Species Status Assessment

Common Name: Winter skate **Date Updated:** 1/12/2024

Scientific Name: *Leucoraja ocellata* **Updated by:** Siobhan Keeling

Class: Chondrichthyes

Family: Rajidae

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

The winter skate is a benthic batoid endemic to the Northwest Atlantic with distributions ranging from Labrador, Canada, to Cape Hatteras, NC (Figure 1). In the fall, the center of the distribution is in Georges Bank, while in the spring, the species is more broadly distributed across its' range (Packer et al., 2003; Frisk et al., 2008) (Figure 2). Although skates are not known to undertake large-scale migrations, they may move seasonally in response to changes in water temperature in some portions of their range, generally offshore in summer and early autumn, returning in shore during winter and spring (Sosebee 2006). Winter skate life history characteristics (late age to maturity, long generation time, low fecundity, and slow population growth) increase their vulnerability to exploitation, reduce rate of recovery, and increase extinction risk (Kyne et al. 2012). Although there is no commercial target fishery for winter skate, they are commonly caught as by-catch and the stock is in an overfished state. Winter skate are most abundant in the Long Island Sound, off the coast of the South Shore, and in the Hudson-Raritan estuary, with large numbers caught during spring and autumn in the Northeast Fishery Science Center (NEFSC) trawl surveys (NEFMC 2009). Historical declines resulted from international demersal fishing, a threat that was limited in 1977 when the EEZ was extended to 200 nm allowing only U.S. and Canadian fishing vessels (Kulka et al., 2020). Within the U.S. portion of the species range, in the early 1980s, there was an increase in winter skate biomass along with spiny dogfish (Squalus acanthias) following a decline in more commercially valuable ground fishes (e.g., cod, flounders, haddock) (Frisk et al., 2008). According to the NEFSC Bottom Trawl data, following the initial increase in abundance in the 1980s, biomass decreased in the 1990s before increasing and stabilizing in the 2000s (New England Fishery Management Council, 2020). Populations in the U.S. appear to be stable or increasing.

I. Status

a. Current legal protected Status

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

ii. **New York:** Not Listed

b. Natural Heritage Program

i. **Global:** GNR (Unranked)

ii. **New York:** SNR (Unranked) **Tracked by NYNHP?:** No

Other Ranks:

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

-IUCN Red List: Endangered

-Northeast Regional SGCN: RSGCN

-COSEWIC: special concern

Status Discussion:

The winter skate was determined to be overfished because the biomass index dropped below the threshold (44th SAW 2007). Overfishing is not currently occurring because the three-year moving average of the biomass indices did not exceed the minimum threshold, which the Fishery Management Plan (FMP) defines when overfishing is occurring (NEFMC 2009). The IUCN report states that substantial declines (>90%) have occurred in two major areas of the range and although the causes of the decline are mixed and uncertain, a precautionary assessment of Endangered status globally is warranted (Kulka et al. 2009). The winter skate was petitioned for listing under the Endangered Species Act in 2011, but NOAA Fisheries determined that a status review was not warranted at that time (NEFMC 2012).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Stable	Late 1980's-present		-
Northeastern US	Yes	Declining	Stable	Late 1980's-present (Mid-Atlantic Bight)		-
New York	Yes	Declining	Stable	Late 1980's-present		Yes
Connecticut	Yes	Declining	Stable	Late 1980's-present	Not Listed	Yes
Massachusetts	Yes	Declining	Stable	1989-present	Not Listed	No
New Jersey	Yes	Declining	Stable	Late 1980's-present	Not Listed	No
Pennsylvania	No	-	-			-
Vermont	No	-	-			-
Ontario	No	-	-			-
Quebec	Yes	Declining	Stable	Late 1980's-present	Not Listed	-

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):*

Although there are no direct surveys of winter skate in New York waters, the Connecticut Department of Environmental Protection (CTDEP) spring and autumn finfish trawl surveys in Long Island Sound were conducted from 1984-2006, and the Northeast Fishery Science Center (NEFSC) bottom trawl surveys heavily survey the Mid-Atlantic Bight (see Figures 2 and 3).

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

The current population trend is decreasing according to the IUCN red list (Kulka et al. 2020).NEFSC autumn survey biomass indices of winter skate peaked in the mid- 1980s, declined through the early 1990s, and have since stabilized at moderately higher levels (Sosebee 2006). Spawning stock biomass generally follows the same pattern showing low values in the 1970s followed by an expansion of size composition in the 1980s, and declines beginning in the mid to late 1990s. CTDEEP survey indices suggest that after increasing to a series high from 1984-1989, winter skate in Long Island sound have declined slightly. In 2007 the winter skate was determined to be overfished because the biomass index dropped below the threshold, but overfishing was not occurring because the three-year moving average of the biomass indices did not exceed that maximum threshold (see Figure 4)(NEFMC 2009). Current NEFSC indices of winter skate biomass are about 38% of the peak observed during the mid-1980s (NEFMC 2009).

Distribution Map

Leucoraja ocellata

Legend

EXTANT (RESIDENT)

Compiled by:

IUCN SSC Shark Specialist Group 2020

Figure 1. IUCN Red List Winter Skate distribution map (Kulka 2020)

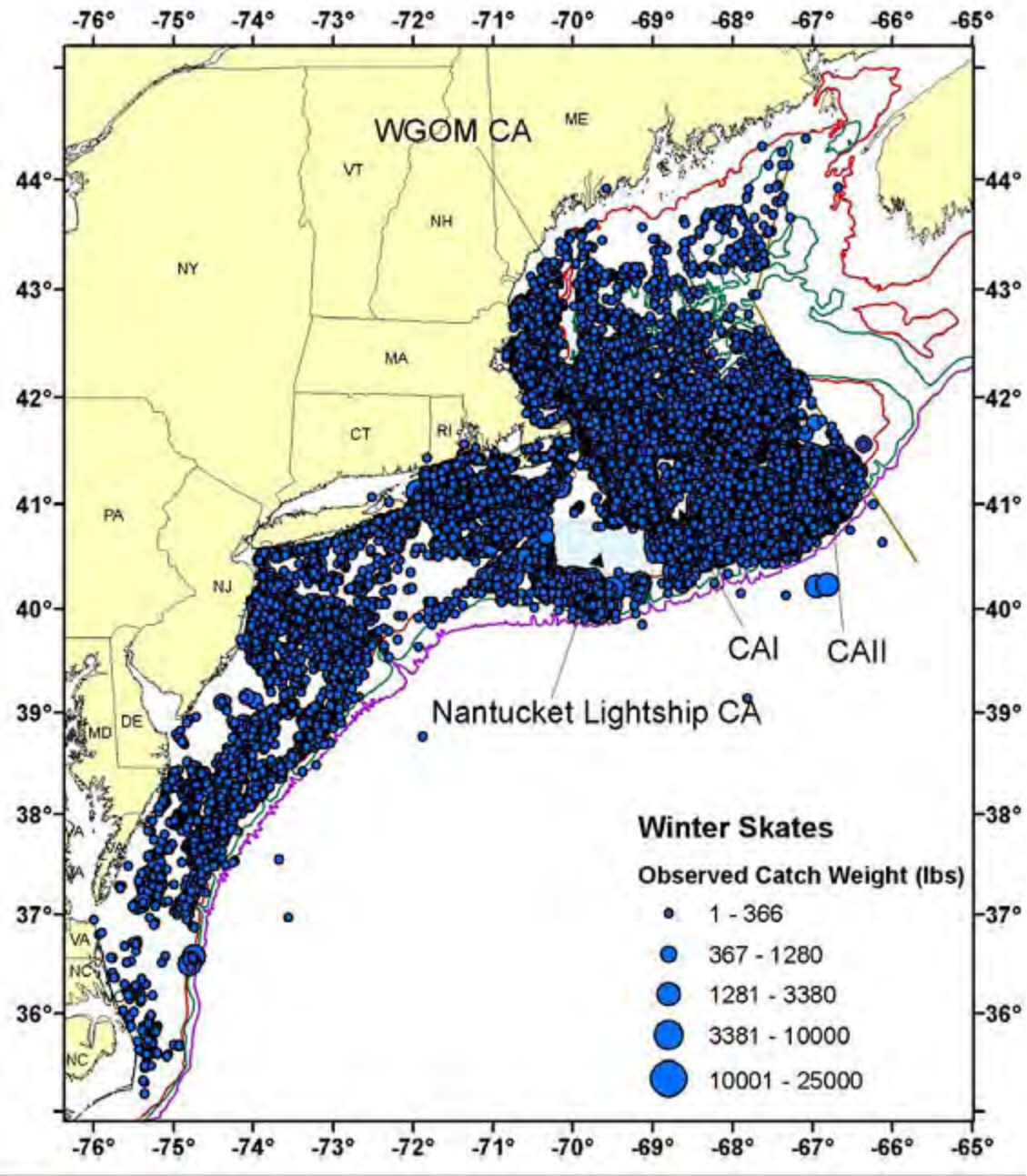

Figure 2. Distribution of winter skates from the Northeast Fisheries Observer Program, 1989-2005 (44th SAW 2007).

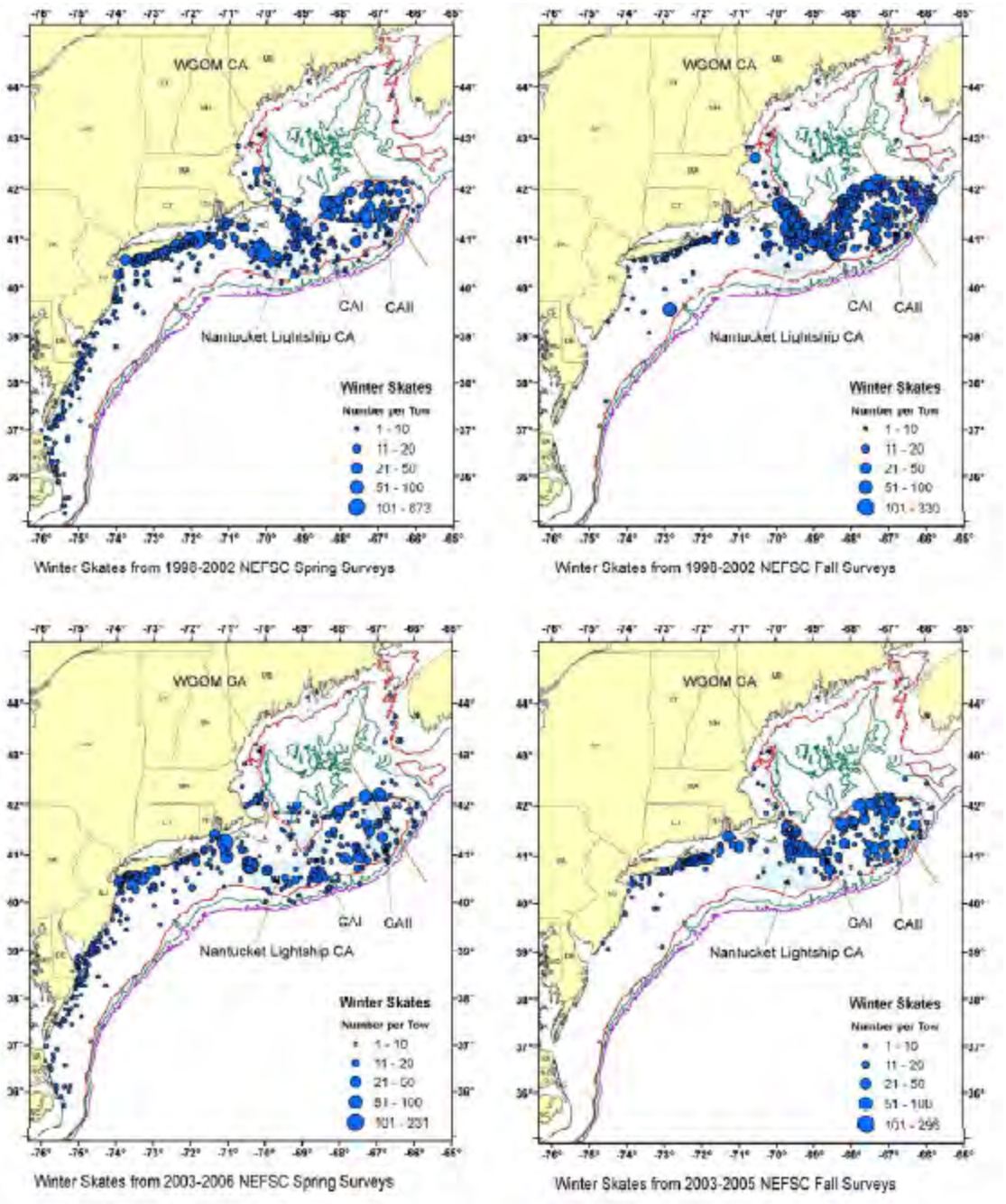

Figure 3. Distribution of winter skate from the spring and autumn NEFSC surveys from 1998-2006 (44th SAW 2007).

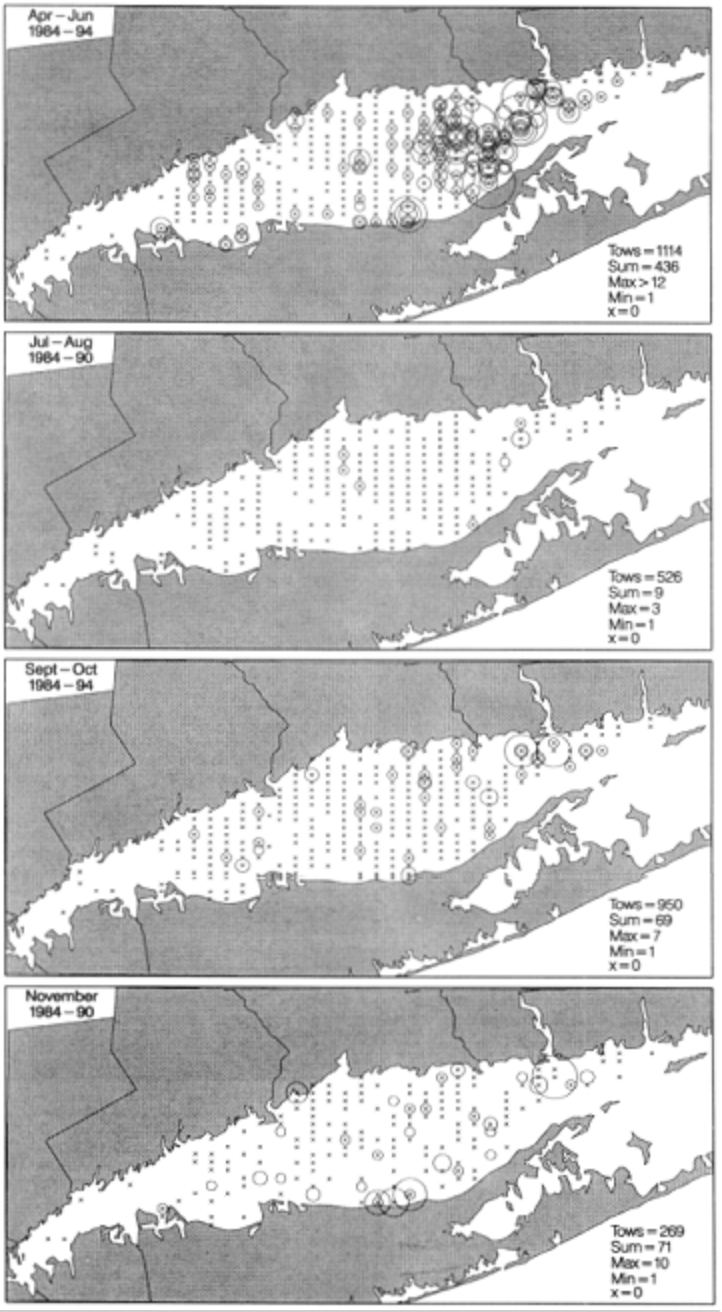

Figure 4. Distribution and abundance of juvenile and adult winter skate collected in Long Island Sound based on the finfish surveys of the Connecticut Fisheries Division, 1984-1994 (Packer et al. 2003).

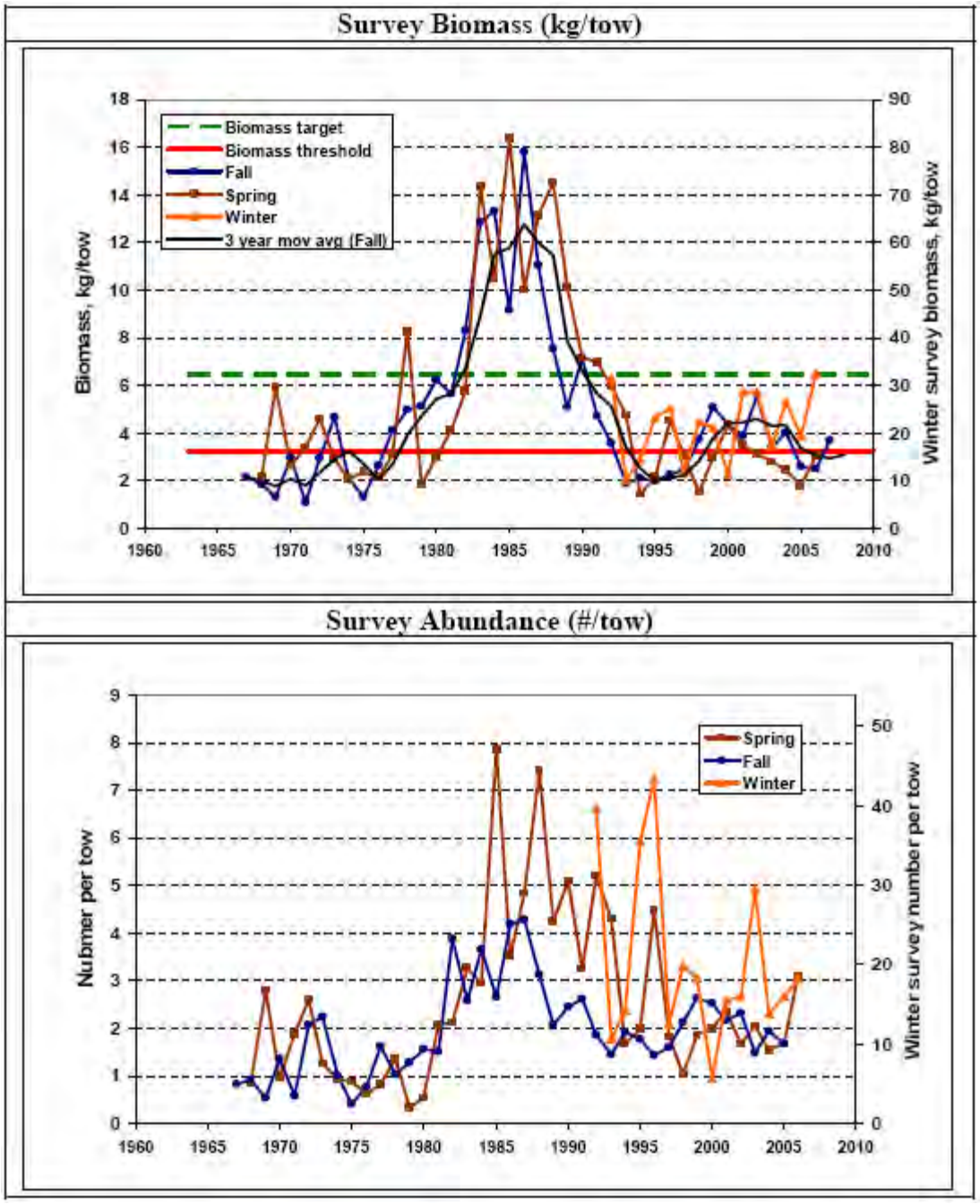

Figure 5. Winter skate stratified mean weight and number per tow for the winter, spring and fall NEFSC trawl surveys from Cape Hatteras, NC to the Gulf of Maine (NEFMC 2009).

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

Winter skate are commonly observed in waters along the New England coast and NEFSC spring and autumn bottom trawl surveys indicate that winter skate are most abundant in the Georges Bank and Southern New England offshore regions (44th SAW 2007). In spring, reports show that winter skate are most abundant in the Long Island Sound on sand bottoms in the Mattituck Sill and Eastern Basin (Packer et al. 2003).

Details of historic and current occurrence:

Historic:

Winter skate historically occurred in the Long Island Sound, off the South Shore, and in the Hudson-Raritan estuary, most abundant in winter months.

Current:

Winter skate currently occupy the same distribution they have historically, throughout the Long Island Sound, off the South Shore, and in the Hudson-Raritan estuary.

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%	Core	

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, Benthic Geomorphology, Benthic Flat

b. Marine, Deep Subtidal, Benthic Geomorphology, Benthic Flat

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 winter skate is a benthic species, preferring sand and gravel bottoms from the shoreline to 400 meters, with highest abundance occurring at depths of 21-80 meters (Kulka et al. 2009, Packer et al. 2003). They are found at depths of 5 to 725m on continental shelves and upper slopes (Kulka et al. 2020). Some reports suggest that bottom type, rather than depth, are more important in determining distributions of winter skate (Packer et al 2003). They occur in waters from the surface to 90m in depth. Major prey items are primarily forage fish (herrings, hake) or benthic megafauna (crabs, shrimp), with primary food sources shifting from invertebrates to fish as skates increase in size (44th SAW 2007, Kulka et al. 2009). Some observational records state that winter skate is a permanent resident off southern New England between 15-46 meters although there are seasonal fluctuations in abundance. It has been recorded over a temperature range of -1.2˚C to 19˚C and salinities of 28-35ppt depending on life stage (Packer et al. 2003). Winter skate remain buried in depressions during the day and are more active at night (Packer et al. 2003).

V. Species Demographics and Life History

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

Winter skates reach a maximum size of 113 cm total length (TL) with males maturing at 53 to 58cm (TL) (Kulka et al. 2020). They are oviparous and some degree of reproduction takes place year round, although reproduction peaks during the summer months (Packer et al. 2003). Females reach maturity at 65 to 77 cm (TL) and offspring are 11 to 13 cm (TL) with 18 to 36 eggs produced per year (Kulka et al. 2020). Females produce approximately 40 egg cases per year, each containing one embryo. Egg cases are released in offshore waters on rock bottom habitats and embryos remain in the cases during the gestation period of about a year and a half. Common predators include grey seals, gulls, sharks, rays and other larger skate species (Kulka et al. 2009). Due to its slow life history characteristics, winter skate are vulnerable to exploitation, reduced rates of recovery, and risk of extinction. Winter skates exhibit a lifespan of about 20 years, reaching functional maturity at 12 years (Sosebee 2006, Frisk and Miller 2009). There are differences in this species' life history depending on their distribution. In the Gulf of Maine, females mature at 5 years and maximum age is 11 years. On the Scotian shelf, females mature at 14 years and maximum age is 19 years. In the Gulf of St. Lawrence, winter skate mature at 5 years (42cm (TL)) and outside of the gulf they mature at 13 years (75cm (TL)). In the Gulf of St. Lawrence, generation time is about 10 years and generation time is 17 years outside of it.

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

Winter skate are frequently taken as by-catch during groundfish trawling and scallop dredge operations and discarded. Recreational and foreign landings appear to be insignificant at less than 1% of total fishery landings (Packer et al. 2003). Landings have increased since the mid-1980s, partly in response to increased demand for lobster bait and more significantly, to the increased export market for skate wings (44th SAW 2007). Overfishing combined with slow life history characteristics makes this species vulnerable to exploitation. Although direct effects of climate change on skates are unknown, changes in water temperature and sea level rise are likely to affect individual performance, distribution, and abundance (Harley et al. 2006).

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	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 winter skate.

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

Yes: ü **No: _____** **Unknown: _____**

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

Winter skate have been managed by the National Marine Fisheries Service under the Northeast Skate Complex Fishery Management Plan (FMP) since 2003, along with six other species in the complex (barndoor, thorny, smooth, clearnose, little and rosette skates). The FMP includes catch reporting requirements, a TAC (total allowable catch), possession limits, and prohibitions on possession of barndoor and thorny skate in the U.S (status). In 2011 the New England Fishery Management Council voted in favor of the Framework Adjustment I to the FMP, changing the skate wing fishery possession limit from 5,000 lbs. of skate wings per trip (year-round) to 2,600 lbs. per trip from May 1 through August 31, and 4,100 lbs. per trip from September 1 through April 30. The primary goal of the Framework Adjustment I was to reduce possession limits to a level that the directed skate wing fishery season would extend year-round and not exceed the total available landings.

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

Fisheries independent data are needed where individual species are reported to better understand winter skate abundance in New York (Packer et al. 2003). Investigation of the influence of annual water temperature changes or other environmental factors on shifts in the range and distribution of winter skate are needed to determine potential climate change impacts. Efforts to address skate management issues such as misidentification, high amounts of discards, and limitations in gear technology should be addressed (Kulka et al. 2009).

Action Category	Action	Description
A.2 Direct Species Management	A.2.0.0.0 Direct species management	-Harvest management -Trade management -Limiting population growth
B.4 Law Enforcement and Prosecution	B.4.0.0.0 Law Enforcement and Prosecution	International level, national level
C.6 Design and Plan Conservation	A.2.0.0.0 Direct species management	Species recovery
C.7 Legislative and Regulatory Framework or Tools	C.7.0.0.0 Legislative and Regulatory Framework or Tools	International level, national level

Table 2. Recommended conservation actions for winter skate (Kulka et al. 2020).

VII. References

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