Species Status Assessment

Class: Reptilia
Family: Cheloniidae
Scientific Name: *Caretta caretta*
Common Name: Loggerhead turtle

Species synopsis:

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 and Legal Protected Status

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

ii. New York Threatened; SGCN

b. Natural Heritage Program Rank

i. Global G3

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

Other Rank:
CITES: Appendix I
IUCN: Endangered

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

a. North America

i. Abundance

__X__ declining ____increasing _____stable ____unknown

ii. Distribution:

____ declining ____increasing _____stable __X__ unknown

Time frame considered: __Majority of nesting populations along the North American Atlantic coast have been in decline since the 1980s (NMFS and USFWS 2008).__

b. Regional

i. Abundance

__X__ declining ____increasing ____stable _____unknown

ii. Distribution:

____ declining ____increasing ____stable __X__ unknown

Regional Unit Considered: Northwest Atlantic
Time Frame Considered: Decline of 1.3% in 11 beaches from VA-GA 1983 – 2008. Decline of 25% from 1986 – 2008 in FL (NMFS and USFWS 2008).

c. Adjacent States and Provinces

CONNECTICUT Not Present _____ No data _____

i. Abundance

____ declining ____ increasing ____ stable __X__ unknown

ii. Distribution:

____ declining ____ increasing ____ stable __X__ unknown

Time frame considered: Trends never analyzed.
Listing Status: Threatened SGCN? Yes

MASSACHUSETTS Not Present _____ No data _____

i. Abundance

____ declining ____ increasing ____ stable __X__ unknown

ii. Distribution:

____ declining ____ increasing ____ stable __X__ unknown

Time frame considered: Trends never analyzed.
Listing Status: Threatened SGCN? Yes

NEW JERSEY **Not Present _____** **No data _____**

i. Abundance

____ declining ____ increasing ____ stable __X__ unknown

ii. Distribution:

____ declining ____ increasing ____ stable __X__ unknown

Time frame considered: Trends never analyzed.
Listing Status: Endangered SGCN? Yes

ONTARIO **Not Present __X__** **No data _____**

PENNSYLVANIA **Not Present __X__** **No data _____**

QUEBEC **Not Present __X__** **No data _____**

VERMONT **Not Present __X__** **No data _____**

d. NEW YORK **No data _____**

i. Abundance

__X__ declining ____ increasing ____ stable _____ unknown

ii. Distribution:

____ declining ____ increasing ____ stable __X__ unknown

Time frame considered: Decline from 1987 – 2004 (Morreale et al. 2005)

Monitoring in New York.

None. The only monitoring that occurs for the species is entanglement and stranding response provided by Riverhead Foundation.

Trends Discussion:

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).

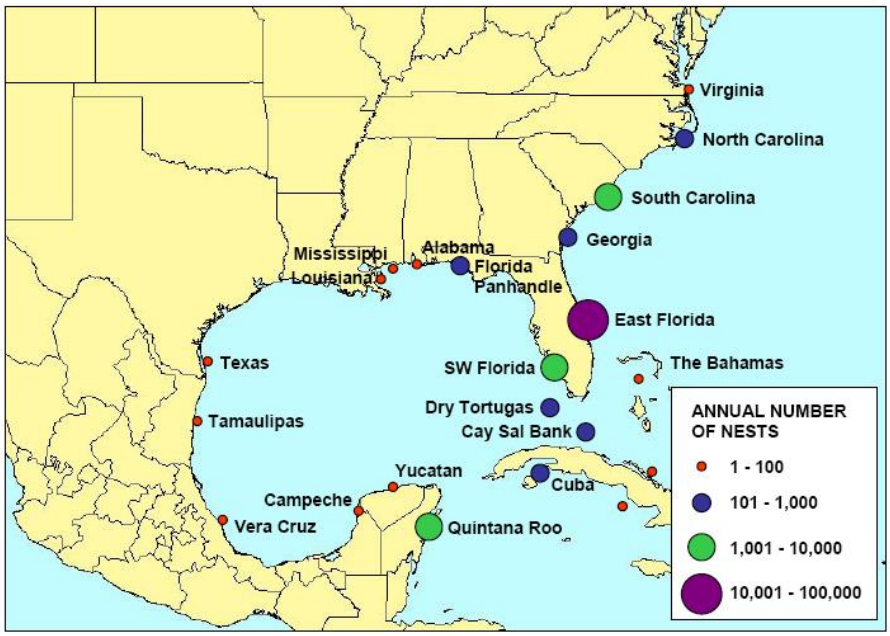

Figure 1. Location of and estimated annual number of loggerhead nests on nesting beaches from 2001 – 2008. Data from the Northwest Atlantic Ocean DPS (NMFS and USFWS 2008).

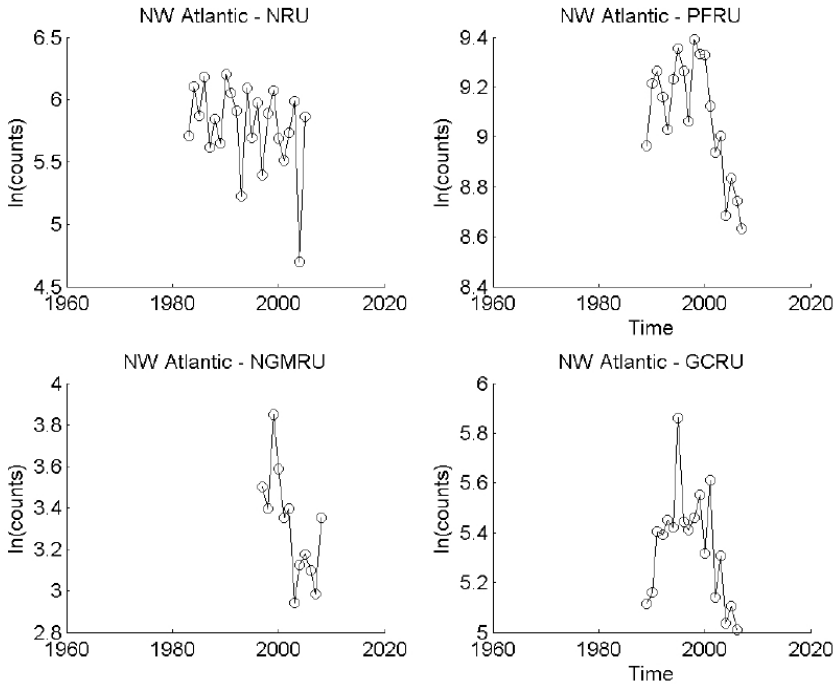

Figure 2. Changes in the numbers of nesting females at nesting beaches for the Northwest Atlantic Ocean DPS. The number of nesting females was computed from the observed number of nests divided by the mean clutch frequency (5yr). NRU = Northern Recovery Unit, PFRS = Peninsular Florida Recovery Unit, 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.

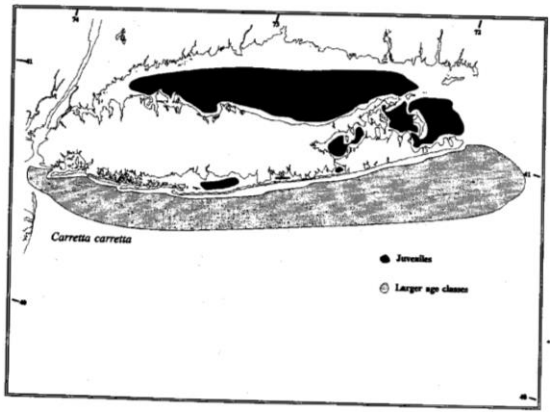

Figure 3. Areas where green turtles have been sighted in New York waters (Sadove and Cardinale 1993).

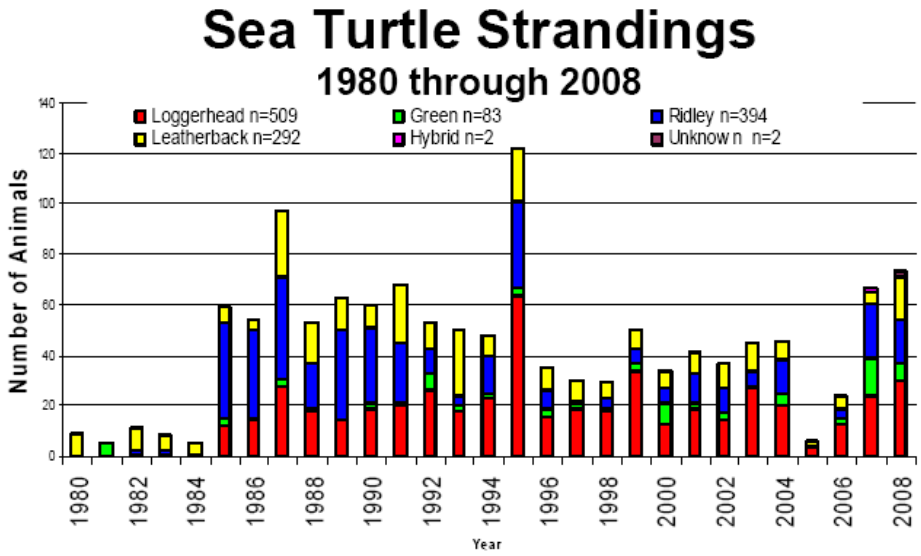

Figure 4. New York sea turtle strandings as documented by Riverhead Foundation (DiGiovanni 2009).

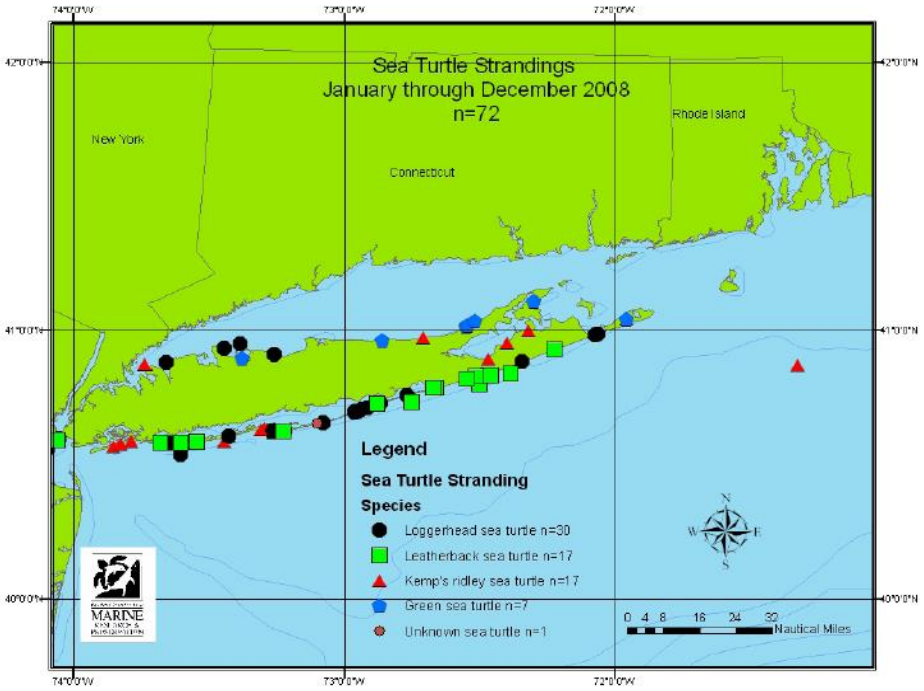

Figure 5. Distribution of sea turtle strandings for the period of January through December 2008 (DiGiovanni 2009).

III. New York Rarity, if known:

Historic	# of Animals	# of Locations	% of State
prior to 1970	_____	_____	_____
prior to 1980	_____	_____	_____
prior to 1992	129 (56%)	_____	_____

Details of historic 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).

Current	# of Animals	# of Locations	% of State
	2 (4%)	_____	_____

Details of current occurrence:

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:

% of NA Range in New York	Classification of New York Range
____ 100 (endemic)	____ Core
____ 76-99	__X__ Peripheral
____ 51-75	____ Disjunct
____ 26-50	Distance to core population:
__X__ 1-25	_____

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IV. Primary Habitat or Community Type:

1. Marine, Shallow Subtidal
2. Pelagic
3. Marine, Deep Subtidal

4. Estuarine, Brackish Shallow Subtidal

5. Estuarine, Brackish Deep Subtidal

6. Marine Eelgrass Meadow

Habitat or Community Type Trend in New York:

_____ Declining _____Stable _____ Increasing __X__ Unknown

Time frame of decline/increase: _____

Habitat Specialist? _____ Yes __X__ No

Indicator Species? __X__ Yes _____ No

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. New York Species Demographics and Life History

_____ Breeder in New York

_____ Summer Resident

_____ Winter Resident

_____ Anadromous

__X__ Non-breeder in New York

__X__ Summer Resident

_____ Winter Resident

_____ Catadromous

_____ Migratory only

_____Unknown

Species Demographics and Life History Discussion:

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.

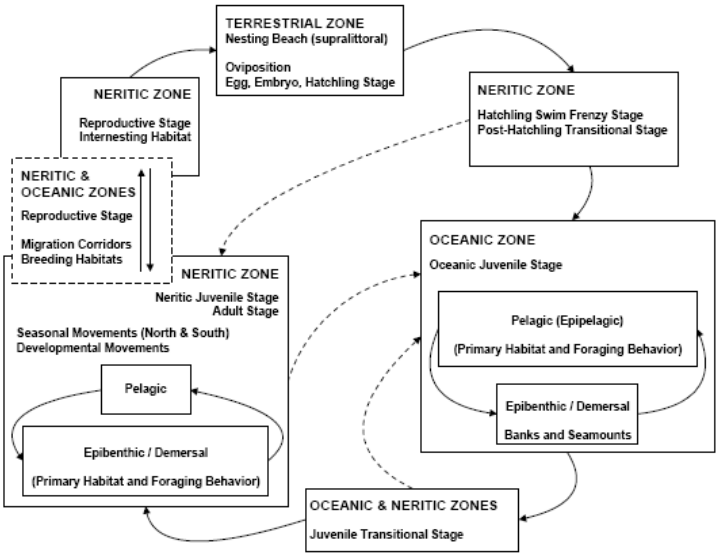

Figure 6. Generalized life history of North Atlantic loggerhead sea turtles (Bolten 2003).

VI. Threats:

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. 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.). Of the approximately 18 cold-stunned sea turtles that Riverhead Foundation has responded to since November 2012, 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, dessication, 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?

_____ No ____ Unknown

__X__ 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:

Riverhead Foundation should continue to carry out stranding and entanglement response for sea turtles. The Foundation 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.

Conservation Actions	
Action Category	**Action**
Education & Awareness	Awareness & Communications
External Capacity Building	Alliance & Partnership Development

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. Certainty of Information (0 = no data, 0.5 = uncertain, 1 = certain)

A. Trend Information

	North America	Regional	New York
Abundance	1	1	0.5
Occurrence	1	1	0.5
Distribution	1	1	0.5

B. Current Rarity

# of Animals	0.5
# of Occurrences	0.5
% of State	0.5
% of NA Range	1

C. Habitat/Community Type

Classification 1

Trends 0.5

D. Species Demographics and Life History

Demographics 1

Life History 1

E. Threats 1. 0.5 2. 0.5 3. 0.5 4. 0.5 5. 0.5

6 0.5 7. 0.5 8. 0.5 9. _____ 10. _____

F. Overall 0.5

Certainty of Information Discussion:

Loggerhead turtles are fairly well understood throughout their range, although mof the abundance and trend data comes from nesting grounds, so further research on foraging grounds is warranted. Additionally, information on sea turtles in New York comes from dedicated studies in the 1980s and 1990s, and not much work has been done since then, with the exception of stranding and entanglement response. Further research into current population trends, life history, and habitat use in state waters would be beneficial.

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IX. Experts Consulted

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