Species Status Assessment

Common Name: Green turtle **Date Updated:** January 2024

Scientific Name: *Chelonia mydas* **Updated by:**

Class: Reptilia

Family: Cheloniidae

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

The green turtle is a marine turtle that was originally described by Linnaeus in 1758 as Testudo mydas. In 1868 Marie Firmin Bocourt named a new species of sea turtle Chelonia agassizii. It was later determined that these represented the same species, and the name became Chelonia mydas. In New York, the green turtle can be found from July – November, with individuals occasionally found cold-stunned in the winter months (Berry et al. 1997, Morreale and Standora 1998). Green turtles are sighted most frequently in association with sea grass beds off the eastern side of Long Island. They are observed with some regularity in the Peconic Estuary (Morreale and Standora 1998). Green turtles experienced a drastic decline throughout their range during the 19th and 20th centuries as a result of human exploitation and anthropogenic habitat degradation (NMFS and USFWS 1991). In recent years, some populations, including the Florida nesting population, have been experiencing some signs of increase (NMFS and USFWS 2007). Trends have not been analyzed in New York; a mark-recapture study performed in the state from 1987 – 1992 found that there seemed to be more green turtles at the end of the study period (Berry et al. 1997). However, changes in temperature have lead to an increase in the number of cold stunned green turtles in recent years (NMFS, NY Marine Rescue Center).

I. Status

a. Current legal protected Status

i. **Federal:** Breeding population in Florida-endangered; All other populations–Threatened **Candidate:** N/A

ii. **New York:** Threatened

b. Natural Heritage Program

i. **Global:** G3

ii. **New York:** S1N **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Endangered

-Northeast Regional SGCN:

-CITES Appendix I

Status Discussion:

Green turtles have been heavily exploited throughout the world, and the breeding populations of Bermuda and the Cayman Islands were wiped out. Because of declining populations, the green turtle was first listed under the Endangered Species Act in 1978. The Florida and Pacific coast of Mexico breeding populations were listed as endangered, while all other populations were considered threatened (NMFS and USFWS 1991). Green turtles seen in the mid-Atlantic and Northeast are typically treated as endangered, although it is uncertain whether they nest in Florida or another area (ENSP 2006). In the U.S., the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) have joint jurisdiction of this species.

Because the green turtle is highly migratory, it is also protected under several international treaties including the Convention on Migratory Species, the Specially Protected Areas and Wildlife Protocol of the Cartagena Convention, and the Inter-American Convention for the Protection and Conservation of Sea Turtles.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Increasing	Stable	Last 30 years		Choose an item.
Northeastern US	Yes	Increasing	Stable	Late 1970s-2005		Choose an item.
New York	Yes	Unknown	Unknown		Threatened	Yes
Connecticut	Yes	Unknown	Unknown		Threatened	Yes
Massachusetts	Yes	Unknown	Unknown		Threatened	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	Unknown	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):*

The only regular monitoring that occurs for the species is entanglement and stranding response provided by The NY Marine Rescue Center (NYMRC) d/b/a The Riverhead Foundation. Prior to 2015, DEC was able to provide the Riverhead Foundation with 25 acoustic tags for tracking the movements of sea turtles. Several of these tags were placed on turtles that were released by the Foundation.

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

Trends of green turtles in New York are poorly understood. Sadove and Cardinale (1993) estimated that there were “at least 100 turtles” in the New York Bight area each year. Berry et al. (1997) performed a mark-recapture study from 1986 – 1997 and recapture rates indicated that the number of green turtles appeared to be increasing in state waters over the study period. Unfortunately, there are no recent numbers (1997 – present) to further analyze if the population has continued to increase. Stranding reports have been variable from year to year, with no significant trends being reported (DiGiovanni 2009; Figures 4 and 5). Whether the number of stranded individuals can be used as an estimator of population size is currently unknown.

Trend information that does exist indicates that green turtle populations are stable or increasing. NMFS and USFWS (2007) compiled information on nesting populations of green turtles from various nesting grounds in the western North Atlantic thought to be representative of their region. Nesting populations in Florida, the Yucatan Peninsula, Costa Rica, and Suriname are all listed as increasing, while the nesting populations in Venezuela and Brazil are stable (NMFS and USFWS 2007). It is largely unknown where green turtles seen in New York nest, though Florida and/or the Caribbean are likely options. Two satellite-tagged green turtles were tracked from New York to South Carolina before the transmitters died (DiGiovanni 2009, DiGiovanni et al. 2010). In Florida, the number of nests has increased to an abundance of over 5,000 annual nests from the late 1980s to 2005 (NMFS and USFWS 2007). With changes in temperature it is expected that more green and other sea turtles will be seen in the New York area, as evidenced in increases in cold stunned animals (NMFS, Riverhead Foundation).

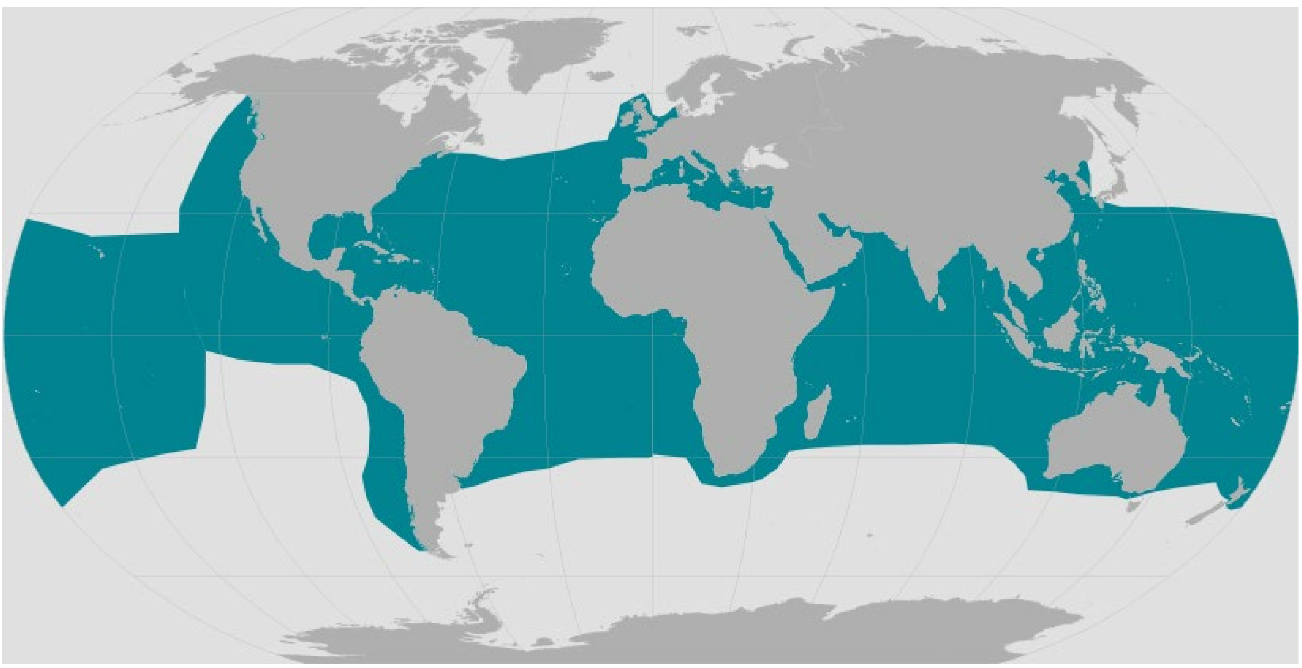

Figure 1. World map providing approximate representation of the green sea turtle's range (NOAA 2023).

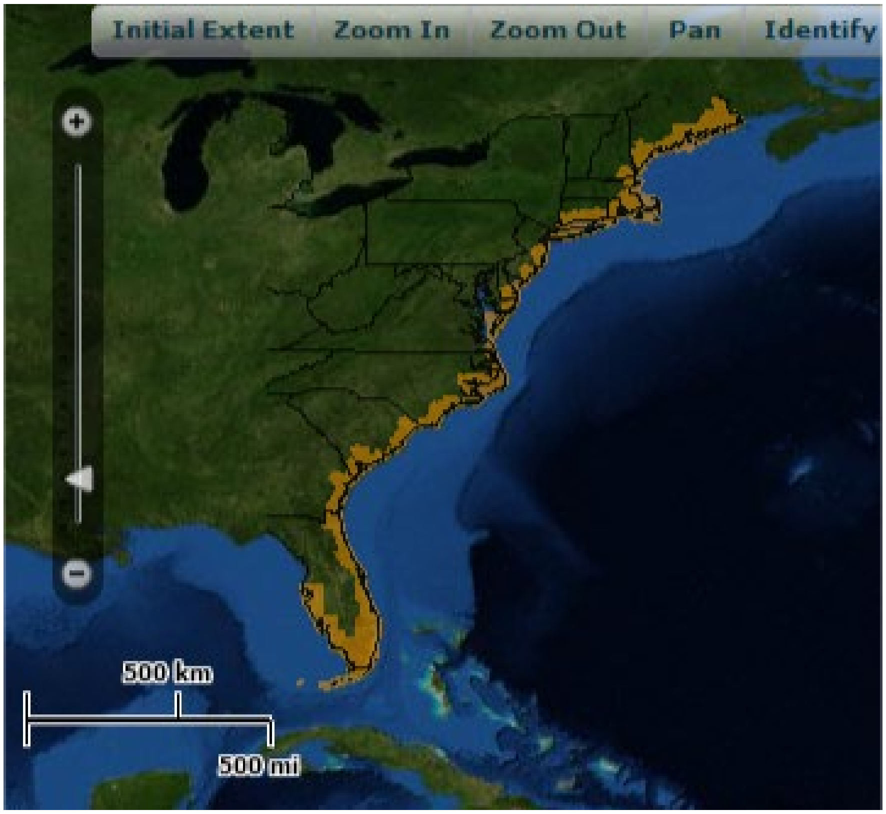

Figure 2. U.S. Atlantic range of the green turtle (USFWS 2012).

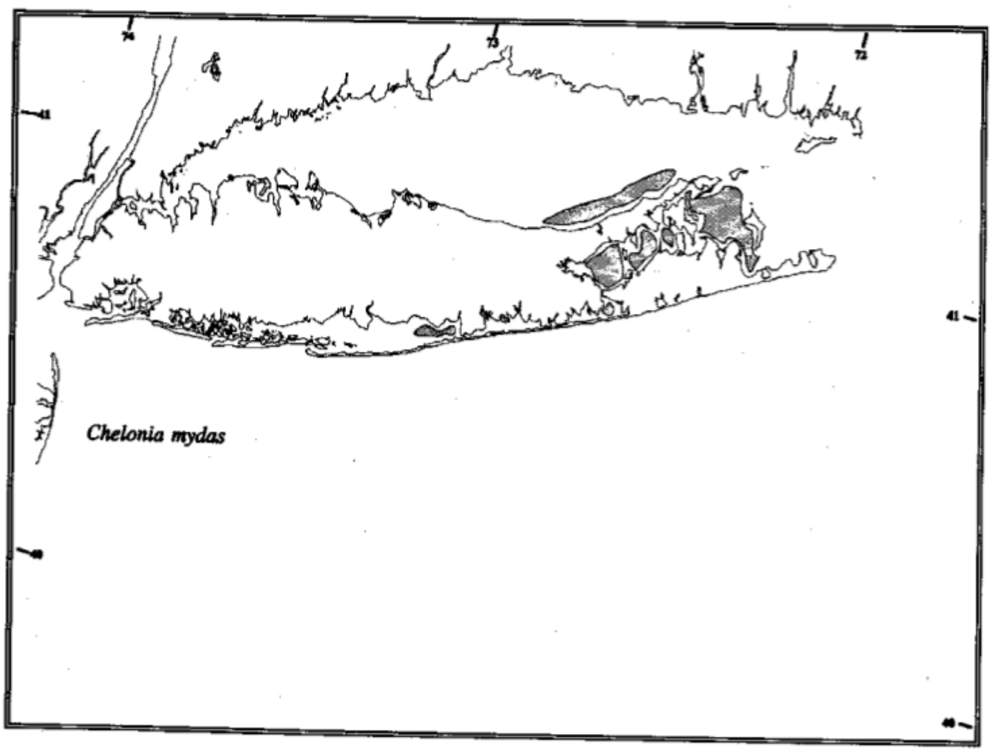

Figure 3. Areas where green turtles have been sighted in New York waters (Sadove and Cardinale 1993).

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

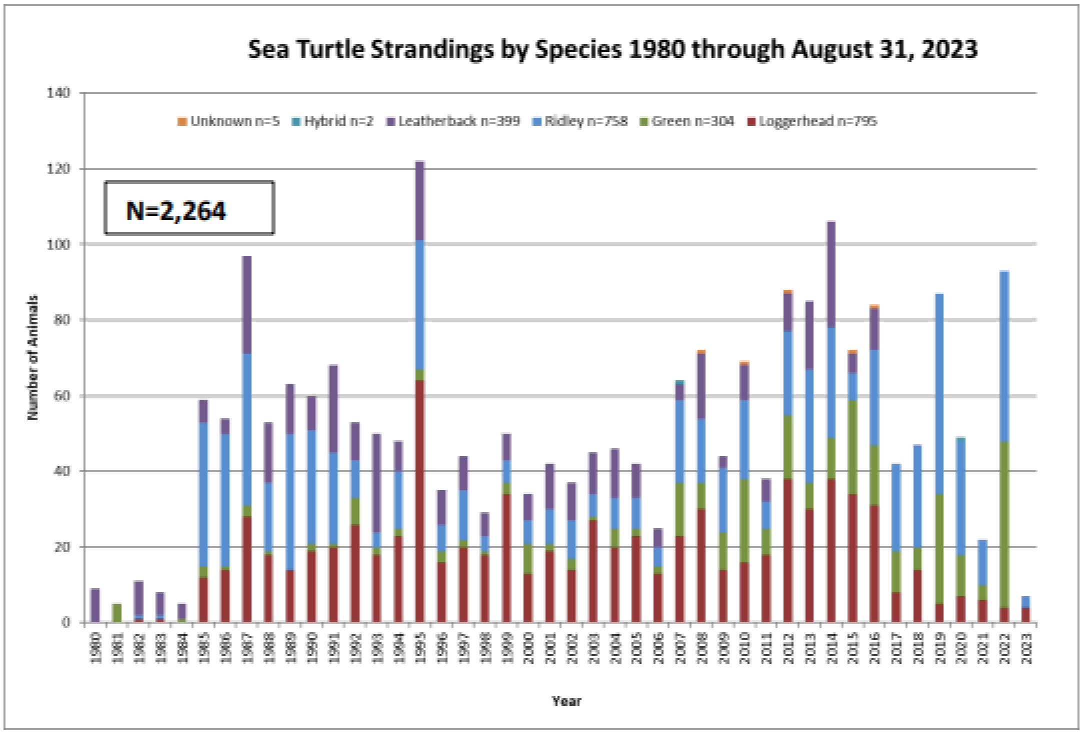

Figure 4: New York sea turtle strandings 1980 through August 31, 2023 by NY Marine Rescue Center (Montello et al. 2023).

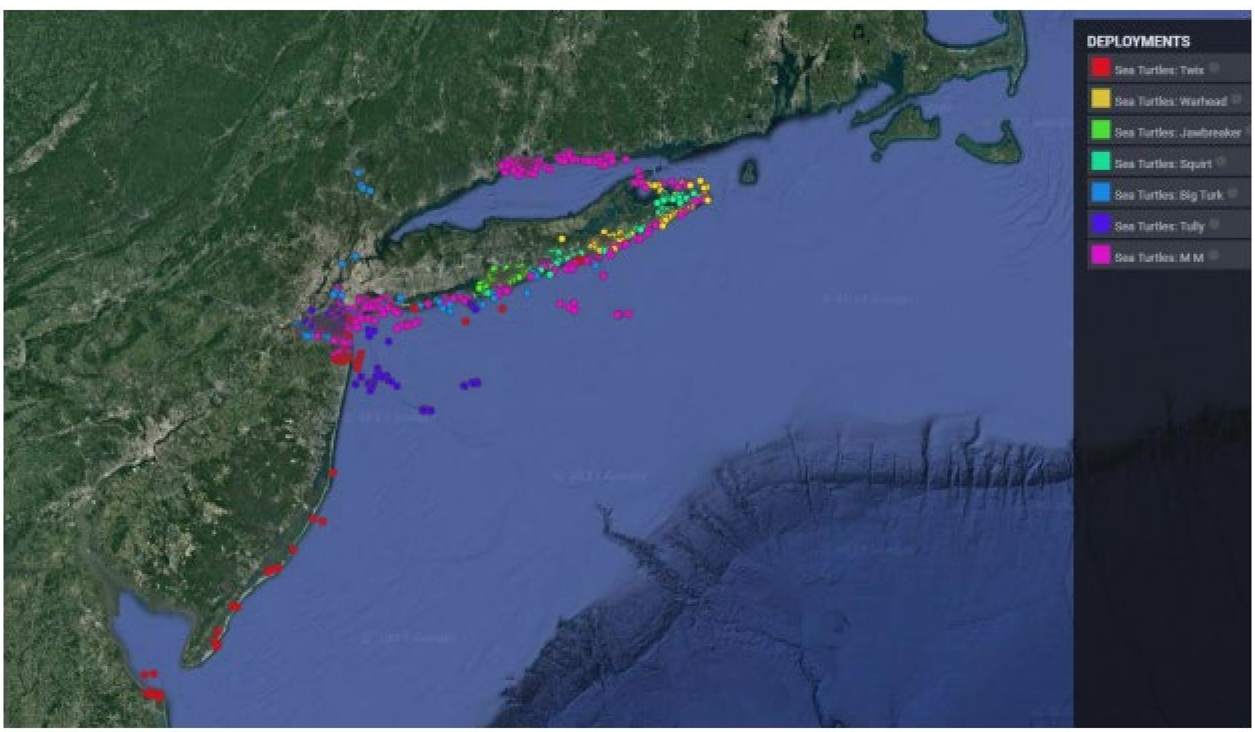

Figure 5: Movement pattern of 8 sea turtles tagged and released by NYMRC (Montello et al. 2023).

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

Table 1: Records of green sea turtle in New York.

Details of historic and current occurrence:

Unknown in New York. Sadove and Cardinale (1993) indicated that "at least 100" green turtles use the New York Bight region each year, based on surveys, reports and strandings from the 1970s to early 1990s. Mark-recapture data in a study from 1986 – 1997 indicated that the number of green turtles using state waters was increasing (Berry et al. 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

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

a. Marine, Shallow Subtidal, Aquatic Bed

b. Pelagic

c. Marine Eelgrass Meadow

d. Estuarine, Brackish Shallow Subtidal, Aquatic Bed

e. Marine, Deep subtidal

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
Yes	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:

Green turtle hatchlings leave nesting beaches and move into convergence zones in the open ocean (Carr 1986). They spend an undetermined amount of time in these areas (Carr 1986). Once reaching a carapace length of ~20-25 cm, green turtles travel from the open ocean to benthic feeding grounds in relatively shallow, protected waters (NMFS and USFWS 1991). While on these feeding grounds, green turtles forage on algae, sea grasses, and invertebrates (NMFS and USFWS 2007).

Green turtles, the majority being juveniles (Morreale et al. 1992, Reynolds and Sadove 1997), are found in New York during the months of July through November (Sadove and Cardinale 1993, Berry et al. 1997). Green turtles are found in some abundance throughout the Peconic Estuary (Berry et al. 1997). While they are seen free-swimming in the pelagic environment, their distribution in New York (see Figure 8 and Trends Discussion) has been found to correlate significantly with that of submerged aquatic vegetation (i.e., eelgrass beds), which they are likely feeding upon (Berry et al. 1997).

Eelgrass beds have declined drastically since the early 1900s. A wasting disease in the early 1930s led to the disappearance of ~90% of eelgrass beds along the U.S. Atlantic seaboard (Stephenson 2009). Brown tide blooms in the 1980s led to further declines in eelgrass beds throughout the Peconic Estuary (Stephenson 2009). It is believed that this area has lost over 80% of its historical (1930s) population of eelgrass (Figure 6 and Stephenson 2009). The Cornell Cooperative Extension (CCE) estimated that the Peconic Estuary boasted approximately 8,720 acres of eelgrass in 1930. In 2003, only 1,552 acres were documented (Figure 6).

The Peconic Estuary Program heads a Submerged Aquatic Vegetation Long-Term Eelgrass Monitoring Program that closely monitors eight eelgrass sites in the Peconic Estuary. There has been an overall decline in shoot density and coverage at the majority of these sites, with three sites no longer supporting eelgrass (Figure 7).

Surveys of eastern Long Island Sound in 2002, 2006 and 2009 have documented trends in eelgrass extent on the northern section of Long Island (Figure 3). While the three areas surveyed have shown an increase in acreage and number of eelgrass beds (Tables 1 and 2), they represent a relatively small area of Long Island Sound (Figure 3).

There has not been a change in overall amount of pelagic and shallow subtidal ecosystem; however, the changes in eelgrass abundance and density could potentially represent a change in habitat suitability. It is known that eelgrass beds in the state have been in decline since the 1930s, but it is not known whether green turtle use of state waters also declined during this period as habitats potentially became less suitable because of reduced foraging areas. 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 New York waters.

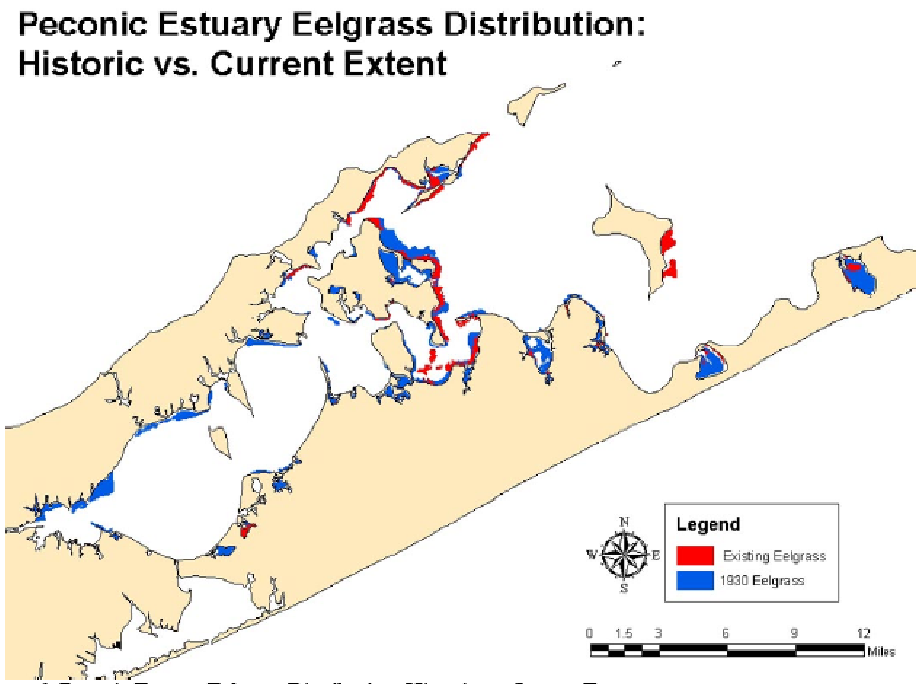

Figure 1: Peconic Estuary Eelgrass Distribution: Historic vs. Current Extent
Approximately 1,552 acres of existing eelgrass documented by Tiner, et al, 2003, using 2000 aerials, as compared to approximately 8,720 acres of 1930 eelgrass.
Source: CCE

Figure 6: Peconic Estuary Eelgrass Distribution, Historic vs. Current Extent (CCE)

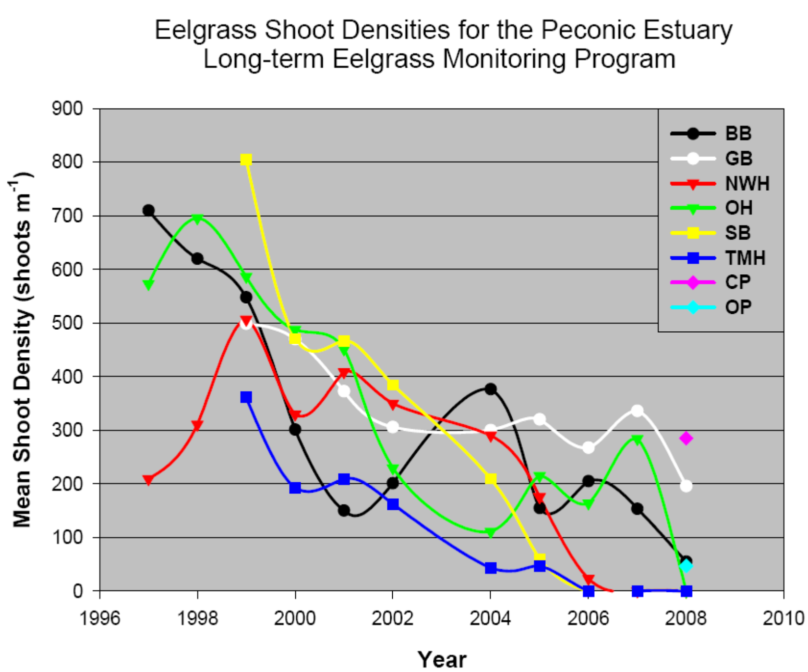

Figure 2: Eelgrass Shoot Densities for the Peconic Estuary Long-Term Eelgrass Monitoring Program
Density at the 8 monitored beds continue to decline; many reference sites and stations supporting little if any eelgrass. BB= Bullhead Bay, Southampton; GB= Gardiners Bay/Hay Beach, Shelter Island; NWH= Northwest Harbor, East Hampton; OH= Orient Harbor, Southold; SB= Southold Bay, Southold; and, TMH= Three Mile Harbor, East Hampton; CP= Cedar Point, East Hampton; OP= Orient Point, Southold.
Source: CCE

Figure 7: Eelgrass shoot densities for the Peconic Esturary Long-term Monitoring Program (CCE)

Figure 8. Location of eelgrass beds in eastern Long Island sound as surveyed by the USFWS in 2009. Darker blue area represents New York waters (Tiner et al. 2009).

Table 2. Acreage and number of three eelgrass beds on the northern tip of Long Island as documented on surveys of eastern Long Island Sound (see Figure 3 for approximate locations of beds). Data sources: Tiner et al. (2010) and Tiner et al. (2007).

Year	Sub-basin	Acres of high density (number)	Acres of medium density (number)	Acres of low density (number)	Total acres (number)
2006	Fishers Island	4.1 (12)	190.4 (25)	6.8 (5)	201.3 (42)
	North Shore	0	18.1	6.8	24.9
	Plum Island	0	9.5	0	9.5
2009	Fishers Island	149.0 (11)	191.3 (33)	5.6 (3)	345.9 (47)
	North Shore	5.0 (3)	5.5 (2)	0	10.5 (5)
	Plum Island	7.6 (1)	0	0	7.6 (1)

Table 3. Changes in acreage and number of eelgrass beds in New York from surveys of eastern Long Island Sound conducted in 2002, 2006, and 2009 (see Figure 3 for approximate location of beds). + represents a gain, while – represents a loss. Source: Tiner et al. (2010).

Sub-basin	2002 - 2006 Acreage Change	2002 - 2006 Change in # of Beds	2006 - 2009 Acreage Change	2002 - 2009 Change in # of Beds
Fishers Island	+7.8	+11	+22.5*	+5
North Shore	+9.2	+1	-14.4	+2
Plum Island	+9.5	+1	-1.9	-0-
Total	+26.5	+13	+6.2*	+7

*Two large beds totaling 122.1 acres on the south side of Fishers Island could be seen on the 2009 imagery while they were not visible on 2006 imagery due to environmental conditions. Field inspections in 2006 had located robust beds in this area and recorded their occurrence as points since the beds could not be accurately delineated on the imagery. Consequently, for the 2009 report, we did not treat this acreage as a gain because robust beds were noted in this area in 2006 and their boundaries could not be established.

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	No	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 lifespan of green turtles is unknown, but thought to be 80 or more years (NMFS 2013). A green sea turtle in the New England Aquarium has been in captivity since 1970, and is believed to be around 80 years old (NEAQ 2013).

In the southeastern U.S., green sea turtles nest from June through September (Ehrhart and Witherington 1992). Females return to the same beaches year after year, although they may lay eggs at several different beaches within a season. Females lay eggs nocturnally at up to nine nests within a season. The average number of nests per female per season is about three; the nests are generally laid at intervals of about two weeks. Clutch size is around 75 – 200 eggs, which incubate for about 45 – 75 days before hatching (NatureServe 2013). Green turtle eggs exhibit temperature dependent sex determination, with eggs incubated below a critical temperature being males, and those incubated above a critical temperature being females (Spotila et al. 1987). Eggs often hatch at night.

It is believed that newly hatched green turtles travel to offshore areas, where they forage for several years (NMFS 2013). Once juveniles reach a certain length (carapace of ~20-25 cm), the majority move into nearshore foraging areas (NMFS and USFWS 2007). These foraging areas can be up to 3,000 km away from nesting beaches (NatureServe 2013). It is at this juvenile stage that green turtles are found in New York and other Northeastern waters (Morreale and Standora 1998).

Green turtles reach sexual maturity anywhere between 20 – 50 years of age (NMFS 2013). Females return to natal beaches to deposit eggs (Carr et al. 1978, Meylan et al. 1990). Females nest at 2,3 or 4 or more year intervals (NMFS and USFWS 2007, NatureServe 2013, NMFS 2013). Reproductive longevity is estimated to range from 17-23 years (Carr et al. 1978, Fitzsimmons et al. 1995, Chaloupka et al. 2004), and females may deposit between 900 – 3,300+ eggs in her lifetime (NMFS and USFWS 2007). Male reproductive behavior is largely unknown, although it is believed that they return to nesting grounds every year to mate (NMFS and USFWS 1991). It is now known that adult green turtles return to the same foraging grounds each year after nesting (Godley et al. 2002, Broderick et al. 2006, NMFS and USFWS 2007), and have specific home ranges that include feeding and resting areas within the major foraging grounds (Seminoff et al. 2002, Godley et al. 2003, Makowski et al. 2006, Seminoff and Jones 2006, Taquet et al. 2006). Some percentage of green turtles remain in pelagic habitats and rarely, if ever, enter nearshore foraging areas (Pelletier et al. 2004, NMFS and USFWS 2007).

Eggs and hatchlings are predated upon by a variety of species, including raccoons, feral hogs, foxes, crabs, and ants (NMFS and USFWS 1991). Raccoons may take up to 96% of all nests on certain beaches (NMFS and USFWS 1991). Severe storms and erosion also destroy some nests (NMFS and USFWS 1991).

Juveniles and subadults have been found to have lower survival rates than adults (NMFS and USFWS 2007). This may be partially accounted for by increased levels of predation on younger turtles. Sharks, killer whales, bass and grouper are all known to prey upon green turtles to some extent; tiger sharks appear to be the principal predator (Stancyk 1982).

Disease is known to have a relatively large effect on many green sea turtle populations. Fibropapillomatosis (FP) causes the growth of tumors that can block the vision in turtles and lead to decreased swimming and foraging capabilities (Herbst 1994, NMFS and USFWS 2007). As many as 62% of the green turtles in Florida are affected by FP (Schroeder et al. 1998).

Sea turtles are vulnerable to dramatic changes in temperature. While green turtles are believed to migrate out of New York waters in late summer, some may be feeding in shallow waters and still be in the area when water temperatures drop significantly (Morreale and Standora 1998). When this happens, sea turtles can fall victim to a process known as cold-stunning. This is a hypothermic state that can result in the turtle drifting at sea in a lethargic state. Cold-stunning often results in mortality, unless the turtles wash ashore and are rescued by stranding groups.

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

Threats to NY Populations	
Threat Category	**Threat**
1. Transportation & Service Corridors	Shipping Lanes (ship strikes)
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch and entanglement in fishing gear)
3. Pollution	Garbage & Solid Waste
4. Pollution	Industrial & Military Effluents (contaminants)
5. Pollution	Agricultural & Forestry Effluents (contaminants)
6. Climate Change and Severe Weather	Temperature Extremes (cold-stunning)
7. Residential & Commercial Development	Housing & Urban Areas (destruction and alteration of nearshore foraging areas from coastal development)
8. Residential & Commercial Development	Commercial & Industrial Areas (destruction and alteration of nearshore foraging areas from coastal development)
9. Residential & Commercial Development	Tourism & Recreation Areas (destruction and alteration of nearshore foraging areas from marina construction)
10. Climate Change and Severe Weather	Habitat Shifting & Alteration
11. Pollution	Excess Energy (anthropogenic noise)
12. Energy Production & Mining	Oil & Gas Drilling (oil spills)
13. Natural System Modifications	Other Ecosystem Modifications (shoreline stabilization)
14. Natural System Modifications	Other Ecosystem Modifications (sea walls)
15. Human Intrusions & Disturbance	Recreational Activities (boating)

One of the major threats to sea turtle populations in New York is fisheries interactions. Sea turtles can become trapped in pound nets, longline fisheries, trap fisheries, trawl fisheries, purse seines and gill nets. Turtles trapped in gear can drown or suffer serious injuries as a result of constriction by lines (NMFS and USFWS 1991). Additionally, turtles can be hooked by longline gear, which can cause injury and reduced feeding capabilities. Trawlers that are not outfitted with Turtle Excluder Devices (TEDs) can entrap and drown sea turtles. Additionally, dredges can destroy habitat and crush or entrap sea turtles (NMFS and USFWS 1991). In New York, Morreale and Standora (1998) reported that commercial fisherman were responsible for 84% of all 317 live turtles captured in a mark-recapture study from 1987 – 1992. 93% of these captures were in pound nets; sea turtles were also caught in trawls and entangled in lobster pot lines and gill nets (Morreale and Standora 1998).

Climate change is believed to have major effects on sea turtles throughout their range. Extreme temperature changes could lead to increased numbers of cold-stunned sea turtles; it is also possible that changing temperatures could lead to conditions that are more favorable for sea turtles. Additionally, climate change is believed to be associated with rising water temperatures, as well as changes in ice cover, salinity, oxygen levels and circulation (IPCC 2007). These changes are likely to cause shifts in range and abundance of different species of algae, plankton and fish (IPCC 2007). These shifts could alter the suitability of New York habitat (as well as habitat in other parts of sea turtles' ranges) for occupancy by sea turtles. Conditions at nearshore foraging areas have been shown to impact the timing of green turtle reproduction (Limpus and Nicholls 1987, Solow et al. 2002), and thus could have large effects on green turtle population dynamics. Changing currents as a result of climate change could affect sea turtle migration and survival of oceanic-stage juveniles (NMFS and USFWS 2007).

Climate change could have significant effects on green turtles in other parts of their range as well. More nests could be destroyed as a result of the increasing abundance and severity of storms along the nesting range. Rising sea levels could cause major problems on low-lying nesting beaches. Additionally, there is concern that rising temperatures could skew hatchling sex ratios towards a strong female bias (NMFS and USFWS 2007). Higher sand temperatures have been documented at at least one nesting site (Hays et al. 2003).

Coastal development can lead to destruction or degradation of sea turtle habitat. Eelgrass beds used by green sea turtles may be destroyed as a result of such development and ecosystem alterations development can exacerbate. Green turtles can occasionally be taken into the cooling systems of coastal power plants, where they are submerged and drown (NMFS and USFWS 2007). The construction of seawalls, rock revetments, groins, jetties, and sand bags degrades sea turtle nesting habitat (NMFS and USFWS 1991). Additionally, bright lighting near beaches can disorient hatchlings, and cause them to move towards the light rather than the ocean (Ehrhart 1983; Mann 1977; McFarlane 1963; Philibosian 1976). This misorientation can lead to increased risk from predators, entrapment in vegetation, dessication, and being hit by vehicles (NMFS and USFWS 1991).

Sea turtles may occasionally be hit by vessels, which can cause mortality and severe injury. This has been documented to be a major problem in Florida (Singel et al. 2003), and it is likely to occur more often than reported throughout the range (NMFS and USFWS 2007). Seminoff et al. (2002) found that boat traffic excluded green turtles from preferred coastal foraging areas, which could have negative effects on the population.

PCBs, mercury, copper, and other heavy metals have been found in the tissues of green turtles (Al Rawahy et al. 2006; Lewis 2006; Miao et al. 2001; Presti et al. 1999). The effects of these contaminants on green turtles is currently unknown, but there is concern that elevated levels could lead to immunosuppression and hormonal imbalances (NMFS and USFWS 2007). Oil spills are known to directly affect marine turtles (Yender and Mearns 2003), and could also lead to immunosuppression and chronic health issues (Sindermann et al. 1982). Immunosuppression by contaminants and habitat degradation is believed to be a major cause of FP (George 1997), although there is evidence that it is not a requirement for the development of tumors associated with the disease (Work et al. 2001).

Sea turtles could ingest or become entangled in marine debris, which can reduce food intake and digestive capacity and cause injury or mortality (Bjorndal et al. 1994, Sako and Horikoshi 2002).

The effects of anthropogenic noise on sea turtles are poorly understood. Studies have shown that sea turtles exposed to certain levels of low frequency sound may spend more time at the surface and/or move out of the area (O'Hara and Wilcox 1990; Lenhardt et al. 1983). Samuel et al. (2005) found elevated noise levels, primarily from boat traffic, in the Peconic Bay Estuary system in New York during the sea turtle activity season. They suggest that continued exposure to these sound levels could potentially lead to behavioral effects on sea turtles using the area (Samuel et al. 2005). The authors also suggest that similar sound levels should be expected in other coastal foraging and nesting areas. Sea turtles have been found to change swimming patterns and orientation in response to air guns, which are frequently used in oil and gas exploration (O'Hara 1990).

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 green turtle is listed as a threatened species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species. It is also protected as a federally-listed threatened 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 green turtle. Whether they are adequate to protect the habitat is currently unknown.

The Peconic Estuary Program put together an Eelgrass Management Plan for the Peconic Estuary in 2009 (Stephenson 2009) in an effort to help conserve eelgrass beds, which are used by green turtles in New York (Berry et al. 1997).

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

NY Marine Rescue Center should continue to carry out stranding and entanglement response for sea turtles. The Rescue Center rescues and rehabilitates injured and cold-stunned individuals. Before being released, rehabilitated sea turtles are sometimes given a satellite tag, which helps expand our knowledge on movements and habitat use. Placing PIT tags and/or satellite tags on as many individual turtles as possible will help to further our knowledge on green turtle life history, and this practice should be encouraged. It is critical to determine where New York green turtles travel to and nest to help reduce the threats to the population during other stages of its life.

Long-term surveys to monitor the population of green turtles in New York should be implemented. Sea turtle use of state waters was fairly well established by studies throughout the 1980s and 1990s, but not much work has been done in recent years. Monitoring would allow researchers to garner a better idea of population trends and habitat use of this species in the State, and see if shifts in use have occurred. Additionally, further research into the effects of the various threats listed above on the green turtle population in the State should be encouraged. Bycatch rates should be closely monitored, and research into reducing these rates would be beneficial.

Education on this species and the importance of reporting ship strikes and entanglements is encouraged. Conservation actions following IUCN taxonomy are categorized in the table below.

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. Education and Awareness	Awareness and communications
2. External Capacity Building	Alliance and Partnership Development

Table 4: Recommended conservation actions for green sea turtles.

VII. References

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Originally prepared by	Amanda Bailey
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Latest revision	

Species Status Assessment

Common Name: Hawksbill turtle **Date Updated:** January 2024

Scientific Name: *Eretmochelys imbricata* **Updated by:**

Class: Reptilia

Family: Cheloniidae

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

The hawksbill is a small to medium-sized sea turtle that is distributed widely throughout tropical and subtropical waters. The hawksbill was originally named *Testudo imbricata* by Linnaeus. An Atlantic and Indian/Pacific subspecies were recognized by Smith and Smith (1979), although recent evidence does not support this designation (Pritchard and Trebbau 1984). This species has very occasionally been found as far north as Massachusetts and is considered a rare visitor to New York (NMFS 2013). One record comes from the Long Island Sound after a hurricane in 1938 (Sadove and Cardinale 1993). Hawksbills are not found in the stranding record of New York, and have not been documented in recent research efforts in the area.

I. Status

a. Current legal protected Status

i. **Federal:** Endangered **Candidate:** N/A

ii. **New York:** Endangered

b. Natural Heritage Program

i. **Global:** G3

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

Other Ranks:

-IUCN Red List: Critically Endangered

-Northeast Regional SGCN:

-CITES: Appendix I

Status Discussion:

The hawksbill was listed as endangered under the Endangered Species Act in 1970. Critical habitat was designated around Mona and Monito Islands, Puerto Rico in 1998. In the U.S., the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) have joint jurisdiction.

Because the hawksbill is highly migratory and travels between countries, it is also protected by a number of international agreements. These include: Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the Convention on Migratory Species (CMS), the Specially Protected Areas and Wildlife (SPAW) Protocol of the Cartagena Convention, and the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Unknown	Past 20-100 years		Choose an item.
Northeastern US	Yes	Declining	Unknown	Last 20 years		Choose an item.
New York	Choose an item.	Unknown	Choose an item.		Endangered	Choose an item.
Connecticut	No	Choose an item.	Choose an item.			Choose an item.
Massachusetts	Choose an item.	Unknown	Unknown		Endangered	Yes
New Jersey	Choose an item.	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	No	Choose an item.	Choose an item.			Choose an item.

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

None. The only monitoring that occurs for the species is entanglement and stranding response provided by NY Marine Rescue Center if any hawksbill turtles ever where to strand or become entangled in New York.

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

Trends of hawksbills are very difficult to determine. What information does exist comes from nesting beaches. Currently, little to no trend information exists for this species on foraging grounds. There are several nesting sites in the insular Caribbean and Caribbean mainland that are important to hawksbills. Long-term monitoring and estimates of trends exist for some of these sites. In Antigua/Barbuda, trends information exists for one of around 36 nesting beaches. This site has seen an almost 80% increase in number of nesting females since the 1980s (Richardson et al. 2006, Parish and Goodman 2006, McIntosh et al. 2003, Stapleton and Stapleton 2004, 2006). However, there has not been any evidence that the other beaches in the area are increasing similarly (NMFS and USFWS 2007). Barbados has seen a 700% increase in the estimated number of nesting females since the mid-1980s (NMFS and USFWS 2007). In Cuba, evidence suggests that some beaches are declining (Carrillo et al. 1999, Moncada et al. 1999), while others are increasing (NMFS and USFWS 2007). In Puerto Rico, nesting females appeared to be in decline until the 1990s, but all four beaches surveyed increased in the past 20 – 30 years (NMFS and USFWS 2007). Mona Island, which currently has 199 – 332 nesting females annually, increased by over 500% from 1974 – 2005.

In the West Caribbean mainland nesting region, the most important nesting site is the Yucatan Peninsula. The number of nesting females declined until around 1978, which hawksbills received protection, and increased from 1985 – 1999 (Garduno-Andrade et al. 1999). Unfortunately, the population declined by 63% from 1999 – 2004 before it hit its lowest point in 2004 (NMFS and USFWS 2007). Nesting numbers are increasing again (NMFS and USFWS 2007). The important nesting ground at Playa Chiriqui, Panama has declined by over 95% in the past 50 years (Carr 1956, Carr et al. 1982, Meylan and Donnelly 1999). In Bastimentos Island National Marine Park, the number of nesting females has tripled since they received protection in 1988 (Meylan et al. 2006). Belize, Colombia and Honduras all had historically important nesting sites, but numbers have declined to under 100 nesting females at all of these locations (NMFS and USFWS 2007).

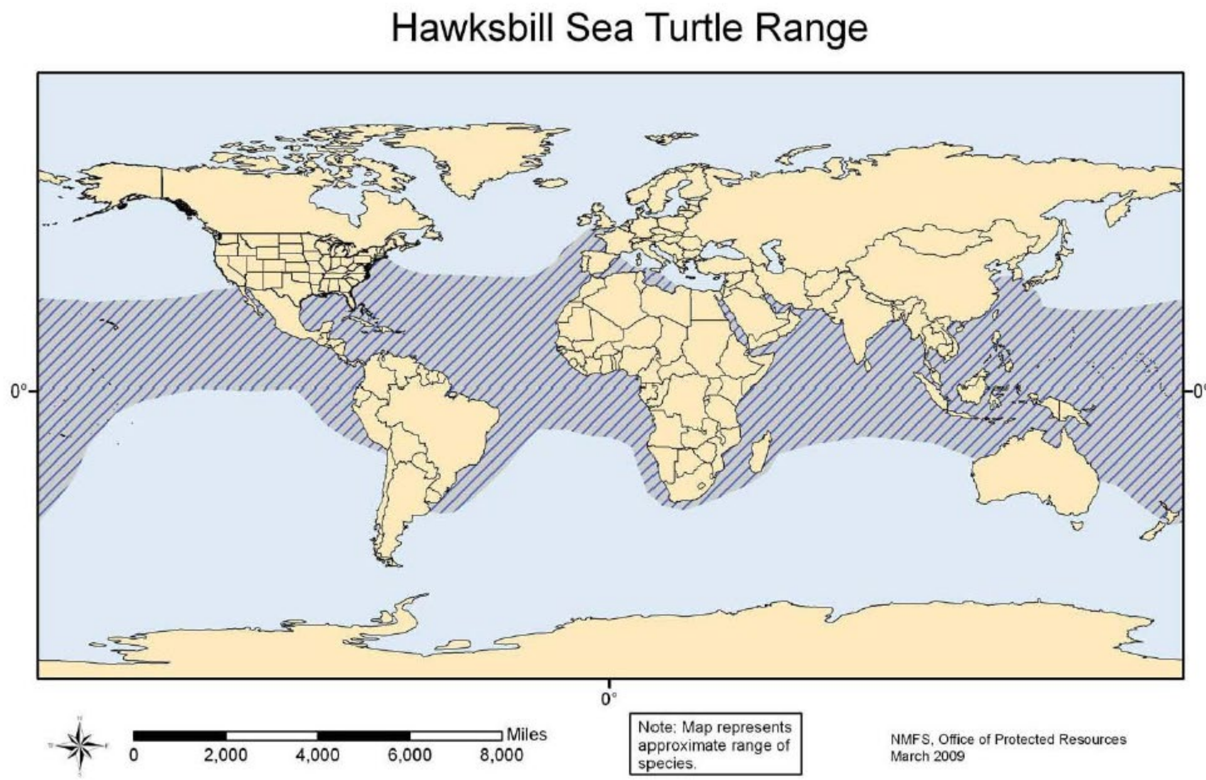

Figure 1. Hawksbill sea turtle distribution (NMFS 2009)

Ocean Basin	Number of Sites								
	Total Sites	Recent Trends (within past 20 years)				Historic Trends (during a period of >20 to 100 years)			
		▲	—	▼	?	▲	—	▼	?
Atlantic	33	9	0	11	13	0	0	25	8
Indian	31	0	2	5	24	0	0	17	14
Pacific	19	1	1	13	4	0	0	16	3
Total	**83**	**10**	**3**	**29**	**41**	**0**	**0**	**58**	**25**

Table 1. Summary of recent trends (within the past 20 years) and historic trends (during a period of >20 to 100 years) for each of the 83 sites for which data are available. Key to trend symbols: ▲= increasing population, ▼= decreasing population, **--** = stable population, ? = unknown trend. Source: NMFS and USFWS 2007.

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

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995	1		
1995-2004			
2005-2014			
2015-2023			

Table 2: Records of Hawksbill sea turtle in New York.

Details of historic and current occurrence:

No recent reports of hawksbills in NY waters.

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

There has been one record of a hawksbill in Long Island Sound after a hurricane in 1938 (Sadove and Cardinale 1993). There have been no recent reports and the species has not shown up in stranding records for New York.

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

a. Size/Waterbody Type: Pelagic, Marine, Deep Subtidal, Shallow Subtidal, Aquatic Bed, Artificial Structure, Reef

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:

Hawksbills are distributed worldwide throughout tropical and subtropical waters. They nest along healthy, sandy beaches. Post-hatchlings move offshore, where they are typically found in convergence zones until reaching a carapace length of about 20 – 30 cm, when they move into neritic foraging areas. These foraging areas typically include coral reefs or other hard bottom habitats, sea grass or algal beds, mangrove bays and creeks of mud flats (Musick and Limpus 1997, NMFS and USFWS 2007).

Hawksbills have been recorded as far north as Massachusetts, but there have been no recent reports of the species in New York waters. It probably is only a rare visitor to the area. The report that does exist in the State is from Long Island Sound after a hurricane in 1938 (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?
Unknown	Unknown	Unknown	Unknown	Unknown	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):*

Hawksbills exhibit slow growth rates throughout their range. In the Caribbean, Hawksbills grew an average of 2 – 5 cm per year (Boulon 1994, Diez and van Dam 2002, Leon and Diez 1999). Immature females grow faster than immature males (Chaloupka and Limpus 1997), and growth slows as the turtles approach sexual maturity (Chaloupka and Limpus 1997, Diez and van Dam 2002). Hawksbills reach sexual maturity around 20 – 40 years of age (NMFS and USFWS 2007). Individual hawksbills in the Caribbean have been documented nesting for periods of 14 – 22 years (Parrish and Goodman 2006). Hawksbills exhibit temperature dependent sex determination, with eggs incubated below a critical temperature being males, and those incubated above a critical temperature being females (NMFS and USFWS 2007).

After reaching sexual maturity, females return to nesting beaches every 2 – 5 years. Over the course of a nesting season, they lay 3 – 5 nests, each with around 130 eggs (Richardson et al. 1999, Mortimer and Bresson 1999, Witzell 1983). This would mean that females lay about 1,170 – 7,190 eggs over the course of her reproductive lifetime (NMFS and USFWS 2007).

Post-hatchlings move offshore and inhabit the pelagic ecosystem, where they are believed to be carried by the gyre system are often associated with convergence zones and *Sargassum* beds (NMFS and USFWS 1992, NMFS and USFWS 2007). Immature hawksbills that were tagged in the U.S. Virgin Islands were subsequently found in Puerto Rico, the British West Indies, St. Martin and St. Lucia (Boulon 1989). An immature hawksbill traveled from the Bahamas to the Turks and Caicos Islands (Bjomdal et al. 1985), and another migrated over 3500 km from Brazil to Senegal (Marcovaldi and Filippini 1991).

Some adult hawksbills appear to migrate between foraging and nesting grounds. Females foraging in Nicaragua have been tracked to nesting beaches in Costa Rica, Jamaica and Panama (NMFS and USFWS 1992, Meylan 1982). One hawksbill traveled nearly 3000 km from Isla Mujeres, Mexico to the Dominican Republic (NMFS and USFWS 1992).

Hawksbill eggs are preyed upon by feral pigs, mongoose, raccoons and coatimundis, dogs, ghost crabs, monitor lizards, ants, and fly larvae (NMFS and USFWS 2007). Hatchlings are preyed upon by birds and fish, and carnivorous fish take juveniles and adults (Witzell 1983).

The role of disease in hawksbill mortality is poorly understood. Fibropapillomatosis, a disease that causes the growth of internal and external tumors, has been documented at low frequencies in hawksbills. Tumors can occasionally grow large enough to affect swimming, vision, feeding, and escape from predators (Herbst 1994).

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

It is unlikely that threats in New York are having any significant effects on the hawksbill population, as the species is very rarely seen in the area. However, the species is highly migratory, and faces many threats throughout its range.

Coastal development is increasing, especially for tourism in tropical areas (NMFS and USFWS 2007). This development threatens to destroy nesting beaches of hawksbills. This species prefers to nest in vegetation, so they are particularly susceptible to the removal of native vegetation (NMFS and USFWS 2007). Coastal development also often leads to increased artificial lighting. Hatchlings use light to orient themselves towards the ocean as they travel from the beach, and artificial lighting near the beaches can lead to disorientation and hatchlings moving away from the water (Witherington and Bjorndal 1991). This misorientation can lead to increased risk from predators, entrapment in vegetation, dessication, and being hit by vehicles (NMFS and USFWS 2007). Additionally, artificial lighting may alter the behavior of nesting adults (Witherington 1992). Processes such as beach armoring also affect the suitability and availability of nesting beaches (Lutcavage et al. 1997).

Hawksbills were severely affected by historic overexploitation. Directed hunting still threatens many populations today. The past century has seen millions of hawksbills killed for the tortoiseshell trade (NMFS and USFWS 2007). From 1950 – 1992, Japan imported bekko (tortoiseshell) from over one million turtles, including at least 400,000 adult female hawksbills (Milliken and Tokunaga 1987, Groombridge and Luxmoore 1989, Meylan and Donnelly 1999). The tortoiseshell trade continues illegally throughout the Americas (Fleming 2001, Chacon 2002, Reuter and Allan 2006).

The exploitation of hawksbill eggs is also a major problem throughout their range. The NMFS and USFWS 5 –Year Review (2007) lists egg exploitation as being a major problem at

Antigua/Barbuda, Bahamas, Belize, Bonaire, British Virgin Islands, Colombia, Dominican Republic, Equatorial Guinea, Honduras, Jamaica, Grenada, Nicaragua, Panama, Sao Tome and Principe, St. Kitts, Trinidad and Tobago and Venezuela in the Atlantic Ocean. The killing of nesting females and foraging immature and adults is also a problem at seventeen of these sites (NMFS and USFWS 2007).

Hybridization between hawksbills and loggerheads have been documented in Florida and Brazil (Meylan and Redlow 2006; Lara-Ruiz et al. 2006). Additionally, hybridizations between hawksbills and olive ridleys and green turtles have also been documented (Lara-Ruiz et al. 2006, Seminoff et al. 2003).

Climate change could have major affects on hawksbills throughout their range. Changing temperatures could affect the suitability of certain areas for occupancy by hawksbills, as could changes in range and abundance of different species of algae, plankton and fish resulting from climate change (IPCC 2007). Changing currents as a result of climate change could affect sea turtle migration and survival of oceanic-stage juveniles (NMFS and USFWS 2008). Hawksbills are frequently found associated with coral reef ecosystems; climate change has led to extensive coral bleaching (Sheppard 2006) and could continue to impact foraging populations of hawksbills (NMFS and USFWS 2007).

Climate change likely will have effect on nesting hawksbills as well. More nests could be destroyed as a result of the increasing abundance and severity of storms along the nesting range. Rising sea levels could cause major problems on low-lying nesting beaches. Additionally, there is concern that rising temperatures could skew hatchling sex ratios towards a strong female bias (NMFS and USFWS 2007).

One of the major threats to sea turtle populations in New York is fisheries interactions. Sea turtles can become trapped in pound nets, longline fisheries, trap fisheries, trawl fisheries, purse seines and gill nets. Turtles trapped in gear can drown or suffer serious injuries as a result of constriction by lines (NMFS and USFWS 2007). Additionally, turtles can be hooked by longline gear, which can cause injury and reduced feeding capabilities. Trawlers that are not outfitted with Turtle Excluder Devices (TEDs) can entrap and drown sea turtles. Additionally, dredges can destroy habitat and crush or entrap sea turtles (NMFS and USFWS 2007).

PCBs, mercury, copper, and other heavy metals and persistent organic pollutants have been found in the tissues of sea turtles throughout their range (Al Rawahy et al. 2006, Lewis 2006, Miao et al. 2001, Presti et al. 1999). The effects of these contaminants on hawksbill turtles are currently unknown, but there is concern that elevated levels could lead to immunosuppression and hormonal imbalances (NMFS and USFWS 2007). Oil spills are known to directly affect marine turtles (Yender and Mearns 2003), and could also lead to immunosuppression and chronic health issues (Sindermann et al. 1982). There is some evidence that hawksbills may be more susceptible to negative effects of oil pollution than other sea turtles (Meylan and Redlow 2006).

Sea turtles could ingest or become entangled in marine debris, which can reduce food intake and digestive capacity and cause injury or mortality (Bjorndal et al. 1994, Sako and Horikoshi 2002).

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:

Hawksbill turtles are protected under the Environmental Conservation Law (ECL) of New York. The hawksbill is listed as a state threatened 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 potential habitat of the hawksbill turtle.

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

The hawksbill is not regularly seen in New York waters. There are no recent records of the species in State waters, and sightings north of Florida are considered rare (NMFS and USFWS 2007). Mark-recapture studies on sea turtles in the New York Bight region from 1987 – 2002 (Morreale and Standora 1998) and from 2002 – 2004 (Morreale et al. 2005) did not find any evidence of this species. Any management or conservation actions that are used for other sea turtles in New York waters should also benefit hawksbills that may be moving through the area.

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. Education & Awareness	Awareness & Communications
2. External Capacity Building	Alliance & Partnership

Table 3: Recommended conservation actions for hawksbill turtle.

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for sea turtles.

Curriculum development:

____ To provide public outreach programs about local species and their environment within the Long Island Sound and the New York Bight. Partnering with agencies such as the New York State Marine Mammal and Sea Turtle Rescue Program, NYSDEC, NOAA, U.S. Coast Guard and local law enforcement, will allow the Riverhead Foundation to adhere to the actions listed in the sea turtle recovery plans more efficiently and effectively.

Fact sheet:

____ To provide literature for local communities, as well as law enforcement agencies, regarding sea turtles and their environment within the Long Island Sound and the New York Bight. The information distributed by the Riverhead Foundation to these people will provide a more effective response to strandings and sightings of animals.

Population monitoring:

____ Mark recapture studies will provide data on the diet composition of these animals between bodies of water. These results can be compared to historical studies to identify any shifts in prey species.

____ Determine sex composition of NY sea turtle populations. As the New York region is a critical developmental habitat for sea turtles it is important to understand if there is a sexual bias for this area. Historical studies were unable to obtain the sex of many live animals.

____ Radio and satellite tags can be combined with aerial and shipboard survey work to study abundance, distribution, and movements associated with seasonal changes.

____ Genetic studies should be conducted to identify stock structure and possibly understand broad scale movements.

____ Mark recapture studies will provide data on size class, and population structure. With these data comparisons can be made within years, between years and between bodies of water (e.g. Long Island Sound, Peconic Bay, Great South Bay, offshore waters) and also compared to stranded animals to understand how and if stranded animals can be used as a representative of the current population or a proxy for ecosystem health.

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Originally prepared by	Amanda Bailey
Date first prepared	May 6, 2013
First revision	July 30, 2013 (Kimberley Corwin)
Latest revision	

Species Status Assessment

Common Name: Kemp's ridley turtle **Date Updated:** January 2024

Scientific Name: *Lepidochelys kempii* **Updated by:**

Class: Reptilia

Family: Cheloniidae

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

The Kemp's ridley turtle is the smallest of the sea turtles. First named *Thalassochelys kempii* by Samuel Garman in 1880, the Kemp's ridley was named after a fisherman who submitted the type specimen from Key West, Florida (NMFS et al. 2011). When it was determined that the Kemp's ridley and olive ridley (*Lepidochelys olivacea*) were cogeneric, Kemp's ridleys were renamed as *Lepidochelys kempii.* Occasionally, the species name is spelled *kempi.* Some consider Kemp's ridley to be a subspecies of the olive ridley, but this view is generally not supported in the scientific community, and Pritchard (1969, 1989) determined that there was enough morphological evidence to support the notion that Kemp's ridleys are a separate species. Genetic evidence also supports this designation (Bowen et al. 1991).

The Kemp's ridley experience declines throughout its range from the 1930s to 1980s (NMFS et al. 2011). Most populations appear to be stable or increasing currently (NMFS et al. 2011). Trends are usually derived from nesting beaches. New York appears to be an important foraging ground for juvenile Kemp's ridleys aged 2-5 (Sadove and Cardinale 1993, Morreale and Standora 1998). Long Island Sound was listed as potential critical habitat for the species by a recent petition (WildEarth Guardians 2010). Sadove and Cardinale (1993) estimated that 100-300 juvenile Kemp's ridleys used New York waters each year between June and October. An increasing amount of individuals have been found cold-stunned during the winter over the last couple of years (Montello 2023).

I. Status

a. Current legal protected Status

i. **Federal:** Endangered **Candidate:** N/A

ii. **New York:** Endangered

b. Natural Heritage Program

i. **Global:** G1

ii. **New York:** S1N **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Critically Endangered

-CITES Appendix I

Status Discussion:

The Kemp's ridley was first listed under the Endangered Species Conservation Act in 1970, and subsequently under the Endangered Species Act in 1970. In the U.S., the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) have joint responsibility.

Since the Kemp's ridley is highly migratory, it is protected under several international treaties, including the Convention on Migratory Species, Specially Protected Areas and Wildlife Protocol of the Cartagena Convention, and the Inter-American Convention for the Protection and Conservation of Sea Turtles.

NMFS and USFWS have been working with the Mexican government to establish a bi-national recovery plan (2nd revision released in 2011). The Kemp's ridley has been protected in Mexico since the 1960s, and a complete ban on the take of any sea turtle was established in 1990. The Rancho Nuevo nesting beach was protected in 1977, and it was designated a National Protected Area in 2002.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Increasing	Unknown	Mid 1980s-2011		Choose an item.
Northeastern US	Yes	Increasing	Unknown			Choose an item.
New York	Yes	Unknown	Unknown		Endangered	Yes
Connecticut	Yes	Declining	Unknown		Endangered	Yes
Massachusetts	Yes	Unknown	Unknown		Endangered	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	No	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):*
None. The only monitoring that occurs for the species is entanglement and stranding response provided by NY Marine Rescue Center.

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

The Kemp's ridley turtle experienced a major decline from the 1930s to the 1980s throughout its range (NMFS et al. 2011). Most of the current trend information comes from nest counts at nesting beaches. Estimates of turtles at foraging grounds are unavailable throughout most of their range, as these estimates are more difficult and expensive to perform in comparison to surveys of nesting beaches.
Rancho Nuevo, in Mexico, had an estimated 40,000 nesting females in 1947 (Carr 1963). The lowest nest count of this beach was 702 nests in 1985, which likely represented less than 300

females (NMFS et al. 2011). Since the mid-1980s, the number of nests in this area has increased by about 15% each year (Heppell et al. 2005). In 2009, over 20,000 nests were observed, although this number dropped to just over 13,000 in 2010 (NMFS et al. 2011).

In the U.S., the majority of Kemp's ridley nests are found along the Texas coast. Over 900 nests were documented in Texas from 2002 – 2010, compared to 81 nests observed from 1948-2001 (Shaver and Caillouet 1998, Shaver 2005).

Population growth models predict that the population should continue to grow at a rate of at least 12-16% (possibly as high as 19%), each year if survival rates remain constant (Heppell et al. 2005, NMFS et al. 2011). Based on these models, the NMFS et al. (2011) Bi-National Recovery Plan estimated that the Kemp's ridley population could reach the down-listing criterion of 10,000 nesting females in a season by 2011. Whether the down-listing criterion was met is currently unknown, although NMFS initiated a 5-year review of the population in October, 2012. The plan does note that the models depend on the assumption of high egg survival rates. Each year, numerous nests are protected by being relocated to a corral to prevent predation, harvest and inundation. As the population grows, the proportion of protected nests will likely decrease, and thus the growth rate could slow (Heppell et al. 2005).

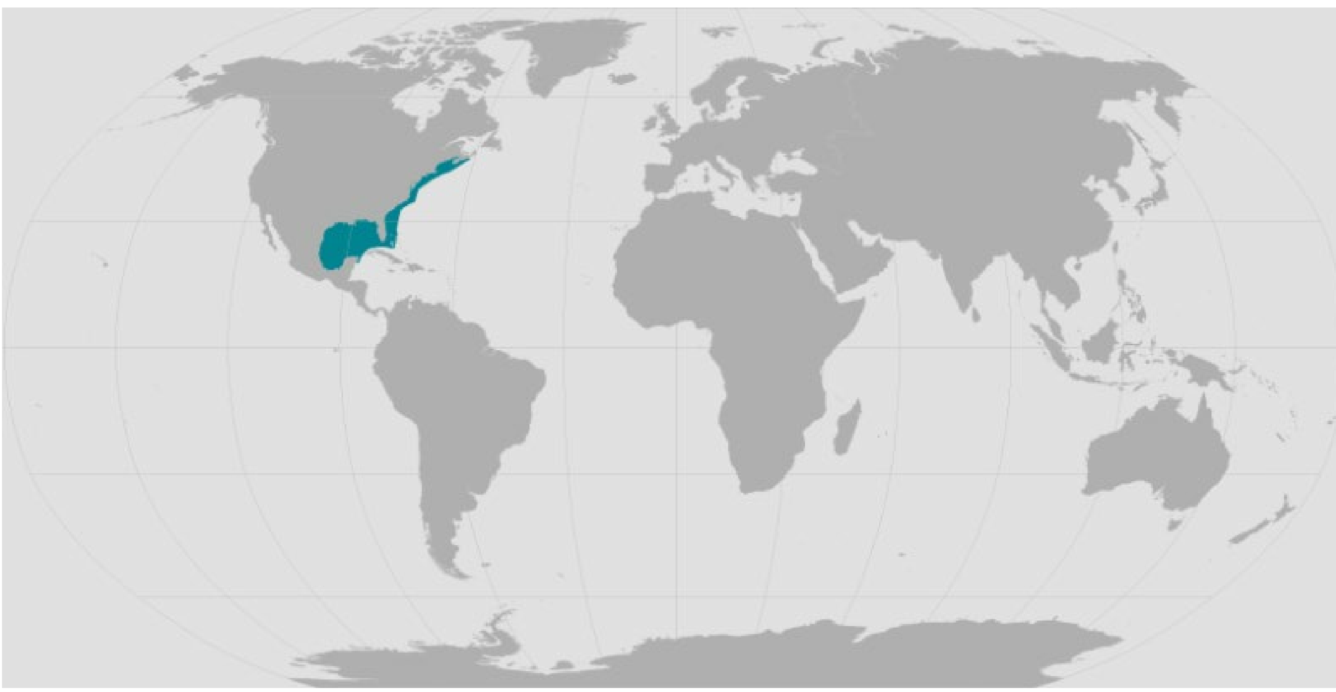

Figure 1. Kemp's ridley sea turtle range (NOAA 2024)

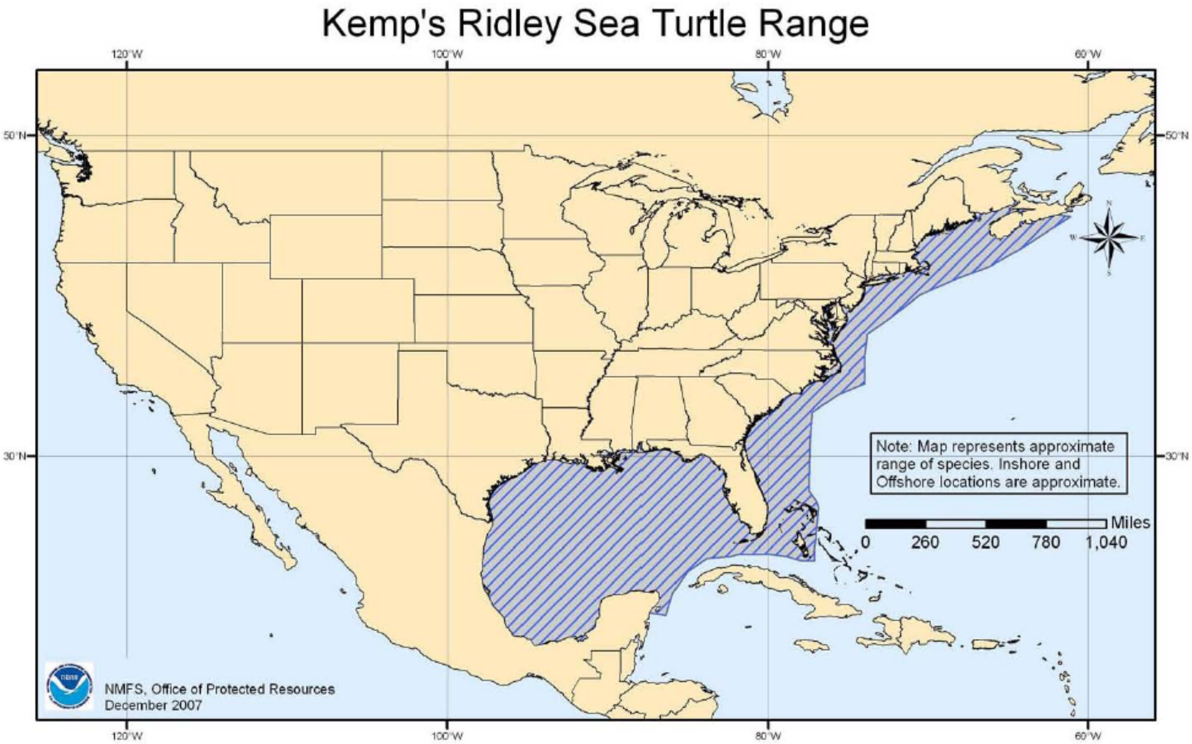

Figure 2. Kemp's ridley sea turtle distribution (NMFS 2007).

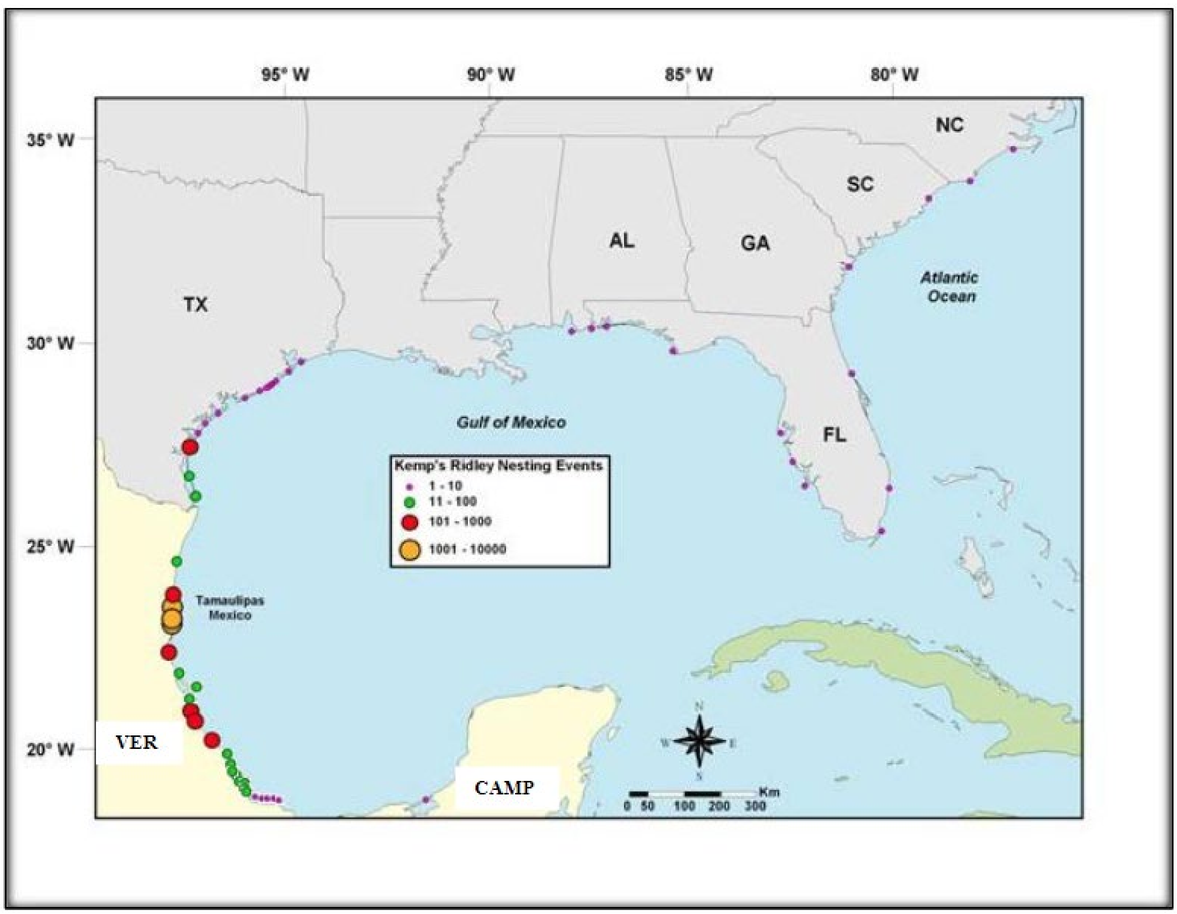

Figure 3. Major nesting beaches of Kemp's ridley sea turtles (NMFS et al. 2015)

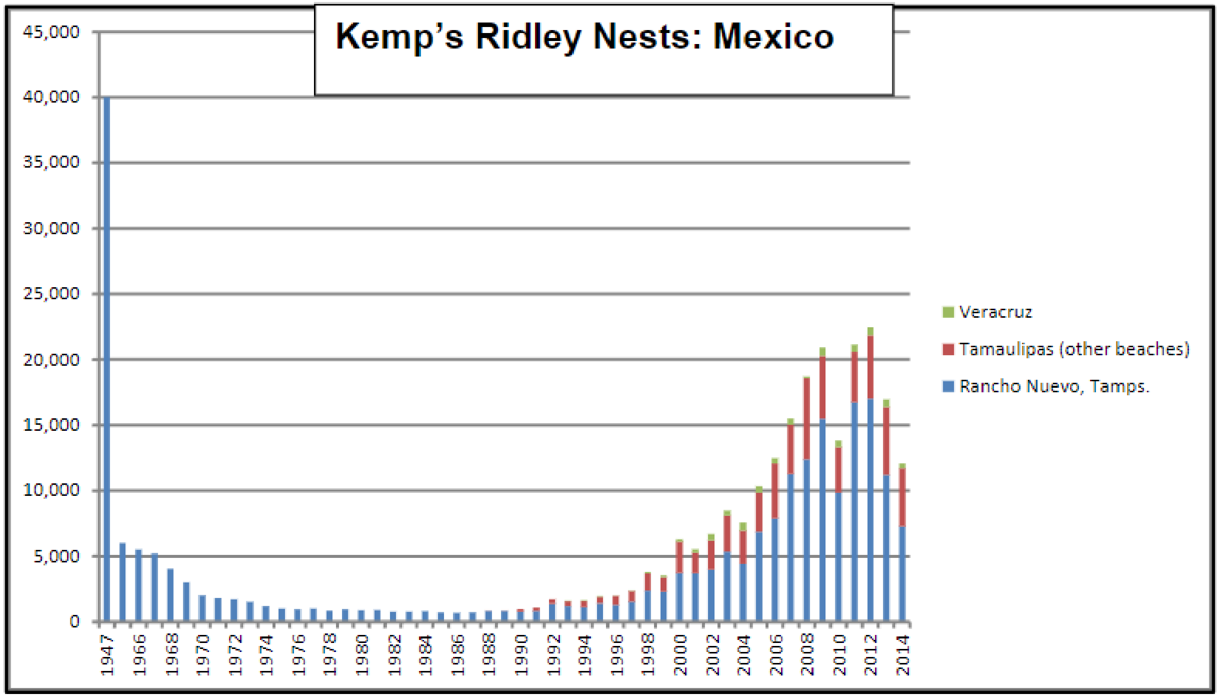

Figure 4. The total number of nests recorded at Tamaulipas (Rancho Nuevo and adjacent beaches) and Veracruz, Mexico, from 1947-2014. Prior to 1988 only Rancho Nuevo was surveyed. Playa Dos was added in 1988 and Tepehuajes in 1996 (NMFS et al. 2015).

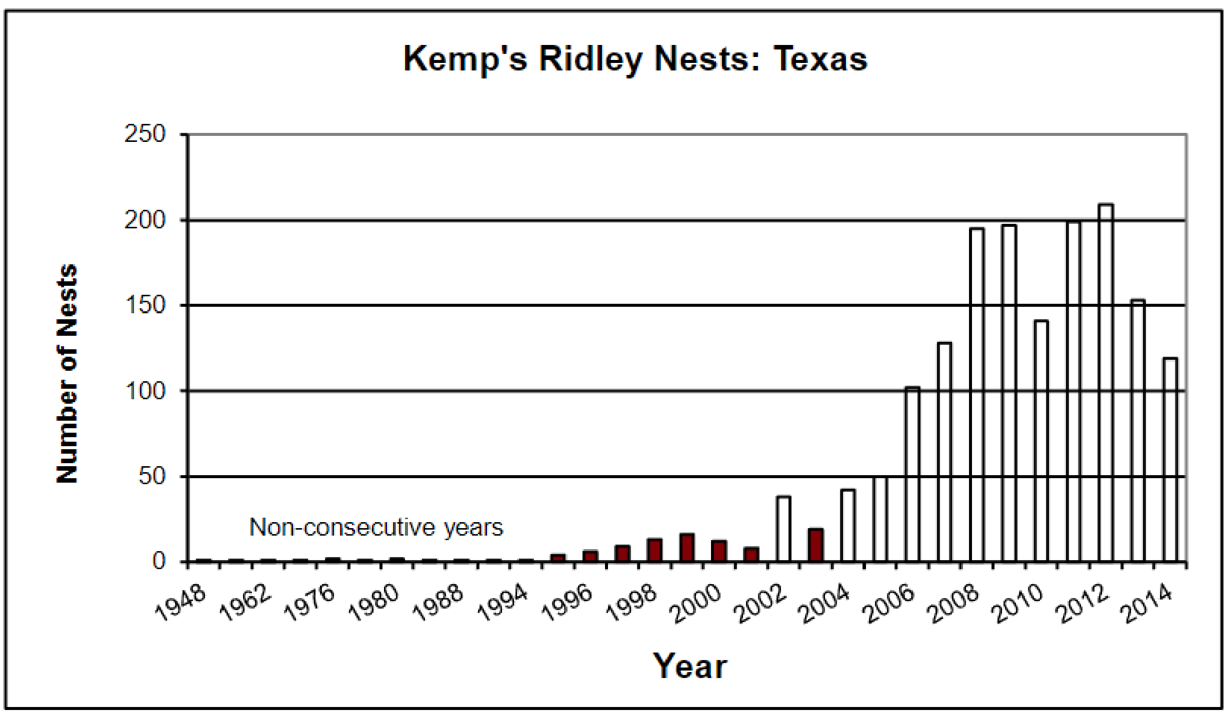

Figure 5. The total number of nests recorded at PAIS, Texas, from 1948-2014 (D. Shaver, PAIS, personal communication 2015) (NMFS et al. 2015).

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

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995	100-300		
1995-2004			
2005-2014			
2015-2023			

Table 1: Records of Kemp's ridley sea turtle in New York.

Details of historic and current occurrence:

Sadove and Cardinale (1993) estimated 100 – 300 juvenile Kemp's ridley turtles using the New York Bight region based on mark-recapture studies done from 1987 – 1992.

New York's Contribution to Species North American Range:

Unknown for New York. Recent abundance estimates are not available.

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

Kemp's ridley turtles are found with some regularity from June – October in the New York Bight (Sadove and Cardinale 1993, Morreale and Standora 1998). Mark-recapture from 1987 – 1992 indicate that around 100 – 300 juvenile Kemp's ridley turtles use the region each summer. It appears that the majority of these turtles use New York waters for just one season, and do not return in subsequent years. Each winter, NY Marine Rescue Center responds to cold-stunned Kemp's ridley turtles. In the recent years there has been an increase in the number of cold stunned turtles in NY, with the majority of the individuals being Kemp's Ridley and green sea turtles (Montello 2023). Morreale and Standora (1998) documented two Kemp's ridleys that were found cold-stunned in subsequent years, but did not ever document a Kemp's ridley that was tagged during the summer and found cold-stunned the subsequent winter. It is generally believed that those individuals that are found cold-stunned are migrating from more northern foraging grounds (Morreale and Standora 1998).

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

a. Marine, Deep Subtidal, Marine Eelgrass Community, Estuarine, Brackish Shallow Subtidal, Aquatic Bed/Benthic Geomorphology, Brackish Deep Subtidal

b. Pelagic

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:

Kemp's ridley turtles nest on sandy, high-energy oceanic beaches. Hatchlings are carried by the currents; most remain in the Gulf of Mexico and may be associated with the *Sargassum* community. Juveniles spend two years in the pelagic environment. Most likely remain within the Gulf of Mexico, with some being transported into the Northwest Atlantic via the Gulf Stream (Collard and Ogren 1990, Putman et al. 2010). After two years, juveniles recruit to neritic benthic habitat (NMFS et al. 2011). It is this stage that is found in New York waters. While present in the neritic environment, Kemp's ridleys have been documented in a large variety of benthic substrates, including sandy bottoms (Morreale and Standora 1992), seagrass beds (Carr and Caldwell 1956, Byles 1988, Danton and Prescott 1988, Schmid and Barichivich 2005, 2006), mud bottoms (Ogren 1989, Schmid 1998), or some combination of these (Ogren 1989, Rudloe et al. 1991).

In New York, juveniles 2-5 years of age with a carapace length of ~27 cm can be found in certain areas within Long Island Sound, Block Island Sound, Gardiners Bay and the Peconic Estuary. These seem to be the most important habitats for juvenile Kemp's ridleys in New York; they are also found in some number in Jamaica Bay, lower New York harbor and Great South Bay (Sadove and Cardinale 1993). They are found in New York waters from June through October, and cold-stunned individuals are found occasionally during the winter.

There are similar foraging areas that extend from New England south to Florida for Kemp's ridleys that are recruited into the Northwest Atlantic. Many are found in estuarine habitats. In general, the farther south the foraging area is, the larger the average size of Kemp's ridleys utilizing the area (Carr 1980, Henwood and Ogren 1987). Whether this is because the turtles are older or just exhibit higher growth rates is unknown (Snover 2002).

Each winter, juveniles migrate from foraging areas to overwintering areas. Once turtles migrate past Cape Hatteras, North Carolina, some move offshore into the warmer waters of the Gulf Stream, and some continue as far as Cape Canaveral, Florida to overwinter. Those that do continue to Florida primarily use hard bottom substrate and live bottom habitat to overwinter (Gitschlag 1996, Schmid and Witzell 2006). During spring, Kemp's ridleys migrate back north (Henwood and Ogren 1987, Schmid 1995), although there has not been any evidence to indicate that the same individuals are returning to New York waters each year (Morreale and Standora 1998).

Kemp's ridleys originally tagged as juveniles off the Atlantic Coast have been documented using the Rancho Nuevo nesting beach (Schmid 1995; Chaloupka and Zug 1997; Schmid and Witzell 1997, Schmid and Woodhead 2000). Nesting also occurs in Veracruz, Mexico; Texas; and occasionally in North Carolina, South Carolina and Florida (NMFS et al. 2011). In July of 2018, a nest was found in Queens, NY in the Gateway National Recreation Area. 96 hatchlings were released and this was the first record of a Kemp's ridley sea turtle nesting and depositing eggs in NY (Rafferty et al. 2019). The majority of adults are found in the Gulf of Mexico (USFWS and NMFS 1992). They are primarily found in nearshore waters that are 37 m or less (NMFS et al. 2011). Females establish residency seasonally in waters surrounding the Yucatan Peninsula and the northern Gulf of Mexico (NMFS et al. 2011). Habitat use by males is poorly understood, although they appear to remain primarily in nearshore waters (Shaver 2006a, 2007, Shaver et al. 2005b).

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	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):*

Actual life span has not been documented, but is estimated to be around fifty years. Kemp's ridley turtles are believed to reach sexual maturity between 10 and 16 years of age (Chaloupka and Zug 1997; Schmid and Witzell 1997; Zug et al. 1997; Schmid and Woodhead 2000). Kemp's ridley turtles display a synchronized nesting habit known as an "arribada." Large groups of turtles will gather at a nesting beach, and waves of females will come ashore to nest. The triggers of an arribada are currently unknown (NMFS et al. 2011). The only confirmed Kemp's ridley arribada occurs in Tamaulipas, Mexico. Nearly 95% of the total worldwide Kemp's ridley nesting occurs in this state, concentrated mainly on three beaches: Rancho Nuevo, Tepehaujes, and Barra del Tordo (NMFS et al. 2011).

The nesting season is from May to July. Females nest two to three times per season, with an inter-nesting interval of two to three weeks (Miller 1997; NMFS et al. 2011). Around 100 eggs are deposited in each nest. The average remigration interval is two years, although intervals of one and three years also occur. There is some thought that males are not reproductively active every year (Wibbels et al. 1991).

The sex of hatchlings is determined by incubation temperature, with eggs incubated above a critical temperature being females, and eggs incubated below a critical temperature being males (Mrosovsky 1994; Wibbels 2003). Eggs that are relocated to corrals display a strong female bias, with about 76% of hatchlings from 1998 – 2006 being females (NMFS et al. 2011). From 2001 – 2006, over 60% of hatchlings from nests left in place were females (NMFS et al. 2011). A female-bias is also seen in juveniles, although it is less pronounced than the hatchling bias (Gregory and Schmid 2001; Witzell et al. 2005; Coyne and Landry 2007). See Habitat Discussion for information on dispersal capabilities and movement information. Kemp's ridleys tagged in New York have been tracked to waters off the southeastern U.S., including the coastal waters of North and South Carolina (Morreale and Standora 1989, 1998).

Egg survival has been estimated to be around 0.678 based on data from Rancho Nuevo 1992 – 2003 (NMFS et al. 2011). All hatchlings that emerge within the corrals are released directly into the water, whereas a lower percentage of hatchlings from *in situ* nests survive the trek to the water. Monitoring of 3,000 *in situ* nests in 2007 determined an emergence success of around 80%, and 66% of hatchlings reached the water (NMFS et al. 2011).

Survival rates of other life stages are poorly understood and difficult to estimate. Annual survival was estimated to be 0.61 for benthic immatures from 2 – 5 years of age (TEWG 2000; Heppell et al. 2005). Heppell et al. (2005) used an age-based model to fit nest numbers at Rancho Nuevo, Tepehaujes and Playa Dos from 1978 – 2003 to estimate survival of different life stages. The model suggested an annual survival rate of 0.31 for pelagic immatures and 0.91 for large benthic immatures and adults (Heppell et al. 2005). This model was updated by the Kemp's Ridley Recovery Team (NMFS et al. 2011) to determine survival rates from 1997 – 2009. The survival rate of hatchlings and pelagic-stage immatures was estimated to be 0.318; the survival rate of neritic juveniles age 2 – 5 was estimated to be 0.815 (NMFS et al. 2011). The survival rate of large juveniles and adults was estimated to be 0.935 (NMFS et al. 2011).

Raccoons, dogs, pigs, skunks, badgers, gulls, coyotes, ghost crabs and ants are known to prey upon eggs and/or hatchlings. In Rancho Nuevo, 88 nests were left *in situ* with no predator protection during the 2003-2004 nesting season. 73 of these nests were depredated and eight were poached (NMFS et al. 2011). The relocation of about 90% of nests in Mexico to corrals has drastically reduced predation. Domestic animals are believed to take around 5% of nests in Rancho Nuevo and Play Dos-Barra del Tordo (NMFS et al. 2011). As the population increases and a smaller proportion of nests are relocated into corrals, predation is expected to increase (NMFS et al. 2011).

Density-dependent pathogens are known to effect nesting success of olive ridleys (Mo 1988). Whether the same phenomenon will be observed in Kemp's ridleys as nesting density increases is currently unknown (NMFS et al. 2011). Severe storms can destroy nests and affect egg and hatchling survival.

Large fish and sharks are known to prey upon hatchling and juvenile Kemp's ridleys (NMFS et al. 2011). 159 juvenile to adult Kemp's ridleys that stranded from 1980 – 2006 had evidence of shark attacks, although whether the bites occurred pre- or post-mortem was unknown in most instances (NMFS et al. 2011). Red tides appear to have some effect on Kemp's ridleys, 59 stranded in "apparent association with red tide occurrence" from 1991 – 2001 (STSSN).

A number of diseases have been documented in sea turtles. Fungal infestations leading to systemic mycoses have been found in cold-stunned Kemp's ridleys (Manire et al. 2001) and also can cause mortality in captive-reared Kemp's ridleys (Leong et al. 1989). Endoparasites such as trematodes, tapeworms, and nematodes can lead to mortality in sea turtles. Leeches and barnacles also may contribute to mortality in Kemp's ridleys (Herbst and Jacobson 1995, George 1997). Fibropapillomatosis (FP), a disease that causes the growth of tumors and skin lesions is believed to have been documented in Kemp's ridley turtles (Barragan and Sarti 1994; Guillen and Pena Villalobos 2000). FP causes the growth of tumors that can block the vision in turtles and lead to decreased swimming and foraging capabilities (Herbst 1994).

Sea turtles are vulnerable to dramatic changes in temperature. While most turtles are believed to migrate out of New York waters in late summer (Morreale and Standora 1998), some may be feeding in shallow waters and still be in the area when water temperatures drop significantly. When this happens, sea turtles can fall victim to a process known as cold-stunning. This is a hypothermic state that can result in the turtle drifting at sea in a lethargic state. Cold-stunning often results in mortality, unless the turtles wash ashore and are rescued by stranding groups.

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

Threats to NY Populations	
Threat Category	**Threat**
1. Transportation & Service Corridors	Shipping Lanes (ship strikes)
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch and entanglement in fishing gear)
3. Pollution	Garbage & Solid Waste
4. Pollution	Industrial & Military Effluents (contaminants)
5. Pollution	Agricultural & Forestry Effluents (contaminants)
6. Climate Change and Severe Weather	Temperature Extremes (cold-stunning)
7. Residential & Commercial Development	Housing & Urban Areas (destruction and alteration of nearshore foraging areas from coastal development)
8. Residential & Commercial Development	Commercial & Industrial Areas (destruction and alteration of nearshore foraging areas from coastal development)
9. Residential & Commercial Development	Tourism & Recreation Areas (destruction and alteration of nearshore foraging areas from marina construction)
10. Climate Change and Severe Weather	Habitat Shifting & Alteration
11. Pollution	Excess Energy (anthropogenic noise)
12. Energy Production & Mining	Oil & Gas Drilling (oil spills)
13. Natural System Modifications	Other Ecosystem Modifications (shoreline stabilization)
14. Natural System Modifications	Other Ecosystem Modifications (sea walls)
15. Human Intrusions & Disturbance	Recreational Activities (boating)

One of the major threats to sea turtle populations in New York is fisheries interactions. Sea turtles can become trapped in pound nets, longline fisheries, trap fisheries, trawl fisheries, purse seines and gill nets. Turtles trapped in gear can drown or suffer serious injuries as a result of constriction by lines (NMFS et al. 2011). Additionally, turtles can be hooked by longline gear, which can cause injury and reduced feeding capabilities. Trawlers that are not outfitted with Turtle Excluder Devices (TEDs) can entrap and drown sea turtles. Additionally, dredges can destroy habitat and crush or entrap sea turtles (NMFS et al. 2011). In New York, Morreale and Standora (1998) reported that commercial fisherman were responsible for 84% of all 317 live turtles captured in a mark-recapture study from 1987 – 1992. 93% of these captures were in pound nets; sea turtles were also caught in trawls and entangled in lobster pot lines and gill nets (Morreale and Standora 1998).

Climate change is believed to have major effects on sea turtles throughout their range. Extreme temperature changes could lead to increased numbers of cold-stunned sea turtles; it is also possible that changing temperatures could lead to conditions that are more favorable for sea turtles. There have been a record high number of cold-stunned sea turtles found the past couple of winter throughout the Northeast; it is believed that this could be a result of climate change (M. Montello, pers. comm.). Of the 94 cold-stunned sea turtles that NY Marine Rescue Center responded to in the 2022/2023 season, 43 were Kemp's ridley turtles. Additionally, climate change is believed to be associated with rising water temperatures, as well as changes in ice cover, salinity, oxygen levels and circulation (IPCC 2007). These changes are likely to cause shifts in range and abundance of different species of algae, plankton and fish (IPCC 2007). These shifts could alter the suitability of New York habitat (as well as habitat in other parts of sea turtles' ranges) for occupancy by sea turtles. Changing currents as a result of climate change could affect sea turtle migration and survival of oceanic-stage juveniles (NMFS et al. 2011).

Climate change could have significant effects on Kemp's ridley turtles in other parts of their range as well. More nests could be destroyed as a result of the increasing abundance and severity of storms along the nesting range. Rising sea levels could cause major problems on low-lying nesting beaches. Additionally, there is concern that rising temperatures could skew hatchling sex ratios towards a strong female bias (NMFS et al. 2011).

Coastal development can lead to destruction or degradation of sea turtle foraging habitat. Noise produced during construction could have negative behavioral and physiological effects on sea turtles, and increased vessel traffic can lead to exclusion from foraging areas or increased collision rates (NMFS et al. 2011). The construction of seawalls, rock revetments, groins, jetties, and other beach armoring mechanisms degrades sea turtle nesting habitat and increases erosion in certain areas of the beaches (NMFS et al. 2011). Additionally, bright lighting near beaches can disorient hatchlings, and cause them to move towards the light rather than the ocean (Ehrhart 1983; Mann 1977; McFarlane 1963; Philibosian 1976). This misorientation can lead to increased risk from predators, entrapment in vegetation, dessication, and being hit by vehicles (NMFS et al. 2011). Increased human presence on nesting beaches can lead to egg and hatchling mortality from beach vehicles, beach cleaning, and recreational beach equipment. Nesting females may also alter their behavior in areas of high human presence (NMFS et al. 2011).

Sea turtles may occasionally be hit by vessels, which can cause mortality and severe injury. About 13% of turtles that stranded from 1997 – 2001 had evidence of ship strikes, although it was not possible to determine whether the collisions occurred pre- or post-mortem in most instances (NMFS et al. 2011). From 1996 – 2000, 128 nesting females in the three major nesting beaches in Mexico had evidence of propeller scarring (Witzell and Schmid 2004). It is likely that sea turtles are struck by vessels more often than reported. It is also possible that increased boat traffic may exclude Kemp's ridleys from foraging areas. Sea turtles are also occasionally taken into the intake canal of power plants, where they can drown (NMFS et al. 2011). With a recent increase in boat traffic, NY has seen more human interactions between vessels and all species of sea turtles (Montello personal communication).

Persistent chlorinated hydrocarbons, heavy metals, and organic contaminants have been found in Kemp's ridley turtles (NMFS et al. 2011). The effect of most of these contaminants on Kemp's ridleys is currently unknown, but there is concern that elevated levels could lead to immunosuppression and chronic health problems (NMFS et al. 2011). Keller et al. (2004) found correlations between organochlorine contaminants and changes in immune function, possible liver damage, and changes in protein and carbohydrate regulation. There is some evidence that contaminants bioaccumulate in Kemp's ridleys (Orvik 1997), and also that female marine turtles offload contaminants to eggs (McKenzie et al. 1999). In freshwater turtle species, high concentrations of chlorobiphenyls and organochlorine pesticides in eggs has been correlated with decreased hatching success (Bishop et al. 1991).

The Gulf of Mexico, which supports a large proportion of the Kemp's ridley population, is an area of high-density offshore oil exploration and extraction (NMFS et al. 2011). Oil spills are known to directly affect marine turtles (Yender and Mearns 2003), and can lead to immunosuppression and chronic health issues (Sindermann et al. 1982; Lutcavage et al. 1997). Oil spills can affect nesting success and hatchling survival, with the potential for eggs and hatchlings to become oiled. Additionally, nesting females may crawl through oil on beaches, avoid oiled beaches, or be blocked from nesting areas by oil barriers used in spill response (Milton et al. 2003; NMFS et al. 2011). There is the potential that Kemp's ridleys could be impacted by a degradation of water quality from operational discharges of oil extraction (NMFS et al. 2011).

Sea turtles could ingest or become entangled in marine debris, which can reduce food intake and digestive capacity and cause injury or mortality (Bjorndal et al. 1994; Sako and Horikoshi 2002). There is also the potential that sea turtles could absorb toxins in the ingested debris (Balazs 1985). Kemp's ridleys have ingested plastic, rubber, fishing line and hooks, tar, string, Styrofoam, epoxy and aluminum (Shaver 1991; Werner 1994). Generally, ingestion of debris is not believed to be as much of a problem for Kemp's ridleys as for other species of sea turtles (Bjorndal et al. 1994; Witzell and Schmid 2005).

The effects of anthropogenic noise on sea turtles are poorly understood. Studies have shown that sea turtles exposed to certain levels of low frequency sound may spend more time at the surface and/or move out of the area (Lenhardt et al. 1983, O'Hara and Wilcox 1990). Samuel et al. (2005) found elevated noise levels, primarily from boat traffic, in the Peconic Bay Estuary system in New York during the sea turtle activity season. They suggest that continued exposure to these sound levels could potentially lead to behavioral effects on sea turtles using the area (Samuel et al. 2005). The authors also suggest that similar sound levels should be expected in other coastal foraging and nesting areas. Sea turtles have been found to change swimming patterns and orientation in response to air guns, which are frequently used in oil and gas exploration (O'Hara and Wilcox 1990).

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 Kemps ridley turtle is listed as an endangered species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species. It is also protected as a federally-listed endangered 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 Kemp's ridley turtle. Whether they are adequate to protect the habitat is currently unknown.

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

NY Marine Rescue Center should continue to carry out stranding and entanglement response for sea turtles. The Center rescues and rehabilitates injured and cold-stunned individuals. Before being released, rehabilitated sea turtles are sometimes given a satellite tag, which helps expand our knowledge on movements and habitat use. Placing PIT tags and/or satellite tags on as many individual turtles as possible will help to further our knowledge on Kemp's ridley turtle life history. NY Marine Rescue Center already places satellite tags on many rehabbed and released Kemp's ridleys, and this practice should be encouraged to continue. It is critical to determine where New York Kemp's ridleys travel to and nest to help reduce the threats to the population during other stages of its life.

Long-term surveys to monitor the population of loggerheads in New York should be implemented. Sea turtle use of state waters was fairly well established by studies throughout the 1980s and 1990s, but not much work has been done in recent years. Monitoring would allow researchers to garner a better idea of population trends and habitat use of this species in the State, and see if shifts in use have occurred. Additionally, further research into the effects of the various threats listed above on the Kemp's ridley population in the State should be encouraged. Bycatch rates should be closely monitored, and research into reducing these rates would be beneficial.

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. Education and Awareness	Awareness and communications
2. Land/Water Protection	Resource and habitat protection

Table 2: Recommended conservation actions for Kemp's ridley sea turtle.

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Originally prepared by	Amanda Bailey
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Latest revision	

Species Status Assessment

Common Name: Leatherback turtle **Date Updated:** January 2024

Scientific Name: *Dermochelys coriacea* **Updated by:**

Class: Reptilia

Family: Dermochelyidae

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

The leatherback turtle is unique among sea turtles in that it has no hard, bony shell (NMFS and USFWS 1992). It is the only member of the family Dermochelyidae (NMFS and USFWS 1992, ALTRT 2006). Two subspecies, an Atlantic leatherback (Dermochelys coriacea coriacea) and a Pacific leatherback (Dermochelys coriacea schlegelii) have been described; however, genetics (Dutton et al. 1996) and morphology (Pritchard 1979) do not support the separation and thus, only one species is currently recognized. The leatherback is the most pelagic species of sea turtles (Morreale and Standora 1998). The species has the ability to regulate its body temperature, allowing it to travel farther north than other species (NMFS and USFWS 1992). It is found relatively often from May – November in the New York Bight region. The leatherback is most often seen along the south shore of Long Island and within Long Island Sound (Sadove and Cardinale 1993). Trends for the species in New York are unknown, although nesting data suggests a stable to increasing population (NMFS and USFWS 2007).

I. Status

a. Current legal protected Status

i. **Federal:** Endangered **Candidate:** N/A

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

b. Natural Heritage Program

i. **Global:** G2

ii. **New York:** S1N **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Critically Endangered

-Northeast Regional SGCN:

-CITES: Appendix I

-Canadian Species at Risk Act (SARA): Endangered

Status Discussion:

Leatherback turtles are listed as Endangered throughout their range, and have been listed under the Endangered Species Act since 1970. In the U.S., the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) have joint jurisdiction of this species. Because the leatherback is a wide-ranging pelagic species, it is also protected by numerous international treaties including the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the Convention on Migratory Species, Specially Protected Areas and Wildlife Protocol of the Cartagena Convention, and the Inter-American Convention for the Protection and Conservation of Sea Turtles (NMFS 2013).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Increasing	Unknown	Last 20-30 years		Choose an item.
Northeastern US	Yes	Increasing	Unknown	1989-present		Choose an item.
New York	Yes	Unknown	Unknown		Endangered	Yes
Connecticut	Yes	Declining	Unknown		Endangered	Yes
Massachusetts	Yes	Unknown	Unknown		Endangered	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.	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):*

None. The only monitoring that occurs for the species is entanglement and stranding response provided by NY Marine Rescue Center.

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

Sadove and Cardinale (1993) gave a rough estimate of 500 – 800 leatherback turtles using the New York Bight region each year. Trends of leatherback turtles in New York are poorly understood. Strandings of leatherbacks are highly variable from year to year, with no significant patterns reported (DiGiovanni 2009; Figures 3 and 4). As a highly migratory marine species that is not sighted with any real frequency, it is difficult to evaluate trends. Most trend data that do exist come from nesting beaches. Unfortunately, there is still uncertainty as to where leatherbacks sighted in New York waters nest. One individual that was flipper-tagged on a nesting beach in French Guiana was recovered in New York waters (Morreale and Standora 1998). Whether all leatherbacks seen in the area nest in French Guiana is unknown, but unlikely. Leatherbacks off of Atlantic Canada have been found to nest in French Guiana, Suriname, Trinidad, Costa Rica, Panama, Colombia, Grenada and Puerto Rico (Turtle Expert Working Group 2007).

The Turtle Expert Working Group (2007) identified seven main populations of nesting leatherbacks throughout the Atlantic Ocean. All of these populations are stable or increasing, with the exception of the western Caribbean and West Africa. There are no data for the West African population (NMFS and USFWS 2007). In Florida, the number of leatherback nests has increased from 98 nests in 1988 to 800-900 nests in the early 2000s (Stewart and Johnson 2006, NMFS and USFWS 2007). Standardized nest counts done from 1989 – 2006 found that leatherback nesting in Florida has increased by about 1.17% each year (Turtle Expert Working Group 2007). The growth rate in Puerto Rico from 1978 – 2005 was estimated to be around 1.10, as was the growth rate in the U.S. Virgin Islands (Turtle Expert Working Group 2007). Dutton et al. (2005) estimated that the leatherback population in this area increased 13% per year from 1994 – 2001. The annual growth rate at the British Virgin Islands was estimated to be 1.2 from 1994 – 2004 (Hastings 2003, Turtle Expert Working Group 2007).

Troeng et al. (2007) estimated that the nesting population of leatherbacks using Costa Rica's Atlantic Coast declined by over 67%. The probability of growth in the nesting population was only 0.03 at the most important nesting beach in the central Caribbean from 1995 - 2005.

About 40% of the entire world population of leatherbacks is believed to nest in French Guiana and Suriname. The population is believed to be stable or slightly increasing. The probability that the nesting population was growing from 1967 – 2005 was about 0.95 (Turtle Expert Working Group 2007). Leatherback nesting populations were also believed to be increasing in Guyana, Trinidad, and Brazil (Turtle Expert Working Group 2007).

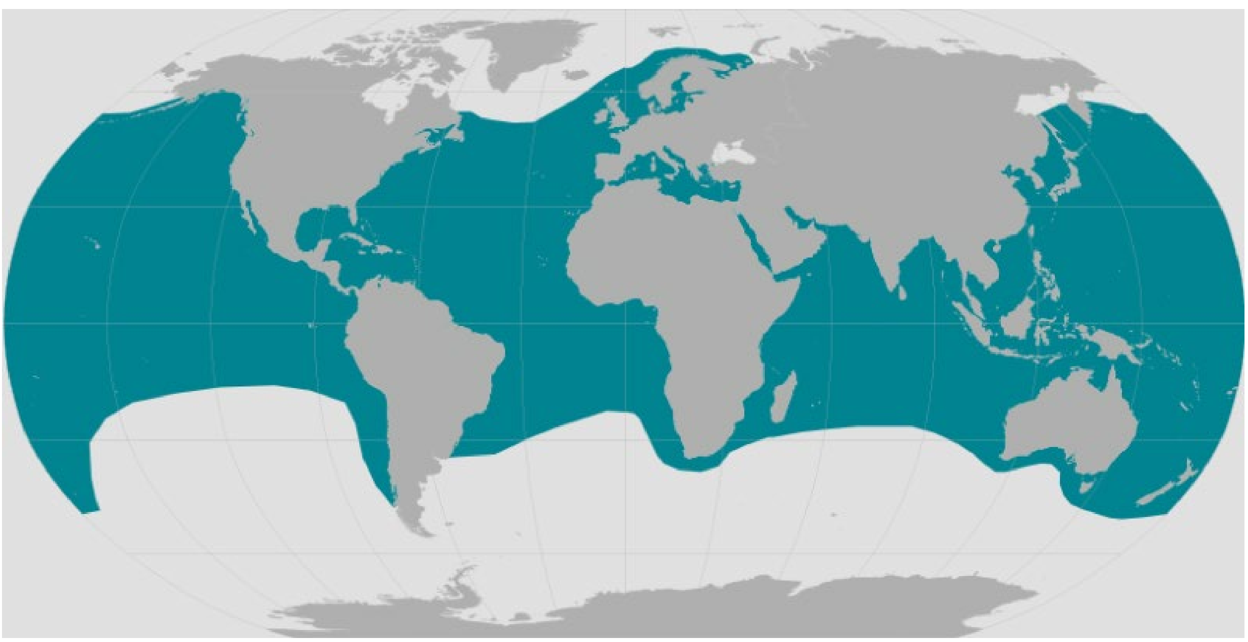

Figure 1. Leatherback sea turtle distribution (NOAA 2024)

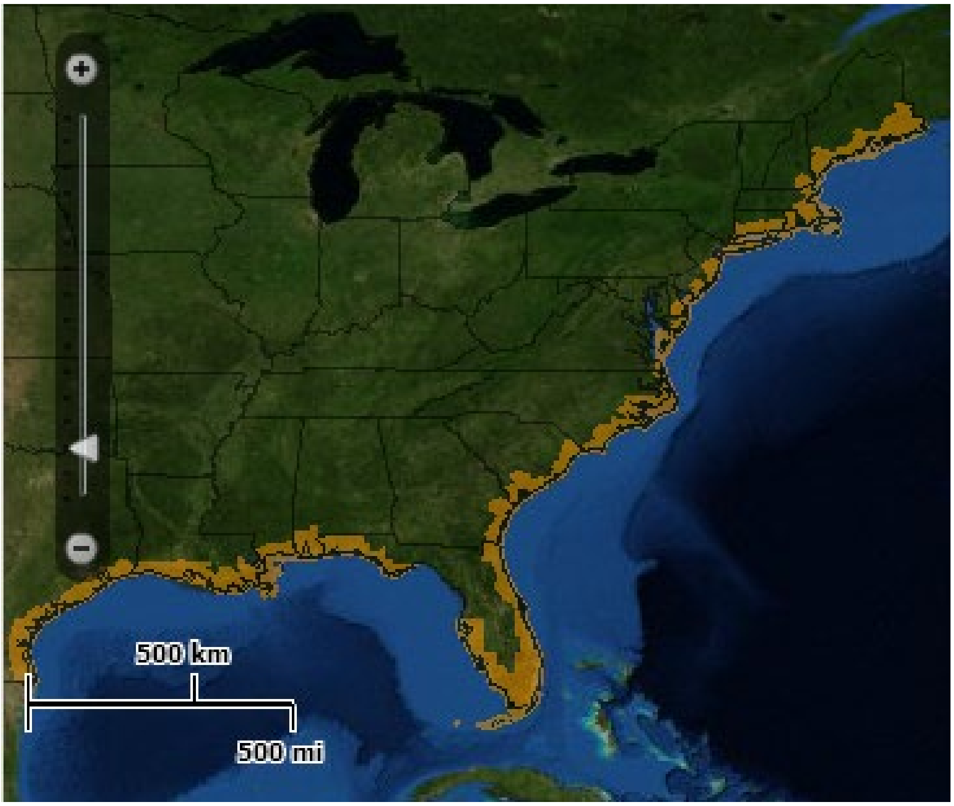

Figure 2. Range of the leatherback turtle in the U.S. Atlantic coast (USFWS 2013).

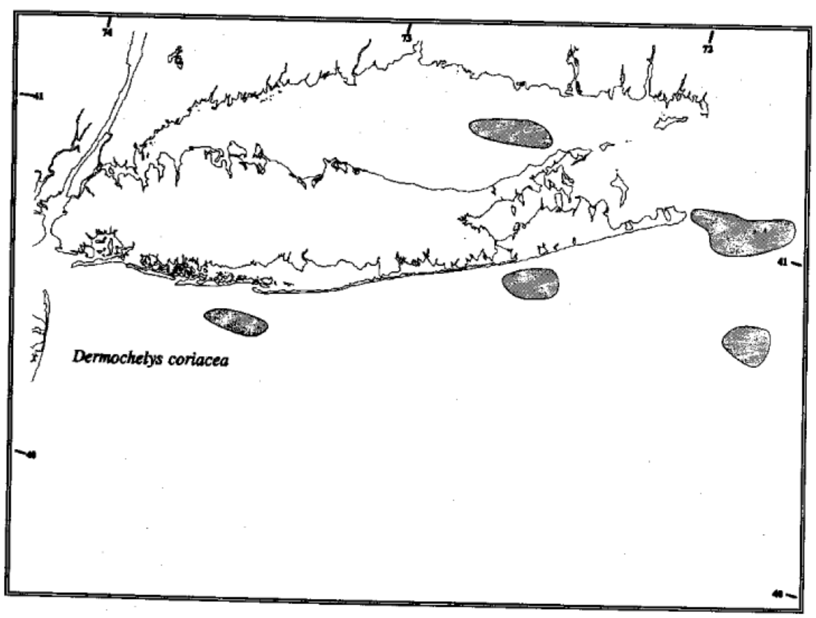

Figure 3. Areas of sightings of leatherback sea turtles in New York by Okeanos Foundation (Sadove and Cardinale 1993).

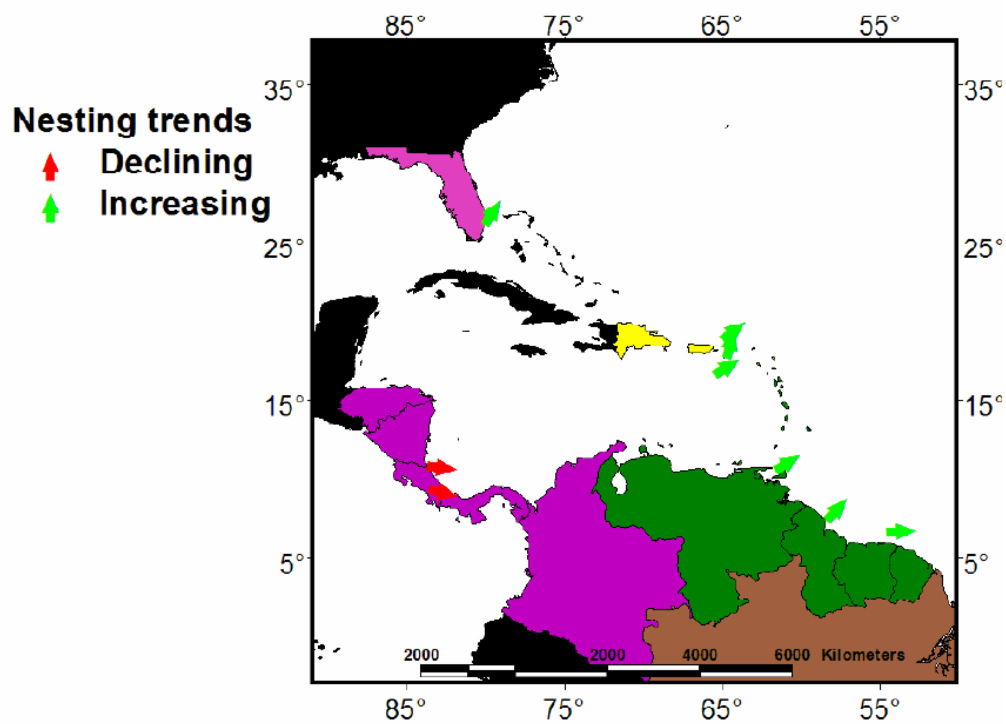

Figure 4. Nesting population trends for leatherbacks in the western North Atlantic. Values of λ were scaled against the angle of an arrow with λ=1.20 corresponding to the arrow pointing straight up and λ=0.80 pointing straight down (Turtle Expert Working Group 2007).

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

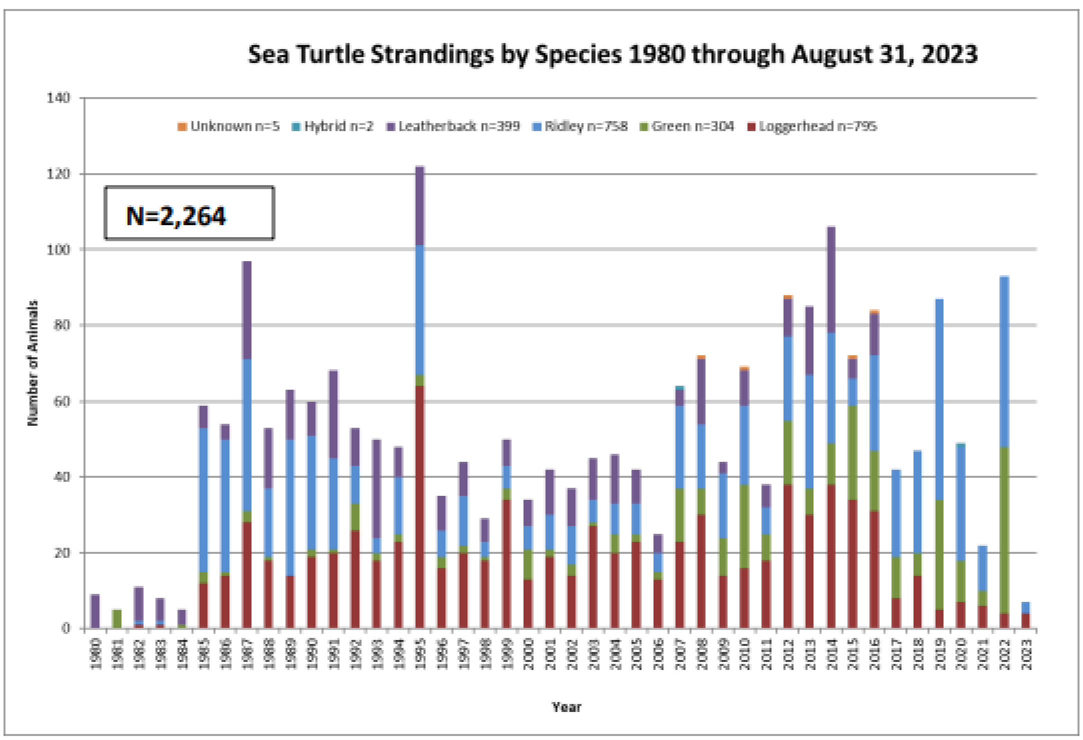

Figure 5: New York sea turtle strandings 1980 through August 31, 2023 by NY Marine Rescue Center (Montello et al. 2023).

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

Table 1: Records of leatherback turtle in New York.

Details of historic and current occurrence:
Unknown for New York. Sadove and Cardinale (1993) gave a rough estimate of 500-800 leatherbacks using the New York Bight region annually, based on surveys from the 1970s – 1990s.

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

Sadove and Cardinale (1993) state that the leatherback is "one of the most abundant species of sea turtle in New York Bight." They estimated that the annual number of turtles using New York wasters was 500 – 800 animals, although they note that this is a "very rough" estimate. Unfortunately, no surveys have been conducted recently in New York.

Shoop and Kenney (1992) performed aerial and shipboard surveys and found about seven leatherbacks for every 1,000 km from Nova Scotia to Cape Hatteras, North Carolina. They estimated a population of 100-900 leatherbacks in this area during the summer. This was recognized as a minimum population based on animals at the surface.

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

a. Size/Waterbody Type: Pelagic, Estuarine, Brackish Shallow Subtidal, Brackish Deep Subtidal, Marine, Deep Subtidal, Shallow 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:

The leatherback turtle has the largest range of any reptile species (ALTRT 2006). Because of the ability to regulate their body temperature, leatherbacks can tolerate colder waters than other species of sea turtles (ALTRT 2006, NMFS and USFWS 1992, NMFS and USFWS 2007). They have been documented as far north as 70°15'N (Gulliksen 1990) and as far south as 27°S (Boulon et al. 1988).

The major nesting assemblages of leatherback turtles are described above (See Trends Discussion). Researchers are uncertain about where newly hatched leatherbacks travel to, but it is believed that juveniles with a curved carapace length of <100cm remain in water that is at least 26°C (NMFS and USFWS 2007). An unknown proportion of adult leatherbacks travel into temperate waters after each nesting season (ALTRT 2006). While in these waters, leatherbacks appear to prefer continental shelf waters (Lazell 1980, Shoop and Kenney 1992, James 2000, Lawson and Gosselin 2003). While offshore, leatherbacks are found along thermal fronts and the edges of oceanic gyre systems (Collard 1990, Lutcavage 1996). All of these areas concentrate prey. Indeed, while foraging along the east coast of the U.S. and Canada, the distribution and movements of leatherbacks are believed to correlate with seasonally abundant prey (Bleakney 1965, Goff and Lien 1988, Shoop and Kenney 1992, James and Herman 2001).

In New York, leatherbacks are observed most frequently off the south shore of Long Island, and also occasionally in Long Island Sound (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?
Choose an item.	Yes	Choose an item.	Yes	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 life expectancy of leatherbacks is unknown, but is at least thirty years (NMFS and USFWS 1992). They are believed to reach sexual maturity around 29 years of age (Aven and Goshe 2007). The longest observed reproductive lifespan is 18 years, observed in South Africa (Hughes 1996).

Females nest nocturnally on beaches from March – July (NMFS and USFWS 1992). They exhibit some degree of site fidelity to their natal beach, but do not appear to be as strict as other species of sea turtles (NMFS and USFWS 2007). This may make them more able to colonize new beaches. Male leatherbacks appear to exhibit some degree of site fidelity at breeding grounds (James et al. 2005). Mating is believed to occur near the nesting beach, although it is rarely observed (Godfrey and Barreto 1998, Reina et al. 2005).

Females deposit around 100 eggs in each of 5-7 nests a nesting season (NMFS and USFWS 1992). The interval between each nesting event is about 9-10 days (NMFS and USFWS 1992). The nesting events can occur on beaches hundreds of km apart; leatherbacks from Gabon traveled 2,000 – 4,500 km during the entire nesting season (Witt et al. 2008). Females reproduce every 2-3 years (NMFS and USFWS 1992). The nests incubate for 55-75 days. The sex of the hatchlings is dependent on the incubation temperature (NMFS and USFWS 1992).

Once eggs hatch, hatchlings travel into the pelagic environment. Very little is known about these "lost years." The survival in the first year of life has been estimated to be 0.0625 (Spotila et al. 1996).

Adult leatherbacks are known to travel long distances between nesting and foraging grounds. During the first year after nesting, leatherbacks have been observed traveling continuously and adjusting foraging behavior based on local conditions (Hays et al. 2006). Satellite-tracked leatherbacks nesting in Atlantic Costa Rica and Panama traveled into the Gulf of Mexico, along the east coast of North America to Nova Scotia, and over to the Azores Islands (Troeng et al. 2004, 2007; Evans et al. 2007). Those tagged in Florida tended to remain in North American continental shelf waters until winter, when they moved off the shelf. One traveled to the Mauritanian Coast and another to the north equatorial Atlantic (Eckert et al. 2006). Females, males and subadults who forage in the North Atlantic have been shown to make return migrations to key feeding areas (James et al. 2005).

Feral pigs, dogs, mole crickets, raccoons, armadillos, monitor lizards, mongoose, civets, genets, ghost crabs, jackals, dipteran larvae, and army ants have all been documented to prey on leatherback eggs (NMFS and USFWS 2007). Fish and birds are known to prey on hatchlings (Vose and Shank 2003). Jaguars, killer whales, and sharks occasionally prey on adults (Long 1996, Pitman and Dutton 2004).

The role of disease on natural mortality of leatherbacks is poorly understood. Fibropapillomatosis has been documented in leatherbacks, although it is not as common as in other sea turtle species (Huerta et al. 2002). Fibropapillomatosis causes tumors that can hamper swimming, vision, feeding, and escape from predators (Herbst 1994).

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

Threats to NY Populations	
Threat Category	**Threat**
1. Transportation & Service Corridors	Shipping Lanes (ship strikes)
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch and entanglement in fishing gear)
3. Pollution	Garbage & Solid Waste
4. Pollution	Industrial & Military Effluents (contaminants)
5. Pollution	Agricultural & Forestry Effluents (contaminants)
6. Residential & Commercial Development	Housing & Urban Areas (destruction and alteration of nearshore foraging areas from coastal development)
7. Residential & Commercial Development	Commercial & Industrial Areas (destruction and alteration of nearshore foraging areas from coastal development)
8. Residential & Commercial Development	Tourism & Recreation Areas (destruction and alteration of nearshore foraging areas from marina construction)
9. Climate Change and Severe Weather	Habitat Shifting & Alteration (the jellyfish shift)
10. Pollution	Excess Energy (anthropogenic noise)
11. Energy Production & Mining	Oil & Gas Drilling (oil spills)
12. Natural System Modifications	Other Ecosystem Modifications (shoreline stabilization)
13. Natural System Modifications	Other Ecosystem Modifications (sea walls)
14. Human Intrusions & Disturbance	Recreational Activities (boating)

One of the major threats to sea turtle populations in New York is fisheries interactions. Leatherback turtles can become trapped in pound nets, longline fisheries, trap fisheries, trawl fisheries, purse seines, and gill nets. Entanglements in fixed gear are known to be a threat in temperate coastal foraging habitats (James et al. 2005a). 92 leatherbacks were documented as entangled in fixed pot gear from New York to Maine from 1990 – 2000 (Dwyer et al. 2002). Turtles trapped in gear can drown or suffer serious injuries as a result of constriction by lines (NMFS and USFWS 1992) and prolonged entanglements may affect their ability to feed, dive, swim and reproduce (Balazs 1985). Trawlers that are not outfitted with Turtle Excluder Devices (TEDs) can entrap and drown sea turtles. Additionally, dredges can destroy habitat and crush or entrap sea turtles (NMFS and USFWS 1992).

Longline and gill net fisheries appear to be major problems for leatherbacks throughout their range (NMFS and USFWS 2007). The decline of the Mexican population of leatherbacks is believed to coincide with the growth of longline and coastal gill net fisheries in the Pacific (Eckert and Sarti 1997). An estimated 50,000 leatherbacks were taken as bycatch by the pelagic longline fishery in 2000 (Lewison et al. 2004). An estimated 3,000 leatherbacks are entangled in coastal gill nets annually off of Trinidad; about 1/3 of these are believed to die as a result (Lee Lum 2006). While bycatch rates vary widely between areas, Lewison et al. (2004) suggested that the overall bycatch levels are not sustainable.

Climate change is believed to have major effects on sea turtles throughout their range. Climate change is expected to extend the foraging range of leatherback turtles north into higher latitude waters (NMFS and USFWS 2007). Additionally, climate change is believed to be associated with rising water temperatures, as well as changes in ice cover, salinity, oxygen levels and circulation (IPCC 2007). These changes are likely to cause shifts in range and abundance of different species of algae, plankton and fish (IPCC 2007). These shifts could alter the suitability of New York habitat (as well as habitat in other parts of sea turtles' ranges) for occupancy by sea turtles. Changing currents as a result of climate change could affect sea turtle migration and survival of oceanic-stage juveniles (NMFS and USFWS 2007).

Climate change could have significant effects on leatherback turtles in other parts of their range as well. More nests could be destroyed as a result of the increasing abundance and severity of storms along the nesting range. Severe storms and rising sea levels could cause major problems on low-lying nesting beaches. Additionally, there is concern that rising temperatures could skew hatchling sex ratios towards a strong female bias (Mrosovsky et al. 1984; Hawkes et al. 2007). Rising sand temperatures have been documented at at least one nesting site (Hays et al. 2003). Leatherbacks do have a tendency to have individual nest placement preferences, and often deposit some clutches in the cooler tide zone of beaches, so this may not be a severe issue (Kamel and Mrosovsky 2004).

Coastal development can lead to destruction or degradation of sea turtle habitat, particularly on their nesting grounds. The construction of buildings, pilings, seawalls, rock revetments, groins, jetties, and sand bags degrades sea turtle nesting habitat (NMFS and USFWS 2007). Additionally, bright lighting near beaches can disorient hatchlings, and cause them to move towards the light rather than the ocean (McFarlane 1963, Philibosian 1976, Mann 1977, Ehrhart 1983). This misorientation can lead to increased risk from predators, entrapment in vegetation, dessication, and being hit by vehicles (NMFS and USFWS 1991). Some countries do have regulations on lighting by the beach, but the majority do not (NMFS and USFWS 2007). Unfortunately, the effects of development on turtles in the marine environment are difficult to monitor (NMFS and USFWS 2007).

Organochlorine contaminants, cadmium, copper, zinc, and toxic metals have all been identified in leatherbacks (Godley et al. 1998b; McKenzie et al. 1999; Caurant et al. 1999; Storelli and Marcotrigiano 2003). The effects that these contaminants may have on leatherbacks are currently unknown. High levels of organochloride pesticides have been found in the sand of a French Guiana nesting beach (Guirlet 2005); there is some speculation that this could explain low hatching success on the beach (Girondot et al. 2007). Offloading of contaminants from nesting females to eggs has been documented in leatherbacks (Stewart et al. 2007). Oil spills are known to directly affect marine turtles (Yender and Mearns 2003), and could also lead to immunosuppression and chronic health issues (Sindermann et al. 1982).

Sea turtles could ingest or become entangled in marine debris, which can reduce food intake and digestive capacity and cause injury or mortality (Bjorndal et al. 1994; Sako and Horikoshi 2002). Leatherback turtles may be more at risk than other species, as debris tends to concentrate in convergence zones where turtles feed (Shoop and Kenney 1992, Lutcavage et al. 1997). The species feeds primarily upon jellyfish, and may mistake plastics and balloons as prey and ingest them, causing blockages, starvation, absorption of toxic byproducts and other health issues (Plotkins and Amos 1989, ALTRT 2006). There have been reports of leatherbacks ingesting plastic bags, balloons, plastic and Styrofoam pieces, tar balls, plastic sheeting, and fishing gear (Hartog and Van Nierop 1984, Sadove and Morreale 1989, Lucas 1992, Starbird 2000). Sea turtles may occasionally be hit by vessels, which can cause mortality and severe injury. In Florida, over 17% of all stranded leatherbacks have evidence of vessel collisions, although it is possible that these collisions occur post-mortem (NMFS and USFWS 1992). Vessel collisions are believed to happen more often than reported throughout the range of this species (NMFS and USFWS 2007).

While not included as a threat by the Recovery Plan or 5-Year Review, the Canadian Recovery Plan (ALTRT 2006) lists anthropogenic noise as a potential threat. Studies have shown that sea turtles exposed to certain levels of low frequency sound may spend more time at the surface and/or move out of the area (Lenhardt et al. 1983, O'Hara and Wilcox 1990). This could lead to the displacement of turtles from preferred foraging areas (O'Hara and Wilcox 1990; Moein et al. 1994). Additionally, sea turtles have been found to change swimming patterns and orientation in response to air guns, which are frequently used in oil and gas exploration (O'Hara 1990). Unfortunately, researchers do not have a good idea about the hearing capabilities of leatherback turtles, so many of the effects of anthropogenic noise on sea turtles are largely unknown.

The harvesting of adult leatherbacks and eggs is a problem throughout their range. While this is not a problem in the U.S., the wide-ranging nature of leatherbacks means that those that forage along the east coast of the U.S. may be threatened by exploitation in their nesting grounds. Poaching of adults for meat and/or oil and/or the collection of eggs for sale in local and foreign markets occurs in the British Virgin Islands, Dominican Republic, Jamaica, Puerto Rico, U.S. Virgin Islands and the Bahamas (Fleming 2001).

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 leatherback turtle is listed as an endangered species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species. It is also protected as a federally-listed endangered 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 leatherback turtle. Whether they are adequate to protect the habitat is currently unknown.

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

The NY Marine Rescue Center should continue to carry out stranding and entanglement response for sea turtles. The Rescue Center rescues and rehabilitates injured and ill individuals. Before being released, rehabilitated sea turtles are sometimes given a satellite tag, which helps expand our knowledge on movements and habitat use. Placing PIT tags and/or satellite tags on as many individual turtles as possible will help to further our knowledge on leatherback turtle life history, and this practice should be encouraged. It is critical to determine where New York leatherback turtles travel and nest to help reduce the threats to the population during other stages of its life.

Long-term surveys to monitor the population of leatherback turtles in New York should be implemented. Sea turtle use of state waters was fairly well established by studies throughout the 1980s and 1990s, but not much work has been done in recent years. Monitoring would allow researchers to garner a better idea of population trends and habitat use of this species in the State, and see if shifts in use have occurred. Additionally, further research into the effects of the various threats listed above on the leatherback turtle population in the State should be encouraged. Bycatch rates should be closely monitored, and research into reducing these rates would be beneficial.

Education on this species and the importance of reporting ship strikes and entanglements is encouraged. Conservation actions following IUCN taxonomy are categorized in the table below.

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. Education & Awareness	Awareness & Communications
2. External Capacity Building	Alliance & Partnership Development

Table 2: Recommended conservation actions for leatherback turtle.

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for sea turtles.

Curriculum development:

____ To provide public outreach programs about local species and their environment within the Long Island Sound and the New York Bight. Partnering with agencies such as the New York State Marine Mammal and Sea Turtle Rescue Program, NYSDEC, NOAA, U.S. Coast Guard and local law enforcement, will allow the Riverhead Foundation to adhere to the actions listed in the sea turtle recovery plans more efficiently and effectively.

Fact sheet:

____ To provide literature for local communities, as well as law enforcement agencies, regarding sea turtles and their environment within the Long Island Sound and the New York Bight. The information distributed by the Riverhead Foundation to these people will provide a more effective response to strandings and sightings of animals.

Population monitoring:

____ Mark recapture studies will provide data on the diet composition of these animals between bodies of water. These results can be compared to historical studies to identify any shifts in prey species.

____ Determine sex composition of NY sea turtle populations. As the New York region is a critical developmental habitat for sea turtles it is important to understand if there is a sexual bias for this area. Historical studies were unable to obtain the sex of many live animals.

____ Radio and satellite tags can be combined with aerial and shipboard survey work to study abundance, distribution, and movements associated with seasonal changes.

____ Genetic studies should be conducted to identify stock structure and possibly understand broad scale movements.

____ Mark recapture studies will provide data on size class, and population structure. With these data comparisons can be made within years, between years and between bodies of water (e.g. Long Island Sound, Peconic Bay, Great South Bay, offshore waters) and also compared to stranded animals to understand how and if stranded animals can be used as a representative of the current population or a proxy for ecosystem health.

VII. References

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Originally prepared by	Amanda Bailey
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Latest revision	

Species Status Assessment

Common Name: Loggerhead turtle **Date Updated:** January 2024

Scientific Name: *Caretta caretta* **Updated by:**

Class: Reptilia

Family: Cheloniidae

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

Linnaeus first named loggerhead *Testudo caretta* in 1758. Although the loggerhead has received more than 35 different names (Dodd 1988), *Caretta caretta* is currently the accepted name. An Indo-Pacific subspecies *Caretta caretta gigas* was described in the 1930s, but most evidence does not support the designation of this subspecies (Dodd 1988; Bowen 2003). Loggerheads are found in New York waters during the summer month, and occasionally found cold-stunned during the early winter. Sadove and Cardinale (1993) described two separate demographic groups of loggerheads that use State waters. Juveniles are found frequently in nearshore bays and Long Island Sound, while a broader range of age classes that includes adults are found up to 40+ miles off the southern Long Island coast (Sadove and Cardinale 1993). Recent evidence suggests that loggerheads are declining throughout much of their range, including the New York Bight (Morreale et al. 2005, NMFS and USFWS 2008).

I. Status

a. Current legal protected Status

i. **Federal:** Threatened **Candidate:** N/A

ii. **New York:** Threatened, SGCN

b. Natural Heritage Program

i. **Global:** G3

ii. **New York:** S1N **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Endangered

-Northeast Regional SGCN:

-CITES: Appendix I

Status Discussion:

The loggerhead turtle was first listed under the Endangered Species Act in 1978. In the U.S., the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) have joint jurisdiction. When first listed, the loggerhead was designated as threatened. In 2011, nine distinct population segments were designated. The Northwest Atlantic Ocean DPS, South Atlantic Ocean DPS, Southeast Indo-Pacific Ocean DPS, and Southwest Indian Ocean DPS were all listed as threatened. The Northeast Atlantic Ocean DPS, Mediterranean Sea DPS, North Indian Ocean DPS, North Pacific Ocean DPS and the South Pacific Ocean DPS are all listed as endangered (NMFS 2013). Within the Northwest Atlantic Ocean DPS there are five recovery units listed under the Recovery Plan (NMFS and USFWS 2008): Northern Recovery Unit (southern VA through FL/GA border), Peninsula Florida Recovery Unit (FL/GA border through Pinellas County, FL), Dry Tortugas Recovery Unit (islands west of Key West, FL), Northern Gulf of Mexico Recovery Unit (Franklin County, FL through TX), and the Greater Caribbean Recovery Unit (Mexico through French Guiana, the Bahamas, Lesser Antilles and Greater Antilles).

Because the loggerhead turtle is highly migratory, it is also protected under several international treaties including the Convention on Migratory Species, the Specially Protected Areas and Wildlife Protocol of the Cartagena Convention, and the Inter-American Convention for the Protection and Conservation of Sea Turtles.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Unknown	1980s-2008	Threatened	Choose an item.
Northeastern US	Yes	Declining	Unknown	1983-2008	Threatened	Choose an item.
New York	Yes	Declining	Unknown	1987-2004	Threatened	Yes
Connecticut	Yes	Unknown	Unknown		Threatened	Yes
Massachusetts	Yes	Unknown	Unknown		Threatened	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	No	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):*

None. The only monitoring that occurs for the species is entanglement and stranding response provided by NY Marine Rescue Center.

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

The loggerhead sea turtle is declining through much of its range. The nesting grounds on U.S. beaches are extremely important to the population; South Florida represents one of only two nesting aggregations that have greater than 10,000 nesting females per year (NMFS and USFWS 2008). Currently, the easiest and most affordable way to get indications on population trends is through nesting surveys that are corrected for any changes in the length of time between successive nesting migrations and/or changes in clutch frequency.
Data from the Northern Recovery Unit (NRU) suggest a long-term decline. Long-term nest counts from eleven representative beaches from North Carolina, South Carolina and Georgia show an annual decline of 1.3% from 1989 – 2008 (NMFS and USFWS 2008). Additionally, aerial surveys in South Carolina have found that nesting in South Carolina has decreased 1.9% per year since

1980 (NMFS and USFWS 2008). Nest counts from the Peninsular Florida Recovery Unit (PFRU, the largest assemblage) show a 26% decline from 1989 – 2008 (NMFS and USFWS 2008). PRFU nesting has declined by 41% since 1998 (NMFS and USFWS 2008). Nesting trends could not be determined for the Dry Tortugas Recovery Unit (DTRU). The Northern Gulf of Mexico Recovery Unit showed a 4.7% annual decline in nesting from 1997 – 2008 (NMFS and USFWS 2008). Smaller nesting assemblages in the Greater Caribbean Recovery Unit (GCRU) have declined in the past several years. Nesting from Quintana Roo, Yucatan, Mexico increased from 1987 – 2001, but has declined since 2001 to the point where the previous increase has not held (NMFS and USFWS 2008).

There have been several in-water studies of sea turtles. Aerial surveys done in the Chesapeake Bay region found a 65% - 75% decline in loggerhead and Kemp's ridley sea turtles since the 1980s (Mansfield 2006). Catch rates of loggerheads in pound nets increased significantly from 1995 – 2003 in the Pamlic-Albemarle Estuarine Complex in North Carolina (Epperly et al. 2007). Capture rates of loggerheads in shrimp trawlers in the southeast U.S. Atlantic *suggest* an increase in abundance since the 1980s (Maier et al. 2004). Two studies in the Mosquito Lagoon, FL area found a decrease in capture frequency of loggerheads from the late 1970s to 1990s – 2000s; however, the two studies used very different netting effort, and thus the decline may be related to that (NMFS and USFWS 2008). Capture rate of loggerheads in St. Lucie Power Plant, FL have increased since 1977 (FPL and Quantum Resources, Inc. 2005). Studies in Florida Bay from 2000 – 2007 have found no significant trends in the loggerhead population (NMFS and USFWS 2008). The loggerhead population in New York appears to be declining. Juvenile sea turtles were captured in pound nets during a study from 1987 – 1992. During that time period, loggerheads made up 59% of the total captures (Morreale and Standora 1998). This study was resumed from 2002 – 2004 when only two loggerheads were captured. These two individuals represented less than 4% of the total captures during the period (Morreale et al. 2005).

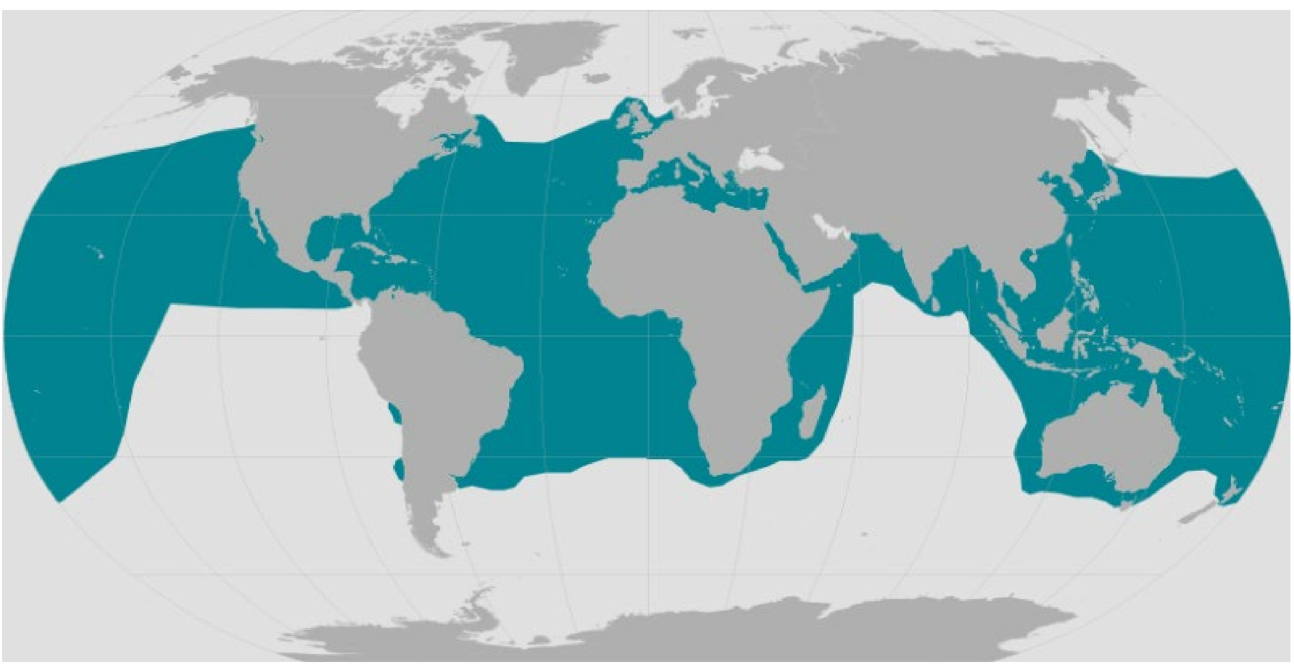

Figure 1. Loggerhead sea turtle distribution map (NOAA 2024)

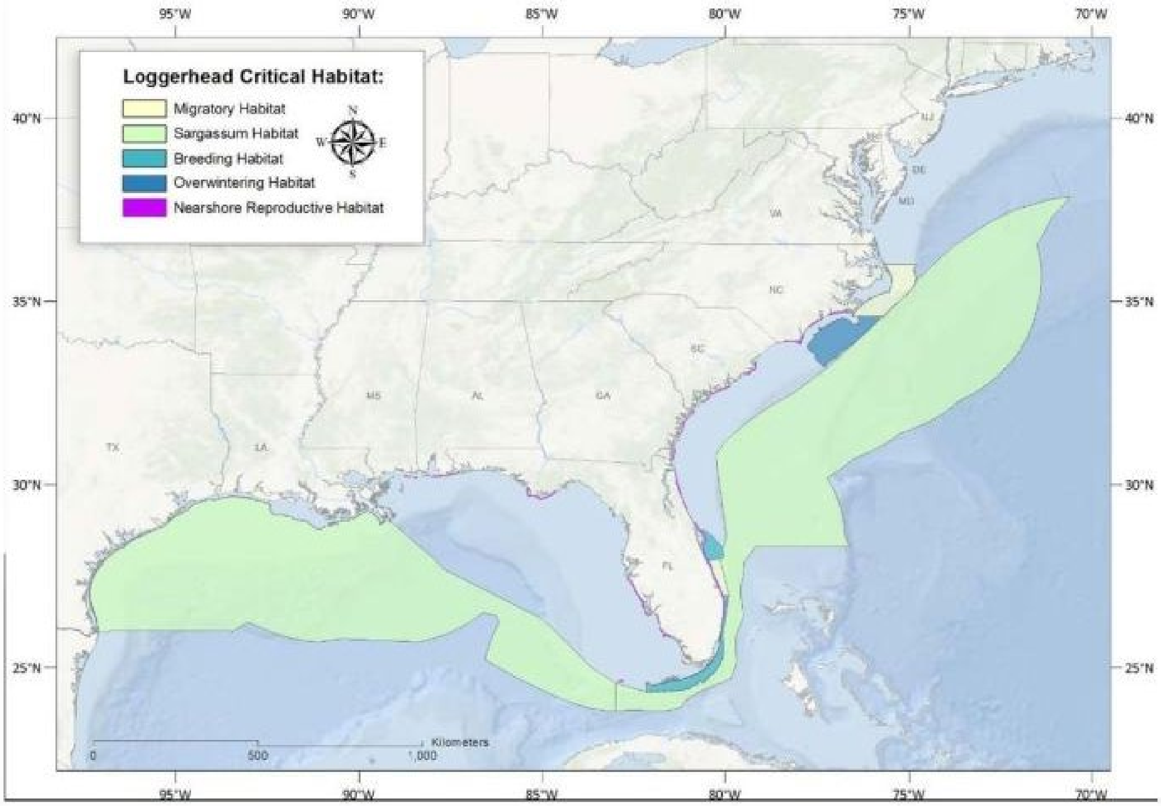

Figure 2. Critical habitat for loggerhead sea turtles (NOAA 2024)

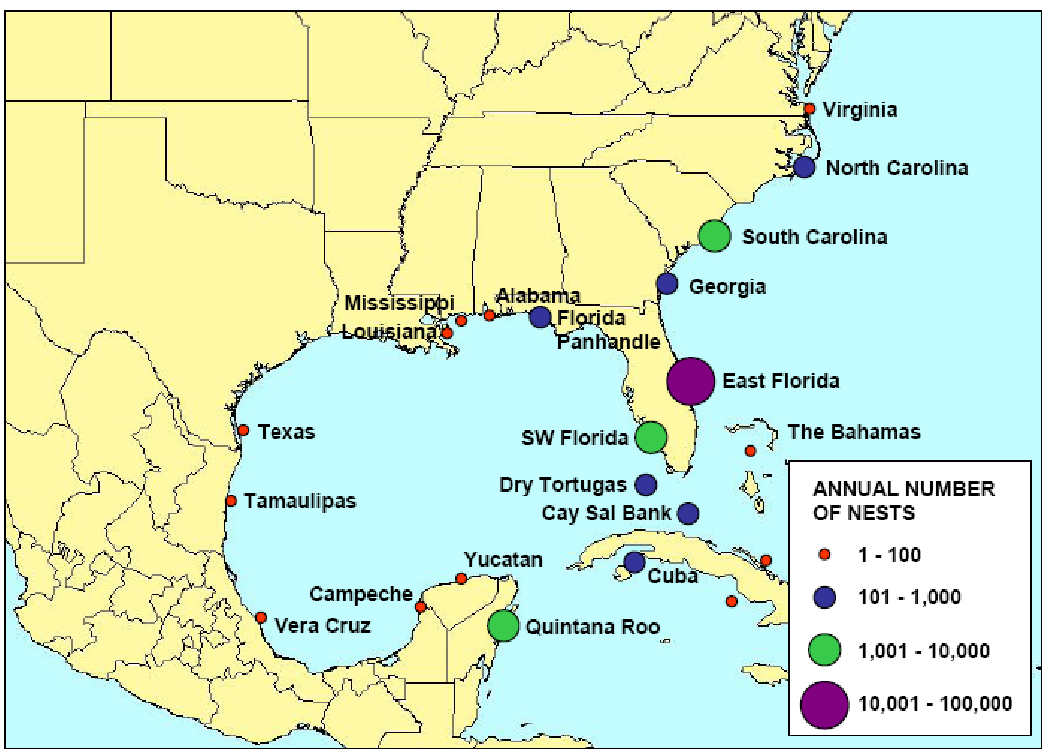

Figure 3. Location of and estimated annual number of loggerhead nests on nesting beaches from 2001 – 2008. Data from the Northwest Atlantic Ocean DPS (NMFS and USFWS 2008).

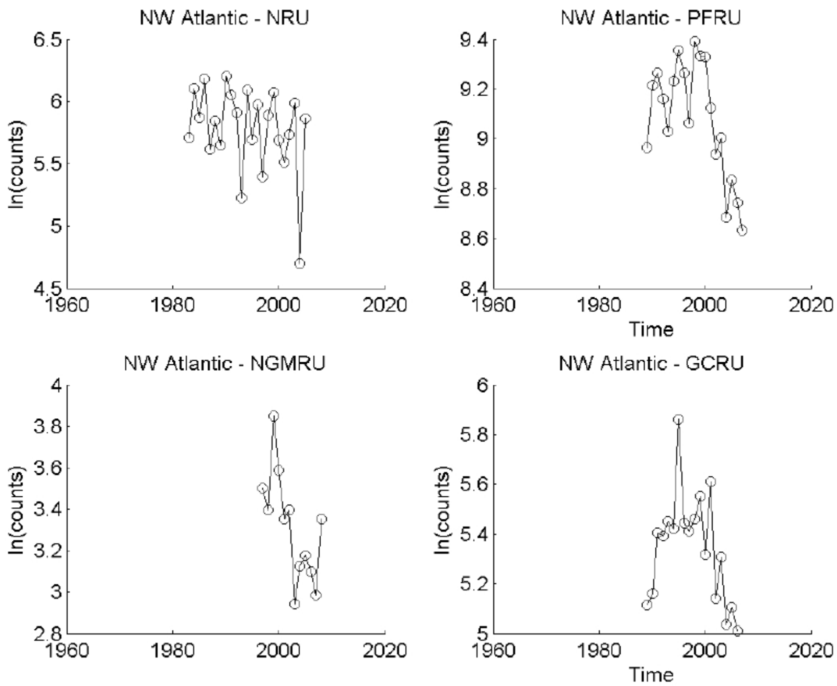

Figure 4. Changes in the numbers of nesting females at nesting beaches for the Northwest Atlantic Ocean DPS. The number of nesting females was computed from the observed number of nests divided by the mean clutch frequency (5yr). NRU = Northern Recovery Unit, PFRS = Peninsular Florida Recovery Unit, NGMRU = Northern Gulf of Mexico Recovery Unit, and GCRU = Greater Caribbean Recovery Unit (Conant et al. 2009).

Table 1. Summary of loggerhead in-water population studies in the U.S. from which trend data have been reported. Source: Conant et al. 2009.

Location	Methodology	Study Period[1]	Trend Result[2]	Reference
New York, inshore waters	Fishery Dependent (pound nets)	1987-2004	Declining	Morreale *et al.* 2005
Chesapeake Bay, VA	Aerial Survey	1982-2004	Declining	Mansfield 2006
Pamlico Sound, NC	Fishery Dependent (pound nets)	1995-2003	Increasing	Epperly *et al*. 2007
Southeast U.S. Atlantic - SEAMAP	Trawl	1990-2000	No trend	NMFS 2001
Southeast U.S. Atlantic	Trawl	2000-2003	No trend	Maier *et al*. 2004
Mosquito Lagoon, FL	Tangle Net	1977-2005 1995-2005	Declining No trend	Jane Provancha, Dynamac Corporation, personal communication, 2006
Indian River Lagoon, FL	Tangle Net	1982-2005	No trend	Ehrhart *et al*. 2007
St. Lucie Nuclear Power Plant, FL	Power Plant Intake Structures	1977-2004	Increasing	FPL and Quantum Resources, Inc. 2005
Florida Bay, FL	Sightings	2000-2006	No trend	Barbara Schroeder, NMFS, personal communication, 2006

[1] Study period does not imply continuous annual sampling, see project discussion for details.
[2] See project discussion for potential biases, caveats, and details.

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

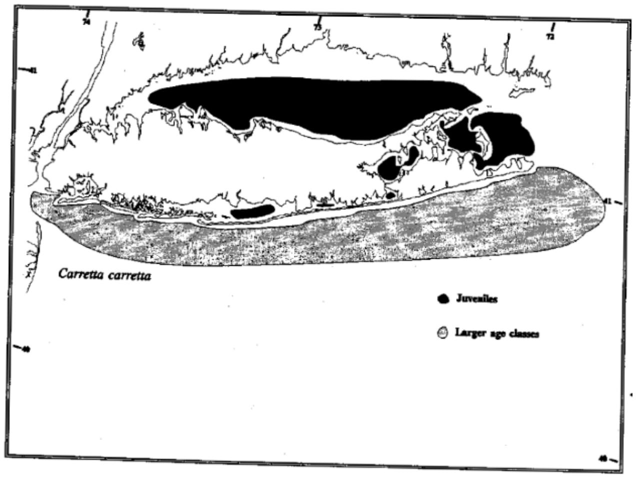

Figure 5. Areas where green turtles have been sighted in New York waters (Sadove and Cardinale 1993).

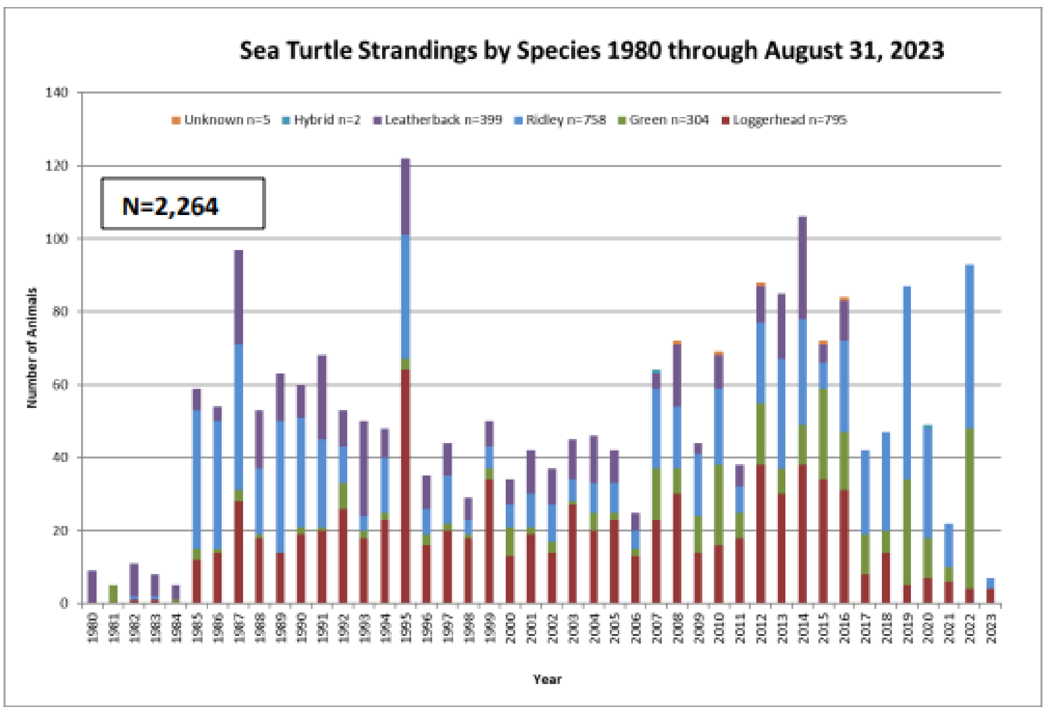

Figure 6: New York sea turtle strandings 1980 through August 31, 2023 by NY Marine Rescue Center (Montello et al. 2023).

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-1995	129 (56%)		
1995-2004			
2005-2014			
2015-2023			

Table 1: Records of loggerhead turtle in New York.

Details of historic and current occurrence:

129 loggerheads were captured in a mark-recapture study in New York waters from 1987 – 1992. The species represented 56% of all original captures (Morreale and Standora 2005).

Morreale et al. (2005) initiated a study using a subset of the pound nets used in the 1987 – 1992 study period. From 2002 – 2004, only two loggerheads were captured. The species represented just 4% of captures.

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

Sadove and Cardinale (1993) estimated approximately 800 loggerheads using the New York Bight region based on data from the 1970s – early 1990s. Studies using captures by pound nets showed declines in relative proportion and total abundance of loggerheads between 1987 – 1992 and 2002 – 2004 (Morreale and Standora 1998; Morreale et al. 2005). Morreale et al. (2005) speculated that this decline could be related to shifts in foraging areas, and/or increased mortality of younger age classes.

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

a. **Size/Waterbody Type:** Marine, Shallow Subtidal, Pelagic, Deep Subtidal, Estuarine, Brackish Shallow Subtidal, Brackish Deep Subtidal, Marine Eelgrass Meadow

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:

Loggerhead nesting beaches in the North Atlantic can be found along the U.S. coast from southern Virginia to Alabama, with Florida being one of only two nesting areas in the world that boasts over 10,000 nesting females each year (Conant et al. 2009). Nesting also occurs on the Yucatan Peninsula, Bahamas, Cuba, on the eastern coast of Central America, Colombia, Venezuela and the eastern Caribbean Islands. Additionally, nesting also occurs in Brazil, the Cape Verde Islands, and the west coast of Africa (Conant et al. 2009).

Once hatchlings enter the surf, they enter a "swim frenzy" stage and travel to areas of downwelling (Witherington 2002). They often spend periods of time within floating Sargassum patches (Witherington 1995). Juvenile loggerheads enter the oceanic zone. During this period, most loggerheads spend 75% of their time in the first five meters of the water column (Bolten 2003). After a period of time that can span up to 15 years, juveniles move into continental shelf waters from Massachusetts south into the Caribbean (NMFS and USFWS 2008). They are frequently found in estuarine waters during this life stage, and may occasionally move back into the oceanic zone, especially during winter (Morreale and Standora 2005, Mansfield 2006, McClellan and Read 2007, NMFS and USFWS 2008).

As loggerheads enter the adult stage, their habitat preferences shift. While they still use the neritic zone, they are less likely to use shallow, estuarine habitats with limited ocean habitats. Instead, they are found in shallow water habitats that have large areas of open ocean access, such as Florida Bay (NMFS and USFWS 2008). Adults are also found in offshore continental shelf waters from New York to the Caribbean (Schroeder et al. 2003).

In New York, loggerheads can be found from May through October. Juveniles can be found using bays and Long Island Sound, while a larger range of age classes that includes adults can be found offshore. These individuals can be found 40 miles or more off the south side of Long Island (Sadove and Cardinale 1993). Loggerheads in New York prey upon spider, horseshoe, green, and portunid crabs (Sadove and Cardinale 1993).

There has not been a change in overall amount of pelagic and shallow subtidal ecosystem; however, there may be changes in habitat suitability. Shifts in prey distribution can lead to previously suitable areas becoming unsuitable, and vice versa. Changes in water temperature, pollution (including noise pollution), coastal development, vessel traffic, etc. may also affect the suitability of certain areas. 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?
Choose an item.	Choose an item.	Choose an item.	Yes	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):*

Loggerhead turtles can live to be over 57 years of age (Dahlen et al. 2000). They reach sexual maturity between 32 and 35 years of age, and females exhibit strong site fidelity to nesting beaches (NMFS and USFWS 2008). While nest fidelity is not perfect, it may make it difficult for females to recolonize nesting beaches that have been previously destroyed (Miller 1997). Females return to beaches every 2 – 4 years to nest (Richardson et al. 1978; Bjorndal et al. 1983). Nesting occurs from April through September. Females lay 3 – 6 nests of 100 – 126 eggs each (Dodd 1988, NMFS and USFWS 2008). The eggs incubate for 42 – 75 days before hatching. Loggerhead turtle eggs exhibit temperature dependent sex determination, with eggs incubated below a critical temperature being males, and those incubated above a critical temperature being females (NMFS and USFWS 2008). Eggs often hatch at night. See habitat discussion for more detailed information on habitats used by different life stages. Reproductive longevity for this species is at least 25 years (Dahlen et al. 2000).

Mortality of post-hatchlings is believed to be high, although survival estimates are not available. From 2 – 6 years of age, when loggerheads are occupying the oceanic zone, the annual survival probability is estimated to be around 0.9 (NMFS and USFWS 2008). After 6 years of age, when turtles begin to move into the neritic zone, the estimated annual survival probability drops drastically to just over 0.6, partially because of bycatch in fisheries (Bjorndal et al. 2003). From the ages of 14 – 24, when juveniles typically inhabit the neritic zone, the annual survival probability is estimated to be 0.7 – 0.8 (Heppell et al. 2003). Existing estimates of annual adult survival are typically of nesting females, and are estimated to be around 0.85 (Heppell et al. 2003).

Ghost crabs, raccoons, feral hogs, foxes, coyotes, armadillos and red fire ants prey upon eggs and/or hatchlings (NMFS and USFWS 2008). Raccoons may take up to 96% of all nests on certain beaches (NMFS and USFWS 2008). Juvenile and adult loggerheads may be preyed upon by fish, sharks, and killer whales. Severe storms and erosion also destroy some nests (NMFS and USFWS 2008).

A variety of diseases have been documented in loggerhead sea turtles, although the actual effects of these diseases on the population are largely unknown (NMFS and USFWS 2008). Bacterial encephalitis and ulcerative stomatitis/obstructive rhinitis/pneumonia and *Bartonella* have been reported in loggerheads in North Carolina (George 1997, Valentine et al. 2007). Bacterial and fungal infections are common in captive sea turtles, though there are few records in the wild (Herbst and Jacobson 1995; George 1997). Some loggerheads display symptoms of fibropapillomatosis (FP), although it does not occur in the species nearly as often as in green turtles (NMFS and USFWS 2008). FP causes the growth of tumors that can block the vision in turtles and lead to decreased swimming and foraging capabilities (Herbst 1994).

Endoparasites, including trematodes, tapeworms and nematodes have been found in loggerheads (Herbst and Jacobson 1995); these endoparasites may lead to debilitation and/or mortality. Trematodes were listed as a possible cause of a loggerhead epizootic from 2000 – 2001 (Jacobson et al. 2006). Additionally, leeches, barnacles, and other ectoparasites may have negative effects on sea turtle health. Harmful algal blooms may also play a role in loggerhead mortality (NMFS and USFWS 2008).

Sea turtles are vulnerable to dramatic changes in temperature. While most turtles are believed to migrate out of New York waters in late summer, some may be feeding in shallow waters and still be in the area when water temperatures drop significantly (Morreale and Standora 1998). When this happens, sea turtles can fall victim to a process known as cold-stunning. This is a hypothermic state that can result in the turtle drifting at sea in a lethargic state. Cold-stunning often results in mortality, unless the turtles wash ashore and are rescued by stranding groups.

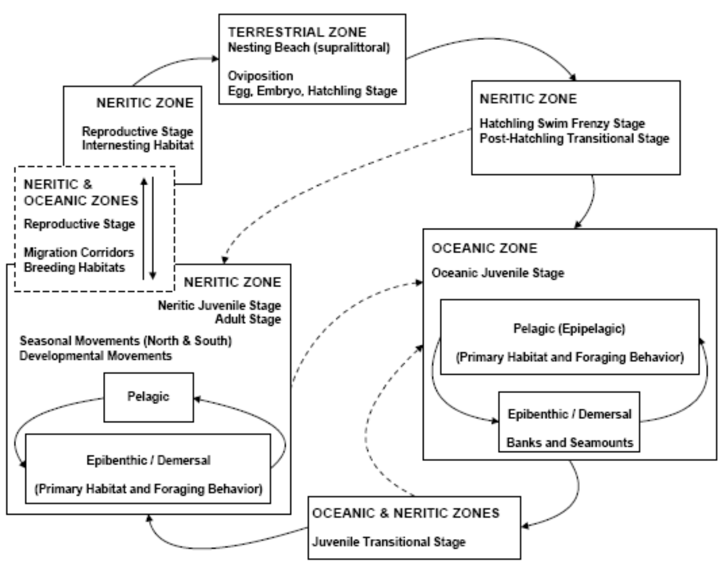

Figure 7. Generalized life history of North Atlantic loggerhead sea turtles (Bolten 2003).

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

Threats to NY Populations	
Threat Category	**Threat**
1. Transportation & Service Corridors	Shipping Lanes (ship strikes)
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch and entanglement in fishing gear)
3. Pollution	Garbage & Solid Waste
4. Pollution	Industrial & Military Effluents (contaminants)
5. Pollution	Agricultural & Forestry Effluents (contaminants)
6. Climate Change and Severe Weather	Temperature Extremes (cold-stunning)
7. Residential & Commercial Development	Housing & Urban Areas (destruction and alteration of nearshore foraging areas from coastal development)
8. Residential & Commercial Development	Commercial & Industrial Areas (destruction and alteration of nearshore foraging areas from coastal development)
9. Residential & Commercial Development	Tourism & Recreation Areas (destruction and alteration of nearshore foraging areas from marina construction)
10. Climate Change and Severe Weather	Habitat Shifting & Alteration
11. Pollution	Excess Energy (anthropogenic noise)
12. Energy Production & Mining	Oil & Gas Drilling (oil spills)
13. Natural System Modifications	Other Ecosystem Modifications (shoreline stabilization)
14. Natural System Modifications	Other Ecosystem Modifications (sea walls)
15. Human Intrusions & Disturbance	Recreational Activities (boating)

One of the major threats to sea turtle populations in New York is fisheries interactions. Sea turtles can become trapped in pound nets, longline fisheries, trap fisheries, trawl fisheries, purse seines and gill nets. Turtles trapped in gear can drown or suffer serious injuries as a result of constriction by lines (NMFS and USFWS 2008). Additionally, turtles can be hooked by longline gear, which can cause injury and reduced feeding capabilities. Trawlers that are not outfitted with Turtle Excluder Devices (TEDs) can entrap and drown sea turtles. Additionally, dredges can destroy habitat and crush or entrap sea turtles (NMFS and USFWS 2008). In New York, Morreale and Standora (1998) reported that commercial fisherman were responsible for 84% of all 317 live turtles captured in a mark-recapture study from 1987 – 1992. 93% of these captures were in pound nets; sea turtles were also caught in trawls and entangled in lobster pot lines and gill nets (Morreale and Standora 1998).

Climate change is believed to have major effects on sea turtles throughout their range. Extreme temperature changes could lead to increased numbers of cold-stunned sea turtles; it is also possible that changing temperatures could lead to conditions that are more favorable for sea turtles. Of the approximately 18 cold-stunned sea turtles that Riverhead Foundation responded to between November 2012 and August 2013, at least four were loggerhead turtles. Additionally, climate change is believed to be associated with rising water temperatures, as well as changes in ice cover, salinity, oxygen levels and circulation (IPCC 2007). These changes are likely to cause shifts in range and abundance of different species of algae, plankton and fish (IPCC 2007). These shifts could alter the suitability of New York habitat (as well as habitat in other parts of sea turtles' ranges) for occupancy by sea turtles. Changing currents as a result of climate change could affect sea turtle migration and survival of oceanic-stage juveniles (NMFS and USFWS 2008).

Climate change could have significant effects on loggerhead turtles in other parts of their range as well. More nests could be destroyed as a result of the increasing abundance and severity of storms along the nesting range. Rising sea levels could cause major problems on low-lying nesting beaches. Additionally, there is concern that rising temperatures could skew hatchling sex ratios towards a strong female bias (NMFS and USFWS 2008).

Coastal development can lead to destruction or degradation of sea turtle foraging habitat. Noise produced during construction could have negative behavioral and physiological effects on sea turtles, and increased vessel traffic can lead to exclusion from certain areas or increased collisions (NMFS and USWS 2008). Loggerhead turtles can occasionally be taken into the cooling systems of coastal power plants, where they are submerged and drown (NMFS and USFWS 2008). The construction of seawalls, rock revetments, groins, jetties, and other beach armoring mechanisms degrades sea turtle nesting habitat (NMFS and USFWS 2008). Additionally, bright lighting near beaches can disorient hatchlings, and cause them to move towards the light rather than the ocean (Ehrhart 1983; Mann 1977; McFarlane 1963; Philibosian 1976). This misorientation can lead to increased risk from predators, entrapment in vegetation, desiccation, and being hit by vehicles (NMFS and USFWS 2008).

Sea turtles may occasionally be hit by vessels, which can cause mortality and severe injury. Nearly 15% of all stranded loggerheads from the U.S. east coast and Gulf coast showed signs of having been struck by a vessel, although in many cases it could not be determined if the collision occurred pre- or post-mortem (NMFS and USFWS 2008). The problem has increased in recent years, with only 10% of stranded turtles showing signs of vessel strikes in the 1980s to over 20% in 2004 (NMFS and USFWS 2008). It is likely that sea turtles are struck by vessels more often than reported.

Persistent chlorinated hydrocarbons, heavy metals, and organic contaminants have been found in loggerhead turtles (NMFS and USFWS 2008). The effect of most of these contaminants on loggerheads is currently unknown, but there is concern that elevated levels could lead to immunosuppression and chronic health problems (NMFS and USFWS 2008). Keller et al. (2004) found correlations between organochlorine contaminants and changes in immune function, possible liver damage, and changes in protein and carbohydrate regulation. Oil spills are known to directly affect marine turtles (Yender and Mearns 2003), and can lead to immunosuppression and chronic health issues (Sindermann et al. 1982; Lutcavage et al. 1997). Oil spills in Florida have been documented to lead to mortality in hatchlings and adults, and also to affect nest success (FDEP et al. 1997; NOAA and FDEP 2002).

Sea turtles could ingest or become entangled in marine debris, which can reduce food intake and digestive capacity and cause injury or mortality (Bjorndal et al. 1994; Sako and Horikoshi 2002). Between 1997 and 2005, 1.6% of stranded loggerheads in the U.S. were entangled in fishing gear, most often monofilament line (NMFS and USFWS 2008). Sea turtles have been known to ingest debris such as plastic bags, plastic pellets, plastic and Styrofoam pieces, tar balls, and balloons (NMFS and USFWS 2008). Lutz (1990) found that loggerheads actively ingest pieces of latex and plastic sheeting, which may affect energy metabolism and gut function. While severe entanglements and ingestions of debris may cause direct mortality, even minor cases may cause substantial negative, sublethal effects (Bjorndal et al. 1994). Juvenile loggerheads utilize downwelling convergence zones, and frequently are found near rafts of *Sargassum.* These areas often accumulate large amounts of debris, and thus put the young turtles at risk. Over 80% of stranded post-hatchling loggerheads examined by Witherington and Hirama (2006) in Florida had ingested plastics and nearly 34% had ingested tar.

While it is prohibited to take sea turtles for food in the U.S., poaching does still occur. In three counties in Florida, there were 33 arrests for possession or sale of sea turtle eggs from 1980 – 2002 (NMFS and USFWS 2008). The harvesting of adults and/or eggs in other parts of the loggerhead's range is more of a problem. Illegal harvesting of sea turtles was documented by Brautigam and Eckert (2006) in twenty six jurisdictions in the Lesser Antilles, Caribbean, and Central and South America. 45% of Caribbean countries/territories allow some legal harvest of loggerheads (NMFS and USFWS 2008). With the exception of St. Kitts and Nevis and the Turks and Caicos Islands, harvest seasons are in the non-nesting season. The regulations generally support the killing of large juveniles and adults, which are the most reproductively valuable stages (NMFS and USFWS 2008). Because the species is highly migratory, it is possible that this exploitation could be affecting sea turtles found in New York waters.

The effects of anthropogenic noise on sea turtles are poorly understood. Studies have shown that sea turtles exposed to certain levels of low frequency sound may spend more time at the surface and/or move out of the area (O'Hara and Wilcox 1990; Lenhardt et al. 1983). Samuel et al. (2005) found elevated noise levels, primarily from boat traffic, in the Peconic Bay Estuary system in New York during the sea turtle activity season. They suggest that continued exposure to these sound levels could potentially lead to behavioral effects on sea turtles using the area (Samuel et al. 2005). The authors also suggest that similar sound levels should be expected in other coastal foraging and nesting areas. Sea turtles have been found to change swimming patterns and orientation in response to air guns, which are frequently used in oil and gas exploration (O'Hara and Wilcox 1990).

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 loggerhead turtle is listed as a threatened species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species. It is also protected as a federally-listed threatened 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 loggerhead turtle. Whether they are adequate to protect the habitat is currently unknown.

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

NY Marine Rescue Center should continue to carry out stranding and entanglement response for sea turtles. The Rescue Center rescues and rehabilitates injured and cold-stunned individuals. Before being released, rehabilitated sea turtles are sometimes given a satellite tag, which helps expand our knowledge on movements and habitat use. Placing PIT tags and/or satellite tags on as many individual turtles as possible will help to further our knowledge on loggerhead turtle life history, and this practice should be encouraged. It is critical to determine where New York loggerheads travel to and nest to help reduce the threats to the population during other stages of its life.

Long-term surveys to monitor the population of loggerheads in New York should be implemented. Sea turtle use of state waters was fairly well established by studies throughout the 1980s and 1990s, but not much work has been done in recent years. Monitoring would allow researchers to garner a better idea of population trends and habitat use of this species in the State, and see if shifts in use have occurred. Additionally, further research into the effects of the various threats listed above on the loggerhead population in the State should be encouraged. Bycatch rates should be closely monitored, and research into reducing these rates would be beneficial.

Education on this species and the importance of reporting ship strikes and entanglements is encouraged. Conservation actions following IUCN taxonomy are categorized in the table below.

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**
Education & Awareness	Awareness & Communications
External Capacity Building	Alliance & Partnership Development

Table 2: Recommended conservation actions for loggerhead turtle

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for sea turtles.

Curriculum development:

____ To provide public outreach programs about local species and their environment within the Long Island Sound and the New York Bight. Partnering with agencies such as the New York State Marine Mammal and Sea Turtle Rescue Program, NYSDEC, NOAA, U.S. Coast

Guard and local law enforcement, will allow the Marine Rescue Center to adhere to the actions listed in the sea turtle recovery plans more efficiently and effectively.

Fact sheet:

____ To provide literature for local communities, as well as law enforcement agencies, regarding sea turtles and their environment within the Long Island Sound and the New York Bight. The information distributed by the Rescue Center to these people will provide a more effective response to strandings and sightings of animals.

Population monitoring:

____ Mark recapture studies will provide data on the diet composition of these animals between bodies of water. These results can be compared to historical studies to identify any shifts in prey species.

____ Determine sex composition of NY sea turtle populations. As the New York region is a critical developmental habitat for sea turtles it is important to understand if there is a sexual bias for this area. Historical studies were unable to obtain the sex of many live animals.

____ Radio and satellite tags can be combined with aerial and shipboard survey work to study abundance, distribution, and movements associated with seasonal changes.

____ Genetic studies should be conducted to identify stock structure and possibly understand broad scale movements.

____ Mark recapture studies will provide data on size class, and population structure. With these data comparisons can be made within years, between years and between bodies of water (e.g. Long Island Sound, Peconic Bay, Great South Bay, offshore waters) and also compared to stranded animals to understand how and if stranded animals can be used as a representative of the current population or a proxy for ecosystem health.

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