Species Status Assessment

Class: Reptilia
Family: Cheloniidae
Scientific Name: *Eretmochelys imbricata*
Common Name: Hawksbill sea turtle

Species synopsis:

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 and Legal Protected Status

i. **Federal** ___Endangered___ **Candidate?** __N/A___

ii. **New York** ___Endangered___

b. Natural Heritage Program Rank

i. **Global** ___G3___

ii. **New York** ___SNA___ **Tracked by NYNHP?** ___Yes___

Other Rank:
CITES Appendix I
IUCN Critically Endangered

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

a. North America

i. Abundance

__X__ declining ____increasing ____stable ____unknown

ii. Distribution:

____ declining ____increasing ____stable __X__ unknown

Time frame considered: Decline at all nesting beaches over the past 20 – 100 years. In the last 20 years, 29 of 41 sites in the Atlantic have declined (NMFS and USFWS 2007).

b. Regional

i. Abundance

__X__ declining ____increasing ____stable ____unknown

ii. Distribution:

____ declining ____increasing ____stable __X__ unknown

Regional Unit Considered: Atlantic Coast of Central/North America
Time Frame Considered: 9 of 30 nesting sites have declined in the last 20 years, only 6 increased, trends not analyzed for rest (NMFS and USFWS 2007).

c. Adjacent States and Provinces

CONNECTICUT **Not Present __X__** **No data _______**

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: ___Endangered___ 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

____ declining ____ increasing ____ stable __X__ unknown

ii. Distribution:

____ declining ____ increasing ____ stable __X__ unknown

Time frame considered: __Very rare species in New York.__________________

Monitoring in New York.

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

Trends Discussion:

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).

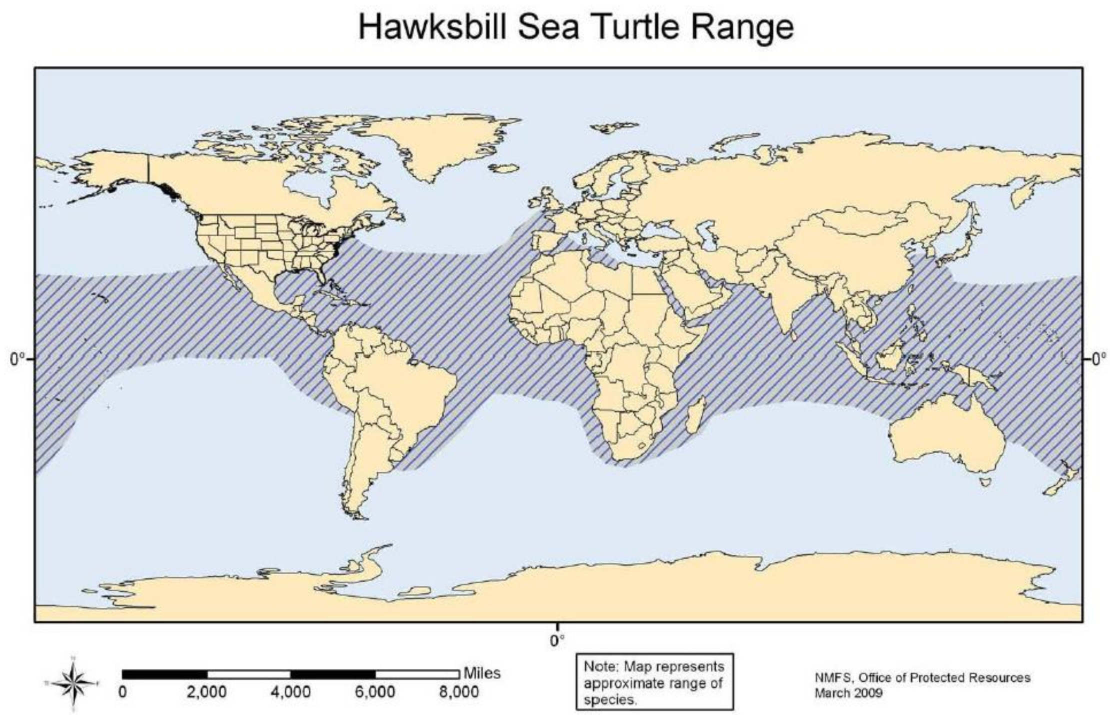

Table 1. Summary of recent trends (within the past 20 years) and historic trends (during a period of >20 to 100 years) for each of the 83 sites for which data are available. Key to trend symbols: ▲= increasing population, ▼= decreasing population, -- = stable population, ? = unknown trend. Source: NMFS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

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**

III. New York Rarity, if known:

Historic	# of Animals	# of Locations	% of State
prior to 1970	1		
prior to 1980			
prior to 1990			

Details of historic occurrence:

One report of a hawksbill in Long Island Sound after a hurricane in 1938 (Sadove and Cardinale 1993).

Current	# of Animals	# of Locations	% of State
	0		

Details of current occurrence:

No recent reports of hawksbills in New York waters.

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	__________

IV. Primary Habitat or Community Type:

1. Pelagic

2. Marine, Deep Subtidal

3. Marine, Shallow Subtidal, Aquatic Bed

4. Marine, Deep Subtidal, Artificial Structure, Reef

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:

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. New York Species Demographics and Life History

______ Breeder in New York

_____ Summer Resident

_____ Winter Resident

_____ Anadromous

_____ Non-breeder in New York

_____ Summer Resident

_____ Winter Resident

_____ Catadromous

_____ Migratory only

__X__ Unknown

Species Demographics and Life History Discussion:

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:

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?

______ No **____ Unknown**

__X__ **Yes**

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.

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.

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Date last revised: July 30, 2013