Common Name: Barndoor skate ***SGCN***
Scientific Name: *Dipturus laevis*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Special Concern

Natural Heritage Program Rank:
Global: G3
New York: SNA
Tracked: No

Synopsis:
The barndoor skate is a marine cartilaginous fish that occurs on continental shelf habitat from the Grand Banks region off the coast of Newfoundland, Canada to Cape Hatteras, North Carolina. It is the largest member of the Rajidae family residing in the Northwest Atlantic, occurring off the coast of New York from the shoreline to depths over 1000m, with highest concentrations from 61-140m (Cavanagh and Damon-Randall 2009). As a benthic fish, it prefers sand or gravel substrates in shallow waters and soft mud in deeper waters. Skates migrate seasonally in response to temperature changes, occurring in shallower water in the spring and autumn (Bigelow and Schroeder 1953). During NMFS bottom trawl surveys juvenile barndoor skates were seen in the Mid-Atlantic Bight down to Hudson Canyon in the winter, with fewer being found in the spring and few being seen in other seasons.

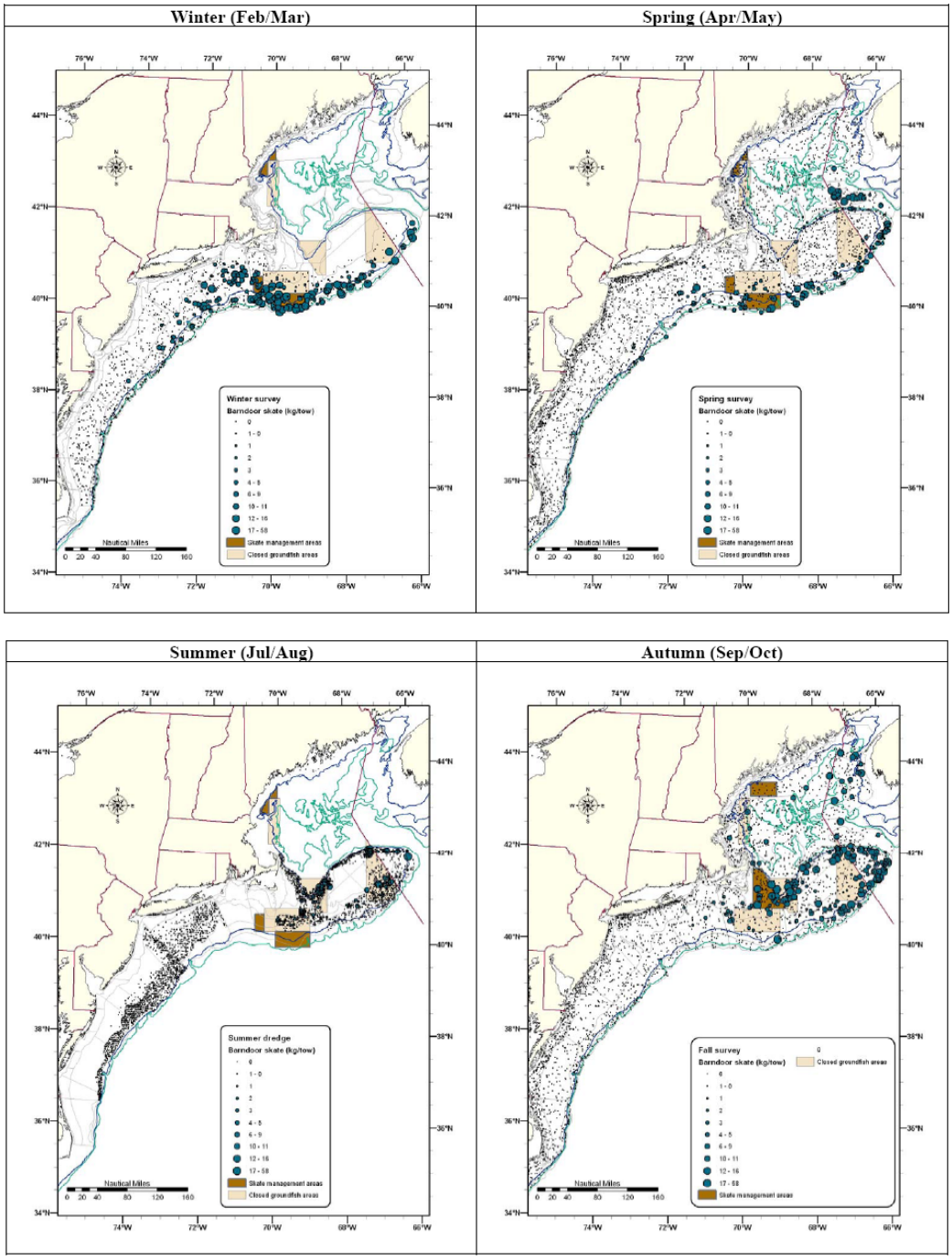
Its status as Special Concern in New York has largely been due to take as bycatch and overfishing. Casey and Myers (1998) stated that abundance had declined severely throughout the range, but more recent surveys from the National Marine Fisheries Service have showed a slow increase in abundance since the mid–1990s, likely as a result of increasingly restrictive fishing regulations. NOAA characterizes the barndoor skate stock as not overfished but also not yet rebuilt.

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Stable	Increasing
6% to 10%		Common			
11% to 25%	X	Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

Habitat Discussion:
Barndoor skates occur near the shoreline in winter and spring and migrate out to the continental shelf during summer and autumn. They are found on mud bottoms as well as on sand and gravel occurring from the shoreline to about 740m in the marine deep subtidal zone, although they are most abundant at depths less than 150m (Bigelow and Schroeder 2002, Packer et al. 2003). Their wide depth distribution may be because they are able to live in a wide range of temperatures (McEachran and Musick 1975, Scott and Scott 1988).

Primary Habitat Type
Marine; Deep Sub-tidal

Distribution:
Individuals have been caught off the southern shore of Long Island in NEFSC trawl surveys as recently as 2008, most commonly during spring and autumn months (NEFMC 2009).



Barndoor skate biomass distribution in the winter trawl (2000-2007), spring trawl (2000-2008), summer dredge (2000-2007), and autumn trawl (2000-2007) surveys (NEFMC 2009).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	M	H
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (illegal harvest)	P	M	H

References Cited:

Bigelow, H.B. and W.C. Schroeder. 2002. Collette, B. B. and Klein-MacPhee, G. (eds.) Fishes of the Gulf of Maine, 3rd ed. Smithsonian Institution Press, Washington, DC, 748 pp.

Casey, J.M., and R.A. Myers. 1998. Near extinction of a large, widely distributed fish. Science, 281(5377):690-692.

Cavanagh, M.F., and K. Damon-Randall. 2009. Status of the barndoor skate (*Dipturus laevis*). National Marine Fisheries Service Report, Northeast Regional Office. 77p.

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

New England Fishery Management Council (NEFMC). 2009. Final amendment 3 to the fishery management plan (FMP) for the northeast skate complex and final environmental impact statement (FEIS) with an initial regulatory flexibility act analysis. NMFS, NEFMC. Newburyport, MA. 459p.

Packer D.B., Zetlin C.A.,and J.J. Vitaliano. 2003. Essential fish habitat source document: Barndoor skate, *Dipturus laevis*. NOAA Tech Memo NMFS NE 173: 23p.

Scott, W.B. and M.G. Scott. 1988. Atlantic fishes of Canada. Can. Bull. Fish. Aquat. Sci. 219, 731 pp.

Common Name: Basking shark ***SGCN***
Scientific Name: *Cetorhinus maximus*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
The basking shark is a large cold water pelagic species that is widely distributed, occurring in temperate and boreal coastal shelf waters across both hemispheres. In North America, there are three geographically distinct populations, the Pacific, North Atlantic, and South Atlantic. They can be found in both coastal and oceanic waters from 200 to 2000 m deep, depending on the season. Basking sharks are highly migratory, moving either from deep to shallow water or from lower to higher latitudes in warmer weather (Fowler 2009). As filter feeders, they are often associated with surface aggregations of zooplankton, particularly along tidal and continental shelf-break fronts (Fowler 2009). Basking sharks are the only extant species of the in the family Cetorhinidae, and second largest fish species (Skomal et al. 2009). The major threat to basking sharks is overfishing, coupled with life history characteristics that make this species especially vulnerable to over exploitation, resulting in high fishing mortality.

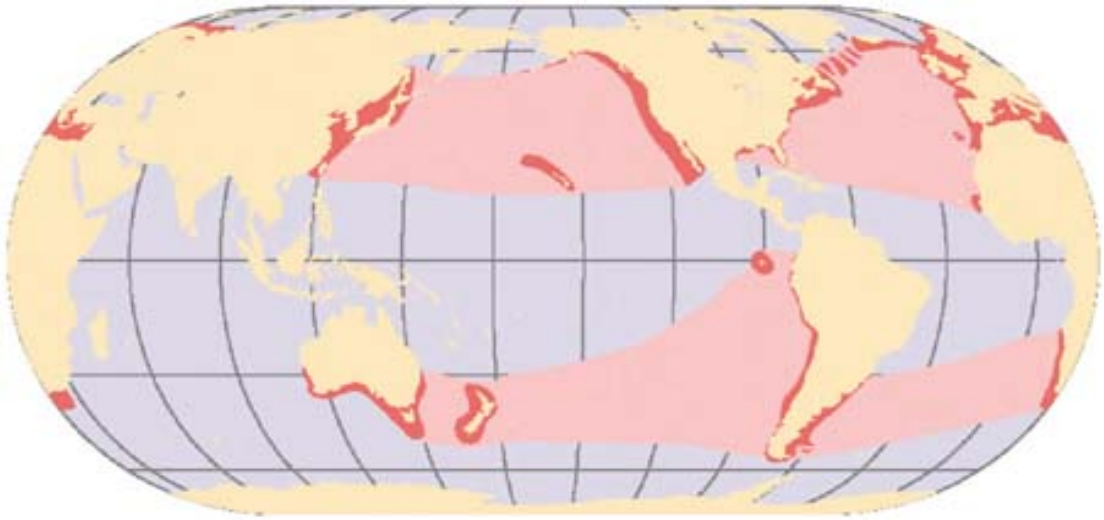
Most basic demographic and life history data are poorly understood or unknown due to the great lack of data for this species. Limited information is available on bycatch rates of basking shark in international fisheries that often don't differentiate shark catch to species, if data are collected at all. The IUCN listing of endangered is primarily based on past records of declining local populations as a result of short term fisheries exploitation and very slow population recovery rates (Fowler 2009).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Moderate Decline	Moderate Decline
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%	X	Rare			

Habitat Discussion:
Although basking sharks have been reported globally from tropical to arctic waters between 11-24˚C, they are most commonly observed in coastal temperate waters where flow patterns create convergence zones that concentrate zooplankton (NOAA 2010). Off the Atlantic Coast of North America, they appear in the southern part of their range in the spring (North Carolina to New York) and shift northward in the summer (New England and Canada). Gore et al. (2008) provide the first evidence of a basking shark using the deep mid-ocean and making a trans-Atlantic migration from satellite tagging data, while Skomal et al. (2009) offer evidence of transequitorial migrations, tracking individuals from southern New England southward to coastal South America, showing occasional descent to mesopelagic depths. They are known to venture inshore to shallow bays or estuaries during the summer where they 'bask' at or near the surface, and are rarely seen during the winter.

Primary Habitat Type
Marine; Deep Sub-tidal

Distribution:



Global distribution of the basking shark (in red = known distribution; pink = uncertain distribution) (FAO 2006).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	N	L	H
2. Transportation & Service Corridors	Shipping Lanes (boat strikes)	W	L	H
3. Climate Change & Severe Weather	Habitat Shifting & Alteration (warming ocean temperatures)	P	L	V
4. Human Intrusions & Disturbance	Recreational Activities (recreational boat strikes)	W	L	H
5. Energy Production & Mining	Renewable Energy (offshore wind farms)	N	L	M

References Cited:

Fowler, S.L. 2009. *Cetorhinus maximus* (Northeast Atlantic subpopulation). In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2.

Gore, M.A., D. Rowat, J. Hall, F.R. Gell, and R.F. Ormond. 2008. Transatlantic migration and deep mid-ocean diving by basking shark. Biology Letters 23(4): 395-398.

NOAA National Marine Fisheries Service. 2010. Species of concern fact sheet: Basking shark, *Cetorhinus maximus*. NOAA. <http://www.nmfs.noaa.gov/ pr/species/ fish/ baskingshark.htm>

Skomal, G.B., S.I. Zeeman, J.H. Chisholm, E.L. Summers, H.J. Walsh, K. McMahon, and S. Thorrold. 2009. Transequatorial migrations by basking sharks in the western Atlantic Ocean. Current Biology 19(12): 1019-1022.

Common Name: Clearnose skate ***SGCN***
Scientific Name: *Raja eglanteria*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
The clearnose skate, a member of the skate family Rajidae, is endemic to the western Atlantic Ocean along the North American coast, occurring from Massachusetts to southern Florida as well as in the northern Gulf of Mexico from Florida to Texas (Ha et al. 2009). They are predominately found in inshore areas at depths less than 110 m, but may occur offshore to depths of 330 m. By-catch is the primary threat to this species from otter trawling and scallop dredging. Skates are not known to undertake large scale migrations, however they do move seasonally in response to temperature changes, moving offshore and northward in summer and early autumn and returning inshore in winter and spring (NEFMC 2003). Clearnose skate are most abundant in the Mid-Atlantic offshore and inshore regions (NEFMC 2009). Abundance is high in New York waters from late April-May to October-November and they frequent the Long Island Sound mostly in September and October. Adults and juveniles are both abundant during the summer months in the Hudson-Raritan estuary, particularly near the channels (Packer et al. 2003).

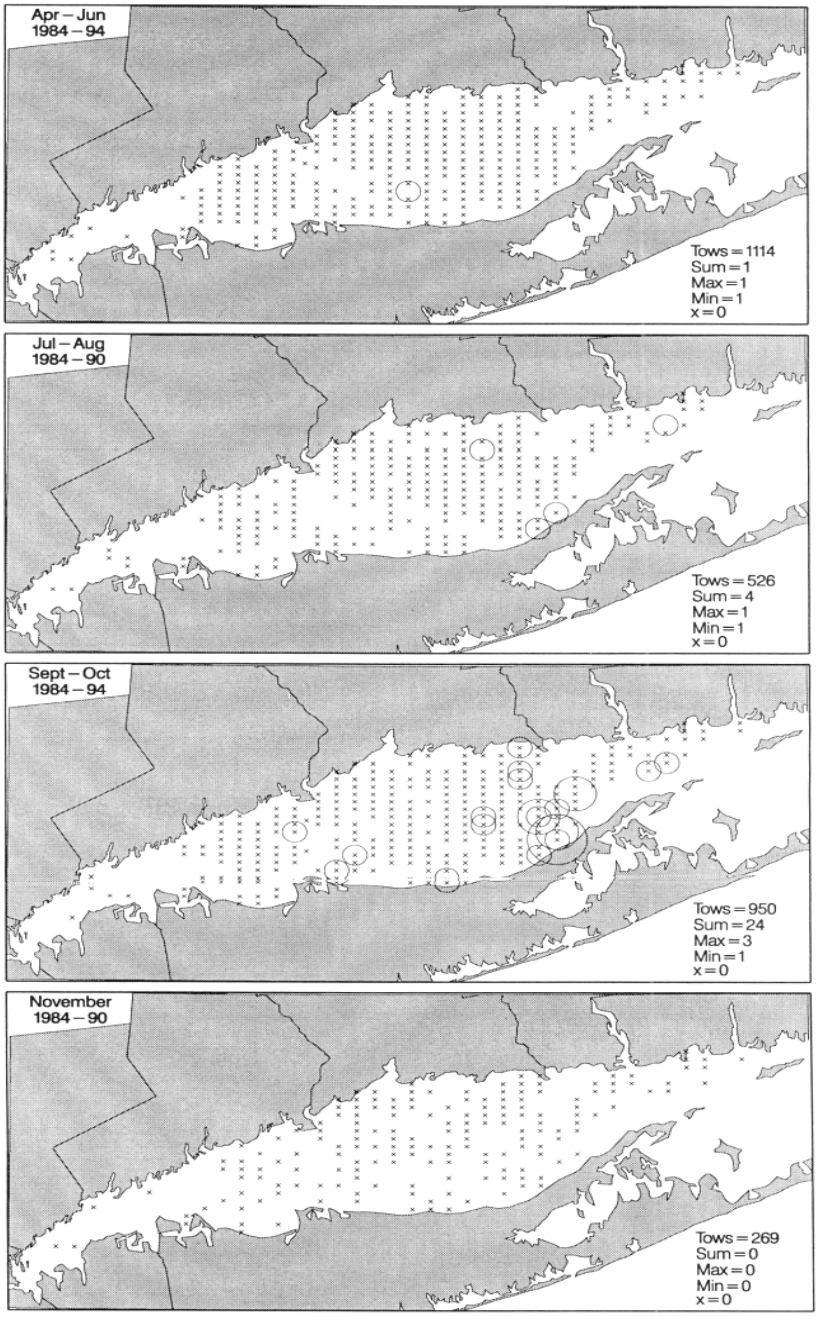
Northeast Fisheries Science Center (NEFSC) spring and autumn survey indices for clearnose skate have increased since the mid-1980s through 2000 and have since declined to about average values (NEFMC 2009). The biomass index is currently above the threshold and the maximum sustainable yield point, therefore the clearnose skate is not considered to be overfished (NEFMC 2009). Overfishing is not occurring because the three-year moving average of the biomass indices did not exceed the maximum threshold (NEFMC 2009).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Stable	Moderate Decline
6% to 10%		Common			
11% to 25%		Fairly common	X		
26% to 50%	X	Uncommon			
> 50%		Rare			

Habitat Discussion:
The clearnose skate is found on soft bottoms along the continental shelf, but also occur on rocky or gravely bottoms from inshore to depths up to 330m (Ha et al. 2009). The 1992–1997 Hudson-Raritan estuary trawl survey showed that the highest densities occurred at depths of 5-8 m for both adults and juveniles during all seasons, at salinities of 20-36 ppt. The Hudson-Raritan survey also found most juveniles occurred at temperatures of 13–24˚C and adults between 9–24˚C (Packer et al. 2003). The highest abundance of clearnose skates in New York waters can be found in the sublittoral zone out to depths of 55 m, frequenting shallow inshore areas and estuaries (Packer et al. 2003). Seagrass is critical habitat for many important prey species of the clearnose skate, including shrimps, crabs, bivalves and many small teleost fish species (Sagarese et al. 2011).

Primary Habitat Type
Estuarine
Marine; Deep Sub-tidal
Marine; Shallow Sub-tidal

Distribution:
Clearnose skates are relatively rare in the Long Island Sound but frequently caught off the south shore in NEFSC trawl surveys during spring and autumn (Packer et al. 2003, NEFMC 2009).



Distribution and abundance of juvenile and adult clearnose skate collected in Long Island Sound from 1984-1994 (Packer et al. 2003).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	M	H
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial harvest)	P	L	H

References Cited:

Ha, D., C. Luer, and J. Sulikowski. 2009. *Raja eglanteria*. In: IUCN 2012. Red List of Threatened Species. Version 2012.2.

New England Fishery Management Council (NEFMC). 2003. Final fishery management plan (FMP) for the Northeast skate complex. National Marine Fisheries Service. 25p.

New England Fishery Management Council (NEFMC). 2009. Final amendment 3 to the fishery management plan (FMP) for the northeast skate complex and final environmental impact statement (FEIS) with an initial regulatory flexibility act analysis. NMFS, NEFMC. Newburyport, MA. 459p.

Packer, D.B., C.A. Zetlin, and J.J. Vitaliano. 2003. Essential fish habitat source document: Clearnose skate, *Raja eglanteria*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-174. U.S. Department of Commerce, Massachusetts, USA.

Sagarese, S.R., R.M. Cerrato, and M.G. Frisk. 2011. Diet composition and feeding habits of common fishes in Long Island Bays, New York. Northeastern Naturalist 18(3): 291-314.

Common Name: Little skate ***SGCN***
Scientific Name: *Leucoraja erinacea*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
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. 2012). 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, leading to declining populations throughout its range. 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).

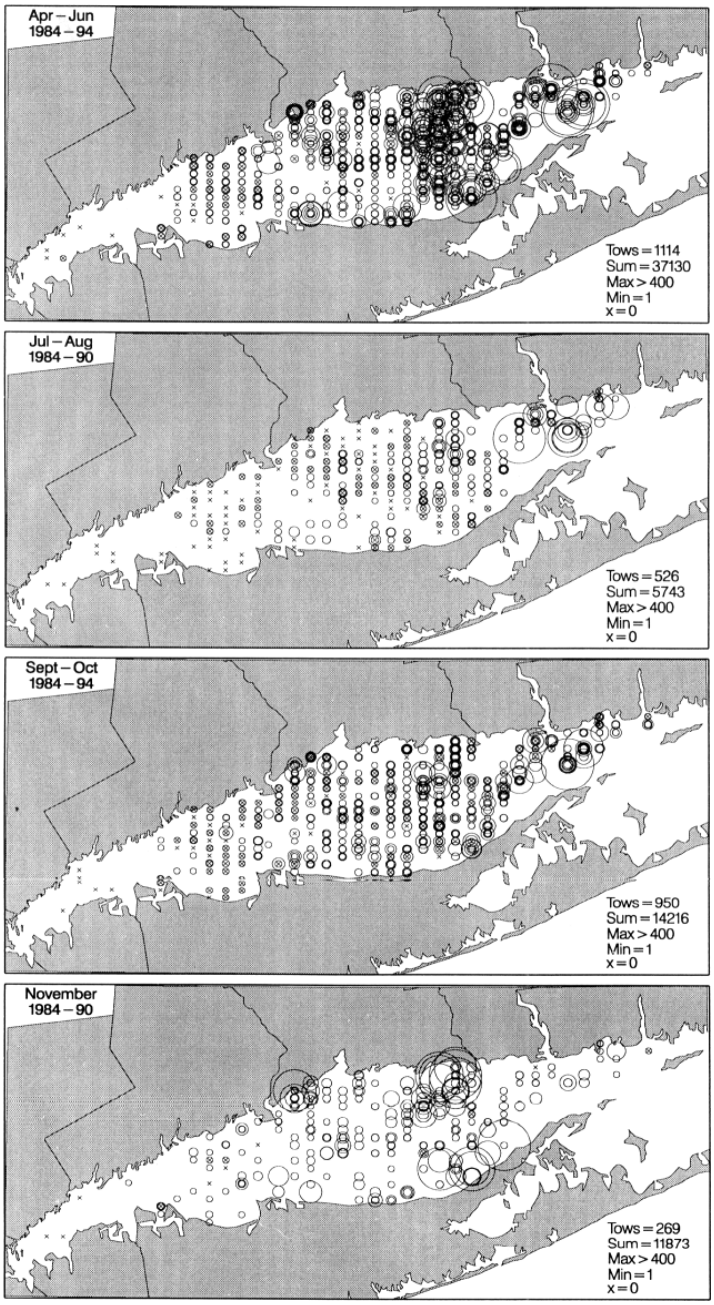
The lack of information on sexual maturity coupled with recent declines in biomass warrant a precautionary assessment of Near Threatened by the IUCN (Kyne et al. 2012). Little skate are not considered overfished by the NEFMC because the biomass index (4.59 kg/tow, 2003-2005) is above the threshold reference point (3.27 kg/tow); however, this index is below the biomass target of 6.54 kg/tow (44th SAW 2007).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant	X	Stable	Moderate Decline
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%	X	Rare			

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).

Primary Habitat Type
Marine; Deep Sub-tidal
Marine; Shallow Sub-tidal

Distribution:
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).



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).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial harvest)	P	M	M
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	M	H
3. Climate Change & Severe Weather	Habitat Shifting & Alteration (warming ocean temperatures)	P	L	V

References Cited:

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.

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.

Packer, D.B., C.A. Zetlin, and J.J. Vitaliano. 2003. Essential fish habitat source document: Little skate, *Leucoraja erinacea*, life history and characteristics. NOAA Technical Memo NMFS NE 175: 66p.

Common Name: Rosette skate ***SGCN***
Scientific Name: *Leucoraja garmani virginica*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

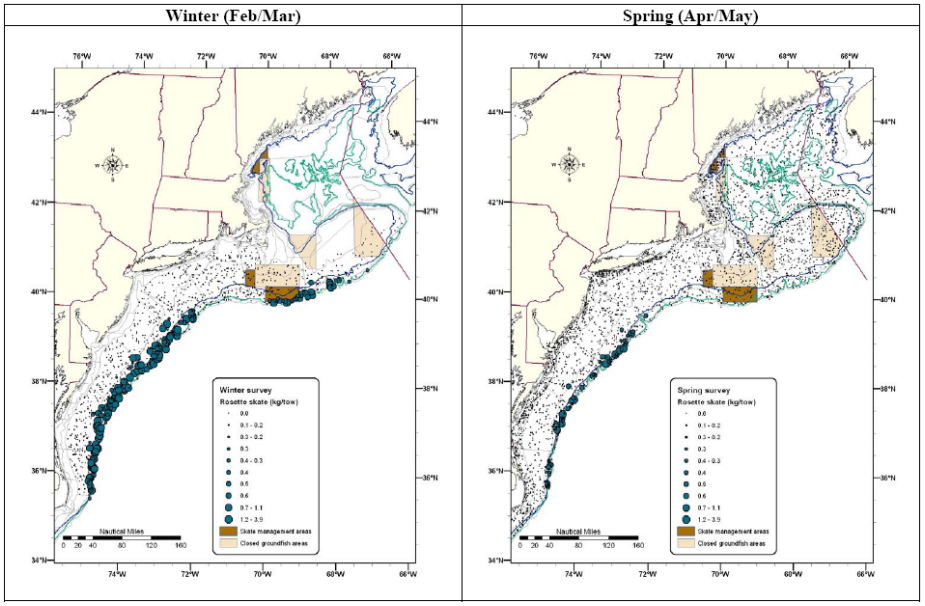
Synopsis:
The rosette skate occurs from Nantucket Shoals, MA to the Dry Tortugas National Park, FL, with separation of two subspecies at Cape Hatteras, NC. Populations north of Cape Hatteras, NC have been considered as the subspecies *L. garmani virginica* while those between the Cape and the Dry Tortugas have been considered as *L. g. garmani*, but they may represent two distinct species (McEachran 1977). As a benthic, deep water species, the rosette skate is most commonly found on the continental shelf at depths of 75–275 meters over sand and mud bottoms (Gedamke et al. 2009). Rosette skate are most abundance in the Mid-Atlantic offshore region, with few fish caught in Southern New England and Georges Bank. Individuals are caught in Northeast Fishery Science Center (NEFSC) trawl surveys off the southern shore of Long Island, most abundant in autumn and spring surveys (NEFMC 2009). There is no directed fishery for this species anywhere in its range rosette skate are often caught as incidental by-catch (Kyne et al. 2012). Rosette skate are managed by the New England Fishery Management Council (NEFMC) under the Northeast Skate Complex Fishery Management Plan (FMP). Rosette skate biomass index is currently above the threshold reference point and therefore the stock is not considered to be overfished by the NEFMC (NEFMC 2009). The IUCN states that there is no reason to believe there is any current threat to rosette skate although catch indices are not available for the southern range of the species, leading to the assessment status of Least Concern (Kyne et al. 2012).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Stable	Stable
6% to 10%		Common			
11% to 25%		Fairly common	X		
26% to 50%		Uncommon			
> 50%		Rare			

Habitat Discussion:
Rosette skate are a benthic, deepwater species found on soft bottoms of sand or mud. It occurs at depths of 33–530 meters but is most common between 74–274 meters and at water temperatures of 5–15 ˚C (Packer et al. 2003). Although skates do not undertake large-scale migrations, they do move seasonally in response to changing temperatures, generally offshore during summer and early autumn, returning inshore during winter and spring. Rosette skate feed mostly on decapods, crustaceans, and to a lesser extent on amphipods, polychaetes, squids and small fishes (Gedamke 2009).

Primary Habitat Type
Marine; Deep Sub-tidal

Distribution:
Rosette skate have been caught off the south shore of Long Island in recent NEFSC trawl surveys.



Rosette skate biomass distribution in winter trawl (2000-2007), spring trawl (2000-2008), summer dredge (2000-2007), and autumn trawl (2000-2007) surveys (NEFMC 2009).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch in groundfish trawling)	W	L	H

References Cited:

Gedamke, T. 2009. *Leucoraja garmani*. In: IUCN 2012. IUCN Red List of Threatened Species Version 2012.2.

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. 1977. Variation in *Raja garmani* and the status of *Raja lentiginosa* (Pisces: Rajidae). Bulletin of Marine Science 27(3): 423-439.

New England Fishery Management Council (NEFMC). 2009. Final amendment 3 to the fishery management plan (FMP) for the northeast skate complex and final environmental impact statement (FEIS) with an initial regulatory flexibility act analysis. NMFS, NEFMC. Newburyport, MA. 459p.

Packer, D.B., C.A. Zetlin, and J.J. Vitaliano. 2003. Essential fish habitat source document: rosette skate, *Leucoraja garmani virginica*, life history and habitat characteristics. NOAA Technical Memo NFM NE 176: 17p.

Common Name: Sandbar shark ***SGCN***
Scientific Name: *Carcharhinus plumbeus*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
The sandbar shark is a large coastal species widespread in subtropical and warm temperate waters around the world. In the Western Atlantic Ocean, it occurs from southern Massachusetts southward to Brazil. Sandbar sharks are long lived with low fecundity and consequently very vulnerable to overfishing. The sandbar shark was historically taken in commercial and recreational fisheries along the Southern Atlantic Coast of the U.S. and in the Gulf of Mexico, which expanded rapidly in the last 20 years and led to significant population declines (Musick et al. 2009). Genetic data indicates no differentiation between Atlantic and Gulf individuals and tagging data shows a high frequency of movement between the basins (NMFS 2011). Individuals have historically been observed along the south shore of Long Island during spring and summer, indicating this is an important pupping area for this species (Spring 1960). Outside the shark research fishery, sandbar sharks are a prohibited species in Atlantic waters (Musick et al. 2009).

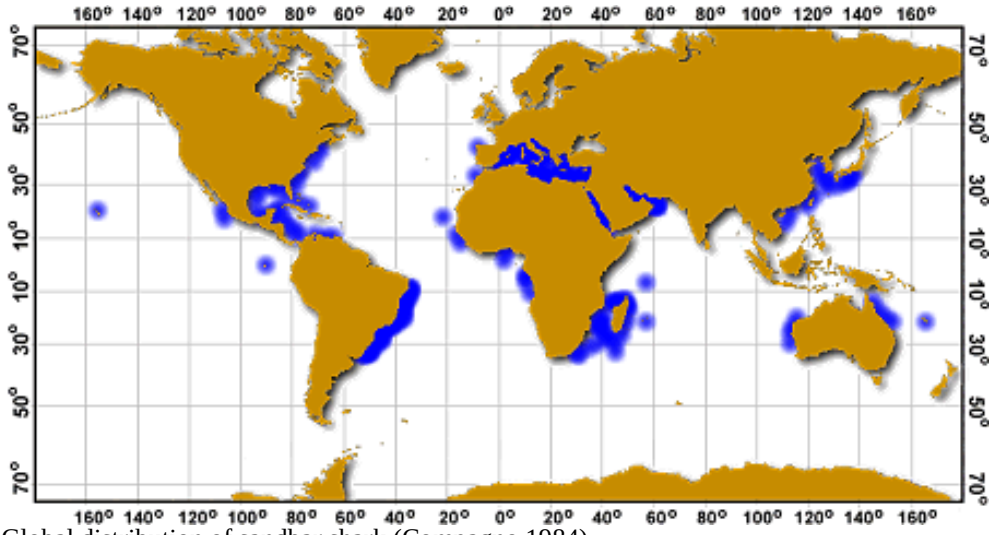
Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Unknown	Moderate Decline
6% to 10%		Common			
11% to 25%		Fairly common	X		
26% to 50%		Uncommon			
> 50%	X	Rare			

Habitat Discussion:
Sandbar sharks are abundant inshore and offshore species in the coastal-pelagic zone, occurring in temperate and tropical waters. They occur on continental and insular shelves, in adjacent deep water, and oceanic banks. They are common at bay and river mouths, in harbors, and inside shallow muddy and sandy bays, avoiding the surf zone, coral reefs, and rough bottoms (Compagno 1984). Depths range from the intertidal zone to 280 meters (Compagno 1984).

Stocks migrate seasonally along the western North Atlantic seaboard, heading south for the winter and north in the summer (Compagno 1984). Migrations are likely influenced by water temperature, changes in areas of upwelling, and ocean currents. Young form mixed-sex schools on shallow coastal nursing grounds, moving into deeper, warmer water in winter (Compagno 1984). Adults are usually segregated except during southward migration when individuals often travel in large schools. This species is a primarily a predator on small fishes, mollusks and crustaceans (Compagno 1984).

Primary Habitat Type
Marine; Deep Sub-tidal

Distribution:
Nursery grounds were identified in the shallow water along the southern shore of Long Island, particularly Great South Bay, in 1916 (Springer 1960). It was also noted that adults of the two sexes were almost never taken together near Long Island, and females will enter the nursery area to give birth, not remaining for long or actively feeding while there (Springer 1960). Other records indicate that sandbar sharks are common in bays along the ocean side of Long Island from mid-June to mid-September (Nicholas and Breder Jr. 1927). There are no observations of current occurrence; however its likely sandbar sharks are still using the south shore of Long Island as nursery grounds.



Global distribution of sandbar shark (Compagno 1984)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial fishing)	P	L	M
2. Climate Change	Habitat Shifting & Alteration (effects of warming ocean temperature)	P	L	V
3. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	M	H
4. Biological Resource Use	Fishing & Harvesting Aquatic Resources (illegal harvest)	P	L	H
5. Biological Resource Use	Fishing & Harvesting Aquatic Resources (recreational fishing)	P	L	M
6. Energy Production & Mining	Renewable Energy (wind farms)	N	L	M

References Cited:

Compagno, L.J.V. 1984. An annotated and illustrated catalogue of shark species known to date part 2- Carcharhiniformes. FAO species catalogue Vol. 4. Sharks of the World. 125(4).

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.

Musick, J.A., J.D. Stevens, J.K. Baum, M. Bradai, S. Clo, I. Fergusson, R.D. Grubbs, A. Soldo, M. Vacchi, and C.M. Cooren. 2009. *Carcharhinus plumbeus.* In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2.

National Marine Fisheries Service (NMFS). 2011. Southeast Data, Assessment, and Review (SEDAR) 21. Highly migratory species- sandbar shark. NOAA/NMFS Highly Migratory Species Division, North Charleston, SC. 459p.

Nichols, J.T. and C.M. Breder Jr. 1927. The marine fishes of New York and southern New England. Zoologica 9(1): 1-92.

Springer, S. 1960. Natural history of the sandbar shark, *Eulamia milberti*. Fishery Bulletin 178 (61): 1-28.

Common Name: Shortfin mako ***SGCN***
Scientific Name: *Isurus oxyrinchus*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
Shortfin mako shark are a temperate and tropical specie, found in the Atlantic, Pacific and Indian oceans. In northwestern Atlantic, this species ranges between 20˚ and 40˚N, bordered by the Gulf Stream in the west and the mid-Atlantic ridge in the east (Casey and Kohler 1992). It is a highly migratory species, with tagging data showing a single well-mixed population in the Northern Atlantic (Casey and Kohler 1992). Shortfin mako is a large, late-maturing pelagic shark species. Its life-history makes it vulnerable to mortalities associated with bycatch in longline and other fisheries (COSEWIC 2011). In 2011, the majority of shortfin mako harvest is from the U.S. Atlantic Coast and Gulf of Mexico. In 2011, U.S. commercial fisheries harvested over 207,000 pounds of shortfin mako (NOAA 2013). In 2012, International Commission for the Conservation of Atlantic Tunas (ICCAT) conducted a stock assessment for shortfin mako sharks, concluding that the fishery was not overfished, but was vulnerable and recommended a precautionary approach to prevent the overfishing stocks (ICCAT 2012).

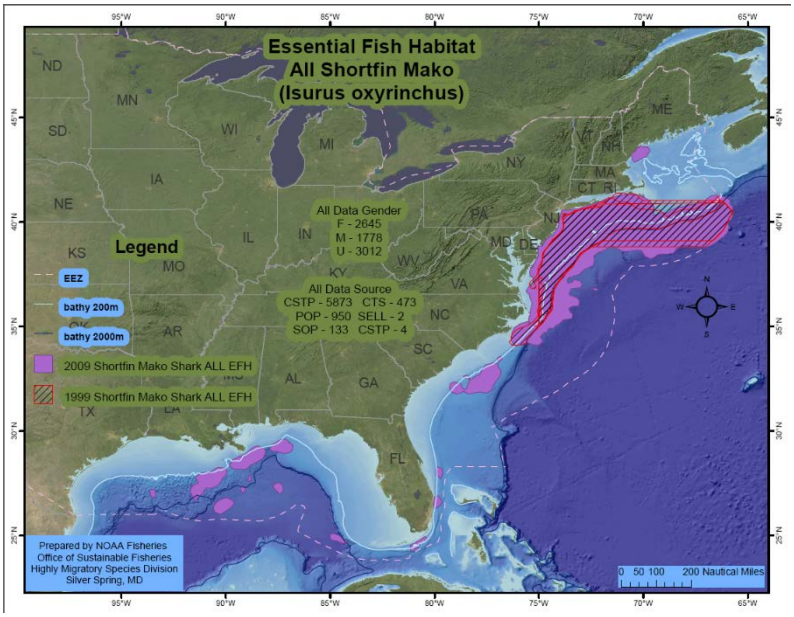
Shortfin mako is assessed to be globally vulnerable do to its estimated and inferred declines, inadequate management, high value of meat and fins, and slow life history characteristics (Cailliet et al. 2009). In 2012, ICCAT completed a stock status assessment for shortfin mako populations in the North and South Atlantic. Results from their assessment found stocks to be healthy with a low probability of overfishing, but still recommend a precautionary approach due to uncertainties with the calculated estimates (ICCAT 2012).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Stable	Moderate Decline
6% to 10%		Common			
11% to 25%		Fairly common	X		
26% to 50%		Uncommon			
> 50%	X	Rare			

Habitat Discussion:
Shortfin makos are active, found in offshore littoral and epipelagic areas. This species inhabits tropical and warm-temperate waters, from the surface down to depths around 100m. It is seldom seen where water temperatures are less that 16˚C (Compagno 2002).

Primary Habitat Type
Marine; Deep Sub-tidal

Distribution:



NMFS (2009)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial harvest)	P	L	H
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch--discards)	N	L	H
3. Biological Resource Use	Fishing & Harvesting Aquatic Resources (recreational fishing)	P	L	M
4. Energy Production & Mining	Renewable Energy (offshore wind farms)	N	L	M

References Cited:

Cailliet, G.M., R.D. Cavanagh, D.W. Kulka, J.D. Stevens, A. Soldo, S. Clo, D. Macias, J. Baum, S. Kohin, A. Duarte, J.A. Holtzhausen, E. Acuña, A. Amorim, & A. Domingo. 2009. Isurus oxyrinchus. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Accessed 23 April 2013.

Casey, J.G. and Kohler, N.E. 1992. Tagging studies on the shortfin mako shark (*Isurus oxyrinchus*) in the western North Atlantic. Australian Journal of Marine and Freshwater Research 43: 45-60.

Committee on the Statues of Endangered Wildlife in Canada (COSEWIC). 2011. Species at risk public registry: shortfin mako. <http://www.sararegistry.gc.ca/default.asp?lang=En&n=9458C6D0-1&offset=1&toc=show>. Accessed 23 April 2013.

International Commission for the Conservation of Atlantic Tunas (ICCAT). 2012. 2012 Shortfin mako stock assessment and ecological risk assessment meeting. Olahao, Portugal. <http://www.iccat.es/Documents/Meetings/Docs/2012_SHK_ASS_ENG.pdf>. Accessed 24 April 2013.

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.

Common Name: Winter skate ***SGCN***
Scientific Name: *Leucoraja ocellata*
Taxon: Sharks, Skates, and Rays

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: Not Ranked
New York: Not Ranked
Tracked: No

Synopsis:
The winter skate is a common shelf species, occurring in the western Atlantic Ocean from Labrador, Canada, southward to the Carolinas. It has a narrow latitudinal range and a high degree of endemicity, with its center of abundance on Georges Bank and in the northern section of the Mid Atlantic Bight (Kyne et al. 2012, Packer et al. 2003). 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).

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).

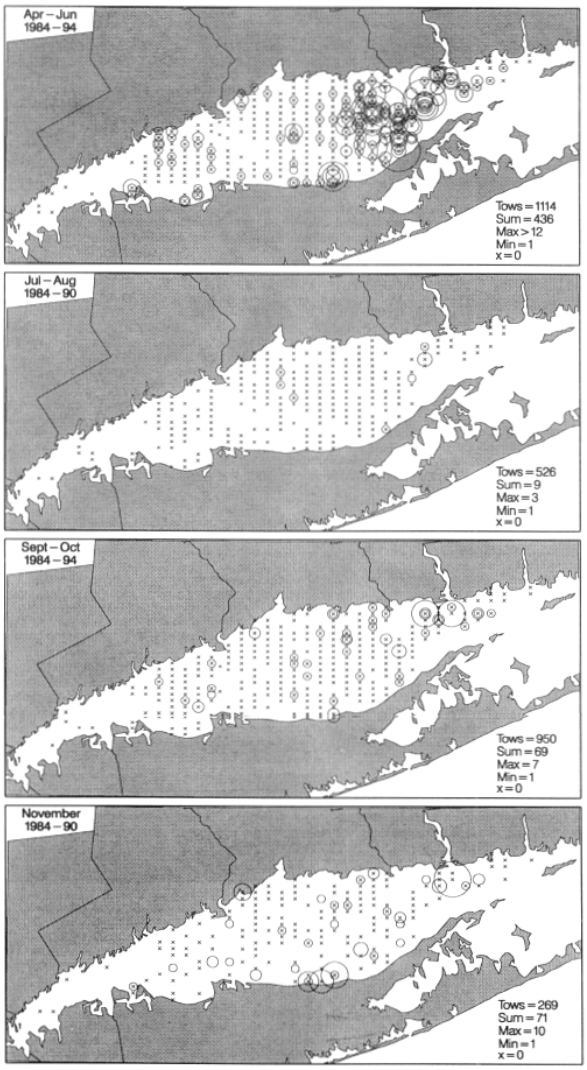
Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Stable	Moderate Decline
6% to 10%		Common			
11% to 25%		Fairly common	X		
26% to 50%		Uncommon			
> 50%	X	Rare			

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). 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 to 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).

Primary Habitat Type
Marine; Deep Sub-tidal

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



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).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	M	H
2. Climate Change & Severe Weather	Habitat Shifting & Alteration (warming ocean temperature)	P	L	V
3. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial harvest)	P	M	H

References Cited:

44th Northeast Regional Stock Assessment Workshop. 2007. 44th SAW assessment summary report. U.S. Dep. Commer., Northeast Fisheries Science Center Reference Document. 07-03: 58p.

Kulka, D.W., J. Sulikowski, and T. Gedamke. 2009. Leucoraja ocellata. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2.

Kyne, P.M., J.K. Carlson, D.A. Ebert, S.V. Fordham, J.J. Bizzarro, 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.

New England Fishery Management Council (NEFMC). 2009. Final amendment 3 to the fishery management plan (FMP) for the northeast skate complex and final environmental impact statement (FEIS) with an initial regulatory flexibility act analysis. NMFS, NEFMC. Newburyport, MA. 459p.

Packer, D.B., C.A. Zetlin, and J.J. Vitaliano. 2003. Essential fish habitat source document: winter skate, Leucoraja ocellata, life history and habitat characteristics. NOAA Technical Memo NMFS NE 179: 57p.

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