

# Species Status Assessment

**Common Name:** Smooth hammerhead shark

**Date Updated:** 1/12/2024

**Scientific Name:** *Sphyrna zygaena*

**Updated by:** Siobhan Keeling

**Class:** Chondrichthyes

**Family:** Sphyrinidae

**Species Synopsis** (a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):

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). Smooth hammerheads are thought to be present in low abundance in the western North Atlantic; they are rarely caught as bycatch in the commercial highly migratory species pelagic longline fisheries or by recreational fisherman using rod and reel (Miller, 2016). Data from pelagic longline records suggest that in the northwest Atlantic between 1981 and 2005, smooth hammerhead sharks have declined by 91%. However, data is very limited for smooth hammerhead sharks (Hayes, 2007). In the northwest Atlantic, the large hammerhead shark complex, which includes smooth hammerheads, scalloped hammerheads (*Sphyrna lewini*), and great hammerheads (*Sphyrna mokarran*), have experienced some of the most severe declines amongst shark species. However, these trends are most likely driven by trends in scalloped hammerhead abundance (Baum and Blanchard, 2010). Species-specific information on smooth hammerheads is limited and distinguishing between hammerhead species is challenging; for example, bycatch was historically reported as *Sphyrna* spp. (Gallagher and Klimley, 2018). In 2016, the National Marine Fisheries Service National Oceanic and Atmospheric Administration conducted an Endangered Species Status Review of smooth hammerhead sharks. The results suggest that although the species displays characteristics that make it inherently vulnerable to extinction (e.g., slow growth rates), current conditions were deemed unlikely to cause extinction. However, there was a high degree of uncertainty in the assessment (Miller et al., 2016).

## I. Status

### a. Current legal protected Status

i. **Federal:** Not listed **Candidate:** No

ii. **New York:** Not listed

### b. Natural Heritage Program

i. **Global:** G3G4, Vulnerable/Apparently Secure, status rounded to G3

ii. **New York:** SU, Unrankable **Tracked by NYNHP?:** No

### Other Ranks:

-New York 2025 SGCN status: Species of Greatest Conservation Need

-IUCN Red List: Vulnerable

-Northeast Regional SGCN: RSGCN

-CITES: II

### Status Discussion:

There is limited information on stock assessments of smooth hammerheads due to the lack of species-specific data. Studies have reported large declines in relative abundance for the hammerhead complex (Baum et al. 2003, Jiao et al. 2008).

## II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Declining	Since 1986		-
Northeastern US	Yes	Declining	Declining	Since 1986 (Northwest Atlantic)		-
New York	No data	Unknown	Unknown	<i>Not specified</i>	Not specified	Yes
Connecticut	No data	-	-	<i>Not specified</i>	Not listed	No
Massachusetts	No data	-	-	<i>Not specified</i>	Not listed	No
New Jersey	No data	-	-	<i>Not specified</i>	Not listed	No
Pennsylvania	No	-	-			-
Vermont	No	-	-			-
Ontario	No	-	-			-
Quebec	No	-	-			-

*Column options*

**Present?:** Yes; No; Unknown; No data; (blank) or Choose an Item

**Abundance and Distribution:** Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item

**SGCN?:** Yes; No; Unknown; (blank) or Choose an item

**Monitoring in New York** (*specify any monitoring activities or regular surveys that are conducted in New York*):

There are no known monitoring activities in New York.

**Trends Discussion** (*insert map of North American/regional distribution and status*):

The current population trend is decreasing according to the IUCN red list (Rigby et al. 2019). In the western Atlantic, smooth hammerheads range from Nova Scotia to southern Florida (Last and Steven 2009). Population data specific to smooth hammerheads are unavailable for the northwest Atlantic. Globally, populations are thought to be decreasing (Casper et al. 2005). Commercial

fishing logbook data in the U.S. pelagic longline fishery between 1986-2000 and observer data between 1992-2005 estimated a decline of 89% for the hammerhead complex (Baum *et al.* 2003). Pelagic longline observer data indicated that *Sphyrna spp.* declined by 76% between 1992-2005 (Camhi *et al.* 2009).

**Distribution Map**

*Sphyrna zygaena*



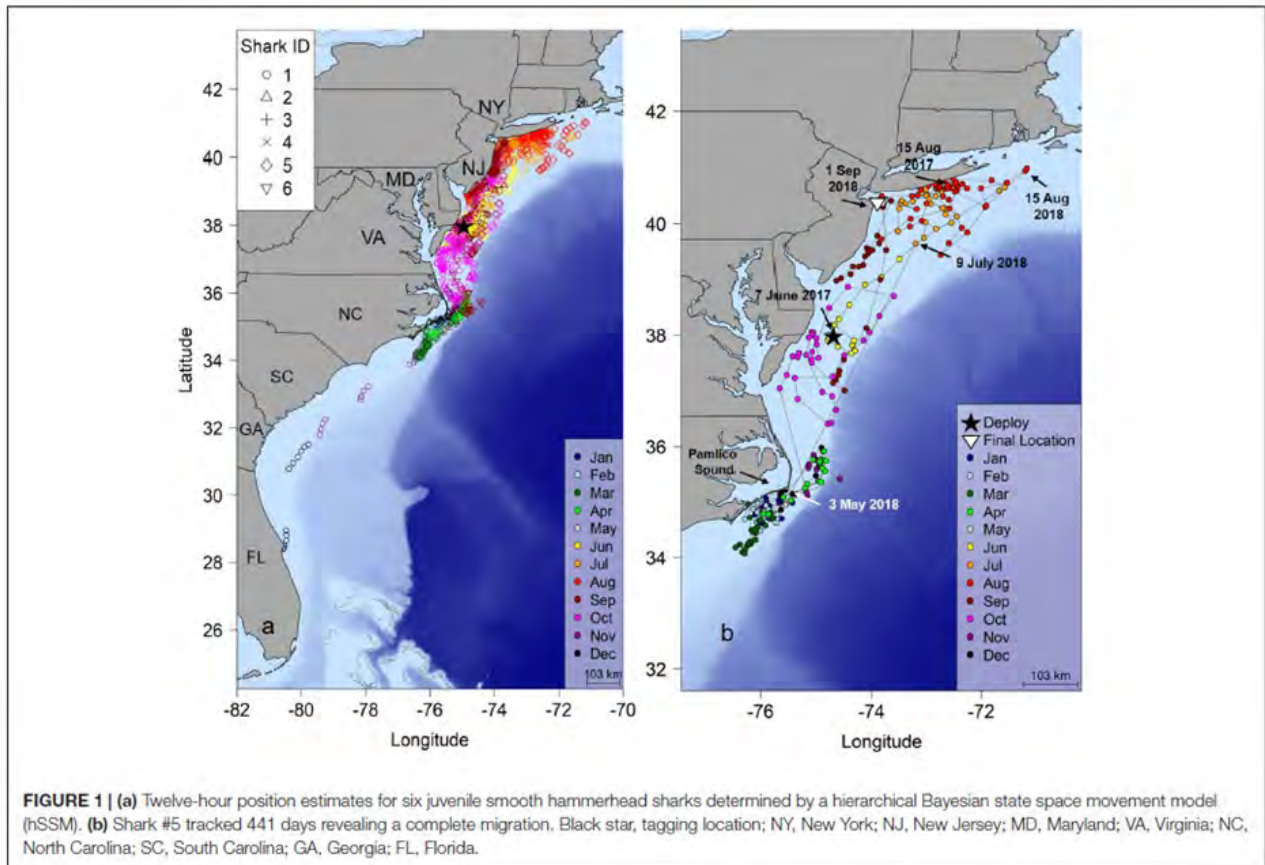
Legend  
■ EXTANT (RESIDENT)

Compiled by:  
IUCN SSC Shark Specialist Group 2018

**Figure 1.** IUCN Red List Smooth Hammerhead Shark distribution map (Rigby 2019)



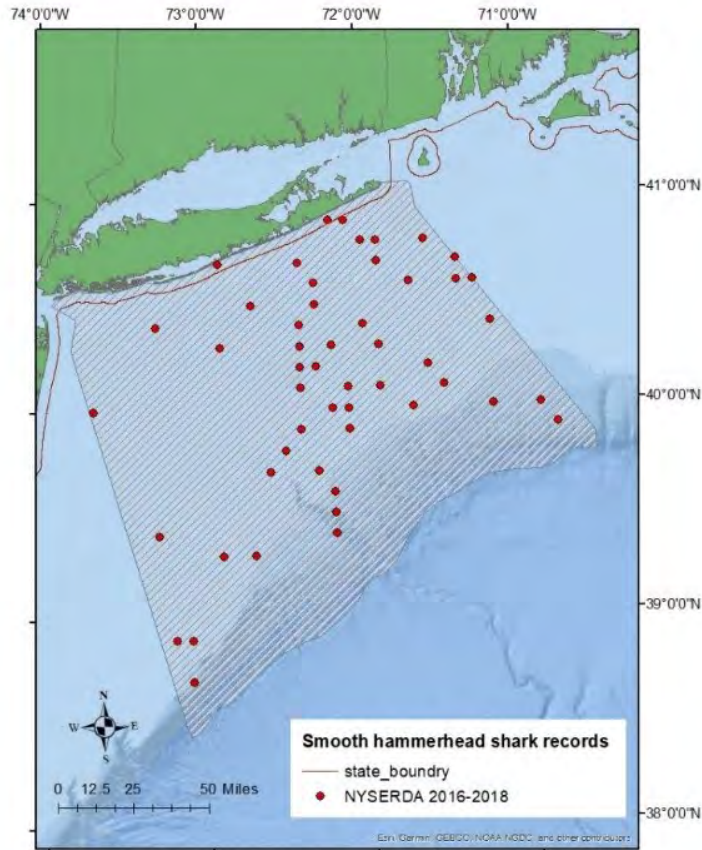
**Figure 2.** Distribution of smooth hammerhead (IUCN 2005).



**Figure 3.** Estimated locations of six tagged juvenile smooth hammerhead sharks (Logan et al., 2020)

**III. New York Rarity** (provide map, numbers, and percent of state occupied)

*Sphyrna zygaena* is a relatively common and widespread shark in temperate waters. It is captured in a number of fisheries throughout its range, mostly by gillnet and longline (Simpfendorfer 2005). Juveniles are seen in large congregations during migration periods. Adults are seen single or in small schools (Florida Museum of Natural History 2008).



**Figure 4.** Records of smooth hammerheads within the NY offshore planning area between 2015-2020

**Details of historic and current occurrence:**

In the western North Atlantic, juvenile smooth hammerheads have shown consistent use of coastal areas in the New York Bight during the summer months and travel south to the coastal areas off Cape Hatteras, North Carolina, during the winter months. Additional research may lead these areas to be designated as essential fish habitats (Logan et al., 2020).

**New York’s Contribution to Species North American Range:**

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
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1-25%	Core	
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Column options

**Percent of North American Range in NY:** 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item

**Classification of NY Range:** Core; Peripheral; Disjunct; (blank) or Choose an item

#### IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

- a. Marine, Shallow Subtidal
- b. Marine, Deep Subtidal
- c. Pelagic

#### Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/Community Trend	Time frame of Decline/Increase
No	No	Stable	

Column options

**Habitat Specialist and Indicator Species:** Yes; No; Unknown; (blank) or Choose an item

**Habitat/Community Trend:** Declining; Stable; Increasing; Unknown; (blank) or Choose an item

#### Habitat Discussion:

The smooth hammerhead is a coastal-pelagic and semi-oceanic species. It occurs on the continental shelf, preferring waters around 20 m deep (Ebert 2003). They are found at depths of 200 m and possibly 500 m (Rigby et al. 2019) 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). Smooth hammerheads leave coastal habitats when they are of 2 to 3 years of age and are the most oceanic hammerhead species (Rigby et al. 2019).

#### V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/Catadromous?
Unknown	-	Unknown	-	-	-

Column options

**First 5 fields:** Yes; No; Unknown; (blank) or Choose an item

**Anadromous/Catadromous:** Anadromous; Catadromous; (blank) or Choose an item

#### Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

The maximum age of smooth hammerheads has yet to be determined; however, it possible that individuals may live 20 years or longer (FLMNH 2008). Smooth hammerheads less than 2 m in length consume inshore squid and teleosts (Smale 1991, Last and Stevens 1994). Larger adults consume squid, teleosts, other sharks and rays (Compagno 1984, Stevens 1984). . Smooth Hammerhead reach a maximum size of 370 to 400 cm total length (TL) with males maturing at 250 to 260 cm TL. Females mature at around 246 to 265 cm TL and it's estimated that they are 15 years of age. Smooth hammerhead are viviparous with a gestation period of 10 to 11 months.

Their size at birth is 49 to 63 cm TL and they have litter sizes of 20 to 50 pups (Rigby et al. 2019). This species is more tolerant of temperate waters than other *Sphyrna* sp.. During the summer months, this species migrates towards the poles, and migrates back towards the equator during the colder winter months (Ebert 2003).

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

Hammerheads are the second most abundant species in the international fin trade (Clarke 2004, Clarke et al. 2006a, 2006b). They are caught in a variety of fisheries including artisanal and small-scale commercial fisheries, bottom longlines as well as offshore pelagic longlines and gillnets. Hammerheads suffer high levels of bycatch and vessel mortality (Morgan and Burgess 2007, Morgan et al. 2009).

The effect of increased global ocean temperatures on sharks is unknown but is likely to result in changes in distribution, migratory movements, and prey availability (ZSL 2010). Synergistic effects between climate and other present threats, particularly by-catch mortality, will likely exacerbate climate-induced changes (Harley et al. 2006).

<b>Threat Level 1</b>	<b>Threat Level 2</b>	<b>Threat Level 3</b>	<b>Spatial Extent</b>	<b>Severity</b>	<b>Immediacy</b>	<b>Trend</b>	<b>Certainty</b>
5. Biological Resource Use	5.4 Fishing & Harvesting Aquatic Resources	5.4.2 Commercial fishing	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
5. Biological Resource Use	5.4 Fishing & Harvesting Aquatic Resources	5.4.2 Commercial fishing (bycatch)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.3 Changes in Temperature Regimes	11.3.3 Gradual temperature change (warming ocean temperatures)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

**Table 1.** Threats to smooth hammerhead shark.

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

Yes:  X                       No:                             Unknown:       

**If yes, describe mechanism and whether adequate to protect species/habitat:**

In NYS, anglers must enroll in the recreational marine fishing registry prior to pursuit of this species. New York anglers may take one smooth hammerhead per vessel per trip with a minimum fork length of 78 inches. Any shark that is landed must have head and fins attached while returning to the dock (NYSDEC 2021).

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

As of March 2013, the smooth hammerhead is listed under CITES Appendix II, due to its similarity in appearance to the globally endangered scalloped hammerhead (CITES 2013). Current management strategies in New York aim to improve the capacity to sample and quantify demersal and pelagic shark populations at all life stages and the role the state’s waters play in their life cycle (NYSDEC 2005).

The New York State Wildlife Action Plan (NYSDEC 2005) provides recommendations for conservation/management actions for pelagic shark species:

- Develop fact sheets for distribution to commercial and recreational fisherman regarding the well being of the pelagic shark stocks.
- Conduct literature review to determine the pupping and juvenile habitat requirements for pelagic coastal sharks in the Middle Atlantic bight.
- Modify New York's regulations as necessary to conform to the federal protection of sharks.
- Initiate a volunteer shark data collection program which would collect additional catch and biological information from New York's recreational anglers.
- Develop appropriate webpage information relative to the shark species found in the Mid-Atlantic bight and their status.

The smooth hammerhead is listed as a large coastal shark by NOAA, under the Atlantic Highly Migratory Species Fishery Management Plan for Atlantic Tuna, Swordfish and Sharks (NMFS 2006). This listing results in the monitoring of international stock and development of future management goals.

Action Category	Action	Description
A.2 Direct Species Management	A.2.0.0.0 Direct species management	-Harvest management -Trade management
C.6 Design and Plan Conservation	A.2.0.0.0 Direct species management	Species recovery

Action Category	Action	Description
A.1 Direct Habitat Management	C.6.5.0.0 Conservation planning	Site/area protection

**Table 2.** Recommended conservation actions for smooth hammerhead (Rigby et al. 2019)

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