Common Name: Atlantic torpedo ray ***SPCN***
Scientific Name: *Torpedo nobiliana*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

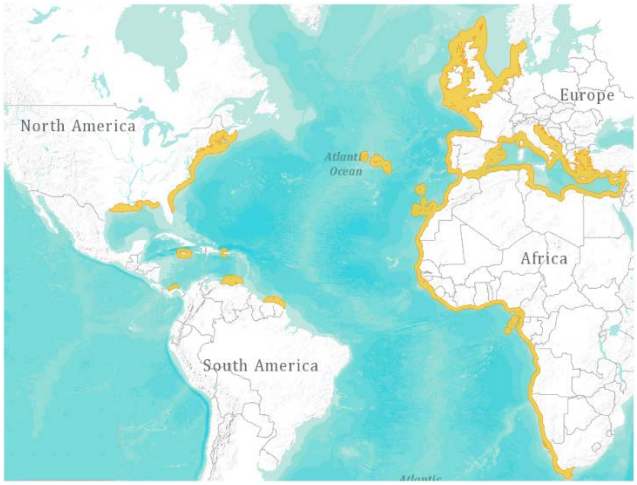
Synopsis:
The Atlantic torpedo ray is a species of electric ray with a wide range in the Atlantic Ocean (Notarbartolo di Sciara et al. 2009). It is a batoid fish and of the two genera and fourteen species of electric rays worldwide, it is the only one found in the Northwest Atlantic Ocean. (Bigelow and Schroeder 2002). In the western Atlantic, it can be found from Nova Scotia, Canada south to Brazil (Robins and Ray 1986,). Coastwide it is found on the continental shelf and has been seen off the south shore of Long Island in New York many times and was caught in a trawl survey in 2009 (Briggs and Waldman 2002, M. Richards, personal communication). This species is found from the surface to depths of about 800 meters; juveniles are mostly benthic (Notarbartolo di Sciara et al. 2009). Atlantic torpedo adults have been reported to migrate long distances (Notarbartolo di Sciara et al. 2009). Because there is such little catch data for this species, current trends cannot be determined (Notarbarto lo di Sciara et al. 2009).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%	X	Uncommon			
> 50%		Rare	X		

Habitat Discussion:
This species can be found from the surface to depths of about 800 meters (Notarbartolo di Sciara et al. 2009, Bester 2013). Juvenile Atlantic torpedo rays prefer soft substrates or coral reef habitats; adults are pelagic or semi-pelagic (Notarbartolo di Sciara et al. 2009).

Primary Habitat Type
Marine; Deep Sub-tidal

Distribution:
This species has been sighted by NYSDEC staff off the coast of Long Island multiple times (Briggs and Waldman 2002). There was a single individual captured in a trawl survey in 2009 in the Atlantic Ocean off the coast of Long Island (M. Richards, personal communication).



IUCN (2009)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	M	H

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Briggs, P.T. and J.R. Waldman. 2002. Annotated list of fishes reported from the marine waters of New York. Northeastern Naturalist 9(1): 47-80.

Notarbartolo di Sciara, G., Serena, F., Ungaro, N., Ferretti, F., Holtzhausen, H.A. & Smale, M.J. 2009. Torpedo nobiliana. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org> (Accessed: April 11, 2013).

Richards, M. 2013. E-mail with data from marine trawl surveys. Personal communication.

Robins, R and G.C. Ray. 1986. A field guide to Atlantic Coast fishes of North America. Houghton Mifflin Harcourt. New York, New York.

Common Name: Blue shark ***SPCN***
Scientific Name: *Prionace glauca*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Nor Ranked
Tracked: No

Synopsis:
Blue sharks are one of the most wide-ranging large open ocean predators, occurring worldwide in temperate and tropical waters. In the Atlantic Ocean they are present from Newfoundland, Canada southward to Argentina, occasionally occurring inshore in areas around oceanic islands and in locations where the continental shelf is narrow (Stevens 2009). As a pelagic species, their habitat includes open areas from the surface to about 350m deep, where temperatures are 10–20˚C; they may be found at greater depths in tropical waters (Hazin et al. 1994). Although tagging studies indicate a single North Atlantic population, their biology, migrations, and the impacts fisheries have on this species must be considered at the level of ocean basins due to their highly migratory nature (ASMFC 2008). Even though the blue shark is one of the most abundant pelagic species globally, it is also the shark species taken as bycatch in the greatest numbers in longline and net fisheries (Camhi et al. 2009). Due to its prevalence of catch in fisheries, it is also one of the best studied pelagic sharks, but its conservation status still remains uncertain and the health of the population has never been properly assessed (Campana et al. 2006).

The status of blue sharks in the Atlantic Ocean is currently ambiguous, with some research indicating declines and some indicating a stable population. An estimated 20 million individuals are taken annually, mainly as bycatch, but there are no current population estimates and many unreported catches (Aires-da-Silva et al. 2008). The few assessments of fisheries-dependent data carried out suggest little population decline, although there is concern over the removal of such large numbers of this apex predator from the oceanic ecosystem (Stevens 2009). In a 2009 ecological risk assessment conducted on eleven species of pelagic elasmobranches, the blue shark was determined to have intermediate vulnerability to pelagic longline fisheries with a productivity of 0.286 and susceptibility to the fishery of 0.514, resulting in a vulnerability rank of 7 (higher number indicates lower vulnerability) (Cortes et al. 2010).

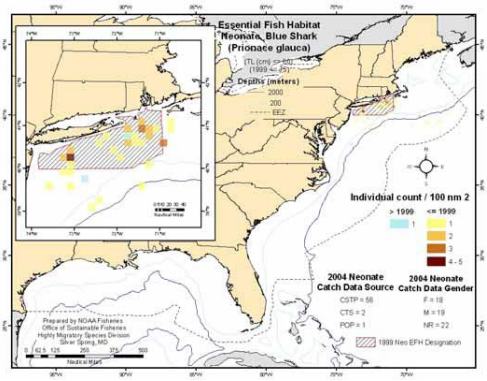
Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Stable	Moderate Decline
6% to 10%		Common	X		
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%	X	Rare			

Habitat Discussion:
Blue sharks inhabit deep waters, usually in temperatures between 10-20˚C at depths ranging from the surface to 350m, although they occasionally dive deep with a maximum observed depth of 1160m (Stevens 2009, Queiroz et al. 2012). Their migratory patterns are complex and encompass great distances with spatial structure related to reproduction and distribution of prey, involving major ocean migrations

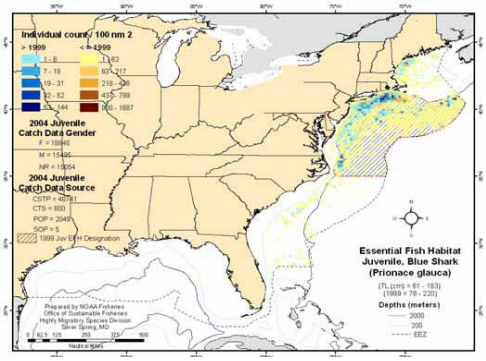
(Fowler et al. 2005). In the Northwest Atlantic, essential habitat for neonates is primarily north of 40˚N from Manasquan Inlet, NJ to Buzzards Bay, MA in waters 25m to the exclusive economic zone boundary. Juveniles prefer habitat around 45˚N (off of Cape Hatteras, NC) in waters 25m to the EEZ boundary (ASMFC 2008). The space-use patterns of blue sharks indicate that they spend much of their time in areas where pelagic longline activities are the highest, which could account for the high levels of by-catch and declining populations (Queiroz et al. 2012). Some tagged individuals have shown patterns consistent with reverse diel vertical migration, possibly related to changes in the thermal structure of the water column or changes in prey type and density (Queiroz et al. 2012). Sexual segregation at the spatial and temporal scale has also been observed, with males dominating early in the year and females outnumbering males in July-September (Tavares et al. 2012).

Primary Habitat Type
Marine; Deep Sub-tidal

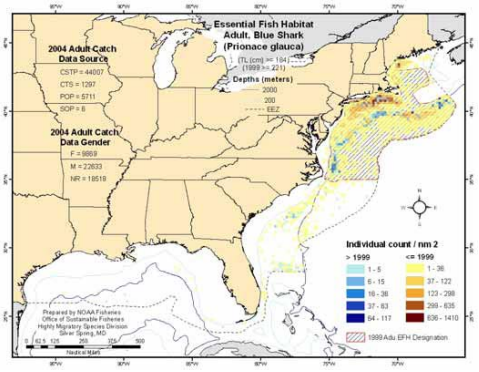
Distribution:



Essential habitat for blue shark neonates (ASMFC 2008)



Essential habitat for blue shark juveniles (ASMFC 2008)



Essential habitat for adult blue sharks (ASMFC 2008)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	L	H
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (recreational fishing)	P	L	L
3. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial fishing)	P	L	H
4. Energy Production & Mining	Renewable Energy (offshore wind farms)	N	L	M

References Cited:

Atlantic States Marine Fisheries Commission Coastal Sharks Plan Development Team. 2008. Interstate Fishery Management Plan for Atlantic Coastal Sharks. Fishery Management Report No. 46. 193p.

Camhi, M.D., S.V. Valenti, S.V. Fordham, S.L. Fowler, and C. Gibson. 2009. The conservation status of pelagic sharks and rays: report of the IUCN shark specialist group pelagic shark red list workshop. IUCN Species Survival Commission Shark Specialist Group. Newbury, UK. 78p.

Cortes, E., F. Arocha, L. Beerkircher, F. Carvalho, A. Domingo, M. Heupel, H. Holtzhausen, M.N. Santos, M. Ribera, and C. Simpfendorfer. 2010. Ecological risk assessment of pelagic sharks caught in the Atlantic pelagic longline fisheries. Aquatic Living Resources 23(1): 25-34.

Fowler, S.L., R.D. Cavanagh, M. Camhi, G.H. Burgess, G.M. Cailliet, S.V. Fordham, C.A. Simpfendorfer, and J.A. Musick. 2005. Sharks, rays and chimaeras: the status of the chondrichthyan fishes. IUCN Species Survival Commission Shark Specialist Group.

Hazin, F.H.V., C.E. Boeckman, E.C. Leal, R.P.T. Lessa, K. Kihara, and K. Otsuka. 1994. Distribution and relative abundance of the blue shark, *Prionace glauca*, in the southwestern equatorial Atlantic Ocean. Fisheries Bulletin 92: 474-480.

Queiroz N, N.E. Humphries, L.R. Noble, A.M. Santos, and D.W. Sims. 2012. Spatial dynamics and expanded vertical niche of blue sharks in oceanographic fronts reveal habitat targets for conservation. PLoS ONE 7(2): e32374.

Stevens, J. 2009. *Prionace glauca*. In: IUCN 2012. Red List of Threatened Species. Version 2012.2.

Tavares, R., M. Ortiz, and F. Arocha. 2012. Population structure, distribution and relative abundance of the blue shark (*Prionace glauca*) in the Caribbean Sea and adjacent waters of the North Atlantic. Fisheries Research 129(130): 137-152.

Common Name: Cownose ray ***SPCN***
Scientific Name: *Rhinoptera bonasus*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
Cownose rays are one of the most readily identifiable ray species due to their indented snout and specialized bi-lobed fin beneath the head, appearing bovine-like. The cownose ray is a large batoid of the family Rhinopteridae, characterized by its flat body and venomous spine present on the whip-like tail. Cownose rays occur from New England (southern Massachusetts) to Brazil, including the Gulf of Mexico and Cuba. Another population exists in the eastern Atlantic Ocean off the coast of western Africa and the Cape Verde Islands, and the western Atlantic and the Gulf of Mexico populations are thought to be separate, but there is insufficient data to support this (Barker 2006). Presence in New York would occur between late spring and late fall, but there are no recent observations in state waters.

This is a benthic to epipelagic species, occurring along the continental and insular shelves in shallow marine and brackish waters (Barker 2006). Cownose rays are assumed to be highly migratory but movement patterns are not well known (Kyne et al. 2012). Establishment of a commercial fishery has been suggested due to competition between rays and humans for shellfish consumption and the potential damage that large schools may have on shellfish and seagrass beds. The Virginia Sea Grant at Virginia Institute of Marine Science is currently researching cownose rays to develop management options to lessen income loss to shellfish growers while ensuring the sustainability of Chesapeake Bay cownose ray populations, without opening a commercial fishery (Fisher 2010). The schooling nature and inshore habitat of this species coupled with their low productivity and late maturity make cownose rays susceptible to overexploitation and recovery from population declines would be limited (Kyne et al. 2012).

Cownose rays rays are susceptible to overexploitation and may have limited ability to recover from population declines due to their schooling behavior in inshore habitats and slow life history characteristics (Barker 2006). Heavy fishing pressure in the inshore environment, especially throughout Central and South America, is also likely to have an effect on population abundance, resulting in the global Near Threatened assessment by the IUCN. Although they are taken as by-catch in U.S. waters, these activities aren't thought to pose a significant threat to this species at the present time and the population appears to be healthy, but population status and catch level data are urgently needed (Kyne et al. 2012).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%	X	Uncommon	X		
> 50%		Rare			

Habitat Discussion:
Cownose rays occur in marine and brackish waters up to 60ppt, often swimming into estuaries and bays (Kittle 2013). They are pelagic swimmers and benthic feeders, found at depths of 0-22m (Barker 2006). Cownose rays are a gregarious species, forming large schools that can number in the thousands. They are presumed to make long migrations with their school, moving northward in late spring and southward in late fall (Barker 2006). The onset of migration may be influenced by changes in water temperature for some populations and possibly due to other factors such as food availability or predator avoidance in the estuaries. Chesapeake Bay is an important location for pupping and mating, where large schools of cownose rays are abundant from late spring to late fall (Fisher 2010).

Primary Habitat Type
Marine; Deep Sub-tidal
Marine; Shallow Sub-tidal

Distribution:
There are no records of cownose ray in New York waters.

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	L	H
2. Climate Change & Severe Weather	Habitat Shifting & Alteration (warming ocean temperatures)	P	L	V

References Cited:
Barker, A.S. 2006. *Rhinoptera bonasus*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2.

Fisher, R. 2010. Life history, tropical ecology, and prey handling by cownose ray, Rhinoptera bonasus, from Chesapeake Bay. Report to National Oceanic and Atmospheric Administration.

Kittle, K. 2013. Biological profile: cownose ray. Florida Museum of Natural History (FLMNH). www.flmnh.ufl.edu. Web. Accessed 14 Mar. 2013.

Kyne, P.M., J.K. Carlson, D.A. Ebert, S.V. Fordham, J.J. Bizzarro, R.T. Graham, D.W. Kulka, E.E. Tewes, L.R. Harrison, and N.K. Dulvy. 2012. The conservation status of North American, Central American, and Caribbean chondrichthyans. IUCN Species Survival Commission Shark Specialist Group, Vancouver, Canada. 156p.

Common Name: Longfin mako shark ***SPCN***
Scientific Name: *Isurus paucus*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
Globally, there is a lack of information regarding the abundance, distribution, and life history of the longfin mako. Locally, there is no information pertaining to their presence in New York waters. Although historical catch records of longfin mako along the U.S. Atlantic coast do exist (Dodrill and Gilmore 1979), this species is rare leading to vast uncertainty in, or a general lack of abundance estimates (Camhi et al. 2009). This species is large, reaching over four meters in length and is classified as being oceanic pelagic with low fecundity (two to eight pups per litter) (Reardon et al. 2006). It is assumed that significant underreporting of this species exists due to the confusion between shortfin and longfin makos (Camhi et al. 2009, Queiroz et al. 2006). However, it is known to be caught as bycatch in longline tropical pelagic fisheries, particularly offshore longlining (Queiroz et al. 2006). Further, most records of catch come from Portugal, Spain, and South Africa (Camhi et al. 2009). Based on the current information in the literature, this species is found in warmer waters far south of New York. It is possible it could be found on rare occasion in the New York Bight. However, New York specific conservation efforts would likely have no significant impact on this species. It is therefore, recommended that this species be removed from the list of Species of Greatest Conservation Need.

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:
Longfin mako sharks are classified as oceanic and generally occur in warm waters. They possibly occur circumglobally and their range of depth is unknown (Camhi et al. 2009).

Primary Habitat Type
Marine; Deep Sub-tidal
Marine; Shallow Sub-tidal

Distribution:
The current occurrence of longfin mako sharks in New York waters is unknown. Based on life history and global catch records, it is believed to be found farther south and not in New York waters.

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing and Harvesting Aquatic Resources (bycatch)	N	L	H
2. Biological Resource Use	Fishing and Harvesting Aquatic Resources (illegal harvest)	N	L	H
3. Climate Change and Severe Weather	Habitat Shifting & Alteration (warming ocean temperatures)	P	L	V

References Cited:

Camhi, M.D., Valenti, S.V., Fordham, S.V., Fowler, S.L. and Gibson, C. 2009. The Conservation Status of Pelagic Sharks and Rays: Report of the IUCN Shark Specialist Group Pelagic Shark Red List Workshop. IUCN Species Survival Commission Shark Specialist Group. Newbury, UK. 78p.

Dodrill, J.W. and R.G. Gilmore.1979. First North American continental record of the longfin mako (*Isurus paucus* Guitart Manday). Florida Scientist, 42: 52-58.

Queiroz, N., S. Araujo, P.A. Ribeiro, P. Tarroso, R. Xaier, and A.M. Santos. 2006. JMBA 2 – Biodiversity Records. Published online.

Common Name: Scalloped hammerhead shark ***SPCN***
Scientific Name: *Sphyrna lewini*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
The smooth hammerhead shark is a coastal pelagic species, found worldwide in warm temperate and tropical waters (Compagno 1984, Miller et al. 2013). It inhabits continental and insular shelves, ranging from intertidal and surface waters, to depths up to 450 m (Compago 1984, Klimley 1993). Scalloped hammerhead sharks are targeted and taken as bycatch in many global fisheries. Their fins are the primary product for international trade (Miller et al. 2013). Stock assessments of the northwest Atlantic population found the population to have decreased from 155,500 individuals in 1981 to 26,500 in 2005 (Hayes et al. 2009). Since 2005, numbers have remained relatively stable, with the current population estimated to be between 25,000–28,000 individuals (Hayes et al. 2009).

All life-stages of scalloped hammerhead are highly vulnerable to overharvest throughout its range. This species is taken both as a target and as bycatch. The fins of this species are the primary product for international trade (Miller et al. 2013). Where catch data is available, declines up to 50-90% have occurred over the last 30 years in areas throughout its range. Given the population declines, increased targeting for its high value fins, and continuing fishing pressure, the scalloped hammerhead is considered globally endangered by the IUCN (Baum et al. 2007). The extinction risk assessment team concluded that the Northwestern Atlantic and Gulf of Mexico distinct population segment (DPS) is at a “low” risk of extinction throughout its range, now and in the foreseeable future. Although there are some concerns about the decline in absolute abundance, the Northwestern Atlantic and Gulf of Mexico DPS has a high likelihood of rebuilding (NOAA 2013).

In 5 April 2013, the Eastern Atlantic and Eastern Pacific DPS of scalloped hammerhead sharks were warranted to be listed as federally endangered. The Central and Southwest Atlantic and Indo-West Pacific were warranted to be listed as threatened under the Endangered Species Act (ESA). The Central Pacific and North West Atlantic & Gulf of Mexico DPS were not warranted listing on the ESA due to a low risk of extinction. The public comment period closed on 4 June 2013 (NOAA 2013).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:
The scalloped hammerhead shark inhabits coastal warm temperate and tropical seas worldwide. It occurs over continental and insular shelves, and in adjacent deep waters, but is rarely found in waters colder than

22˚C (Compagno 1984). It ranges from intertidal and surface to depths up to 450-512m (Sanches 1991, Kimley 1993). It has also been seen entering enclosed bays and estuaries (Compagno 1984). Adult aggregations can be found offshore over seamounts and near islands, while neonate and juvenile groups are common in near shore nursery habitats (Compagno 1984).

Primary Habitat Type
Marine; Deep Sub-tidal
Marine; Shallow Sub-tidal

Distribution:
There are no records of scalloped hammerhead sharks in New York waters.

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial harvest)	P	L	H
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	N	L	H
3. Climate Change & Severe Weather	Habitat Shifting & Alteration (warming ocean temperatures)	P	L	V

References Cited:
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Compagno, L. J. V. 1984. Sharks of the World. An annotated and illustrated catalogue of shark species known to date. Part II (Carcharhiniformes). FAO Fisheries Synopsis No. 125, Vol. 4, Part II. FAO, Rome.

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Miller, M.H., J. Carlson, P. Cooper, D. Kobayashi, M. Nammack, and J. Wilson. 2013. Status review report: scalloped hammerhead shark (*Sphyrna lewini*). Report to National Marine Fisheries Service, Office of Protected Resources. 131 pp.

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Common Name: Smooth hammerhead shark ***SPCN***
Scientific Name: *Sphyrna zygaena*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
One of the larger species in the genus *Sphyrna*, the smooth hammerhead shark is a coastal-pelagic and semi-oceanic species. It primarily stays on the continental shelf and prefers waters around 20m deep, although it has been reported at depths of 200m (Ebert 2003). There is very little species-specific data on smooth hammerheads and data it is commonly lumped under a hammerhead category, which includes the scalloped (*S. lewini*), great hammerhead (*S. mokarran*) and smooth hammerhead (*S. zygaena*) (Casper et al. 2005). The smooth hammerhead ranges from Nova Scotia to southern Florida (Last and Stevens 2009). There are ambiguous reports on the population trend of smooth hammerheads, but the hammerhead complex has decreased in abundance since the 1980s (Baum et al. 2003, Jiao et al. 2008).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:
The smooth hammerhead is a coastal-pelagic and semi-oceanic species. It occurs on the continental shelf, preferring waters around 20 m deep, but have been reported at depths of 200 m (Ebert 2003). This species commonly found over deep reefs on the edge of the continental shelf (Smale 1991). Nursery habitat is smooth sandy substrates in shallow waters up to 10m (Bass et al. 1975).

Primary Habitat Type
Marine; Deep Sub-tidal
Marine; Shallow Sub-tidal

Distribution:
There are no records of smooth hammerhead shark in New York waters.

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial fishing)	P	L	H
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	N	L	H
3. Climate Change & Severe Weather	Habitat Shifting & Alteration (increasing ocean temperature)	P	L	V

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Ebert, D.A. 2003. The sharks, rays and chimaeras of California (California Natural History Guides #71). University of California Press, Berkley and Los Angeles, California. 262 pp.

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Common Name: Smooth skate ***SPCN***
Scientific Name: *Malacoraja senta*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: GNR
New York: Not Ranked
Tracked: No

Synopsis:
The smooth skate is one of the smallest species of skate endemic to the north-western Atlantic, occurring off the banks of Newfoundland and the southern Gulf of St. Lawrence, Canada, southward to New Jersey. There are four (possibly five) distinct concentrations of smooth skate off Canada, separated by wide areas where individuals never occur (Kulka et al. 2006). Individuals have been caught off the south shore of Long Island in Northeast Fishery Science Center (NEFSC) trawl surveys, but generally very few individuals are caught in inshore areas of Southern New England and the Mid-Atlantic Bight (44th SAW 2007). Smooth skate are not targeted in any commercial fishing operations, but are taken in mixed fisheries or as by-catch by trawls, long-lines, crab pots and scallop dredges (Kyne et al. 2012). The Northeast Skate Complex Fishery Management Plan (FMP) prohibits the possession of smooth skate and establishes biomass targets and essential fish habitat for this species. Like other elasmobranches, this species exhibits characteristics that make them vulnerable to exploitation such as late maturity and a long life span.

The majority of the smooth skate population occurs in Canada, where survey data show population declines of 73–91%, warranting the endangered status. The U.S. portion of the population declined in the 1970s but has been stable at lower levels since. The U.S. population is negatively affected by fisheries and biomass indices were below biomass thresholds until recently, resulting in a status of Near Threatened (44th SAW 2007, Sulikowski et al. 2009). The globally endangered status is justified as the majority of the total population (~75%) is found within Canadian waters (Kyne et al. 2012). The smooth skate has been flagged for priority reassessment by the IUCN and is currently undergoing revision (Kyne et al. 2012). The 3-year average survey biomass of 0.23 kg/tow for 2009-2011 was 77% above the overfished threshold and 85% above the maximum sustainable yield target, indicating the stock could be rebuilt before the 2020 deadline if the current biomass trends continue (NEFMC 2012).

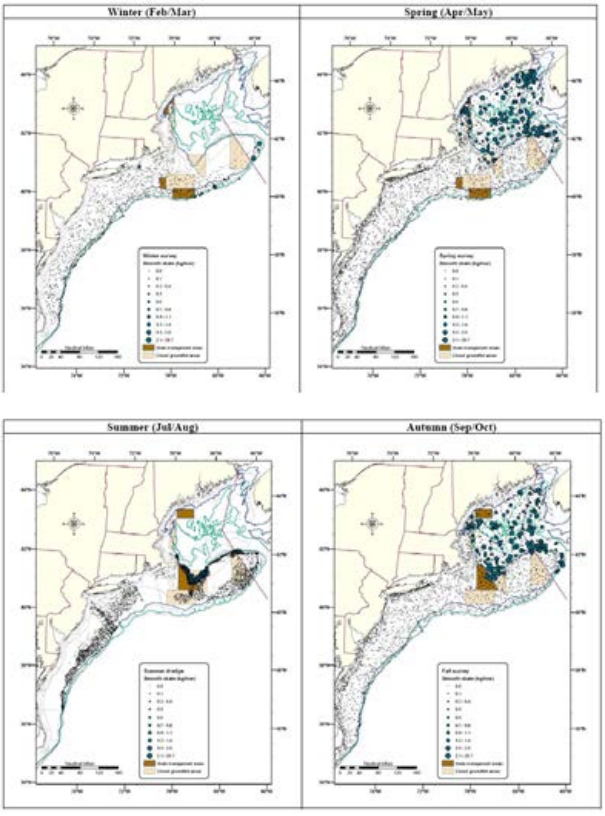
Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Moderate Decline
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

Habitat Discussion:
The smooth skate occurs in deep brackish and marine waters from 25 to 1,436 meters but is most abundant between 70-480 meters (McEachran and Musick 1975, Kyne et al. 2012). It appears to be temperature specific, occupying a narrow range of water temperature throughout its range (3-10˚C) (Kyne et al. 2012). It prefers substrates of soft mud and clay bottoms of deeper troughs and basins, and sand and

shells of the offshore banks (Sulikowski et al. 2009). Smooth skate are very selective in their diet, eating mostly small crustaceans through most of its life and only taking fish at largest sizes (Sulikowski et al. 2009). Co-occurrence and possibly competition with the thorny skate may have led to food specialization in smooth skate and possibly caused the low abundance and low diversity of prey species in the diet of this species (Packer et al. 2003). Smooth skate do not undergo large-scale migrations but they do move seasonally in response to temperature, moving offshore in summer and autumn and returning inshore in winter and spring.

Primary Habitat Type
Marine; Deep Sub-tidal

Distribution:
McEachran and Musick (1975) found no individuals in the Mid-Atlantic Bight during their groundfish surveys from 1969-1970, but NEFSC trawl surveys have caught individuals off the south shore of Long Island since the 1960s (NEFMC 2009, Packer et al. 2003). NEFSC bottom trawl surveys have caught individuals off the southern shore of Long Island as recently as 2008 (NEFMC 2009).



Smooth skate biomass distribution in the winter trawl (2000-2007), spring trawl (2000-2008), summer dredge (2000-2007), and autumn trawl (2000-2007) surveys (NEFMC 2009)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	L	M
2. Climate Change & Severe Storms	Habitat Shifting & Alteration (warming ocean temperature)	P	L	V
3. Climate Change & Severe Storms	Temperature Extremes	P	L	V

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Common Name: Tiger shark ***SPCN***
Scientific Name: *Galeocerdo cuvier*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: GNR
New York: Not Ranked
Tracked: No

Synopsis:
The tiger shark is a wide-ranging species, occurring throughout the world's temperate and tropical waters in the open ocean as well as shallow coastal waters. Off the Atlantic Coast, tiger sharks are found from Cape Cod to Uruguay, including the Gulf of Mexico, Bermuda and islands of the Caribbean. Tiger sharks undergo seasonal migrations, moving into temperate waters during warmer months and returning to tropical waters in the winter (Knickle 2010). They have been documented making transoceanic migrations between islands and are capable of traveling long distances in a short amount of time (NMFS 2009). Tiger sharks are rarely encountered north of the Mid-Atlantic Bight, but on occasion have been sighted in shallow coastal areas of New York (NMFS 2009). They are caught in numerous fisheries worldwide, both as target species and as by-catch. The Atlantic Ocean population of tiger sharks is part of the large coastal shark (LCS) complex managed by the National Marine Fisheries Service, which enforces commercial and recreational fishing regulations to combat the overfished status for these species. Although the tiger shark generally does not face a high risk of extinction due to their high fecundity and fast growth rates, there is little information about pupping, nursery areas and population and abundance numbers, therefore continued demand may result in further decline in the future.

There is evidence of declines for several populations where the tiger shark has been heavily fished, but in general this species does not face a high risk of extinction due to their fast growing and fecund nature (Simpfendorfer 2009). However, continued demand, mainly for fins, may result in further declines in the future and this warrants the IUCN's "Near Threatened" status throughout the range (Simpfendorfer 2009). The 2005/2006 Southeast Data, Assessment and Review (SEDAR) stock assessment for the large coastal shark complex determined that it is inappropriate to assess the LCS complex as a whole due to variation in life history parameters, different intrinsic rates of increase, and different catch and abundance data (Casey 2006). Based on these results, NOAA Fisheries has changed the status of the LCS complex from overfished to unknown.

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:
The tiger shark is a saltwater species, preferring seagrass ecosystems of coastal areas but occasionally inhabiting other areas where prey is available, including estuaries, harbors, and lagoons. They spend approximately 36% of their time in shallow coastline habitats, generally from the surface to depths of 150

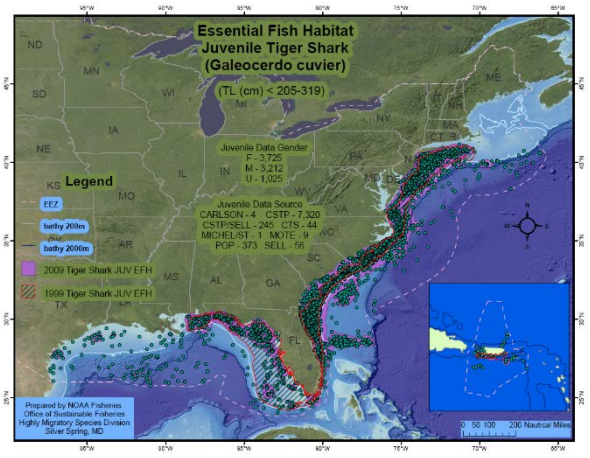
meters (Heithaus et al. 2002). Nurseries appear to be in offshore areas, but they have not been well described. Natanson et al. (1998) reported nursery areas occurring at approximately 35˚N to 29˚20'N (approximately North Carolina to Florida) along the East Coast, out to a depth of 100 meters. Driggers et al. (2008), however, found that tiger sharks in the western North Atlantic Ocean do not use specific areas as nurseries, but that parturition appears to occur over a broad range and the general pupping area from at least 27 to 25˚N, off the coast of southeastern North America and in the Gulf of Mexico. Locations where high abundances of young-of-the-year individuals occurred were likely influenced by areas of high localized productivity.

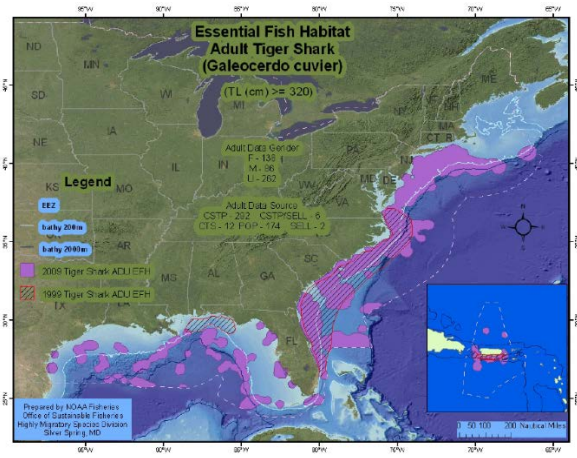
Essential fish habitat for neonates and juveniles is defined as shallow coastal areas up to depths of 200 meters from Cape Canaveral, FL to offshore of Montauk, Long Island, NY. Adult habitat occurs offshore from Chesapeake Bay, MD south to Ft. Lauderdale, FL (NMFS 2009).

Tiger sharks are voracious, indiscriminate predators, feeding on all kinds of fish, marine mammals, turtles, seabirds, sea snakes, squids, mollusks, crabs, and even carrion and garbage. Tiger sharks are solitary nocturnal predators, except during the mating season or while communally feeding on large carcasses (Draper 2011). As one of the largest carnivores in the ocean, there are few predators that feed on tiger sharks, although some juveniles fall prey to other sharks. Tiger sharks have very large home ranges, swimming up to 16 km in one day and often not returning to that area for a year (Draper 2011).

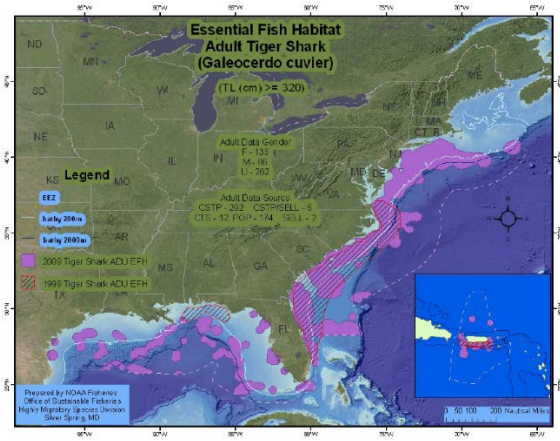
Primary Habitat Type
Marine; Deep Sub-tidal
Marine; Shallow Sub-tidal

Distribution:
Tiger sharks are rarely encountered north of the Mid-Atlantic Bight, but they may be found in shallow coastal regions of New York at night during feeding time (NMFS 2009).





Essential habitat of neonate/young-of-the-year (left) and juvenile (right) tiger shark (NMFS 2009)



Essential habitat of adult tiger shark (NMFS 2009)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial and recreational fishing)	P	L	M
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	M	H
3. Pollution	Garbage & Solid Waste (ingestion of garbage)	P	L	M
4. Climate Change & Severe Weather	Habitat Shifting & Alteration (warming ocean temperatures)	P	L	V

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