

Stephanasterias albula (White Sea Star)

Priority 2 Species of Greatest Conservation Need (SGCN)

Class: *Asteroidea* (Sea Stars)
Order: *Forcipulatida* (Sea Stars)
Family: *Asteriidae* (Sea Stars)

General comments: none

No Species Conservation Range Maps Available for White Sea Star

SGCN Priority Ranking - Designation Criteria:

Risk of Extirpation: NA

State Special Concern or NMFS Species of Concern: NA

Recent Significant Declines:

White Sea Star 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 - last record in Cobscook Bay 1973; climate change - Appelhans et al., 2012; Keppel et al., 2014; understudied as dredge by-catch, professional judgement

Regional Endemic: NA

High Regional Conservation Priority: NA

High Climate Change Vulnerability:

Stephanasterias albula is highly vulnerable to climate change.

Understudied rare taxa:

Recently documented or poorly surveyed rare species for which risk of extirpation is potentially high (e.g. few known occurrences) but insufficient data exist to conclusively assess distribution and status. *criteria only qualifies for Priority 3 level SGCN*

Notes:

recent decline - last record in Cobscook Bay 1973; climate change - Appelhans et al., 2012; Keppel et al., 2014; understudied as dredge by-catch, professional judgement

Historical: NA

Culturally Significant: NA

Habitats Assigned to White Sea Star:

Formation Name Intertidal

Macrogroup Name Intertidal Gravel Shore

Habitat System Name: Lower Intertidal ****Primary Habitat**** Notes: spawning, assumed juvenile feeding habitat, adult feeding habitat

Formation Name Subtidal

Macrogroup Name Subtidal Coarse Gravel Bottom

Habitat System Name: Coarse Gravel ****Primary Habitat**** Notes: spawning, assumed juvenile feeding habitat, adult feeding habitat, over-wintering habitat

Macrogroup Name Subtidal Pelagic (Water Column)

Habitat System Name: Nearshore Notes: larval development and dispersal

Habitat System Name: Offshore Notes: larval development and dispersal

Stressors Assigned to White Sea Star:

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Stressor 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: Severe **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: Severe **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: Severe **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:** Moderately actionable

Notes: Unintentional by-catch by commercial bottom trawling reduces this top predator population and subsequently results in decreased benthic diversity through trophic cascades and thus decreases the availability of food for other species.

IUCN Level 1 Threat Climate Change and Severe Weather

IUCN Level 2 Threat: Habitat Shifting or Alteration

Severity: Severe **Actionability:** Actionable with difficulty

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

IUCN Level 2 Threat: Temperature Extremes

Severity: Severe **Actionability:** Actionable with difficulty

Notes: White sea stars are cold-water species. Increased water temperatures have interactive effects with ocean pH decreasing survivorship of larvae and growth rate of sea stars. Likelihood is high (high certainty). Increased water temperatures are linked with lethal disease. Likelihood is unpredictable based on disease agent and thus can range from small to large-scale. The ability to mitigate sea temperature change 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 sea star prey, 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 Assigned to White Sea Star:

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

Conservation Actions Associated with the Echinoderms Guild:

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

Stressor(s) Addressed By This Conservation Action

Domestic and Urban Waste Water

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

Stressor(s) Addressed By This Conservation Action

Marine and Freshwater Aquaculture

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

Stressor(s) Addressed By This Conservation Action

Fishing and Harvesting of Aquatic Resources

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

Stressor(s) Addressed By This Conservation Action

Fishing and Harvesting of Aquatic Resources

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

Stressor(s) Addressed By This Conservation Action

Fishing and Harvesting of Aquatic Resources

Conservation Action	Category: Research	Biological Priority: high	Type: on-going
Conduct research to support management, including but not limited to stock assessments, population genetics, population monitoring, etc.			

Stressor(s) Addressed By This Conservation Action

Fishing and Harvesting of Aquatic Resources

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

Stressor(s) Addressed By This Conservation Action

Fishing and Harvesting of Aquatic Resources

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

Stressor(s) Addressed By This Conservation Action

Habitat Shifting or Alteration

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

Stressor(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 2015 Wildlife Action Plan: Element 4, Table 4-1.

Habitat Based Conservation Actions:

Additional conservation actions that may benefit habitat(s) associated with this species can be found in Maine's 2015 Wildlife Action Plan: Element 4, Table 4-15. 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, stressors, and voluntary conservation actions identified in the Plan complement, but do not replace, existing work programs and priorities by state agencies and partners.