# Species Status Assessment

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

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

**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 months, 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). Loggerheads found in New York State are most likely part of the NW Atlantic Distinct Population Segment (NMFS and USFWS 2023). 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: Vulnerable

-Northeast Regional SGCN: RSGCN

-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. Since 2010, loggerhead sea turtles have been managed in distinct population segments (DPS) and regional management units (RMU). Loggerheads have 10 confirmed RMUs (Wallace et al. 2023) and loggerheads found in New York most likely derive from the Northwest Atlantic DPS. 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). The Mid-Atlantic Bight foraging grounds is often used by turtles from the Northern Recovery Unit (Pfaller et al. 2020).

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-2020 | Threatened | - |
| **Northeastern US** | Yes | Declining | Unknown | 1983-2008 | Threatened | - |
| **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 | - | - | | | - |
| **Vermont** | No | - | - | | | - |
| **Ontario** | No | - | - | | | - |
| **Quebec** | No | - | - | | | - |

*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 main monitoring that occurs for the species is entanglement and stranding response provided by NY Marine Rescue Center d/b/a The Riverhead Foundation and the Atlantic Marine Conservation Society (AMSEAS). Satellite tags were placed on a total of 7 loggerhead sea turtles that were rehabilitated after being cold stunned between 2007-2015. All these individuals migrated south after being tagged, exhibiting expected movement patterns after being rehabilitated. This data also supports that rehabilitated individuals occupy similar habitats to non-rehabilitated individuals and exhibit typical diving behavior once released back into the wild (Robinson et al. 2020). Strandings respondents in New York report turtle report turtle response data periodically to the NOAA Sea Turtle Stranding and Salvage Network (STSSN 2024). NYSDEC helped organize aerial surveys, targeted to survey large whale species, that were carried out in the NY Bight in 2017-2020. Sea turtles were also opportunistically sighted during these surveys. Due to the small size of most sea turtles, it is difficult to confidentially confirm most species while in the air. There

are some occasions where it is possible. During the 3 years of the aerial survey, 16 loggerheads were identified down to the species. The rest of the sightings were grouped into an unidentified sea turtle category which consisted of 424 sightings of 503 individuals. Sea turtle sightings were highest during the summer followed by the fall and lowest during the spring and winter months (Tetra Tech and LGL 2020).

The New York State Energy Research and Development Authority (NYSERDA) ran aerial surveys from 2016-2019 prepared by Normandeau inc. that included data on sea turtle abundance (NYSERDA 2021). From 2016-2019, 1,397 loggerhead turtles were recorded from aerial transects, and an additional approximately 370 turtles were not able to be identified to species (NYSERDA 2021). Loggerheads were most frequently observed in the summer months (NYSERDA 2021). The New York State Department of State (NYSDOS) prepared an Offshore Atlantic Ocean Study in 2013 that modelled sea turtle abundance in New York based off of the North Atlantic Right Whale Consortium database, which details shipboard survey observations from 1978-2011 (NYSDOS 2013).

Research at Stony Brook University on the diet of loggerhead sea turtles was conducted to determine patterns in prey abundance in New York and New Jersey (Donaton 2019). Loggerhead dive behavior was tracked throughout the Western Atlantic coast, including in the New York Bight, which found shorter average dive times than other areas, and more time spent near the surface during the warmer months of the year (Hatch et al. 2022). Loggerhead activity was tracked using ROVs off the coast of New Jersey, and observed predation, activity levels, and diving behavior (Smolowitz et al. 2015). Loggerheads (n=190) were also tagged in the Mid-Atlantic effort as a part of a study to predict loggerhead response to climate change, and turtles from that project entered New York waters during Spring and Summer (Patel et al. 2021).

Due to the highlight migratory nature of sea turtles, many regional research programs also study sea turtles that may include New York waters. The Atlantic Marine Assessment Program for Protected Species (AMAPPS), a multi-agency effort to survey protected species run jointly by NOAA, NMFS, BOEM, and the U.S. Navy, runs aerial surveys in New York waters. Loggerhead sea turtles were captured on AMAPPS transects generally south of Long Island, NY. AMAPPS III (2020 – 2024) is currently running surveys that include New York Waters (NEFSC-SEFSC 2021). The U.S. Navy has developed a spatial density model for sea turtles off the Atlantic Coast that predicts monthly sea turtle presence in the Mid-Atlantic and elsewhere. The model applies a novel approach to using unspecific, hard-shell turtle sightings in mapping (Sparks and DiMatteo 2023). The OBIS-SEAMAP database reports sighting records from a number of compiled sources, including AMAPPS, (NEFSC-SEFSC 2021), NYSERDA, Robinson (et al. 2020), New York Aerial Surveys, and more.

## **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). In the 5-Year Review for the NW Atlantic DPS, nesting counts decreased in US states between 2016 and 2020, though the

overall nesting trend appears to be stable (NMFS and USFWS 2023). 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 2024a)


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

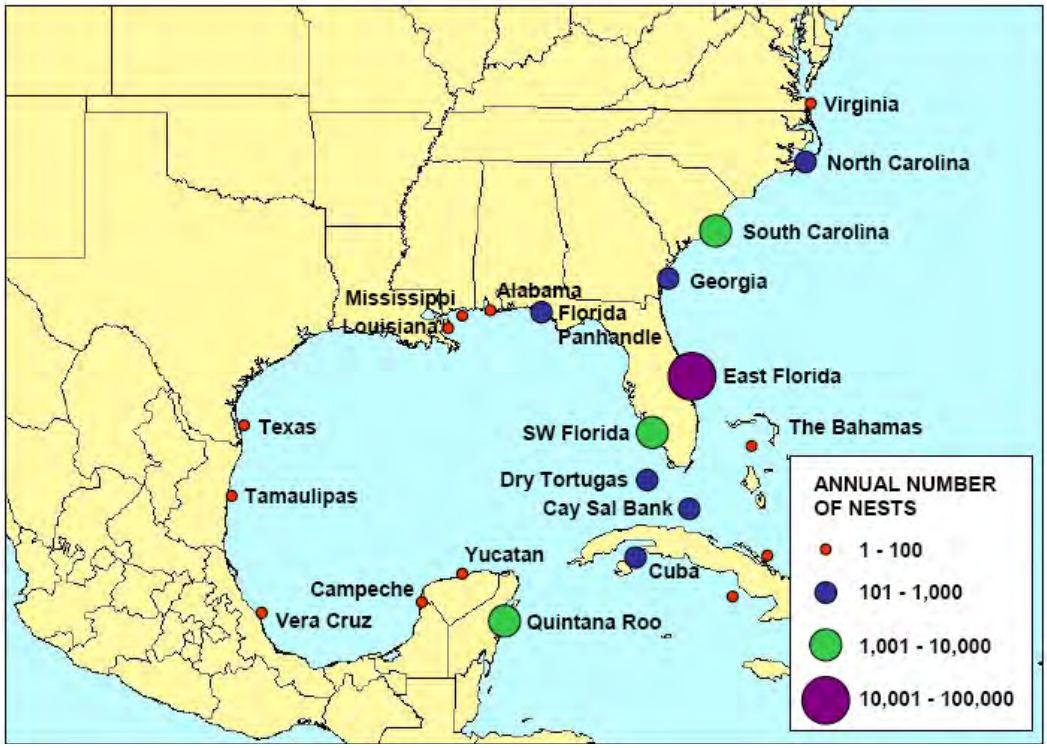


**Figure 3**. Location of and estimated annual number of loggerhead nests on nesting beaches from 2001 – 2008. Data from the Northwest Atlantic Ocean DPS (NMFS and USFWS 2008).

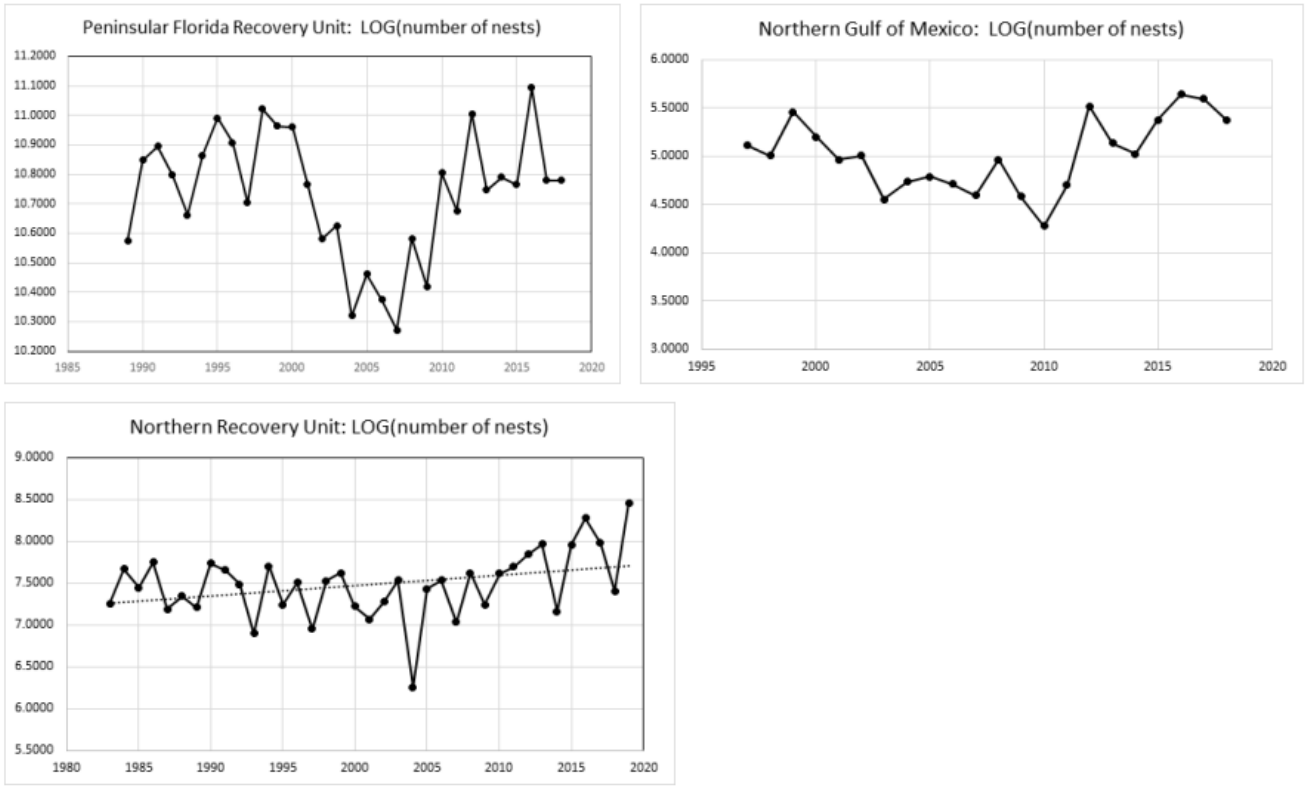


**Figure 4.** Average annual nesting trends at index nesting beaches. Northern Recovery Unit shows positive growth of 1.3%, short of 2% recovery criteria target. Figures from Bolten et al. (2019) and republished in NMFS and USFWS (2023).


**Figure 5.** Conservation status of loggerhead turtle in North America (NatureServe 2024).

**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<br>1995-2005 | Declining<br>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)*

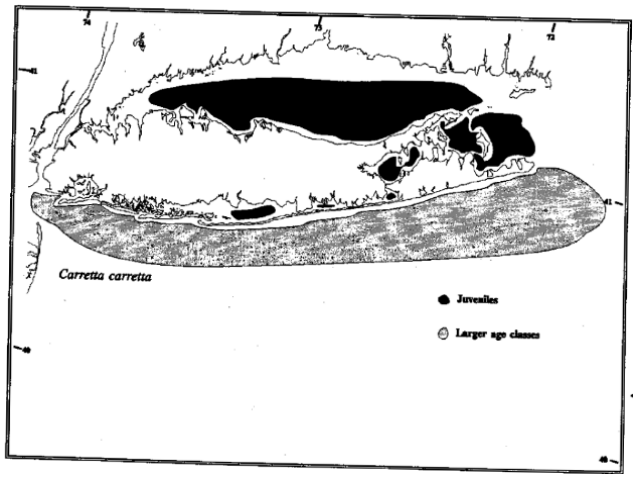


**Figure 6**. Areas where loggerhead turtles have been sighted in New York waters (Sadove and Cardinale 1993).

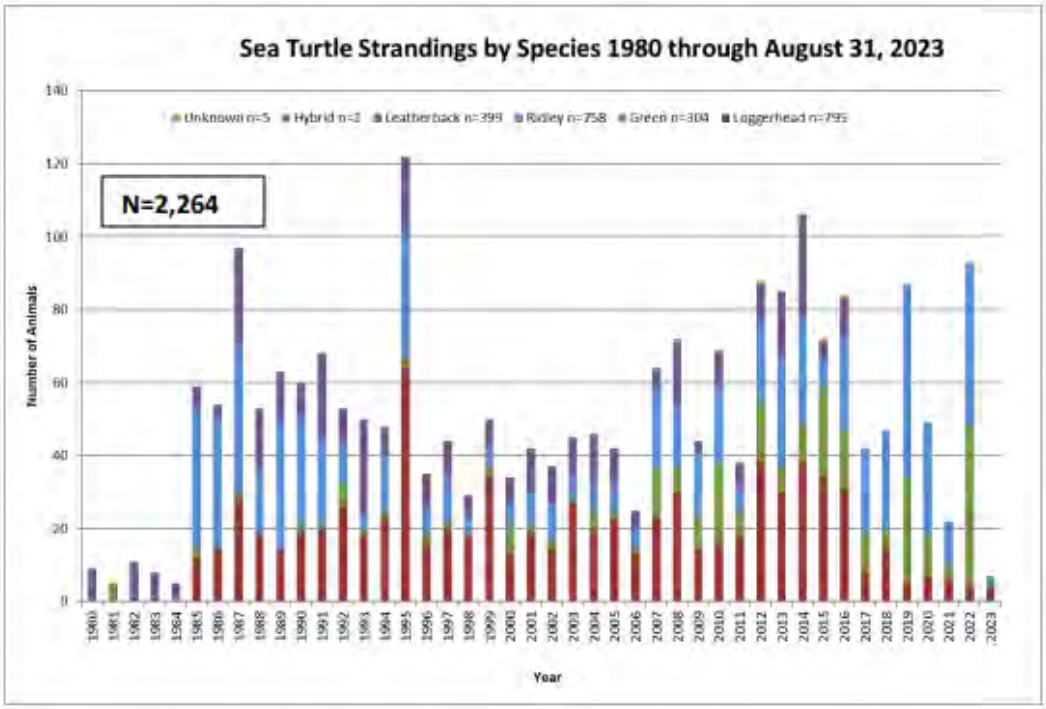


**Figure 7:** New York sea turtle strandings 1980 through August 31, 2023 by NY Marine Rescue Center (Montello et al. 2023).

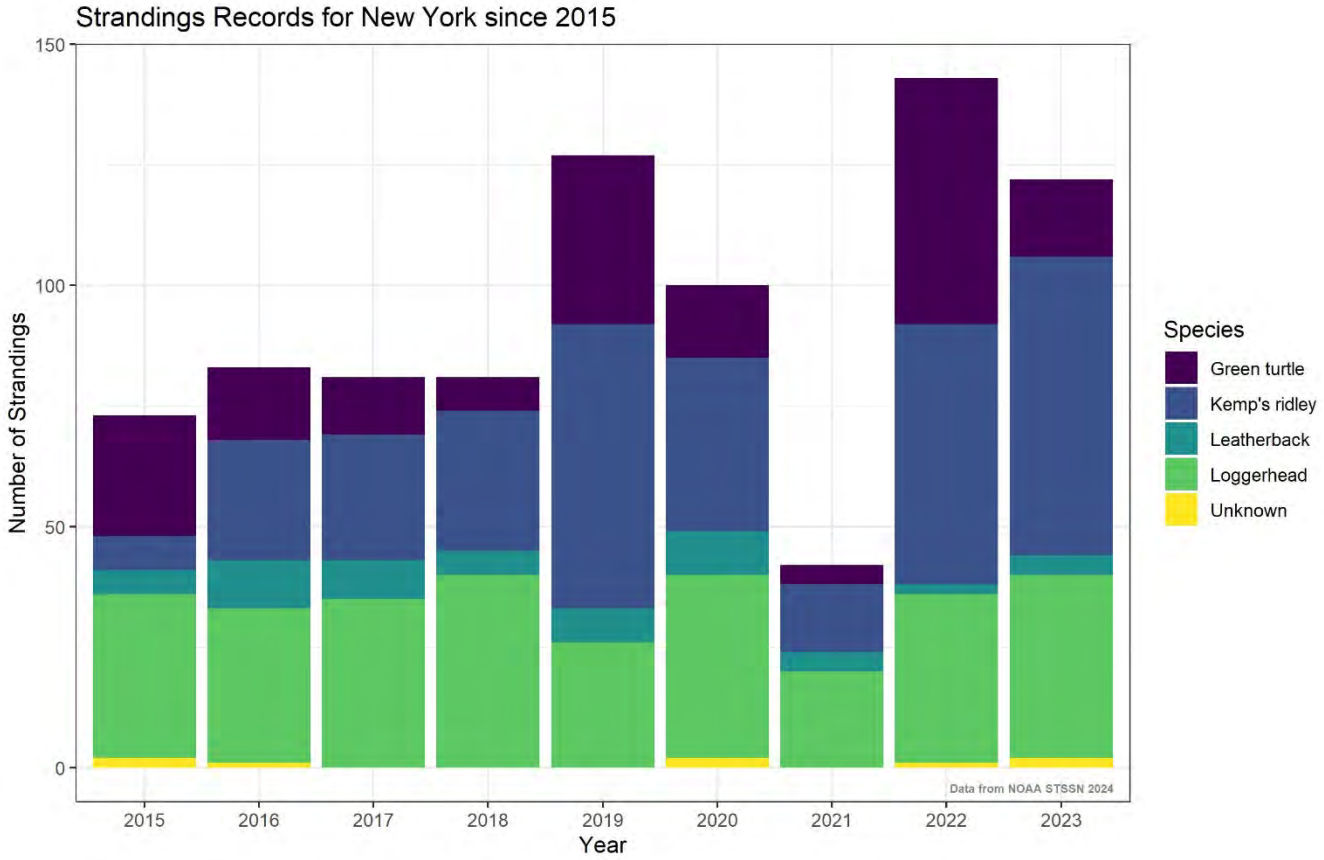


**Figure 8.** New York sea turtle strandings reported to NOAA Sea Turtle Stranding and Salvage Network (NOAA STSSN 2024), including data from NY Marine Rescue Center and the Atlantic Marine Conservation Society. Figure prepared by NYNHP.

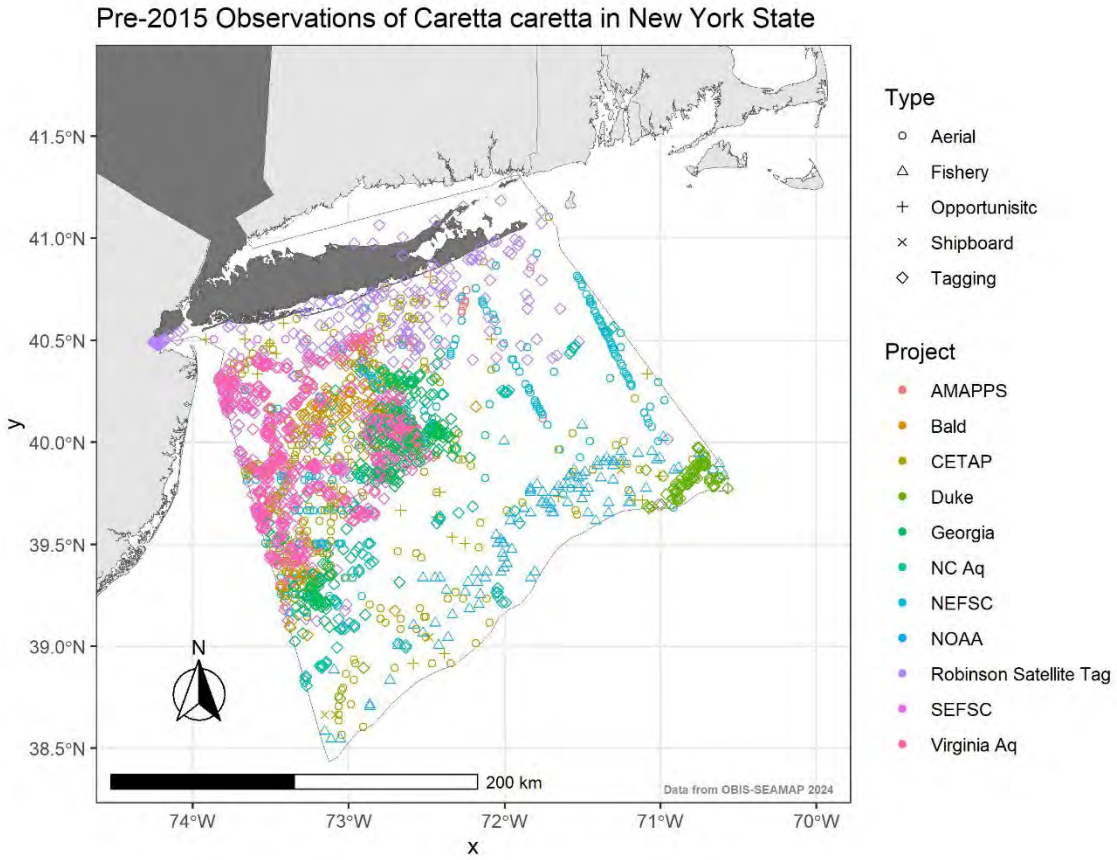


**Figure 9.** Observations of loggerhead sea turtles reported to OBIS-SEAMAP prior to 2015 (OBIS-SEAMAP 2024). Project data included from Atlantic Marine Assessment Program for Protected Species (AMAPPS), Bald Head Island (Godley 2024), Cetacean and Turtle Assessment Program (CETAP), Duke University Marine Laboratory (McClellan 2024), Georgia Department of Natural Resources (Dodd 2024), North Carolina Aquarium, Northeast Fisheries Science Center (NEFSC), National Oceanic and Atmospheric Administration (NOAA), Robinson et al. (2020), Southeast Fisheries Science Center (SEFSC), and Virginia Aquarium. Figure prepared by NYNHP.

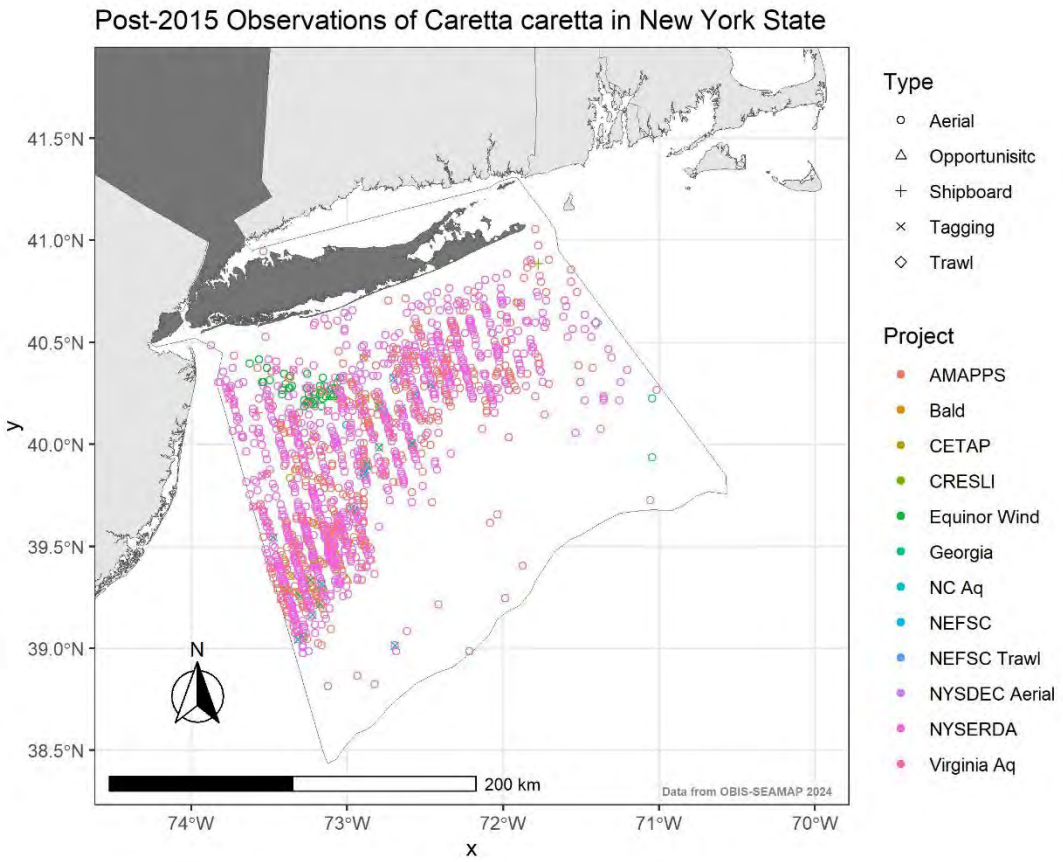


**Figure 10.** Observations of loggerhead sea turtles reported to OBIS-SEAMAP after 2015 (OBIS-SEAMAP 2024). Project data included from Atlantic Marine Assessment Program for Protected Species (AMAPPS), Bald Head Island (Godley 2024), Cetacean and Turtle Assessment Program (CETAP), Coastal Research and Education Society of Long Island (CRESLI), Equinor Wind Project, Georgia Department of Natural Resources (Dodd 2024), North Carolina Aquarium, Northeast Fisheries Science Center (NEFSC), NEFSC Trawl Data, New York State Department of Environmental Conservation Aerial Surveys (NYSDEC), New York State Energy Research and Development Authority (NYSERDA), and the Virginia Aquarium. Figure Prepared by NYNHP.

## 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.

Using data submitted to OBIS-SEAMAP (2024), records post 2005 can be estimated from Aerial and Shipboard based projects. OBIS-SEAMAP was founded in 2002, and compiles data from many sources. The sampling effort and data submission is dependent on each individual project, so may represent an incomplete collection of records and species distribution. These observations were geographically filtered within the area described by the New York Ocean Action Plan (Figure 9). The increase in records could be reflective of an increase in effort post 2015, for example, NYSERDA and NYSDEC Aerial survey efforts began after 2015 (see Figure 11). For the period 2005 – 2014, OBIS-SEAMAP has records of 188 loggerhead sea turtles, and for 2015 – 2023, it has records of 1682 sea turtles.

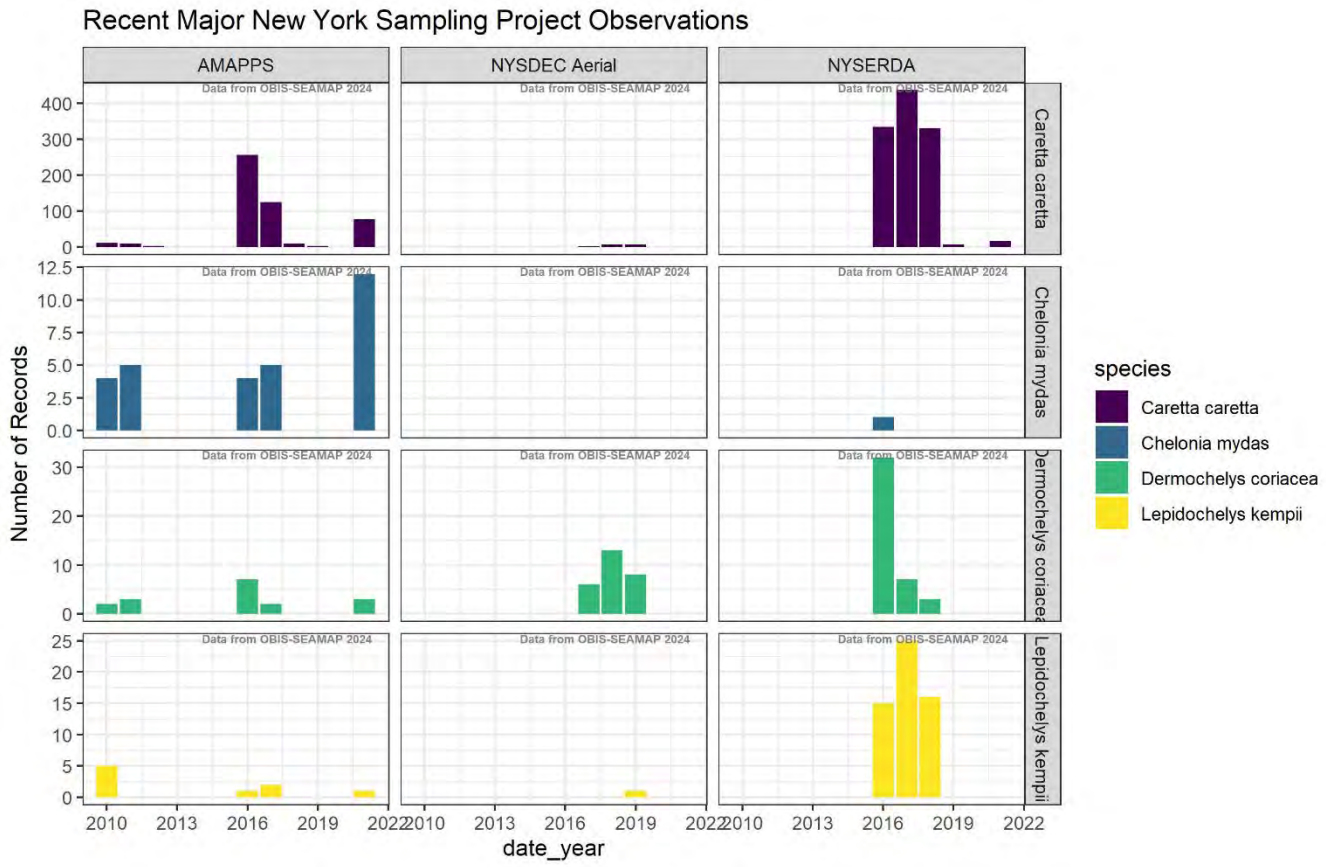


**Figure 11.** An example of biased record data for different years of sampling due to important survey project start dates. Only AMAPPS collected data prior to 2015, and NYSERDA was able to capture high numbers of sea turtles compared to AMAPPS during years they overlapped. Figure prepared by NYNHP.

### 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). Benthic prey in the nearshore environments like in New York include hermit crabs, rock crabs, and scallops (NMFS and USFWS 2023). Stomach contents of loggerheads stranded on the coast of Long Island found *Cancer irroratus, Pagurus spp.,* and Naticidae moonsnails, though available prey may be changing in response to warming nearshore waters (Donaton et al. 2019). ROV observations of loggerheads in the Mid-Atlantic Bight observed turtles pelagic feeding on jellyfish, and benthic feeding on hermit crabs, rock crabs, and scallops (Smolowitz et al. 2015). In aerial surveys, the vast majority of loggerheads were observed in ‘Zone 2’, or between 15 nautical miles offshore and 60m depth (NYSERDA 2021). Tagged loggerheads from North Carolina have been observed migrating to New York foraging grounds and researchers were able to identify “core-use” areas off New York and New Jersey an average of 46.5m deep, 22.4 degrees Celsius, and with 1622.1 net primary production rates (Braun McNeil et al. 2020). The summer net primary productivity of the northern foraging grounds was higher than other core-use foraging grounds examined in this study, highlighting New York’s importance for this stage of the loggerhead lifecycle (Braun McNeil et al. 2020).

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 (see Donaton et al. 2019). Climate

change may increase potentially suitable habitat for loggerheads in the NW Atlantic (Patel et al. 2021). 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. | 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):*

Loggerhead turtles can live to be over 57 years of age (Dahlen et al. 2000) and are estimated to live more than 70 years (NOAA 2024). 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 approximately 100 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.

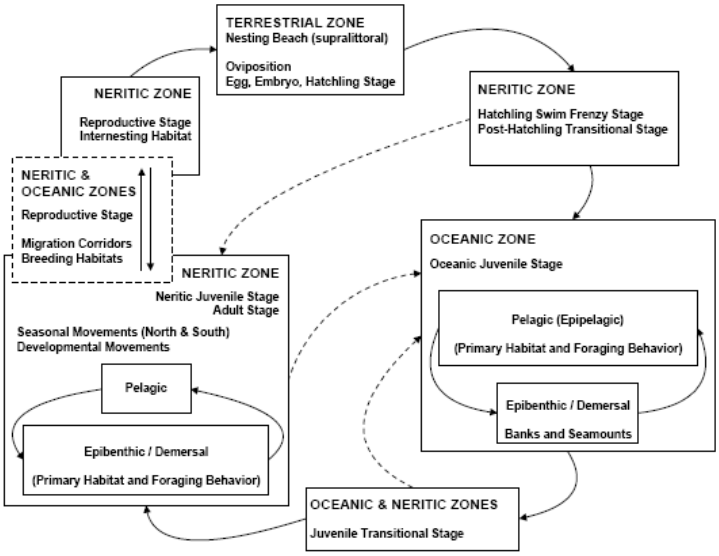


**Figure 12**. Generalized life history of North Atlantic loggerhead sea turtles (Bolten 2003).

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

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). In particular, several studies found longline fisheries and shrimp trawlers are responsible for the highest mortality from fisheries for loggerhead turtles (NMFS and USFWS 2023). 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. Ninety-three percent 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. There have been a record high number of cold-stunned sea turtles found this winter throughout the Northeast; it is believed that this could be a result of climate change (L. Bonacci, pers. comm.). Between 1998 and 2019, 48 loggerhead sea turtles have been reported as cold-stunned (Montello et al. 2022). 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). A change in the benthic prey of juvenile loggerheads was already found in Long Island, shifting from larger crabs to smaller crustaceans and gastropods as temperatures warm (Donaton et al. 2019).

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). Finally, harmful algal blooms can cause brevetoxicosis and result in death or an increase in turtle strandings (NMFS and USFWS 2023).

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). The impact of anthropogenic noise on sea turtles requires future research, but surveyed experts report a belief that seismic surveys could pose a threat to turtles (Nelms et al. 2016).

| Threat Level 1 | Threat Level 2 | Threat Level 3 | Spatial Extent | Severity | Immediacy | Trend | Certainty |
|---|---|---|---|---|---|---|---|
| 1. Residential and Commercial | 1.1 Housing & Urban Areas | 1.1.1 Dense housing & urban areas (destruction/alteration of nearshore foraging areas from coastal development) | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 1. Residential and Commercial | 1.2 Commercial & Industrial Areas | 1.2.1 Commercial & industrial areas (destruction/alteration of nearshore foraging areas from coastal development) | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 1. Residential and Commercial | 1.3 Tourism & Recreation Areas | - | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 3. Energy Production & Mining | 3.1 Oil & Gas Drilling | 3.1.2 Offshore oil development (oil spills) | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 4. Transportation & Service Corridors | 4.3 Shipping Lanes | 4.3.1 Shipping (ship strikes) | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 5. Biological Resource Use | 5.4 Fishing & Harvesting Aquatic Resources | 5.4.2 Commercial fishing (bycatch and entanglement) | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 6. Human Intrusions & Disturbance | 6.1 Recreational Activities | 6.1.4 Recreational boating | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 7. Natural System Modifications | 7.3 Other Ecosystem Modifications | 7.3.1 Shoreline alteration (shoreline stabilization) | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 7. Natural System Modifications | 7.3 Other Ecosystem Modifications | 7.3.1 Shoreline alteration (sea walls) | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 9. Pollution | 9.2 Industrial & Military Effluents | - | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 9. Pollution | 9.3 Agricultural & Forestry Effluents | - | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 9. Pollution | 9.4 Garbage & Solid Waste | - | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9. Pollution | 9.6 Excess Energy | 9.6.3 Noise pollution | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 11. Climate Change | 11.1 Habitat Shifting & Alteration | - | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| 11. Climate Change | 11.3 Changes in Temperature Regimes | 11.3.3 Gradual temperature change (cold-stunning) | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |

**Table 2:** Threats to loggerhead turtle.

## 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. 7 individuals were released with satellite tags after being rehabilitated and the data showed they acclimated back to the wild quickly after being released (Robinson et al. 2020). At least 177 sea turtles of any species have been released from New York Rescue operators (Innis et al. 2019). 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.

In a report from the New York Bight Sea Turtle Workshop (Bonacci-Sullivan 2018), the following research and management recommendations were made: 1) Collect baseline data on presence and residence time; 2) Targeted nearshore aerial and vessel surveys; 3) reconsideration of size limits for tagging due to importance of juvenile turtles; 4) Collect information on the impact of the pound net fishery; 5) create a sea turtle nesting response plan; 6) support stranding-response programs; and 7) increase outreach efforts.

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***

| Action Category | Action | Description |
|---|---|---|
| B.3 Outreach | B.3.1.4.0 Public outreach and information | Awareness & Communications |
| C.10 Institutional Development | C.10.2.0.0 External support and organizational development | Alliance and Partnership Development |

**Table 3:** 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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