



Crustaceans

Northern Shrimp

Pandalus borealis

Priority 1 Species of Greatest Conservation Need (SGCN)

Class: Crustaceans (*Malacostraca*)

Order: Decapods (*Decapoda*)

Family: Pandalid Shrimps (*Pandalidae*)



General comments:

The Northern Shrimp (*Pandalus borealis*) is a cold-water species found in the Gulf of Maine and other parts of the North Atlantic. It plays an important role in marine food webs and was once a valuable winter fishery resource in Maine. Due to population declines and low recruitment, the fishery has been closed since 2013, and the species is closely monitored by state and federal agencies.

No Species Conservation Range Maps Available

SGCN Priority Ranking - Designation Criteria:

Recent Significant Declines:	Northern Shrimp is currently undergoing steep population declines, which has already led to, or if unchecked is likely to lead to, local extinction and/or range contraction. Notes: Recent Declines: http://www.asmfc.org/uploads/file/528fa8f12013Northern
Regional Endemic:	<i>Pandalus borealis</i>'s global geographic range is at least 90% contained within the area defined by USFWS Region 5, the Canadian Maritime Provinces, and southeastern Quebec (south of the St. Lawrence River). Notes: Recent Declines: http://www.asmfc.org/uploads/file/528fa8f12013Northern
High Regional Conservation Priority:	Atlantic States Marine Fisheries Commission Stock Assessments: Status: Depleted, Status Comment: "Based on the results of the 2018 Stock Assessment Update, the northern shrimp stock in the Gulf of Maine remains depleted, with spawning stock biomass (SSB) at extremely low levels since 2013." Reference: Microsoft Word - NShrimpAssessmentUpdateReport_2018 (asmfc.org)

Habitat Associations:

Formation: Subtidal

Macrogroup: Subtidal Mud Bottom

★ Primary Habitat

Habitat System: Unvegetated

offshore deep mud basins, primary for adult, adult spawning, and juvenile, egg-bearing females aggregate/feed nearshore; near mouths of estuaries; eggs hatch, juvenile feeding habitat; nearshore and offshore, adult transitional phase, male and spent female feeding habitat offshore

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Formation: Subtidal

Macrogroup: Subtidal Pelagic (Water Column)

★ Primary Habitat	Habitat System: Nearshore <i>larval, juvenile, adult, spent female feeding habitat</i>
★ Primary Habitat	Habitat System: Offshore <i>primary for larval, also used by juvenile, adult</i>

Threats

Threat Priority Level based on Severity and Actionability		Moderate Severity		High Severity	
	Highly Actionable		Medium-High		High
	Moderately Actionable		Medium		Medium-High
	Actionable with Difficulty		Low		Low

IUCN Level 1 Threat Biological Resource Use

IUCN Level 2 Threat: Fishing and Harvesting of Aquatic Resources

Severity: Moderate Severity **Actionability:** Highly Actionable

Notes: Recent (2010-2012) state-wide catch levels have been higher than those recommended by ASMFC scientists. Regulations have been implemented to close fisheries (in 2014 and 2015). The fishing effect is difficult to measure because of other stressors, but in past years, the likelihood of over-fishing impacting the stock was likely; certainty was moderate; and the spatial extent was pervasive (state-wide (coastal)).

IUCN Level 1 Threat Pollution

IUCN Level 2 Threat: Agricultural and Forestry Effluents

Severity: High Severity **Actionability:** Moderately Actionable

Notes: Crustacean larvae and adults are exceptionally sensitive to excessive nutrients, toxic chemicals (including pesticides and chemical therapeutants), and/or sediments.

IUCN Level 2 Threat: Domestic and Urban Waste Water

Severity: High Severity **Actionability:** Moderately Actionable

Notes: Crustacean larvae and adults are exceptionally sensitive to excessive nutrients, toxic chemicals (including pesticides and chemical therapeutants), and/or sediments.

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IUCN Level 1 Threat Climate Change and Severe Weather

IUCN Level 2 Threat: Changes in Temperature Regimes

Severity: High Severity

Actionability: Actionable with Difficulty

Notes: Northern shrimp are an arctic/sub-arctic species in the southernmost extent of their range in the Gulf of Maine, and have been highly sensitive to warming conditions. The likelihood of this impact is likely and may be occurring (high); certainty is high; and the spatial extent is pervasive (state-wide (coastal)).

IUCN Level 2 Threat: Habitat Shifting or Alteration

Severity: High Severity

Actionability: Actionable with Difficulty

Notes: Northern shrimp are an arctic/sub-arctic species in the southernmost extent of their range in the Gulf of Maine, and have been highly sensitive to warming conditions. The likelihood of this impact is likely and may be occurring (high); certainty is high; and the spatial extent is pervasive (state-wide (coastal)).

IUCN Level 1 Threat Invasive and Other Problematic Species, Genes and Diseases

IUCN Level 2 Threat: Invasive Non-native-Alien Species-Diseases

Severity: Moderate Severity

Actionability: Actionable with Difficulty

Notes: Invasives could have effects largely unknown at this time. Likelihood is high and large scale (throughout the region), so actionability is low.

Species Level Conservation Actions:

Only species specific conservation actions that address high (red) or medium-high (orange) priority threats are summarized here.

Conservation Action	Category	Biological Priority	Type
Monitor stock status through surveys and sampling programs	Survey and Monitoring	critical	on-going

Threat(s) Addressed By This Conservation Action

■ Fishing and Harvesting of Aquatic Resources

Conservation Action	Category	Biological Priority	Type
Conduct research to support stock assessment and population dynamics modeling	Research	high	new

Threat(s) Addressed By This Conservation Action

■ Fishing and Harvesting of Aquatic Resources

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Conservation Action	Category	Biological Priority	Type
Determine the relative roles of natural predation, fishing mortality, and climate change in stock dynamics	Research	high	on-going

Threat(s) Addressed By This Conservation Action

- Fishing and Harvesting of Aquatic Resources

Conservation Action	Category	Biological Priority	Type
Design and encourage the use of more size-selective fishing gear	Public Outreach	high	on-going

Threat(s) Addressed By This Conservation Action

- Fishing and Harvesting of Aquatic Resources

Conservation Actions Associated with the Shrimp Guild:

Conservation Action	Category	Biological Priority	Type
Develop molecular tools to identify where specimens are collected.	Research	high	on-going

Threat(s) Addressed By This Conservation Action

- Fishing and Harvesting of Aquatic Resources

Conservation Action	Category	Biological Priority	Type
Ground-truth mapped habitat and compare to historical maps to monitor change over time, may require updating mapping plans to map more frequently	Survey and Monitoring	high	on-going

Threat(s) Addressed By This Conservation Action

- Fishing and Harvesting of Aquatic Resources

Conservation Action	Category	Biological Priority	Type
Through education and collaboration, reduce the use of antifouling agents and biocides that negatively affect SGCN, and investigate alternative biofouling agents.	Policy	critical	on-going

Threat(s) Addressed By This Conservation Action

- Agricultural and Forestry Effluents

Conservation Action	Category	Biological Priority	Type
Expand existing education and research among researchers and managers to improve understanding and close data loopholes in order to inform management	Research	high	on-going

Threat(s) Addressed By This Conservation Action

- Domestic and Urban Waste Water

Broad Taxonomic Group Conservation Actions:

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Additional relevant conservation actions for this species are assigned within broader taxonomic groups in Maine's Wildlife Action Plan: Element 4.

Habitat Based Conservation Actions:

Additional conservation actions that may benefit habitat(s) associated with this species can be found in Maine's Wildlife Action Plan: Element 4. Click on the Habitat Grouping of interest to launch a habitat based report summarizing relevant conservation actions and associated SGCN.

The Wildlife Action Plan was developed through a lengthy participatory process with state agencies, targeted conservation partners, and the general public. The Plan is non-regulatory. The species, threats, and voluntary conservation actions identified in the Plan complement, but do not replace, existing work