Common Name: Bay scallop
Scientific Name: *Argopecten irradians*
Taxon: Marine Mollusks

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

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

Synopsis:
The bay scallop, *Argopecten irradians*, is a short-lived marine bivalve common along the eastern coast of the United States. Their distribution in North America ranges from Cape Cod, Massachusetts to Laguna Madre, Texas (Fay et al. 1983). Three subspecies exist along this range with the New England and mid-Atlantic, *Argopecten irradians irradians* overlapping in southern New Jersey with *A. i. concentricus* (Fay et al. 1983). Bay scallops can live in a variety of habitats but eelgrass beds appear to be preferential, providing shelter from predators and, due to reduced water velocity, an accumulation of particulate matter on which they can filter-feed (MacKenzie 2008b, Fay et al. 1983, Peterson et al. 1984). Although never as large as oyster and clam fisheries, historically, bay scallops did support a thriving fishery in Massachusetts, New York, and North Carolina (MacKenzie 2008a). However, due to mass eelgrass die-offs in the 1930s and 1980s (from wasting disease and brown tide, respectively), bay scallop abundance and subsequent harvest plummeted (MacKenzie 2008a). Bay scallop populations in New York, and other coastal areas, have yet to return to their historic levels and this is believed to be tied to low densities of spawning stock (resulting in low fertilization success) and loss of their optimal habitat, eelgrass beds (Tettlebach and Smith 2009, Fonseca and Uhrin 2009).

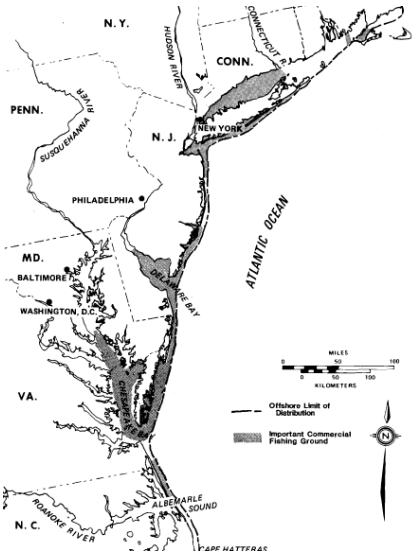
Bay scallops once supported a profitable commercial fishery in Massachusetts, New York, and North Carolina waters (MacKenzie 2000a). In the 1930s bay scallop populations and catch plummeted in conjunction with an eelgrass die-off in North American and Europe, due to "wasting disease" (Fonseca and Uhrin 2009). Although some populations were able to slightly recover over time, in the 1980s additional eelgrass die-offs occurred in the coastal waters of Long Island due to brown tide (Fonseca and Uhrin 2009). These brown tide events caused bay scallops in Long Island waters to come close to extirpation (Tettlebach and Smith 2009). Again in 1995, another brown tide event decimated bay scallop populations, and bay scallops have yet to significantly rebound in abundance (Tettlebach and Smith 2009). The lack of recovery is attributed to loss of habitat and low fertilization success (due to a small and insufficiently densely distributed spawning stock) (Tettlebach and Smith 2009). Bay scallop plantings and small spawner sanctuaries have seen some success and will hopefully contribute to the future self-sustainability of New York populations (Tettlebach and Smith 2009, Rossi-Snook 2012). In 2012, 34,480 bushels of bay scallops were commercially harvested from New York (NYSDEC 2012). Although higher than some previous years, particularly the late-1980s and early-1990s, this harvest number is still significantly lower than the peak commercial harvest in 1962 of 164,646 bushels (NYSDEC 2012).

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

Habitat Discussion:
Bay scallops are found on the Atlantic coast from Cape Cod, Massachusetts to the Gulf of Mexico near Texas. Their distribution is primarily estuarine or near-coastal usually being found no more than three miles offshore (Fay et al. 1983). Bay scallops can live on a variety of substrates but eelgrass beds appear to be preferential habitat (Fay et al. 1983). Not only does this habitat protect bay scallops from predation during all life stages, but is an optimal place to feed and grow due to a reduction in water velocity and subsequent accumulation of food material in these beds (Mackenzie 2008b, Fay et al. 1983; Peterson et al. 1984). Spawning in or near eelgrass beds is also thought to significantly increase concentrations of gametes thus ultimately resulting in an increased chance of fertilization (MacKenzie 2008b). Fay et al. (1983) cites a preferential depth of 0.3 to 10 meters, with bay scallops being found as deep as 18 meters. Various life stages of the bay scallop have preferential salinities and temperatures at which they function optimally (Fay et al. 1983).

Primary Habitat Type
Estuarine; Brackish Intertidal
Estuarine; Brackish Shallow
Marine; Intertidal

Distribution:
Currently, bay scallops are primarily harvested from Little Peconic Bay, Great Peconic Bay and Gardiners Bay. Bay scallops are still harvested in Great South Bay's western end, between Jones and Fire Island Inlets, in years when they are present (MacKenzie 2008b).



Fay et al. (1983)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
Biological Resource Use	Fishing &Harvesting Aquatic Resources (legal harvest)	R	L	L
Human Intrusions & Disturbances	Recreational Activities (loss of seagrass)	N	L	L
Climate Change & Severe Weather	Habitat Shifting & Alteration (loss of seagrass; water temperature)	W	H	V
Pollution	Household Sewage & Urban Waste Water (point source)	W	H	V
Pollution	Household Sewage & Urban Waste Water (non-point source: groundwater)	P	H	H
Pollution	Agricultural & Forestry Effluents (algal bloom/eutrophication/ water chemistry changes)	P	H	H
Biological Resource Use	Fishing & Harvesting Aquatic Resources (illegal harvest)	N	L	L

References Cited:

Fay, C.W., R.J. Neves, and G.B. Pardue. 1983. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic)—bay scallop.1J.S. Fish and Wildlife Service, Division of Biological Services, FWS/OBS-82/11.12. U.S. Army Corps of Engineers.TR EL-82-4. 17 pp.

Fonseca, M. S., and A.V. Uhrin. 2009. The Status of Eelgrass, *Zostera marina*, as Bay Scallop Habitat: Consequences for the Fishery in the Western Atlantic. Marine Fisheries Review. 71 (3): 21-33.

Mackenzie, C.L., Jr. 2008a. History of the Bay Scallop, *Argopecten irradians*, Fisheries and Habitats in Eastern North America, Massachusetts through Northeastern Mexico. Marine Fisheries Review. 70(3-4):

MacKenzie, C.L., Jr. 2008b. The bay scallop, *Argopecten irradians*, Massachusetts through North Carolina: its biology and the history of its habitats and fisheries. Marine Fisheries Review. 70:6–79.

New York State Department of Environmental Conservation (NYSDEC). 2012. Shellfish Landings History 1946-2012.

Peterson, C.H., H.C. Summerson, and P.B. Duncan. 1984. The influence of seagrass cover on population structure and individual growth rate of a suspension-feeding bivalve, *Mercenaria mercenaria*. Journal of Marine Research. 42(1): 123-138.

Tettlebach, S.T., and C.F. Smith. 2009. Bay Scallop Restoration in New York. Ecological Restoration. 27(1):20-22.

Common Name: Eastern oyster
Scientific Name: *Crassostrea virginica*
Taxon: Marine Mollusks

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G5
New York: Not Ranked
Tracked: No

Synopsis:
The eastern oyster, *Crassostrea virginica* is a sessile bivalve that is distributed along the eastern coast of the U.S. with a native range extending from Canada to Mexico. They have been introduced for aquaculture purposes to Japan, Great Britain, Australia, Hawaii, and the western coast of the United States (Sellers and Stanley 1984). Oysters live in brackish estuarine waters and are generally found clustered in oyster beds or reefs. Larval oysters often settle on adult oyster shells and remain in that location for the remainder of their life (Sellers and Stanley 1984). Historically, oysters supported a large commercial fishery in New York and throughout their range (NYSDEC 2005, BRT 2007). Eastern oyster abundance has declined throughout its range, including New York, resulting in declines in commercial harvest and the loss of ecological functions such as water filtration and habitat for fish and invertebrates (BRT 2007). Currently, most of the commercial harvest from New York, New Jersey, Connecticut and Massachusetts comes from aquaculture (J. O'Dwyer, pers. comm.). Some current threats to oysters in New York waters include poor water quality, a lack of suitable attachment sites, and disease (BRT 2007, NYSDEC 2005). Presently, The Oyster Restoration Research Project (ORRP) is researching the efficiency of artificially built reefs, and will hopefully one day be able to restore oyster reefs in the New York City/Hudson River area (Grizzle et al. 2011).

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

Habitat Discussion:
Shallow estuaries are optimal habitat with the preferential depth in mid-Atlantic waters cited as 0.6 to five meters (Sellers and Stanley, BRT 2007). Both rocky and muddy bottoms are suitable substrates for oyster attachment, provided that the mud can support the oyster's weight (Sellers and Stanley 1983). The preferred attachment and settling site for larval oysters is upon adult oyster shells in oyster beds or reefs (Sellers and Stanley 1983). Since adult oysters are sessile, once settled they spend the remainder of their life at their original attachment site. Larval oysters, spat, and adults all have optimal water temperature and salinity ranges; however, adult oysters are much more tolerant of fluctuating conditions when compared to the other life stages (Sellers and Stanley 1983).

Primary Habitat Type
Estuarine; Brackish Intertidal
Estuarine; Brackish Shallow

Distribution:
Currently, there are no naturally occurring reefs in Great South Bay, Long Island Sound, Raritan Bay, or the Hudson River. However, Mecox Bay, Southampton, East Hampton town waters, the Huntington-Northport Bay complex, and Mattituck Inlet all have stable oyster populations, although many of these towns supplement their natural populations with oysters from shellfish hatcheries (NYSDEC 2005).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources	W	M	L
2. Invasive& Other Problematic Species & Genes	Problematic Native Species (predators)	P	L	H
3. Pollution	Household Sewage &Urban Waste Water (eutrophication/algal blooms)	P	H	H
4. Pollution	Agricultural & Forestry Effluents	P	H	H
5. Pollution	Air-Borne Pollutants (ocean acidification)	P	H	H
6. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (disease: dermo, MSX)	P	H	V
7. Natural System Modifications	Other Ecosystem Modifications (conversion of shell beds to mudflats)	P	M	M

References Cited:
Eastern Oyster Biological Review Team (BRT). 2007. Status review of the eastern oyster (*Crassostrea virginica*). Report to the National Marine Fisheries Service, Northeast Regional Office. February 16, 2007. 105 pp.

Grizzle, R., K. Ward, J. Lodge, K. Mosher-Smith, K. Kalchmayr, and P. Malinowski. 2011. Oyster Restoration Research Project (ORRP) Technical Report: ORRP Phase I: Experimental Oyster Reef Development and Performance Results. 20 pp.

New York State Department of Environmental Conservation (NYSDEC). 2005. New York State Comprehensive Wildlife Conservation Strategy. http://www.dec.ny.gov/docs/wildlife_pdf/appendixa8.pdf. Accessed 7 June 2013.

Sellers, M.A., and J.G. Stanley. 1984. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (North Atlantic)—American oyster. U.S. Fish Wildl. Serv. FWS/OBS-82/11.23. U.S. Army Corps of Engineers, TR EL-82-4. 15 pp.

Common Name: Hard clam ***SGCN – High Priority***
Scientific Name: *Mercenaria mercenaria*
Taxon: Marine Mollusks

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G5
New York: Not Ranked
Tracked: No

Synopsis:
Hard clams, commonly known as little necks, cherrystones, or northern quahogs (depending on their size), are found along the entire eastern coast of the U.S and into the Gulf of Mexico. They have been introduced for aquaculture purposes to the western U.S. coast, Asia, the Caribbean, and Europe (Eversole 1987). Hard clams are a popular food item and are often harvested both recreationally and commercially for that purpose. They are filter-feeding, benthic organisms and prefer a sandy-muddy substrate in which they can burrow (Eversole 1987). They are long-lived, typically living from 12 to 20 years, with some individuals being aged at 40 years (NOAA 2013).

Historically, New York supported a productive and profitable hard clam fishery (NYSDEC 2005). Since the 1980s hard clams have been declining in abundance, with the cause of the decline directly linked to overfishing in the 1970s and 1980s (Bricelj 2009). Harvest pressure has been greatly reduced since its peak in 1976 but populations have yet to recover and several factors appear to be impeding this recovery (Bricelj 2009). These include harmful algal blooms (i.e., brown tide), habitat loss, and inadequate densities, distributions, and viability of spawning adults (Bricelj 2009, LoBue and Starke 2013). Additionally, this species has been negatively impacted by the parasitic infection specific to hard clams, Quahog Parasite Unknown (QPX) (Sunila n.d., NYSG 2003).

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

Habitat Discussion:
Hard clams naturally occur along the eastern coast of North America from the Gulf of St. Lawrence, Canada to the northern part of the Gulf of Mexico (Kraeuter 2004). They can burrow up to 15 centimeters below the substrate surface and occur in a variety of substrates including sand flats and eelgrass beds. A bottom that is a mix of sand and mud with shells or other debris present is the preferential habitat (Kraeuter 2004, NOAA 2013). Hard clams can be found in a range of salinities (12 to 30 ppt) but are generally more abundant in salinities that are greater than 15 ppt (Kraeuter 2004). They are found in the intertidal zone out to depths of 15 meters (Eversole 1987). Hard clams have been introduced for aquaculture purposes to the western U.S. coast, the Caribbean, Europe, and parts of Asia (Kraeuter 2004, NOAA 2013).

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

Distribution:
Hard clams most likely still occur in all bays around Long Island. Harvest in 2012 came from many South Shore bays including but not limited to: Oyster Bay, Great South Bay, Patchogue Bay, Bellport Bay, Narrow Bay, Moriches Bay, Moneybogue Bay, Quantuck Bay, Quogue Canal, and Shinnecock Bay. They also were harvested from the Peconics, Gardiners Bay, Flanders Bay, Napeague Bay, the Long Island Sound, Huntington and Northport Bay, Oyster Bay, Cold Spring Harbor, Hempstead Harbor and other North shore areas (NYSDEC 2012). Raritan Bay has high densities of clams but due to water quality this area is closed to harvest (J. O'Dwyer, pers. comm.).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources	R	L	L
2. Natural System Modifications	Other Ecosystem Modifications (loss of seagrass)	W	L	H
3. Pollution	Air-Borne Pollutants (ocean acidification)	P	L	V
4. Pollution	Household Sewage & Urban Waste Water (loss of food and habitat)	W	H	H
5. Pollution	Agricultural & Forestry Effluents (loss of food and habitat)	P	H	H
6. Human Intrusions & Disturbances	Recreational Activities (loss of seagrass)	N	L	L
7. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss of seagrass-water temperature)	W	H	V
8. Agriculture & Aquaculture	Annual & Perennial Non-Timber Crops (eutrophication, algal bloom, water chemistry changes)	P	H	H
9. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (QPX disease)	R	L	H

References Cited:

Bricelj, V. M. 2009. The Hard Clam Research Initiative: Factors Controlling *Mercenaria mercenaria* Populations in South Shore Bays of Long Island, NY. New York Sea Grant, Report NYSGI-T-09-001.

Eversole, A.G. 1987. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic)—hard clam. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.75). U.S. Army Corps of Engineers, TR EL-82-4.

Kraeuter, J.N. 2004. Cultured Aquatic Species Information Programme. *Mercenaria mercenaria*. Cultured Aquatic Species Information Programme. In: FAO Fisheries and Aquaculture Department [online]. Accessed 28 May 2013.

LoBue, C., and A. Starke. 2013. Hard clam (*Mercenaria mercenaria*) restoration in Great South Bay (2010-2012). The Nature Conservancy, Long Island Chapter.

National Oceanographic and Atmospheric Administration (NOAA). 2013. NOAA Fishwatch: Northern Quahog. http://www.fishwatch.gov/seafood_profiles/species/clams/species_pages/northern_quahog_clam_farmed.htm. Accessed 28 May 2013.

New York State Department of Environmental Conservation (NYSDEC). 2005. New York State Comprehensive Wildlife Conservation Strategy. http://www.dec.ny.gov/index.html. Accessed 29 May 2013.

New York State Department of Environmental Conservation (NYSDEC). 2013. Shellfish Harvest Limits. http://www.dec.ny.gov/outdoor/29870.html. Accessed 17 May 2013.

New York Sea Grant (NYSG). 2003. QPX Disease in Hard Clams, Quahog Parasite Unknown. http://xs1.somas.stonybrook.edu/~MADL/pubspdf/qpxfactsheet.pdf. Accessed 7 June 2013.

Sunila, I. n.d. QPX Disease. Connecticut Department of Agriculture, Bureau of Aquaculture and Laboratory. http://seagrant.uconn.edu/whatwedo/aquaculture/pdf/qpx.pdf. Accessed 7 June 2013.