Thyonidium drummondii (Sea Cucumber)

Priority 2 Species of Greatest Conservation Need (SGCN)

Class: *Holothuroidea* (Sea Cucumbers)
Order: *Dendrochirotida* (Sea Cucumbers)
Family: *Cucumariidae* (Sea Cucumbers)

General comments: none

No Species Conservation Range Maps Available for Sea Cucumber

SGCN Priority Ranking - Designation Criteria:

Risk of Extirpation: NA

State Special Concern or NMFS Species of Concern: NA

Recent Significant Declines:

Sea Cucumber 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 1973; climate change - Arctic Province Species; understudied as dredge by-catch, professional judgement

Regional Endemic: NA

High Regional Conservation Priority: NA

High Climate Change Vulnerability:

Thyonidium drummondii 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 - Trott, in review; last record in Cobscook Bay 1973; climate change - Arctic Province Species; understudied as dredge by-catch, professional judgement

Historical: NA

Culturally Significant: NA

Habitats Assigned to Sea Cucumber:

Formation Name **Intertidal**

Macrogroup Name **Intertidal Gravel Shore**

Habitat System Name: Lower Intertidal ****Primary Habitat**** **Notes:** *spawning, assumed juvenile feeding habitat, adult feeding habitat, non-pelagic direct larval development*

Formation Name **Subtidal**

Macrogroup Name **Subtidal Coarse Gravel Bottom**

Habitat System Name: Coarse Gravel ****Primary Habitat**** **Notes:** *non-pelagic direct larval development, assumed over-wintering habitat, spawning, adult feeding habitat, assumed juvenile feeding habitat*

Stressors Assigned to Sea Cucumber:

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

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IUCN Level 1 Threat **Biological Resource Use**

IUCN Level 2 Threat: Fishing and Harvesting of Aquatic Resources

Severity: Severe **Actionability:** Moderately actionable

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

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 **Climate Change and Severe Weather**

IUCN Level 2 Threat: Habitat Shifting or Alteration

Severity: Moderate Severity **Actionability:** Actionable with difficulty

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

IUCN Level 2 Threat: Temperature Extremes

Severity: Moderate Severity **Actionability:** Actionable with difficulty

Notes: Sea cucumbers are cold-water species. Increased water temperatures have interactive effects with ocean pH decreasing suvivorship and growth rate of 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 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 Assigned to Sea Cucumber:

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:

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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

Conservation Action **Category:** Research **Biological Priority:** high **Type:** new
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

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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.