

# Species Status Assessment

**Common Name:** Dusky shark

**Date Updated:** 12/1/2023

**Scientific Name:** *Carcharhinus obscurus* **Updated by:** Tajrian Sarwar (MISC)

**Class:** Chondrichthyes

**Family:** Carcharhinidae

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

Dusky sharks are a coastal-pelagic species which occurs at tropical and warm temperate waters along continental shelves, ranging from the surf zone to pelagic waters up to 400 meters deep (McCandless 2014). This species can be found from Nova Scotia to Cuba, including the northern Gulf of Mexico; from Nicaragua to southern Brazil in the western Atlantic and from southern California to the Gulf of California in the eastern Pacific (NOAA 2011, NatureServe 2012). It is also found in the Mediterranean, Indian, and western Pacific, including Madagascar and Australia (Knickle no date, Musick et al. 2007, NatureServe 2012). This species is especially vulnerable to overfishing because of its large size, late maturity, and low fecundity (NOAA 2011, NRDC 2013). In the Northwest Atlantic population, steep declines from overfishing occurred in the 1980s and 1990s; based on the trends between 1960 and 2015, there was approximately a 74% decline in relative abundance (McClandess et al., 2014). Though commercial harvest has been prohibited since 2000, dusky sharks are still susceptible to on-vessel and post-release mortality following incidental capture (bycatch) by pelagic and bottom longline fisheries, especially as essential habitat for this species overlaps with longline fishery operations along the eastern coast of the United States (Kroetz 2021). The most recent stock assessment for the dusky shark concluded that this species is overfished and is experiencing overfishing (SEDAR 2016).

## I. Status

### a. Current legal protected Status

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

ii. **New York:** Not Listed

### b. Natural Heritage Program

i. **Global:** G3 Vulnerable

ii. **New York:** S2S3 Imperiled **Tracked by NYNHP?:** No

### Other Ranks:

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

-IUCN Red List: Endangered A2bd

-Implied Status under the U.S. Endangered Species Act (USES): Species of Concern

-Northeast Regional SGCN: RSGCN, High conservation concern

-CITES: Appendix II

### Status Discussion:

Overfishing combined with low fecundity and late maturation has resulted in a large decrease in population size of the dusky shark. Dusky shark populations in the Northwest Atlantic and Eastern Indian Ocean have experienced sharp declines; populations in the Eastern Atlantic and Western

Indian Ocean have also declined to a lesser extent. Global population is estimated to have experienced a reduction of 72% in the last 90-115 years. Management actions in the Northwest Atlantic and Eastern Indian Ocean have resulted in the stabilization of Dusky Shark populations in these regions. Recovery is expected to be slow and requires international cooperation given the highly migratory nature and inherent vulnerabilities associated with this species' life history (Rigby 2019).

## II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
<b>North America</b>	Yes	Declining	Declining	Last 20 years (NRDC 2013)		-
<b>Northeastern US</b>	Yes	Declining	Declining	Past 20 years (NRDC 2013) (Northeast U.S.)		Yes
<b>New York</b>	Yes	Declining	Declining		Not Listed	Yes
<b>Connecticut</b>	No data	Unknown	Unknown		Not Listed	No
<b>Massachusetts</b>	No data	Unknown	Unknown		Not Listed	No
<b>New Jersey</b>	No data	Unknown	Unknown		Not Listed	No
<b>Pennsylvania</b>	No	-	-			-
<b>Vermont</b>	No	-	-			-
<b>Ontario</b>	No	-	-			-
<b>Quebec</b>	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

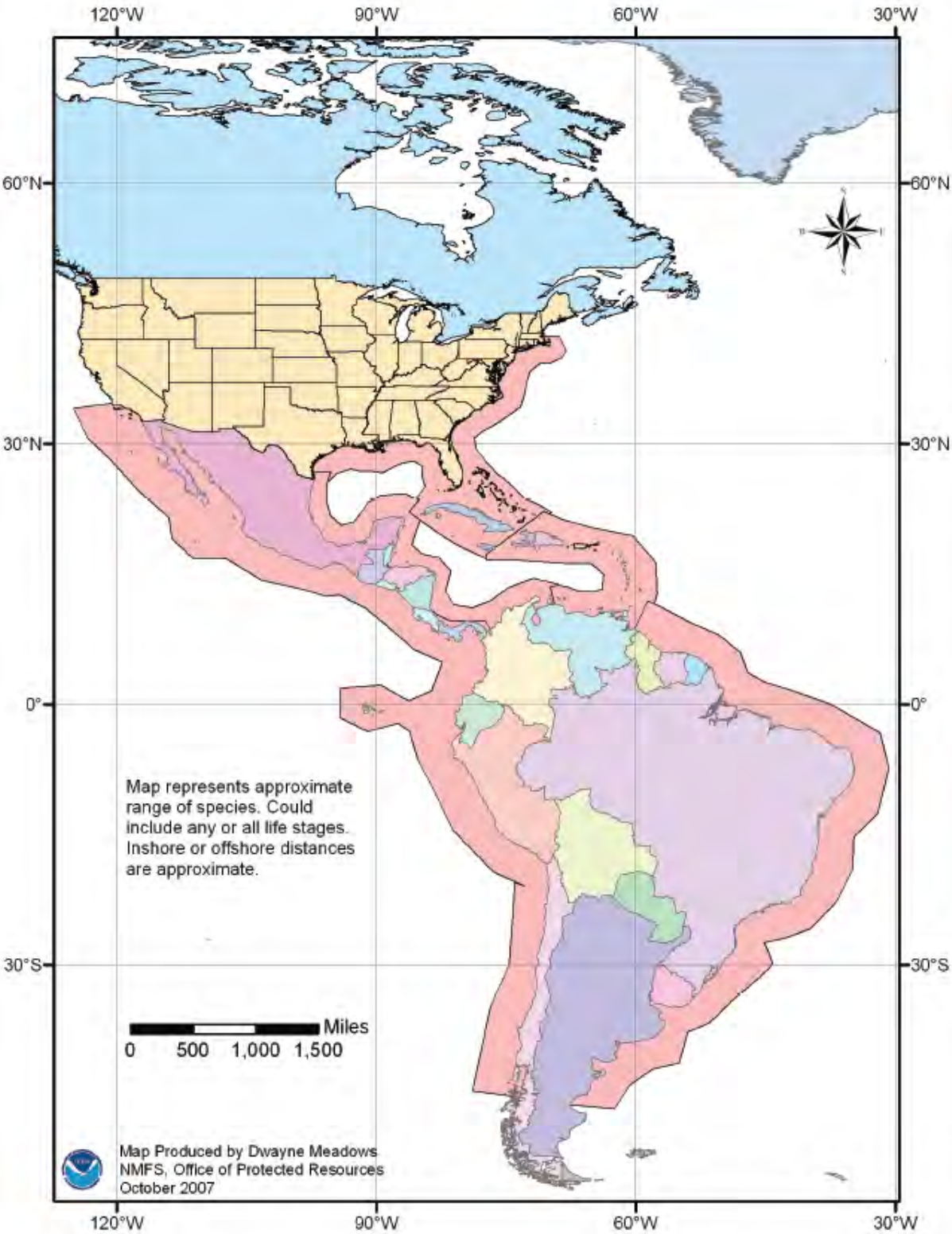
### **Monitoring in New York** (specify any monitoring activities or regular surveys that are conducted in New York):

The National Marine Fisheries Services Cooperative Shark Tagging Program is an ongoing effort by recreational, commercial anglers, and NMFS to tag sharks throughout the Atlantic Ocean and Gulf Coast. Since 1962 over 295,000 sharks of 52 different species have been tagged. The tagging of sharks provides information on stock identity, movements and migration, abundance, age and growth, mortality and behavior (Kohler 2018).

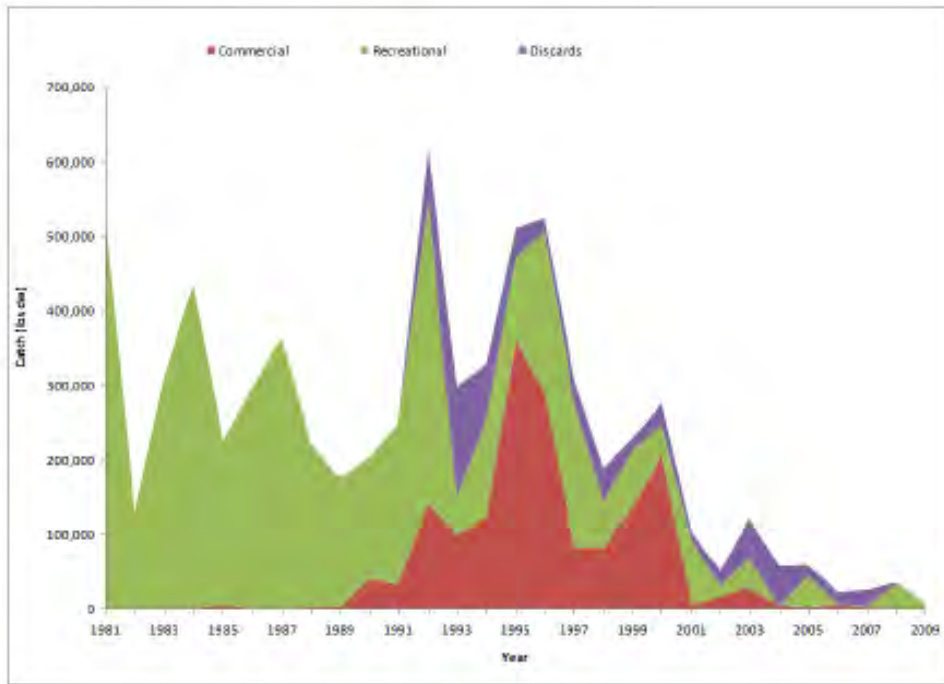
### **Trends Discussion** (insert map of North American/regional distribution and status):

According to the 2016 Southeast Data, Assessment, and Review for the Northwest Atlantic Dusky Shark population, the stock is overfished, with overfishing occurring since the mid-1980s. In the Northwest Atlantic population, dusky sharks have been experiencing a decline since the mid-19<sup>th</sup>

century, with trend analysis of this population's biomass between 1960-2015 indicating annual reduction rate of 2.6%, with an estimated reduction of 89.9% over three generation lengths, or 89.4 years (SEDAR 2016).

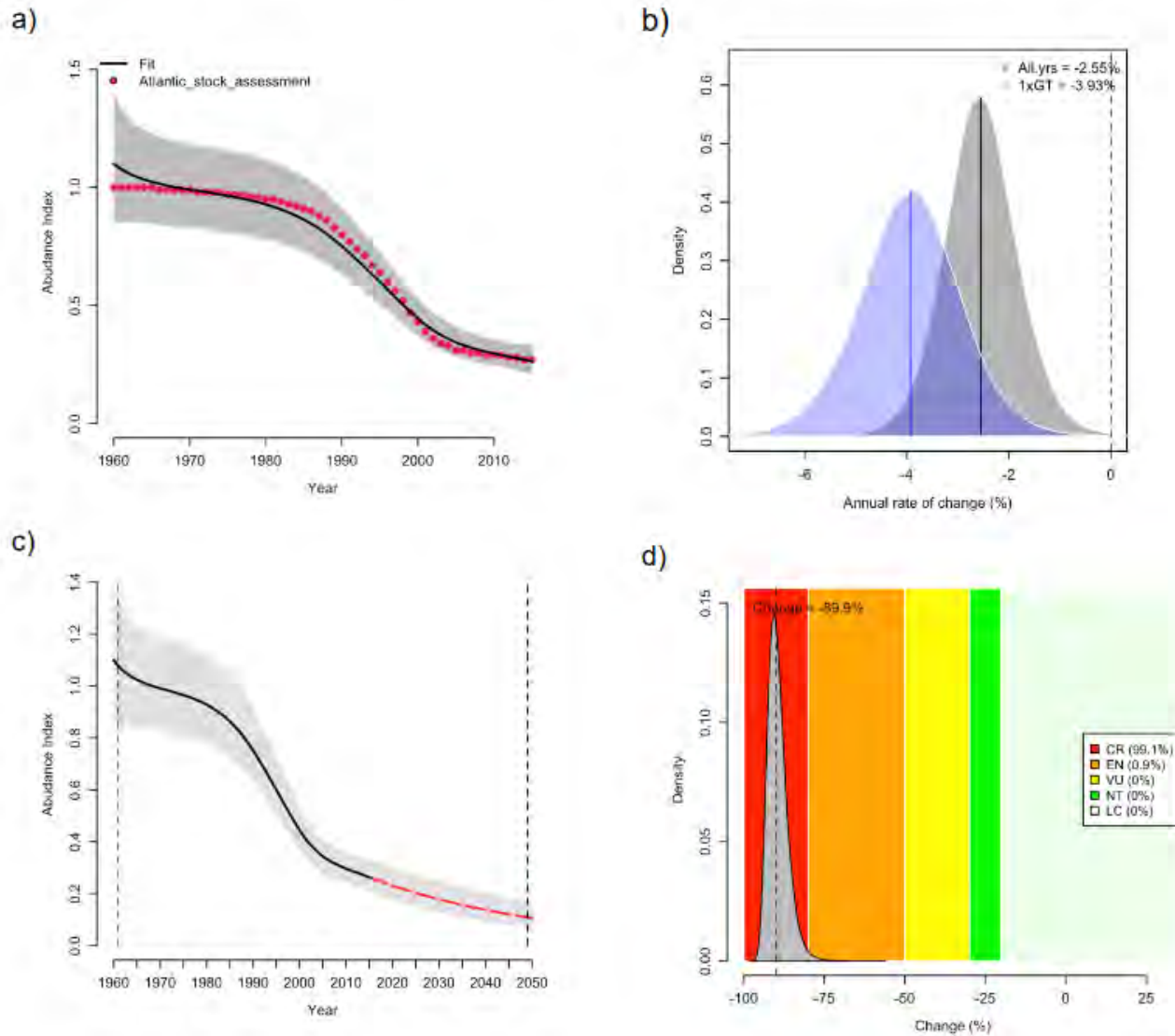


**Figure 1.** Distribution of the dusky shark in the western hemisphere (NOAA 2011)



**Figure 2.** Total catches of dusky shark (in pounds dressed weight), 1981-2009 in the western Atlantic Ocean including the Gulf of Mexico (SEDAR 2011).

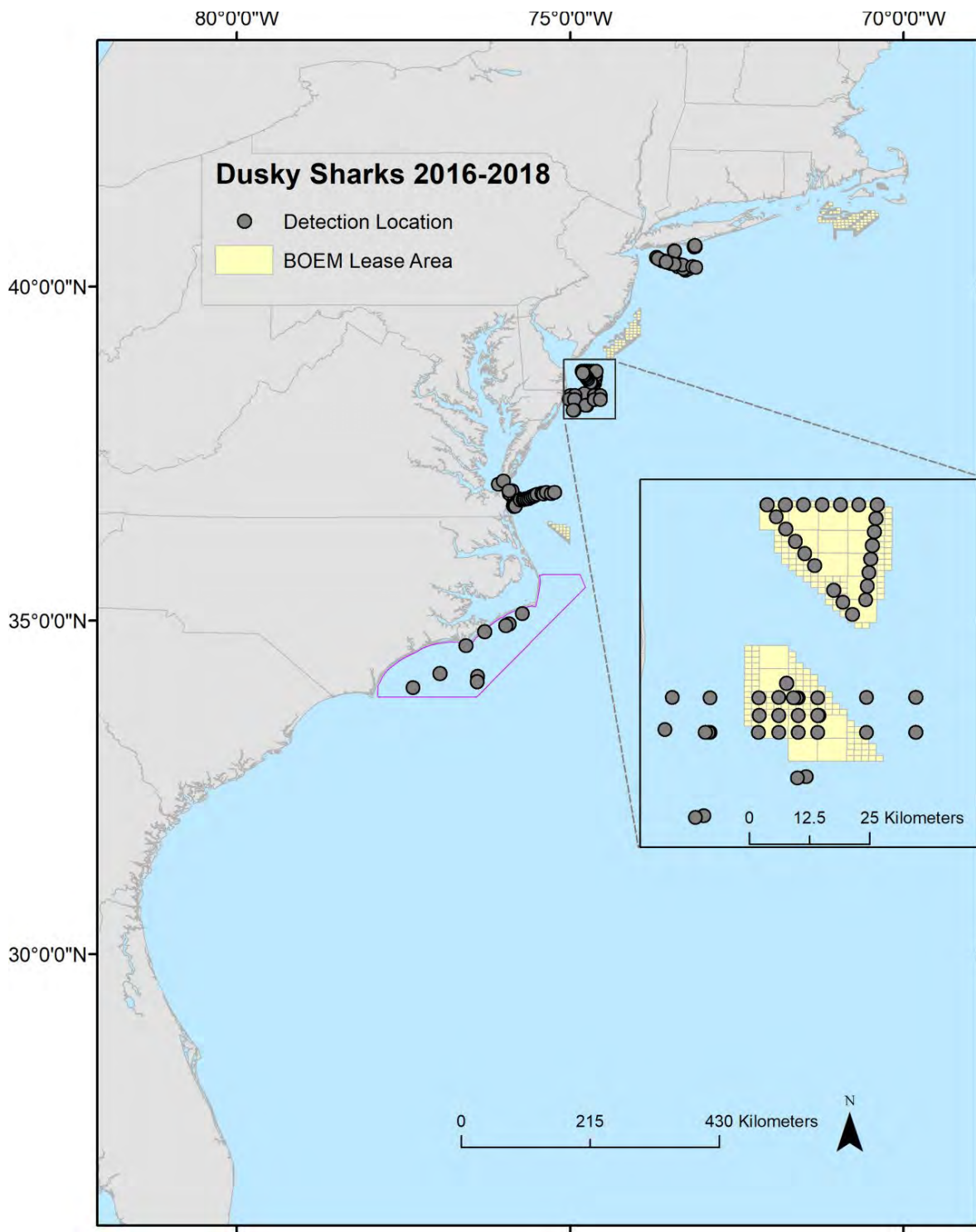
North Atlantic: Stock assessment (1960–2015), Northwest Atlantic, biomass (proportion B/B<sub>0</sub>)



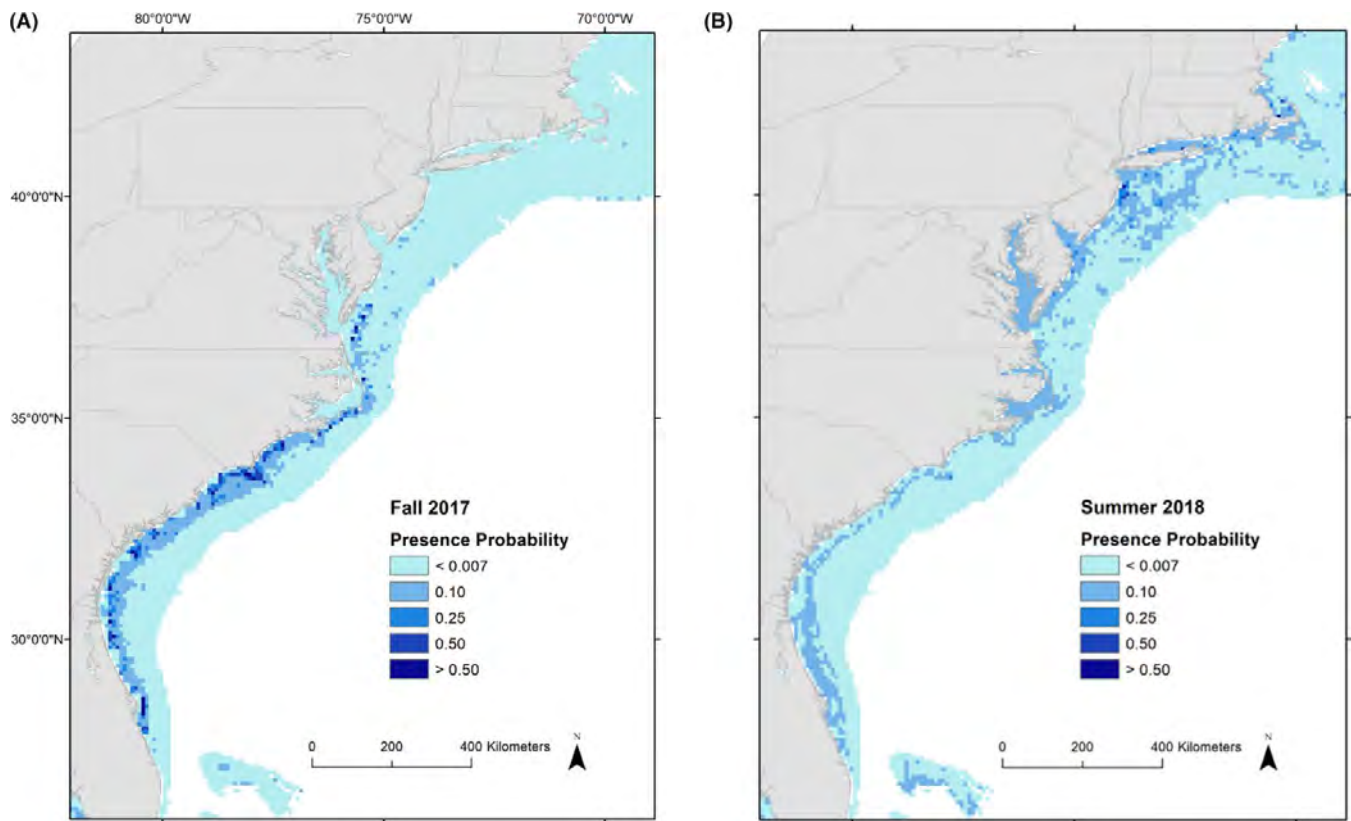
**Figure 3.** JARA results for Dusky Shark (*Carcharhinus obscurus*) in the Northwest Atlantic showing: (a) the JARA fit to the observed time-series; (b) the posterior probability for the percentage annual population change calculated from all the observed data (in black) and the last 1 generation length (in blue) with the mean (solid lines) shown relative to a stable population (% change = 0, black dashed line); (c) the observed (black line) and predicted (red line) population trajectory over three generations (89.4 years, dashed grey lines), and; (d) the median reduction over three generation lengths (dashed line) and corresponding probabilities for rates of population reduction falling within the IUCN Red List categories (Rigby 2019)

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

This species is much rarer than in previous decades as a result of overfishing.



**Figure 4:** Locations of acoustic transmitter detections of tagged juvenile Dusky Sharks between September 2017 and October 2018. The Mid- Atlantic Shark Closed Area is outlined in purple. (Bangley 2020)



**Figure 5:** Mapped presence probability based on boosted regression tree modeling of juvenile Dusky Shark tag detections and satellite-recorded environmental data during (A) fall 2017 (aggregated data from September to November 2017) and (B) summer 2018 (aggregated data from June to August 2018). (Bangley 2020)

**Details of historic and current occurrence:**

**Historic:** Dusky sharks have occurred in NY waters, and have been targeted heavily for their meat, fins, and liver oil since the mid-19<sup>th</sup> century. After this period of intense overexploitation, Dusky Shark populations have declined significantly, and have been designated a prohibited species since 2000 following the 1999 Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks.

**Current:** Following the ban on commercial harvest of Dusky Sharks, overfishing has been reduced but still continues due to incidental capture/bycatch of this species.

**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, Deep Subtidal
- c. Estuarine, Brackish Shallow Subtidal

**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:**

This is a coastal-pelagic species that occupies mostly continental shorelines from shallow waters to the outer reaches of the continental shelf and adjacent waterways to 400 meters (1,300 feet) in depth (NOAA 2011, NRDC 2013). Adults avoid areas of low salinity, but juveniles may use shallow coastal estuaries and bays as nurseries (NRDC 2013). In the Northwest Atlantic, small juveniles are known to use nearshore coastal waters as nursery habitat from off New Jersey to South Carolina during the summer months (McCandless 2014, Bangley 2020)

**V. Species Demographics and Life History**

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

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):

This is a long-lived, slow growing species that can have a lifespan of 40 years if not more (Natanson et al. 1995, SEDAR 2011, NRDC 2013). The average size dusky shark is about 11.8 feet and 400 pounds (NOAA 2011). Males attain reproductive maturity at about 19 years while females are mature at 21 years (Musick et al. 2009, NOAA 2011). Mating occurs in the spring and the reproductive cycle takes 3 years, 2 years of gestation and 1 resting year (NRDC 2013). Females can produce a litter of 2-12 pups (NRDC 2013). The dusky shark relies on the survival of a few pups to ensure population growth (Musick et al. 2009). This species is inherently vulnerable to overexploitation due to its low rate of population increase (NRDC 2011). Dusky sharks species undertake seasonal migrations in response to changing water temperature (NOAA 2011). On both coasts of the U.S. this species migrates north in summer when waters warm then returns south in fall (NOAA 2011, NRDC 2013). Food items include herring, eels, mullet, groupers, grunts,

croakers, bluefish, mackerel, tunas, various flatfish, a variety of sharks, skates and rays, crabs, octopuses, squid, starfish and sometimes human refuse (Gelsleichter et al. 1999).

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

<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>
3. Energy Production & Mining	3.3 Renewable Energy	3.3.2 Wind farms (offshore)	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	5.4.1 Recreational or subsistence 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.
5. Biological Resource Use	5.4 Fishing & Harvesting Aquatic Resources	5.4.3 Poaching/persecution of aquatic species	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 dusky shark.

Although this species is prohibited in United States and Canadian fisheries, there is still high bycatch mortality (Musick 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 change and other present threats, particularly bycatch 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:**

Dusky sharks have been designated as a prohibited species, meaning there is a ban on commercial and recreational harvest for this species, since 2000 with the implementation of the 1999 Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks.

In 2017, the Dusky Shark was listed on Appendix II of the Convention on Migratory Species.

This species is listed on Appendix II of CITES, which regulates its harvest and trade.

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

The New York State Wildlife Action Plan (NYSDEC 2005) identifies 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.

To allow recovery, it is recommended that Dusky Shark retention and landings be prohibited as long as the global population is classified as Endangered (or above). Short of that, regional and national limits on catch based on scientific advice and/or the precautionary approach, improved reporting of catch and discard data, efforts to minimize bycatch mortality, and promotion of safe release protocols are urgently needed, as is full implementation of commitments agreed through international treaties (Rigby 2019).

Action Category	Action	Description
A.1 Direct Habitat Management	C.6.5.0.0 Conservation planning	Site/area protection
A.2 Direct Species Management	A.2.0.0.0 Direct species management	Harvest management

**Table 2.** Recommended conservation actions for dusky shark.

## VII. References

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