

Species Status Assessment

Common Name: American lobster

Date Updated: 12/1/2023

Scientific Name: *Homarus americanus*

Updated by: Kyle Martin, MISC

Class: Malacostraca

Family: Nephropidae

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

American lobsters are benthic crustaceans which inhabit rocky reefs, as well as sandy and muddy bottoms. American lobsters can be found all along the continental shelf of the western North Atlantic, with higher abundances in their northern range and lower abundance in the southern portion of their range. Within the U.S., American lobsters have historically been categorized into three biological stocks – Gulf of Maine (GOM), Georges Bank (GBK), and Southern New England (SNE), but evidence of connectivity between the GOM and GBK stocks has been discovered during the 2015 ASMFC stock assessment. Therefore, the GOM and GBK stocks have since been combined into one stock (GOM/GBK). New York's American lobster population is in the SNE stock. The GOM/GBK stocks have been experiencing record highs in rate of increase, abundance, biomass, and recruitment in recent years. Meanwhile, SNE stocks have declined to record low levels in abundance, biomass, and recruitment in the past 20 years due to continued fishing pressure and changing environmental conditions. (ASMFC 2020).

I. Status

a. Current legal protected Status

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

ii. **New York:** Not Listed

b. Natural Heritage Program

i. **Global:** G5 secure

ii. **New York:** S2 imperiled **Tracked by NYNHP?:** No

Other Ranks:

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

-IUCN Red List: Least Concern

Status Discussion:

American lobster abundance has been increasing in the Gulf of Maine and Georges Bank stocks, while the Southern New England stock, including New York's population, has been steadily declining since the late 1990s.

Warming waters around New York has been linked to decreasing fecundity and overall abundance of the SNE American lobster stock. Increased temperatures induce stress in lobsters and increase epizootic shell disease incidence. The SNE stock is considered overfished but overfishing is not occurring while the GOM and GB stocks are not overfished and overfishing is not occurring (ASMFC 2020).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Stable	Stable	1997-2009		-
Northeastern US	Yes	Declining	Stable	2002-2012 SNE Stock		-
New York	Yes	Declining	Stable	1997-2009		Yes
Connecticut	Yes	Declining	Stable	1997-2009	Not Listed	Yes
Massachusetts	Yes	Increasing	Stable	1997-2009	Not Listed	Yes
New Jersey	Yes	Declining	Stable	1997-2009	Not Listed	Yes
Pennsylvania	No	-	-			-
Vermont	No	-	-			-
Ontario	No	-	-			-
Quebec	Yes	Increasing	Stable	1997-2009	Not Listed	-

Column options

Present?: Yes; No; Unknown; No data; (blank) or Choose an Item

Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item

SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

The NYSDEC currently runs a sea sampling program for the American lobster during the commercial fishery's open season. This program involves monitoring catch from commercial fishermen and is conducted in the Long Island Sound (LIS), eastern end of Long Island, and the ocean along the south shore of Long Island. The data is used to characterize NY's commercial landings by collecting information on catch per unit effort, size distributions and sex ratios of lobsters.

Data from the National Marine Fisheries Service (NMFS) and the Northeast Area Monitoring and Assessment Program (NEAMAP) trawl surveys are also used for assessments on the American lobster population in NY. The NMFS' Northeast Fisheries Science Center Ecosystem Surveys Branch conducts several cruises throughout the year and collects biological data on a wide array of species (NMFS 2012). Since 2008, NEAMAP has been conducting both spring and fall surveys from Cape Cod, MA to Cape Hatteras, NC (VIMS 2013). The Connecticut Department of Energy and Environmental Protection (CT DEEP) also conducts a trawl survey that collects data on a variety of marine species that are found in the Long Island Sound, including the American lobster.

Past monitoring efforts in NY include a survey conducted from 2003 to 2009 to estimate young-of-the-year (YOY) indices and a ventless trap survey that was conducted along the south shore of Long Island from 2006 to 2009. Various state agencies still conduct this coastwide study as part of the provisions set forth by the ASMFC. Lobster population data in New York is collected from fishery-dependent sampling of commercial and recreational lobster landings, as well as data collected from fishery-independent surveys such as NEAMAP and SoMAS Near Shore Ocean Trawl.

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

The Atlantic States Marine Fisheries Commission 2020 American Lobster Benchmark Stock Assessment and Peer Review Report indicates record high abundance and recruitment in the Gulf of Maine/Georges Bank stock, while record low abundance and recruitment has been reported in the Southern New England stock. Abundance of lobster in the SNE stock has declined by 85% since the 1990s. Based on models of climatic predictions, it has been estimated that by 2030, only ~20% of habitat within the SNE area would be at least moderately suitable for American Lobster (Tanake 2020). Decreased habitat suitability has driven lobster populations’ movement from inshore habitats to cooler offshore habitats (Mazur 2020). The overall decline of SNE lobster populations is attributed to physiological stressors related to changing environmental factors, which include increasing sea bottom temperatures, climate-driven recruitment failure, and incidence of epizootic shell disease (Goldstein 2022; ASMFC 2020).

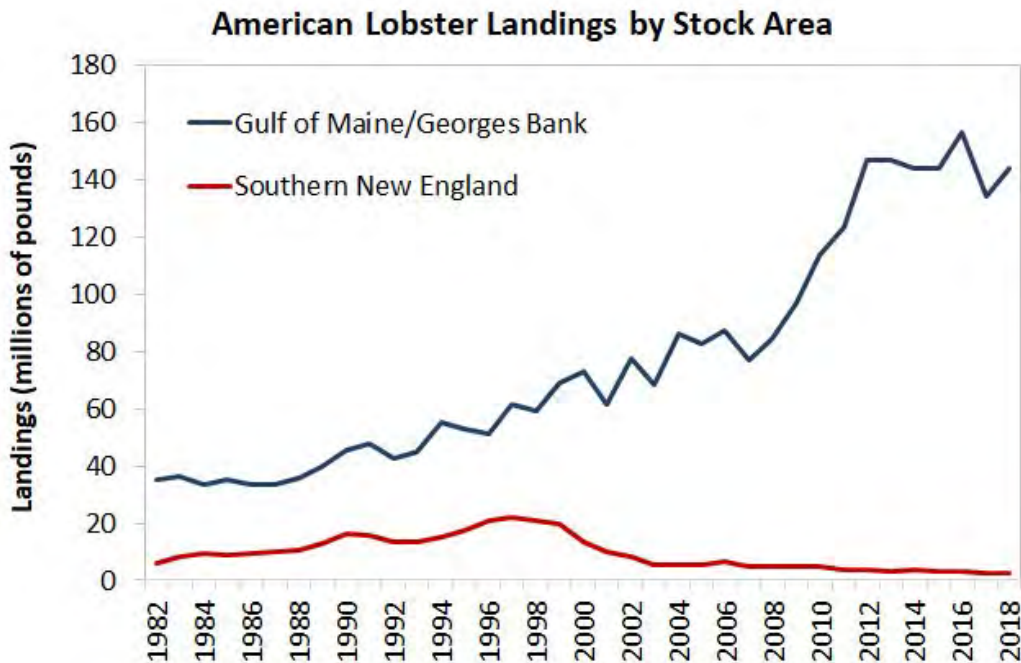
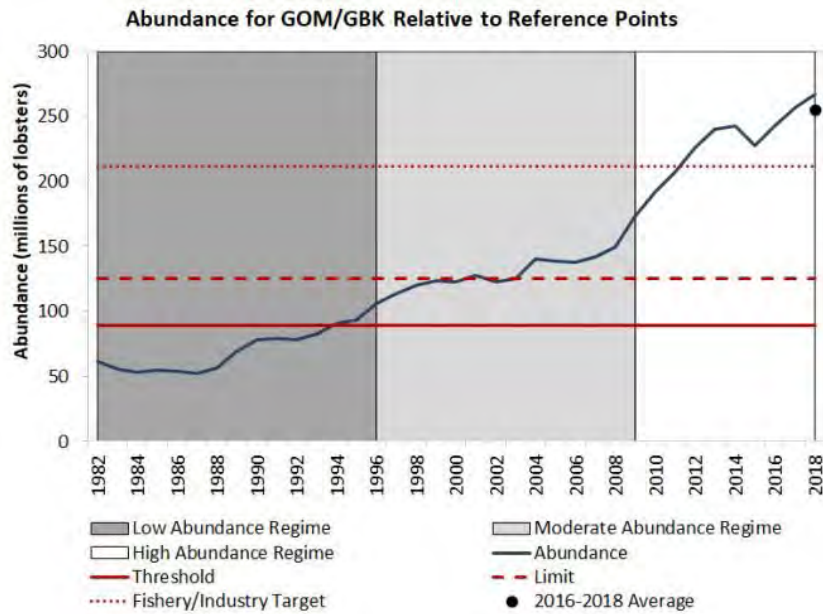
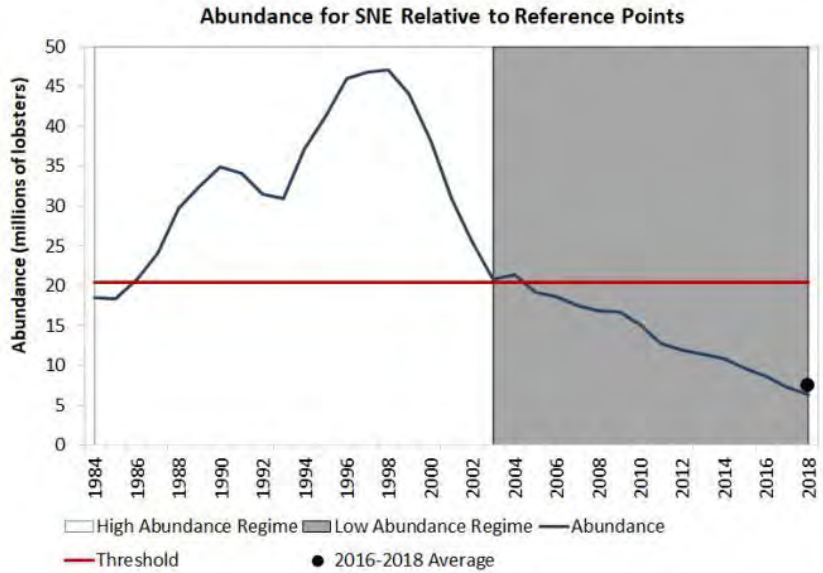


Figure 1. Current American lobster population trend by stock area (ASMFC 2023)



GOM/GBK stock abundance (solid blue line) compared to the fishery/industry target (dotted red line), abundance limit (dashed red line), and abundance threshold (solid red line) reference points based on detected low (dark grey period), moderate (light grey period), and high (white period) abundance regimes. The circle is the three-year (2016-2018) average reference abundance.



SNE stock abundance (solid blue line) compared to the abundance threshold (solid red line) reference point based on detected low (dark grey period) and high (white period) abundance regimes. The circle is the three-year (2016-2018) average reference abundance.

Figure 2. American lobster stock abundance relative to reference points (ASMFC 2023)



Figure 3. IUCN Red List distribution map of the American lobster

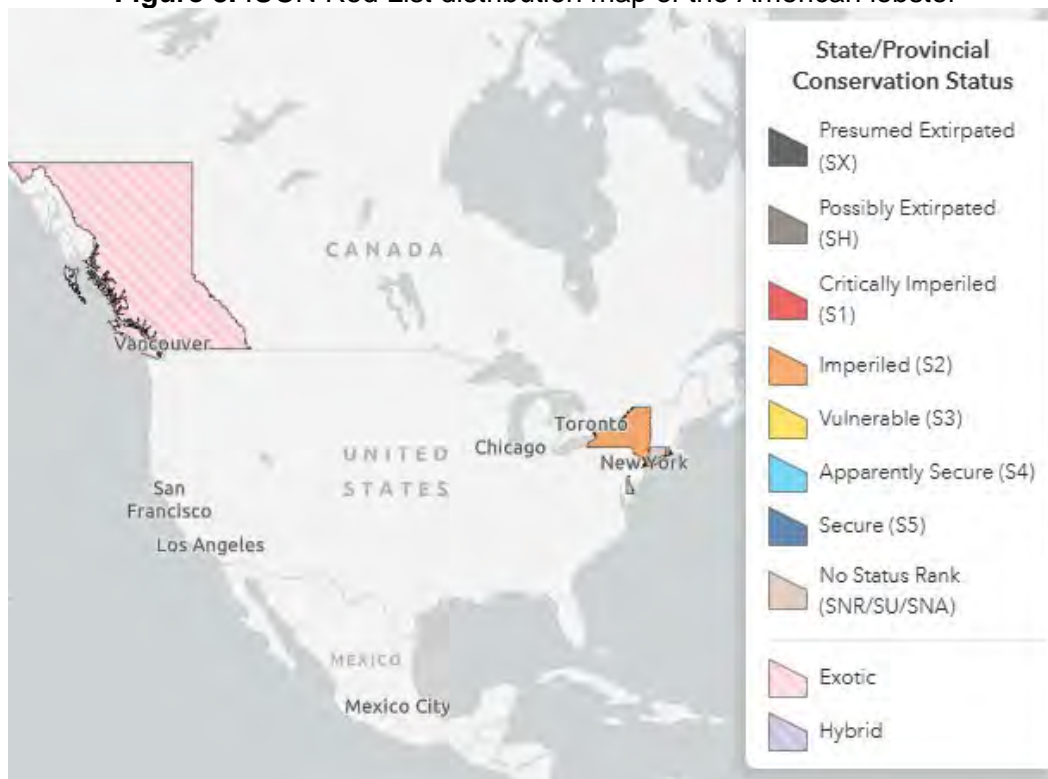
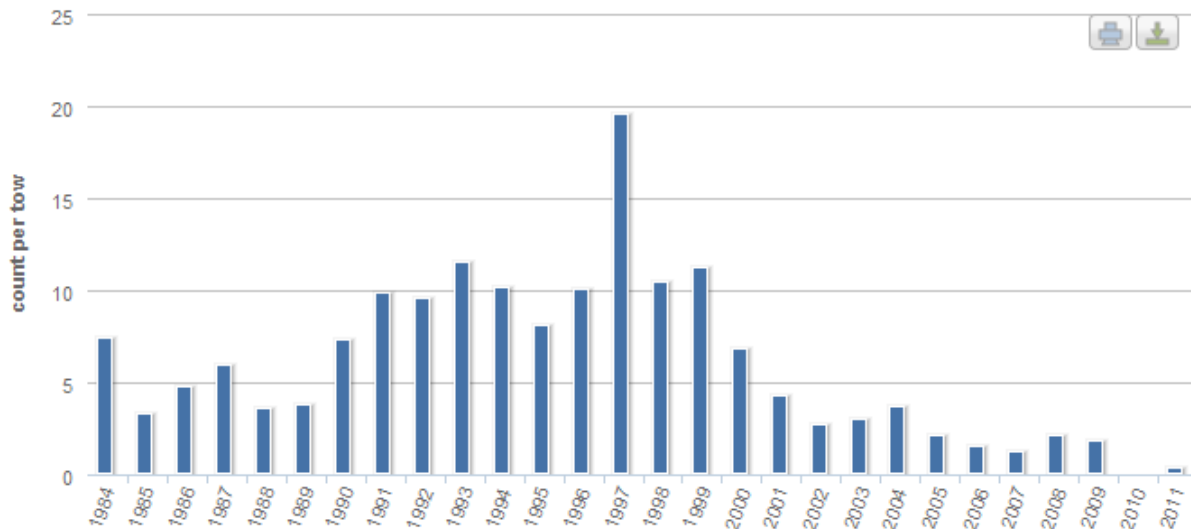


Figure 4. Conservation status of American Lobster in North America (NatureServe 2024).

STATUS & TRENDS: LISS ENVIRONMENTAL INDICATORS

TYPE OF INDICATORS: ▲ Health/Condition ● Response/Performance ■ Socio-Economic Historical/Background

▲ Lobster Abundance



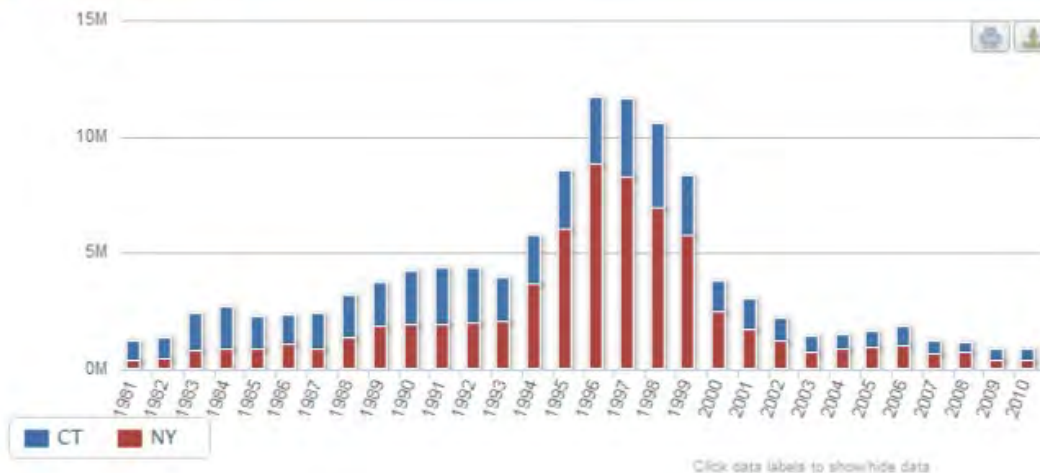
Source: CTDEEP Long Island Sound Trawl Survey (fall sampling) * No fall survey was conducted in 2010 due to research vessel being out of service.

Figure 5. Lobster abundance in the Long Island Sound as measured by average count per tow. Data taken from the CTDEEP Long Island Sound Fall Trawl Survey (LISS 2013).

STATUS & TRENDS: LISS ENVIRONMENTAL INDICATORS

TYPE OF INDICATORS: ▲ Health/Condition ● Response/Performance ■ Socio-Economic Historical/Background

■ Lobster Landings



Source: CTDEEP and NYSDEC

Figure 6. Lobster landings from New York and Connecticut (LISS 2013).

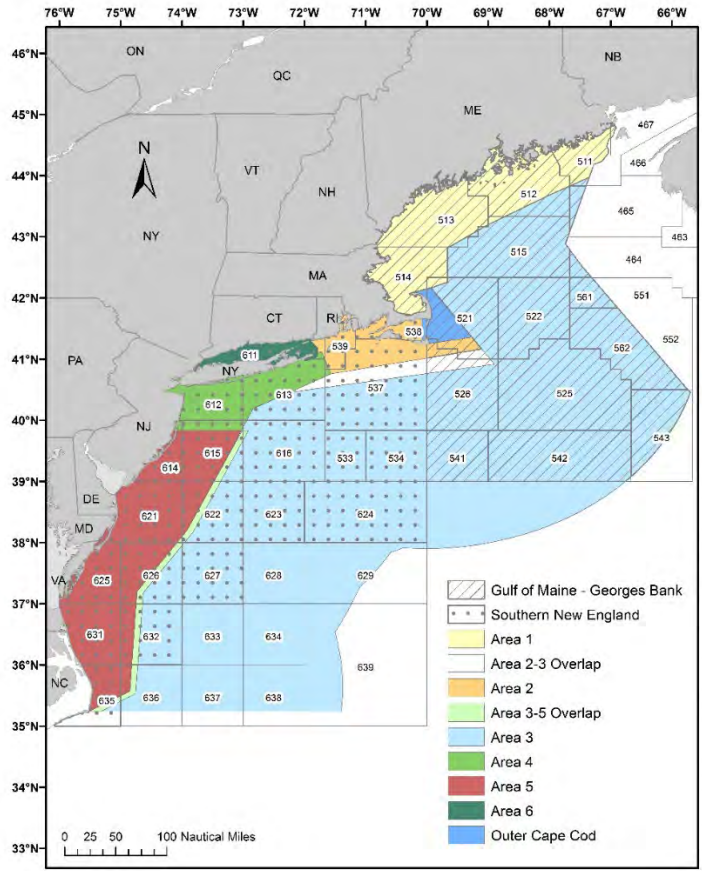


Figure 7. Map of American Lobster Conservation Management Areas and Statistical Areas to define the American lobster stock (ASMFC 2023)

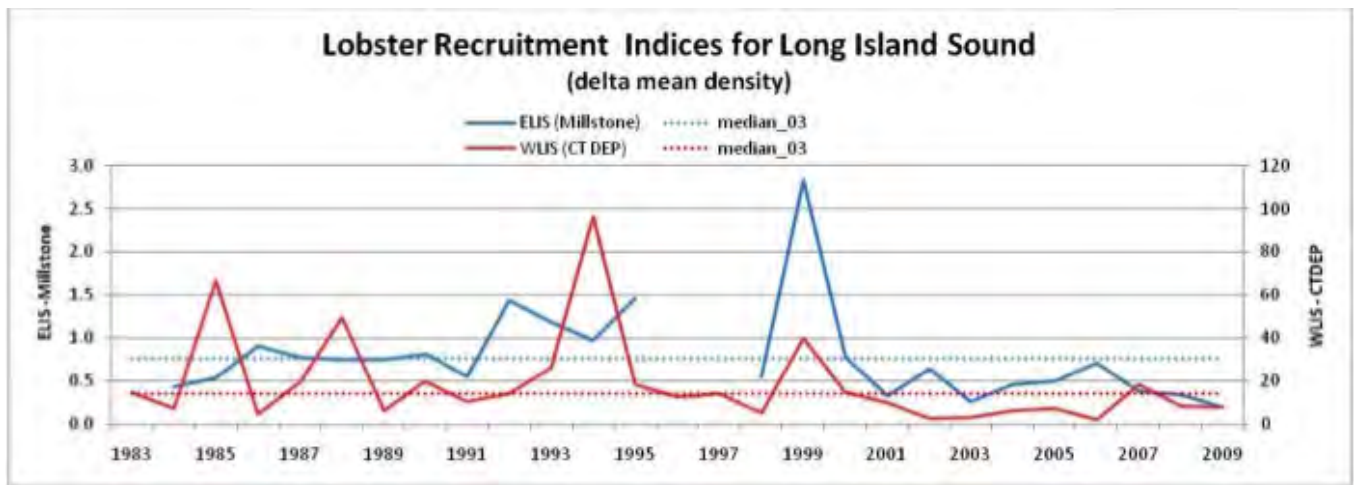


Figure 8. Larval indices for the Long Island Sound lobster population. Eastern Long Island Sound (ELIS) data are entrainment densities of lobster larvae at the Millstone Power Station; data provided courtesy of Dominion Nuclear Connecticut. Western Long Island Sound (WLIS) data are densities of stage 4 lobster larvae caught in the CT DEP plankton survey at seven fixed stations in NY and CT waters of western Long Island

Sound (taken from ASMFC 2010).

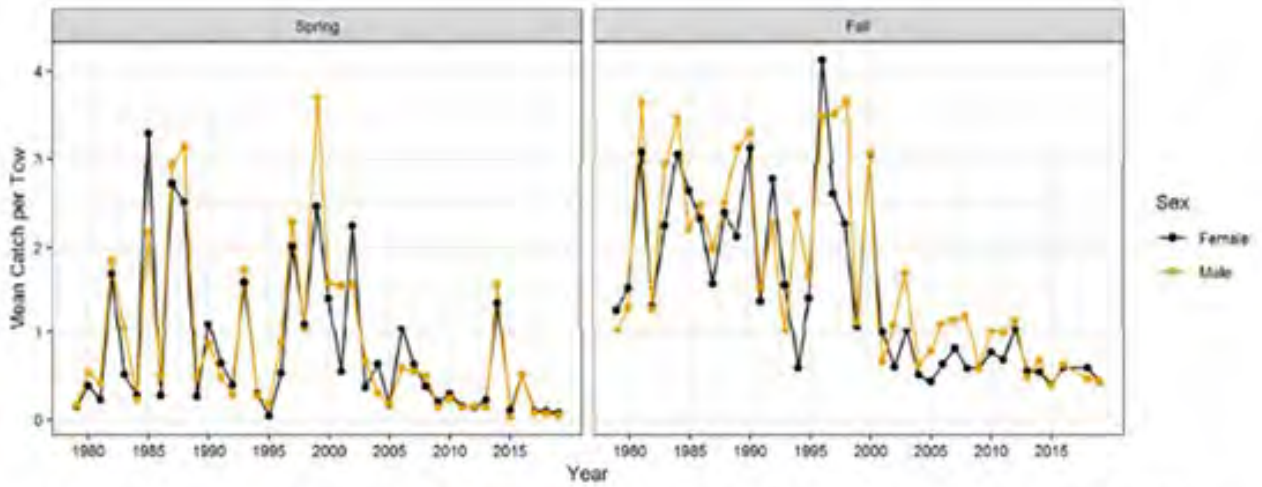


Figure 108. NEFSC Trawl Survey seasonal mean catch per tow of 53+ mm CL lobsters from SNE strata.

Figure 9. NEFSC Fall and Spring Bottom Trawl Survey (ASMFC, 2020)

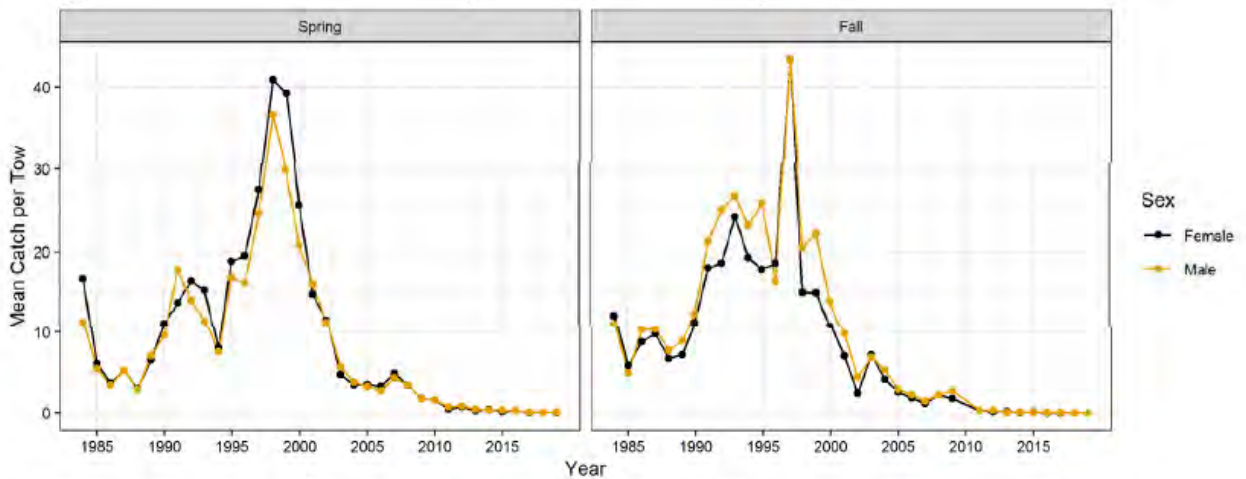


Figure 112. CT Trawl Survey seasonal mean catch per tow of 53+ mm CL lobsters.

Figure 10. CT Trawl Survey (ASMFC, 2020)

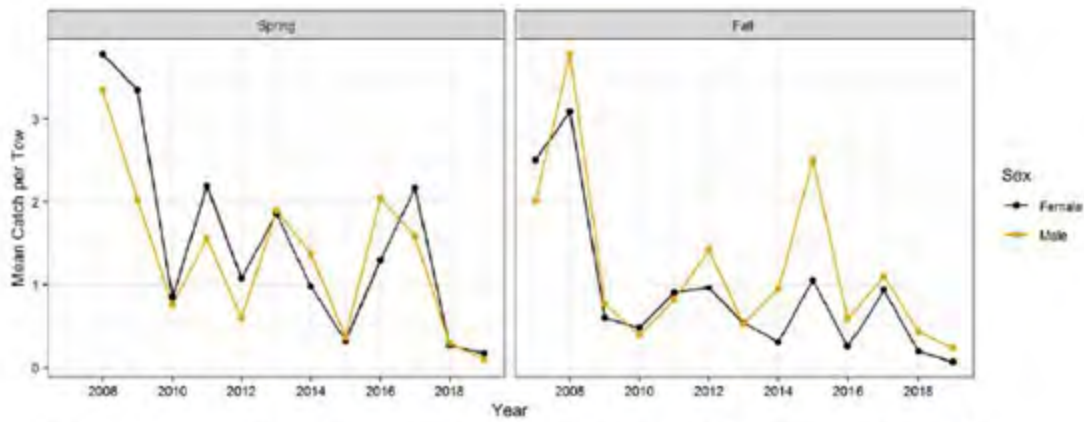


Figure 109. NEAMAP Trawl Survey seasonal mean catch per tow of 53+ mm CL lobsters.

Figure 11. NEAMAP Trawl Survey (ASMFC, 2020)

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

The American lobster is not rare in New York's coastal waters and is present in favorable habitat.

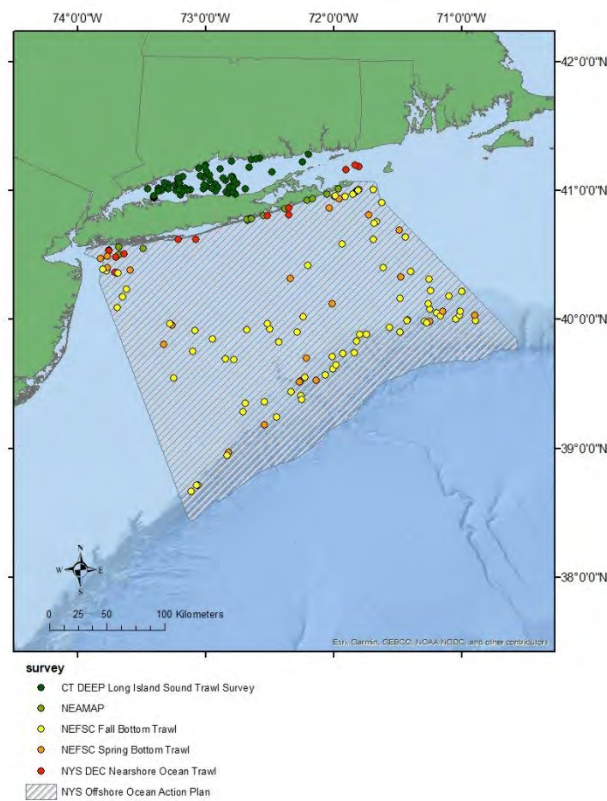


Figure 12: Records of American lobster between 2015-2020 within the geographic scope of the NY Ocean Action Plan

Details of historic and current occurrence:

Historic:

Lobster has been an economically and culturally important fishery throughout New England for hundreds of years. Historically, the SNE fishery was predominately an inshore fishery with landings that peaked in 1997 at 21.8 million pounds and accounted for 26% of the U.S. lobster landings. (ASMFC 2023)

Current:

In 2010, landings in Long Island Sound were 412,289 lbs. A peak number of landings occurred in Long Island Sound in 1996 followed by another year of high landings in 1997 (8,833,655 lbs. and 8,243,152 lbs. respectively). Following the peak, landings declined to the lowest on record in 2018 (2.7 million pounds), accounting for only 2% of the U.S. landings. The fishery has also shifted to a predominantly offshore fishery as inshore abundance has declined. New York American Lobsters are currently severely depleted with poor prospects of recovery. (ASMFC 2023).

New York’s Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Core	

Column options

Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item

Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Size/Waterbody Type:

1. Estuarine, Brackish Shallow Subtidal
2. Estuarine, Brackish Deep Subtidal
3. Marine, Deep Subtidal
4. Benthic

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/Community Trend	Time frame of Decline/Increase
No	No	Stable	

Column options

Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item

Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

American lobsters begin their life as planktonic (free-swimming) larvae where they converge near surface waters to feed. After their fourth molt they settle on the ocean floor where they remain benthic for their adult lives. They have been found on a variety of substrates including: eel grass, rocks, firm mud, or marsh peat. In order to shelter themselves from predation, they typically prefer substrates in which they can create burrows (ASMFC 2006).

Lobsters can be found in the intertidal zone, inshore (up to depths of 40 meters) and offshore (up to 700 meters) along the continental shelf. Water with a temperature of 15-18°C and salinity of 20-25ppt is preferred, but American lobsters have been shown to exist in a wider range. However,

lobsters exposed to temperatures and salinities outside of their preferred range for an extended period of time can be negatively affected physiologically (ASMFC 2006).

V. Species Demographics and Life History

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

Column options

First 5 fields: Yes; No; Unknown; (blank) or Choose an item

Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

American lobsters tend to be solitary and territorial organisms. Typically a lobster stays within 5-10 km² of its home range. Mature offshore lobsters migrate inshore to mate. This migration pattern is in contrast to southern inshore lobsters that tend to migrate into cooler water seasonally and perhaps more recently due to environmental changes, permanently (ASMFC 2006). American lobsters periodically molt their hard exoskeletons in order to grow and to allow for mating. Only during a molting phase is the female able to accept sperm from the male which she then stores internally for up to two years. Once ready, the female extrudes the eggs onto her underside where they are fertilized by the stored sperm. The eggs remain attached to the female for nine to eleven months until they are ready to hatch. This usually occurs around mid-May to mid-June or when water temperatures are above 12.5°C (ASMFC 2006). Fecundity of female lobsters varies with size, with smaller lobsters releasing thousands of eggs, and older, larger lobsters releasing up to tens of thousands of eggs (NOAA 2013).

Once the eggs are hatched, the larval lobsters, which are extremely vulnerable to predation, undergo several molts. The first four stages are classified as planktonic, with the lobster increasing in size for each molt. During the fifth stage, the lobster now more closely resembles its adult stage. It then migrates to the bottom of the ocean floor where it remains benthic for the remainder of its life (ASMFC 2006).

The largest lobster caught was recorded as 44 pounds. Based on age at size determination, it is estimated that the maximum age a lobster may reach is 100 years. There is currently not yet a way to determine the exact age of a lobster. A lobster at market size is generally considered to be anywhere from four to nine years old. It is thought that lobsters molt at least 20 to 25 times in their life before they are reproductively mature, which could be anywhere from five to eight years (NOAA 2013).

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

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
5. Biological Resource Use	5.4 Fishing & Harvesting Aquatic Resources	5.4.2 Commercial fishing	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
5. Biological Resource Use	5.4 Fishing & Harvesting Aquatic Resources	5.4.3 Poaching/persecution of aquatic species	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.2 Problematic Native Plants & Animals	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.4 Pathogens	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.1 Domestic & Urban Wastewater	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.2 Industrial & Military Effluents	9.2.1 Oil spills	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.2 Industrial & Military Effluents	9.2.4 PCB	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.2 Industrial & Military Effluents	9.2.5 Mercury	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.5 Air-Borne Pollutants	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.1 Habitat Shifting & Alteration	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 1: Threats to American lobster

From ASMFC 2010:

Overwhelming environmental and biological changes coupled with continued fishing greatly increase the difficulty for the SNE stock to rebuild. There has been a widespread increase in the area and duration of water temperatures above 20°C throughout SNE inshore waters. Long-term trends in the inshore portion of SNE show a pronounced warming period since 1999. Lobsters typically avoid water greater than 19°C and prolonged exposure to water temperatures above 20°C causes respiratory and immune system stress, increased incidence of shell disease, acidosis and suppression of immune defenses in lobster (Crossin et al. 1998; Worden et al. 2006; Dove et al. 2005; Glenn and Pugh, 2006; Dove et al. 2004; Robohm et al. 2005).

An increase in predators, such as striped bass, dogfish, and scup, may also be increasing predation on the American lobster. When trapped lobsters are released, for whatever reason, they are vulnerable to predation as they seek new shelter. Increasing temperatures in shallow inshore habitat may be permanently driving lobsters from the SNE stock and LIS population into cooler offshore waters. Larval recruitment into inshore areas may be affected by this shift in distribution of spawning females.

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

Yes: X

No:

Unknown:

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

New York has in place several regulations for the commercial and recreational harvesting of American lobsters. Recreational regulations consist of daily limits, size restrictions, and a required permit. V-notching is required for all legal-sized, egg bearing females, and the lobster must be immediately returned to the water. This system enables the animal to be free from harvest for two years (or until the notch is no longer present due to molting). While the recreational season is year round, the commercial fishery has seasonal closures. There is currently a moratorium on new commercial lobster fishing permits. Gear type is also regulated in lobster fishing (NYSDEC 2013a; NYSDEC2013b).

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

In response to continued declining abundance of the SNE stock, the Management Board approved Addendum XVII in February 2012 to reduce exploitation by 10% in the SNE management areas beginning in July 2013. Within the management areas mandatory V-notch programs, seasonal closures, or a combination of both will be put in place to meet the requirements of the addendum. The board also initiated Draft Addenda XVIII and XIX, to rebuild the SNE stock over the long-term. Both addenda were initiated to scale the SNE fishery to the size of the SNE resource, including an option for a minimum reduction in traps fished by 25%. Draft Addendum XIX specifically addresses Lobster Conservation Management Area (LCMT) 2 and 3. Options in the documents will include recommendations from the LCMTs, TC, and Plan Development Team (ASMFC 2012c). The 2009 Technical Committee for the ASMFC suggested a five-year moratorium on lobster fishing in the Long Island Sound in order to help rebuild the stock (ASMFC 2010). Addendum XXV was initiated in response to the 2015 stock assessment showing continuing declines in the SNE stock, which considered management tools such as gauge size changes, trap reductions, and season closures to achieve a 5% increase in egg production. However only one out of the five Lobster Conservation Management Team proposals evaluated was sufficient to achieve this target, and the Board ultimately decided not to move forward with the Addendum (ASMFC 2020). It is proposed that increased regulations be put in place on lobster harvest during times of environmental or biological stress (i.e., increasing water temperature and incidences of shell

disease). In addition to harvest regulations, benthic habitat protection or rebuilding is a vital component to the conservation of lobster populations. Since lobsters often shown signs of stress with increasing water temperature and poor water quality, it is crucial to monitor and improve environmental conditions, paying close attention to dissolved oxygen levels (NYSDEC 2005).

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.0.0.0 Direct Habitat Management	Resource/Habitat Protection
A.1 Direct Habitat Management	A.1.0.0.0 Direct Habitat Management	Site/Area Protection
C.6 Design and Plan Conservation	C.6.2.3.0 Conserve without acquisition (legally binding)	Manage harvesting of American lobster

Table 2: Recommended conservation actions for American lobster.

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