Species Status Assessment

Class: Reptilia
Family: Cheloniidae
Scientific Name: *Lepidochelys kempii*
Common Name: Kemp's ridley turtle

Species synopsis:

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

The Kemp's ridley experience declines throughout its range from the 1930s to 1980s (NMFS et al. 2011). Most populations appear to be stable or increasing currently (NMFS et al. 2011). Trends are usually derived from nesting beaches. New York appears to be an important foraging ground for juvenile Kemp's ridleys aged 2-5 (Sadove and Cardinale 1993, Morreale and Standora 1998). Long Island Sound was listed as potential critical habitat for the species by a recent petition (WildEarth Guardians 2010). Sadove and Cardinale (1993) estimated that 100-300 juvenile Kemp's ridleys used New York waters each year between June and October. Occasionally, individuals are found cold-stunned during the winter (DiGiovanni 2009, 2010).

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 ___G1___

ii. New York ___S1N___ **Tracked by NYNHP?** ___Yes___

Other Rank:
CITES Appendix I
IUCN: Critically Endangered

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

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

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

II. Abundance and Distribution Trends

a. North America

i. Abundance

____ declining __X__ increasing _____stable ____unknown

ii. Distribution:

____ declining ____increasing _____stable __X__ unknown

Time frame considered: __Number of nests on one of the primary nesting beaches, Rancho Nuevo, has increased by 15% since the mid-1980s (Heppell et al. 2005). Population models predict that the population will grow by at least 12-16% each year (Heppell et al. 2005; NMFS et al. 2011).__

b. Regional

i. Abundance

____ declining __X__ increasing ____stable _____unknown

ii. Distribution:

____ declining ____increasing ____stable __X__ unknown

Regional Unit Considered: __U.S. coast__________________________________
Time Frame Considered: ___11+% increase in number of nests in Texas, the major nesting area for Kemp's ridleys in the U.S. (NMFS et al. 2011). _________

c. Adjacent States and Provinces

CONNECTICUT Not Present _______ No data _______

i. Abundance

__X__ declining ____ increasing ____ stable ____unknown

ii. Distribution:

____ declining ____ increasing ____ stable __X__ unknown

Time frame considered: ___Not given__________________________________
Listing Status: ___Endangered________________________ 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 not 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 not 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: ___Trends not analyzed.______________________________

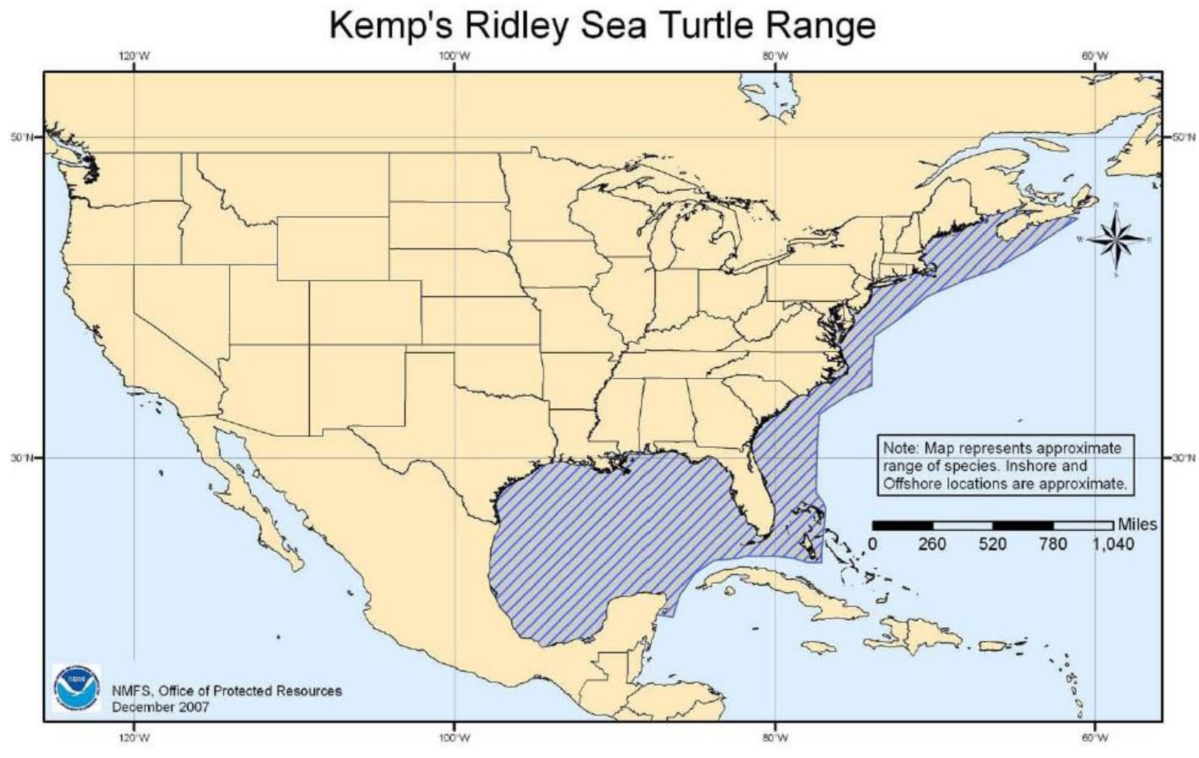
Monitoring in New York.
None. The only monitoring that occurs for the species is entanglement and stranding response provided by Riverhead Foundation.

Trends Discussion:
The Kemp's ridley turtle experienced a major decline from the 1930s to the 1980s throughout its range (NMFS et al. 2011). Most of the current trend information comes from nest counts at nesting beaches. Estimates of turtles at foraging grounds are unavailable throughout most of their range, as these estimates are more difficult and expensive to perform in comparison to surveys of nesting beaches.

Rancho Nuevo, in Mexico, had an estimated 40,000 nesting females in 1947 (Carr 1963). The lowest nest count of this beach was 702 nests in 1985, which likely represented less than 300 females (NMFS et al. 2011). Since the mid-1980s, the number of nests in this area has increased by about 15% each year (Heppell et al. 2005). In 2009, over 20,000 nests were observed, although this number dropped to just over 13,000 in 2010 (NMFS et al. 2011).

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

Population growth models predict that the population should continue to grow at a rate of at least 12-16% (possibly as high as 19%), each year if survival rates remain constant (Heppell et al. 2005, NMFS et al. 2011). Based on these models, the NMFS et al. (2011) Bi-National Recovery Plan estimated that the Kemp's ridley population could reach the down-listing criterion of 10,000 nesting females in a season by 2011, and could reach the delisting criterion of an average of 40,000 nesting females per season over a 6-year period by 2024. Whether the down-listing criterion was met is currently unknown, although NMFS initiated a 5-year review of the population in October, 2012. The plan does note that the models depend on the assumption of high egg survival rates. Each year, numerous nests are protected by being relocated to a corral to prevent predation, harvest and inundation. As the population grows, the proportion of protected nests will likely decrease, and thus the growth rate could slow (Heppell et al. 2005).



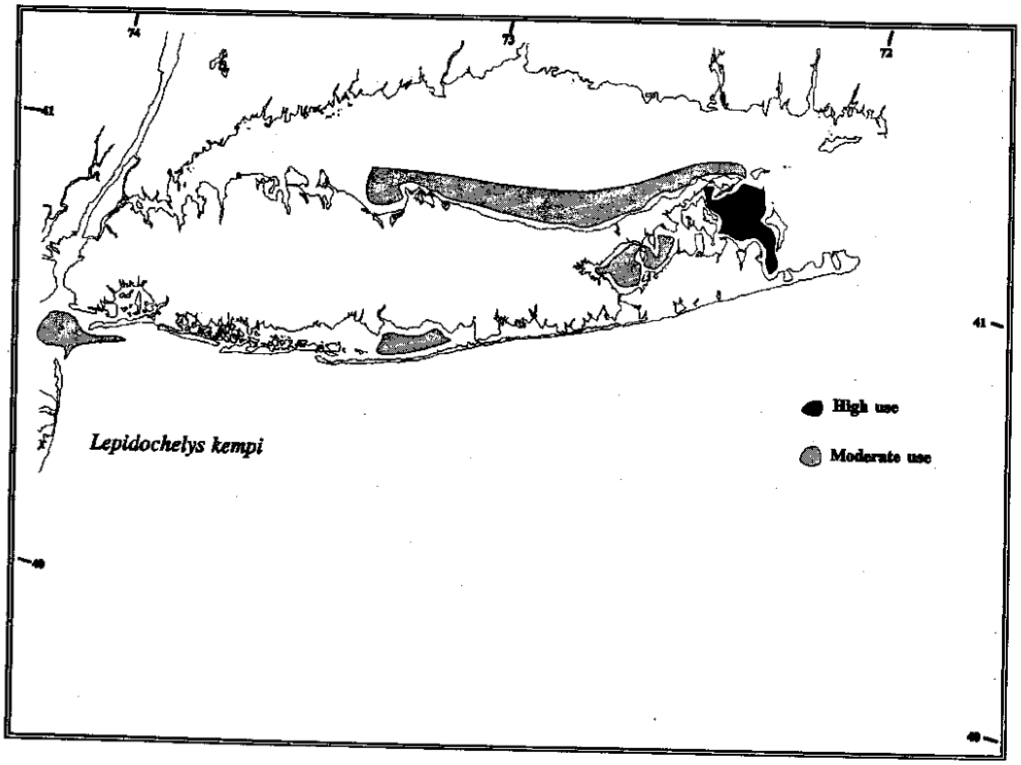


Figure 2. Kemp's ridley sea turtle distribution in New York (Sadove and Cardinale 1993).

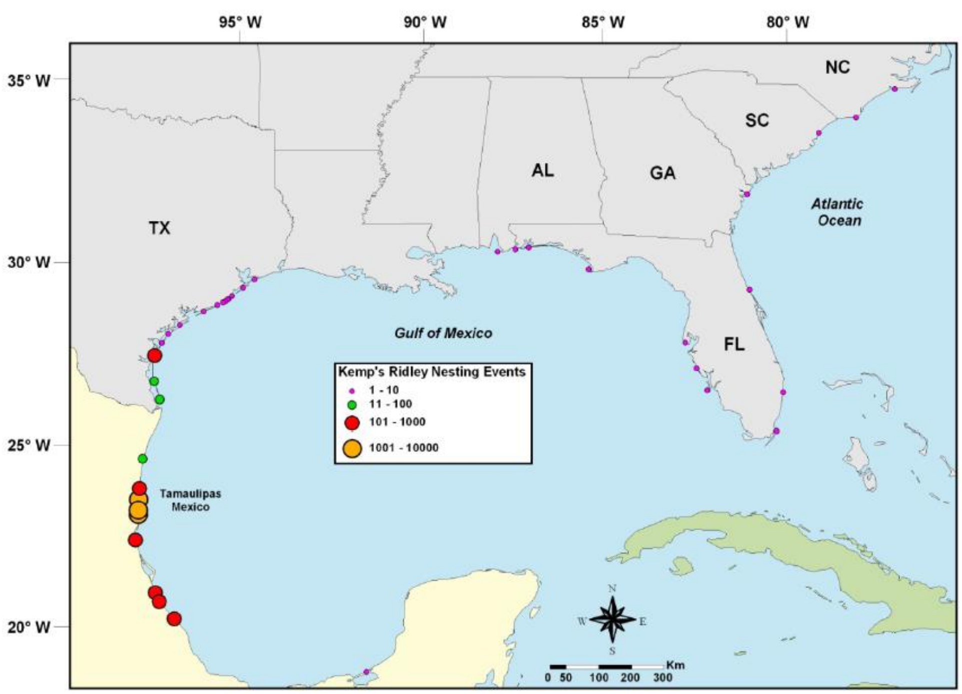


Figure 3. Major nesting beaches of Kemp's ridley sea turtles (NMFS et al. 2011).

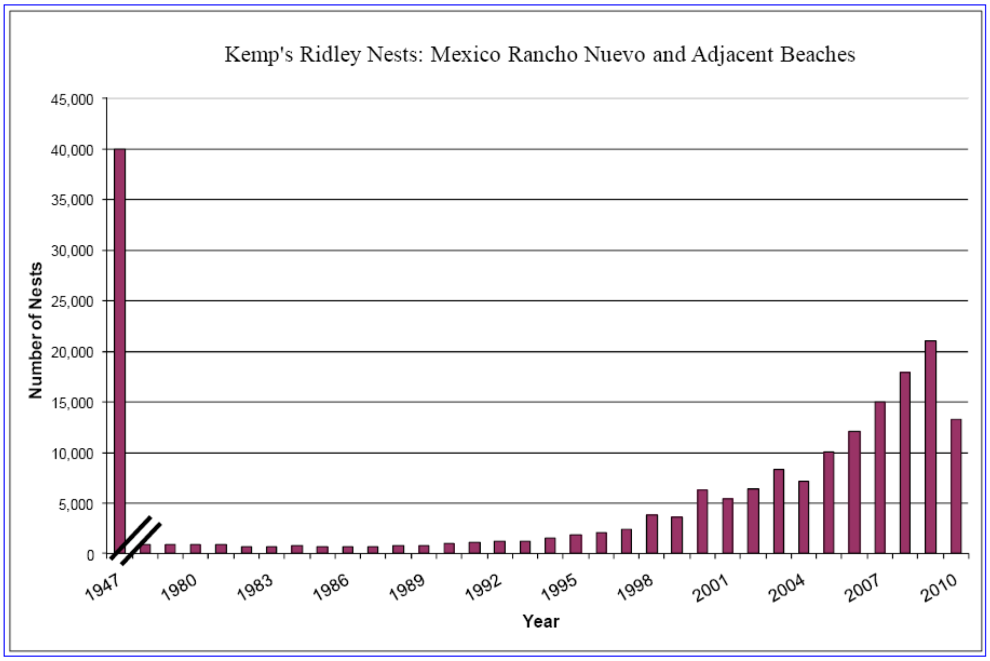


Figure 4. Number of nests recorded during surveys of nesting beaches at Tamaulipas and Veracruz, Mexico. Note: the 1947 number was derived from an amateur film and is a single reference point representing nesting females on a single day. The total nests over the entire 1947 nesting season is believed to be much higher. Systematic surveys of the Rancho Nuevo nesting beach began in 1966 and were extended to other beaches in 1990 (NMFS et al. 2011).

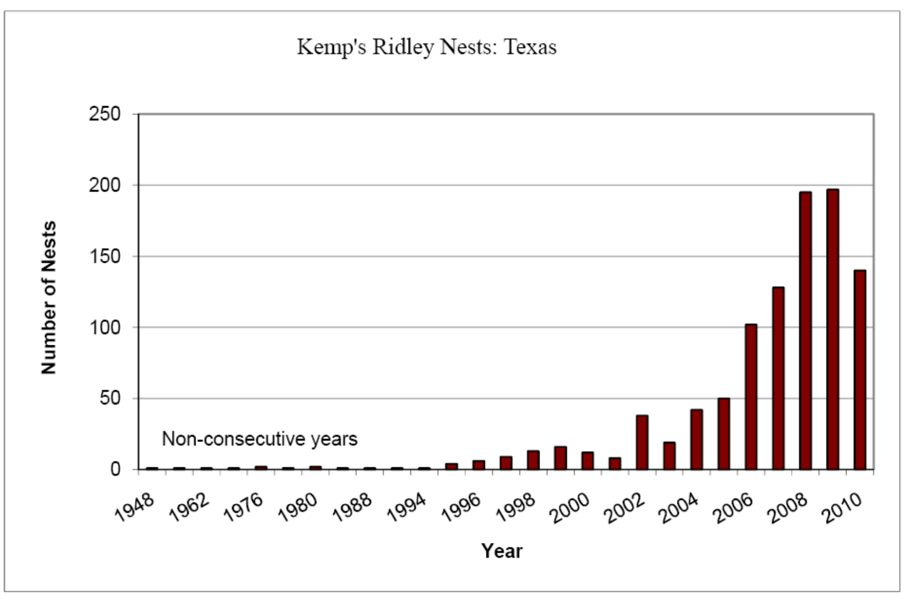


Figure 5. Number of nests recorded on nesting beaches in Texas, U.S. Nests were reported opportunistically by the public or through systematic surveys, and recorded after confirmation of the presence of eggs. Systematic surveys of the PAIS nesting beach did not begin until 1986, and surveys were extended to other Texas beaches starting in 1999 (NMFS et al. 2011).

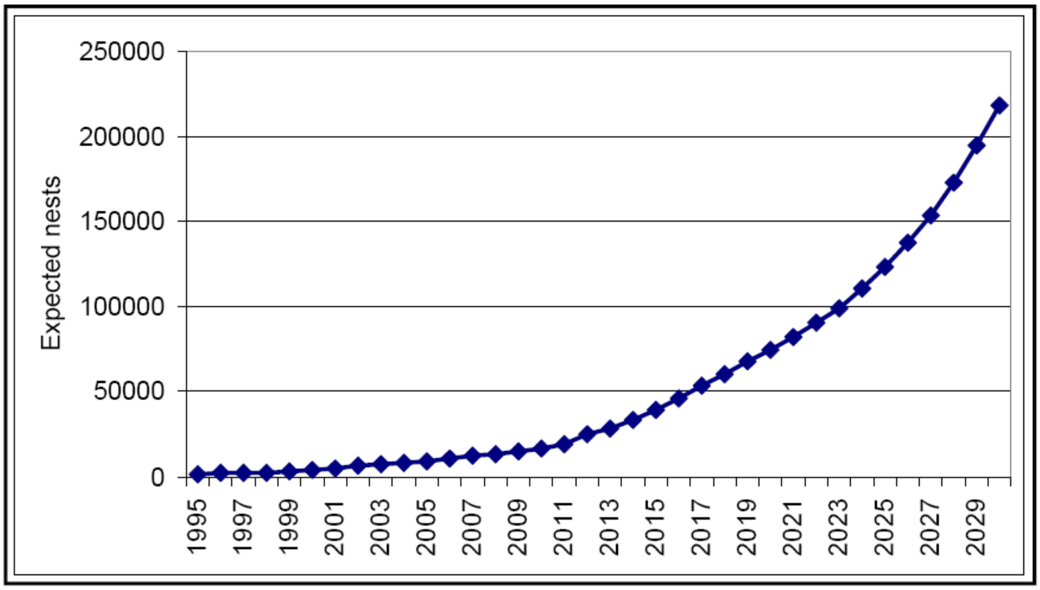


Figure 6. Expected number of nests predicted in the model for past and future years based on the assumption of continued high egg survival rates. Model assumes that 14,500 nests would be placed in corrals for protection. As more nests are left in place, overall egg survival will decrease, and the population growth rate will be reflected in subsequent nesting activity (NMFS et al. 2011).

III. New York Rarity, if known:

Historic	# of Animals	# of Locations	% of State
prior to 1970	________	________	________
prior to 1980	________	________	________
prior to 1992	100-300	________	________

Details of historic occurrence:

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

Current	# of Animals	# of Locations	% of State
	________	________	________

Details of current occurrence:

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

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. Marine, Deep Subtidal

2. Pelagic

3. Marine Eelgrass Community

4. Estuarine, Brackish Shallow Subtidal, Aquatic Bed/Benthic Geomorphology

5. Estuarine, Brackish Deep Subtidal

Habitat or Community Type Trend in New York:

____ **Declining** ____**Stable** ____ **Increasing** __X__ **Unknown**

Time frame of decline/increase: __Trends not analyzed__

Habitat Specialist? _____ **Yes** __X__ **No**

Indicator Species? __X__ **Yes** ______ **No**

Habitat Discussion:

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

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

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

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

Kemp's ridleys originally tagged as juveniles off the Atlantic Coast have been documented using the Rancho Nuevo nesting beach (Schmid 1995; Chaloupka and Zug 1997; Schmid and Witzell 1997, Schmid and Woodhead 2000). Nesting also occurs in Veracruz, Mexico; Texas; and occasionally in North Carolina, South Carolina and Florida (NMFS et al. 2011). The majority of adults are found in the Gulf of Mexico (USFWS and NMFS 1992). They are primarily found in nearshore waters that are 37 m or less (NMFS et al. 2011). Females establish residency seasonally in waters surrounding the Yucatan Peninsula and the northern Gulf of Mexico (NMFS et al. 2011). Habitat use by males is poorly understood, although they appear to remain primarily in nearshore waters (Shaver 2006a, 2007, Shaver et al. 2005b).

V. 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:

Actual life span has not been documented, but is estimated to be around fifty years.

Kemp's ridley turtles are believed to reach sexual maturity between 10 and 16 years of age (Chaloupka and Zug 1997; Schmid and Witzell 1997; Zug et al. 1997; Schmid and Woodhead 2000). Kemp's ridley turtles display a synchronized nesting habit known as an "arribada." Large groups of turtles will gather at a nesting beach, and waves of females will come ashore to nest. The triggers of an arribada are currently unknown (NMFS et al. 2011). The only confirmed Kemp's ridley arribada occurs in Tamaulipas, Mexico. Nearly 95% of the total worldwide Kemp's ridley nesting occurs in this state, concentrated mainly on three beaches: Rancho Nuevo, Tepehaujes, and Barra del Tordo (NMFS et al. 2011).

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

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

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

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

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

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

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

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

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

VI. Threats:

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

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

Climate change could have significant effects on Kemp's ridley turtles in other parts of their range as well. More nests could be destroyed as a result of the increasing abundance and severity of storms along the nesting range. Rising sea levels could cause major problems on low-lying nesting beaches.

Additionally, there is concern that rising temperatures could skew hatchling sex ratios towards a strong female bias (NMFS et al. 2011).

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

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

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

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

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

There is also the potential that sea turtles could absorb toxins in the ingested debris (Balazs 1985). Kemp's ridleys have ingested plastic, rubber, fishing line and hooks, tar, string, Styrofoam, epoxy and aluminum (Shaver 1991; Werner 1994). Generally, ingestion of debris is not believed to be as much of a problem for Kemp's ridleys as for other species of sea turtles (Bjorndal et al. 1994; Witzell and Schmid 2005).

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

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

______ No ____ Unknown

__X__ Yes

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

In addition, Article 17 of the ECL works to limit water pollution, and Article 14 presents the New York Ocean and Great Lakes Ecosystem Conservation Act. This act is responsible for the conservation and restoration of coastal ecosystems "so that they are healthy, productive and resilient and able to deliver the resources people want and need." Both of these help to protect the habitat of the Kemp's ridley turtle. Whether they are adequate to protect the habitat is currently unknown.

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

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 Kemp's ridley turtle life history. Riverhead Foundation already places satellite tags on many rehabbed and released Kemp's ridleys, and this practice should be encouraged to continue. It is critical to determine where New York Kemp's ridleys travel to and nest to help reduce the threats to the population during other stages of its life.

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

Education on this species and the importance of reporting ship strikes and entanglements is encouraged.

VII. References

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