

Species Status Assessment

Common Name: Scalloped hammerhead shark **Date Updated:** 1/12/2024

Scientific Name: *Sphyrna lewini* **Updated by:** Siobhan Keeling

Class: Chondrichthyes

Family: Sphyrnidae

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

The scalloped 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 (Compagno 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).

I. Status

a. Current legal protected Status

i. **Federal:** Not Listed **Candidate:** Yes

ii. **New York:** Not Listed

b. Natural Heritage Program

i. **Global:** G4, Apparently Secure

ii. **New York:** S2?, Imperiled **Tracked by NYNHP?:** No

Other Ranks:

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

-IUCN Red List: Critically Endangered

-Northeast Regional SGCN: Watchlist [Assessment Priority]

-CITES: II

Status Discussion:

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).

On 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)

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Stable	1980s-present		-
Northeastern US	Yes	Declining	Stable	1980s-present (West North Atlantic)		-
New York	Yes	Unknown	Unknown	Not Specified		Yes
Connecticut	Choose	Unknown	Unknown	Not Specified	Not Listed	No
Massachusetts	No	Choose an	Choose an			-
New Jersey	-	Unknown	Unknown	Not Specified	Not Listed	No
Pennsylvania	No	Choose an	Choose an			-
Vermont	No	Choose an	Choose an			-
Ontario	No	Choose an	Choose an			-
Quebec	No	Choose an	Choose an			-

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). The Atlantic population of scalloped hammerhead has experience severe declines since 1983 (Jiao et al. 2011). Additional studies have shown that populations have declined 89% since 1986 (Baum et al. 2003). In a recent assessment, Hayes et al. (2009) found that the stock of scalloped hammerhead sharks in the northwestern Atlantic and Gulf of Mexico had been depleted by 83%. It was estimated that the 2005 population was only 45% of the size required to produce a maximum sustainable yield and that fishing mortality was estimated to be 129% of fishing mortality

associated with maximum sustainable yield. Hayes et al. (2009) estimated that a total allowable catch of 2,583 individuals per year would allow a 70% probability of recovery within 10 years, 86% within 20 years, and 91% within 30 years.

Distribution Map

Sphyrna lewini



- Legend
- EXTANT (RESIDENT)
 - POSSIBLY EXTANT (RESIDENT)

Compiled by:
IUCN SSC Shark Specialist Group 2018

Figure 1. IUCN Red List Scalloped Hammerhead distribution map (Rigby et al. 2019)



Figure 2 Worldwide distribution map of the scalloped hammerhead shark (Bester 2011).

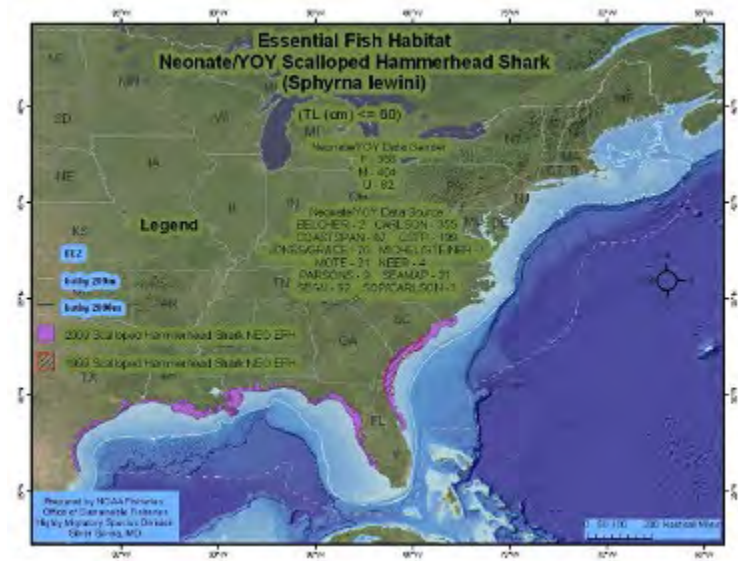


Figure 3. Essential habitat required by young-of-the-year scalloped hammerhead sharks (NMFS 2009).



Figure 4. Essential habitat required by juvenile scalloped hammerhead sharks (NMFS 2009).



Figure 5. Essential habitat for adult scalloped hammerhead sharks (NMFS 2009).

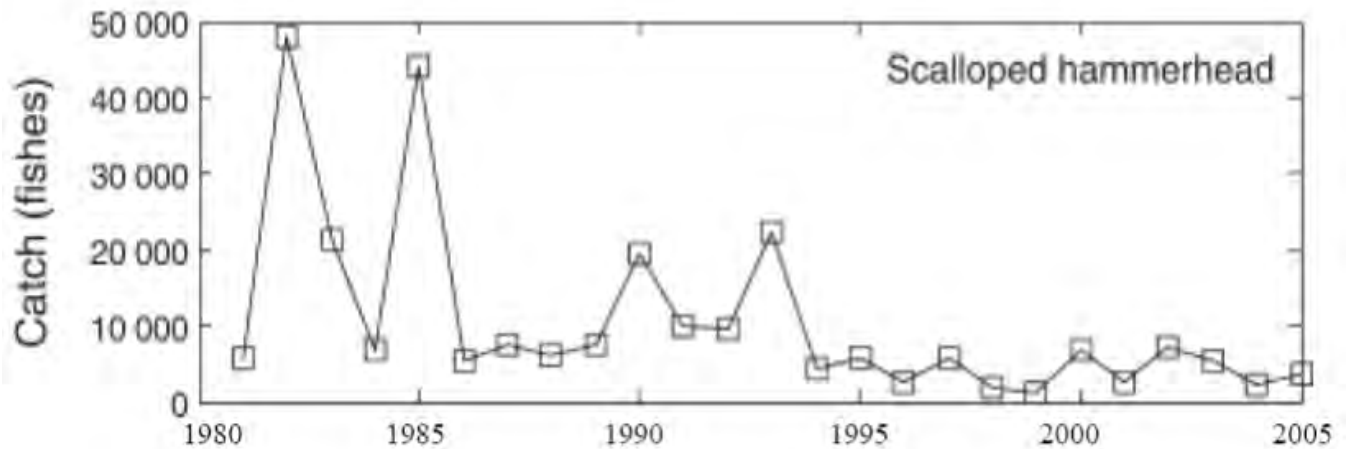


Figure 6. Catches of scalloped hammerhead shark in the northwestern Atlantic and Gulf of Mexico, including recreational, commercial landing, and pelagic long lines from 1980-2005 (Jiao et al. 2011).

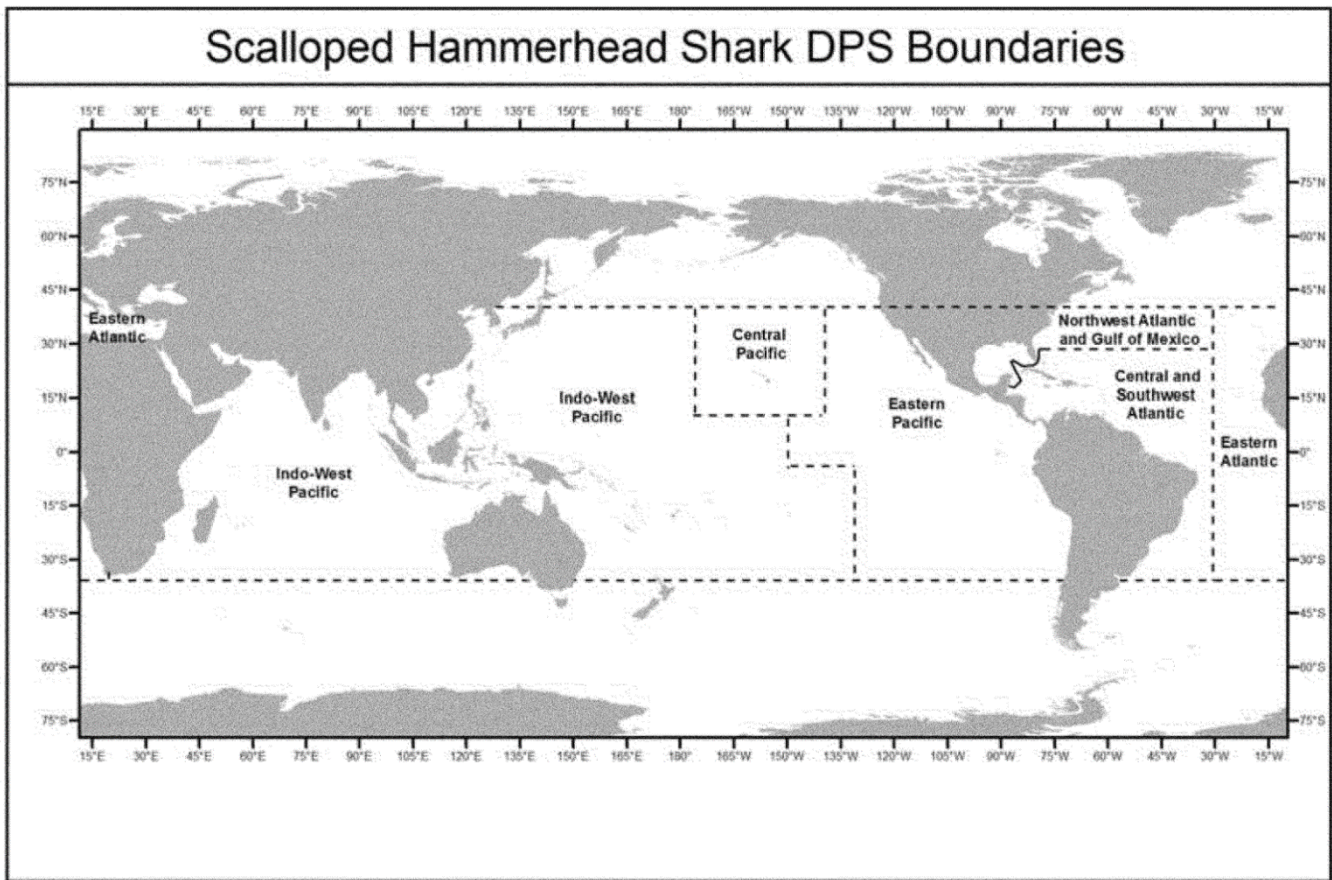


Figure 7. Map of scallop hammerhead shark DPS boundaries (NOAA 2013).

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

Juvenile and adult scalloped hammerhead sharks can occur as solitary individuals, pairs or in schools. Schools are often seen during summer migrations (Compagno 1984). This species is considered the most abundant hammerhead species (Maquire et al. 2006). Analysis of scalloped hammerhead shark genetics from West Africa and the East Coast of the United States revealed genetic isolation between the two discrete populations (Miller et al. 2013). A tagging study by Kohler and Turner (2001) found that scalloped hammerhead sharks along the eastern U.S. coast and Gulf of Mexico moved less than 100 km. The limited dispersal indicates a separation of the northwest Atlantic and Gulf of Mexico population from the Central South American population.

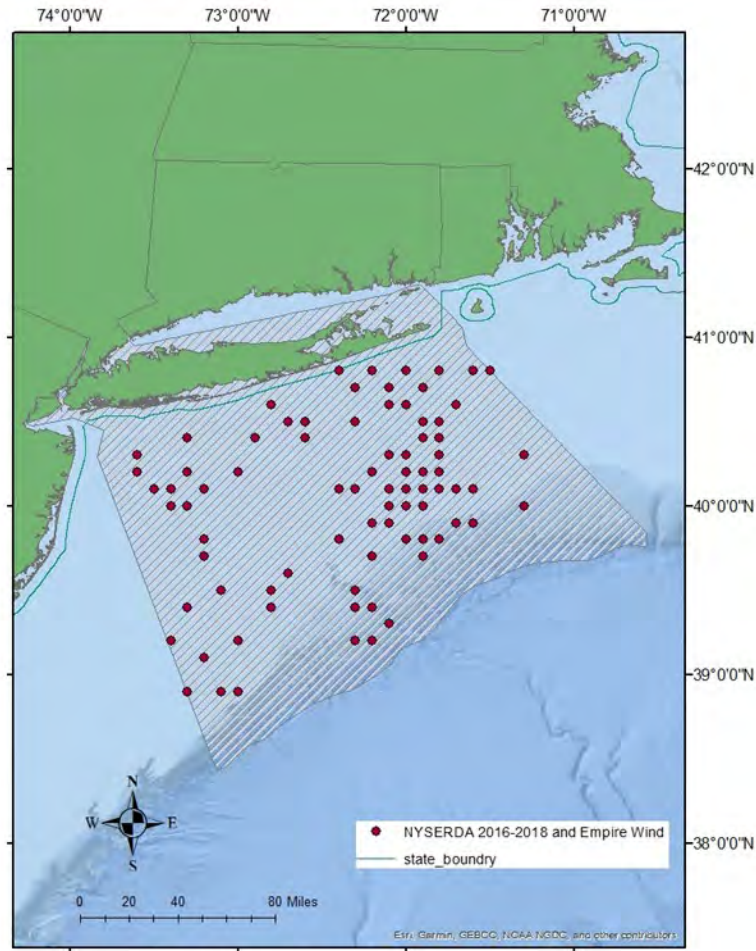


Figure 8: NY digital aerial survey

Details of historic and current occurrence:

Scalloped hammerhead records are available for NY from digital aerial surveys (see Figure 8)

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
1-25%	Peripheral	

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, Shallow Subtidal
- c. Marine, Deep Subtidal
- d. 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 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). They are a pelagic shark found in coastal and semi-oceanic areas over continental and insular shelves (Rigby et al. 2019). It ranges from intertidal and surface to depths up to 450-512m (Sanches 1991, Kimley 1993). Scalloped hammerhead sharks are usually found at the surface to 275m depths with a maximum record of 1,043m (Rigby et al. 2019). 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). Females migrate to coastal areas to pup while adults usually spend most of their time in midwater and offshore areas (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	-	-	-	-	-

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*):

Scalloped hammerhead sharks are a long lived (20-30 years), late maturing and relatively slow growing species (Branstetter 1990). This species maximum size is 370 to 420 cm total length (TL) (Rigby et al. 2019). Scalloped hammerhead sharks are highly mobile. They have been observed making short migrations along continental margins and between oceanic islands (Kholer and Turner 2001, Duncan and Holland 2006). Tagging studies showed that this species aggregates around and travels to “hot spots” (Holland et al. 1993, Kohler and Turner 2001, Duncan and Holland 2006). This species is capable of traveling long distances up to 1,600-1,900 km, and will also leave areas for long periods of time, from 2 weeks to almost a year before returning (Kholer and Turner 2001, Bessudo et al. 2011). In a mark and recapture study of scalloped hammerhead sharks on the East Coast of the U.S. and Gulf of Mexico, individuals moved less than 100 km (Kholer and Turner 2001). Nursery habitats are inhabited by juveniles for up to or more than a year (Duncan and Holland 2006). The scalloped hammerhead is an opportunistic feeder. Their diet includes a variety of teleosts, cephalopods, crustaceans, and rays (Compagno 1984, Bush 2003).

Males reach maturity at 140 to 198 cm (TL). Females reach maturity at 200 to 250 cm (TL) with an age of 13.2 years. The reproductive cycle is annual or biennial (Rigby et al. 2019). This species is viviparous, with a gestation period of 9-12 months (Stevens and Lyle 1989). Females move inshore to birth (Millet et al. 2013) ,and produce litters of 12 to 41 pups that are 31 to 57 cm (TL). Maximum age is 35 years and generation length is 24.1 years (Rigby et al. 2019).

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

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
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	(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 scalloped hammerhead shark.

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 at 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).

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 scalloped 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). As of March 2013, the scalloped hammerhead is listed under CITES Appendix II (CITES 2013).

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

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 scalloped 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
A.1 Direct Habitat Management	C.6.5.0.0 Conservation planning	Site/area protection

Table 2. Recommended conservation actions for scalloped hammerhead (Rigby 2019).

VII. References

- Baum, J.K., Myers, R.A., Kehler, D.G., Worm, B., Harley, S.J. and P.A. Doherty. 2003. Collapse and conservation of shark populations in the northwest Atlantic. *Science* 299: 389-392.
- Baum, J.K., S. Clarke, A. Domingo, M. Ducrocq, A.F. Lamónaca, N. Gaibor, R. Graham, S. Jorgensen, J.E. Kota, E. Medina, J. Martinez-Ortiz, J. Monzini Taccone di Sitizano, M.R. Morales, S.S. Navarro, J.C. Pérez-Jiménez, C. Ruiz, W. Smith, S.V. Valenti, and C.M Vooren. 2007. *Sphyrna lewini*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Accessed 17 April 2013.
- Bessudo, S., G.A. Soler, A.P. Klimley, J.T. Ketchum, A. Hearn, and R. Arauz. 2011. Residency of the scalloped hammerhead shark (*Sphyrna lewini*) at Malpelo Island and evidence of migration to other islands in the Eastern Tropical Pacific. *Environmental Biology of Fishes* 91: 165–176.
- Bester, C. 2011. Species Profile: Scalloped Hammerhead. Florida Museum of Natural History. Accessed October 11, 2011. <<http://www.flmnh.ufl.edu/fish/Gallery/Descript/Schammer/ScallopedHammerhead.html>>
- Branstetter, S. 1990. Early life-history implications of selected carcharhinoid and lamnoid sharks of the northwest Atlantic, p. 17-28. In: Elasmobranchs as living resources: advances in the biology, ecology, systematics and the status of the fisheries. H.L. Pratt Jr., S.H. Gruber and T. Taniuchi (eds.). NOAA Tech. Rep. NMFS 90.
- Bush, A. 2003. Diet and diel feeding periodicity of juvenile scalloped hammerhead sharks, *Sphyrna lewini*, in Kāne'ohe Bay, Ō'ahu, Hawai'i. *Environmental Biology of Fishes* 67: 1-11.
- Clarke, S. 2004. Shark product trade in Hong Kong and mainland China and implementation of the CITES shark Listings. TRAFFIC East Asia, Hong Kong, China.
- Clarke, S.C., J.E. Magnussen, D.L. Abercrombie, M.K. McAllister and M.S. Shivji. 2006a. Identification of shark species composition and proportion in the Hong Kong shark fin market based on molecular genetics and trade records. *Conservation Biology* 20(1): 201-211.

- Clarke, S.C., M.K. McAllister, E.J. Milner-Gulland, G.P. Kirkwood, C.G.J. Michielsens, D.J. Agnew, E.K. Pikitch, H. Nakano and M.S. Shivji. 2006b. Global Estimates of Shark Catches using Trade Records from Commercial Markets. *Ecology Letters* 9: 1115-1126.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). 2013. Final decisions on proposals to amend the appendices considered at CITES CoP16. <www.cites.org/eng/news/pr/2013/cop16_final_%20decisions.pdf>. Accessed 4 April 2013.
- 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.
- Duncan, K.M. and K.N. Holland. 2006. Habitat use, growth rates and dispersal patterns of juvenile scalloped hammerhead sharks *Sphyrna lewini* in a nursery habitat. *Marine Ecology Progress Series* 312: 211–221.
- Harley, C.D.G., A.R. Hughes, K.M. Hultgren, B.G. Miner, C.J.B. Sorte, C.S. Thornber, L.F. Rodriguez, L. Tomanek, and S.L. Williams. 2006. The impacts of climate change in coastal marine systems. *Ecology Letters* 9: 228-241.
- Hayes, C.G., Y. Jiao, and E. Cortés. 2009. Stock assessment of scalloped hammerheads in the Western North Atlantic Ocean and Gulf of Mexico. *North American Journal of Fisheries Management* 29: 1406–1417.
- Holland, K.N., B.M. Wetherbee, J.D. Peterson, and C.G. Lowe. 1993. Movement and distribution of hammerhead shark pups on their natal grounds. *Copeia* 1993: 495-502.
- Jiao, Y., E. Cortés, K. Andrews, and F. Guo. 2011. Poor-data and data-poor species stock assessment using a Bayesian hierarchical approach. *Ecological Applications* 21: 2691-2708.
- Klimley, A.P. 1993. Highly directional swimming by scalloped hammerhead sharks, *Sphyrna lewini*, and subsurface irradiance, temperature, bathymetry, and geomagnetic field. *Marine Biology* 117: 1–22.
- Kohler, N.E. and P.A. Turner. 2001. Shark tagging: a review of conventional methods and studies. *Environmental Biology of Fishes* 60: 191-223.
- Maguire, J.J., M.P. Sissenwine, J. Csirke, R.J.R. Grainger, and S.M. Garcia. 2006. The state of world highly migratory, straddling and other high seas fisheries resources and associated species. FAO Fisheries Technical Paper. No. 495. FAO, Rome. 84p.
- 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.
- Morgan A. and G.H. Burgess. 2007. At-vessel fishing mortality for six species of sharks caught in the northwest Atlantic and Gulf of Mexico. *Gulf and Caribbean Research* 19(2): 1-7.
- Morgan, A., P. Cooper, T. Curtis and G. Burgess. 2009. An overview of the United States East Coast bottom longline shark-fishery, 1994-2003. *Marine Fisheries Review* 71: 23-38.
- National Marine Fisheries Service (NMFS). 2009. Final amendment 1 to the 2006 consolidated Atlantic highly migratory species fishery management plan, essential fish habitat. National Oceanic and

Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, Silver Spring, MD. Public Document. pp. 395.

National Oceanic and Atmospheric Administration (NOAA). 2013. Endangered and Threatened Wildlife and Plants; Proposed Endangered, Threatened, and Not Warranted Listing Determinations for Six Distinct Population Segments of Scalloped Hammerhead Sharks; Proposed Rule. Federal Register 78 FR 20717.

NatureServe Explorer. 2023. NatureServe Explorer. Page last published 5 January 2024. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.106078/Sphyrna_lewini Accessed 11 January 2024.

New York State Department of Environmental Conservation. 2005. New York State Comprehensive Wildlife Conservation Strategy. <<http://www.dec.ny.gov/index.html>. >

New York State Department of Environmental Conservation. 2015. New York State Species of Greatest Conservation Need. https://extapps.dec.ny.gov/docs/wildlife_pdf/sgnc2015list.pdf

New York State Department of Environmental Conservation. 2021. NYCRR: Chapter 1-Fish and Wildlife Part 40.7 Coastal Sharks. [https://govt.westlaw.com/nycrr/Document/I21d644f5c22211ddb7c8fb397c5bd26b?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)&bhcp=1](https://govt.westlaw.com/nycrr/Document/I21d644f5c22211ddb7c8fb397c5bd26b?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhcp=1)

Northeast Fish and Wildlife Diversity. 2023. Regional Species of Greatest Conservation Need (RSGCN). <https://northeastwildlifediversity.org/rsgcn> Accessed 5 January 2024.

Rigby, C.L., Dulvy, N.K., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureaux, N., Romanov, E., Sherley, R.B. & Winker, H. 2019. *Sphyrna lewini*. The IUCN Red List of Threatened Species 2019: e.T39385A2918526. Accessed on 08 January 2024.

Sanches, J.G. 1991. Catálogo dos principais peixes marinhos da República de Guiné-Bissau. Publicações avulsas do I.N.I.P. No. 16. 429 p. as cited in Froese, R. and D. Pauly, Editors. 2000. FishBase 2000: concepts, design and data sources. ICLARM, Los Baños, Laguna, Philippines. 344 p.

Stevens, J.D. and J.M. Lyle. 1989. The biology of three hammerhead sharks (*Eusphyrna blochii*, *Sphyrna mokarran* and *S. lewini*) from Northern Australia. Australian Journal of Marine and Freshwater Research 40: 129-146.

Zoological Society of London. 2010. McNamara, A., J. Atkinson, J. Baillie, B. Collen, K. Breach, H. Froy, S. Khela, A. Mukherjee, J. Peet, R. Smith, W. Fodon, and A. Kuhl. Climate change vulnerability of migratory species: the path ahead. A Project Report for CMS Scientific Council 16, Bonn, 28-30 June. 224p.