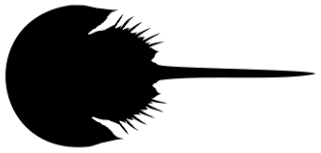

Horseshoe Crabs And Sea Scorpions

Horseshoe Crab

Limulus polyphemus

Priority 1 Species of Greatest Conservation Need (SGCN)

Class: Horseshoe Crabs And Sea Scorpions *(Merostomata)*
Order: Horseshoe Crabs *(Xiphosura)*
Family: Horseshoe Crabs *(Limulidae)*

General comments:

The Horseshoe Crab (Limulus polyphemus) is a large marine arthropod more closely related to spiders than to true crabs. It spawns on sandy beaches and mudflats during high tides in late spring and early summer, with its eggs serving as a vital food source for migratory shorebirds. Although populations have declined in some parts of the Atlantic coast, the New England stock is considered stable.

No Species Conservation Range Maps Available

SGCN Priority Ranking - Designation Criteria:

Recent Significant Declines:	Horseshoe Crab 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: http://www.asmfc.org/species/horseshoe-crab
High Regional Conservation Priority:	**Northeast Regional Synthesis (RSGCN):** Responsibility: High, Concern: Moderate **Atlantic States Marine Fisheries Commission Stock Assessments:** Status: Decreasing, Status Comment: "ARIMA results give some indication of stock status (whether the populations are increasing or decreasing) and the probability of the current state of the populations being less than an index based reference point. However, specific reasons for continued Reference: 63d2ed62HSCAssessment_PeerReviewReport_May2019.pdf (asmfc.org)

Habitat Associations:

Formation: Intertidal

Macrogroup: Intertidal Mudflat

✶ **Primary Habitat**	**Habitat System:** Non-Vascular Mudflat *adults spawn near tideline, eggs laid and develop near tideline, trilobite larval phase remains buried for a number of weeks, juveline feeding habitat, adult feeding habitat*

Macrogroup: Intertidal Sandy Shore

✶ **Primary Habitat**	**Habitat System:** Sand Flat *adults spawn near tideline, eggs laid and develop near tideline, trilobite larval phase remains buried for a number of weeks, juveline feeding habitat, adult feeding habitat*

Horseshoe Crab *Limulus polyphemus*

Priority 1 SGCN

Formation: Intertidal	
Macrogroup: Intertidal Tidal Marsh (peat-forming)	
✶ **Primary Habitat**	**Habitat System:** Acadian Coastal Salt Marsh *adults spawn near tideline, eggs laid and develop near tideline, trilobite larval phase remains buried for a number of weeks, juveline feeding habitat, adult feeding habitat*
Formation: Subtidal	
Macrogroup: Subtidal Coarse Gravel Bottom	
✶ **Primary Habitat**	**Habitat System:** Coarse Gravel *over-wintering habitat, adult feeding habitat*
Macrogroup: Subtidal Mud Bottom	
✶ **Primary Habitat**	**Habitat System:** Unvegetated *over-wintering habitat, adult feeding habitat*
Macrogroup: Subtidal Pelagic (Water Column)	
	Habitat System: Nearshore *larval development and dispersal*
	Habitat System: Offshore *larval development and dispersal*
Macrogroup: Subtidal Sand Bottom	
✶ **Primary Habitat**	**Habitat System:** Unvegetated *over-wintering habitat, adult feeding habitat*

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: Unintentional catch by commercial trawling reduces population size and subsequently results in local extinctions, impaired role of the functional group "predator," and subsequently results in decreased benthic diversity through trophic cascades and thus decreases the availability of food for other species. Small-scale intentional catch for bait, biomedical products and research causes local population reductions

Horseshoe Crab *Limulus polyphemus*

Priority 1 SGCN

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.

IUCN Level 2 Threat: Industrial and Military Effluents

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

Notes: Industrial development has been statistically correlated with malformed horsehoe crab embryos. The specific causes of impact are increased non-point source pollution (heavy metals; mercury and tributylin). Toxins can bioaccumilate in eggs fed on by sea birds. Liklihood is high. Actionability is moderate, i.e. the threat can be minimized in newly developing areas. Oil spills are toxic to species with intertidal distributions. Local scale spills have an unpredictable likelihood and actionability is moderate and influenced by response time to spills.

IUCN Level 1 Threat Residential and Commercial Development

IUCN Level 2 Threat: Housing and Urban Areas

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

Notes: Habitat degradation of estuaries and coastal areas cause decrease in available mating, egg-laying, larval development, and forage habitat. Liklihood is high and increasing (high certainty), current spatial extent is most severe in Southern Maine, but expanding along coast, so actionability is moderate, i.e. the threat can be minimized in newly developing areas.

Horseshoe Crab *Limulus polyphemus*

Priority 1 SGCN

IUCN Level 1 Threat Residential and Commercial Development

IUCN Level 2 Threat: Commercial and Industrial Areas

Severity:	Moderate Severity	**Actionability:**	Moderately Actionable

Notes: Armored shores decrease availability of mating, egg-laying, larval development, and forage habitat. Spatial extent is fairly low (confined to a few areas), but is substantial in those areas. Actionability is moderate, i.e., can be minimized in newly developing areas.

IUCN Level 1 Threat Climate Change and Severe Weather

IUCN Level 2 Threat: Changes in Precipitation and Hydrological Regimes

Severity:	High Severity	**Actionability:**	Actionable with Difficulty

Notes: Severe storms coincident with mating and egg laying has resulted in mass strandings and loss of eggs washed away in surf. Likelihood is low and unpredictable so actionability is low.

IUCN Level 2 Threat: Changes in Temperature Regimes

Severity:	High Severity	**Actionability:**	Actionable with Difficulty

Notes: Increased water temperatures may have interactive effects with ocean pH decreasing suvivorship of larvae and growth rate shown for other Arthropods (crustaceans). Likelihood is high (high certainty) and large scale. The ability to mitigate sea temperature change is low.

IUCN Level 2 Threat: Habitat Shifting or Alteration

Severity:	High Severity	**Actionability:**	Actionable with Difficulty

Notes: Sea level rise will result in significant loss of mating, egg-laying, larval development, and forage habitat. Ocean acidification may result in decreased suvivorship of larvae, and growth and feeding shown in other Arthropods (crustaceans). Likelyhood is high and large scale. The ability to mitigate sea level rise and ocean acidification is low.

Horseshoe Crab *Limulus polyphemus*

Priority 1 SGCN

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: Invasive non-native and alien diseases 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
Conduct surveys to monitor and better understand distribution and abundance	Survey and Monitoring	high	new

Threat(s) Addressed By This Conservation Action

- Fishing and Harvesting of Aquatic Resources

Conservation Action	Category	Biological Priority	Type
Encourage use of selective fishing gear that minimizes bycatch and impacts to habitat.	Public Outreach	high	on-going

Threat(s) Addressed By This Conservation Action

- Fishing and Harvesting of Aquatic Resources

Conservation Action	Category	Biological Priority	Type
Purchase or protect undeveloped shoreline and adjacent areas that is known or potential habitat for horseshoe crab	Habitat Management	high	on-going

Threat(s) Addressed By This Conservation Action

- Housing and Urban Areas

Conservation Action	Category	Biological Priority	Type
Identify areas where degraded water quality may adversely impact horseshoe crabs	Research	moderate	on-going

Threat(s) Addressed By This Conservation Action

- Domestic and Urban Waste Water

Conservation Action	Category	Biological Priority	Type
Promote research to fill data gaps and inform managers	Research	high	on-going

Threat(s) Addressed By This Conservation Action

- Domestic and Urban Waste Water

Guild Level Conservation Actions:

This Species is currently not attributed to a guild.

Horseshoe Crab *Limulus polyphemus*

Priority 1 SGCN

Broad Taxonomic Group Conservation Actions:

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