Common Name: American shad
Scientific Name: *Alosa sapidissima*
Taxon: Marine Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G5
New York: S4
Tracked: No

Synopsis:
This species of herring is anadromous and can be found along the Atlantic Coast from Florida to the Gulf of St. Lawrence in northeastern Quebec (Smith 1985, ASMFC 2007a). American shad in New York are found in the Hudson River and Delaware River and are part of the mid-Atlantic population. This population has a migratory range of thousands of miles along the Atlantic Coast (Smith 1985, Kahnle and Hattala 2010, Stegemann and Stang 2013). The American shad spends most of its life at sea only entering fresh water to spawn (Smith 1985, NatureServe 2012). In New York, the American shad was historically found in the Delaware River and Hudson River in large numbers (ASMFC 2007). In the past two decades the Hudson and Delaware populations have declined (ASMFC 2007a). Even with recent restoration efforts, population size is much smaller than historical levels as a result of dams, overfishing, and water pollution (Kart et al. 2005, Haas-Castro 2006, ASMFC 2007a, DFO 2013).

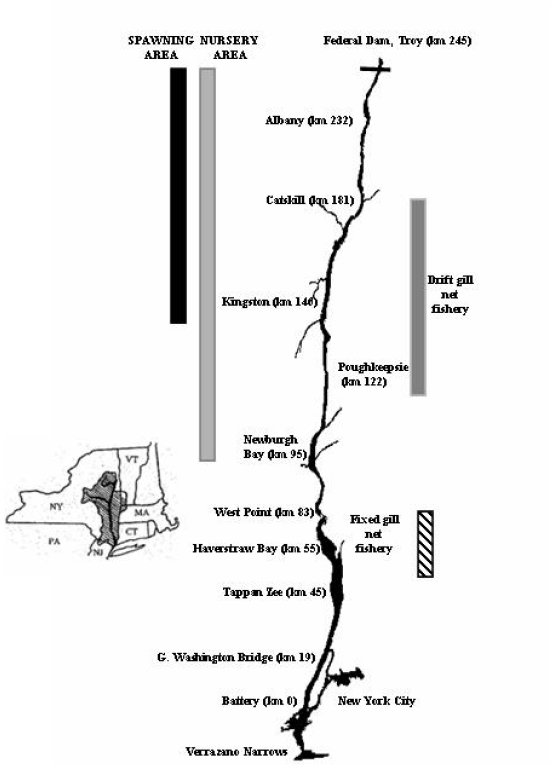
The New York American shad population is at an all-time low since 1880 (Kahnle and Hattala 2010). Since the 1990s, some local populations in Connecticut, Massachusetts, Maine and Vermont have increased as a result of improvements in water quality, stocking programs, and the use of fish passage ways to increase access to spawning waters; however, shad abundance in these states is still far below historical levels (Kart et al. 2005, Haas-Castro 2006, ASMFC 2007a). Current data indicate that Hudson River shad stock is at a historic low (ASMFC 2007b, Hattala and Kahnle 2009). Adult mortality has increased and is well above acceptable levels while mean age, size and stock size has also decreased (Hattala and Kahnle 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			
26% to 50%		Uncommon	X		
> 50%	X	Rare			

Habitat Discussion:

Primary Habitat Type
Estuarine
Marine; Deep Sub-tidal

Distribution:
This species historically occurred in the Hudson River and its tributaries, the Delaware River, and streams/coastal waters of Long Island (Hattala and Kahnle 2009). American shad were also found in New York's portion of the Susquehanna River, as far upstream as Binghamton, Broome County (Stegemann and Stang 2013). Large hydropower dams built in the 1920s currently prevent fish from reaching this portion of the Susquehanna (Stegemann and Stang 2013). The American shad is still found in the Hudson River, Delaware River, streams on Long Island, and coastal waters off Long Island.



Hudson River Estuary with spawning, nursery, and fishery areas for American shad (ASMFC 2007b).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Natural System Modifications	Dams & Water Management/Use (dams)	W	L	H
2. Natural System Modifications	Other Ecosystem Modifications (Channelization and Dredging)	N	M	M
3. Biological Resource Use	Fishing & Harvesting Aquatic Resources (overharvest for use as baitfish)	N	L	L
4. Pollution	Household Sewage & Urban Waste Water (urban runoff and sewage)	P	L	H
5. Pollution	Agricultural & Forestry Effluents (poor land use practices associated with farming/groundwater)	P	L	V
6. Pollution	Industrial & Military Effluents (thermal and toxic discharges)	N	L	H
7. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	M	H
8. Climate Change & Severe Weather	Habitat Shifting & Alteration (increasing water temperatures/spawning runs)	W	M	V
9. Climate Change & Severe Weather	Habitat Shifting & Alteration (increasing ocean temperatures)	N	L	V
10. Energy Production & Mining	Renewable Energy (hydropower turbines, entrainment)	N	M	H
11. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (zebra mussels)	N	M	H

12. Biological Resource Use	Fishing & Harvesting Aquatic Resources (illegal harvest)	P	L	M

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Common Name: Atlantic sturgeon
Scientific Name: *Acipenser oxyrinchus*
Taxon: Marine Fish

SGCN – High Priority

Federal Status: Endangered
New York Status: Endangered

Natural Heritage Program Rank:
Global: G3
New York: S1
Tracked: Yes

Synopsis:
The Atlantic sturgeon, *Acipenser oxyrinchus*, is in the family Acipenseridae which includes 26 species worldwide. Atlantic sturgeon is an anadromous fish that can be found along the entire Atlantic Coast from Labrador, Canada to St. Johns River, Florida. The Atlantic sturgeon is the largest sturgeon found in New York and is found year round within the Hudson River Estuary, Long Island Sound, and the waters of the south shore Long Island. The Hudson River is a vital spawning habitat and nursery for the Atlantic sturgeon. In the United States, the Atlantic sturgeon is currently present in 32 rivers, and spawning occurs in at least 14 of these rivers (Atlantic Sturgeon Status Review Team 1998, NMFS 1998).

This prehistoric fish was once plentiful in the Hudson until the late 1800s through the early 1900s when overfishing depleted the population dramatically. Pollution, sedimentation, and blockage of access to spawning areas by dams also played a role in the population decrease as well as inhibiting population recovery (Gilbert 1989, Burkhead and Jenkins 1991, Marine and Coastal Species Information System 1996). In 1997 the New York State Department of Environmental Conservation passed a statewide moratorium and the Atlantic States Marine Fisheries Commission passed a coast wide moratorium on fishing and possession of Atlantic sturgeon. In addition in February of 2012 was listed under the Endangered Species Act by the National Marine Fishery Service. The Hudson River population is one of two populations that are presumed to be the healthiest in the United States (Atlantic Sturgeon Status Review Team 2007) but this stock is at its lowest level in the past 120 years (NYSDEC 2005).

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

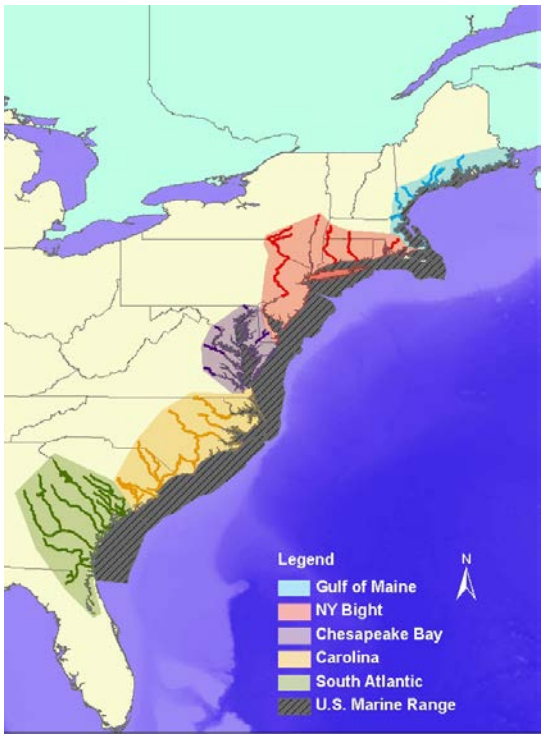
Habitat Discussion:
The Atlantic sturgeons are benthic bottom feeders that utilize both estuary and marine habitats. The Hudson River Estuary is important spawning and nursery habitat for young of year and juveniles up to 6 years old. Juveniles leave the estuary between 1-6 years old and head out into the ocean to spend the rest of their lives only returning to spawn.

From T-4 Grant Progress Report: Results indicate that NY is an important year-round habitat for Atlantic sturgeon and that sturgeon mainly utilizes shallow inshore waters of less than 15 meters. There is a strong seasonal component, with spring and fall having the highest catches of Atlantic sturgeon. Data from the

random stratified surveys and the targeting trawling suggest that in particular the Rockaway area Queens County NY represents an area where sturgeon aggregate and may warrant protection as essential habitat.

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

Distribution:
Atlantic sturgeon occur in three watersheds. In the Hudson River there is estimated to be a spawning stock size of 870 (600 males and 270 females), which is 80% of the total population (Kahnle et al. in press).



NOAA (2013)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Energy Production & Mining	Renewable Energy (offshore energy production)	N	L	H
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	P	H	M
3. Natural System Modification	Dams & Water Management/Use (water control structure entrainment)	N	M	M
4. Pollution	Industrial & Military Effluents	P	L	H
5. Transportation & Service Corridors	Shipping Lanes (dredging)	N	M	H
6. Transportation & Service Corridors	Shipping Lanes (vessel strikes)	P	L	H
7. Energy Production & Mining	Renewable Energy (hydro turbines)	N	M	H
8. Transportation & Service Corridors	Roads & Railroads (Hudson River transportation corridor including railroad/road bridge reconstruction, transmission)	P	M	V
9. Biological Resource Use	Fishing & Harvesting Aquatic Resources (illegal harvest, caviar/flesh)	P	L	H

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Common Name: Atlantic tomcod
Scientific Name: *Microgadus tomcod*
Taxon: Marine Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G5
New York: S3
Tracked: No

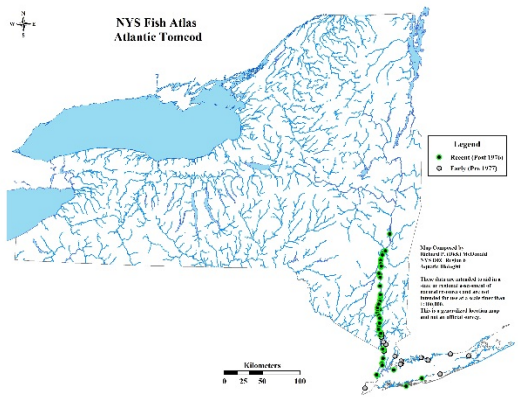
Synopsis:
Atlantic tomcod is a small anadromous Gadiform fish, which ranges from Labrador to Chesapeake Bay, more commonly being found in the northern portion of its range (Page and Burr 1991). The population of Atlantic tomcod is the southernmost population to spawn (Dew and Hecht 1976, Stewart and Auster 1987, Daniels et al. 2005). The Atlantic tomcod favors colder water and produces an antifreeze protein at 10 degrees Celsius on Long Island (Bigelow and Schroeder 1953). They migrate up rivers to spawn from November to February. This species is an inshore species and frequently inhabits the mouth of rivers in tidal estuaries and salt creeks (Bigelow and Schroeder 1953, Booth 1967, Lambert and Fitzgerald 1979). The Atlantic tomcod is a bottom dwelling species dependent on benthic prey and tends to remain within its natal estuary. Tomcod from highly polluted systems tend to accumulate unusually high concentrations of contaminants. In the Hudson River, these include PCDDs, PCDFs, and PCBs (Courtenay et al. 1999). However, tomcod have developed mutations which reduce, but do not eliminate, their susceptibility to the negative effects of dioxins and PCBs (Wirgin et al. 2011). Throughout its range the trend for tomcod is uncertain but is likely stable or slowly declining (NatureServe 2013).

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

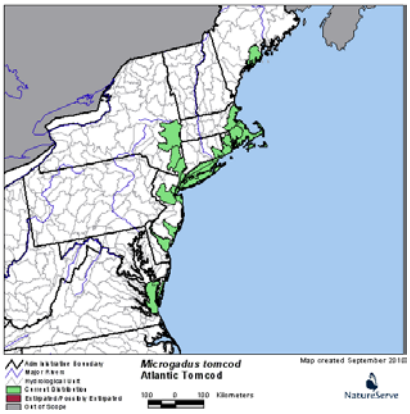
Habitat Discussion:
Tomcod are found around the mouth of rivers in tidal estuaries, salt creeks and as far upstream as the head of tide in tributary streams (Bigelow and Schroeder 1953, Booth 1967, Lambert and Fitzgerald 1979). Atlantic tomcod prefer cold water and avoid the warm waters of small streams and shallow coastal areas. Tomcod spawn on substrates of ledge, boulders and cobble or near shore in shallow water full of ice and slush (Booth 1967, Peterson et al. 1980). There are no recordings of individuals in waters greater than 26 degrees C (Howe 1971).

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

Distribution:
Atlantic tomcod occur in bays surrounding Long Island and within the Hudson River (M. Richards and D. Carlson, personal communication).



Carlson (2012)



NatureServe (2013)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Pollution	Industrial & Military Effluents (chemical contamination causing liver cancer)	P	H	H
2. Climate Change & Severe Weather	Habitat Shifting & Alterations (higher water temperatures)	P	V	V
3. Pollution	Household Sewage & Urban Waste Water (low oxygen content in sewage discharge areas)	N	H	H
4. Pollution	Industrial & Military Effluents (heavy metals including cadmium, mercury, lead)	N	H	H
5. Transportation & Service Corridors	Shipping Lanes (dredging)	N	L	H
6. Biological Resource Use	Fishing & Harvesting Aquatic Resources (incidental catch by recreational anglers)	N	L	L

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Common Name: Fourspine stickleback ***SGCN – High Priority***
Scientific Name: *Apeltes quadracus*
Taxon: Marine Fish

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G5
New York: S4
Tracked: No

Synopsis:
The fourspine stickleback is one of five species in the family Gasterosteidae, occurring close to the shore in the western Atlantic Ocean from the Gulf of St. Lawrence, Canada, to North Carolina. A small number of populations are known far upstream in the Hudson, Delaware, and Susquehanna drainages, and a few other isolated freshwater situations (lakes in Nova Scotia) (Wootton 2010). The fourspine stickleback is heavily reliant on the seagrass beds of New York's coastal and estuarine waters for refuge, spawning, nursery and foraging grounds and they are commonly found throughout the estuarine portion of the Upper Hudson and Lower Hudson-Long Island bays watershed basins (NYSDEC 2005). This species is represented by a large number of occurrences, or subpopulations, and no major threats are known (NatureServe 2013).

The IUCN reports that fourspine stickleback are expanding their range, colonizing new areas, and increasing rapidly in numbers, often to the detriment of native fish species (Wootton 2010). In Lake Superior, this species was accidently introduced through ballast water discharge and is now considered an invasive species in this region. They compete with other species for invertebrate prey, also preying upon the eggs and larvae of other fishes in the nearshore habitats preferred by this species, and populations of native sticklebacks have declined following the establishment of this species in Lake Superior (Fuller et al. 2013). Other sources have noted that this species may be in decline in its native New York range (Kelley and Schultz 2003, NYSDEC 2005, Carlson 2009).

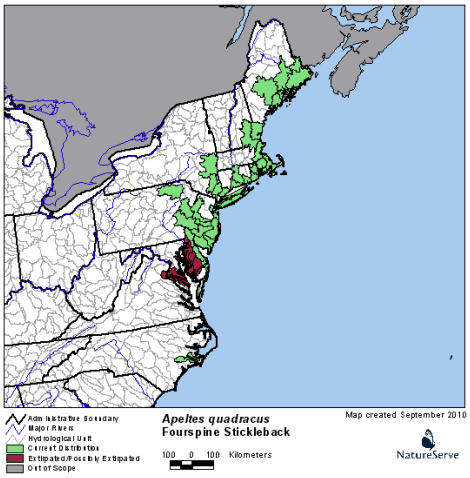
Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%		Abundant		Unknown	Moderate Decline
6% to 10%	X	Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

Habitat Discussion:
The fourspine stickleback is a benthopelagic species, preferring vegetated areas with calm water and are rarely found in swift currents or along coastlines exposed to strong wave action (Grant and Lee 2004). They also occur in brackish waters and occasionally in backwaters and freshwater lakes. Young-of-the-year utilize shallow subtidal areas (<1.2 meters) with substrates composed mainly of small rocks and gravel or eelgrass habitat within estuaries as nursery grounds (Grant and Lee 2004). Adults are most often observed in areas of dense eelgrass habitat as well as over unvegetated sandy substrates in shallow subtidal (3-6 meters) areas from August to November (Grant and Lee 2004). Fourspine sticklebacks often live sympatrically with other species of stickleback throughout their native range, though they are

generally solitary in regard to other members of their own species. They have the widest range of salinity tolerance of any North American species of stickleback (Fuller et al. 2013).

Primary Habitat Type
Estuarine; Brackish Shallow
Marine; Deep Sub-tidal
Rooted Vascular

Distribution:
Currently, the fourspine stickleback is found in the Lower Hudson and Long Island Bays, the Atlantic Ocean-New York Bight, and other inland areas along the Hudson (NYSDEC 2005).



NatureServe (2013)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Natural System Modifications	Dams & Water Management/Use (change in SAV beds in Hudson River)	N	L	H
2. Pollution	Industrial & Military Effluents (toxic discharge)	R	L	H
3. Pollution	Agricultural & Forestry Effluents (nutrient runoff)	R	L	H
4. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (water chestnut affecting SAV beds)	N	L	M
5. Human Intrusions & Disturbance	Recreational Activities (loss of SAV from boating)	W	H	H
6. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss of SAV from climate change)	W	H	V
7. Natural System Modifications	Other Ecosystem Modifications (loss of SAV from dredging)	R	H	H
8. Natural System Modifications	Dams & Water Management/Use (loss of connectivity from culverts, dams)	N	L	H

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Common Name: Lined seahorse ***SGCN – High Priority***
Scientific Name: *Hippocampus erectus*
Taxon: Marine Fish

Federal Status: Not Listed
New York Status: Not Listed

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

Synopsis:
This species is associated with submerged aquatic vegetation and is found from the southern tip of Nova Scotia in Canada, southward along the Atlantic coast to Mexico, the Caribbean, and Venezuela (Teixeira and Musick 2001, Project Seahorse 2003). It is most commonly found in coastal waters with aquatic vegetation, but can be found in deeper channels (Project Seahorse 2003). The lined seahorse has been found around Long Island as recently as 2012 (M. Richards, personal communication). Populations in the central-southern extant of the range are in decline as a result of overharvesting (Project Seahorse 2003). It is difficult to determine population trends at the northern limits of the lined seahorse's distribution.

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%	X	Uncommon			
> 50%		Rare	X		

Habitat Discussion:
The lined seahorse can be found in waters up to 240 feet in depth (Project Seahorse 2003). It is associated with aquatic vegetation such as seagrass, mangroves, sponges, and floating Sargassum (Dias et al. 2002, Project Seahorse 2003, Sedberry and Webster 2005, Bester no date). It can be found at the surface and bottom of both shallow water and deeper areas in channels, bays, along beaches, and in or near salt marshes (Dias et al. 2002, Project Seahorse 2003).

Primary Habitat Type
Marine; Deep Sub-tidal

Distribution:
Table 1 (below) includes data from the Western Long Island Seine Survey (1984–2012), Crustaceans WLIS Lobster Trawl Survey (2006–2007), and the Peconic Bay Small Mesh Trawl Survey (2006–2012). The associated years listed above only represent years with lined seahorse occurrences, and not necessarily the total duration of the individual surveys.

Table 1: Occurrences of lined seahorse in New York State waters (M. Richards, personal communication)

Location of Occurrence	Year Present
Jamaica Bay	1984-1997, 1999, 2001-2002, 2005-2008, 2010
Staten Island	1984-1986, 1988-1989
Hempstead Harbor	1984
Little Neck Bay	1984, 1988, 1998, 2002,-2003, 2006, 2007
Manhasset Bay	1986, 1988, 1991, 1998, 2000-2001
Shinnecock Bay	1987
Long Island Sound West	1990, 2006
Great South Bay Islip	2001
Westchester Shoreline	2006
Little Peconic Bay	2006-2009, 2011
Great Peconic Bay	2006, 2008, 2009, 2012
Shelter Island Sound South	2006-2009
Shelter Island Sound North	2007-2008
Flanders Bay	2009
South Oyster Bay	1984-1989

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Pollution	Industrial & Military Effluents (toxic discharge)	R	L	H
2. Pollution	Agricultural & Forestry Effluents (nutrient runoff)	R	L	H
3. Human Intrusions & Disturbance	Recreational Activities (loss of SAV from boating)	W	H	H
4. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss of SAV from climate change)	W	H	V
5. Transportation & Service Corridors	Shipping Lanes (loss of SAV from dredging)	R	H	H
6. Biological Resource Use	Fishing & Harvesting Aquatic Resources (harvest for aquariums and cultural use)	R	H	M
7. Biological Resource Use	Fishing & Harvesting Aquatic Resources (commercial bycatch)	R	L	H
8. Natural System Modifications	Dams & Water Management/Use (loss of connectivity from culverts, dams)	N	L	H

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Common Name: Northern pipefish
Scientific Name: *Syngnathus fuscus*
Taxon: Marine Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G5
New York: S3
Tracked: No

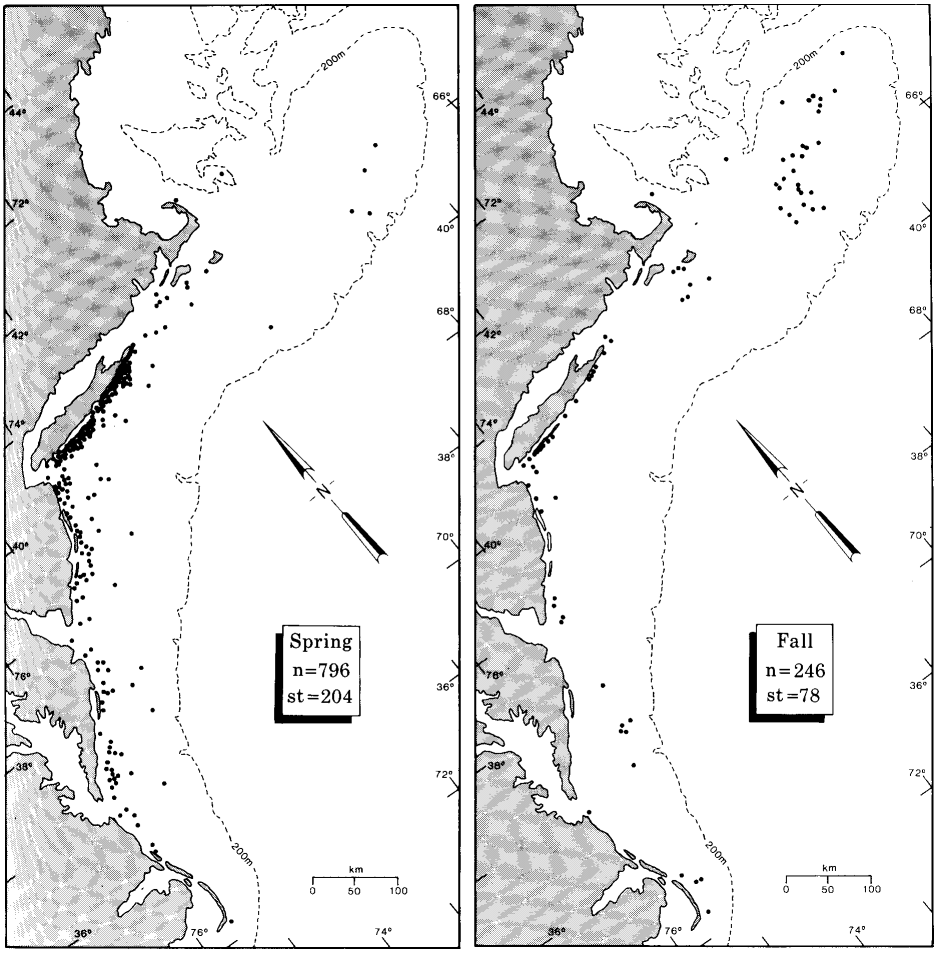
Synopsis:
The northern pipefish occurs along the Atlantic Coast of North America from the Gulf of St. Lawrence, Canada to Jupiter Inlet, Florida and in the northwestern portion of the Gulf of Mexico. In New York, it inhabits the Long Island Sound and Hudson River Harbor, occurring in sea grass beds and estuaries; it has a strong reliance on submerged aquatic vegetation (SAV). Evidence shows that pipefish migrate seasonally out of northern Mid-Atlantic Bight estuaries into shallow continental shelf waters during fall and back into estuaries during spring (Lazzari and Able 1990). Data from NYSDEC fishery independent surveys show a general decline from the mid-1980s for the northern pipefish, but these surveys were not directed toward SAV dependent species and therefore they may not be sampled well (NYSDEC 2005).

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%	X	Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

Habitat Discussion:
The northern pipefish occurs in seagrass beds in bays and estuaries, but may enter freshwater rivers and streams. Evidence suggests that northern pipefish undertake seasonal inshore-offshore migrations, occurring in estuaries in the summer and migrating out to shallow continental shelf waters for the winter (Lazzari and Able 1990). They were abundant in the Mid-Atlantic Bight during spring through early fall before their winter migration to depths no greater than 366 m (Lazzari and Able 1990). Most spring collections of northern pipefish occurred in bottom waters where temperatures ranged 4–6˚C, while winter fall collections were in waters of 12–15˚C, both at depths between 10-24 m (Lazzari and Able 1990). The U.S. Fish and Wildlife Service completed a 2009 survey of eelgrass beds in eastern Connecticut and the North Fork of Long Island, locating 172 eelgrass beds in eastern Long Island Sound totaling 1,980 acres (46 acres fewer than identified in the 2006 survey) (Tiner et al. 2010).

Primary Habitat Type
Estuarine; Brackish Shallow
Marine; Shallow Sub-tidal
Rooted Vascular

Distribution:
While there are no current sources of survey data, the species is known to still occur in the waters off Long Island.



Locations of northern pipefish in spring and fall trawl collections in the Mid-Atlantic Bight by the National Marine Fisheries Service from 1963-1986 (Lazzari and Able 1990).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Natural System Modifications	Dams & Water Management/Use (change in SAV beds in Hudson River)	N	L	H
2. Pollution	Industrial & Military Effluents (toxic discharge)	R	L	H
3. Pollution	Agricultural & Forestry Effluents (nutrient runoff)	R	L	H
4. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (water chestnut affecting SAV beds)	N	L	M
5. Human Intrusions & Disturbance	Recreational Activities (loss of SAV from boating)	W	H	H
6. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss of SAV from warming water temperature)	W	H	V
7. Transportation & Service Corridors	Shipping Lanes (loss of SAV from dredging)	R	H	H
8. Biological Resource Use	Fishing & Harvesting Aquatic Resources (for aquariums and cultural use)	R	M	M
9. Natural System Modifications	Dams & Water Management/Use (loss of connectivity from culverts, dams)	N	L	H

References Cited:

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Tiner, R., K. McGuckin, M. Fields, N. Fuhrman, T. Halavik, and A. MacLachlan. 2010. 2009 eelgrass survey for Eastern Long Island Sound, Connecticut and New York. U.S. Fish and Wildlife Service, National Wetlands Inventory Program, Northeast Region, Hadley, MA. National Wetlands Inventory report. 15p.

Common Name: Tautog
Scientific Name: *Tautoga onitis*
Taxon: Marine Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: GNR
New York: SNRN
Tracked: No

Synopsis:
Tautog, also referred to as black fish, range along the mid-Atlantic Bight from Nova Scotia to South Carolina (Bigelow and Schroeder 1953). In New York, this species can be found in the Hudson River estuary, New York Bight, and Long Island Sound. Tautog prefer areas with good shelter for protection, and are found around rock reefs, rocky outcrops, shellfish beds, gravel, eelgrass beds, and kelp or sea lettuce (*Ulva lactuca*) beds (Steimle and Shaheen 1999). Since the mid-1980s, tautog populations have been exposed to intensive recreational and commercial fishing (ASMFC 2011). In 1996, the Atlantic States Marine Fishery Commission drafted an interstate fishery management plan for tautog to reduce fishing mortality rates and increase recruitment (ASMFC 1996).

Tautog populations have been subject to intensive fishing over the last two decades. Approximately 90% of the recorded landings have come from recreational fishing although the commercial harvest of tautog for the live market is heavily under-reported. There has been a decline of 60% in recorded landings (ASMFC 2006). An intensive stock assessment confirmed that fishing mortality was above recommended levels (ASMFC 2006).

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			
26% to 50%		Uncommon	X		
> 50%	X	Rare			

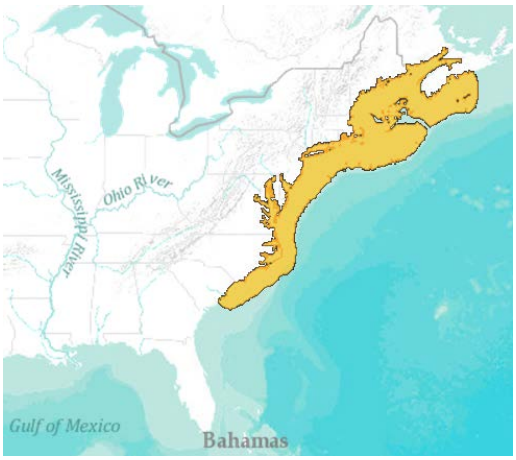
Habitat Discussion:
Tautog eggs are buoyant and are generally confined to coastal waters. Eggs and larvae are found in highest concentrations on the inner continental shelf off southern New England and Long Island. Younger larvae tend to stay near the water's surface, while older, larger larvae spend more time in deeper waters. Adults are associated with reefs and manmade structures (Arendt et al. 2001). Smaller juveniles utilize sea lettuce and other macroalgal habitats, moving to eelgrass (*Zostera* sp.) and rocky habitats as they grow (Sogard et al. 1992). The most important habitat parameter affecting the distribution of tautog is the availability of cover. They can be found around rocky shores, breakwaters, off-lying ledges, submerged wrecks, piers, docks, and jetties. Tautogs are also found over boulder-strewn bottoms and on mussel beds in shallow water (Bigelow and Schroeder 1953). Tautogs are opportunistic sight feeders, consuming a variety of invertebrates including mollusks, especially blue mussels (*Mytilus edulis*), barnacles, and various crustaceans (Olla et al. 1974).

Primary Habitat Type
Bar
Jetties
Reefs
Rooted Vascular
Shellfish Bed

Distribution:
Tautogs currently inhabit the Hudson River estuary, New York Bight and New York Sound (M. Richardson, personal communication). See locations in Table 1.

Table 1: Data from the Western Long Island Seine Survey (1984-2011), Crustaceans Ventless Lobster Trawl Survey (2007-2009), Crustaceans WLIS Lobster Trawl Survey (2003-2009), Ocean Trawl (2010) and the Peconic Bay Small Mesh Trawl Survey (2006-2012). Years listed below only represent years with tautog occurrences, not necessarily the total duration of the surveys.

Waterbody	Years
Atlantic Ocean	2010
Cold Spring Harbor	2001,2003-2007,2011
Connetquot River	1984,1988
Cutchogue Harbor	2006-2009,2011-2012
Flanders Bay	2007-2009,2011-2012
Gardiners Bay	1988
Great Peconic Bay	1986-1987,2006-2012
Great South Bay Brookhaven	1988,1991
Great South Bay Islip	1984-2001
Hempstead Harbor	1984-1990,2005-2011
Jamaica Bay	1985-2009,2011
Little Neck Bay	1985-1986,1988-1992,1995-2007,2010
Little Peconic Bay	2006-2012
Long Island Sound East	2007-2009
Long Island Sound West	1984-1985,1990,2003-2004,2006-2009
Manhasset Bay	1984-1993,1995-2008,2011
Moriches Bay	2001
Novack Bay	2006-2012
Outside State Waters-Long Island Sound	2003-2004,2006-2009
Oyster bay Harbor	2003-2008,2011
Port Jefferson Harbor	1985,1988,1993-1994,1997,1999,2001-2005
Shelter Island Sound North	2006-2012
Shelter Island Sound South	2006-2012
Shinnecock Bay	1987,2001-2002
South Oyster Bay	1984-1985,1987-1989
Southold Bay	2006,2009-2010
Staten Island	1984-1989
Stony Brook Harbor	1988
Westchester Shoreline	2003-2004,2006-2009



IUCN Red List (2010)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Transportation & Service Corridors	Shipping Lanes (dredging for pipelines and power)	N	L	H
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (recreational and commercial harvest)	W	M	M
3. Human Intrusions & Disturbance	Work & Other Activities (degradation of reef habitat)	N	L	H
4. Pollution	Industrial & Military Effluents (contaminants including cadmium and petroleum)	N	L	H
5. Climate Change & Severe Weather	Habitat Shifting & Alteration (increased water temperatures)	R	H	V
6. Biological Resource Use	Fishing & Harvesting Aquatic Resources (illegal harvest)	W	H	M

References Cited:

Atlantic States Marine Fisheries Commission (ASMFC). 1996. Fishery management plan for tautog. Fishery Management Report No. 25: 1-69.

Atlantic States Marine Fisheries Commission (ASMFC). 2011. 2010 Review of the Atlantic States Marine Fisheries Commission fishery management plan for tautog (*Tautoga onitis*). Tautog Stock Assessment Subcommittee 26p.

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Olla, B.L., A.J Bejda, and A.D. Martin. 1974. Daily activity, movements, feeding, and seasonal occurrence in the tautog, *Tautoga onitis*. Fisheries Bulletin 72:27-35.

Sogard, S.M., K.W. Able, and M.P. Fahay. 1992. Early life history of the tautog, *Tautoga onitis*, in the Mid-Atlantic Bight. Fisheries Bulletin 90:529-539.

Steimle, F.W. and P.A. Shaheen. 1999. Tautog (*Tautoga onitis*) life history and habitat requirements. NOAA Technical Memorandum NMFS-NE-118. 29p.

Common Name: Threespine stickleback ***SGCN – High Priority***
Scientific Name: *Gasterosteus aculeatus*
Taxon: Marine Fish

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G5
New York: S4
Tracked: No

Synopsis:
The threespine stickleback is treated as a species complex, with many unique and reproductively-isolated populations, subspecies, or species. Existing populations are either strictly marine, anadromous, or freshwater resident. Several subspecies have been identified by differences in lateral plate morphs. Current subspecies include *Gasterosteus aculeatus aculeatus*; *G. a. williamsoni*, the unarmored threespine stickleback, which is federally endangered and restricted to CA; and *G. a. santaeannae*, the Santa Ana stickleback. Some taxonomists would classify the sticklebacks inhabiting isolated lakes in British Columbia into many more subspecies (Hammerson et al. 2012). Although the species is abundant and in no threat of extinction, several populations that represent specific diversity are in danger of local extirpation in British Columbia and California.

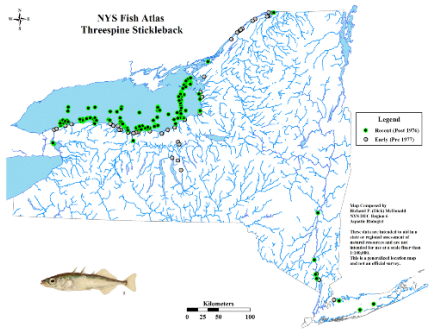
In New York, the threespine stickleback is historically known to be in Lake Ontario, Cayuga Lake, lower Hudson, and Long Island bays area. Non-indigenous populations had been introduced into Lake Erie and into other Great Lakes through the Nipissing Canal from the Ottawa River (Smith 1985, D. Carlson, personal communication). This species inhabits brackish and freshwater habitats. Currently, native populations can be found along the shore of Lake Ontario, in the St. Lawrence River, and Long Island (Smith 1985). In freshwater, this stickleback inhabits weedy pools and backwaters. In marine and brackish waters, this species is associated with seaweed rafts (Page and Burr 2011). Threats known to affect this species are human disturbances to spawning habitat and water quality, and predation by lake trout (*Salvelinus namaycush*) (NatureServe 2012).

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%	X	Common			
11% to 25%		Fairly common	X		
26% to 50%		Uncommon			
> 50%		Rare			

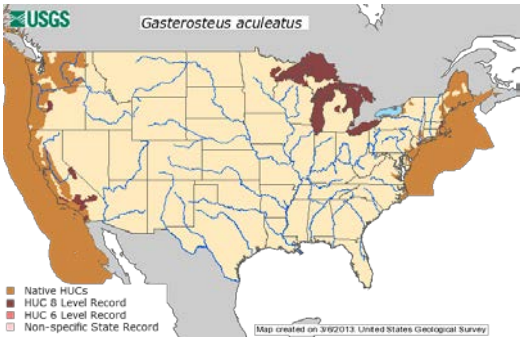
Habitat Discussion:
The threespine stickleback occurs in salt, brackish and freshwater habitats. This species inhabits quiet weedy pools and backwaters, or occurs among emergent plants at stream edges, over bottoms of sand and mud (Lee et al. 1980, Page and Burr 2011). Marine populations apparently are pelagic, usually staying close to shore. In some lakes, two morphologically and ecologically distinct forms may occur, one being littoral and one being limnetic (Hammerson et al. 2010).

Primary Habitat Type
Lake; Large Lake
Marine; Deep Sub-tidal
Tidal Creek

Distribution:
This species is present in Lake Ontario, the St. Lawrence River, and Lower Hudson River and around Long Island (D. Carlson, personal communication). There are current records of this species in Lake Erie (Mandrak and Crossman 1992).



Locations in New York where threespine stickleback have been collected in New York (D. Carlson, personal communication) Map created by Carlson and Daniels, NYSDEC



Native range of *Gasterosteus aculeatus* in North America (Fuller 2013).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Natural System Modifications	Dams & Water Management/Use (change in SAV beds in Hudson River)	N	L	H
2. Pollution	Industrial & Military Effluents (toxic discharge)	R	L	H
3. Pollution	Agricultural & Forestry Effluents (nutrient runoff)	R	L	H
4. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (water chestnut affecting SAV beds)	N	L	M
5. Human Intrusions & Disturbance	Recreational Activities (loss of SAV boating)	W	H	H

6. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss of SAV from climate change)	W	H	V
7. Natural System Modifications	Other Ecosystem Modifications (loss of SAV from dredging)	R	H	H
8. Natural System Modifications	Dams & Water Management/Use (loss of connectivity from culverts, dams)	N	L	H

References Cited:

Carlson, D. 2013. E-mail and excel file about the population distribution of threespine stickleback in New York. Personal communication. NYSDEC. Watertown, NY.

Fuller, P. 2005. *Gasterosteus aculeatus*. USGS Nonindigenous Aquatic Species Database. Gainesville, Florida. http://nas.er.usgs.gov/queries/FaceSheet.asp?SpeciesID=702. Accessed 29 March 2013.

Hammerson, G., Freyhof, J., Kottelat, M. & Lukey, J.R. 2010. *Gasterosteus aculeatus*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. www.iucnredlist.org. Accessed 29 March 2013.

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Page, L.M., and B.M. Burr. 2011. Peterson field guide to freshwater fishes of North America north of Mexico. Second edition. Houghton Mifflin Company, Boston, Massachusetts.

Smith, C.L. 1985. The inland fishes of New York State, New York State Department of Environmental Conservation. Albany, New York. 522 pp.

Common Name: Winter flounder ***SGCN – High Priority***
Scientific Name: *Pseudopleuronectes americanus*
Taxon: Marine Fish

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G5
New York: S3?
Tracked: No

Synopsis:
The winter flounder is a demersal flatfish commonly found in North Atlantic Ocean estuaries and on the continental shelf. Winter flounder occur from the Gulf of St. Lawrence, Canada to North Carolina, although they are not abundant south of Delaware Bay. This species is one of the most abundant components of demersal fish in the Long Island Sound and Hudson-Raritan Estuary and it is an important commercial and recreational fish throughout its range. Some adults move offshore to cooler, deeper waters during the spring and summer, returning in autumn prior to spawning. Since peak landing levels in 1966, winter flounder landings have experienced peaks and dips, with an overall decline to currently low levels. Threats to essential habitat and overfishing have been two of the major causes of decline of winter flounder, with dredging, pollution, nutrient enrichment, and impingement also contributing to mortality rates. Despite very low current fishing mortality, winter flounder populations around New York have not shown any signs of recovery. Winter flounder are also essential prey for osprey in New York, and continued declines of flounder populations may lead to declines in osprey populations (NYSDEC 2005). The New York population is part of the southern New England/Mid-Atlantic (SNE/MA) stock unit managed by the Atlantic States Marine Fisheries Commission (ASMFC) in state waters. Winter flounder stocks were most recently assessed at the 52nd Northeast Regional Stock Assessment Workshop in 2011, where the Stock Assessment Review Committee determined that the Southern New England/Mid-Atlantic (SNE/MA) winter flounder stock has a status of overfished and overfishing is not occurring (NESFC 2011).

Declines in winter flounder stock have impaired fisheries in New York, where commercial catch is less than 9% of peak levels observed during the 1980s and recreational catch is less than 2% of peak levels (Sagarese and Frisk 2011). Spawning stock biomass peaked at 44.3 million pounds in 1982, declining to a low of 9.9 million pounds in 2005. After Amendment I to the ASMFC FMP, spawning stock biomass has increased to nearly 15.6 million lbs. in 2010 (NEFSC 2011).

Within the southern New England/Mid-Atlantic stock of winter flounder, commercial landings have declined from 1964-2011 with periodic peaks and dips (see fig. 4). After reaching a historical peak in 1966 of 26.4 million lbs., harvest levels have fallen to the lowest ever in 2010 with 383,604 lbs. (NEFSC 2011). These low landings may be due to the federal waters retention prohibition, which requires that catch be released, and the limit of 50 lbs. of bycatch within state waters. The commercial fishery accounts for about 90% of total harvest through this region.

Recreational landings peaked in 1984 with 12.1 million lbs. and have declined to an all-time low in 2010 with 61,729 lbs. By 2010, landings fell to a historic low of 62,000 lbs., likely due to the federal retention prohibition and 2-fish bag limit for recreational fishing in state waters (see fig. 4; ASMFC 2012).
The NYSDEC's small mesh trawl survey caught a total of 659 winter flounder in June and July of 2011, an increase from the survey's low in 2002 of 83 individuals, but still much lower than the survey maximum (25,782) in 1992 (NEFSC 2011).

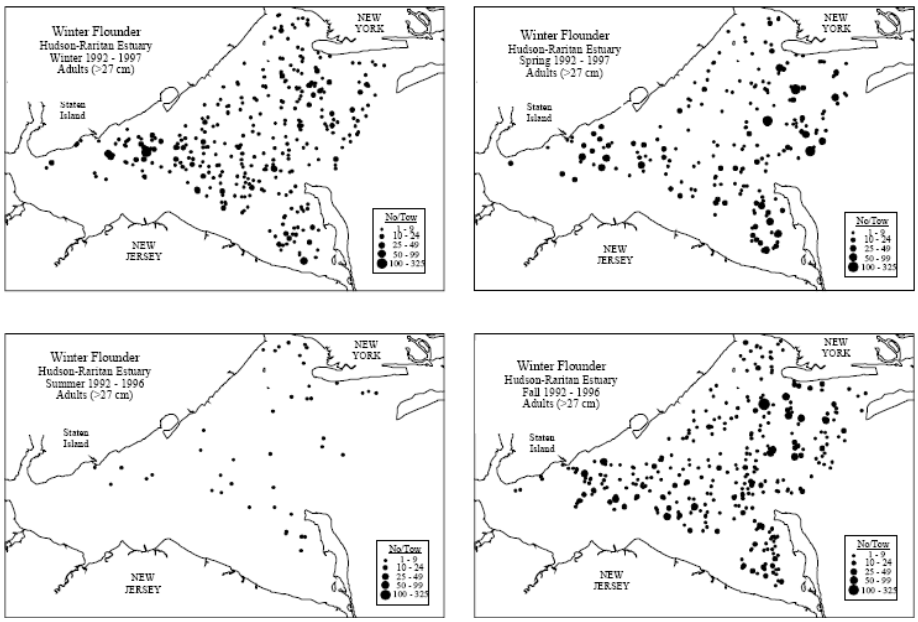
Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant		Moderate Decline	Severe Decline
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%	X	Rare			

Habitat Discussion:
Eggs require bottom habitats with a substrate of sand, mud or gravel in the inshore areas of southern New England. Temperatures must be less than 10˚C, salinities between 10-30%, and water depths less than 5 meters. Larvae require pelagic and bottom waters with depths less than 6 meters and surface temperatures less than 15˚C. Young-of-the-year (YOY) and juveniles both require bottom habitats and will occur where temperatures are below 28˚C at depths of 1 to 50 meters (Periera et al. 1999). While YOY and juveniles reside permanently in the estuaries, adults may leave the estuary in late spring/summer, migrating to deeper, cooler portions of estuaries or to offshore areas, returning in autumn prior to spawning. Vegetated habitat, such as submerged aquatic vegetation and macroalgal beds, also provide important nursery habitat for juveniles (ASMFC 2012).

In New York, two distinct behavioral groups have been identified: an inshore contingent that is present in coastal bays year-round, and an offshore contingent of larger individuals that travels inshore during winter to spawn (Sagarese and Frisk 2011). In contrast to the expectations in previous literature, Sagarese and Frisk (2011) documented adult winter flounder occurring in Shinnecock Bay, NY during all seasons, with 89% occurring between May and October when they should have been offshore in cooler water. Habitat degradation from dredging, pollution, runoff, nutrient enrichment, and construction of inshore structures has increased mortality rates of winter flounder.

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

Distribution:
Winter flounder occur throughout the Long Island Sound and Hudson-Raritan Estuary.



Distribution and abundance of adult winter flounder collected in the Hudson-Raritan estuary, based on Hudson-Raritan trawl surveys during winter (January-March), spring (April and June), summer (July-August) and fall (October-December) from January 1992 to June 1997 (Pereira et al. 1999).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Transportation & Service Corridors	Shipping Lanes (dredging)	N	L	H
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (overfishing)	P	H	M
3. Natural System Modifications	Other Ecosystem Modifications (in-water and shoreline structures)	N	L	M
4. Pollution	Household Sewage & Urban Waste Water (enrichment from waste water treatment facilities)	P	M	H
5. Pollution	Agricultural & Forestry Effluents (agricultural runoff/groundwater)	P	M	H
6. Climate Change & Severe Weather	Temperature Extremes (warming winter temperatures – predation of spawners)	P	M	V
7. Climate Change & Severe Weather	Habitat Shifting & Alteration (warming summer temperatures – survival/fitness)	P	M	V
8. Pollution	Air-Bourne Pollutants (mosquito spraying)	N	L	M

References Cited:

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