaculture operations in eastern Canada are licensed to shoot nuisance seals, but the number of seals killed is unknown (Jacobs and Terhune 2000; Baird 2001). Small numbers of harbor seals are taken in subsistence hunting in northern Canada, and Canada also issues personal hunting licenses which allow the holder to take six seals annually (DFO 2008).

U.S.: Historically, harbor seals were bounty-hunted in New England waters, which may have caused a severe decline of this stock in U.S. waters (Katona *et al*. 1993; Lelli *et al*., 2009). Bounty-hunting ended in the mid-1960s.

Other sources of harbor seal mortality include human interactions, storms, abandonment by the mother, disease (Anthony *et al.* 2012), and predation (Katona *et al.* 1993; NMFS unpublished data; Jacobs and Terhune 2000). Mortalities caused by human interactions include boat strikes, fishing gear interactions, oil spill/exposure, harassment, boat strikes and shooting.

Harbor seals strand each year throughout their migratory range. Stranding data provide insight into some of these sources of mortality. From 2008-2012, 1,327 harbor seal stranding mortalities were reported between Maine and Florida (Table 3; NMFS unpublished data). Sixty-five (4.9%) of the dead seals stranded during this five-year period showed signs of human interaction (10 in 2008, 6 in 2009, 20 in 2010, 20 in 2011, and 9 in 2012), with 15 (1.1%) having some sign of fishery interaction (5 in 2008, 0 in 2009, 6 in 2010, 2 in 2011 and 2 in 2012). Three harbor seals during this period were reported as having been shot. An Unusual Mortality Event (UME) was declared for harbor seals in northern Gulf of Maine waters in 2003 and continued into 2004. No consistent cause of death could be determined. The UME was declared over in spring 2005 (MMC 2006). NMFS declared another UME in the Gulf of Maine in autumn 2006 based on infectious disease. A UME was declared in November of 2011 that involved 567 harbor seal stranding mortalities between June 2011 and October 2012 in Maine, New Hampshire and Massachusetts. The UME was declared closed in February 2013.

Stobo and Lucas (2000) have documented shark predation as an important source of natural mortality at Sable Island, Nova Scotia. They suggest that shark-inflicted mortality in pups, as a proportion of total production, was less than 10% in 1980-1993, approximately 25% in 1994-1995, and increased to 45% in 1996. Also, shark predation on adults was selective towards mature females. The decline in the Sable Island population appears to result from a combination of shark-inflicted mortality on both pups and adult females and inter-specific competition with the much more abundant gray seal for food resources (Stobo and Lucas 2000; Bowen *et al.* 2003).

Table 3. Harbor seal (*Phoca vitulina concolor*) stranding mortalities along the U.S. Atlantic coast (2008-2012) with subtotals of animals recorded as pups in parentheses[a].

State	2008	2009	2010	2011[b]	2012	Total
Maine	178 (152)	72 (61)	70 (64)	147 (115)	131 (101)	598
New Hampshire	3 (2)	15 (12)	20 (15)	77 (63)	24 (18)	139
Massachusetts	50 (4)	74 (36)	82 (26)	133 (80)	54 (35)	392
Rhode Island	6 (4)	5 (2)	4 (0)	7 (0)	14 (0)	36
Connecticut	0	0	0	1 (1)	1 (1)	2
New York	5 (1)	14 (1)	15 (0)	17 (0)	14 (1)	65
New Jersey	7	11 (2)	21 (0)	10 (0)	7 (0)	56
Maryland	0	2 (0)	0	1 (0)	0	3
Virginia	1	3	1 (0)	4 (0)	0	9
Northe Carolina	6 (2)	6 (5)	11 (1)	2 (0)	2 (0)	27
Total	256	202	224	399	247	1327

Unspecified seals (all states)	51	34	22	11	27	132

a. Some of the data reported in this table differ from that reported in previous years. We have reviewed the records and made an effort to standardize reporting. Records of live releases and rehabbed animals have been eliminated. Mortalities include animals found dead and animals that were euthanized, died during handling, or died in the transfer to, or upon arrival at, rehab facilities.
b. Unusual Mortality event (UME) declared for harbor seals in southern Maine to northern Massachusetts in 2011.

STATUS OF STOCK

Harbor seals 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. The 2008-2012 average annual human-caused mortality and serious injury does not exceed PBR. The status of the western North Atlantic harbor seal stock, relative to OSP, in the U.S. Atlantic EEZ is unknown. Total 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.

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