Species Status Assessment

Common Name: Blue whale **Date Updated:** February 2024

Scientific Name: *Balaenoptera musculus* **Updated by:**

Class: Mammalia

Family: Balaenopteridae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

The blue whale is the largest animal to have ever lived on Earth, as well as the largest species of whale and can be found in all of the world's oceans (Gambell 1979, Yochem and Leatherwood 1985, Mead and Brownell 1993). This includes the North Atlantic and North Pacific. There are three known subspecies of blue whales: *Baleanoptera musculus musculus,* which inhabits the Northern Hemisphere; *B. m. intermedia,* which inhabits the Antarctic; and *B. m. brevicauda,* also known as the pygmy blue whale, found in the southern Indian Ocean and southwestern Pacific (Rice 1977, Ichihara 1966).

In the North Atlantic, blue whales are found from the subtropics to the poles, with most recent records being from the Gulf of St. Lawrence, where they can be found during the spring, summer and fall (Sears et al. 1987, Sears and Larsen 2002). They rarely appear in US waters of the North Atlantic and spend much more time further off shore than other baleen whales. It is believed that blue whales are using waters of the New York Bight primarily as part of their migration routes from summer feeding areas to lower latitude winter breeding areas.

The species has been documented in the NY Bight during visual surveys and a pilot passive acoustic study in the New York Bight (Sadove and Cardinale 1993, BRP 2010). Sightings and acoustic detections have been confined to offshore waters greater than 25 miles off the coast (Sadove and Cardinale 1993, BRP 2010). Additionally, blue whales were detected acoustically only during the late winter and early spring. It should be noted, however, that monitoring did not take place during the summer due to a lack of funds. It is, therefore, unknown if blue whales are present in the NY Bight during summer months (BRP 2010).

Blue whales were severely depleted by whaling throughout their range starting with the introduction of steam-powered ships in the second half of the 19th century. At that time the blue whale became the most profitable species due to its size and was heavily targeted before gaining protection in the North Atlantic in the 1955 (Gambell 1979, Best 1993). Long-term studies in the Gulf of St. Lawrence have identified over 400 individual blue whales. Unfortunately, studies only occurred in this small portion of their range due to the rarity of sightings in other parts of the range. Therefore, it is difficult to determine population estimates and trends for this species (NMFS website, NMFS 2010). However, the most recent stock assessment for the western North Atlantic stock by NMFS gives 440 as the minimum population estimate (NMFS 2010).

I. Status

a. Current legal protected Status

i. **Federal:** Endangered **Candidate:** ________

ii. **New York:** Endangered

b. Natural Heritage Program

i. **Global:** G3G4

ii. **New York:** SNA **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List:

-Northeast Regional SGCN:

Status Discussion:

Estimates of the eastern Canadian population before whaling put the number between 1,100 – 1,500 blue whales (Sergeant 1966, Allen 1970). It is known that the population was severely diminished by whaling during the 19th and early 20th centuries. At least 11,000 blue whales were killed throughout the North Atlantic during this time period (Sigurjónsson and Gunnlaugsson 1990), which is believed to have been approximately 70% of the population (DFO 2009). Blue whales received protection from whaling in 1955 (Reeves et al. 1998). Estimates after this protection was granted put the population in the "very low hundreds, at most" in the western North Atlantic (Mitchell 1974). Some recent estimates suggest that the number of mature blue whales is not greater than 250 individuals (Sears and Calambokidis 2002). However, NOAA, Fisheries estimate for the North Atlantic is 400-600 individuals (NMFS website).

The blue whale was listed under the Marine Mammal Protection Act when it was first enacted in 1972 and under the Endangered Species Act in 1973. In 1983 it was listed as a species of special concern in Canada. The Canadian population was split into two stocks in 2002, and the North Atlantic stock was listed as endangered under the Species at Risk Act (SARA) that year (DFO 2009).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown			Choose an item.
Northeastern US	Yes	Unknown	Unknown			Choose an item.
New York	Yes	Unknown	Unknown		Endangered	Yes
Connecticut	Yes	Unknown	Unknown		Not listed	No
Massachusetts	Yes	Unknown	Unknown		Endangered	Choose an item.
Rhode Island	Yes	Unknown	Unknown		Not listed	Yes
New Jersey	Yes	Unknown	Unknown		Endangered	Choose an item.
Pennsylvania	No	N/A	Choose an item.			Choose an item.
Vermont	No	Choose an item.	Choose an item.			Choose an item.
Ontario	No	Choose an item.	Choose an item.			Choose an item.

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
Quebec	Yes	Unknown	Unknown		Endangered	Choose an item.

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

From February 2008 – March 2009 Cornell University partnered with DEC and conducted passive acoustic monitoring for cetaceans in New York coastal waters (BRP 2010).

NOAA, NEFSC, Protected Species Branch conducts regular aerial and ship board surveys to determine the abundance and distribution of protected species in the North East. However, sampling, including scale of sampling is not specific either to large whales in the New York Bight, nor is sampling year round. There are no current monitoring activities or regular surveys conducted by the State of New York or specific to large whales in the New York Bight. However, DEC, Marine Resources and Natural Heritage Program are currently in the planning stages to establish a regular monitoring program for large whales. The monitoring techniques and protocols have not yet been determined. There is currently funding for three years of monitoring.

Trends Discussion *(insert map of North American/regional distribution and status):*

It is known that there was a long-term decline of western North Atlantic blue whales since whaling on the species began in the late 19th century. However, post-whaling abundance and trends are currently unknown. The blue whale is seen very rarely along the eastern U.S. seaboard. These sightings are too infrequent to reliably determine population size in this area. Unfortunately, because such a small portion of the blue whale range in the western North Atlantic has been reliably sampled, existing studies cannot be used to analyze abundance of the species (Hammond et al. 1990, Sears and Calambokidis 2002).

Some trend information is available for western North Atlantic blue whales in the Gulf of St. Lawrence, where most research and sightings have occurred. Currently, over 400 individual blue whales have been photographically identified in this area (DFO 2009). About 40% return to the Gulf of St. Lawrence regularly, while others have been seen for less than three seasons between 1979 – 2002 (Sears and Calambokidis 2002). An unexpectedly small number of blue whales calves have been seen in the area, with only 22 mother-calf pairs being documented in 34 years of research (MICS 2012). This may possibly be related to low calf production. But, it is not possible to say that these observations mean that blue whales have a low calving rate or whether mother-calf pairs use a different area than the one surveyed, or if a certain percentage of calves are weaned before reaching these feeding grounds (Reeves et al. 1998). Regardless of any potential trends, these studies cannot be used to extrapolate for blue whales in areas out the Gulf of St. Lawrence.

Population trends of blue whales in other areas have been determined. Preliminary analysis of blue whale sightings data from vessels in Iceland has documented an increase of about 5% per year since the 1960s (Sigurjónsson and Gunnlaugsson 1990). Blue whales in the Antarctic are estimated to have been increasing at over 7% per year from 1968 – 2001 (Branch et al. 2004).

These estimates apply only to the areas studied, and it cannot be assumed that the western North Atlantic population of blue whales is experiencing similar rates of increase.

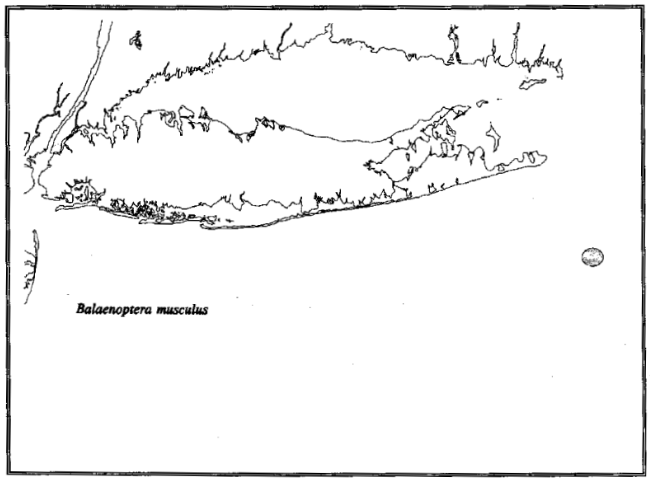

Figure 1. Locations of sightings of blue whales by surveys conducted by the Okeanos Ocean Research Foundation from 15 years of research from the 1970s – early 1990s. From Sadove & Cardinale 1993.

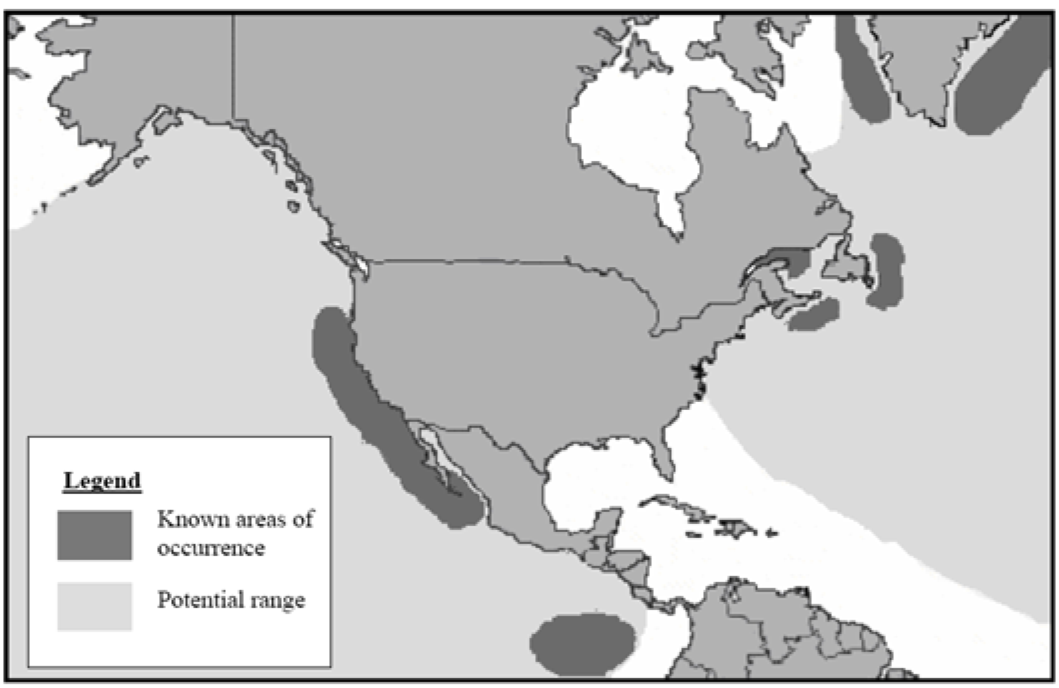

Figure 2. Geographical range of the blue whale, along the coast of North and Central America. Adapted from Sears and Calambokidis (2002).

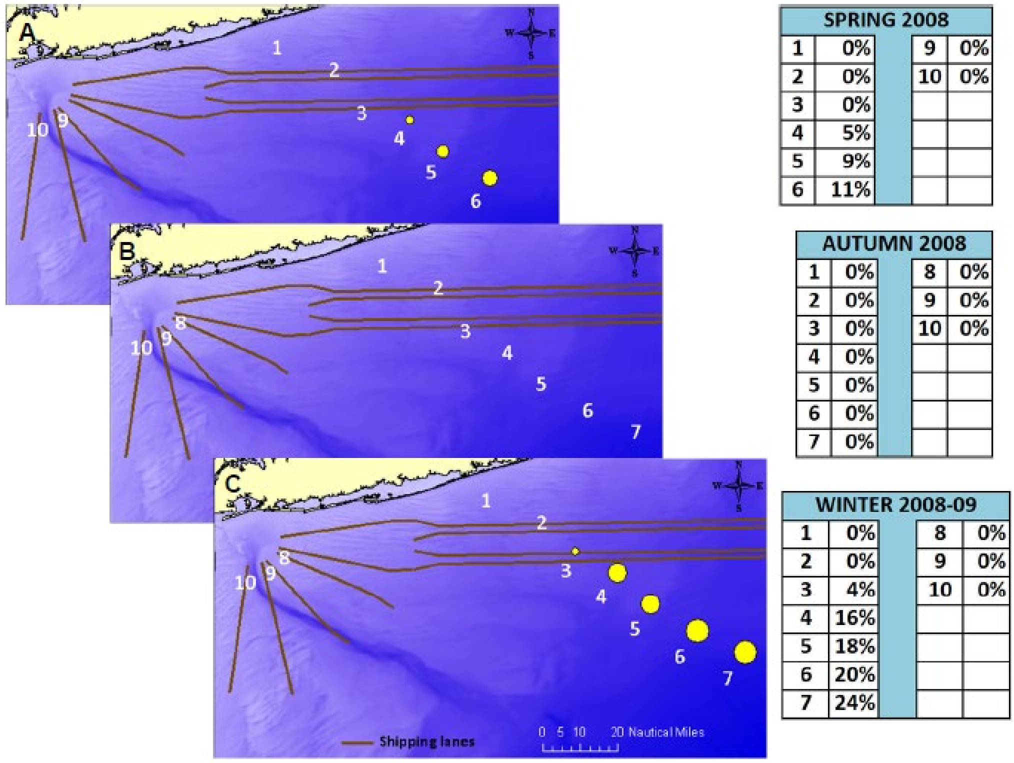

Figure 3. Seasonal presence of blue whales in the New York Bight region. A) blue whale presence during spring (1 March – 14 May 2008), B) presence during autumn (31 August – 2 Dec 2008), and C) presence during winter (5 December 2008 – 3 March 2009). Tables to the right of each plot show the actual percentages of days with blue whale song during each season. Figure from BRP 2010.

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995			
1995-2004			
2005-2014			
2015-2023			

Table 1: Records of blue whale in New York.

Details of historic and current occurrence:

Unknown for New York. The only information on blue whales in the state comes from 15 years of surveys (from the 1970s to early 1990s) by Okeanos Ocean Research Foundation, where "less than a dozen" blue whale sightings occurred (Sadove and Cardinale 1993) and occasional sightings in surveys by NOAA, Fisheries.

Unknown for New York. Similar surveys to those conducted by Okeanos Ocean Research Foundation (above) have not been conducted in recent years. Surveys have been conducted by NOAA, Fisheries but nature of the surveys and rarity of sightings makes abundances difficult to determine. Blue whales are known to exist from acoustical monitoring conducted by Cornell University in 2008 and 2009, where they were detected on 28 of 258 recording days (BRP 2010).

The blue whale is considered a rare visitor to New York waters, and Northeastern U.S. waters in general. Surveys conducted from the 1970s – early 1990s had less than a dozen blue whale sightings total. Recent acoustic monitoring has detected blue whales in March 2008 and January and February 2009. It is believed that blue whales use New York waters primarily as a migration route. During the summer feeding season, the western North Atlantic blue whale population is believed to use the waters from Greenland south to the waters off of Cape Cod, MA (Reeves et al. 1998, DFO 2009).

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Pelagic

b. Marine, Deep Subtidal

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
No	Yes	Unknown	

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

Little is known about the habitat used by blue whales in New York waters. This area is generally considered to be a migratory corridor, although Sadove and Cardinale (1993) noted that the blue whales seen in surveys by the Okeanos Foundation (all single individuals) were associated with large groups of feeding fin whales and therefore were possibly feeding. Blue whales are often associated with bathymetric features that are believed to concentrate their main prey source, euphausiids (DFO 2009). These include continental shelf edges, underwater canyons, and deep channels where upwelling occurs (DFO 2009). If blue whales are feeding while migrating through New York they may be found in areas where their prey could be expected to be concentrated.

The blue whales seen during Okeanos Foundation surveys were always in water greater than thirty meters deep (Sadove and Cardinale 1993). Observations also came from areas 25 or more miles south of Montauk Point (See Figure 1 in Trends Discussion above). In the Cornell passive acoustic monitoring program, two strings of recording devices were set up. One was in the New York Harbor area, and the other string began ten miles south of Southampton and extended to the edge of the continental shelf (Figure 3, BRP 2010). Blue whales were only detected on the devices off of Long Island, and most frequently on the device farthest out to sea, implying a more offshore distribution (BRP 2010). Blue whales were detected for a week in March 2008, and several times in January and February 2009 (BRP 2010). Further research is needed to be able to determine which areas of New York waters are most frequently used by this species. Also, research is needed to determine if blue whales are feeding while in this area.

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Choose an item.	Choose an item.	Yes	Choose an item.	Choose an item.	Choose an item.

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

The most popular method for aging baleen whales involves counting the layers on their waxy ear plug. This method gives an estimation of age, but is not exceptionally precise. The oldest known blue whale aged using this technique was around 110 years old. The average life span is believed to be 40 – 90 years old (Reeves et al. 1998).

The western North Atlantic population of blue whales is known to be far-ranging. Whales photographically identified in the Gulf of St. Lawrence have been seen in New England waters, off the coast of Greenland and over the Scotian Shelf (DFO 2009). At least some portion of the population remains in these waters year-round, others travel to lower latitude breeding grounds in the winter. Females give birth on these breeding grounds after a 10 – 12 month gestation period. Calves are nursed for 6 – 7 months before being weaned en route to or on summer feeding grounds. It is currently believed that female blue whales give birth every two to three years. The age at which blue whales reach sexual maturity is believed to be between 5 – 15 years (Mizroch et al. 1984, Yochem and Leatherwood 1985).

Like other species of baleen whales, blue whales are solitary animals. They may be found associating with one another on occasion, but in general the only true bond is between mothers and young calves (Reeves et al. 1998). There are not long-term family bonds like those that occur in several species of toothed whales. Any associations between adult baleen whales tend to be short-term and are often made when feeding conditions make it beneficial for group feeding to occur. Blue whales are baleen whales whose diet consists primarily of euphausiids. In the Western North Atlantic their diet consists of two main species: *Thysanoessa inermis* and *Meganyctiphanes norvegica*.

Two sources of natural mortality in blue whales include ice entrapment and predation by killer whales. Animals that become caught in ice can die from physical injury by ice blocks or can drown when breathing holes freeze over. However, these occur only while they are in the Gulf of St. Lawrence or further north, and not while they are in the New York Bight (Sears et al. 1990, Stenson et al. 2003). There have been some records of mortality or injury due to ship strikes in the US Atlantic EEZ (NMFS 2010). This may be an issue in New York.

VI. Threats *(from NY 2015 SWAP or newly described)*

Threats to NY Populations	
Threat Category	**Threat**
1. Transportation & Service Corridors	Shipping Lanes (vessel strikes)
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (entanglement in fishing gear)
3. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss/change of prey from climate change)
4. Energy Production & Mining	Oil & Gas Drilling (exploration and production)
5. Energy Production & Mining	Renewable Energy (offshore wind)
6. Human Intrusions & Disturbance	Recreational Activities (whale watching, recreational fishing)
7. Pollution	Excess Energy (anthropogenic noise including shipping)
8. Pollution	Garbage & Solid Waste
9. Pollution	Industrial & Military Effluents (contaminants)
10. Human Intrusions & Disturbance	War, Civil Unrest & Military Exercises (military sonar)
11. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (transmittable, viruses, parasites)
12. Invasive & Other Problematic Species & Genes	Problematic Native Species (algal blooms)

In general, threats to blue whales are not well known (NMFS 2010). Two of the potentially most significant known anthropogenic threats to large whale populations include vessel strikes and fishery interactions, specifically entanglement in fishing gear. It is believed that both vessel collisions and entanglements occur more frequently than observational studies would suggest, as many events are most likely not reported, and affected whales may die at sea and not be recovered (Heyning and Lewis 1990). Jensen and Silber (2004) compiled information on ship strikes involving all whale species from

1975 – 2002. They found eight reported instances that involved a blue whale (Jensen and Silber 2004). All of these resulted in death; however, only one took place in the North Atlantic. All others were in the Pacific, with three of the remaining seven occurring off of California (Jensen and Silber 2004). The one event documented event that occurred in the North Atlantic involved a juvenile blue whale and was reported in Rhode Island (Jensen and Silber 2004). Unfortunately, it is extremely difficult to track a specific event to a geographic location and often, as in this instance, the reported location indicates where the carcass (or injured whale) was discovered, not where the actual collision took place. While collisions are not believed to be a major threat to the western North Atlantic blue whales, at least 9% of the blue whales in the Gulf of St. Lawrence have scars indicative of vessel contact (Sears et al. 1990, Reeves et al. 1998). It is not known what impact ship strikes have on blue whale populations.

There have only been two reported blue whale entanglement events in the North Atlantic. One resulted in a mortality and occurred in the Gulf of St. Lawrence, and the other event was a live blue whale on Stellwagen Bank (off the coast of Massachusetts) trailing gear and a lobster pot buoy (Reeves et al. 1998). However, it is possible that the relatively few entanglement events are a factor of incomplete reporting and rarity of sighting. It is not currently known what impact entanglements may have on blue whale populations (Reeves et al. 1998).

Stranding and entanglement response and outreach in New York are currently provided by Riverhead Foundation. They respond to all marine mammal strandings; however, they are not authorized to disentangle large whales. The nearest group authorized by NOAA to perform such entanglements is the Rhode Island Division of Fish and Wildlife. In an attempt to reduce large whale entanglements, Cornell Cooperative Extension has begun a “ghost” gear removal project. Working with the DEC’s Crustacean Unit and commercial fishermen, the project has removed 4,881 abandoned lobster traps from Long Island Sound as of June 21, 2012.

Long term changes in climate and oceanographic processes as a result of climate change could have numerous effects on blue whales. Blue whales feed almost exclusively on euphausiids, and are dependent on high concentrations of this prey source to survive (DFO 2009). Climate change could alter the suitability of certain areas for euphausiids. For example, one of the major types of krill consumed by blue whales (*Thysanoessa raschi*) depends on a cold intermediate layer, which very well may be lost with the trend towards increasing water temperature that has been observed in the North Atlantic (DFO 2009, Simard et al. 1986). Additionally, current alterations could lead to changes in concentration of euphausiids, which could lead to distribution shifts in blue whales and possibly detrimental effects in the species.

The effects of other anthropogenic activities, such as offshore energy development are also largely unknown. Oil spills threaten marine mammals including the blue whale. The other major threat of development and other human activities is noise pollution. Cetaceans, including blue whales, rely heavily on sound to communicate. Increasing levels of anthropogenic noise in the ocean could hamper this ability. Ross (1987, 1993) estimated that the ambient noise level in the oceans rose 10 dB from 1950 – 1975 because of shipping; background noise has been estimated to be increasing by 1.5 dB per decade at the 100 Hz level since propeller-driven ships were invented (National Research Council 2003). The oceans are getting progressively louder, and the waters off of New York are no exception (BRP 2010).

Several species of large whales have been found to increase the amplitude of their calls in response to large levels of noise, which could lead to increased energy consumption (See Holt et al. 2008, Parks et al. 2010). Above a certain level of noise, some whale species are known to stop vocalizing (See Melcón 2012), and there is also the potential for masking of calls if background noise occurs within the frequencies used by calling whales (BRP 2010). In a large, solitary species, this could lead to difficulty finding other whales, including potential mates.

In some instances, exceptionally loud noises, usually active military sonar, have led to temporary and permanent threshold shifts and even death by acoustic trauma in certain species of cetaceans (NMFS

2011). While this has not been documented in blue whales, there is the potential for such deleterious effects to occur.

Recreational vessel activity, such as whale-watching has been known to affect some species of cetaceans. (Williams, Trites and Bain 2002). Unlike some other species, blue whales are not the target of heavy whale-watching pressure in New York waters, so it is assumed that these effects are minimal.

It is currently believed that contaminants such as organochlorines, organotins, and heavy metals do not negatively impact blue whales and other baleen as much as other marine mammals (O'Shea and Brownell 1994). Blue whales feed at a low trophic level, and so there is little chance for the bioaccumulation of toxins that occurs in many of the odontocetes (toothed whales). While no significant effects of contaminants have yet been documented, it is possible that exposure has long-term effects such as reduced reproductive success and/or long-term survival. It is also possible that ingestion of solid pollutants (garbage) may occur, which could lead to potential blockage of the stomach. Such ingestion has been documented in several species of cetaceans, including sperm and minke whales, but never in a blue whale (Reeves et al. 1998).

There have been several reports of blue/fin whale hybrids (Berube and Aguilar 1998). At least five instances of such hybridization have been reported, although there have been several more observations of possible hybrids (Berube and Aguilar 1998). Of the four cases examined in detail, the mother was confirmed to be a blue whale in three of the instances (Berube and Aguilar 1998). The reproductive capabilities and fitness of the hybrids is unknown. However, some studies indicate that these may be issues (Berube and Aguilar 1998).

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: _✓_ **No:** _____ **Unknown:** _____

If yes, describe mechanism and whether adequate to protect species/habitat:

The blue whale is protected in the United States by its status as a federally Endangered species. In addition, the blue whale (along with all other marine mammals) receives federal protection under the Marine Mammal Protection Act of 1972 (MMPA). The blue whale is protected internationally from commercial hunting under the International Whaling Commission's (IWC) global moratorium on whaling. The moratorium was introduced in 1986, and is voted on by member countries (including the United States) at the IWC's annual meeting.

Blue whales are also protected under the Environmental Conservation Law (ECL) of New York. The Blue whale is listed as a state endangered species in New York. Section 11 – 0535 protects all state-listed endangered and threatened species and makes it illegal to take, import, transport, possess or sell any listed species or part of a listed species. In addition, Article 17 of the ECL works to limit water pollution, and Article 14 presents the New York Ocean and Great Lakes Ecosystem Conservation Act. Whether these protections are adequate to protect is currently unknown. There is not currently enough information about distribution and abundance to assess this adequately.

The North Atlantic Large Whale Take Reduction Plan identified floating groundline used in the trap and pot fisheries as an entanglement threat for large whales. The National Marine Fisheries Service subsequently passed a new law making it mandatory for all pot and trap fisheries to switch over to sinking groundline by 2008. To encourage compliance by fishermen, DEC's Marine Endangered Species and Crustacean Unit partnered with the Cornell Cooperative Extension of Suffolk County and initiated gear buyback programs, which removed 16.9 tons of floating rope from New York's commercial lobster fishery. Further analysis is required before it is known if any real reduction in large whale entanglement has occurred as a result of the switch from floating to sinking groundline.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

It is still largely unknown how frequently blue whales utilize New York coastal waters. Long-term surveys and monitoring strategies should be developed. Historically, vessel and aerial survey techniques have been used. These visual techniques provide valuable information, but also are limited by weather and sea conditions and are rather expensive and time-consuming. The use of passive acoustics as a way to monitor large whales is promising. Cornell University partnered with NYS DEC and placed marine autonomous recording units in the New York Bight region for periods of time in 2008 – 2009. These recorders detected several species of cetaceans using these waters, including blue whales (BRP 2010). Unfortunately, the project ran out of funding and the recorders were removed. However, valuable information was obtained, and DEC, Marine Resources and the Natural Heritage Program are in the planning stages to establish a regular monitoring program.

Better information about abundance and distribution can assist with management and conservation decisions. Additionally, studies to determine behavior of blue whales when they are in the area could help determine whether or not they are feeding as they are migrating. This information is helpful because it is known that, at least in Right whales, feeding behaviors make them more vulnerable to ship strikes (Parks et al. 2011b).

Some potential protective measures could be seasonal speed restrictions on vessels in high use areas could be put into effect and/or seasonal area closures on certain fisheries where the gear poses an entanglement threat. Another possible measure could be the establishment of a near real-time acoustic monitoring of large whales, such as that being used for Right whales in Massachusetts to reduce the threat of vessel collisions.

Finally. little is known about general life history and demography of this species, and the real effects of the threats in New York waters are unknown. Further research into the actual effects that threats such as climate change are having on blue whales is warranted. In addition, education on this species and the importance of reporting ship strikes and entanglements would be helpful.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection):
https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Conservation Actions	
Action Category	**Action**
1.	
2.	

Table 2: (need recommended conservation actions for blue whale).

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Originally prepared by	Amanda Bailey
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Latest revision	

Species Status Assessment

Common Name: Fin whale **Date Updated:** 2/16/2024

Scientific Name: *Balaenoptera physalus* **Updated by:**

Class: Mammalia

Family: Balaenopteridae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

The fin, or finback, whale is the second largest of all of the great whales. A sleek and stream-lined rorqual, the fin whale is found in all of the world's oceans. It is similar in appearance to the blue, sei, and Bryde's whale. There are currently two recognized subspecies of fin whales: *Balaenoptera physalus physalus* of the Northern Hemisphere; and *B. p. quoyi* of the Southern Hemisphere. The International Whaling Commission (IWC) has designated different stock boundaries for North Atlantic fin whales. Under the IWC, fin whales of the eastern United States, Nova Scotia, and southeastern Newfoundland comprise a single stock. However, recent genetic work suggests the presence of several subpopulations of fin whales with limited gene flow throughout the North Atlantic (Berube et al. 1998). Such a structure was originally proposed by Kellogg (1929), who also proposed that these subpopulations utilize the same feeding grounds. Genetic work conducted by Berube et al. (1998) provides evidence for this hypothesis.

Surveys by NOAA, Fisheries have frequently encountered fin whales in the waters from Cape Hatteras north to Canada (NMFS 2013). In the New York Bight fin whales are the most abundant baleen whales and can be found year-round (Sadove and Cardinale 1993, BRP 2010). Surveys done by Okeanos Ocean Research Foundation found fin whales concentrated in five feeding grounds within 30 miles of shore during the summer, over the continental shelf during the fall and early winter, and feeding very close to Long Island during late winter to spring (Sadove and Cardinale 1993). Fin whales exhibit a high degree of site fidelity, and the same whales are often seen throughout the year and from year to year (Sadove and Cardinale 1993). It should also be noted that Hain et al 1992 found that, based on neonate stranding data, there is some possibility that during Oct-Jan calving may take place in the mid-Atlantic. However, the exact location of calving has not been confirmed.

Like the other species of great whales, fin whales were heavily exploited by the whaling industry. The IWC declared a moratorium for the North Atlantic population in 1987. Currently, Fin whales remain fairly common in U.S. waters (NMFS 2013). Trend data is not available; however, recent abundance estimates range from 1,925-3,628 (NMFS 2013).

I. Status

a. Current legal protected Status

i. **Federal:** Endangered **Candidate:** ____

ii. **New York:** Endangered

b. Natural Heritage Program

i. **Global:** G3G4

ii. **New York:** S1 **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Vulnerable

-CITES: Appendix I

-Northeast Regional SGCN: Highly imperiled, very high conservation concern

-Canada Species at Risk Act (SARA): Special concern

-Marine Mammal Protection Act (MMPA): Strategic

Status Discussion:

Fin whales have been listed as endangered under the Endangered Species Act (ESA) since it was first passed in 1973. The North Pacific fin whale is listed as threatened under the Canadian Species at Risk Act (SARA), while the North Atlantic population is listed as a species of special concern. Fin whale populations worldwide suffered from heavy whaling pressure throughout the 20th century. They were finally protected from commercial whaling in the North Atlantic in 1987, although Greenland is allowed a small aboriginal subsistence hunt each year. Additionally, Iceland killed over 280 fin whales from 2006 – 2010, before suspending its fin whale hunt for the 2011 and 2012 season. Whether this hunt will be resumed is unknown. Although pre-whaling numbers are unknown, most populations of fin whales are considered relatively stable (NMFS 2010).

Trend data is not available for the western North Atlantic populations; however, recent abundance estimates range from 1,925-3,628 (NMFS 2013). The best abundance estimate for the western North Atlantic is considered to be 3,522, based on the Canadian Trans-North Atlantic Sighting Survey (TNASS) conducted in 2007 (NMFS 2013). Fin whales are the most commonly sighted whales in the New York Bight and have been observed at all times of year; trends and abundance for this area are unknown (Sadove and Cardinale 1993, BRP 2010).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown			Yes
Northeastern US	Yes	Unknown	Unknown			Yes
New York	Yes	Unknown	Unknown		Endangered	Yes
Connecticut	Yes	Unknown	Unknown			No
Massachusetts	Yes	Unknown	Unknown		Endangered	Yes
Rhode Island	Yes	Unknown	Unknown			Yes
New Jersey	Yes	Unknown	Unknown		Endangered	Yes
Pennsylvania	No	Choose an item.	Choose an item.			Choose an item.
Vermont	No	Choose an item.	Choose an item.			Choose an item.
Ontario	No	Choose an item.	Choose an item.			Choose an item.
Quebec	Choose an item.	Choose an item.	Choose an item.			Choose an item.

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

From February 2008 – March 2009 Cornell University partnered with DEC and conducted passive acoustic monitoring for cetaceans in New York coastal waters (BRP 2010).

NOAA, NEFSC, Protected Species Branch conducts regular aerial and ship board surveys to determine the abundance and distribution of protected species in the North East. However, sampling, including scale of sampling, is not specific either to large whales in the New York Bight, nor is sampling year round. There are no current monitoring activities or regular surveys conducted by the State of New York or specific to large whales in the New York Bight. However, DEC, Marine Resources and Natural Heritage Program are currently in the planning stages to establish a regular monitoring program for large whales. The monitoring techniques and protocols have not yet been determined. There is currently funding for three years of monitoring.

Trends Discussion *(insert map of North American/regional distribution and status):*

Trends have not been analyzed for the western North Atlantic population of fin whales. Overall, most studies agree that there was a decline in the population during the period of exploitation, but it is not known how much. Chapman (1976) estimated that the population of fin whales using American waters (both the Atlantic and Pacific) declined by more than 50% between 1958 and 1970. Breiwick (1993) estimated that the "exploitable" population (adults over fifty ft) in the Nova Scotia stock numbered around 1,500 in 1964, and were reduced to about 325 in 1973.

Although pre-whaling numbers are unknown, most populations of fin whales are considered relatively stable currently (NMFS 2010). Recent abundance estimates range from 1,925-3,628 (NMFS 2013). The best abundance estimate for the western North Atlantic is considered to be 3,522, based on the Canadian Trans-North Atlantic Sighting Survey (TNASS) conducted in 2007 (NMFS 2013). Fin whales are the most commonly sighted whales in the New York Bight and have been observed at all times of year; trends and abundances for this area are unknown (Sadove and Cardinale 1993, BRP 2010).

While trends are not available for the North Atlantic, some other areas have conducted trend analyses of fin whale populations. A "substantial increase" in fin whales has been suggested by seabird surveys in the Pribilof Islands, Alaska between 1975 – 1978 and 1987 – 1989 (Baretta and Hunt 1994). An annual increase of 4.8% has been estimated for a population of fin whales in the coastal waters south of the Alaska Peninsula from 1987 – 2003 (Zerbini et al. 2006). A slight increase was also suggested for the California/Oregon/Washington stock of fin whales from 1979 – 1993; however, this increase was not statistically significant (Barlow et al. 1997). While these trends are encouraging, it is important to note that it is not possible to extrapolate the results to other areas. These trend analyses took place over limited areas and dealt with a specific population of fin whales.

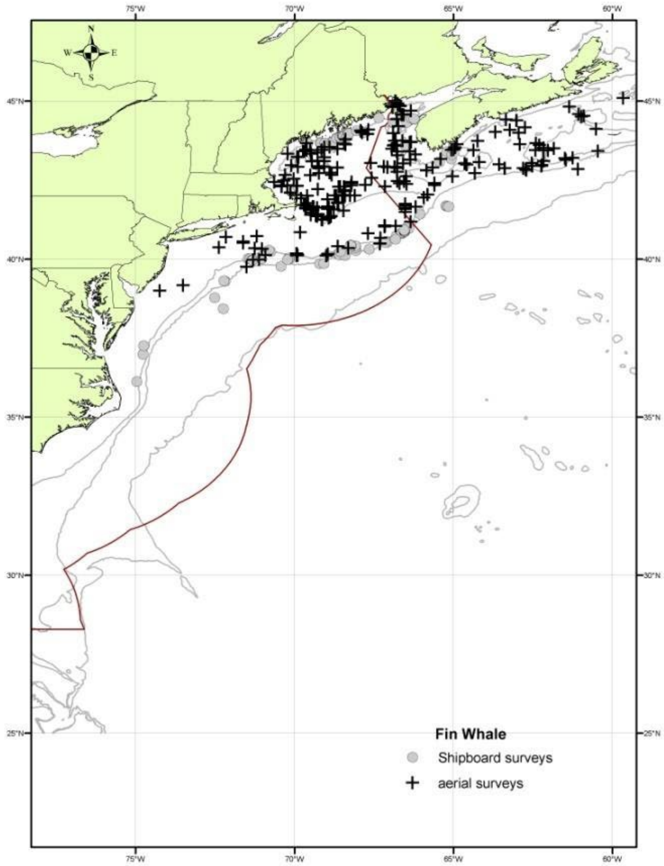

Figure 1. Distribution of fin whale sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010 and 2011. Isobaths are the 100 m, 1000 m, and 4000 m depth contours. Figure and caption from NMFS 2013.

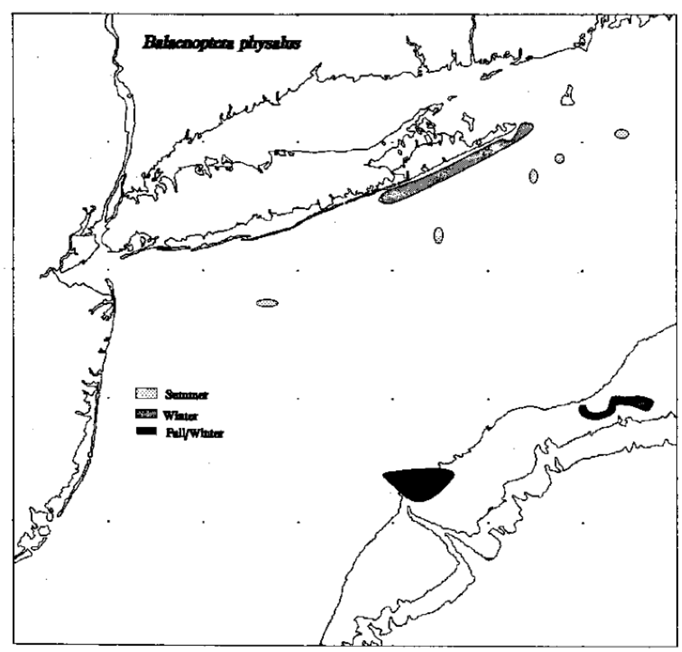

Figure 2. Locations of sightings of fin whales by surveys conducted by the Okeanos Ocean Research Foundation from 15 years of research from the 1970s – early 1990s. Figure from Sadove & Cardinale 1993.

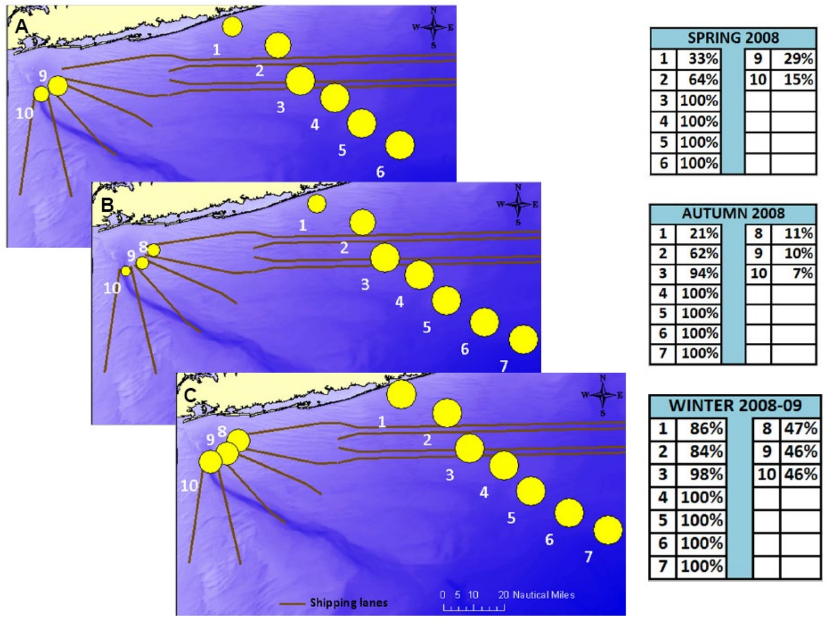

Figure 3. Seasonal presence of fin whales in the New York Bight region. A) fin whale presence during spring (1 March – 14 May 2008), B) presence during autumn (31 August – 2 Dec 2008), and C) presence during winter (5 December 2008 – 3 March 2009). Tables to the right of each plot show the actual percentages of days with fin whale song during each season. Figure and caption from BRP 2010.

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

The fin whale is the most common baleen whale in New York waters (Sadove and Cardinale 1993, BRP 2013). While most species of baleen whales are believed to use state waters primarily as a migratory route, fin whales are found year-round, and use the area as a summer feeding ground (Sadove and Cardinale 1993, BRP 2010). Surveys by Okeanos Foundation in the 1970s – early 1990s found fin whales on most surveys, with feeding groups of over 200 animals not uncommon in the summer (Sadove and Cardinale 1993). They estimated that around 400 animals used the New York Bight region regularly, although there were instances when over 800 fin whales were in the area at one time (Sadove and Cardinale 1993). Passive acoustic monitoring in 2008 and 2009 documented fin whales every single day. No monitoring occurred in the summer period due to lack of funding (BRP 2010). Unfortunately, there is no way to document how many fin whales are present in a recording, only that they are present.

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995			
1995-2004			
2005-2014			
2015-2023			

Table 1: Records of fin whale in New York.

Details of historic and current occurrence:

Unknown for New York. The fin whale is the most abundant large whale in waters of the New York Bight. The only population estimates come from 15 years of surveys conducted by the Okeanos Ocean Research Foundation (from the 1970s – 1993). These estimated the population using New York waters to be around 400 animals (Sadove and Cardinale 1993).

Unknown for New York. Passive acoustic monitoring by Cornell University's Bioacoustic Research Program (2010) documented fin whales on all 269 days of monitoring during the spring, autumn, and winter 2008 – 2009. They were recorded on both the New York harbor devices and also the devices placed offshore of Long Island.

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Core	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Pelagic, marine, deep subtidal

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
Yes	No	Unknown	

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

In the western North Atlantic, fin whales are very widely distributed. They can be found from the Gulf of Mexico north to the edge of the pack ice in the Arctic (NMFS 2010). However, their distribution is concentrated between North of Cape Hatteras and Canada (NMFS 2013.) It is widely believed that fin whale distribution in primarily driven by prey abundance (NMFS 2010). In Iceland, fin whales feed primarily upon krill; whaling data indicates that fin whale catches were correlated with known krill spawning areas (Rørvik et al. 1976). Throughout the eastern United States, fin whales sightings are centered along the 100 m isobath, well spread out between shallower and deeper water. Fin whales are often found along submarine canyons on the shelf break and other areas where upwelling events concentrate prey.

Fifteen years of surveys by Okeanos Foundation in the New York Bight area resulted in good knowledge of the distribution of fin whales in state waters throughout the year. Okeanos Foundation researchers Sadove and Cardinale (1993) reported that fin whales could typically be found within five feeding areas in the New York Bight area from April through August. The feeding areas were located within thirty miles of land, and there were often large groups of 20 or more whales feeding together in these areas (Sadove and Cardinale 1993). From September until December fin whales could usually be found on the continental shelf farther offshore, near the

200m isobath. From January until March fin whales could be found feeding within one mile of the eastern shores of Long Island (Sadove and Cardinale 1993).

The Okeanos Foundation surveys were conducted from the 1970s – early 1990s, and it is currently unknown if fin whales exhibit these same distribution patterns today. The passive acoustic monitoring done by Cornell University in 2008 – 2009 provided some evidence that they may. The program detected fin whales on all 258 days of monitoring (BRP 2010). Ten different recording units were set up: three just outside of New York Harbor, and seven starting 10 miles south of Southampton, Long Island and spreading 70 miles to the edge of the continental shelf (BRP 2010). The four units farthest offshore detected fin whales on all days. If the fin whales were still following the same distribution patterns seen by Okeanos Foundation, then one would expect the fewest near-shore detections from September until December. That pattern was observed in the acoustic monitoring project. Fin whales were detected on ≤ 11% of the days during this period on all of the New York Harbor recording units, and only on 21% of the days on the buoy 10 nautical miles from Southampton (BRP 2010; see figure 3 in Trends Discussion). In contrast, fin whales were detected nearly 50% of the days from December – March on the New York Harbor units, and on ≥ 84% of days on the three units closest to shore in the Southampton string (BRP 2010). This would correspond with the time period where fin whales were observed close to shore off of Long Island by Okeanos Foundation (Sadove and Cardinale 1993).

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Yes	Choose an item.	Choose an item.	Yes	Yes	Choose an item.

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

Fin whales are believed to have a lifespan of 80 – 90 years (NMFS 2010). In populations that were heavily harvested, both male and female fin whales tend to reach sexual maturity between six or seven years of age, compared to populations that are near carrying capacity, which typically reach sexual maturity around ten years of age (Gambell 1985). Females are believed to give birth in the winter after a gestation period of about one year (Haug 1981, Gambell 1985). While most calves are born during December and January, fin whales can give birth year-round (Hain et al. 1992). Calves are nursed for 6 – 7 months. Females typically give birth every two to three years (NMFS 2010).

The fin whale migration is poorly understood. Acoustic monitoring suggests a migratory pattern like that of other large whales: summers spent in high-latitude feeding grounds and winters in low-latitude feeding grounds (Clark 1995). Fin whales were detected moving south into the West Indies (Clark 1995). However, fin whales are known to persist in some areas, such as the New York Bight, year-round. It has been suggested that fin whales may move offshore during the winter (Jonsgård 1966, Clark 1995). In New York, at least some faction of the population actually moves closer to shore during the winter period (Sadove and Cardinale 1993). Whether that faction represents all age groups or perhaps only juvenile or non-reproductive individuals is unknown. Sadove and Cardinale (1993) suggest that fin whales may calve in New York waters, but this has never been confirmed.

Fin whales often exhibit strong site fidelity, returning to the same feeding grounds year after year. This site fidelity appears to be maternally driven, with calves returning to the same feeding grounds they traveled to with their mothers as calves (NMFS 2013). Even though site fidelity is exhibited by many individuals, long-distance travels by many fin whales shows that this is not always the case (NMFS 2010).

Little is known about natural mortality in fin whales. There have been some reports of predation on fin whales by killer whales in the western North Atlantic (Mitchell and Reeves 1988). It is believed that disease probably plays a role in mortality as well, although the extent of which is unknown. There has been a suggestion that crassicaudiosis in the urinary tract of North Atlantic fin whales is the primary cause of natural mortality (Lambertsen 1986). It is believed that natural mortality rates are between 0.04 and 0.06 in fin whales (Aguilar and Lockyer 1987). Vessel collision and entanglement in fishing gear are considered the two major human-caused sources of mortality and serious injury (NMFS 2013).

VI. Threats *(from NY 2015 SWAP or newly described)*

Two of the best known anthropogenic threats to large whale populations include vessel strikes and fishery interactions, specifically entanglement in fishing gear. Both of these threats are believed to be more problematic than observational studies suggest, as many events are most likely not reported, and affected whales may die at sea and not be recovered (Heyning and Lewis 1990). Unfortunately, it is extremely difficult to track a specific event to a geographic location, so it is nearly impossible to know whether an event occurred in New York waters. Jensen and Silber (2004) compiled information on reported ship strikes from 1975 – 2002. They found that fin whales were the most commonly affected species of whale, with 75 records (Jensen and Silber 2004). From 2005 – 2010, there were nine confirmed deaths of fin whales caused by vessel collisions (NMFS 2013). One of these was reported off of Southampton, NY (NMFS 2013). It is unknown if the animal was struck in New York waters, or if the whale was killed outside of state waters and was brought in on the bow of a ship or drifted in.

Entanglement in fishing gear is another major threat to many species of cetaceans throughout the North Atlantic. There have been four reported fin whale entanglement events in the North Atlantic since 2006. Two of these resulted in mortality, while the other two were classified as “serious injures” (NMFS 2013). The fate of both of the live whales is unknown. Whales that survive entanglement but are injured may suffer from reduced survival and fecundity, as has been documented in North Atlantic right whales (Knowlton et al 2012).

Stranding and entanglement response and outreach in New York are currently provided by Riverhead Foundation. They respond to all marine mammal strandings; however, they are not authorized to disentangle large whales. The nearest group authorized by NOAA to perform such entanglements is the Rhode Island Division of Fish and Wildlife. In an attempt to reduce large whale entanglements, Cornell Cooperative Extension has begun a “ghost” gear removal project. Working with the DEC’s Crustacean Unit and commercial fishermen, the project has removed 4,881 abandoned lobster traps from Long Island Sound as of June 21, 2012.

Climate change has led to temperature and current shifts throughout the North Atlantic Ocean. These changes could lead to shifts in distribution of fin whales as occupied habitats may become unsuitable and previously unsuitable habitats may become occupied. Certain studies have shown that the productivity of ocean basins may be altered by shifts in the climate (Quinn and Neibauer 1995, Mackas et al. 1989). Prey species may be affected; copepods already exhibited signs of a shift in distribution as a result of climate change (Hays et al. 2005). Fin whales are generalist feeders, so there is a good chance that they may be more resilient to the affects of climate change than other species who specialize on one prey item (NMFS 2010). The effects of climate change on both fin whales and their prey need to be further researched, but the potential effects are large, which is why the severity was listed as “unknown, potentially high” and the irreversibility was listed as “high/very high.”

The effects of other anthropogenic activities, such as offshore energy development are also largely unknown. Oil spills threaten marine mammals including the fin whale. The other major threat of development and other human activities is noise pollution. Cetaceans, including fin whales, rely heavily on sound to communicate. Increasing levels of anthropogenic noise in the ocean could hamper this ability. Ross (1987, 1993) estimated that the ambient noise level in the oceans rose 10 dB from 1950 – 1975 because of shipping; background noise has been estimated to be increasing by 1.5 dB per decade at the 100 Hz level since propeller-driven ships were invented (National Research Council 2003). The oceans are getting progressively louder, and the waters off of New York are no exception (BRP 2010). Acoustic monitoring in the New York Bight region in 2008 and 2009 found elevated levels of background noise (due in large part to shipping traffic) (BRP 2010).

Several species of large whales have been found to increase the amplitude of their calls in response to large levels of noise, which could lead to increased energy consumption (See Holt et al. 2008, Parks et al. 2011). Above a certain level of noise, some whale species are known to stop vocalizing (See Melcón et al. 2012), and there is also the potential for masking of calls if background noise occurs within the frequencies used by calling whales (BRP 2010). In a large, solitary species, this could lead to difficulty finding other whales, including potential mates.

In some instances, exceptionally loud noises, usually active military sonar, have led to temporary and permanent threshold shifts and even death by acoustic trauma in certain species of cetaceans (NMFS 2010). While this has not been documented in fin whales, there is the potential for such deleterious effects to occur.

Recreational vessel activity, such as whale-watching has been known to affect some species of cetaceans. Fin whales are often targeted by whale-watching activities in New York and other areas, so there is the potential that some of these negative effects may be seen. Fin whales in the Gulf of St. Lawrence were documented as altering their dive behavior when approached by vessels (Michaud and Giard 1998, Edds and Macfarlane 1987). In Maine, fin whales approached by vessels decreased their dive times, surface times, and number of breaths per surfacing (Stone et al. 1992). In the Mediterranean, fin whales altered their behavior when approached by ships, and did not return to their normal behaviors (which included foraging) when vessels left (Jahoda et al. 2003).

It is currently believed that contaminants such as organochlorines, organotins, and heavy metals do not negatively impact fin whales and other baleen as much as other marine mammals (O'Shea and Brownell 1994). Fin whales feed at a low trophic level, and so there is little chance for the bioaccumulation of toxins that occurs in many of the odontocetes (toothed whales). While no significant effects of contaminants has yet been documented, it is possible that exposure has long-term effects such as reduced reproductive success and/or long-term survival. It is also possible that ingestion of solid pollutants (garbage) may occur, which could lead to potential blockage of the stomach. Such ingestion has been documented in several species of cetaceans, including sperm and minke whales, but never in a fin whale (NMFS 2011).

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: _✓___ **No:** _____ **Unknown:** _____

If yes, describe mechanism and whether adequate to protect species/habitat:

The fin whale is protected in the United States by its status as a federally Endangered species. In addition, the fin whale (along with all other marine mammals) receives federal protection under the Marine Mammal Protection Act of 1972 (MMPA). The fin whale is protected internationally from commercial hunting under the International Whaling Commission's (IWC) global moratorium on whaling.

Fin whales are also protected under the Environmental Conservation Law (ECL) of New York. The fin whale is listed as a state endangered species in New York. Section 11 – 0535 protects all state-listed endangered and threatened species and makes it illegal to take, import, transport, possess or sell any listed species or part of a listed species. In addition, Article 17 of the ECL works to limit water pollution, and Article 14 presents the New York Ocean and Great Lakes Ecosystem Conservation Act. This act is responsible for the conservation and restoration of coastal ecosystems "so that they are healthy, productive and resilient and able to deliver the resources people want and need." Both of these help to protect the habitat of the fin whale. Whether they are adequate to protect the habitat is currently unknown.

The North Atlantic Large Whale Take Reduction Plan identified floating groundline used in the trap and pot fisheries as an entanglement threat for large whales. The National Marine Fisheries Service subsequently passed a new law making it mandatory for all pot and trap fisheries to switch over to sinking groundline by 2008. To encourage compliance by fishermen, DEC's Marine Endangered Species and Crustacean Unit partnered with the Cornell Cooperative Extension of Suffolk County and initiated gear buyback programs, which removed 16.9 tons of floating rope from New York's commercial lobster fishery. Further analysis is required before it is known if any real reduction in large whale entanglement has occurred as a result of the switch from floating to sinking groundline. Because species trends can not be determined and threats exist in the form of ship strike, entanglement and other threats, it is unknown if current mechanisms are adequate to protect the species**.**

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

It is still largely unknown how fin whales utilize New York coastal waters. What information we do have comes from surveys done in the 1970s – early 1990s, and it is very possible that fin whales have shifted their distribution and habitat use patterns since then. Long-term surveys and monitoring strategies should be developed.

If it is known where and when fin whales are occurring in New York waters, more effective management and conservation strategies can be employed. Seasonal speed restrictions on vessels in high use areas could be put into effect. In addition, seasonal and/or area closures on certain fisheries where the gear poses the largest threat to large whales may help minimize entanglement in gear.

Near real-time acoustic monitoring of large whales, specifically right whales, is currently being used off of the coast of Massachusetts in an effort to reduce vessel collisions with large whales. When a right whale is detected, an alert goes out to all large shipping vessels in the area, and a speed restriction goes into place. Similar monitoring in New York could help reduce the threat of vessel collisions with large whales in coastal waters. Even if a speed restriction only goes into place for the critically endangered right whale, knowledge that there are large whales in the area could lead to increased awareness and alertness and possibly reduce the potential of a collision.

The fin whale would benefit greatly from further research. Even though it is the most common baleen whale in New York waters, little is known about general life history and demography of this species, and the real effects of the threats in New York waters are unknown. Information about whether or not calving and feeding is taking place in the New York Bight would be very valuable. Further research into the actual effects that threats such as climate change are having on fin whales is warranted. In addition, education on this species and the importance of reporting ship strikes and entanglements is encouraged.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection):
https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Conservation Actions	
Action Category	**Action**
1.	
2.	

Table 2: (need recommended conservation actions for fin whale).

VII. References

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VIII. Version History

Originally prepared by	Amanda Bailey
Date first prepared	February 8, 2013
First revision	May 28, 2013
Latest revision	

Species Status Assessment

Common Name: Harbor porpoise **Date Updated:** 2/16/2024

Scientific Name: *Phocoena phocoena* **Updated by:**

Class: Mammalia

Family: Phocoenidae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

There are four subspecies of harbor porpoise that are found worldwide: *P. phocoena phocoena* in the North Atlantic, *P. p. vomerina* in the eastern North Pacific, an unnamed subspecies in the western North Pacific (Hammond et al. 2008) and *P. p. relicta* in the Black Sea (Hammond et al. 2008). Four populations of harbor porpoise are generally recognized in the western North Atlantic (Gaskin 1984, 1992; Wang et al. 1996; Westgate et al. 1997; Westgate and Tolley 1999; Johnston 1995; Read and Hohn 1995). These four populations include: the Gulf of Maine/Bay of Fundy, Gulf of St. Lawrence, Newfoundland and Greenland. Genetic studies indicate that ~60% of Harbor porpoises found in New York and other mid-Atlantic waters are from the Gulf of Maine stock, ~25% are from the Newfoundland stock, about 12% are from the Gulf of St. Lawrence stock and less than 3% are from the Greenland stock (Rosel et al. 1999; Hiltunen 2006, NMFS 2013).

In the eastern U.S. EEZ, harbor porpoises are found concentrated in the northern Gulf of Maine and Bay of Fundy in the summer. In the spring and fall, harbor porpoises are typically widely dispersed from New Jersey to Maine. In the winter, the greatest concentrations of harbor porpoise can be found from New Jersey to North Carolina, with animals also found from New York to Canada (NMFS 2013). Sadove and Cardinale (1993) found that Harbor porpoises were most commonly in New York waters from December – June in the late 1980s to early 1990s. They found that Harbor porpoise were sighted 12 miles or more offshore during March and April, while they were commonly seen inshore from March – June (Sadove and Cardinale 1993). They also found that sightings in Long Island Sound frequently occurred between January and March; while sightings in Great South Bay and eastern bays typically fell during April and May (Sadove and Cardinale 1993). Current population trends are unknown.

I. Status

a. Current legal protected Status

i. **Federal:** Not listed **Candidate:** No

ii. **New York:** Special Concern; SGCN

b. Natural Heritage Program

i. **Global:** G4G5

ii. **New York:** S4 **Tracked by NYNHP?:** No

Other Ranks:

IUCN Red List: Least Concern

Northeast Regional SGCN: RSGCN

Status Discussion:

In 1991, the Sierra Club Legal Defense Fund submitted a petition to the National Marine Fisheries Service (NMFS) to list the Gulf of Maine/Bay of Fundy (GOM/BOF) stock of harbor porpoise as threatened under the Endangered Species Act (NMFS 2001). In 1993, NMFS published a proposed rule listing the stock as threatened, based on the fact that bycatch in gillnet gear was a significant threat to the population, and that no regulations were currently in place to attempt to reduce bycatch (NMFS 1993). In 1999, NMFS determined that listing the stock under the ESA was not warranted, and the GOM/BOF stock was maintained as a candidate species (NMFS 2001).

As a result of the settlement of Center for Marine Conservation et al. v. Daley et al (Civ. No. 1:98CV02029 EGS), NMFS initiated a status review of the GOM/BOF harbor porpoise stock, which was published in 2001 (NMFS 2001). As a result of this status review, NMFS determined that listing of the stock under the ESA was not warranted, and the stock was removed from the candidate species list (NMFS 2001). NMFS (2013) considers this stock to be a strategic stock, as the number of human-caused mortalities and serious injuries each year exceeds the Potential Biological Removal (as described by the MMPA Sec. 3 16 U.S.C. 1362 as a product of the minimum population size, one-half the maximum productivity rate, and a recovery factor). The western North Atlantic population of harbor porpoise is currently designated a species of special concern under the Committee on the Status of Endangered Wildlife in Canada, and is being reviewed as a possible addition to the Canadian Species at Risk Act under the same title (DFO 2013). Harbor porpoise is also designated a species of special concern by the state of New York.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown			Choose an item.
Northeastern US	Yes	Unknown	Unknown			Yes
New York	Yes	Unknown	Unknown		Special concern	Yes
Connecticut	Yes	Unknown	Unknown		Special concern	Yes
Massachusetts	Yes	Unknown	Unknown		Not listed	Yes
Rhode Island	Yes	Unknown	Unknown		Not listed	No
New Jersey	Yes	Unknown	Unknown		Special concern	Yes
Pennsylvania	No	Choose an item.	Choose an item.			Choose an item.
Vermont	No	Choose an item.	Choose an item.			Choose an item.
Ontario	No	Choose an item.	Choose an item.			Choose an item.
Quebec	Yes	Unknown	Unknown			Choose an item.

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

There are no known current monitoring activities or regular surveys in New York. Most information on harbor porpoises coastwide comes from bycatch data from NOAA observers, stranding data and surveys by NOAA's NEFSC which are conducted only during the summer. In New York stranding data is collected by the Riverhead Foundation. No monitoring activities for harbor porpoises are being planned at this time.

Trends Discussion *(insert map of North American/regional distribution and status):*

The worldwide population of harbor porpoise is estimated to be at least 700,000 individuals (Hammond et al. 2008). The most recent minimum population estimate of just under 62,000 individuals from North Carolina to the lower Bay of Fundy is based on surveys conducted in 2011 (NMFS 2013). It is believed that ~60% of these animals are from the Gulf of Maine stock, ~25% are from the Newfoundland stock, about 12% are from the Gulf of St. Lawrence stock and less than 3% are from the Greenland stock (Rosel et al. 1999; Hiltunen 2006, NMFS 2013).

Trends have not been analyzed for any of the four stocks of harbor porpoise found in the western North Atlantic. Although several abundance estimates for the GOM/BOF stock (which is the stock the majority of harbor porpoise sighted in NY waters are believed to belong to) have been calculated (Table 1), the surveys covered different areas and used different methods, so the estimates are not comparable. Gaskin (1992) mentioned that the GOM/BOF stock of harbor porpoises was in decline during the 1980s and early 1990s due to incidental catches in the gill net fishery, although he noted that this "must be used with the greatest caution." There has not been subsequent information to support this claim, and there is no recent monitoring to determine population trends.

While trend information does not currently exist for the western North Atlantic stocks of harbor porpoises, declines have been reported for several other populations. In the Black Sea, harbor porpoise populations declined as a result of legal and illegal hunting until 1991, and continue to be threatened by bycatch in fishery gear (Reeves and Notarbartolo 2006). It is believed that this threat is large enough to continue the negative population trend (Reeves and Notarbartolo 2006). The Baltic Sea stock of harbor porpoise is currently declining as a result of unsustainable levels of bycatch in gill net gear (IUCN 2008). Osmek et al. (1996) reported declines in harbor porpoise abundance in Puget Sound since the 1940s and anecdotal evidence of potential recent declines throughout inland Washington waters. Harbor porpoise in Southeast Alaska also appear to be undergoing a population decline (Dalheim et al. 2012).

Currently, the human-caused mortality and serious injury for the GOM/BOF stock of harbor porpoise is higher than the Potential Biological Removal but, as mentioned above, it is currently unknown if this is leading to a population decline.

Table 1. Summary of recent abundance estimates for the Gulf of Maine/Bay of Fundy harbor porpoise. Month, year and area covered during each abundance survey and the resulting abundance estimate (N_{best}) and coefficient of variation (CV). Table from NMFS (2013).

Month/Year	Area	N_{best}	CV
Jun-Jul 2004	GOM to lower BOF	51,520	0.65
Aug-06	S. GOM to lower BOF to Gulf of St. Lawrence	89,054	0.47
Jul-Aug 2007[a]	Scotian Shelf and Gulf of St. Lawrence	12,732	0.61

Jul-Aug 2011	North Carolina to lower Bay of Fundy	61,959	0.32

[a] A portion of this survey covered habitat of the Gulf of Maine/Bay of Fundy stock. The estimate also includes animals from the Gulf of St. Lawrence and Newfoundland stocks.

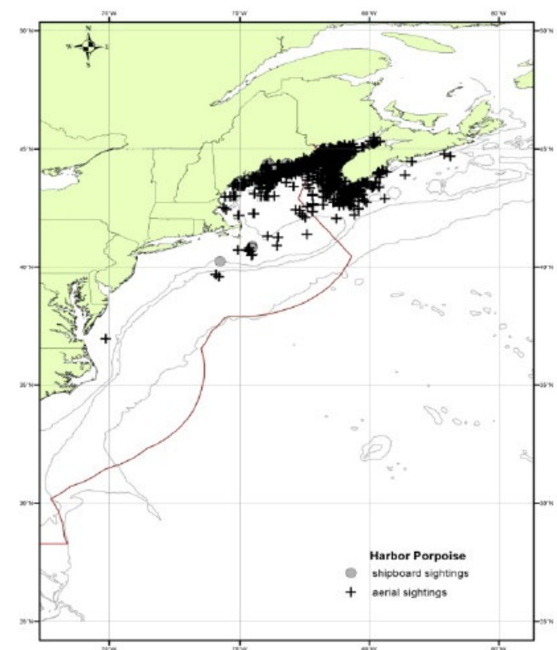


Figure 1. Distribution of harbor porpoises from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010 and 2011. Isobaths are the 100m, 1000m, and 4000m depth contours.

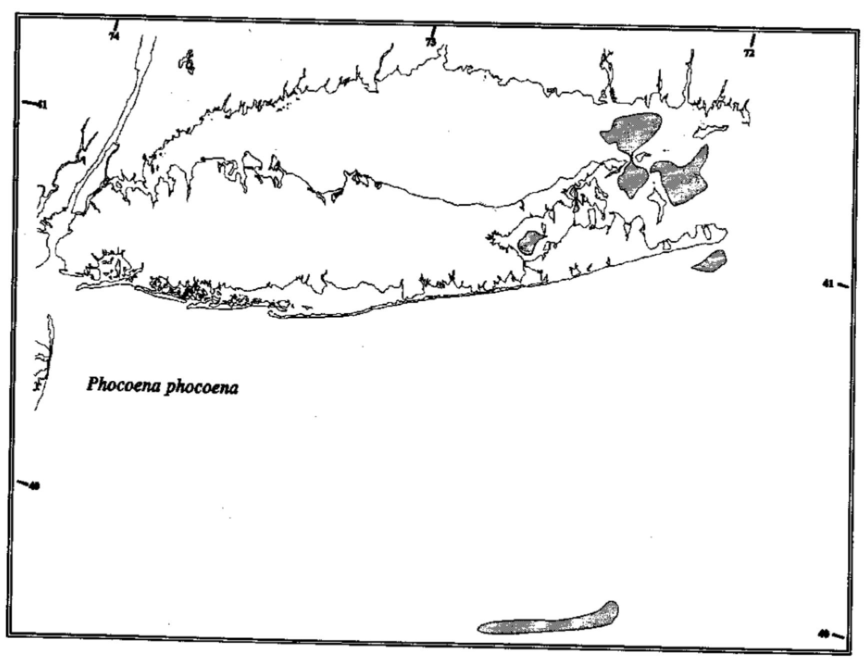


Figure 2. Locations of sightings of harbor porpoises by surveys conducted by the Okeanos Ocean Research Foundation from 15 years of research from the 1970s – early 1990s. From Sadove & Cardinale 1993.

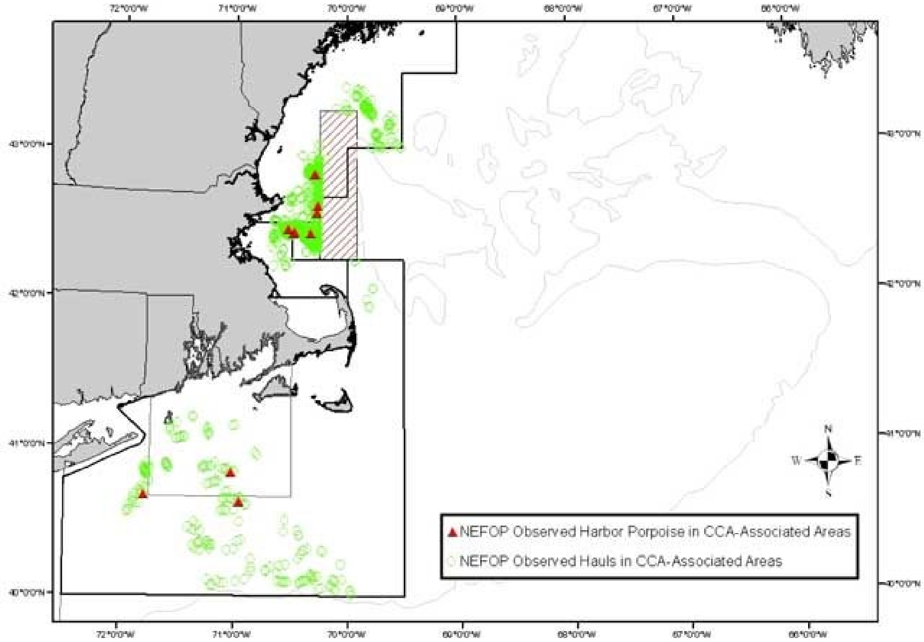


Figure 3. Northeast Fishery Observer Program (NEFOP) observed gillnet hauls and harbor porpoise bycatch locations for the 2011-2012 Harbor Porpoise Take Reduction Plan (HPTRTP) management season. Hatched area represents the year-round Western Gulf of Maine Closure Area. Figure from Orphanides 2012.

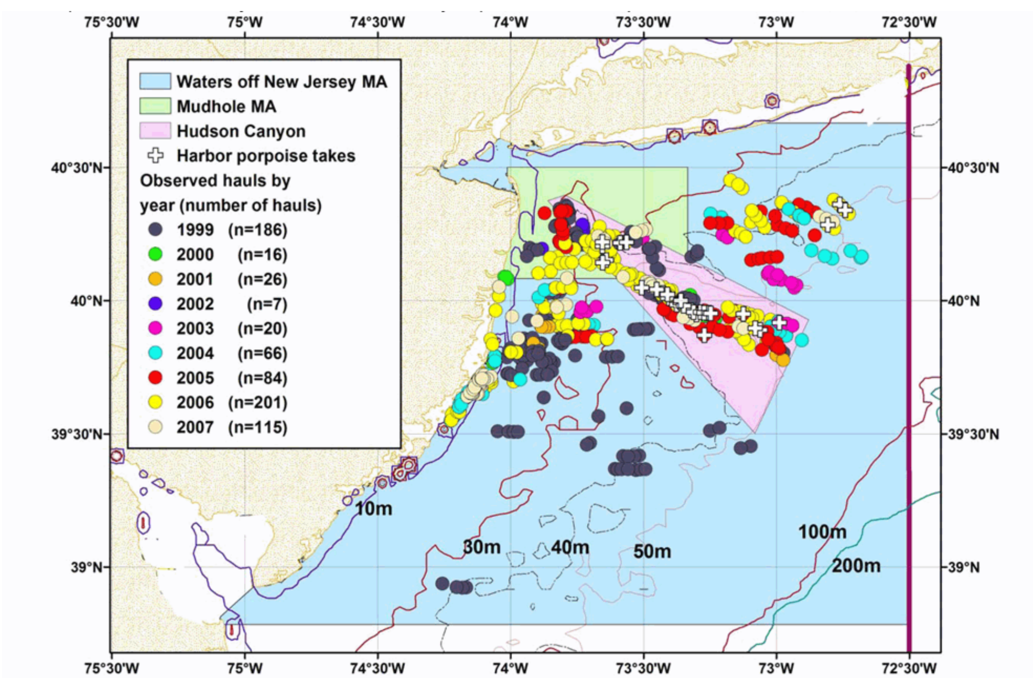


Figure 4. Locations of observed hauls by year (colored circles) and observed hauls with harbor porpoise (Phocoena phoceona) takes (white crosses) in the New Jersey region, which includes the Mudhole management area (MA), waters off New Jersey (excluding the Mudhole) and Hudson Canyon. Data are from January-April, 1999-2007. Depth contours are 10, 30, 40, 50, 100 and 200 m. Figure from Palka et al 2009.

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995			
1995-2004			
2005-2014			
2015-2023			

Table 2: Records of harbor porpoise in New York.

Details of historic and current occurrence:

Unknown for New York. Sadove and Cardinale (1993) report that there is anecdotal evidence from before the 1970s of "large schools of dolphin" that were most likely harbor porpoise based on descriptions, in Long Island Sound and Peconic Bay. They then report that harbor porpoise were not often seen in New York waters until the 1980s and 1990s, when populations appeared to increase (Sadove and Cardinale 1993). There is no quantitative data presented to support this claim.

Harbor porpoise use New York waters primarily during the winter months (Sadove and Cardinale 1993, NMFS 2013). Harbor porpoise tend to be widely dispersed from New Jersey to Maine during the fall and spring, and are found in intermediate densities off of New Jersey and New York in the winter (NMFS 2013). Rough population estimates done by Sadove and Cardinale (1993) based on sightings by Okeanos Foundation estimated around 50 individuals using New York waters during the winter period. Harbor porpoises are found as bycatch by fisheries observers on trips in the Mid-Atlantic on a regular basis.

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Pelagic

b. Marine, Deep Subtidal

c. Estuarine, Deep Subtidal

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
No	Yes	Unknown	

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:
Harbor porpoises can be found in temperate waters throughout the Northern Hemisphere (Gaskin 1984). They are found most frequently in continental shelf waters (Read 1999); only 0.6% of harbor porpoise documented by the CETAP (1982) surveys were found deeper than 2000 m. Harbor porpoise are often found in coastal bays and waters less than 200 m deep (Hammond et al. 2008), although they are capable of diving to depths of at least 220 m (Bjørge and Tolley 2002, Otani *et al.* 1998).

The harbor porpoise is small, and thus is not capable of storing large amounts of energy (Koopman 1998). Therefore, it is believed that their distribution is probably strongly driven by the distribution of their prey. Preferred prey includes herring, capelin and cephalopods (NMFS website). Harbor porpoise can often be found in areas where oceanic processes, such as tidal currents, concentrate prey items (Johnston et al. 2005).

In New York, 15 years of surveys by Okeanos Foundation from the 1970s to 1990s found harbor porpoises in a variety of locations. Harbor porpoise can occasionally be seen in the open ocean (12 or more miles from shore), where group size typically ranges from single animals to groups of over twelve (Sadove and Cardinale 1993). These groups are most frequently seen during the months of April and May (Sadove and Cardinale 1993). In Long Island Sound, groups of up to five animals can be seen most often from January through March (Sadove and Cardinale 1993). Harbor porpoise have also been sighted in Peconic Bay, Block Island Sound, Gardiners Bay and Great South Bay (Sadove and Cardinale 1993).

While the amount of pelagic ecosystem in New York is not changing at any substantial rate, its suitability may be. Changes in prey density may alter an area's suitability for occupancy by harbor porpoises. In addition, pollution (including noise pollution) may make a previously occupied area unsuitable for this species. Passive acoustic monitoring in the New York Harbor region and offshore of Long Island to the continental shelf edge found that there was the potential for acoustic masking of cetacean calls due to high levels of anthropogenic noise (BRP 2010). It is possible that harbor porpoise may avoid these areas when noise levels are elevated. Further research needs to be done to identify whether these factors are altering habitat availability in New York waters.

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Unknown	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

Most knowledge of the life history of harbor porpoise comes from bycatch data. In a sample of 239 gillnet-killed harbor porpoise, the oldest individual was 17 years old (Read and Hohn 1995). The majority of animals were less than 12 years old (Read and Hohn 1995). Females reach sexual maturity between three and four years of age, and appear to have a calf each year (Read and Hohn 1995). Gestation is between 10 – 11 months, with calves being born between May and August (Hammond et al. 2008). Calves are nursed for 6 – 10 months (Hammond et al. 2008).

Satellite tracking of individual harbor porpoise has shown that immature animals have larger home ranges than mature porpoises (Sveegaard et al. 2011). Harbor porpoise caught in herring weirs in Canada were outfitted with satellite tags to analyze movements (Read and Westgate 1997). Of the nine tracked individuals, five moved out of the Bay of Fundy (where they were initially captured) and into the Gulf of Maine; at least one individual who entered the Gulf of Maine moved extensively throughout it (Read and Westgate 1997). Tracking data indicates that harbor porpoise may not follow a temporally coordinated migration (Read and Westgate 1997, NMFS 2013).

In New York, there is much uncertainty about harbor porpoise life history. Most harbor porpoise sightings and strandings in the state occur between the months of December and June (Sadove and Cardinale 1993, Polachek et al 1995). It is unknown if harbor porpoise take up short-term residence when in state waters or if they are just moving through (Sadove and Cardinale 1993). There have been calves sighted on at least two instances in Long Island Sound, but it is currently unknown if calves are born in state waters or not (Sadove and Cardinale 1993).

Disease appears to play a major role in harbor porpoise natural mortality. Stranded individuals in the United Kingdom were most frequently killed by fisheries interactions and parasitic and bacterial pneumonia (Baker and Martin 1992). Baker and Martin (1992) found that parasitoses of various organs was very common, and documented 295 diseases and other lesions in the 41 harbor porpoises examined. Jauniaux et al. (2002) reported that harbor porpoise that stranded in Belgium and France died most often from emaciation, severe parasitosis and pneumonia. They observed lung oedema, enteritis, hepatitis, gastritis and encephalitis in the carcasses examined (Jauniaux et al. 2002). Predation also apparently plays a role in natural mortality. Bottlenose dolphins, grey seals, and white sharks have all been shown to prey upon harbor porpoises (Ross and Wilson 1996; Cotter et al. 2012; Haelters et al. 2012; Arnold 1972). By far the greatest threat to Harbor Porpoises is mortality or serious injury from interaction with commercial fishing gear (NMFS 2013).

VI. Threats *(from NY 2015 SWAP or newly described)*

The largest threat to harbor porpoise throughout their range is accidental entrapment in fishing gear. In New York, harbor porpoise are primarily threatened by the gillnet fishery, although harbor porpoise are also reported taken from trawl fisheries (NMFS 2013). Bycatch annual mortality for the harbor porpoise in the Mid-Atlantic gillnet fishery (and Northeast sink gillnet fishery) from 2005 – 2010 are as follows: 470 (630) in 2005, 511 (514) in 2006, 58 (395) in 2007, 350 (666) in 2008, 201 (591) in 2009, and 257 (387) in 2010. The total annual human-caused mortality estimate for the GOM/BOF stock of harbor porpoise, derived from fishery observer programs from the U.S. and Canada, is 835 harbor porpoise per year (NMFS 2013). The Potential Biological Removal (PBR) calculated by NMFS (2013) is 706. The PBR is defined by the Marine Mammal Protection Act as "the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population." For the GOM/BOF stock, the estimated human-caused mortality exceeds the PBR, which suggests that the current levels of harbor porpoise bycatch may be unsustainable.

Climate change has led to temperature and current shifts throughout the North Atlantic Ocean. These changes could lead to shifts in distribution of harbor porpoise as occupied habitats may become unsuitable and previously unsuitable habitats may become occupied. Certain studies have shown that the productivity of ocean basins may be altered by shifts in the climate (Quinn and Neibauer 1995, Mackas et al. 1989). Prey species may be affected; harbor porpoise in New York are believed to feed primarily on fish such as Atlantic herring and silver hake (Palka et al. 1996). Adult silver hake prey mainly upon small schooling fish, including herring and sand lance, which depend upon copepods and other forms of zooplankton as prey (PCCS 2012). Copepods have already exhibited signs of a shift in distribution as a result of climate change (Hays et al. 2005). Porpoise in West Greenland have already been shown to have switched feeding habits and increase residence time since the 1990s, presumably because of climate change (Heide-Jorgensen et al. 2011). The effects of climate change on both harbor porpoise and their prey can be expected to vary greatly by location, and further research is needed to determine effects in New York.

Harbor porpoise, like other cetaceans, rely on sound for communication and also for echolocation, which they use to find prey. Ross (1987,1993) estimated that the ambient noise level in the oceans rose 10 dB from 1950 – 1975 because of shipping; background noise has been estimated to be increasing by 1.5 dB per decade at the 100 Hz level since propeller-driven ships were invented (National Research Council 2003). The oceans are getting progressively louder, and the waters off of New York are no exception (BRP 2010). Acoustic monitoring in the New York Bight region in 2008 and 2009 found elevated levels of background noise, due in large part to shipping traffic (BRP 2010).

High levels of noise could have several effects on marine mammals. Exceptionally loud noises, usually active military sonar, have led to temporary and permanent threshold shifts and even death by acoustic trauma in certain species of cetaceans (Richardson et al. 1995). More commonly, anthropogenic noise can cause avoidance of an area and alterations in behavior (Richardson et al. 1995). Olesiuk et al. (2002) found that harbor porpoise abundance dropped significantly up to three km from areas where Acoustic Harassment Devices, a marine mammal deterrent often used by the aquaculture industry that emits a loud noise, were used. Harbor porpoises are found most commonly in coastal waters, where there are often high levels of recreational and other vessel activity. Whether increased levels of vessel noise are enough to drive harbor porpoises from an area is currently unknown. There is also the potential that certain levels of anthropogenic noise could mask harbor porpoise calls and echolocation clicks, potentially decreasing foraging success (Richardson et al. 1995).

The threats from alternative energy development, such as offshore wind, are largely due to anthropogenic noise. There is a proposal to install a wind farm off of Long Island, potentially the largest wind project in the county (Long Island- New York City Offshore Wind Project 2013). Construction of an offshore wind farm requires pile-driving to install the foundations. Pile-driving produces large levels of high intensity noise, and there is concern that such activities could have significant effects on marine mammals (Richardson et al. 1995). Studies have shown that harbor porpoise abundance has decreased during the construction of wind farms (Carstensen et al. 2006, Tougaard et al. 2006, Tougaard et al. 2009). Operational wind turbines produce more constant, low levels of noise (Madsen et al. 2006). While these levels are generally not considered loud enough to severely impact marine mammals, Tougaard et al. (2005) found that only a partial recovery of harbor porpoise occurred over two years after construction of a wind farm. In contrast to this, Scheidat et al. (2011) documented an increase in harbor porpoise acoustic activity in the wind farm, perhaps because of increased food availability and/or decreased vessel activity in the wind farm. Further research to determine the effects of wind farms on harbor porpoise from the GOM/BOF stock is needed.

There has been some recent concern about contaminant levels in odontocetes (toothed whales) such as the harbor porpoise. Odontocetes generally feed at a higher trophic level than most baleen whales, so they are more at risk of bioaccumulation of various contaminants. Blubber samples were taken from harbor porpoise from 1989 – 1991, and analysis by Westgate et al. (1997) showed the porpoise from the GOM/BOF stock had the highest contaminant levels of the animals examined (which included individuals from the Gulf of St. Lawrence and Newfoundland). The levels of PCBs were the highest, followed by chlorinated bornanes, DDT, and chlordanes (Westgate et al. 1997). Males had higher levels than females, who offloaded contaminants to offspring through the placenta and lactation (Westgate et al. 1997). The porpoise in this study had lower levels of PCBs and DDT than documented in porpoise from the 1970s, and it is currently unknown if this trend has continued. Many of these contaminants have been linked to deleterious health effects and decreased reproductive success in mammal species, but it is currently largely unknown how elevated levels of contaminants affect harbor porpoise (Westgate et al. 1997).

Threats to NY Populations

Threat Category	Threat
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (entanglement in gill nets)
2. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss of prey from climate change)
3. Energy Production & Mining	Oil & Gas Drilling
4. Energy Production & Mining	Renewable Energy (offshore wind)
5. Human Intrusions & Disturbance	Recreational Activities
6. Pollution	Excess Energy (anthropogenic noise)
7. Pollution	Garbage & Solid Waste
8. Pollution	Industrial & Military Effluents (contaminants)
9. Human Intrusions & Disturbance	War, Civil Unrest & Military Exercises (military sonar)
10. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (transmissible diseases)
11. Invasive & Other Problematic Species & Genes	Problematic Native Species (algal blooms)

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: _✓___ **No:** _____ **Unknown:** _____

If yes, describe mechanism and whether adequate to protect species/habitat:

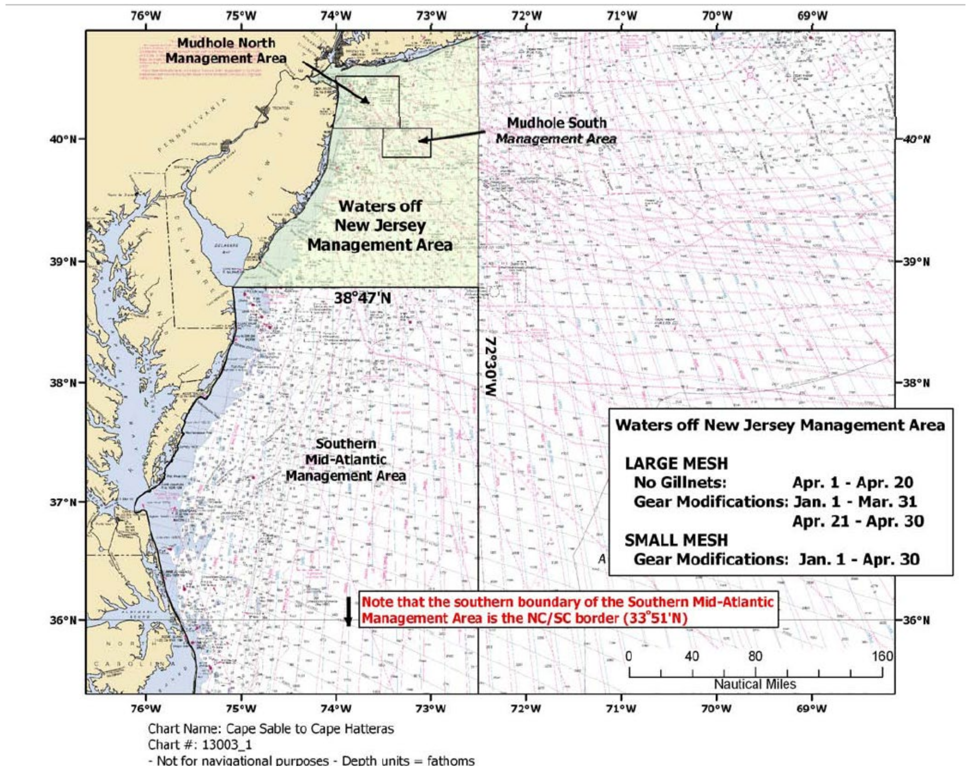
The harbor porpoise, like all other marine mammals, is protected in the United States by the Marine Mammal Protection Act of 1972. Harbor porpoise habitat is also protected under the Environmental Conservation Law (ECL) of New York. Article 17 of the ECL works to limit water pollution, and Article

14 presents the New York Ocean and Great Lakes Ecosystem Conservation Act. This act is responsible for the conservation and restoration of coastal ecosystems “so that they are healthy, productive and resilient and able to deliver the resources people want and need.” Whether these are adequate to protect the habitat of harbor porpoise is currently unknown.

Harbor porpoise in the western North Atlantic are protected by the Harbor Porpoise Take Reduction Plan (HPTRP), which was put into place in an attempt to decrease harbor porpoise mortality in gillnet gear. New York waters are covered by both the New England and Mid-Atlantic HPTRP (see figures below). A small portion of New York waters falls under the ‘Southern New England Management Area’ in the New England HPTRP. When using gillnet gear in the Southern New England Management Area from December 1 through May 31, pingers must be placed on gillnets. Pingers are an acoustical deterrent, and must be placed at each end of the gillnet string and also between nets in a string (HPTRP: New England 2010). Additionally, operators must complete a NOAA Fisheries training program before using pingers (HPTRP: New England 2010). Palka et al. (2008) documented a decrease in bycatch of harbor porpoises of 50 – 70% in nets where pingers were used correctly. However, this research also found that bycatch of porpoises was greater in nets where too few pingers were used than in nets with no pingers (Palka et al. 2008). This study also estimated compliance to pinger requirements, and found that, from 1999 – 2007, only 20 – 40% of observed hauls used the correct amount of pingers (Palka et al. 2008).

In the Mid-Atlantic HPTRP, New York waters fall under the ‘Waters off New Jersey Management Area.’ In this area, large gillnet gear (7 – 18 inches) is prohibited from April 1 – March 20. From January 1 – March 31 and from April 21 – April 30, specific modifications to the gear must be made. Additionally, small gillnet gear must adhere to specific modifications from January 1 – April 30. See the Mid-Atlantic HPTRP document for specific modification requirements. Moriches Bay Inlet, Fire Island Inlet, and Jones Inlet are all exempt from these requirements.

From 1994 – 1998, before the HPTRP was established, NMFS (2013) estimated that the average annual harbor porpoise mortality and serious injury was 1,163 in the Northeast sink gillnet fishery and 358 in the mid-Atlantic gillnet fishery. From 2006 – 2010, after the plan was established, the average annual mortality and serious injury was estimated to be 511 in the Northeast sink gillnet fishery and 275 in the mid-Atlantic gillnet fishery (NMFS 2013).



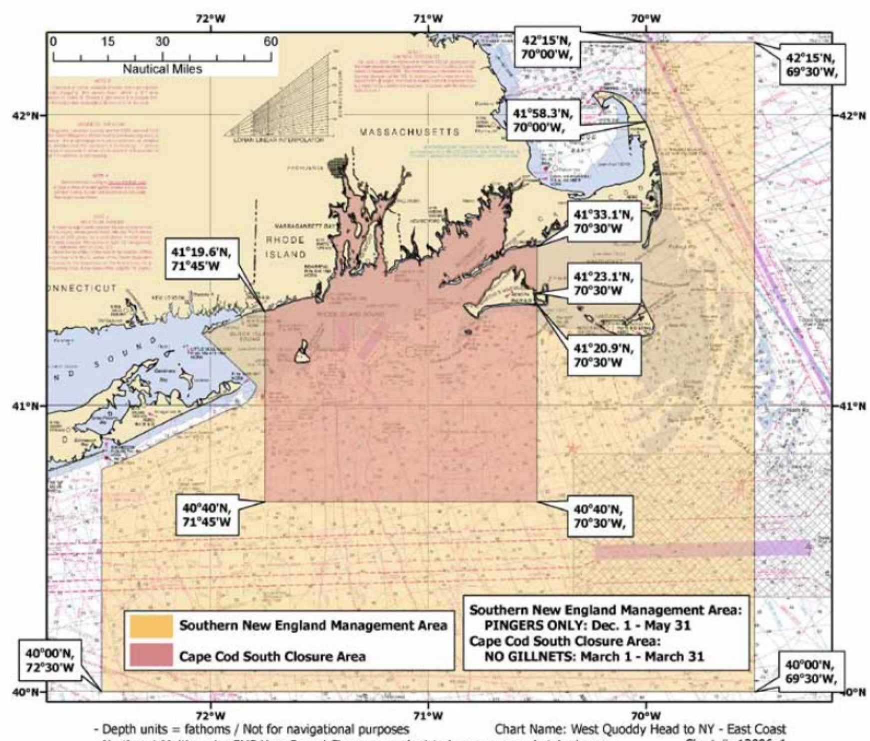


Figure 5. Management areas including New York waters as defined by the HPTRP. Figures taken from the HPTRP: Mid-Atlantic and HPTRP: New England, respectively.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Continued monitoring of bycatch rates is needed to determine if the HPTRPs are having a prolonged, significant effect on harbor porpoise mortality and bringing the annual human-caused mortality and serious injury to a level below 10% of PBR. Additionally, research on improved gear technology and potential deterrent devices is warranted to further reduce harbor porpoise bycatch. The current take reduction measures are now being examined by the Harbor Porpoise Take Reduction Team and changes will be made to the Take Reduction Plan within the next year. It has been found that many of the takes in the Mid-Atlantic are found in trips by fishermen coming from New England who leave gillnets soaking for a period of days to weeks. The take reduction team is trying to address this issue as well as the difficulty of monitoring trips and enforcing any take reduction measures (L. Bonacci, pers. comm.).

Harbor porpoise use of New York waters is poorly understood. What data do exist are from sighting surveys from the 1970s – 1990s, and it is possible that harbor porpoise distribution has shifted since then. Long-term surveys should be developed and implemented to get a better idea of where and when harbor porpoise can be found in state waters. Monitoring might best be done using a combination of techniques such as shipboard and aerial surveys and passive acoustic monitoring. There are pluses and minuses to all of these methods and they may be used best in combination(Kraus et al 1983, Verfuß et al. 2007, NMFS 2013).

If it is known where and when harbor porpoise are occurring in New York waters, more effective management and conservation strategies can be deployed. Seasonal fishery closures and regulations could be improved upon if we know which areas harbor porpoise frequent. Additionally, it would be possible to pick areas of minimal importance to harbor porpoise for projects such as wind farms. Construction activities that may drive animals away could be performed during seasons when harbor porpoise are encountered the least.

Currently, the Riverhead Foundation supplies stranding response for marine mammals, including the harbor porpoise. This group responds to all strandings, provides rehabilitation for live animals, and necropsies on dead animals. The continuation of this work will help to further our understanding of harbor porpoise.

The harbor porpoise would benefit greatly from further research. Little is known about general life history and demography of this species in New York, and the real effects of the threats in state waters are largely unknown. Further research on which stocks the mid-Atlantic harbor porpoises are from would be beneficial to enhance understanding of the species, as would long-term studies on movements of this population to further document habitat use. If harbor porpoise movements are better understood, states could collaborate to provide more effective management and conservation. Further research into the actual effects that threats such as climate change are having on harbor porpoises is warranted.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection):
https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Conservation Actions	
Action Category	**Action**
1.	

2.	

Table 3: (need recommended conservation actions for harbor porpoise).

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Originally prepared by	Amanda Bailey
Date first prepared	March 1, 2013
First revision	July 3, 2013
Latest revision	

Species Status Assessment

Common Name: Humpback whale **Date Updated:** January 2024

Scientific Name: *Megaptera novaeangliae* **Updated by:**

Class: Mammalia

Family: Balaenopteridae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

Humpback whales in the North Atlantic are found in six regions, or feeding grounds. Each area represents a subpopulation, and whales show strong, maternally-driven, site fidelity to these areas (NMFS 2011). Regions include the eastern United States (primarily consisting of the Gulf of Maine), Gulf of St. Lawrence, Newfoundland/Labrador, western Greenland, Iceland, and northern Norway stocks (NMFS 2011). In the past these subpopulations were managed as one stock (Waring et al 1999). More recently, however, the decision was made to manage the Gulf of Maine feeding stock separately (Waring et al. 2000, IWC 2002). Typically, humpback whales migrate from high latitude feeding grounds in the summer to subtropical or tropical calving grounds, such as the Dominican Republic. However, some whales remain on the feeding grounds throughout the year (NMFS website).

While humpback whales often return to the natal feeding grounds, their distribution within those regions is believed to be primarily driven by prey concentrations (NMFS 1991). This pattern has been observed in New York waters, where studies have shown them to be feeding primarily on sand lance (Sadove and Cardinale 1993). Other studies have shown prey shifting between sand lance and herring (and sometimes mackerel) in Humpbacks depending on prey availability (Payne et al. 1986, Fogarty et al. 1991). Humpback diet also includes krill. Generally Surveys by Okeanos Ocean Research Foundation from the 1970s – early 1990s found that humpback whale abundance in the New York Bight region varied widely year to year (Sadove and Cardinale 1993). They often observed humpbacks in shallow waters, including Long Island Sound, Block Island Sound, Gardiner's Bay, Fire Island and New York Harbor (Sadove and Cardinale 1993). Humpbacks of all age classes were seen on surveys from June through September, and juvenile whales were also observed in December and January (Sadove and Cardinale 1993). Humpbacks were acoustically detected in the New York Bight in 2008 and 2009. While, seasonal patterns could not be determined due to survey protocols and analysis time constraints, humpbacks were detected by both the New York Harbor and Long Island arrays (BRP 2010).

NMFS states that humpback populations are increasing in most areas of their distribution (NMFS website). The population trend of the species in New York is unknown. Humpback whales experienced significant declines throughout their range due to -exploitation during the 19th and early 20th centuries. They were frequently hunted by European whalers. Their popularity, in addition to their long pectoral fins, resulted in their scientific name, *Megaptera novaeangliae*, which means "big-winged New Englander" (NMFS 1991). After receiving protection from the International Whaling Commission in 1966, their numbers appear to have been increasing. Stevick (2003) documented an average increase of 3.1% each year for the entire North Atlantic population from 1979 – 1993. Clapham et al. (2003) estimated an average increase of up to 4.0% per year for the Gulf of Maine stock from 1992 – 2000. The variation in the rate of increase is due to uncertainties in calf survival (Clapham et al. 2003).

I. Status

a. Current legal protected Status

i. Federal: Not listed **Candidate:** No

ii. **New York:** Endangered (proposed for removal)

b. Natural Heritage Program

i. **Global:** G4

ii. **New York:** SNA **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Least concern

-CITES: Appendix I

-Northeast Regional SGCN: High conservation concern

-Canada Species at Risk Act (SARA): Not at risk

-Marine Mammal Protection Act (MMPA): N/A

Status Discussion:

Humpback whales were heavily hunted in the 19th and 20th centuries. The species was listed under the Endangered Species Act when it was first enacted in 1973. NOAA, Fisheries states that humpback populations are increasing in most areas of their distribution (NMFS website). NMFS considers the Gulf of Maine population to be a strategic stock, because annual human-related mortality and serious injury exceeds the calculated Potential Biological Removal (PBR) defined by the Marine Mammal Protection Act. However, NOAA, Fisheries considers the Gulf of Maine population to be increasing (Stevic et al. 2003, NMFS 2013). Okeanos Foundation estimated that no more than 50 – 100 individual humpback whales use the New York Bight area at one time, based on the results of their surveys (Sadove and Cardinale 1993). Recent population estimate by NOAA, Fisheries for the western North Atlantic is 11,500 (NMFS 2013). The best abundance estimate of the Gulf of Maine stock is 847 animals; this estimate is derived from line-transect surveys conducted from the southern Gulf of Maine to the upper Bay of Fundy to the Gulf of St. Lawrence in the summer of 2006 (NMFS 2011). The minimum population estimate for this stock is 549 animals (NMFS 2011).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Choose an item.	Choose an item.			Choose an item.
Northeastern US	Yes	Choose an item.	Choose an item.			Choose an item.
New York	Yes	Choose an item.	Choose an item.			Choose an item.
Connecticut	Yes	Choose an item.	Choose an item.			Choose an item.
Massachusetts	Yes	Choose an item.	Choose an item.			Choose an item.
Rhode Island	Yes	Choose an item.	Choose an item.			Choose an item.

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
New Jersey	Yes	Choose an item.	Choose an item.			Choose an item.
Pennsylvania	No	Choose an item.	Choose an item.			Choose an item.
Vermont	No	Choose an item.	Choose an item.			Choose an item.
Ontario	No	Choose an item.	Choose an item.			Choose an item.
Quebec	Yes	Choose an item.	Choose an item.			Choose an item.

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

From February 2008 – March 2009 Cornell University partnered with DEC and conducted passive acoustic monitoring for cetaceans in New York coastal waters (BRP 2010).

NOAA, NEFSC, Protected Species Branch conducts regular aerial and ship board surveys to determine the abundance and distribution of protected species in the North East. However, sampling, including scale of sampling, is not specific either to large whales in the New York Bight, nor is sampling year round. There are no current monitoring activities or regular surveys conducted by the State of New York or specific to large whales in the New York Bight. However, DEC, Marine Resources and Natural Heritage Program are currently in the planning stages to establish a regular monitoring program for large whales. The monitoring techniques and protocols have not yet been determined. There is currently funding for three years of monitoring.

Trends Discussion *(insert map of North American/regional distribution and status):*

Humpback whales were heavily hunted in the 19th and 20th centuries. Over-exploitation brought many populations down to below 10% of their historic levels (Braham 1984, NMFS 1991). The humpback whale is believed to be the fourth most numerically depleted species during the time of whaling, behind the North Atlantic right whale (*Eubalaena glacialis*), the blue whale (*Balaenoptera musculus*), and the bowhead whale (*Balaena mysticetus*) (NMFS 1991). American whalers alone killed between 14,000 and 18,000 humpback whales (NMFS 1991). Humpbacks were heavily exploited because of their slow-moving nature, coastal distribution, and high oil yield.

Humpback whales received protection from hunting in the North Atlantic in 1955, and additional protection when listed under the Endangered Species Act in 1973 and the Marine Mammal Protection Act in 1972 (NMFS 1991). Since this time, humpbacks appear to be making a recovery. Most populations, including the Gulf of Maine stock, appear to be increasing (NMFS 2013). The entire North Atlantic is believed to have been increasing at an average rate of 3.1% from 1979 –

1993 (Stevick et al. 2003). The best estimate for maximum productivity (recent estimate of observed population growth) for the Gulf of Maine stock was calculated to be 6.5% by Barlow and Clapham (NMFS 2013). No trend estimates are available for the feeding subpopulations (NMFS 2013). However, an increasing number were documented in the mid-Atlantic during the early 1990s (Wiley et al. 1995).

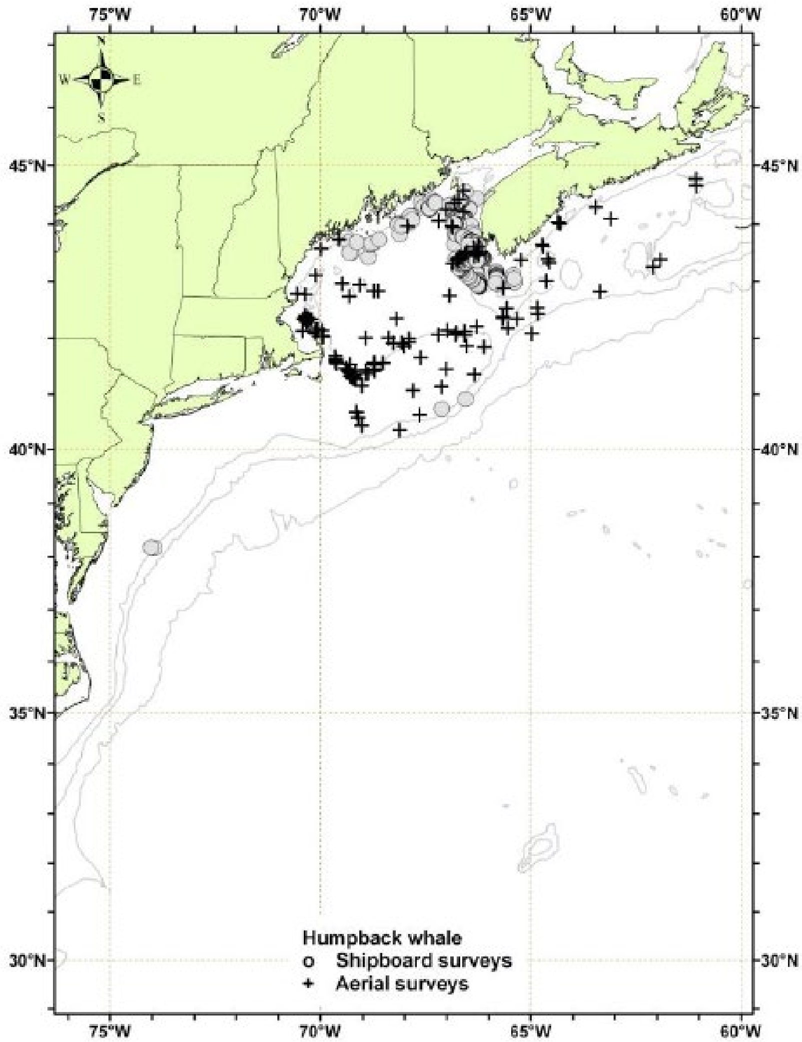

Figure 1. Distribution of humpback whale sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1998, 1999, 2002, 2004, 2006 and 2007. Isobaths are the 100m, 1000m and 4000m depth contours. Figure from NMFS 2011.

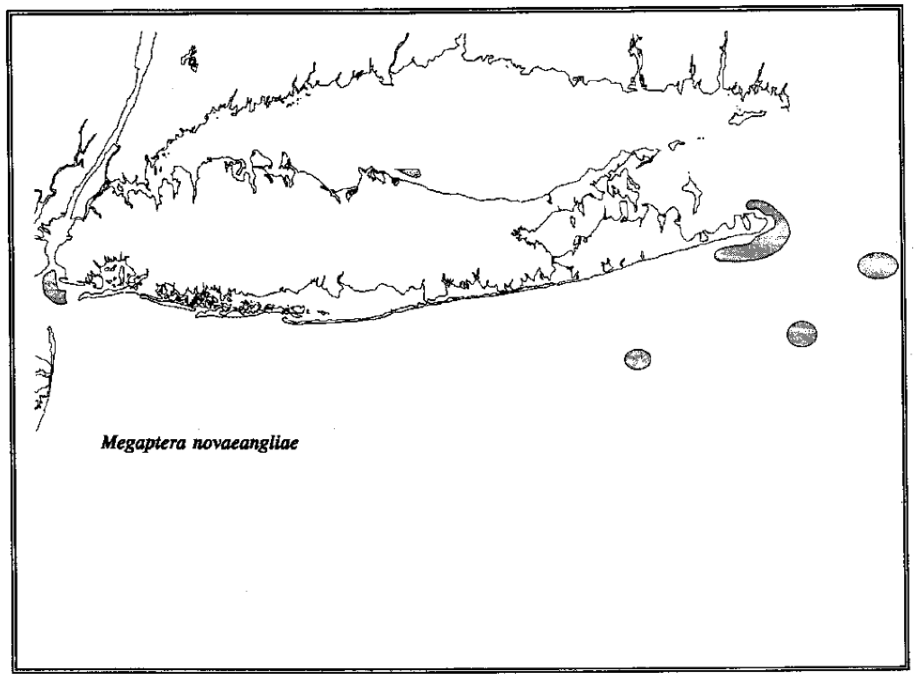

Figure 2. Locations of sightings of humpback whales by surveys conducted by the Okeanos Ocean Research Foundation from 15 years of research from the 1970s – early 1990s. From Sadove & Cardinale 1993.

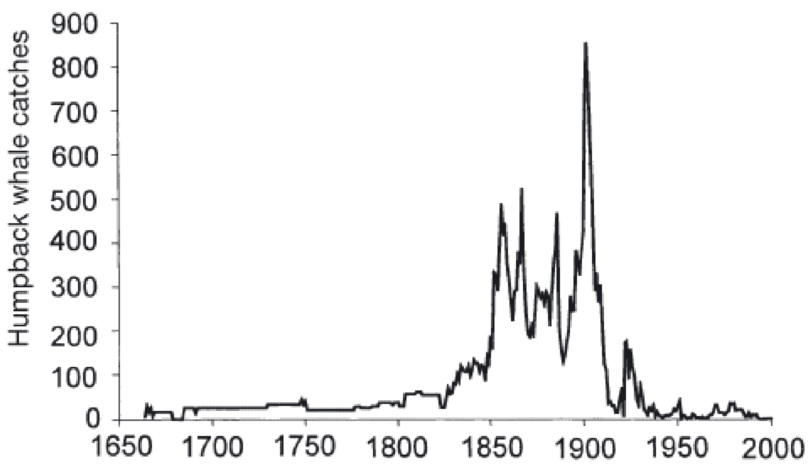

Figure 3. Estimated annual catches of humpback whales from North Atlantic Ocean from 1664 to 2000. Data include individuals caught incidentally through entanglement in fishing nets. Figure from Smith and Reeves 2003, Stevick et al. 2003.

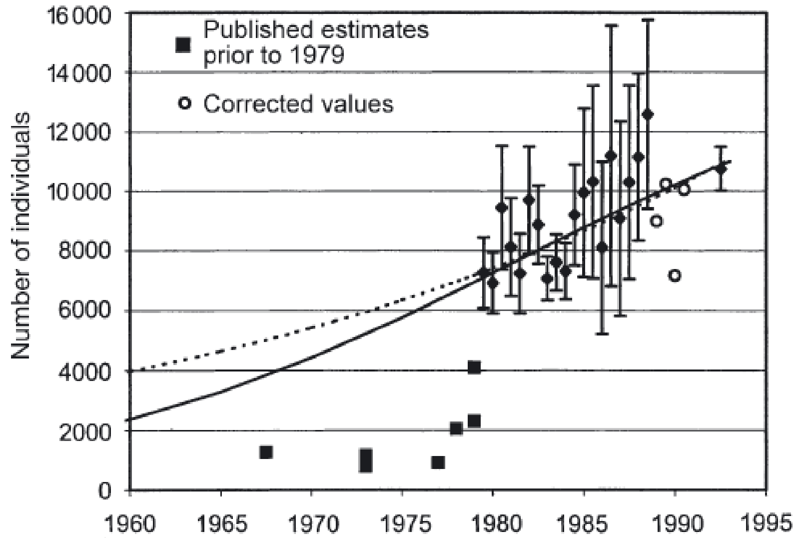

Figure 4. Abundance estimates (±SE) for humpback whales wintering in the West Indies with exponential (---) and logistic (▬) population growth models fitted. Approximate corrected values for estimates showing severe bias. These estimates are not used in fitting the regression. Previously published estimates of abundance all fall well below the expected values from either model. Figure from Stevick et al. 2003.

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

Unfortunately, our knowledge of humpbacks in New York waters comes mostly from dated information from surveys by the Okeanos Foundation in the 1970s – early 1990s. These data indicate that the distribution and abundance of humpback whales in New York waters is highly variable. In some years, they are a rare visitor to the New York Bight, while in other years they are fairly common (Sadove and Cardinale 1993). They were observed most frequently from June – September and again in December and January (Sadove and Cardinale 1993). These surveys indicated that there were never more than 50 – 100 individuals using the New York Bight region at one time. However, an increasing number of humpbacks were documented in the mid-Atlantic during the early 1990s (Wiley et al. 1995).

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995			
1995-2004			
2005-2014			
2015-2023			

Table 1: Records of humpback whale in New York.

Details of historic and current occurrence:

Unknown for New York. Surveys done by Okeanos Foundation documented humpbacks regularly in New York waters in surveys from the 1970s – early 1990s (Sadove and Cardinale 1993). They noted that the actual abundance varied widely from year to year, although humpbacks were most commonly seen during the summer months and between December and January (Sadove and

Cardinale 1993). While no population estimates could be developed, the Okeanos Foundation stated that probably no more than 50 – 100 humpbacks used the New York Bight at one time during this time period (Sadove and Cardinale 1993).

Unknown for New York. During recent deployment of passive acoustic recorders in the New York Harbor area and offshore of Long Island by Cornell University Humpbacks were documented opportunistically on 70 of 258 recording days. The majority (98.6%) were in the spring and winter (BRP 2010). The recording buoys were only deployed during spring 2008, autumn 2008, and winter 2008 – 2009 and data for Humpbacks was only collected opportunistically (BRP 2010).

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
Choose an item.	Choose an item.	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Pelagic

b. Marine, Deep Subtidal

c. Estuarine, Deep Subtidal

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
No	Yes	Choose an item.	

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

Humpback whales in the North Atlantic range from high-latitude feeding grounds to low-latitude breeding grounds. In the western North Atlantic, humpbacks can be found in four different feeding areas: Gulf of Maine/eastern U.S., Gulf of St. Lawrence, Newfoundland/Labrador and western Greenland (NMFS 2011). Humpbacks exhibit feeding site fidelity, and calves usually return to the feeding grounds they initially traveled to with their mothers (NMFS 1991). It is believed that a majority of whales from these feeding grounds migrate to the West Indies to mate and calve. The majority of humpbacks are found in the waters off of the Dominican Republic, most notably Silver Bank, Navidad Bank, and Samana Bay (Balcomb and Nichols 1982, Whitehead and Moore 1982, Mattila et al. 1989, Mattila et al. 1994, NMFS 2011). Not all humpbacks migrate to the West Indies each winter. An increasing number have been documented in the Mid-Atlantic states (Wiley et al. 1995). Surveys by Okeanos Foundation in New York waters found juvenile humpbacks using the New York Bight region during December and January, indicating that this area could be an important wintering area for juvenile whales (Sadove and Cardinale 1993). Studies show that that the area of the mid-Atlantic is an additional winter feeding ground (Barco et al. 2002).

Within the feeding area, humpback whales are often associated with areas of upwelling, which typically occur in areas where there are changes in underwater topography, such as underwater banks, ledges and seamounts (CETAP 1982, Payne et al. 1986, Robbins 2007). There is some evidence of demographic differences throughout the Gulf of Maine feeding ground (Robbins 2007). Robbins (2007) found that females were more likely to use southern areas, while males were more frequently encountered in northern areas, such as the Bay of Fundy. Unfortunately, most research covers only the Gulf of Maine north to the Bay of Fundy, and does not include the New York Bight (Robbins 2007). The study did suggest that adult females appeared to primarily use areas where sand lance was the primary prey (Robbins 2007). In the Gulf of Maine these were nearshore areas where sandy shoals were found, including Stellwagen Bank(Payne et al. 19686). However, it was found that Humpbacks sometimes switched to herring (and sometimes mackerel) when prey availability shifted (Payne et al. 1986, Fogarty et al. 1991). When this occurs Humpbacks have been found further offshore in Cultivator Shoal, Jeffrey's Ledge and the Northeast peak of Georges where they also sometimes feed on krill (Wienrich et al 1997).

Sadove and Cardinale (1993) found humpback whales in New York feeding primarily on sand lance; these surveys observed humpbacks of all age classes, including mother and calf pairs. In this study humpback whales were found to use relatively shallow, near-shore areas (Sadove and Cardinale 1993). They have been observed for a week or more in Long Island Sound, Block Island Sound, Gardiner's Bay, and inlets along the south shore of Long Island (Sadove and Cardinale 1993). These inlets include Shinnecock, Fire Island, and New York Harbor. Sadove and Cardinale (1993) hypothesized that the year-to-year distribution of humpbacks in New York waters is driven primarily by the distribution of prey. However, since regular monitoring has not taken place in the New York Bight, it is possible that prey shifting to herring, mackerel and krill may occur as it does in the Gulf of Maine when prey availability changes. This in turn, could lead to use of areas further offshore.

Changes in prey density may alter an area's suitability for occupancy by humpback whales. In addition, pollution (including noise pollution) may make a previously occupied area unsuitable for this species. Passive acoustic monitoring in the New York Harbor region and offshore of Long Island to the continental shelf edge found that there was the potential for acoustic masking of humpback calls due to high levels of anthropogenic noise. It is possible that humpback whales may avoid these areas when noise levels are elevated. Further research is needed to identify whether or not these factors are altering habitat availability in New York waters.

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Choose an item.	Yes	Choose an item.	Yes	Yes	Choose an item.

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

The expected life span of humpbacks is at least 40 – 50 years, and probably longer (WCNE 2013). Both male and female humpbacks reach sexual maturity around 4 – 6 years of age (NMFS 1991). While on breeding grounds, groups of mature males compete to breed with females (NMFS 1991). This may includes aggressive behavior such as males ramming and hitting one another with their pectoral flippers and flukes and surfacing on top of each other. Injuries may be minor or severe, and a few deaths have been reported (NMFS 1991). Males sing their distinctive song on breeding grounds; it is believed that this may be a way to attract and/or advertise to females. However, the function has not been definitively determined (NMFS website). Recordings of humpback whale song on the feeding grounds throughout the year are believed to correspond with hormonal activity and potentially demonstrate that not all humpbacks migrate to low-latitude breeding grounds (Vu et al. 2012).

Females typically give birth every two to three years, although annual calving has been observed (NMFS 1991). Calves are born on the winter breeding grounds after an 11 – 12 month gestation period (NMFS 1991). Females with calves are usually the last to arrive on the summer feeding grounds (Dawbin 1997). Calves are weaned in December or January.

Humpback whales give birth in low-latitude breeding grounds (in the West Indies for North Atlantic humpbacks). Humpback whales from all different feeding grounds in the North Atlantic in the West Indies, although those who summer in the waters off of Iceland and Norway are less likely to winter in the West Indies (Stevick et al. 2003b). Stevick et al. (2003b) found that whales from the western North Atlantic arrived on the breeding grounds significantly earlier than those from eastern feeding grounds. This could potentially affect the amount of genetic mixing between these groups (Stevick et al. 2003b).

There are many indications that demographic segregation occurs during migration. In the Southern and North Pacific Oceans, late lactating females and calves are generally the first to arrive on the breeding grounds, followed by juveniles, males, non-reproductive ('resting') females, and pregnant females (Dawbin 1997, Craig et al. 2003). However, in the North Atlantic, Stevick et al. (2003b) found that males arrived in the breeding grounds significantly earlier than all females. Whether these patterns are a result of differing selective pressures in the North Atlantic or differing geographic patterns of migration timing in the North Atlantic is currently unknown.

Most humpback whales exhibit maternally-directed site fidelity, returning to the same feeding ground year after year. Seasonal migrations from feeding grounds to breeding grounds can be as long as 8,000 km (Stevick et al. 1999, Stone et al. 1990, Rasmussen et al. 2007, Robbins et al. 2008). There have been reports of longitudinal migrations between different breeding grounds separated by as much as 6,000 km (Darling and Cerchio 1993, Salden et al. 1999). Occasionally, humpback whales even migrate between oceans (Pomilla and Rosenbaum 2005). These movements are almost always made by males, who are willing to travel farther for potential mating opportunities (Darling and Cerchio 1993, Salden et al. 1999, Pomilla and Rosenbaum 2005). Females usually exhibit strict breeding site fidelity (Stevick et al. 2010). However, the longest mammalian migration every documented was by a female humpback whale. This individual was originally photographed off of Brazil, and was resighted two years later off the coast of Madagascar, a distance of at least 9,800 km (Stevick et al. 2010). It is currently unknown how often such large-scale migrations occur, but the phenomenon is believed to be more common in the Southern Hemisphere, where continents do not restrict movements to as large of an extent as in the Northern Hemisphere (Stevick et al. 2010).

Little is known about natural mortality in humpback whales. Parasites are believed to play some role including the nematode *Crassicauda boopis*, which is believed to cause morbidity and mortality in other species of baleen whales (Lambertson 1985, 1986; Lambertsen et al. 1986). Killer whales are also believed to occasionally prey upon humpback whales. In the western North Atlantic, about 14% of individually identified humpback whales exhibit rake marks on their flukes from killer whales (Katona et al. 1988). There have been at least two documented attacks on humpback whales by killer whales on the Grand Banks in Newfoundland (Whitehead 1987). Shark predation may also play a role in natural mortality of young and weak individuals (NMFS 1991).

In the winter of 1987 – 1988, at least 14 humpback whales died in Cape Cod Bay from paralytic shellfish poisoning (PSP) (Geraci et al. 1990). Another animal was reported dead in New York waters in 1988, also of PSP. It is believed that the actual number of mortalities is higher than this, as whales most likely died at sea and were never observed (NMFS 2011). Humpback whales also occasionally become trapped in pack ice. In Newfoundland, there was one ice entrapment event when about 25 humpbacks became entrapped in ice, and some mortality occurred (NMFS 1991).

There have been several Unusual Mortality Events (UMEs) declared for humpback whales since 2000. In 2003, a UME was declared when about 12-15 humpbacks died on Georges Bank (NMFS 2011). While the cause has not been officially declared, some of the whales tested positive for low levels of domoic acid (NMFS 2011). Seven humpbacks were part of a UME in New England in 2005, and 21 dead humpbacks were found between July and December in 2006. The causes of the mortalities are currently unknown (NMFS 2011).

Vessel collision and entanglement in fishing gear are considered the two major human-caused sources of mortality and serious injury (NMFS 2013).

VI. Threats *(from NY 2015 SWAP or newly described)*

Two of the best known anthropogenic threats to large whale populations include vessel strikes and fishery interactions, specifically entanglement in fishing gear. 60% of humpback whale carcasses examined by Wiley et al. (1995) showed evidence of entanglement or vessel collision being the primary cause of death. The potential biological removal (PBR) for the entire Gulf of Maine stock is currently estimated at 1.1 whales (NMFS 2011). From 2005 – 2009, the minimum annual rate of mortality and serious injury from entanglement and vessel collisions was about 5.2 humpbacks (3.8 from entanglements, and 1.4 from vessel collisions; NMFS 2011). Both of these threats are believed to be more of a problem than observational studies suggest, as many events are most likely not reported, and affected whales may die at sea and not be recovered (Heyning and Lewis 1990). Unfortunately, it is extremely difficult to track a specific event to a geographic location, so it is nearly impossible to know whether an event occurred in New York waters; however, the humpback whales observed in New York most likely come from the Gulf of Maine stock (NMFS 2011), so it is beneficial to look at total PBR and anthropogenic injuries and mortalities for this stock.

Jensen and Silber (2004) compiled information on reported ship strikes from 1975 – 2002. They found that humpback whales were the second most commonly affected species of whale, with 44 records. From 2005 – 2009, there were seven confirmed deaths of humpback whales caused by vessel collisions (NMFS 2011). Because of their coastal distribution and slow-moving tendencies, it is believed that humpback whales are at significant risk of being struck by vessels. Humpback whales are one of the few species that have been observed with some regularity in the area around New York Harbor, which has high levels of vessel traffic (Sadove and Cardinale 1993).

Entanglement in fishing gear is another major threat to many species of cetaceans throughout the North Atlantic. From 2005 – 2009, at least six humpbacks have been killed and thirteen seriously injured by entanglements in fishing gear (NMFS 2011). The fate of many of the injured whales is unknown.

Provincetown Center for Coastal Studies (PCCS) and other organizations have been studying entanglement in Gulf of Maine humpbacks since 1997. Because the caudal peduncle is often involved in entanglements and is visible when humpback whales dive, photographs of scarring on this region have provided critical information on entanglement rates in the Gulf of Maine (Robbins and Mattila 2001, Robbins 2009, Robbins 2011). Between 2003 and 2006, about 65% of new individuals entering the entanglement study had evidence of a prior entanglement on their caudal peduncle (Robbins 2009). There were an estimated 203 entanglement events during this time period; only nine of them were well-documented. This led to a reporting rate of only 5.7%.

31% of humpback whales photographed in 1997 and again in 1999 showed evidence of new entanglement scarring acquired during the study period (Robbins and Mattila 2001). In 2009, 12.5% ± 5.9% of humpbacks photographed in 2008 and 2009 showed scarring that was not visible in 2008, implying that the entanglements had occurred within the year (Robbins 2011). From the work done in the Gulf of Maine, Robbins (2009) estimated an annual mortality rate of about 3% due to entanglement for Gulf of Maine humpbacks. Juveniles are more prone to entanglements than mature animals (Robbins and Mattila 2001, Robbins 2011).

Stranding and entanglement response and outreach in New York are currently provided by Riverhead Foundation. They respond to all marine mammal strandings; however, they are not authorized to disentangle large whales. The nearest group authorized by NOAA to perform such entanglements is the Rhode Island Division of Fish and Wildlife. In an attempt to reduce large whale entanglements, Cornell Cooperative Extension has begun a “ghost” gear removal project. Working with the DEC’s Crustacean Unit and commercial fishermen, the project has removed 4,881 abandoned lobster traps from Long Island Sound as of June 21, 2012.

Climate change has led to temperature and current shifts throughout the North Atlantic Ocean. These changes could lead to shifts in distribution of humpback whales as occupied habitats may become unsuitable and previously unsuitable habitats may become occupied (NMFS 1991, Sadove and Cardinale 1993). The effects of other anthropogenic activities, such as offshore energy development are also largely unknown. Oil spills threaten marine mammals including the humpback whale. The other major threat of development and other human activities is noise pollution (Holt et al. 2008, Parks et al. 2010). Above a certain level of noise, some whale species are known to stop vocalizing (See Melcón 2012), and there is also the potential for masking of calls if background noise occurs within the frequencies used by calling whales (BRP 2010). In a large, solitary species, this could lead to difficulty finding other whales, including potential mates.

Recreational vessel activity, such as whale-watching, has been known to affect some species of cetaceans. Humpback whales are the main target of whale-watching activities in New York and other areas, so there is the potential that some of these negative effects may be seen. Scheidat et al. (2004) found that humpback whales in Ecuador increased dive time in the presence of whale-watching vessels, and increased their path directness when vessels left. In Alaska, Baker and Herman (1989) found that humpback whales decreased their blow intervals and increased dive time when approached by vessels. Work done in the southern Gulf of Maine has so far found no negative long-term effects such as decreased calving rate and calf survival as a result of whale-watching activities (Weinrich and Corbelli 2009).

It is currently believed that contaminants such as organochlorines, organotins, and heavy metals do not negatively impact humpback whales and other baleen as much as other marine mammals (O’Shea and Brownell 1994). Humpback whales feed at a low trophic level, and so there is little chance for the bioaccumulation of toxins that occurs in many of the odontocetes (toothed whales). While no significant effects of contaminants has yet been documented, it is possible that exposure has long-term effects such as reduced reproductive success and/or long-term survival. It is also possible that ingestion of solid pollutants (garbage) may occur, which could lead to potential blockage of the stomach.

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: _✓_ **No:** _____ **Unknown:** _____

If yes, describe mechanism and whether adequate to protect species/habitat:

The humpback whale is protected in the United States by its status as a federally Endangered species. In addition, the humpback whale (along with all other marine mammals) receives federal protection under the Marine Mammal Protection Act of 1972 (MMPA). The humpback whale is protected internationally from commercial hunting under the International Whaling Commission’s (IWC) global moratorium on whaling. The moratorium was introduced in 1966, and is voted on by member countries (including the United States) at the IWC’s annual meeting.

Humpback whales are also protected under the Environmental Conservation Law (ECL) of New York. The humpback whale is listed as a state endangered species in New York. Section 11 – 0535 protects all state-listed endangered and threatened species and makes it illegal to take, import, transport, possess or sell any listed species or part of a listed species. In addition, Article 17 of the ECL works to limit water pollution, and Article 14 presents the New York Ocean and Great Lakes Ecosystem Conservation Act. Both of these help to protect the habitat of the humpback whale. Whether they are adequate to protect the habitat is currently unknown. Unfortunately, we do not know much about humpback whale distribution in New York, so it is impossible to assess whether the habitat protection afforded by these acts are effective.

The North Atlantic Large Whale Take Reduction Plan identified floating groundline used in the trap and pot fisheries as an entanglement threat for large whales. It is often difficult to determine which fishery entangling gear is from; however, 53% of identified entanglements on North Atlantic right whales and humpback whales examined by Johnson et al. (2005) involved trap and pot gear. The National Marine Fisheries Service subsequently passed a new law making it mandatory for all pot and trap fisheries to switch over to sinking groundline by 2008. To encourage compliance by fishermen, DEC's Marine Endangered Species and Crustacean Unit partnered with the Cornell Cooperative Extension of Suffolk County and initiated gear buyback programs, which removed 16.9 tons of floating rope from New York's commercial lobster fishery. Further analysis is required before it is known if any real reduction in large whale entanglement has occurred as a result of the switch from floating to sinking groundline.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

It is still largely unknown how humpback whales utilize New York coastal waters. What information we do have comes from surveys done in the 1970s – early 1990s, and it is possible that humpback whales may have shifted their distribution and habitat use patterns since then. Long-term surveys and monitoring strategies should be developed by the state.

If it is known where and when humpback whales are occurring in New York waters, more effective management and conservation strategies can be deployed. Seasonal speed restrictions on vessels in high use areas could be put into effect. In addition, seasonal and/or area closures on certain fisheries where the gear poses the largest threat to large whales (ie. pot and/or gillnet fisheries) may help minimize entanglement in gear.

Near real-time acoustic monitoring of large whales, specifically right whales, is currently being used off of the coast of Massachusetts in an effort to reduce vessel collisions with large whales. When a right whale is detected, an alert goes out to all large shipping vessels in the area, and a speed restriction goes into place. Similar monitoring in New York could help reduce the threat of vessel collisions with large whales in coastal waters.

The humpback whale would benefit greatly from further research. Little is known about its population, behavior and threats while in the New York Bight. Further research into the actual effects that threats such as climate change are having on humpback whales is warranted. In addition, education on this species and the importance of reporting ship strikes and entanglements is encouraged.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection):
https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Conservation Actions

Action Category	Action
1.	
2.	

Table 2: (need recommended conservation actions for humpback whale).

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VIII. Version History

Originally prepared by	Amanda Bailey
Date first prepared	February 20, 2013
First revision	May 31, 2013
Latest revision	

Species Status Assessment

Common Name: North Atlantic right whale **Date Updated:** January 2024

Scientific Name: *Eubalaena glacialis* **Updated by:**

Class: Mammalia

Family: Balaenidae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

The North Atlantic right whale, which was first listed as endangered under the Endangered Species Act in 1973, is considered to be critically endangered (Clapham et al 1999, NMFS 2013). The western population of North Atlantic right whales (NARWs or simply right whales) has seen a recent slight increase. The most recent stock assessment gives a minimum population size of 444 animals with a growth rate of 2.6% per year (NMFS 2013). It is believed that the actual number of right whales is about 500 animals (Pettis 2011, L. Crowe, pers. comm.).

At this time, the species includes whales in the North Pacific and the North Atlantic oceans (NMFS 2005). However, recent genetic evidence showed that there were at least three separate lineages of right whales, and there are now three separate species that are recognized. These three species include: the North Atlantic right whale (*Eubalaena glacialis*), which ranges in the North Atlantic Ocean; the North Pacific right whale (*Eubalaena japonica*), which ranges in the North Pacific Ocean; and the southern right whale (*Eubalaena australis*), which ranges throughout the Southern Hemisphere (NMFS 2005).

The distribution of right whales is partially determined by the presence of its prey, which consists of copepods and krill (Baumgartner et al 2003). Most of the population migrates in the winter to calving grounds from in low latitudes from high latitude feeding grounds in the spring and summer. A portion of the population does not migrate to the calving grounds during the winter and it is unknown where they occur during that season (NMFS website, NMFS 2013).

Mother/calf pairs and individual animals are spotted in New York waters each year, primarily from March – June (Sadove and Cardinale 1993). However, right whales have been found year round in the nearby waters of New Jersey (Whitt et al 2013). They were also present during all three seasons of the 2008-09 passive acoustics study conducted in New York (BRP 2010). Right whales are usually found in shallow, coastal waters off the south side of Long Island. They have also been sighted in Long Island Sound, Block Island Sound, Gardiners Bay and south shore inlets and bays (Sadove and Cardinale 1993). It is believed that right whales primarily use New York waters for migration purposes, as they rarely remain in the area for an extended period of time (Sadove and Cardinale 1993, NMFS 2005). However, a recent study in New Jersey waters found skim-feeding behavior which may indicate that right whales are feeding as they migrate through the mid-Atlantic (Whitt et al 2013).

I. Status

a. Current legal protected Status

i. **Federal:** Endangered **Candidate:** No

ii. **New York:** Endangered

b. Natural Heritage Program

i. **Global:** G1

ii. **New York:** SNA **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Critically endangered

-CITES: Appendix I; IWC Protection Stock

-Northeast Regional SGCN: Very high conservation concern

-Canada Species at Risk Act (SARA): Endangered

-Marine Mammal Protection Act (MMPA): Strategic

Status Discussion:

Right whales were first listed under the Endangered Species Conservation Act in June 1970 (35 FR 18319). When the Endangered Species Act was enacted in 1973, they were subsequently listed as endangered and also as depleted under the Marine Mammal Protection Act (MMPA). The original listing was for “northern right whales”, which included right whales from both the North Atlantic and North Pacific oceans. In 2008, the northern right whale was separated into two distinct species, the North Atlantic right whale and the North Pacific right whale (73 FR 12024). They are currently considered a critically endangered species (Clapham et al. 1999, NMFS 2013).

A recovery plan was enacted in 1991, and revised in 2005 (70 FR 32293). A 5-year review was published in 2012 (77 FR 16538). Critical habitat was designated for the North Atlantic right whale in 1994 (59 FR 28805). The population is believed to be slightly increasing and to be hovering at around 500 individuals (Pettis 2011, L. Crowe, pers. comm.). However, calving frequency, growth rate and number of reproductive females remain causes for concern in the recovery of this stock (NMFS 2013). Additionally, human-caused serious injury and mortality remain above PBR and may also inhibit recovery (NMFS 2013).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Increasing	2010 to present	Endangered	Choose an item.
Northeastern US	Yes	Declining	Increasing			Choose an item.
New York	Yes	Declining	Increasing		Endangered	Yes
Connecticut	Yes	Declining	Increasing		Not listed	Choose an item.
Massachusetts	Yes	Declining	Increasing		Endangered	Yes
Rhode Island	Yes	Declining	Increasing		Endangered	Yes
New Jersey	Yes	Declining	Increasing		Endangered	Yes
Pennsylvania	No	Choose an item.	Choose an item.			Choose an item.
Vermont	No	Choose an item.	Choose an item.			Choose an item.

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
Ontario	No	Choose an item.	Choose an item.			Choose an item.
Quebec	Yes	Declining	Increasing		Endangered	Yes

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

From February 2008 – March 2009 Cornell University partnered with DEC and conducted passive acoustic monitoring for cetaceans in New York coastal waters (BRP 2010).

NOAA, NEFSC, Protected Species Branch conducts regular aerial and ship board surveys to determine the abundance and distribution of protected species in the North East. However, sampling, including scale of sampling, is not specific either to large whales in the New York Bight, nor is sampling year round. Mandatory ship reporting of right whales does exist.

There are no current monitoring activities or regular surveys conducted by the State of New York or specific to large whales in the New York Bight. However, DEC, Marine Resources and Natural Heritage Program are currently in the planning stages to establish a regular monitoring program for large whales. The monitoring techniques and protocols have not yet been determined. There is currently funding for three years of monitoring.

Trends Discussion *(insert map of North American/regional distribution and status):*

The western population of North Atlantic right whales were heavily exploited by whaling in the 1600s by colonist, though it is believed that the stock may have been greatly reduced even prior to that (Reeves et al 2001, Reeves et al 2007). Although it is pre-exploitation numbers are unknown, estimates predict a minimum abundance of about 1,000 individuals (Reeves et al. 1992). The minimum population estimate for 2005 was 361 individuals and for 2010 and 2011 estimates were 396 and 444 individuals respectively (Waring et al. 2012, NMFS 2013). Overall, the western population of North Atlantic right whales appears to be slowly recovering at an average rate of increase of 2.4% from 1990 – 2007 and 2.6% thereafter (Waring et al. 2012, NMFS 2013).

However, the actual rate of population growth has been largely variable, as there have been two periods of documented high mortality rates, one in the 1980s – mid-1990s and one from 2004 – 2005. In the early 1980s to mid-1990s, the survival probability declined from 0.99 to 0.94 and the population actually showed signs of decline (Caswell et al. 1999). In a 16-month period in 2004-2005, eight whales were found dead; six of these whales were females and three of these six were pregnant. Some experts consider population growth rates to have been flat or negative during the period from 1998-2000 possibly due to low calving rates (NMFS 2013).

From 1990 – 2007 the average calf production was 17.2 calves per year, which was up from an average of 11.2 calves/year from 1980 – 1992 (Waring et al. 2012). For the past decade, the average number of calves produced each year was up even more to 20. However, in 2012, only seven newborn calves were sighted in the southeastern U.S., and only one of those mom/calf pairs was resighted on their northern feeding grounds. The calving season looks more promising this year, with 20 mom/calf pairs sighted as of 03/01/2013 (L. Crowe, pers. comm.).

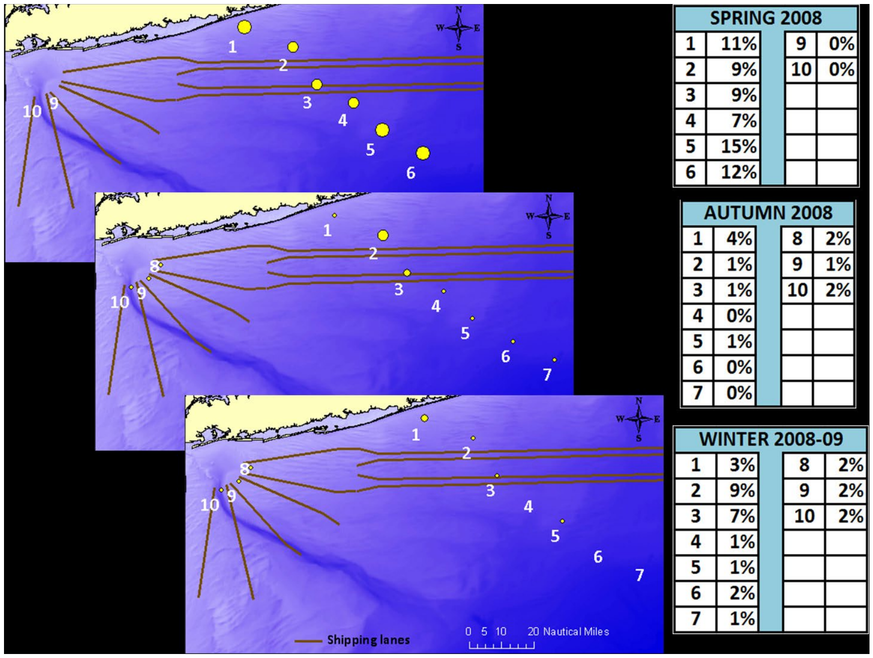

Figure 1. Seasonal presence of right whales in the New York Bight region. A) right whale presence during Spring (1 March – 14 May 2008), B) presence during Autumn (31 August – 2 Dec 2008), and C) presence during Winter (5 December 2008 – 3 March 2009). Tables to the right of each plot show the actual percentages of days with right whale detections during each season. From BRP 2010.

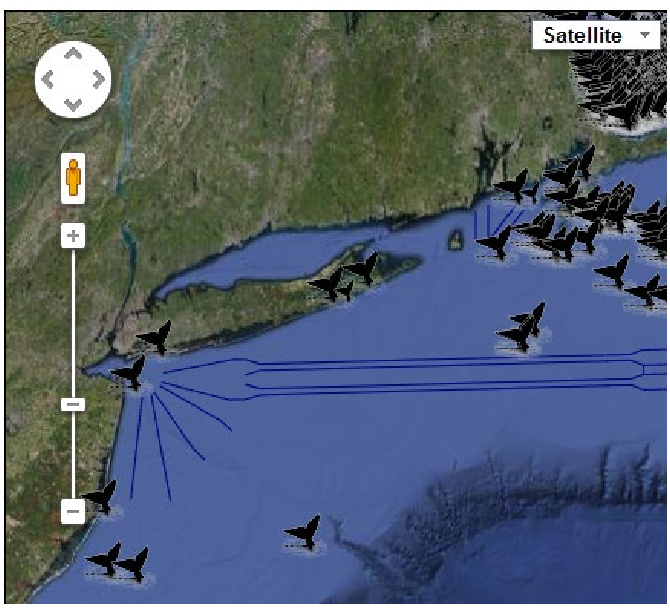

Figure 2. North Atlantic right whale sightings in the New York area from March 20, 2012 – March 20, 2013. Map adapted from NEFSC 2013.

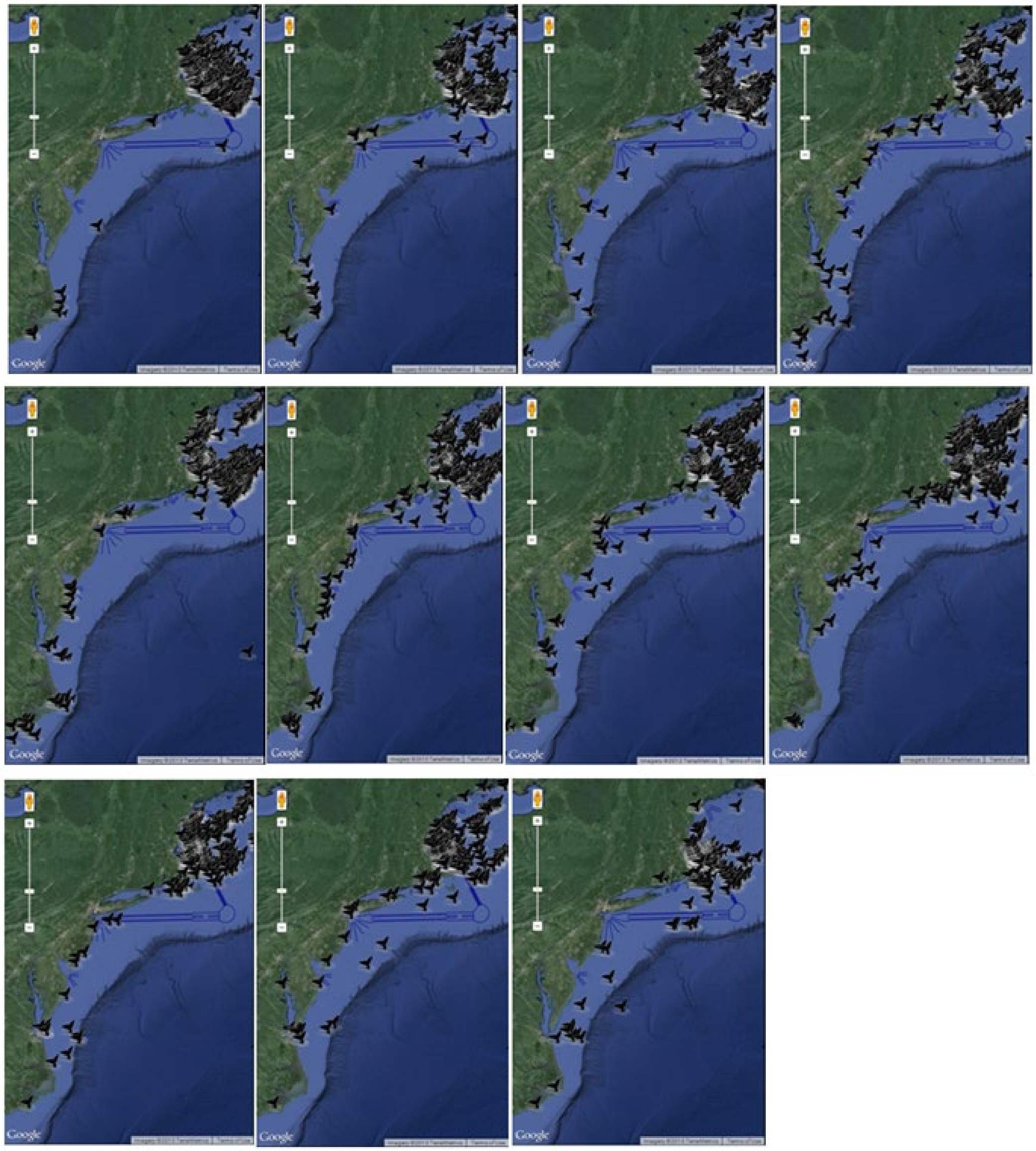

Figure 3. North Atlantic Right Whale Sightings in the NE reported to NOAA from 2003 (top) to 10/18/2013 (bottom). From: NOAA, Fisheries, NEFSC

Figure 4. Range of the western North Atlantic right whale (NARWC 2013).

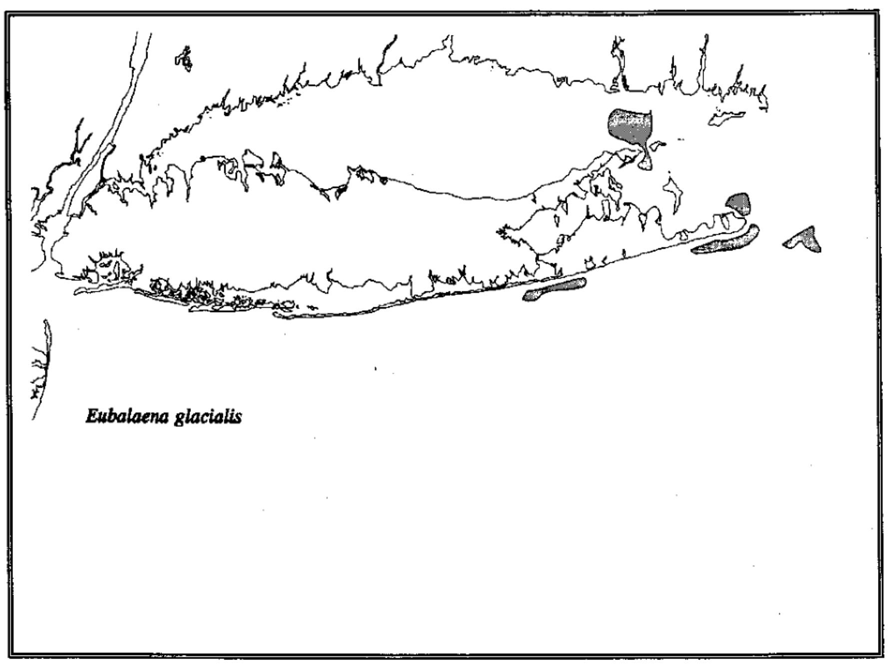

Figure 5. Locations of NARW sightings in New York from 15 years of sighting surveys by Okeanos Foundation from the 1970s – early 1990s. Shaded areas represent areas where right whales were spotted. Figure from Sadove and Cardinale (1993).

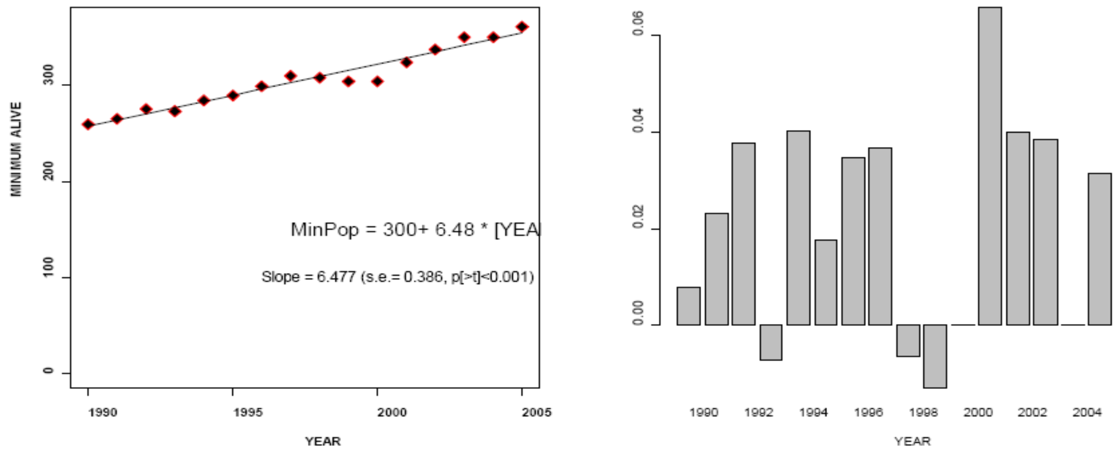

Figure 6. Minimum number alive (a) and crude annual growth rate (b) for cataloged North Atlantic right whales. Minimum number (N) of cataloged individuals known to be alive in any given year includes all whales known to be alive prior to that year and seen in that year or subsequently plus all whales newly cataloged that year. It does not include caves born that year or any other individuals not yet cataloged. Mean crude growth rate (line) is the exponentiated mean of loge [(Nt+1-Nt)/Nt]for each year (t). Figure from Waring et al. (2012).

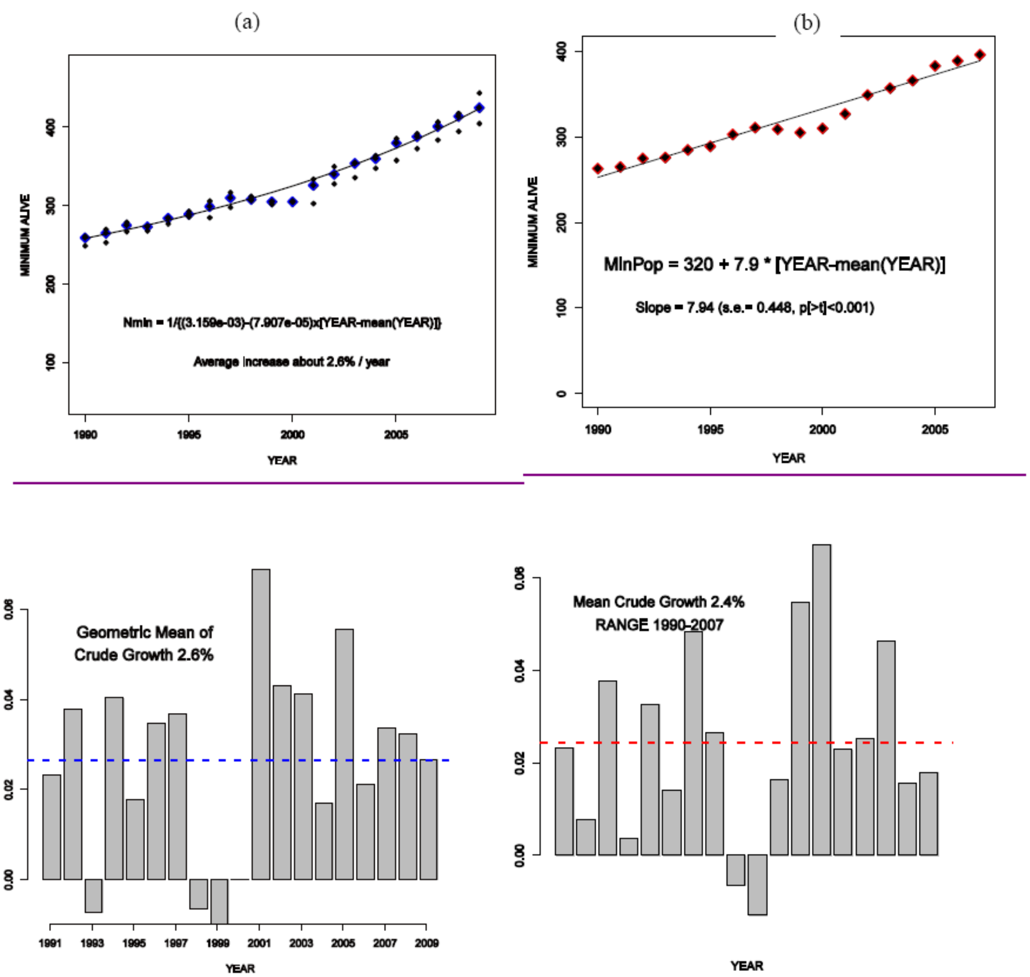

Figure 7. Minimum number alive (a) and crude annual growth rate (b) for cataloged North Atlantic right whales. Minimum number (N) of cataloged individuals known to be alive in any given year includes all whales known to be alive prior to that year and seen in that year or subsequently plus all whales newly cataloged that year. Catalogued whales may include some but not all calves produced each year. Bracketing the minimum number of cataloged whales is the number without calves (below) and that plus calves above, the latter which yields Nmin for purposes of stock assessment. Mean crude growth rate (dashed line) is the exponentiated mean of loge [(Nt+1-Nt)/Nt]for each year (t). From NMFS (2013).

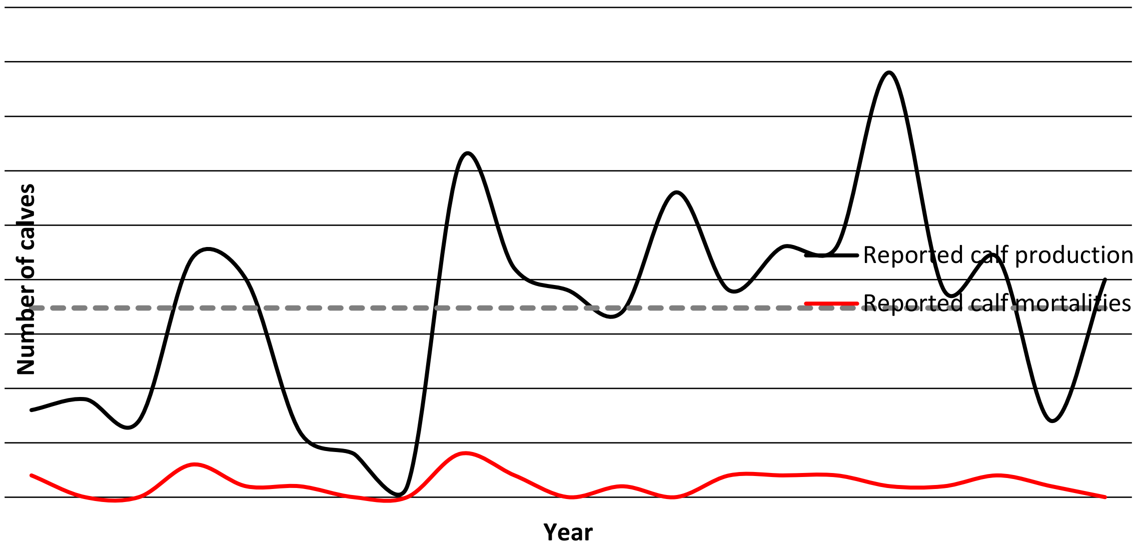

Figure 8. NARW calf production and calf mortality since 1993. The 2013 season includes sightings up to 3/01/2013. The calving season generally extends into April. Data from Waring et al. 2012 and L. Crowe, pers. comm.

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

Although NARW are regularly sighted in New York waters, the sightings are infrequent and usually contain only one to two individuals. Sadove and Cardinale (1993) documented right whales each year from the 1970s – 1993, but stated that most sightings consisted of individuals who did not remain in the area. They believed that right whales were using state waters primarily as a migratory passage. However, recent studies conducted in New Jersey indicate that right whales may be feeding in the mid-Atlantic (Whitt et al 2013). This study also found year round presence of right whales in the mid-Atlantic as did the acoustic study conducted by Cornell in New York waters (Whitt et al 2013, BRP 2010). This may indicate that right whales are in the mid-Atlantic more often than previously believed. The two current seasonal management areas that are in the vicinity of state waters are in effect from November 1 – April 30 each year, as it is believed that these are the time periods when NARWs are most frequently spotted in the area (NARWC 2013).

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995			
1995-2004			

2005-2014			
2015-2023			

Table 1: Records of North Atlantic right whale in New York.

Details of historic and current occurrence:

Unknown for New York. NARW have been infrequently sighted in state waters, although Sadove and Cardinale (1993) report sighting at least one NARW every year from the 1970s – 1993. All of these animals were either mom/calf pairs or solitary individuals, and the majority did not remain in the area for an extended period of time (Sadove and Cardinale 1993).

Unknown for New York. There is no comparable data between historic and current occurrence of NARW in state waters. BRP (2010) detected right whales on 53 of 258 days of monitoring from 2008 and 2009. Abundance in state waters during this time period is unknown, though some information on presence and distribution was collected during this study. Much of the information for the state comes from opportunistic sightings (see Figures 1 and 2, Trends Discussion).

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Core	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Pelagic, marine and estuarine, deep subtidal

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
No	Yes	Increasing	2010 to present

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

North Atlantic right whales have historically been found in the eastern and western Atlantic. It is currently unknown if there is separation between these groups; they are currently considered to be the same species, but are often considered separate for management purposes (Kraus and Rolland 2007). A known male was tracked from Cape Cod to Norway and back again within the period of a year (Jacobsen et al. 2004), and other western North Atlantic right whales have been photographed in Iceland and Norway (Rosenbaum et al. 2000), indicating that there may not be any separation.

Like other species of baleen whales, female NARWs undergo a seasonal migration. They calve in the waters off of the southeastern United States. Some juveniles and non-reproductive females make the journey south with pregnant females (Kraus and Rolland 2007). The rest of the population is believed to remain up north for the entire year. Where the remaining right whales go for the late fall - winter period is poorly understood. Based on right whale biology, it is believed that this fall/winter area would be a mating ground. A recent discovery of relatively large (20+) numbers of right whales of both sexes in the Outer Fall/Jordan Basin region during this period has led to the belief that this area is used as a mating ground (Brown 2012). Whether there are other areas also used by right whales is unknown.

The areas of the coastal waters of the southeastern United States; the Great South Channel; Georges Bank/Gulf of Maine; Cape Cod and Massachusetts Bays; the Bay of Fundy; and the Scotian Shelf appear to be the major habitat areas for right whales. There is thought to be extensive travel within and between these habitats which may vary from year to year (NMFS 2013). In the spring, right whales are frequently found in Great South Channel and Massachusetts and Cape Cod Bay. In the summer and fall, most right whales are sighted in the Bay of Fundy and Roseway Basin (Kraus and Rolland 2007). About 2/3 of the known right whale population can be seen in one of these areas, where the remaining 1/3 go is unknown. Right whales are seen primarily in coastal and shelf waters (NMFS 2005). Their distribution appears to be driven primarily by prey, specifically the distribution of their preferred prey, *Calanus finmarchicus* (NMFS 2005).

Right whales are believed to use New York waters primarily for migration (Sadove and Cardinale 1993, NMFS 2005). Sadove and Cardinale (1993) reported that most sightings of right whales in state waters occurred between March and June. Whales were often spotted very close to shore; they are seen most frequently along the south shore of Long Island (Sadove and Cardinale 1993, NEFSC 2013), and Sadove and Cardinale (1993) reported sightings within Long Island Sound, Block Island Sound, Gardiners Bay and south shore inlets and bays. However, recent studies conducted in New Jersey indicate that right whales may be feeding in the mid-Atlantic (Whitt et al 2013). This study also found year-round presence of right whales in the mid-Atlantic as did the acoustic study conducted by Cornell in New York waters (Whitt et al 2013, BRP 2010). This may indicate that right whales are present in the mid-Atlantic more often than previously believed.

While the amount of pelagic ecosystem in New York is not changing at any substantial rate, its suitability may be. Changes in prey density may alter an area's suitability for occupancy by right whales. In addition, pollution (including noise pollution) may make a previously occupied area unsuitable for this species. Passive acoustic monitoring in the New York Harbor region and offshore of Long Island to the continental shelf edge found that there was the potential for acoustic masking of right whale calls due to high levels of anthropogenic noise (BRP 2010). It is possible that right whales may avoid these areas when noise levels are elevated. Additionally, climate change may alter prey distributions and abundance, though little is known about this due to the lack of research on zooplankton in state water and in the NY Bight in general. Further research needs to be done to identify whether these factors are altering habitat availability in New York waters.

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
No	Yes	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

Female right whales give birth to one calf after a gestation period of approximately 12 months (Best 1994). The number of calves born in the population each year is highly variable, ranging from one to 39. This variation may be a result of nutrition, with good feeding years leading to good calving years (Moore et al. 2001). The average calving interval from 1980 – 2005 is just over three years (Kraus et al. 2007). Between 1998 and 2003, the average calving interval increased to over five years, before dropping back to three years in 2004 and 2005. Calves are nursed for approximately ten months and separate from the mother at around one year of age (Kraus et al. 2007).

Mating in NARWs appears to occur in the midst of large surface-active groups (SAGs) of up to forty or more individuals (Kraus et al. 2007). Females appear to call in males, who travel from distances up to several kilometers to participate in the SAG (Parks 2003, Kraus et al. 2007). The females are usually located in the center of the SAG, with males competing for "alpha" positions next to the female. The female spends the majority of the time avoiding copulation on her back, rolling over about once a minute to breathe and give males the chance to copulate (Kraus and Hatch 2001, Kraus et al. 2007). Females often mate with multiple males, and males achieve reproductive success via sperm competition (Brownell and Ralls 1986). SAGs occur at all times of the year, although right whale biology indicates that fertilization occurs in late fall/winter, indicating that fertilization does not occur in the majority of SAGs (Kraus et al. 2007). It should be noted that not all SAGs are reproductive in nature, with all male and all female SAGs often occurring. They appear to also be important for socialization (Kraus et al. 2007).

The average age of first calving is ten years, although female NARWs have given birth to their first calf at as early as five years of age and as late as twenty-one years of age (Kraus et al. 2007). The age that males reach sexual maturity is unknown, as even juvenile males have been seen involved in surface-active groups (SAGs) that are indicative of mating (Kraus and Hatch 2001, Kraus et al. 2007). Most males who get close enough to actually mate with a female in a SAG are over ten years of age (Kraus et al. 2007). Paternity studies have shown that most males do not successfully reproduce until they are over fifteen years of age (Kraus et al. 2007).

As of November 2012, there were 103 living reproductive females (Knowlton et al. 2012). Additionally there are 13 females that have surpassed 17 years of age (at this time, 90% of female NARWs have given birth to at least one calf) but have not reproduced. One female has given birth to nine calves, which is the maximum number of calves born to one female (Knowlton et al. 2012). The maximum known reproductive span is 35 years (Knowlton et al. 2012). Two whales are currently described as being in senescence, although their ages are unknown (Kraus et al. 2007). One is a female who had a calf in 1976 and none since, and the other is the largest female in the population, and presumed to be among the oldest (Kraus et al. 2007). The longevity is unknown, although believed to be at least 60 – 70 years. In 1935, the last right whale, a calf, was hunted and killed in U.S. waters. Photographs of the event have revealed the mother of the calf to be Eg#1045. Hamilton et al. (1998) reasoned that, if the calf was her first calf and if she gave birth to the calf when she was ten years old, then Eg#1045 would have been 70 years old when last sighted. This is a minimum age estimate, and it is presumed that right whales can live even longer (Kraus and Rolland 2007). Closely related species of whales can live to 100 year or more (NMFS website).

Right whales often exhibit some degree of maternally driven site fidelity. For example, the calves of females who feed in the Bay of Fundy are often seen in subsequent years in the Bay of Fundy. However, this site fidelity is not strict, and NARWs are known to range over large distances. A male right whale was tracked from Cape Cod to the tip of Norway and back in the time span of about a year (Garrison 2007). A satellite tag placed on an entangled right whale broadcasted signals from South Carolina, far offshore to an area west of the Azores and around the Atlantic

Ocean (Garrison 2007). Unfortunately, it was impossible to tell whether the tag was still attached to the whale or had broken free, but there is speculation that many right whales wander from their more “typical” habitats (Garrison 2007).

The sex ratio of NARWs is 50:50 (Brown et al. 1994). Juveniles comprise between 26% and 31% of the population, which is lower than expected for a population experiencing growth (Hamilton et al. 1998).

Around 50% of NARW mortalities are a result of human activities (Moore et al. 2007). Natural mortality in the species is poorly understood. Predation is believed to play some role, although it is unknown how much. Killer whale rake marks have been documented on NARWs (Kraus 1990), and recently white sharks have been observed relatively frequently near NARWs in the southeastern United States (L. Crowe, pers. comm.). Neonatal mortality has been recognized as a source of natural mortality. High levels of *Giardia* and *Cryptosporidium,* parasites that can cause diarrhea, dehydration, weight loss and death in some animals, have been documented in right whales (Hughes-Hanks et al. 2005). Whether the parasites are causing disease in right whales is currently unknown. Several marine biotoxins occur in the same areas as right whales, raising concern that the species may be affected by harmful algal blooms (Rolland et al. 2007). Currently, no deleterious effects of marine biotoxins on right whales have been observed (Rolland et al. 2007). Combining both anthropogenic and natural mortality, Kraus (1990, 2002) estimated that 26-31% of right whales died in their first year of life, 10% in their second, 5% in their third, and at rates between 1% and 4% from ages 4 – 10. NARWs also exhibit very low levels of genetic variability, which raises concerns that the population could be more at risk from disease and contaminant effects, and there is some thought that these combined effects could play a role in the low reproductive rates of right whales (Kraus et al. 2007).

VI. Threats *(from NY 2015 SWAP or newly described)*

Vessel collisions represent the leading cause of mortality to NARW; this has been the case since the 1970s (Reeves et al. 1978, Kraus 1990, Kraus et al. 2005, Moore et al. 2007). Right whales are often found in shallow, coastal waters that are heavily traveled by vessel traffic. Throughout their range, they tend to frequent areas in the vicinity of major shipping routes (outside of New York Harbor, Massachusetts Bay, the Bay of Fundy). The annual human-caused mortality of right whales is currently estimated at about 3 whales; two of these are attributable to vessel strikes (Waring et al. 2012). From 1970 – 2007, 75 NARW carcasses were reported (Knowlton and Brown 2007). At least 28 of these mortalities were a result of a vessel collision (Knowlton and Brown 2007). The vast majority (75%) of these collisions have occurred since 1991, where they represent 50% of the total known mortality of right whales over this time period (Knowlton and Brown 2007). Additionally, approximately 7% of the living population has “major wounds” attributable to ship strikes (Knowlton and Brown 2007). Serious injuries could eventually lead to mortality through infection or possibly decreased foraging efficiency. It is also possible that whales that recover from such injuries could experience decreased reproductive potential (Brown et al. 2009).

Entanglement in fishing gear has also been shown to be a major factor contributing to the slow recovery of NARWs (Knowlton et al. 2005). The majority of entanglements involve gear from fixed gear fisheries, such as gillnets and pot gear (Johnson et al. 2005). Fatal entanglements account for approximately 1 of the 3 NARW annual human-caused mortalities (Waring et al. 2012). From 1970 – 2007, at least 11% of the known right whale deaths were a result of entanglement in fishing gear (Knowlton and Kraus 2001, Brown et al. 2009). The actual number is estimated to be much higher, as many carcasses are not recovered. Many whales with severe entanglements are in poor condition, and thus are more likely to sink when dead (Brown et al. 2009). Moore et al. (2007) estimated that up to two-thirds of the annual right whale deaths (including deaths from entanglement and vessel collisions) go undetected.

Vessel collisions are believed to cause more immediate mortalities than entanglements, but fisheries interactions more frequently result in drawn-out deaths, decreased productivity, and decreased survival (Brown et al. 2009). Over 75% of the known right whale population have scars indicative of at least one entanglement (Knowlton et al. 2005). Additionally, it is estimated that between 14% and 51% of known right whales are involved in entanglements annually (Knowlton et al. 2005). Reproductive females that are carrying gear or have serious injuries from entanglements were significantly less likely to calve again. Females that experienced a moderate or severe entanglement had a significantly longer calving interval than those with no or minor entanglement wounds (Knowlton et al. 2012).

There is some evidence that females may be particularly at risk from human activities. Mother/calf pairs, which migrate from the southeastern U.S. to the Bay of Fundy, are often found in coastal waters heavily trafficked by ships and fishing gear (Fujiwara and Caswell 2001). Additionally, the pairs spend significantly more time at the surface than other demographic groups of right whales, putting them at increased risk of ship collisions (Fujiwara and Caswell 2001). Known deaths from entanglement and ship strikes from 2005 - 2009 are biased towards females (Brown et al. 2009). Human impacts were responsible for the loss of at least 12%, and potentially as much as 37%, of the female population between 1980 and 2012 (Knowlton et al. 2012). These numbers are particularly concerning for the population, as the death of a reproductive female also represents a loss of the potential calves the female would produce.

Stranding and entanglement response and outreach in New York are currently provided by Riverhead Foundation. They respond to all marine mammal strandings; however, they are not authorized to disentangle large whales. The nearest group authorized by NOAA to perform such entanglements is the Rhode Island Division of Fish and Wildlife. In an attempt to reduce large whale entanglements, Cornell Cooperative Extension has begun a “ghost” gear removal project. Working with the DEC’s Crustacean Unit and commercial fishermen, the project has removed 4,881 abandoned lobster traps from Long Island Sound as of June 21, 2012.

Climate change has led to temperature and current shifts throughout the North Atlantic Ocean. These changes could lead to shifts in distribution of right whales as occupied habitats may become unsuitable and previously unsuitable habitats may become occupied. Certain studies have shown that the productivity of ocean basins may be altered by shifts in the climate (Quinn and Neibauer 1995, Mackas et al. 1989). Prey species may be affected; copepods, the main prey of NARWs, have already exhibited signs of a shift in distribution as a result of climate change (Hays et al. 2005). The distribution of right whales is believed to be strongly driven by the distribution of their prey, so it can be assumed that these shifts have the potential to alter right whale habitat use (NMFS 2005, Brown et al. 2009). Additionally, calving success has been linked to nutrition in NARWs, with fewer calves being produced after poor feeding seasons (Angell 2005). It has already been suggested that climate change is affecting the distribution of right whales in the Gulf of Maine and the calving rate of the population (Kenney 1998a, 1998b). The effects of climate change on both right whales and their prey need to be further researched, but the potential effects are large.

NARWs, like other cetaceans, rely on sound for communication. There has been recent concern over the effects of increasing ocean noise level on cetaceans. Ross (1987,1993) estimated that the ambient noise level in the oceans rose 10 dB from 1950 – 1975 because of shipping; background noise has been estimated to be increasing by 1.5 dB per decade at the 100 Hz level since propeller-driven ships were invented (National Research Council 2003). The oceans are getting progressively louder, and the waters off of New York are no exception (BRP 2010). Acoustic monitoring in the New York Bight region in 2008 and 2009 found elevated levels of background noise (due in large part to shipping traffic) (BRP 2010).

High levels of noise could have several effects on marine mammals. Exceptionally loud noises, usually active military sonar, have led to temporary and permanent threshold shifts and even death by acoustic trauma in certain species of cetaceans (Richardson et al. 1995). More commonly, anthropogenic noise can cause avoidance of an area and alterations in behavior (Richardson et al. 1995). Right whales have been shown to increase both the amplitude and frequency of their calls as a result of increased underwater noise (Parks et al. 2007, 2010). There are concerns that this could cause the whales to expend more energy (Parks et al. 2007, 2010). Additionally, Rolland et al. (2012) found a decrease in fGC stress levels in NARWs using the Bay of Fundy that correlated with a decrease in shipping traffic after 9/11, suggesting that elevated noise levels could cause increased stress. While it is currently unknown how this stress may affect NARWs, chronic elevations of GC in other vertebrates have been shown to have detrimental effects on growth, reproduction, and immune response (Sapolsky et al. 2000, Romero and Butler 2007, Romero and Wikelski 2001, Pride 2005). Right whales are found most commonly in coastal waters, where there are often high levels of recreational and other vessel activity. Whether increased levels of vessel noise are enough to drive right whales from an area is currently unknown. There is also the potential that certain levels of anthropogenic noise could decrease the distance right whales calls can be heard, or potentially mask them entirely (Richardson et al. 1995). This could have detrimental effects in a large, solitary species that relies in part on sound for communication, foraging, and navigation (Rolland et al. 2012). The acoustic monitoring by BRP (2010) found the potential for the masking of whale calls in the NARW frequency range in the New York Bight region.

The threats from alternative energy development, such as offshore wind, are largely due to anthropogenic noise. There is a proposal to install a wind farm off of Long Island, potentially the largest wind project in the county (Long Island- New York City Offshore Wind Project 2013). NARWs are often found in shallow waters that are suitable for wind farms, raising concern that this species may be more affected than other baleen whales with a more offshore distribution (Madsen et al. 2006). Construction of an offshore wind farm requires pile-driving to install the foundations. Pile-driving produces high levels of intense noise, and is generally considered the largest threat to marine mammals when talking about wind farms (Madsen et al. 2006). Although no studies exist on right whale reactions to pile-driving, avoidance behavior has been documented in bowhead whales (Balaena mysticetus, a close relative of the right whale) responding to airgun use (Richardson et al. 1986). Operational wind turbines produce more constant, low levels of noise (Madsen et al. 2006). While these levels are generally not considered loud enough to disrupt marine mammal hearing, this is the potential for behavioral effects. No studies on wind turbines currently exist for right whales or any other baleen whales, but Nowacek et al. (2004) documented avoidance responses of NARWs to a tonal signal that was similar in frequency and amplitude to the sound produced by wind turbines. This level is also similar to noise produced by dredging and drilling, and thus there is the potential that these activities could alter right whale use of an area (Madsen et al. 2006).

It is currently believed that contaminants such as organochlorines, organotins, and heavy metals do not negatively impact humpback whales and other baleen as much as other marine mammals (O'Shea and Brownell 1994). Humpback whales feed at a low trophic level, and so there is little chance for the bioaccumulation of toxins that occurs in many of the odontocetes (toothed whales). While no significant effects of contaminants has yet been documented, it is possible that exposure has long-term effects such as reduced reproductive success and/or long-term survival. Gaskin (1987) raised the concern that the Bay of Fundy and Gulf of Maine, both important areas for the majority of the NARW population, are semi-enclosed. Percy et al. (1997) documented concerning levels of a large number of contaminants in the Bay of Fundy.

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: ✓ **No:** _____ **Unknown:** _____

If yes, describe mechanism and whether adequate to protect species/habitat:

The right whale is protected in the United States by its status as a federally Endangered species. In addition, the right whale (along with all other marine mammals) receives federal protection under the Marine Mammal Protection Act of 1972 (MMPA). The right whale is protected internationally from commercial hunting under the International Whaling Commission's (IWC) global moratorium on whaling. The moratorium was introduced in 1986, and is voted on by member countries (including the United States) at the IWC's annual meeting.

Right whales are also protected under the Environmental Conservation Law (ECL) of New York. The right whale is listed as a state endangered species in New York. Section 11 – 0535 protects all state-listed endangered and threatened species and makes it illegal to take, import, transport, possess or sell any listed species or part of a listed species. In addition, Article 17 of the ECL works to limit water pollution, and Article 14 presents the New York Ocean and Great Lakes Ecosystem Conservation Act. This act is responsible for the conservation and restoration of coastal ecosystems "so that they are healthy, productive and resilient and able to deliver the resources people want and need." Both of these help to protect the habitat of the right whale. Whether they are adequate to protect the habitat is currently unknown.

The North Atlantic Large Whale Take Reduction Plan identified floating groundline used in the trap and pot fisheries as an entanglement threat for large whales. It is often difficult to determine which fishery entangling gear is from; however, 53% of identified entanglements on North Atlantic right whales and humpback whales examined by Johnson et al. (2005) involved trap and pot gear. The National Marine Fisheries Service subsequently passed a new law making it mandatory for all pot and trap fisheries to switch over to sinking groundline by 2008. The effectiveness of this measure is currently being analyzed (NMFS 2013). To encourage compliance by fishermen, DEC's Marine Endangered Species and Crustacean Unit partnered with the Cornell Cooperative Extension of Suffolk County and initiated gear buyback programs, which removed 16.9 tons of floating rope from New York's commercial lobster fishery. Further analysis is required before it is known if any real reduction in large whale entanglement has occurred as a result of the switch from floating to sinking groundline. A

Two mid-Atlantic seasonal management areas lay within New York waters (see figure below). From November 1 to April 30 each year, vessels 65 ft or greater must travel at 10 knots or less when traveling through these areas. If right whales are sighted in an area at any time of the year, mariners must report the location to NMFS. If right whales appear to be concentrating in an area, NMFS can enact Dynamic Management Areas (DMAs). Vessels are asked to either avoid this area or reduce their speed to 10 knots or less when inside the DMA, however, these restrictions are not mandatory. While it has been estimated that whale strikes by vessels traveling at less than 11.8 knots were 50% less likely to be lethal than strikes at greater speeds (Vanderlaan and Taggart 2007), Silber and Bettridge (2012) found that compliance to the speed restrictions is low (although improving), and documented no significant decrease in ship strike mortalities and serious injuries in right whales as a result of the restrictions. However, other studies have shown more of a benefit. Conn and Silber (2013) found that ship strike mortality for right whales is likely reduced by 80-90% by vessel speed restrictions. Further analysis on the effectiveness of this measure is being conducted and enforcement is a known issue (NMFS 2013). It should also be noted that this Ship Strike Rule has a sunset clause and will expire on December 9, 2013 unless it is renewed (NMFS 2013).

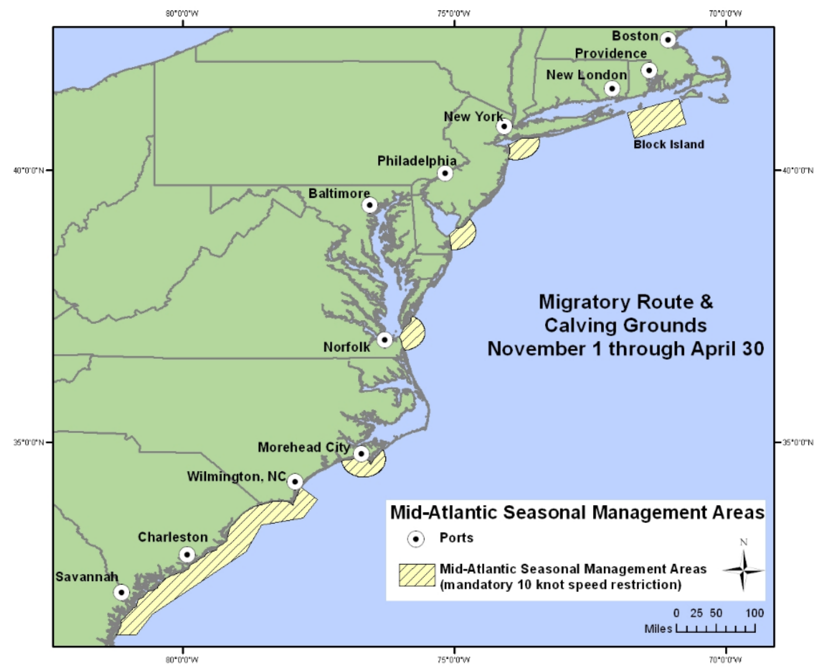

Figure 9. Location of Seasonal Management Areas (SMAs) in the mid-Atlantic (NEFSC 2013).

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

An increased understanding of right whale distribution, abundance and habitat use in New York waters would be beneficial when developing management and conservation strategies. Long-term surveys and monitoring strategies should be developed to determine which areas of state waters are important to right whales, and when they use these habitats. Related to this little is known about current zooplankton distribution and abundance in New York state water and the New York Bight. Because recent studies indicate that right whales may at least sometimes be feeding during migration. Therefore, knowledge about prey distribution may enable predictions about right whale distribution, making this an important area of research.

If right whale use of state waters is better understood, it would be possible to attempt to limit known threats in these areas. For example, wind farms and any drilling or construction activities could be done in areas not frequented by right whales. Additionally, a thorough analysis on right whale sighting locations and shipping routes could be conducted. If right whales are consistently being sighted within shipping lanes, it may be possible to divert vessel traffic from the area. Shipping lanes in the Bay of Fundy were rerouted once it was shown that right whales were found frequently within the Bay of Fundy Traffic Separation Scheme (Knowlton and Brown 2007, Mate et al. 1997, Vanderlaan et al. 2008). Since the scheme was amended, Vanderlaan et al. (2008) estimates that the probability of a vessel/whale interaction in the outbound lane has been reduced by around 90%.

Near real-time acoustic monitoring of right whales is currently being used off of the coast of Massachusetts in an effort to reduce vessel collisions. When a right whale is detected, an alert goes out to all large shipping vessels in the area, and a speed restriction goes into place. Similar monitoring in New York could help reduce ship collisions with right whales.

One of the largest problems with the current regulations protecting right whales from vessel collisions is lack of compliance, especially in Dynamic Management Areas (DMAs). Silber and Bettridge (2012) recommend either expanding or recreating the Seasonal Management Areas

(SMAs) to include recurring DMAs, or making DMA speed restrictions mandatory. While this is a federal regulation, increased understand of right whale use of New York waters could help improve the SMAs, or New York could develop their own regulations for vessels when right whales are in the area. Additionally, increased education of New York mariners would be beneficial to spread awareness of the plight of the NARW, as well as the regulations that should be followed.

Other areas of needed research are looking at the frequency of occurrence of entanglements in fishing gear and reducing the potential for these interactions. Also, the potential effects of wind farms, contaminants, climate change and effects of ocean noise on right whale behavior.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection):
https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Conservation Actions	
Action Category	**Action**
1.	
2.	

Table 2: (need recommended conservation actions for North Atlantic right whale).

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VIII. Version History

Originally prepared by	Amanda Bailey
Date first prepared	March 21, 2013
First revision	June 23, 2013
Latest revision	

Species Status Assessment

Common Name: Sei whale **Date Updated:** 2/16/2024

Scientific Name: *Balaenoptera borealis* **Updated by:**

Class: Mammalia

Family: Balaenopterida

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

The sei whale is the third largest species of baleen whale after the blue and fin whale. This whale is one of the least studied of the large whales. Its taxonomy is currently being disputed, with some arguing for two subspecies of sei whales, a northern form (*B. borealis borealis*) and a southern form (*B. borealis schlegelli*) (Flower 1883, Baker et al. 2004). Other genetic and morphological research found only weak evidence for the existence of a southern subspecies (Perrin et al. 2010). In 2004, a prioritized list of cetacean species in need of further taxonomic research was developed (Taylor 2005, Prieto et al. 2011). Both the northern and southern sei whales were listed under medium priority, indicating that further taxonomic research is needed to determine whether the two populations can be called separate subspecies (Prieto et al. 2011).

Sei whales are found in all oceans, but appear to prefer temperate, offshore areas (Horwood 1987, Perry et al. 1999, NMFS 2011, Prieto et al. 2011). In the western North Atlantic and northeastern United States, sei whales travel to presently unknown breeding grounds in lower latitude waters. The whales are believed to migrate along the continental shelf north to Georges Bank and the southwestern Gulf of Maine (NMFS 2011, Prieto et al. 2011). No known resident seasonal population has been found in New York waters; however, these areas may be important as a migration corridor.

Little is known on the abundance and trends of these elusive whales. Historically, sei whales were targeted by the whaling industry after fin and blue whales became hunted to the point of rarity (Perry et al. 1999, NMFS 2011, Prieto et al. 2011, NMFS 2012). While this hunting was sure to have decreased the population, there are no historical estimates of abundance, so it is not known how much of an effect whaling had on the western North Atlantic sei whales (Perry et al. 1999, NMFS 2011, Prieto et al. 2011, NMFS 2012). Recent trends are also currently unknown. Further research is necessary to establish population estimates.

I. Status

a. Current legal protected Status

i. **Federal:** Endangered **Candidate:** ______

ii. **New York:** Endangered; SGCN

b. Natural Heritage Program

i. **Global:** G5?

ii. **New York:** SNA **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Endangered

-Northeast Regional SGCN: RSGCN

Status Discussion:

The sei whale was listed as endangered under the Endangered Species Act when it was first passed in 1972. Although initially overlooked by whalers, many populations of sei whales were significantly reduced by commercial whaling when more preferred species were depleted (Perry et al. 1999, NMFS 2011, Prieto et al. 2011, NMFS 2012). These whales were hunted from the 1950s through the early 1970s. Even after they received protection in the early 1970s, Japan and Iceland continued to take low numbers of sei whales (Perry et al. 1999, NMFS 2011, Prieto et al. 2011, NMFS 2012). The sei whale is one of the least understood of the baleen whales, and the current status of most stocks is unknown.

The sei whale is divided into four stocks worldwide: the Hawaiian stock, Eastern North Pacific stock, western North Atlantic stock, and Nova Scotia stock, which includes the entire east coast of the United States. These stocks were defined solely for management purposes (Prieto et al. 2011). Further research is warranted to determine if these populations are distinct. The status of this stock is unknown (NMFS 2012, Prieto et al. 2011). However, since average serious injury and death due to human interactions exceeds PBR this is considered a strategic stock (NMFS 2013).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Choose an item.	Choose an item.		Endangered	Choose an item.
Northeastern US	Yes	Choose an item.	Choose an item.		Endangered	Yes
New York	Yes	Choose an item.	Choose an item.		Endangered	Yes
Connecticut	Yes	Choose an item.	Choose an item.		Not listed	No
Massachusetts	Yes	Choose an item.	Choose an item.		Endangered	Yes
Rhode Island	Yes	Choose an item.	Choose an item.		Not listed	Yes
New Jersey	Yes	Choose an item.	Choose an item.		Endangered	Yes
Pennsylvania	No	Choose an item.	Choose an item.			Choose an item.
Vermont	No	Choose an item.	Choose an item.			Choose an item.
Ontario	No	Choose an item.	Choose an item.			Choose an item.
Quebec	Yes	Choose an item.	Choose an item.		Not listed	Choose an item.

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

NOAA, NEFSC, Protected Species Branch conducts regular aerial and ship board surveys to determine the abundance and distribution of protected species in the North East. However, sampling, including scale of sampling, is not specific either to large whales in the New York Bight, nor is sampling year round. There are no current monitoring activities or regular surveys conducted by the State of New York or specific to large whales in the New York Bight. However, DEC, Marine Resources and Natural Heritage Program were planning to establish a regular monitoring program for large whales. The monitoring techniques and protocols have not yet been determined, and there was funding for three years of monitoring (as of 2013).

Trends Discussion *(insert map of North American/regional distribution and status):*

Sei whales were first hunted in the North Atlantic in the 1800s. However, they were not targeted by whaling operations until the 1950s, when blue, fin and humpback whales were reduced to the point of rarity. It is believed that numbers were drastically reduced as a result of this hunting, although whaling pressure in the North Atlantic was not as heavy as in other areas. In 1972, it was estimated that stocks in the North Pacific were at just 21% of historical levels (Perry et al. 1999). While it is unknown how much of a reduction was seen in the North Atlantic, the large-scale Cetacean and Turtle Assessment Program (1982) estimated that there may be just 2,200 – 2,300 individuals in United States Atlantic waters. Four different abundance estimates have taken place in portions of the known range in the United States in 2002, 2004, 2006, and 2011 (NMFS 2013). The 2002 surveys targeted the southern Gulf of Maine to Maine, and came up with an estimate of 71 sei whales. The 2004 surveys focused on the Gulf of Maine to lower Bay of Fundy, and estimated an abundance of 386 sei whales. The 2006 survey targeted the southern Gulf of Maine to upper Bay of Fundy to the Gulf of St. Lawrence and estimated 207 sei whales. In 2011, the area from North Carolina to the southern Bay of Fundy was surveyed, and an estimate of 467 sei whales was generated. The 2002 and 2006 surveys took place in August, while the 2004 surveys were conducted in June and July, and the 2011 surveys stretched from June – August (NMFS 2013). The differences in abundance estimates is most likely a result of differing survey methods and areas covered, but also could be partially because of differing abundance in sei whales at different times of the year.

Sei whales are sighted infrequently in U.S. waters, so it is currently unknown if their population is increasing, decreasing, or remaining stable. Most sightings are of just a few whales, and sei whales are known to have a highly variable summer distribution, making it difficult to say if increased (or decreased) reports are actually because of a change in population size or simply a shift in distribution in response to food, making them more detectable (Perry et al. 1999, NMFS 2011, Prieto et al. 2011, NMFS 2012, NMFS 2013).

Month/Year	Area	N_{best}	CV
Jun-Jul 2004	Gulf of Maine to lower Bay of Fundy	386	0.85
Aug-06	S. Gulf of Maine to upper Bay of Fundy to Gulf of St. Lawrence	207	0.62
Jun-Aug 2011	North Carolina to lower Bay of Fundy	467	0.67

Table 1. Summary of recent abundance estimates for Nova Scotia sei whales with month, year, and area covered during each abundance survey, and resulting abundance estimate (N_{best}) and coefficient of variation (CV). Table from NMFS stock assessment (2013).

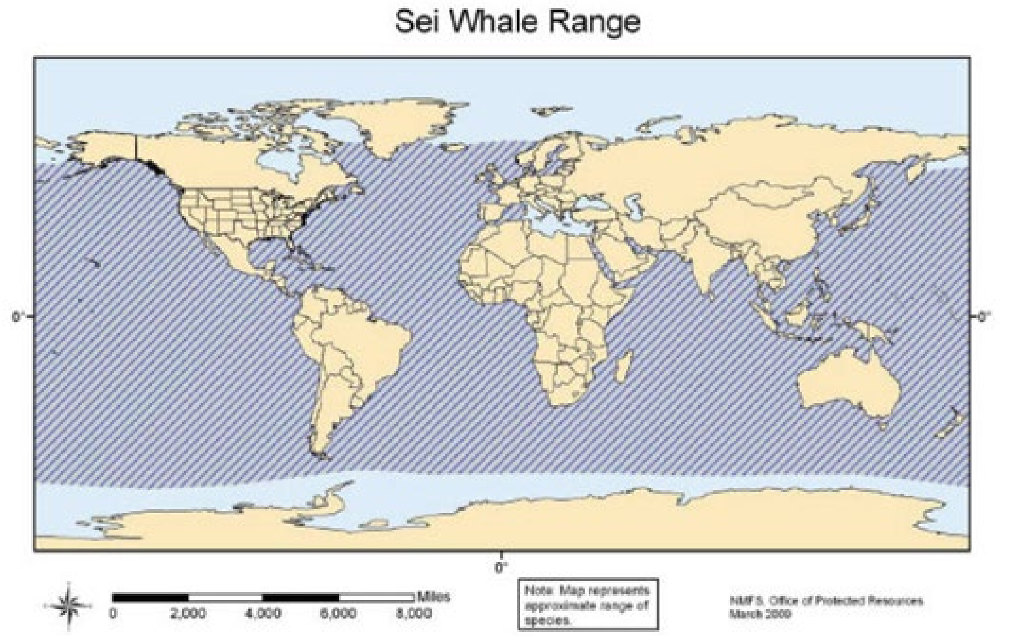

Figure 1. Sei whale global range. Map from NMFS 2011.

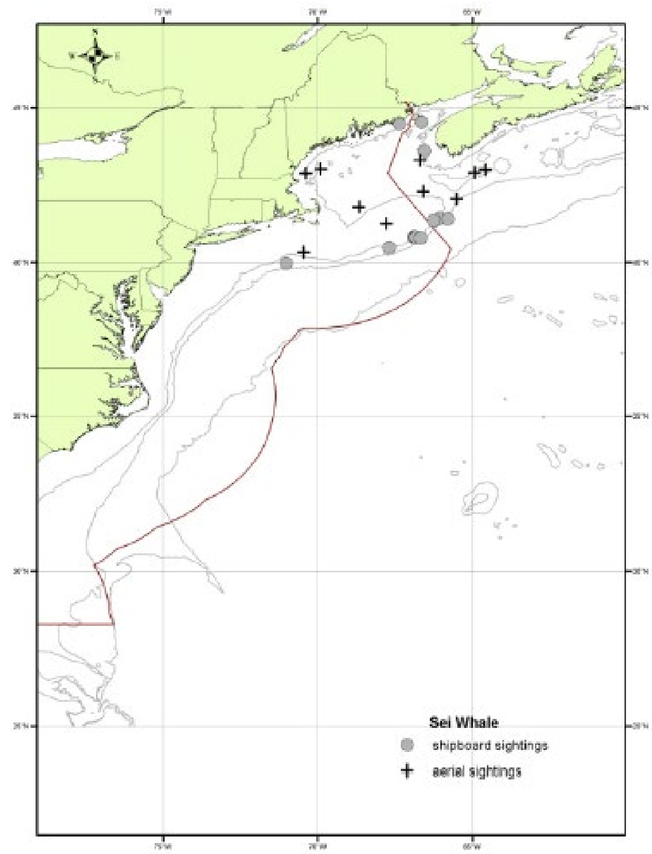

Figure 2. Distribution of sei whale sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010, and 2011. Isobaths are the 100m, 1000m, and 4000m depth contours. Figure from NMFS stock assessment (2013).

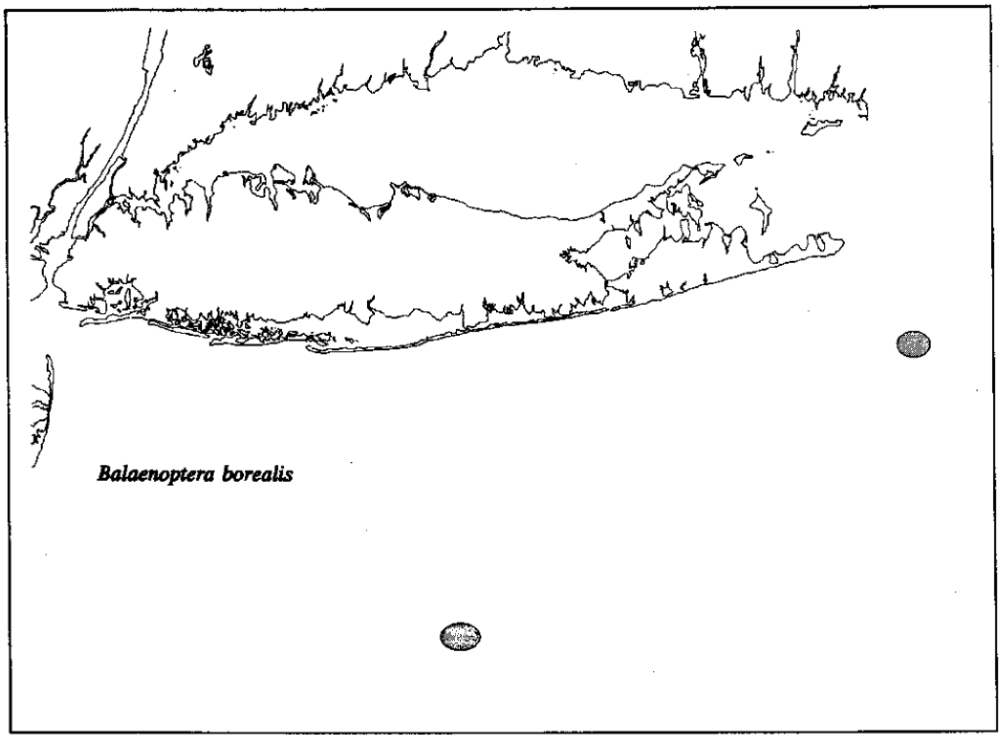

Figure 3. Areas of sei whale sightings in New York waters in 15 years of surveys from 1970s – 1993. Map from Saldove and Cardinale 1993.

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995			
1995-2004			
2005-2014			
2015-2023			

Table 1: Records of sei whale in New York.

Details of historic and current occurrence:

Unknown for New York. Although there are no historical estimates for pre-whaling numbers of sei whales, a study in 1966 estimated that there were 1,856 sei whales in the Nova Scotia stock (Prieto et al. 2011). In 1977, a study estimated between 1,393 and 2,248 sei whales in the Nova Scotia stock (Perry et al. 1999).

Sadove and Cardinale of Okeanos Ocean Research Foundation (1993) reported sei whales being seen "frequently in association with aggregations of fin whales" in the early 1980s, although the species was encountered infrequently between 1985 – 1993. When sighted, the whales were adult animals actively feeding with fin whales during July and August. Although there were not enough sightings of sei whales to develop an accurate population estimate, Okeanos Foundation estimated that there were probably less than 150 individual sei whales that used the New York Bight area during their study period (Sadove and Cardinale 1993).

There have been few, if any, sightings of sei whales in New York waters in recent years. They are known to exist from presence in acoustic surveys that took place from 2008-2009 (BRP 2010). There have been attempts in recent years to gain a more reliable abundance estimate for sei whales in the North Atlantic. Unfortunately, differences in survey effort and methods make it impossible to make direct comparisons of historic and current occurrences. The most recent survey of the Nova Scotia stock was in summer 2011. This survey included both aerial and shipboard surveys that, together, stretched from North Carolina to the lower Bay of Fundy and estimated 357 sei whales (NMFS 2013).

No abundance or trend data currently exists for New York. There have only been a few scattered sighting in the New York Bight (mostly from the 1980s – 1993) and, more recently, acoustic detections (Sadove and Cardinal 1993, BRP 2010). Considered to be a rare visitor to this area.

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Pelagic

b. Marine, Deep Subtidal

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
No	Unknown	Unknown	

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

Along the east coast of North America, sei whales range from the southeastern United States to West Greenland. It is believed that they travel to lower latitudes to breed during winter months and spend the summer at higher latitudes feeding (Perry et al. 1999, NMFS 2011, Prieto 2011). Sei whales are notorious for having a highly variable and unpredictable distribution. In general, they prefer deeper waters, and are frequently found over the continental slope, shelf breaks, and deep ocean basins between banks (Perry et al. 1999, NMFS 2011, Prieto 2011). Occasionally, they are found in more inshore waters, presumably in response to changes in prey density (Prieto 2011). Sei whales have been found occupying the Great South Channel (offshore from Cape Cod, MA) in the spring, and also have been reported in the southern Gulf of Maine in spring and early summer (NMFS 2011, NMFS 2013). These sightings suggest that sei whales may be reasonably common in the area (NMFS 2011).

Sei whales are often associated with ocean fronts and eddies, which are believed to concentrate prey (Skov et al. 2008, Olsen et al. 2009, NMFS 2011). They may use currents for large scale movements; an individual that traveled 1,500 km in less than two weeks from the Azores Islands to the Labrador Sea was associated with gyre-driven and other currents (Olsen et al. 2009).

As the sei whale is only known in New York from a few instances, habitat use in the New York Bight is poorly understood. While the amount of pelagic ecosystem is not changing, its suitability may be. Changes in prey density may alter an area's suitability for occupancy by sei whales. In addition, pollution (including noise pollution) may make a previously occupied area unsuitable for this species. Further research needs to be done to identify whether these factors are altering habitat availability in the New York Bight.

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Choose an item.	Choose an item.	Yes	Choose an item.	Choose an item.	Choose an item.

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

What little life history information is known for sei whales comes from all different ocean basins, and it is unknown whether different populations of sei whales exhibit different life history patterns. However, it is likely that they are similar (NMFS 2011, Prieto et al. 2011). Sei whales migrate seasonally to lower latitude breeding grounds (NMFS 2011, Prieto et al. 2011). The location of these breeding grounds is currently unknown. Based on historical whaling catch data, the migration is believed to be structured by sex and age class, and pregnant females appear to be the first to migrate to and from these grounds (Prieto et al. 2011).

It is believed that the sei whale gestation period is between 10 ¾ and 12 months (Lockyer and Martin 1983). Most calves are born in November and December in the North Atlantic, and conception probably takes place in December and January (Lockyer and Martin 1983). It is believed that sei whale calves are nursed for six to nine months (Lockyer and Martin 1983). Females are believed to have a calving interval of at least two years (Jonsgård and Darling 1977, Lockyer and Martin 1983), and the average age of sexual maturity is believed to be 8-10 years for both males and females (Best and Lockyer 2002).

Little is known on natural mortality in sei whales. Killer whales and sharks may prey upon young or sick individuals, although the extent of this predation is unknown (NMFS 2011, Prieto et al. 2011). An unknown disease in California waters was found to affect 7% of sei whales in the early 1980s. This disease caused the shedding of baleen plates, which impaired the feeding ability of infected whales (Mizroch et al. 1984). No evidence of such a disease has been found in the North Atlantic. There has been some evidence of a viral disease that caused inflammation in the lungs of 14% of sei whales examined in Iceland, although no causative agent was found (Lambertson 1990).

Parasites are considered to be one of the biggest natural threats to sei whales (Horwood 1987). Sei whales in the Antarctic showed a high incidence of infection with several species of helminth parasites (Dailey and Vogelbein 1991). These parasites are known to be capable of causing severe complications in marine mammals, especially when infecting the liver, urinary and respiratory systems, and brains (Lambertsen 1986, Lambertsen et al. 1986, Dailey 2001).

Vessel collision and entanglement in fishing gear are considered the two major human-caused sources of mortality and serious injury. However, entanglement may be less of an issue for Sei whales than for some other large whales because they are generally found far offshore. (NMFS 2013).

VI. Threats *(from NY 2015 SWAP or newly described)*

Two of the best known anthropogenic threats to large whale populations include vessel strikes and fishery interactions, specifically entanglement in fishing gear. Both of these threats are believed to be more of a problem than observational studies suggest, as many events are most likely not reported, and affected whales may die at sea and not be recovered (Heyning and Lewis 1990). Unfortunately, it is extremely difficult to track a specific event to a geographic location, so it is nearly impossible to know whether an event occurred in New York waters. There are five known sei whale/vessel collisions, including an instance where a sei whale was carried into New York Harbor on the bow of a ship. It is unknown whether the whale was struck and killed in New York waters or if the collision occurred outside of state waters and the carcass was carried in by the ship. Compared to many other species of large whales, such as the closely related fin whale, there are relatively few reported instances of vessel strikes on sei whales (Jensen and Silber 2004). It is unknown if there are actually fewer collisions between sei whales and vessels, or if they go unreported, as sei whales are typically found farther offshore, so carcasses would not be recovered in most instances.

Entanglement in fishing gear is another major threat to many species of cetaceans throughout the North Atlantic. There have only been three reported sei whale entanglement events in the North Atlantic since 1990; only one resulted in a known mortality; however, the other two events were reported as "severe injuries," and the final status of the individuals were unknown (NMFS 2011, NMFS 2012, NMFS 2013). It is believed that sei whales are not at as high of a risk of entanglement as other rorquals because of their offshore distribution (NMFS 2011). As with vessel strikes, it is unknown if that is actually the case, or if entanglements simply go undetected and unreported.

Stranding and entanglement response and outreach in New York are currently provided by Riverhead Foundation. They respond to all marine mammal strandings; however, they are not authorized to disentangle large whales. The nearest group authorized by NOAA to perform such entanglements is the Rhode Island Division of Fish and Wildlife.

Sei whale distribution and foraging have been linked to currents and ocean fronts in numerous studies (Skov et al. 2008, Olsen et al. 2009, NMFS 2011). Long term changes in climate and oceanographic processes as a result of climate change could have numerous effects on sei whales. Temperature and current shifts could lead to occupied habitats becoming unsuitable, and the use of previously unoccupied habitat as a response of a shift in distribution. Sei whales in the North Atlantic feed primarily on copepods, which have already exhibited signs of a shift in distribution as a result of climate change (Hays et al. 2005).

The effects of other anthropogenic activities, such as offshore energy development are also largely unknown. Oil spills threaten marine mammals including the sei whale. The other major threat of development and other human activities is noise pollution. Cetaceans, including sei whales, rely heavily on sound to communicate. Increasing levels of anthropogenic noise in the ocean could hamper this ability. Several species of large whales have been found to increase the amplitude of their calls in response to large levels of noise, which could lead to increased energy consumption (See Holt et al. 2008, Parks et al. 2010). Above a certain level of noise, some whale species are known to stop vocalizing (See Melcón 2012), and there is also the potential for masking of calls if background noise occurs within the frequencies used by calling whales (BRP 2010). In a large, solitary species, this could lead to difficulty finding other whales, including potential mates. The acoustic monitoring that took place in the New York Bight region in 2008 and 2009 did find elevated levels of background noise (due in large part to shipping traffic) and the potential for masking of whale calls (BRP 2010).

In some instances, exceptionally loud noises, usually active military sonar, have led to temporary and permanent threshold shifts and even death by acoustic trauma in certain species of cetaceans (NMFS2011). While this has not been documented in sei whales, there is the potential for such deleterious effects to occur.

Recreational vessel activity, such as whale-watching has been known to affect some species of cetaceans. Unlike some other species, sei whales are not the target of heavy whale-watching pressure, so it is assumed that these effects are minimal.

It is currently believed that contaminants such as organochlorines, organotins, and heavy metals do not negatively impact sei whales and other baleen as much as other marine mammals (O'Shea and Brownell 1994). Sei whales feed at a low trophic level, and so there is little chance for the bioaccumulation of toxins that occurs in many of the odontocetes (toothed whales). While no significant effects of contaminants has yet been documented, it is possible that exposure has long-term effects such as reduced reproductive success and/or long-term survival.

Threats to NY Populations	
Threat Category	**Threat**
1. Transportation & Service Corridors	Shipping Lanes (vessel strikes)
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (entanglement in fishing gear)
3. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss/change of prey from climate change)
4. Energy Production & Mining	Oil & Gas Drilling (exploration and production)
5. Energy Production & Mining	Renewable Energy (offshore wind)
6. Human Intrusions & Disturbance	Recreational Activities (whale watching, recreational fishing)
7. Pollution	Excess Energy (anthropogenic noise including shipping)
8. Pollution	Garbage & Solid Waste
9. Pollution	Industrial & Military Effluents (contaminants)
10. Human Intrusions & Disturbance	War, Civil Unrest & Military Exercises (military sonar)
11. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (transmittable disease, viruses, parasites)
12. Invasive & Other Problematic Species & Genes	Problematic Native Species (algal blooms)

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: ✓ **No:** _____ **Unknown:** _____

If yes, describe mechanism and whether adequate to protect species/habitat:

The sei whale is protected in the United States by its status as a federally Endangered species. In addition, the sei whale (along with all other marine mammals) receives federal protection under the Marine Mammal Protection Act of 1972 (MMPA). The sei whale is protected internationally from commercial hunting under the International Whaling Commission's (IWC) global moratorium on whaling. The moratorium was introduced in 1986, and is voted on by member countries (including the United States) at the IWC's annual meeting.

Sei whales are also protected under the Environmental Conservation Law (ECL) of New York. The sei whale is listed as a state endangered species in New York. Section 11 – 0535 protects all state-listed endangered and threatened species and makes it illegal to take, import, transport, possess or sell any listed species or part of a listed species. In addition, Article 17 of the ECL works to limit water pollution, and Article 14 presents the New York Ocean and Great Lakes Ecosystem Conservation Act. This act is responsible for the conservation and restoration of coastal ecosystems "so that they are healthy, productive and resilient and able to deliver the resources people want and need." Both of these help to protect the habitat of the sei whale. Whether they are adequate to protect the habitat is currently unknown.

The North Atlantic Large Whale Take Reduction Plan identified floating groundline used in the trap and pot fisheries as an entanglement threat for large whales. The National Marine Fisheries Service subsequently passed a new law making it mandatory for all pot and trap fisheries to switch over to sinking groundline by 2008. To encourage compliance by fishermen, DEC's Marine Endangered Species and Crustacean Unit partnered with the Cornell Cooperative Extension of Suffolk County and initiated gear buyback programs, which removed 16.9 tons of floating rope from New York's commercial lobster fishery. Further analysis is required before it is known if any real reduction in large whale entanglement has occurred as a result of the switch from floating to sinking groundline.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

It is still largely unknown how frequently sei whales utilize the waters of the New York Bight. Long-term surveys and monitoring strategies should be developed. Historically, vessel and aerial survey techniques have been used. These visual techniques provide valuable information, but also are limited by weather and sea conditions and are rather expensive and time-consuming. In addition, these surveys are often focused in more coastal waters, not over the continental shelf area frequented by sei whales (NMFS 2011). The use of passive acoustics as a way to monitor large whales is promising. Cornell University partnered with NYS DEC and placed marine autonomous recording units in the New York Bight region for periods of time in 2008 – 2009. These recorders detected several species of cetaceans using these waters, including sei whales (BRP 2010).

If it is known where and when sei whales are occurring in New York waters, more effective management and conservation strategies can be deployed. Seasonal speed restrictions on vessels in high use areas could be put into effect. In addition, seasonal and/or area closures on certain fisheries where the gear poses the largest threat to large whales may help minimize entanglement in gear.

Near real-time acoustic monitoring of large whales, specifically right whales, is currently being used off of the coast of Massachusetts in an effort to reduce vessel collisions with large whales. When a right whale is detected, an alert goes out to all large shipping vessels in the area, and a speed restriction goes into place. Similar monitoring in New York could help reduce the threat of vessel collisions with large whales in coastal waters. Even if a speed restriction only goes into place for the critically endangered right whale, knowledge that there are large whales in the area could lead to increased awareness and alertness and possibly reduce the potential of a collision.

The sei whale would benefit greatly from further research. Little is known about general life history and demography of this species, and the real effects of the threats in New York waters are unknown. Further research into the actual effects that threats such as climate change are having on sei whales is warranted. In addition, education on this species and the importance of reporting ship strikes and entanglements is encouraged.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection):
https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Conservation Actions	
Action Category	**Action**
1.	
2.	

Table 2: (need recommended conservation actions for sei whale).

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Latest revision	

Species Status Assessment

Common Name: Sperm whale **Date Updated:** 2/16/2024

Scientific Name: *Physeter macrocephalus* **Updated by:**

Class: Mammalia

Family: Physteridae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

Sperm whales are the only member of the genus *Physeter*. Initially, Linnaeus described four separate species in the genus, this has since been disproven and today there is only one recognized species of sperm whale (NMFS 2010). There was much debate over whether *P. catodon* or *P. macrocephalus* (both given by Linnaeus) was the correct name for the species. Today, most cetologists recognize Holthuis' (1987) argument that the principle of "First Reviser" should apply, and therefore the correct name for the sperm whale is *P. macrocephalus* (NMFS 2010). Both names are still seen in the literature. Some molecular analyses placed sperm whales as being more closely related to baleen whales than other toothed whales (Milinkovitch et al. 1993, 1994); however, most recent evidence does not support this claim (Heyning 1997, Cassens et al. 2000, Nishida et al. 2003, 2007, Arnason et al. 2004, Agnarsson and May-Collado 2008, Xiong et al. 2009). For the purposes of management sperm whales in the North Atlantic are considered one stock, though finer population structure may exist it is difficult to define (Reeves and Whitehead 1997, Lyrholm and Gyllensten 1998, NMFS 2013).

In general, sperm whales in the U.S. Exclusive Economic Zone (EEZ) are found in areas associated with the edge of the Gulf Stream and other oceanographic factors. These include the continental shelf, the shelf edge and mid-ocean regions beyond (Waring et al 1993, 201, NMFS 2013). Another factor affecting sperm whale distribution is social structure, where animals may group themselves according to social units, with males tending to travel the furthest (Best 1979, Whitehead 2002). In New York, sperm whales have been observed in deep continental shelf waters, as well as in a relatively shallow area off of Montauk Point (Sadove and Cardinale 1993, Scott and Sadove 1997). They are most often seen in spring and early summer in New York waters (Sadove and Cardinale 1993, Scott and Sadove 1997). Most of these whales were sighted in an area that corresponds to a seafloor depression making a channel between Block Island Sound and Block Canyon (Scott and Sadove 1997). Sperm whales occasionally wash on New York beaches. Little current information exists on sperm whales in New York.

The best abundance estimate for sperm whales in the western North Atlantic (from North Carolina to the lower Bay of Fundy) is 1,593 (NMFS 2013). Current population trends are unknown.

I. Status

a. Current legal protected Status

i. **Federal:** Endangered **Candidate:**

ii. **New York:** Endangered

b. Natural Heritage Program

i. **Global:** G3G4

ii. **New York:** SNA **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Vulnerable

-Northeast Regional SGCN: RSGCN

Status Discussion:

The sperm whale was commercially harvested around the world for over two and a half centuries (NMFS 2010). The first whaling regulations did not appear until 1970, when the first quotas were introduced. The moratorium on commercial whaling put into place by the International Whaling Commission (IWC) gave sperm whales protection beginning in the 1981 – 1982 pelagic whaling season and the 1986 coastal whaling season (IWC 1982). Of the large whale species it is believed that sperm whales remain the highest in terms of abundance (NMFS website). The best available worldwide estimate for sperm whales is 200,000-1,500,000. However, this is based on information from just a few areas within their range (NMFS website). Whitehead (2002) estimated that the entire global population of sperm whales is around 32% of their pre-whaling numbers. It is believed that sperm whales in the North Atlantic most likely are above this level, as sperm whales were not as heavily exploited in the North Atlantic (NMFS 2010).

In the United States, the sperm whale has been listed by the Endangered Species Act since it was enacted in 1973, and the Marine Mammal Act since 1972. The best population estimate for the eastern United States is 1,593 (NMFS 2013). This estimate is based on a combination of shipboard and aerial surveys that took place from North Carolina north to the lower Bay of Fundy (NMFS 2013). It is thought this estimate is low because it does not correct for dive-time, which can be about 30-60 minutes in duration (Whitehead et al 1991, Watkins et al 1993, NMFS 2013).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Choose an item.	Choose an item.			Choose an item.
Northeastern US	Yes	Choose an item.	Choose an item.		Endangered	Yes
New York	Yes	Choose an item.	Choose an item.		Endangered	Yes
Connecticut	Yes	Choose an item.	Choose an item.		Not listed	No
Massachusetts	Yes	Choose an item.	Choose an item.		Endangered	Yes
Rhode Island	Yes	Choose an item.	Choose an item.		Not listed	Yes
New Jersey	Yes	Choose an item.	Choose an item.		Endangered	Yes
Pennsylvania	No	Choose an item.	Choose an item.			Choose an item.
Vermont	No	Choose an item.	Choose an item.			Choose an item.
Ontario	No	Choose an item.	Choose an item.			Choose an item.

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
Quebec	Yes	Choose an item.	Choose an item.		Not listed	Choose an item.

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

NOAA, NEFSC, Protected Species Branch conducts regular aerial and ship board surveys to determine the abundance and distribution of protected species in the North East. However, sampling, including scale of sampling, is not specific either to large whales in the New York Bight, nor is sampling year round. There are no current monitoring activities or regular surveys conducted by the State of New York or specific to large whales in the New York Bight. However, DEC, Marine Resources and Natural Heritage Program were planning to establish a regular monitoring program for large whales. The monitoring techniques and protocols have not yet been determined, and there was funding for three years of monitoring (as of 2013).

Trends Discussion *(insert map of North American/regional distribution and status):*

Trends have not been analyzed for the western North Atlantic population of sperm whales. Although they were heavily exploited by commercial whaling until the 1970s, the sperm whale remains one of the most abundant large whales in the area (NMFS 2010). Using methods developed by Whitehead (2002), NMFS (2010) estimated the Atlantic population of sperm whales to number between 90,000 – 134,000 sperm whales. Vessel and aerial surveys in 2004 from Florida to the Bay of Fundy developed a population estimate of about 4,804 (NMFS 2013). 2,607 was the estimate for the population from Maryland north to the Bay of Fundy (NMFS 2013). These estimates were not corrected for dive time, and thus are most likely an underestimation of actual abundance (NMFS 2013). The best estimate for sperm whale abundance off of the eastern U.S. comes from shipboard and aerial surveys conducted in 2011 (NMFS 2013). These surveys covered the area north of North Carolina to the lower Bay of Fundy, and estimated an abundance of 1,593 sperm whales (NMFS 2013). Because the survey methods changed between years it is not possible to directly compare the 2011 estimate with earlier estimates. This makes it is very difficult to detect trends (NMFS 2013).

However, global population trends have been modeled and it is estimated that he estimated that the worldwide population of sperm whales was at about 32% of its pre-whaling level as of 1999 (Whitehead 2002). The rate of population increase was estimated to be 0.965% per year (Chiquet et al. 2013). However, this rate is sensitive to changes in survivorship especially of mature females, where a decline of just over 2% could lead to population decline (Chiquet et al. 2013).

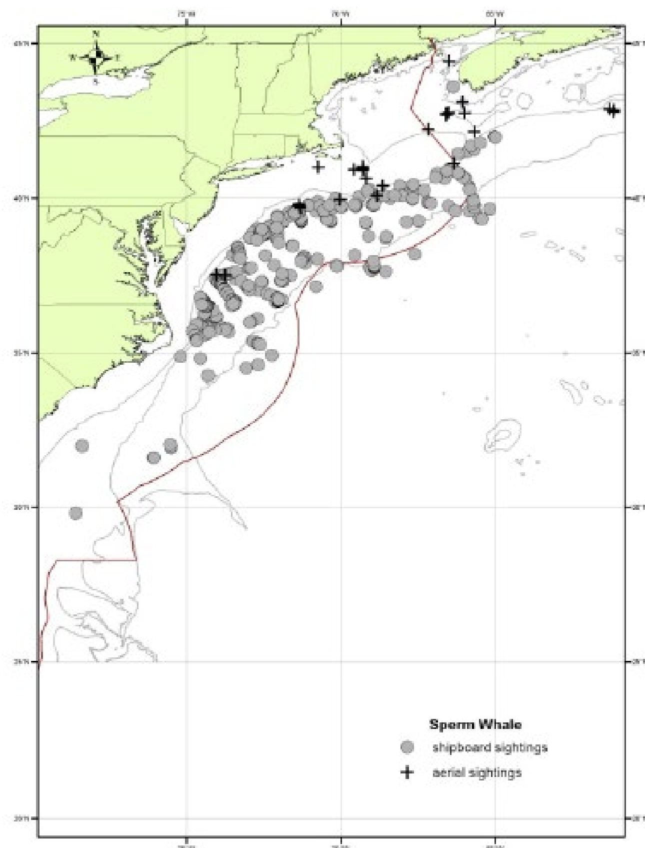

Figure 1. Distribution of sperm whale sightings from NEFSC and SEFSC shipboard and aerial surveys during the summer in 1998, 1999, 2002, 2004, 2006 and 2011. Isobaths are the 100m, 1000m, and 4000m depth contours. Figure from NOAA. Fisheries 2013.

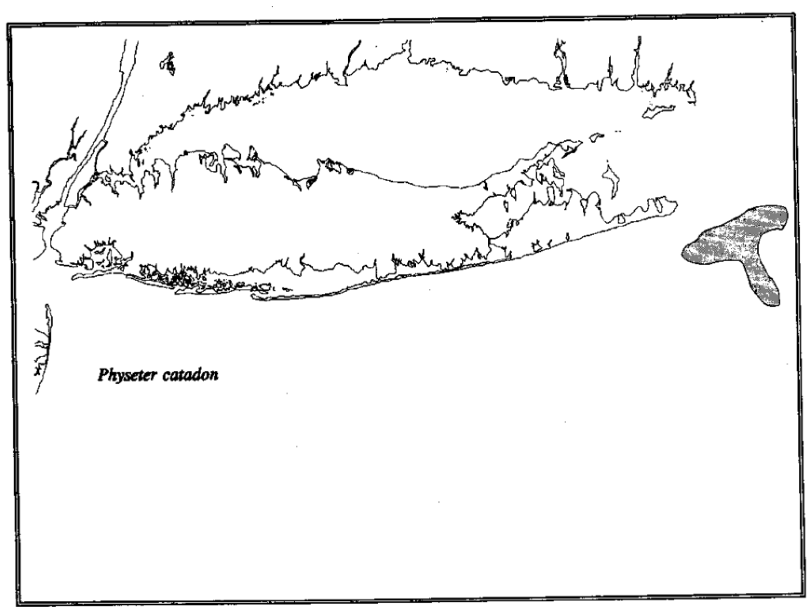

Figure 2. Locations of sightings of sperm whales by surveys conducted by the Okeanos Ocean Research Foundation from 15 years of research from the 1970s – early 1990s. From Sadove & Cardinale 1993.

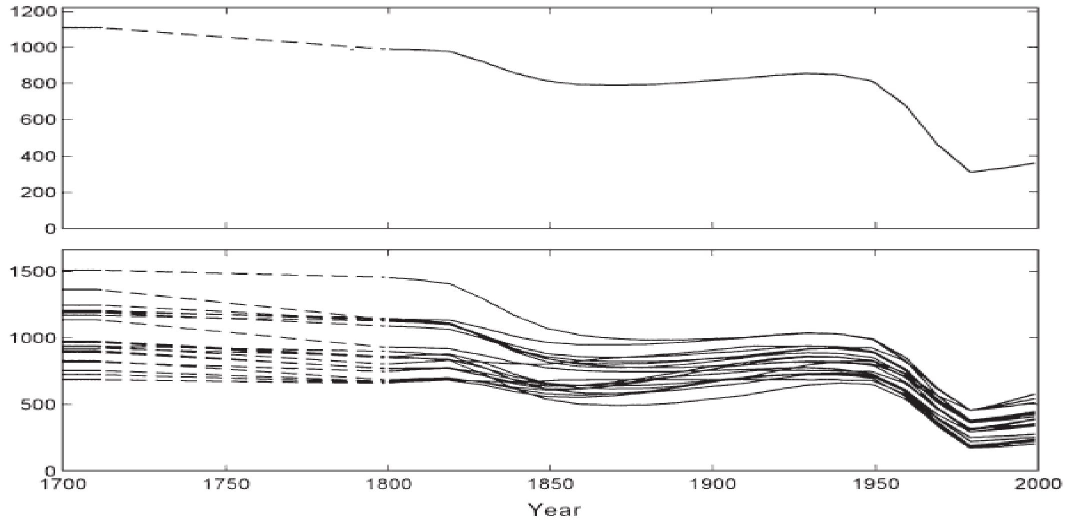

Figure 3. *Physeter macrocephalus.* Estimated population trajectories for the global sperm whale population from 1700 to 1999. The upper plot shows the trajectory calculated from Whitehead (2002)'s best estimate of the population and model parameters, the lower plot shows twenty trajectories calculated using randomly chosen parameters within reasonable ranges. The period from 1712 to 1800 is dashed as information about this time period is very limited. Figure from Whitehead (2002).

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995	12		
1995-2004			
2005-2014	1,593	Western North Atlantic	
2015-2023			

Table 1: Records of sperm whale in New York.

Details of historic and current occurrence:

The Okeanos Ocean Research Foundation documented sperm whales on 12 separate occasions from 1983 – 1989 (Scott and Sadove 1997). In most instances, it is unknown whether these were the same animals seen multiple times or previously unseen individuals. In 1987, the same individual was sighted on four occasions (Scott and Sadove 1997). The whale was in a group of four individuals during each event, so it is believed that these sightings all consisted of the same group of individuals (Scott and Sadove 1997). Many of these sightings came from the Okeanos Foundation's whale-watch vessel, and were not a product of systematic surveys (Scott and Sadove 1997). Due to the nature of these sightings, it is possible that other groups of sperm whales could have been present in the area and were not sighted (Scott and Sadove 1997).

Date	n	Latitude (N)	Longitude (W)	T_S (C)	Depth (m)
06/25/83[a]	3	40°53.0′	71°40.9′	—	55.5
07/09/83	1	40°52.3′	71°38.0′	19°	51.8
07/12/83[a]	1	40°51.1′	71°41.6′	—	58.0
07/23/83[b]	1	40°46.5′	71°38.1′	—	65.2
06/30/85[a]	1	40°49.6′	71°37.0′	—	58.2
07/05/85[a]	4	40°45.0′	71°39.8′	—	68.0
05/27/87	4	40°50.5′	71°40.6′	11°	61.0
06/07/87[a]	2	40°44.2′	71°31.1′	—	63.0
06/10/87	4	40°00.4′	71°40.3′	14°	41.5
06/14/87	4	40°52.1′	71°41.2′	13°	57.9
06/16/87	4	40°54.5′	71°40.1′	17°	53.3
06/17/87[a]	1	40°03.5′	71°24.7′	—	42.9

Notes: No *P. macrocephalus* were sighted during 1982, 1984, 1986, 1988, and 1989; [a] sighted from the whale-watching vessel *Sunbeam*. [b] sighted from the sport fishing vessel *Bluefin*.

Table 2. Sperm whale sightings from 1983 – 1989 as documented by Okeanos Ocean Research Foundation. n = number of individuals sighted and T_s = sea surface temperature. As adapted from Scott and Sadove (1997).

Fisheries show consistent presence in the New York Bight at the edge of the continental shelf (Figure 1). For state waters the most recent accessible information comes from Okeanos Foundation. Scott and Sadove (1997) reported sperm whales in New York waters on sixteen occasions from 1990 – 1994. It is unknown whether sightings were of the same individuals (Scott and Sadove 1997). Subsequent reports of sperm whales in state waters have either not been published or are not accessible.

Date	n	Latitude (N)	Longitude (W)	T_S (C)	Depth (m)
05/22/90	5	40°58.0′	71°32.7′	11°	51.8
05/27/90	1	40°50.9′	71°45.4′	11°	53.3
05/28/90	3	40°50.9′	71°44.0′	11°	56.4
05/29/90	3	40°51.5′	71°41.9′	12°	58.2
10/19/91	4	40°53.1′	71°42.5′	15°	58.0
06/08/92	1	40°52.3′	71°41.1′	12°	58.2
06/10/92	4	40°50.8′	71°42.4′	13°	61.9
06/13/92	3	40°56.1′	71°43.7′	13°	55.5
05/31/93	3	40°44.1′	71°37.8′	13°	66.8
05/16/94	2	40°57.6′	71°29.5′	9°	54.9
05/20/94	1	40°59.7′	71°29.5′	9°	51.0
05/21/94	4	40°58.0′	71°38.4′	10°	51.0
05/25/94	2	40°59.6′	71°37.0′	11°	41.0
05/28/94	4	40°57.2′	71°36.7′	12°	43.2
06/04/94	4	40°58.9′	71°27.0′	14°	55.1
09/04/94	4	40°55.1′	71°40.6′	20°	51.8

Table 3. Sperm whale sightings from 1990 – 1994 as documented by Okeanos Ocean Research Foundation. n = number of individuals sighted and T_s = sea surface temperature. As adapted from Scott and Sadove (1997).

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	

Column options

Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item

Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

Much of our knowledge of sperm whale use of New York state waters comes from surveys conducted by Okeanos Foundation from the 1970s – early 1990s. Sperm whales were documented in eight years from 1983 – 1995 (Scott and Sadove 1997). Unfortunately, there has been little follow-up work to these surveys in recent years. It is currently unknown how often and how many sperm whales are found in New York waters. They seem to be consistently found further offshore in the New York Bight near and over the shelf edge however (NMFS 2013). Though details about time of year when they are present and how long they remain in the area are unknown.

Sperm whales are considered one of the most abundant large whales in the western North Atlantic (NMFS 2010). The current best estimate of sperm whale abundance in the western North Atlantic is 1,593 animals ranging from North Carolina to the lower Bay of Fundy (NMFS 2013).

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Pelagic

b. Marine, Deep Subtidal

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
No	Yes	Unknown	

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

Sperm whales can be found across the entire North Atlantic (NMFS 2010). Currently, the International Whaling Commission recognizes one stock of sperm whales that encompasses the entire North Atlantic (NMFS 2013). Lack of genetic differentiation and documented movements of male sperm whales across the ocean basin suggest that there is not well-defined segregation between the western North Atlantic and eastern North Atlantic populations (Mitchell 1975, Reeves and Whitehead 1997, Dufault et al. 1999, Englehaupt et al. 2009).

In the waters off of the eastern U.S., sperm whales appear to follow a seasonal cycle in distribution (CETAP 1982, Scott and Sadove 1997). Sperm whales can be found concentrated near Cape Hatteras, North Carolina in the winter (NMFS 2013). During the spring, sperm whales are most often found off of Delaware and Virginia, and spread throughout the mid-Atlantic bight and southern Georges Bank; in the summer this range expands to include the continental shelf south of New England and north of Georges Bank into the Northeast Channel (NMFS 2013). During the fall, sperm whales are found along the continental shelf south of New England and also along the edge of the continental shelf in the mid-Atlantic bight (NMFS 2013).

Sperm whales are often found in deep water areas along the outer shelf edge and open ocean waters (Waring et al. 2001). They are often found near seamounts and underwater canyons (Waring et al. 2001). Sperm whales are also believed to be associated with the Gulf Stream edge and warm-core rings (Waring et al. 1993, 2001). Typically, males range farther north into cooler waters than females, who remain in temperate to tropical waters with calves and immature animals (NMFS 2010). Distribution seems to be driven primarily by suitability of the area for breeding and the availability of prey. Sperm whale diet consists of sharks, skates, fishes and large squid (NMFS website). They are able to perform long, deep dives to access their prey. Dives may last from 30-60 minutes and be to depths of 400 m (1,312 ft) (NMFS website).

In New York state waters, the majority of sperm whale sightings have occurred in the late spring to early summer period (Sadove and Cardinale 1993, Scott and Sadove 1997). Two of the 28 sightings of sperm whales from 1983 – 1994 were in the fall; sampling was not as intense during this period of time, so it is unknown whether whales return to the area during this time (Scott and Sadove 1997). The average water depth of the sightings was 55 m (Scott and Sadove 1997). The sightings reported by Scott and Sadove (1997) centered on a bathymetric depression that marks the channel running between Block Island Sound and Block Canyon, just under 30 km SSE of Montauk Point. Although feeding was not confirmed, Scott and Sadove (1997) believed that foraging was occurring and hypothesized the sperm whales used the channel to follow prey inshore. In New York Bight waters sperm whales have been sighted at and over the edge of the continental shelf (NMFS 2013).

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

Sperm whales have a complex, multilevel society. Females form ‘social units’, which contain females and immature animals that travel together, care for each other’s offspring, and defend each other (Whitehead 1998, Christal et al. 1998, Pitman et al. 2001, Gero et al. 2008, Ortega-Ortiz et al. 2012). These units are typically found in temperate and tropical waters south of around 45°N, although they can be found farther north (NMFS 2010). Sexually mature males travel to these areas to breed with females in the winter (NMFS 2010). The inter-birth interval is around 4 – 6 years (Best et al. 1984). Females sperm whales reach sexual maturity at around 9 years of age and rarely give birth after the age of 40 (Whitehead 2003). Sexual maturity among males is prolonged and may occur between the ages of 10-20, though they are not active breeders until their late twenties (Best 1979, NMFS website).

Gestation is believed to range from 15 months to over a year and a half (NMFS 2010). Females nurse their offspring communally for at least two years (Best et al. 1984). Most females remain within their social unit for life (Christal et al. 1998). Males typically leave their mothers around the age of ten to move to cold waters and form bachelor groups (Whitehead 2003). Males are usually solitary once they reach their prime breeding age (Christal and Whitehead 2001). Sperm whales are known to live for at least 60 years (Rice 1989).

Sperm whales are known to be capable of long-distance movements. One male sperm whale tagged in Nova Scotia in 1966 was killed off of Spain in 1973 (Mitchell 1975). Sperm whales killed off of Iceland and Spain have had harpoon fragments from the Azores embedded within them (Martin 1982, Aguilar 1985). Tagged sperm whales have also crossed the equator (Ivashin and Rovnin 1967).

Sperm whales occasionally fall victim to predation events. There have been several accounts of sperm whales harassing and/or attacking sperm whales; occasionally these attacks have resulted in a kill (Pitman and Chivers 1998, Pitman et al. 2001). There has been at least one record of a group of killer whales killing a seemingly healthy adult female sperm whale off the coast of California (Pitman and Chivers 1998). All of the existing published records of attacks on sperm whales by killer whales took place in either the Pacific or Southern Oceans. Sperm whale males also fight among each other (NMFS 2010).

Sperm whales are a species that occasionally mass strand. The causes of these stranding events are usually unknown (Rice 1989, NMFS 2010). There has been some evidence that sperm whale strandings are influenced by lunar and solar cycles (Wright 2005). While the exact mechanisms are currently poorly understood, it is believed that the strandings could be related to the effects that light levels have on the vertical migration of sperm whale prey (Wright 2005) or variations in the magnetic field as a result of solar cycles (Vanselow and Ricklefs 2005).

Disease appears to play some role in natural mortality of sperm whales, although little is known on the full extent it has on sperm whale populations (Lambertsen 1997, NMFS 2010). Lambertsen (1997) identified two potentially lethal diseases in sperm whales: myocardial infarction associated with coronary atherosclerosis and gastric ulceration as a result of nematode infection. Additionally, bone lesions in the rib and chevron area of sperm whales have been observed; Moore and Early (2005) hypothesized that this necrosis could be caused by the formation of nitrogen bubbles after deep dives and ascents. The bone necrosis appeared to be cumulative, with the bone damage increasing in severity as the size of the whale increased (Moore and Early 2005).

Primary human causes of mortality in sperm whales include ship strike and entanglement in fishing gear. However, entanglement may be less of a problem for sperm whales than for other large whales due to their offshore distribution (NMFS 2013).

Little is known on the demographic and life history of sperm whales in New York. The Okeanos Foundation documented two periods of abundance in state waters: one during the late spring and early summer, and another potentially during the fall (Sadove and Cardinale 1993, Scott and Sadove 1997). Based on animal size and head to body size ratio, it is believed that both sexes and all age classes except for calves have been sighted (Sadove and Cardinale 1993, Scott and Sadove 1997). No direct observations of feeding have been made, but on at least one instance parts of squid were observed near where sperm whales were diving (Scott and Sadove 1997). Scott and Sadove (1997) believed that sperm whales take up a short-term residence in the spring/early summer (whales were usually sighted for a duration of one to four weeks) before migrating farther east. The Okeanos Foundation did not usually survey in the fall and winter, so it is unknown whether the few additional fall sightings represented a seasonal return to New York waters or were random, chance sightings (Scott and Sadove 1997).

VI. Threats *(from NY 2015 SWAP or newly described)*

Two of the best known anthropogenic threats to large whale populations include vessel strikes and fishery interactions, specifically entanglement in fishing gear. Both of these threats are believed to be more of a problem than observational studies suggest, as many events are most likely not reported, and affected whales may die at sea and not be recovered (Heyning and Lewis 1990). Unfortunately, it is extremely difficult to track a specific event to a geographic location, so it is nearly impossible to know whether an event occurred in New York waters.

Jensen and Silber (2004) compiled information on reported ship strikes from 1975 – 2002. They found that sperm whales were involved in seventeen out of 292 records (Jensen and Silber 2004). Sperm whales often spend relatively long periods of time (up to ten minutes or more) on the surface between deep dives (Jaquet et al. 1998, Whitehead 2003), which could make them more vulnerable to ship strikes (NMFS 2010). In May 2000, a merchant ship reported a collision with a sperm whale in Block Canyon, off of Long Island (Waring et al. 2009). From 2006 – 2010, NMFS (2013) estimated the average number of sperm whales struck by a ship annually to be 0.2. Because of their offshore distribution, it is likely that sperm whales are struck by vessels more often than reported, however, ship strikes are believed to have a relatively low effect on sperm whale populations overall (NMFS 2010).

Sperm whales do not appear to become entangled in fishing gear as often as several other species of large whales (NMFS 2010). However, there have been reports of sperm whales caught in the pelagic gillnet fishery off of the East Coast in the past. This fishery closed in 1997, and drift gillnets were banned in 1999 (NMFS 2013). One sperm whale was taken by the Canadian halibut longline fishery in 2009 and another in 2010. Currently, sperm whales have not been documented as bycatch in U.S. Atlantic commercial fisheries, although abandoned “ghost gear” from the pelagic gillnet and other fisheries could potentially pose a threat to them (NMFS 2013). Additionally, sperm whales can break through or carry away fishing gear once they become entangled, even when injured (NMFS 2010). This ability coupled with their typically offshore distribution most likely leads to an underreporting of sperm whale entanglement. Even if entangled whales do not die from the entanglements, they could suffer from reduced survival and fecundity, as has been documented in North Atlantic right whales (Knowlton and Kraus 2001).

Stranding and entanglement response and outreach in New York are currently provided by Riverhead Foundation. They respond to all marine mammal strandings; however, they are not authorized to disentangle large whales. The nearest group authorized by NOAA to perform such entanglements is the Rhode Island Division of Fish and Wildlife.

Climate change has led to temperature and current shifts throughout the North Atlantic Ocean. These changes could lead to shifts in distribution of sperm whales as occupied habitats may become unsuitable and previously unsuitable habitats may become occupied. There is some evidence from Pacific equatorial waters that sperm whale feeding success and calf production are negatively affected by increases in sea surface temperatures (Smith and Whitehead 1993, Whitehead 1997). The effects of climate change on both sperm whales and their prey need to be further researched.

The effects of other anthropogenic activities, such as offshore energy development are also largely unknown. Oil spills threaten marine mammals including the sperm whale. Ackleh et al. (2012) used passive acoustics to document an apparent shift in sperm whale distribution away from the spill site of the Deepwater Horizon oil spill in the Gulf of Mexico. The other major threat of development and other human activities is noise pollution. Sperm whales rely heavily on sound to both communicate and also for echolocation. Increasing levels of anthropogenic noise in the ocean could hamper these abilities. Ross (1987, 1993) estimated that the ambient noise level in the oceans rose 10 dB from 1950 – 1975 because of shipping; background noise has been estimated to be increasing by 1.5 dB per decade at the 100 Hz level since propeller-driven ships were invented (National Research Council 2003). The oceans are getting progressively louder, and the waters off of New York are no exception (BRP 2010). Acoustic monitoring in the New York Bight region in 2008 and 2009 found elevated levels of background noise (due in large part to shipping traffic) (BRP 2010). High levels of noise could have several effects on marine mammals from changes in foraging success to death (Richardson et al. 1995).

Currently, there is a large level of uncertainty regarding the effects of anthropogenic noise on sperm whales. Sperm whales have been reported to stop echolocating above certain noise thresholds and when echosounders are in the vicinity (Watkins and Schevill 1975, NMFS 2010). Goold (1996) reported a group of sperm whales being driven through a narrow channel by boats and emissions from echosounders and fishfinders, indicating a change of behavior. Several other species of large whales have been found to increase the amplitude of their calls in response to large levels of noise, which could lead to increased energy consumption (See Holt et al. 2008, Parks et al. 2010). It is currently unknown whether sperm whales exhibit this same behavior.

Seismic surveys, often used for oil and gas exploration, may have effects on sperm whale behavior. Sperm whales in the Gulf of Mexico appeared to move away from the area when surveys began (Mate et al. 1994, Davis et al. 1995, Johnson and Miller 2002). However, other studies found no avoidance (NRC 2003, Miller et al. 2009, Stone 2003).

Recreational vessel activity, such as whale-watching, has been known to affect some species of cetaceans. Whether this is a product of whale-watching vessels not frequenting areas where sperm whales are typically located or whether the whales exhibit an avoidance response to vessels is currently unknown (NMFS 2010). In the waters off of New York and the East Coast, sperm whales are rarely sighted by whale-watching vessels, so this unlikely to be much of a threat.

There has been some recent concern about contaminant levels in odontocetes (toothed whales) such as the sperm whale. Odontocetes generally feed at a higher trophic level than most baleen whales, so they are more at risk of bioaccumulation of various contaminants. Since the 1980s, western Europe has observed an increase in sperm whale strandings, leading to concerns that pollution may be a factor (Goold et al. 2002). Some of the stranded whales were tested for various contaminants; while no direct link between the contaminant level and the strandings was found (Jacques and Lambertsen 1997), the levels of mercury, cadmium and organochlorines were high enough to be concerning (Bouquegneau et al. 1997, Law et al. 1997). Holsbeek et al (1999) found that a sample of sperm whales stranded in the North Atlantic had average levels of mercury, PCBs, DDE and polycyclic aromatic hydrocarbons but had levels of cadmium that were twice as high as measurements in the North Pacific. Many of these contaminants have been linked to deleterious health effects and decreased reproductive success in mammal species, but it is currently largely unknown how elevated levels of contaminants affect sperm whales.

Marine solid pollutants can also threaten sperm whales. Sperm whales often feed at the bottom, and are believed to use a suction method to ingest prey (NMFS 2010). In 1989, a necropsy on a sperm whale in the Mediterranean Sea revealed the cause of death to be stomach obstruction by plastic bags and sheets (Viale et al. 1992). Lambertsen (1990) reported that one of 32 sperm whales examined in Iceland was killed by an illness believed to be caused by ingested plastic obstructing the gut. Overall, there are relatively few instances of injury to sperm whales due to marine solid pollutants, so the perceived threat to the population is generally considered to be low.

Threats to NY Populations	
Threat Category	**Threat**
1. Transportation & Service Corridors	Shipping Lanes (vessel strikes)
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (entanglement in fishing gear)
3. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss/change of prey from climate change)
4. Energy Production & Mining	Oil & Gas Drilling (exploration and production)
5. Energy Production & Mining	Renewable Energy (offshore wind)
6. Human Intrusions & Disturbance	Recreational Activities (whale watching, recreational fishing)
7. Pollution	Excess Energy (anthropogenic noise including shipping)
8. Pollution	Garbage & Solid Waste
9. Pollution	Industrial & Military Effluents (contaminants)
10. Human Intrusions & Disturbance	War, Civil Unrest & Military Exercises (military sonar)
11. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (disease: transmittable, viruses, parasites)
12. Invasive & Other Problematic Species & Genes	Problematic Native Species (algal blooms)

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: ✓ **No:** _____ **Unknown:** _____

If yes, describe mechanism and whether adequate to protect species/habitat:

The sperm whale is protected in the United States by its status as a federally endangered species. In addition, the sperm whale (along with all other marine mammals) receives federal protection under the Marine Mammal Protection Act of 1972 (MMPA). The sperm whale is protected internationally from commercial hunting under the International Whaling Commission's (IWC) global moratorium on whaling. The moratorium was introduced in 1986, and is voted on by member countries (including the United States) at the IWC's annual meeting.

Sperm whales are also protected under the Environmental Conservation Law (ECL) of New York. The sperm whale is listed as a state endangered species in New York. Section 11 – 0535 protects all state-listed endangered and threatened species and makes it illegal to take, import, transport, possess or sell any listed species or part of a listed species. In addition, Article 17 of the ECL works to limit water pollution, and Article 14 presents the New York Ocean and Great Lakes Ecosystem Conservation Act. This act is responsible for the conservation and restoration of coastal ecosystems "so that they are healthy, productive and resilient and able to deliver the resources people want and need." Both of these help to protect the habitat of the sperm whale. Whether they are adequate to protect the habitat is currently unknown. Unfortunately, we have limited understanding of where sperm whales occur in New York, so it is impossible to assess whether the habitat protection afforded by these acts are effective.

The majority of documented sperm whale entanglements occurred in gear used by the pelagic gillnet fishery (NMFS 2013). This fishery was closed in 1997, and drift gillnets were banned in 1999 (NMFS 2013). The North Atlantic Large Whale Take Reduction Plan identified floating groundline used in the trap and pot fisheries as an entanglement threat for large whales. The National Marine Fisheries Service subsequently passed a new law making it mandatory for all pot and trap fisheries to switch over to sinking groundline by 2008. To encourage compliance by fishermen, DEC's Marine Endangered Species and Crustacean Unit partnered with the Cornell Cooperative Extension of Suffolk County and initiated gear buyback programs, which removed 16.9 tons of floating rope from New York's commercial lobster fishery. Further analysis is required before it is known if any real reduction in large whale entanglement has occurred as a result of the switch from floating to sinking groundline.

More could be done to protect all large whales in the New York Bight from ship strike. Particularly around the shipping lanes.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

The extent of sperm whale use of New York waters is poorly understood. What information is available comes from surveys done in the 1970s – early 1990s, though surveys by NMFS show generally the same pattern of distribution. However, these surveys are only carried out at certain times a year so they do not give a complete picture. Long-term surveys and monitoring strategies should be developed. Historically, vessel and aerial survey techniques have been used. Passive acoustics also has promise as a monitoring technique. Sperm whales can be especially difficult to spot during aerial and ship board surveys, as they frequently dive for long periods of time (40+ minutes), so passive acoustics may be needed (NOAA., Fisheries 2010).

If it is known where and when sperm whales are occurring in New York waters, more effective management and conservation strategies can be deployed. Seasonal speed restrictions on vessels in high use areas could be put into effect. In addition, seasonal and/or area closures on certain fisheries where the gear poses the largest threat to large whales may help minimize entanglement in gear.

Near real-time acoustic monitoring of large whales, specifically right whales, is currently being used off of the coast of Massachusetts in an effort to reduce vessel collisions with large whales. When a right whale is detected, an alert goes out to all large shipping vessels in the area, and a speed restriction goes into place. Similar monitoring in New York could help reduce the threat of vessel collisions with large whales in coastal waters. Even if a speed restriction only goes into place for the critically endangered right whale, knowledge that there are large whales in the area could lead to increased awareness and alertness and possibly reduce the potential of a collision.

The sperm whale would benefit greatly from further research. Little is known about general life history and demography of this species in New York, and the real effects of the threats in state waters are largely unknown. Further research into the actual effects that threats such as climate change are having on sperm whales is warranted. In addition, education on this species and the importance of reporting ship strikes and entanglements is encouraged.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection): https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Conservation Actions	
Action Category	**Action**
1.	
2.	

Table 2: (need recommended conservation actions for sperm whale).

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