



Sea Cucumbers

Psolus

Psolus fabricii

Priority 2 Species of Greatest Conservation Need (SGCN)

Class: Sea Cucumbers (*Holothuroidea*)

Order: Sea Cucumbers (*Dendrochirotida*)

Family: Sea Cucumbers (*Psolidae*)



General comments:

Members of the genus *Psolus*, such as the Scarlet *Psolus*, are bright red to orange cold-water sea cucumbers found from the Arctic to Cape Cod. They attach to hard substrates in intertidal and subtidal zones and extend sticky tentacles to capture plankton from the water. Their vivid color makes them conspicuous in rocky habitats.

No Species Conservation Range Maps Available

SGCN Priority Ranking - Designation Criteria:

Recent Significant Declines:	<i>Psolus</i> 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 decline - Trott, in review; last record in Cobscook Bay 1975; subjected to targeted collections for public aquaria display; climate change - Arctic Province Species; understudied as dredge by-catch, professional judgement
High Climate Change Vulnerability:	Vulnerability: 3, Confidence: , Reviewers:

Habitat Associations:

Formation: Intertidal

Macrogroup: Intertidal Gravel Shore

★ **Primary Habitat**

Habitat System: Lower Intertidal

spawning, assumed juvenile feeding habitat, adult feeding habitat

Formation: Subtidal

Macrogroup: Subtidal Coarse Gravel Bottom

★ **Primary Habitat**

Habitat System: Coarse Gravel

spawning, assumed juvenile feeding habitat, adult feeding habitat, assumed over-wintering habitat

Macrogroup: Subtidal Pelagic (Water Column)

Habitat System: Nearshore

larval development and dispersal

Habitat System: Offshore

larval development and dispersal

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Priority 2 SGCN



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 Pollution

IUCN Level 2 Threat: Agricultural and Forestry Effluents

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

Notes: Echinoderm larvae are exceptionally sensitive to excessive nutrients, toxic chemicals (including pesticides and chemical therapeutants), and/or sediments. Adults are sensitive, but comparatively to larvae, less effected.

IUCN Level 2 Threat: Domestic and Urban Waste Water

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

Notes: Echinoderm larvae are exceptionally sensitive to excessive nutrients, toxic chemicals (including pesticides and chemical therapeutants), and/or sediments. Adults are sensitive, but comparatively to larvae, less effected.

IUCN Level 2 Threat: Industrial and Military Effluents

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

Notes: 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 Biological Resource Use

IUCN Level 2 Threat: Fishing and Harvesting of Aquatic Resources

Severity: Moderate Severity **Actionability:** Actionable with Difficulty

Notes: Unintentional catch by commercial bottom trawling reduces population size and subsequently results in local extinctions facilitated by low growth rates, impaired role of the functional group "suspension feeders."

Psolus *Psolus fabricii***Priority 2 SGCN****IUCN Level 1 Threat Climate Change and Severe Weather****IUCN Level 2 Threat: Changes in Temperature Regimes****Severity:** Moderate Severity**Actionability:** Actionable with Difficulty

Notes: Scarlet psolus is a cold-water species. Increased water temperatures have interactive effects with ocean pH decreasing survivorship and growth rate of larvae and adults of echinoderms. 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:** Moderate Severity**Actionability:** Actionable with Difficulty

Notes: Ocean acidification results in decreased survivorship of larvae, and growth and feeding by adult echinoderms. Likelihood is high and large scale. The ability to mitigate ocean acidification is low.

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 such as encrusting colonial tunicates (*Didemnum vexillum*) could decrease availability of habitat and have other effects largely unknown at this time. Likelihood is high and large scale (throughout the region), so actionability is low.

Species Level Conservation Actions:

None. Only species specific conservation actions that address high (red) or medium-high (orange) priority threats are summarized here.

Conservation Actions Associated with the Echinoderms Guild:

Conservation Action	Category	Biological Priority	Type
Expand existing education and research among researchers and managers to improve understanding and management ability	Research	high	on-going

Threat(s) Addressed By This Conservation Action

- Domestic and Urban Waste Water

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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

- Marine and Freshwater Aquaculture

Conservation Action	Category	Biological Priority	Type
Encourage the use of more targeted fishing gear in order to reduce bycatch and habitat disturbance	Public Outreach	high	on-going

Threat(s) Addressed By This Conservation Action

- Fishing and Harvesting of Aquatic Resources

Conservation Action	Category	Biological Priority	Type
Investigate the effect of various harvesting practices on the integrity of habitats and trophic and ecological systems	Research	high	new

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
Conduct research to support management, including but not limited to stock assessments, population genetics, population monitoring, etc.	Research	high	on-going

Threat(s) Addressed By This Conservation Action

- Fishing and Harvesting of Aquatic Resources

Conservation Action	Category	Biological Priority	Type
Encourage the use of more targeted fishing gear in order to reduce bycatch and habitat disturbance	Public Outreach	high	on-going

Threat(s) Addressed By This Conservation Action

- Fishing and Harvesting of Aquatic Resources

Psolus* *Psolus fabricii**Priority 2 SGCN**

Conservation Action	Category	Biological Priority	Type
Research to understand how effects such as habitat modifications, population changes, and pollution can influence SGCN	Research	high	new

Threat(s) Addressed By This Conservation Action

- Habitat Shifting or Alteration

Conservation Action	Category	Biological Priority	Type
Identify species that are resilient to ocean acidification (OA) and rises in sea surface temperature (SST).	Research	high	new

Threat(s) Addressed By This Conservation Action

- Habitat Shifting or Alteration

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