Species Status Assessment

Common Name: Little skate **Date Updated:** 12/4/2023

Scientific Name: *Leucoraja erinacea* **Updated by:** Tajrian Sarwar, MISC

Class: Chondrichthyes

Family: Rajidae

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

The little skate has a relatively narrow distribution, occurring only in the Northwest Atlantic from Grand Banks, Canada to Cape Hatteras, NC. It is considered a shallow water species, occurring inshore to depths of 90 meters (Kyne et al. 2009). Its center of distribution lies in the northern section of the Mid-Atlantic Bight and in Georges Bank, where individuals are found year-round at almost the entire temperature range recorded for this region (Packer et al. 2003). Little skate are most abundant in the Long Island Sound and Hudson-Raritan Estuary during fall and spring, with lowest numbers of occurrence during summer months (Packer et al. 2003). This species is commercially targeted for lobster bait and landed as by-catch. In the U.S., this species is managed by the New England Fishery Management Council (NEFMC) under the Northeast Skate Complex Fishery Management Plan (FMP). Overall, survey data covering most of this species' range indicate that the population is stable and likely to be increasing (Kulka 2020).

I. Status

a. Current legal protected Status

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

ii. **New York:** Not Listed

b. Natural Heritage Program

i. **Global:** G5

ii. **New York:** Not ranked **Tracked by NYNHP?:** No

Other Ranks:

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

-IUCN Red List: Least Concern

-Northeast Regional SGCN:

Status Discussion:

The lack of information on sexual maturity coupled with recent declines in biomass warranted a precautionary assessment of Near Threatened by the IUCN in 2009 (Kyne et al. 2009). However, reevaluation of this species in 2019 suggests that there have been increases in CPUE and relative abundance, and recent assessments by the IUCN indicates that the Little Skate is not experiencing population decline nor is it suspected to be close to reaching the population reduction threshold. Therefore, the Little Skate has been listed as Least Concern by the IUCN (Kulka 2020).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Increasing	Stable	2000-present		-
Northeastern US	Yes	Increasing	Stable	2000-present (Mid-Atlantic Bight)		-
New York	Yes	Stable	Stable	2000-present		Yes
Connecticut	Yes	Declining	Unknown	2000-present	Not Listed	Yes
Massachusetts	Yes	Declining	Unknown	2000-present	Not Listed	No
New Jersey	Yes	Declining	Unknown	2000-present	Not Listed	No
Pennsylvania	No	-	-			-
Vermont	No	-	-			-
Ontario	No	-	-			-
Quebec	Yes	Declining	Unknown	2000-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):*

Northeast Fishery Science Center (NEFSC) trawl surveys are conducted from the Gulf of Maine southward to Cape Hatteras, NC, recording catch of little skate in New York waters. The Connecticut Department of Energy and Environmental Protection (CTDEEP) conducts a yearly trawl survey in September throughout the Long Island Sound.

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

Indices of little skate abundance and biomass from the NEFSC spring survey reached a peak in 1999 and have since declined (NEFMC 2009). Autumn survey indices have been relatively stable over the duration of the time series, with a slight increase in recent years (NEFMC 2009). The 2004-2006 average biomass index of 4.59 kg/tow was above the threshold reference point (3.27 kg/tow), but 19% lower than the 2003-2005 index of 5.65 (Sosebee 2006). An increase in biomass in 2007 produced an increase in the three-year moving average, resulting in the little skate not being listed as overfished in the latest NEFMC assessment. The most recent NEFSC survey trend analysis of data spanning 36 years (1982-2018) indicates an overall yearly rate of increase of 0.9% (Kulka 2020).

Figure 1. IUCN Red List distribution map of little skate (Kulka 2020)

Northeastern USA: Standardized CPUE (1982-2018), NOAA-NEFSC (USA), Survey kg/tow (Spring and Fall seasons).

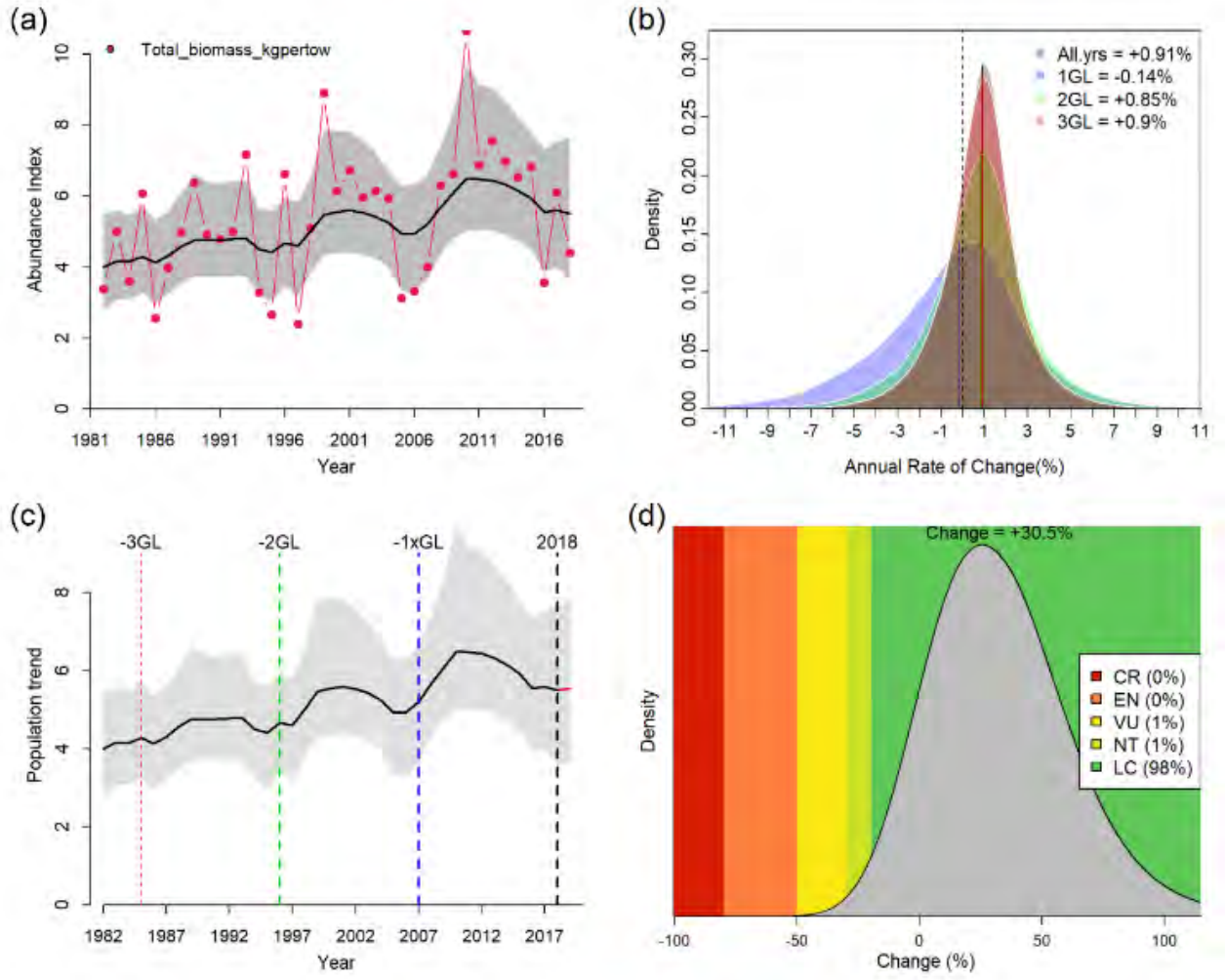

Figure 2. IUCN Red List Assessment of little skate population trends in the Northeastern USA (Kulka 2020)

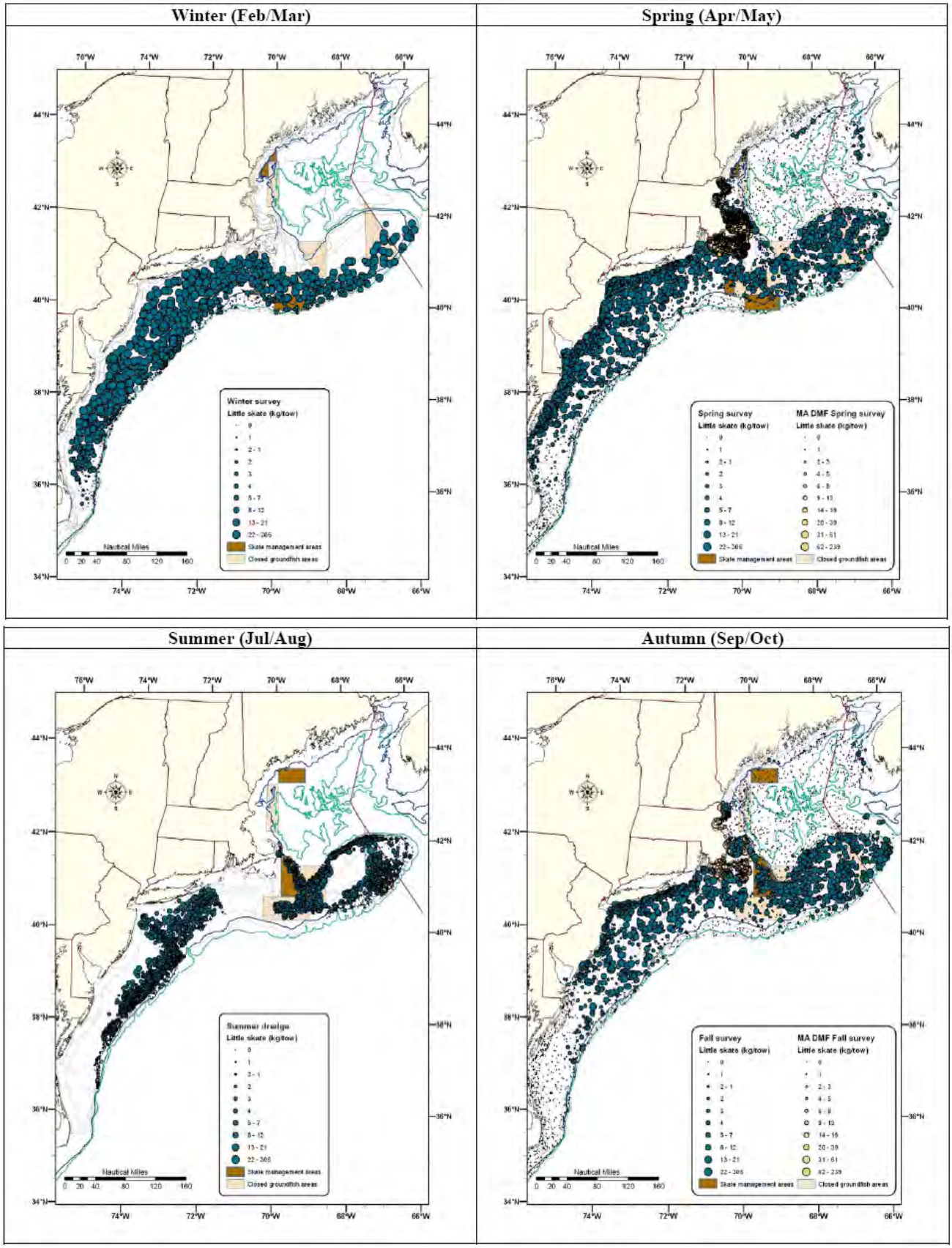

Figure 3. Little skate distribution in the Mid-Atlantic Bight during the winter trawl (2000-2007), spring trawl (2000-2008), summer dredge (2000-2007), and autumn trawl (2000-2007) surveys (NEFMC 2009)

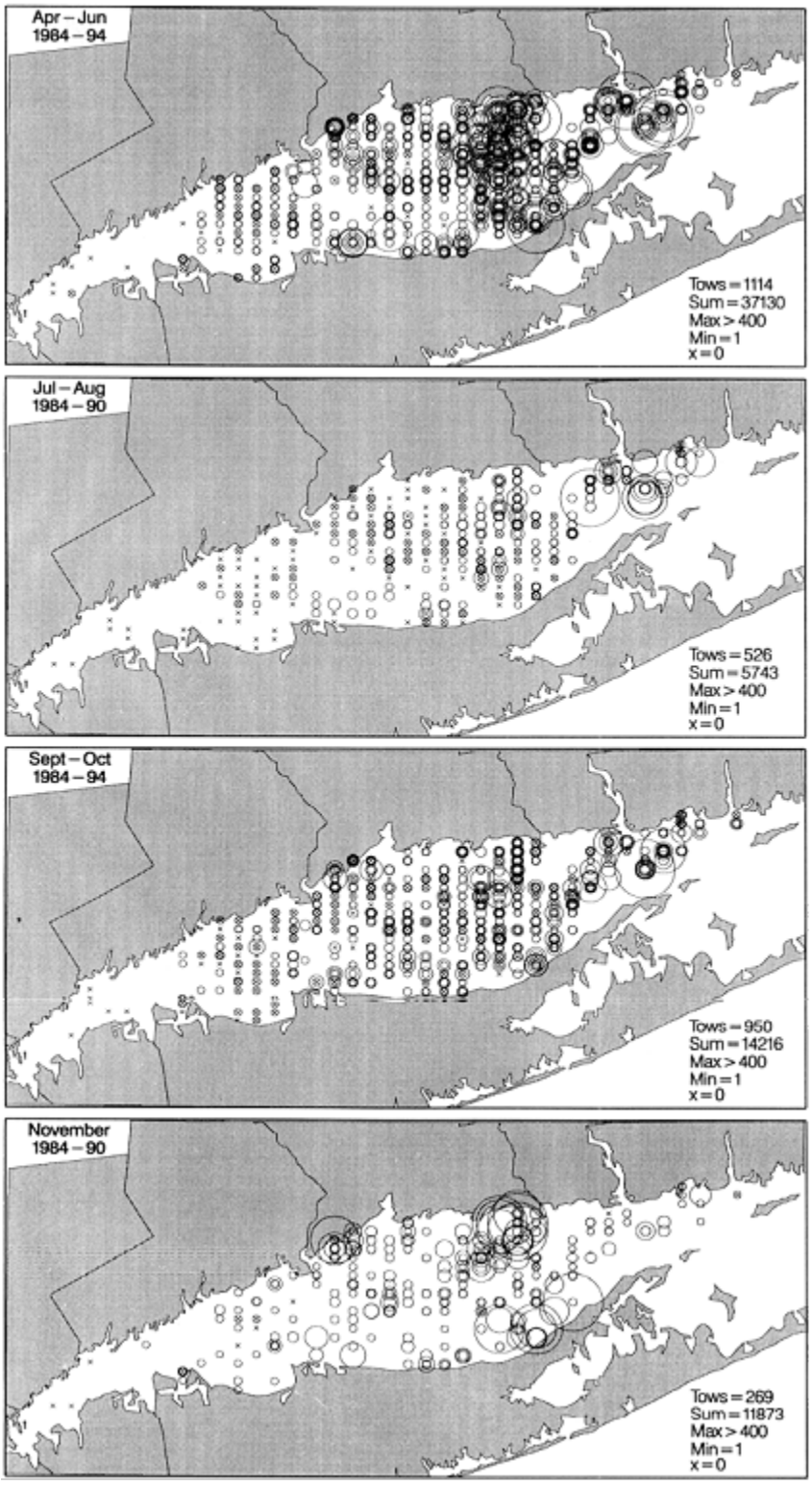

Figure 4. Distribution and abundance of juvenile and adult little skates collected in Long Island Sound, based on the finfish surveys of the Connecticut Fisheries Division, 1984-1994 (Gottschall et al. 2000)

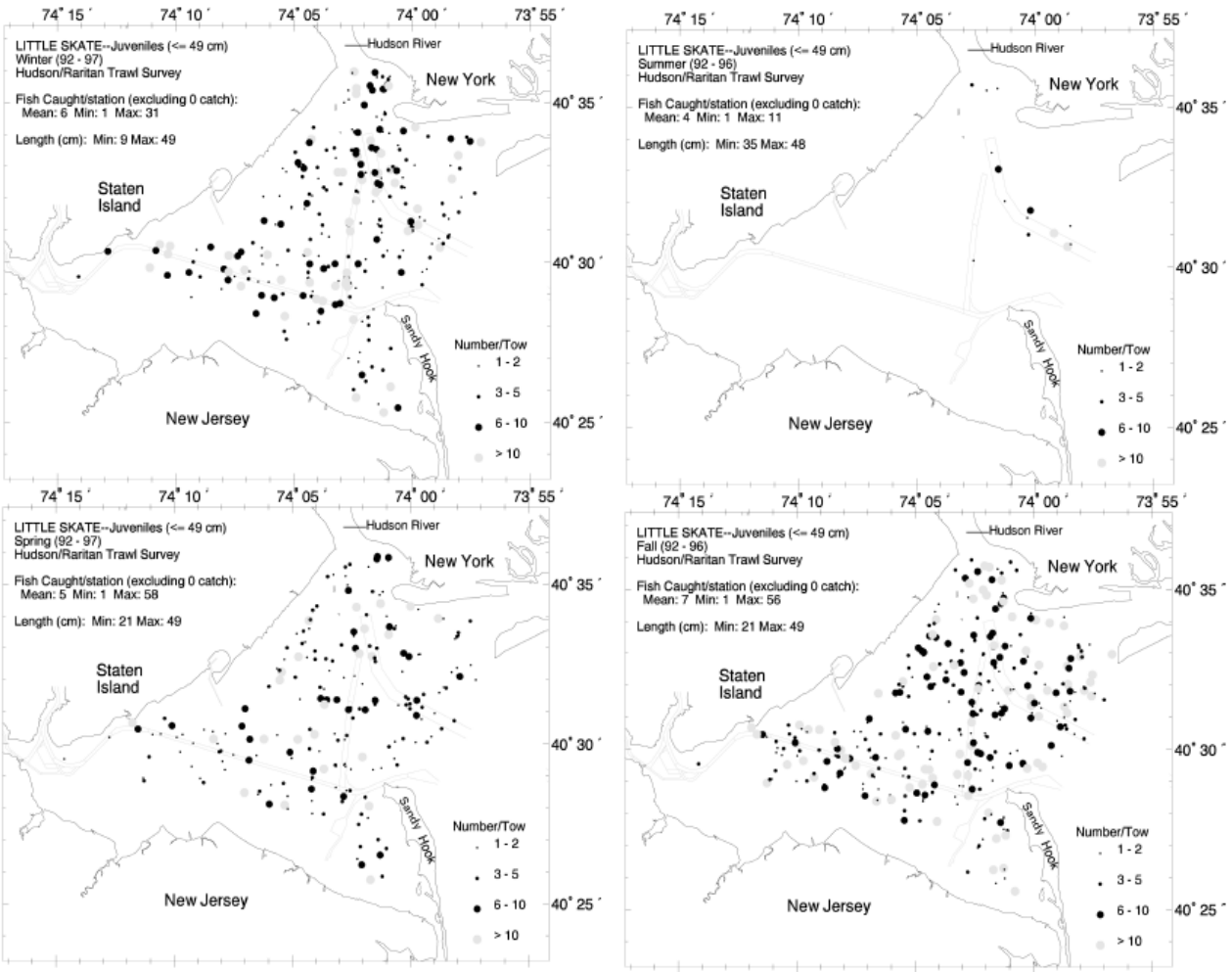

Figure 5. Seasonal distribution and abundance of juvenile winter skate in the Hudson-Raritan estuary, based on Hudson-Raritan trawl surveys, 1992-1997 during summer (top left), winter (top right), spring (bottom left), and fall (bottom right) (Packer et al. 2003)

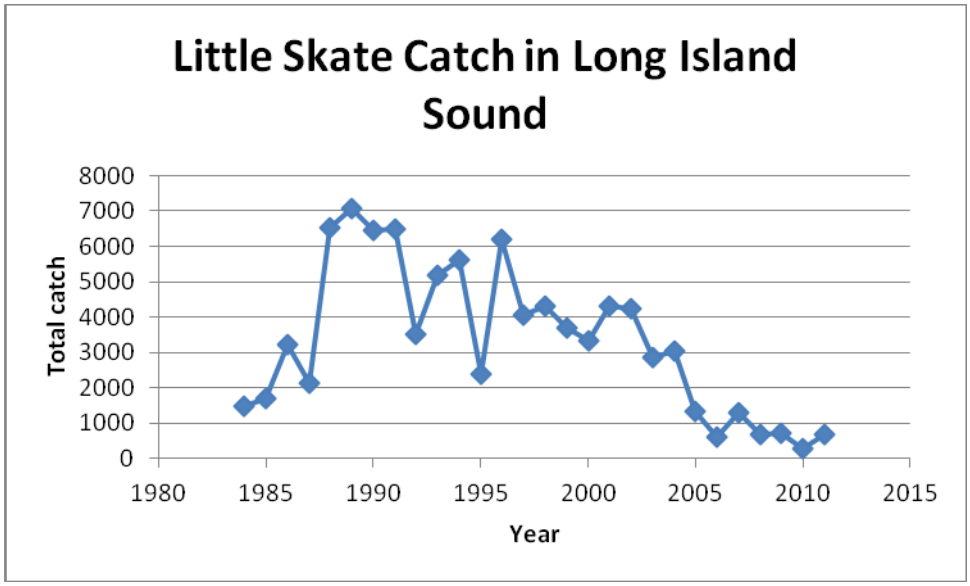

Figure 6. Total catch of little skate in Long Island Sound, 1984-2011, from the CTDEEP trawl surveys (CTDEEP 2012)

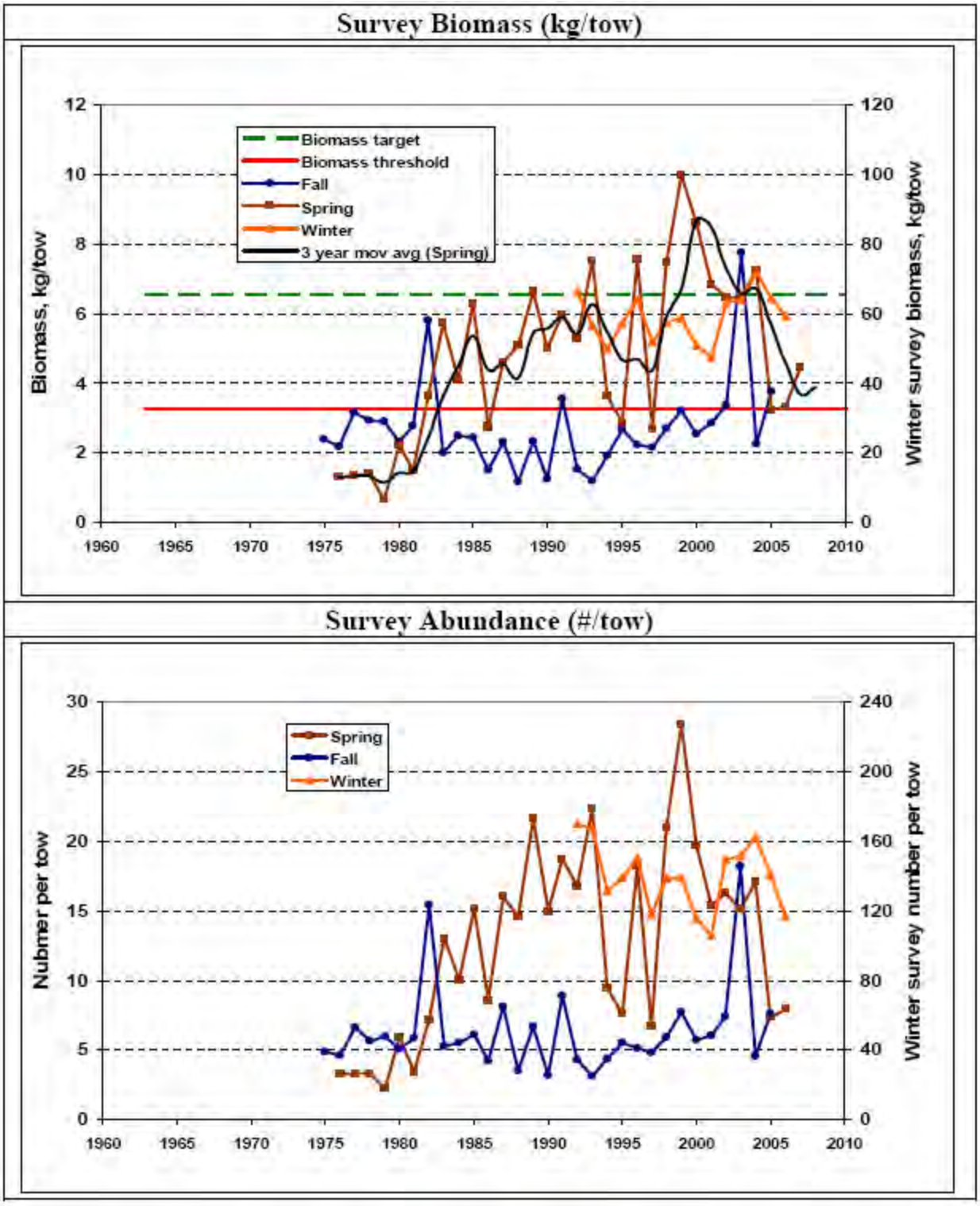

Figure 7. Little skate stratified mean weight (top) and number per tow (bottom) for the winter, spring and fall Northeast Fishery Science Center (NEFSC) trawl surveys, Gulf of Maine to Cape Hatteras (NEFMC 2009)

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

Little skate are one of the dominant members of the demersal fish community in the Northwestern Atlantic Ocean with its center of abundance in the Mid-Atlantic Bight and on Georges Bank (Packer et al. 2003). They are most abundant in the Long Island Sound and Hudson-Raritan estuary during fall, winter, and spring months.

Details of historic and current occurrence:

Historic: McEachran and Musick (1975) reported little skate presence in the Hudson-Raritan estuary in waters < 16-18˚C and Richards (1963) noted little skate at two stations in the Long Island Sound. Schaefer (1967) collected little skate in the surf waters of Long Island during spring and summer while more recent surveys of the Long Island Sound (Gottschall et al. 2000) showed the little skate was most abundant in spring and fall on transitional and sand bottoms with lowest abundance in July-September.

Current: Little skate are currently present throughout the Long Island Sound and Hudson-Raritan estuary, with highest abundance occurring in fall and spring (Packer et al. 2003, CTDEEP 2012).

Little skates are distributed in state ocean waters and federal waters of the NY Bight as evidenced by the DEC nearshore survey and NEFSC bottom trawl. Catches of little skate appear to be declining in the CT DEEP trawl.

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, Deep, Subtidal

b. Marine, Shallow Subtidal

c. Estuarine, Brackish Deep Subtidal Pelagic

d. 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:

Little skate are one of the dominant members of the demersal fish community in the Northwest Atlantic Ocean, occurring from shallow inshore waters out to depths of 350 meters with highest abundance at < 90 meters (Packer et al. 2003). Its center of abundance is the northern section of the Mid-Atlantic Bight and on Georges Bank, where it occurs year round (Packer et al. 2003). Little skate prefer substrates of sand or gravelly bottoms, but may also be found on mud bottoms. Little skate do not undertake large-scale migrations, although they do move onshore and offshore with seasonal temperatures along the inshore fringe of its range, generally moving offshore during summer months in the Mid-Atlantic Bight (McEachran and Musick 1975). Most individuals in the Hudson-Raritan estuary are found in waters < 16-18˚C and at salinities of 20-35 ppt, and more juveniles are present in the estuary than adults (Packer et al. 2003). Invertebrates are the most important prey items for little skate, including decapods crustaceans and amphipods (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	Choose an item.	Choose an item.	Yes	Yes	Choose an item.

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):*

Little skate produce a single fertilized egg for every capsule (mermaid's purse) and capsules are generally laid in pairs. Reproduction occurs year round with two spawning peaks, one in June and one in October (Gottschall 2000). The gestation period is at least six months and thought to be dependent upon the month of egg deposition or possibly temperature (Packer et al. 2003). The rate of egg laying in a study by Johnson (1979) varied from 0.20-0.67 eggs per day with an average rate of 0.39 eggs per day (Gottschall 2000). This species follows a latitudinal gradient of increased size and longevity and decreased growth rate with increasing latitude, meaning little skate from northern regions are larger but grow more slowly than individuals from southern regions (Frisk and Miller 2006). Age at maturity is estimated to be 6-7 years and longevity at 12 years (Frisk and Miller 2006). The most common source of mortality of little skate is from incidental by-catch and direct catch for the lobster bait fishery (Sulikowski et al. 2009).

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

Over-exploitation from commercial fishing and by-catch is the foremost threat to little skate. Bait landings in the skate complex are primarily from little skate (>90%), based on areas fished and known species distribution patterns (Sosebee 2006). Otter trawling is the primary method causing direct and indirect little skate catch, while recreational and foreign landings are considered insignificant at <1% of the total U.S. fishery landings (Sulikowski et al. 2009). Potential effects of climate change on skate species are unknown, however changing temperatures or shifting of habitats may lead to negative effects on the little skate.

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
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	5.4.2 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	5.4.2 Commercial fishing	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 Little skate.

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:

Little skate have been managed in the U.S. since 2003 under the Northeast Skate Complex Fishery Management Plan (FMP), implemented by the Northeast Fishery Management Council. The FMP included catch reporting requirements, a total allowable catch (TAC) for the skate complex, and possession limits. About 2/3 of the TAC is allotted to the skate wing fishery and the remaining third is allocated for skates caught for use as bait (Kyne et al. 2009).

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

Enforcement of species-specific landing reporting requirements is necessary to get accurate catch data for all skate species. Implementing new rules and regulations as necessary and appropriate consistent with rules and regulations implemented by the National Marine Fishery Service will support little skate protection throughout their range. Monitoring of little skate and collection of biological data would help us better understand little skate utilization of New York waters.

Action Category	Action	Description
C.7 Legislative and Regulatory Framework or Tools	C.7.1.0.0 Create, amend, or influence legislation, regulation, or codes	
C.8 Research and Monitoring	C.8.1.0.0 Basic research and status monitoring	

Table 2. Recommended conservation actions for little skate.

VII. References

44th Northeast Regional Stock Assessment Workshop (44th SAW). 2007. 44th SAW assessment summary report. US Department of Commerce, Northeast Fishery Science Center Reference Document 07-03. 58p.

Connecticut Department of Energy and Environmental Protection (CTDEEP). 2012. A study of marine recreational fisheries in Connecticut; part 2: estuarine seine survey. Federal Aid in Sport Fish Recreation F-54-R-31 Annual Performance Report. Hartford, CT. 26p.

Frisk, M.G. and T.J. Miller. 2006. Age, growth, and latitudinal patterns of two Rajidae species in the northwestern Atlantic: little skate (Leucoraja erinacea) and winter skate (Leucoraja ocellata). Canadian Journal of Fisheries and Aquatic Science 63: 1078-1091.

Gottschall, K.F., M.W. Johnson, and D.G. Simpson. 2000. The distribution and size composition of finfish, American lobster, and long-finned squid in Long Island Sound based on the Connecticut Fisheries Division Bottom Trawl Survey, 1984-1994. NOAA Technical Report NMFS 148. 199p.

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

McEachran, J.D. and J.A. Musick. 1975. Distribution and relative abundance of seven species of skates (Pisces: Rajidae) which occur between Nova Scotia and Cape Hatteras. Fishery Bull. 73(1): 110-136.

New England Fishery Management Council (NEFMC). 2009. Stock Assessment and Fishery Evaluation Report (SAFE) for the Northeast Skate Complex. Newburyport, MA. 459p.

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Sosebee, K. 2006. Status of fishery resources off the Northeastern US. NOAA, NEFSC-Resource Evaluation and Assessment Division. Woods Hole, MA. 23p.

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