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Loxospora assateaguensis

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Taxonomy

| Kingdom | Phylum | Class | Order | Family |
|---------|------------|-----------------|--------------|----------------|
| Fungi | Ascomycota | Lecanoromycetes | Not assigned | Sarrameanaceae |

Taxon Name: Loxospora assateaguensis Lendemer

Identification Information:

This crustose lichen can be recognized by its occurrence on bark, blue-gray color, large pustulose soralia and the production of 2-O-methylperlatolic acid.

Assessment Information

| Red List Category & Criteria: | Critically Endangered A3c; B1ab(iii)+2ab(iii) ver 3.1 |
|-------------------------------|---|
| Year Published: | 2018 |
| Date Assessed: | August 31, 2017 |

Justification:

Loxospora assateaguensis is a crustose lichen known from a single location on the Virginian Barrier Islands of the Mid-Atlantic Coastal Plain of southeastern North America. Suitable habitat for this species is significantly fragmented and has been degraded by anthropogenic forces. The threats to *L. assateaguensis* stem from continued degradation of suitable habitat and projected impacts from sealevel rise.

This species is assessed here as Critically Endangered (CR) based on the single known location, small area of occupancy, and extent of occurrence, and the documented declines in habitat quality historically, at present, and projected into the future. It also ranks as CR based on the inferred future decline which estimates that even under the most conservative estimates, that 100% of the population, which lies at ~0.3 meters above sea level (well below the 1.5 meter conservative estimate for sea-level rise by 2100; see Lendemer & Allen 2014, Sallenger *et al.* 2012, U.S. Army Corps of Engineers 2015) will be flooded within the next three generations as a result of sea-level rise and/or intense storm damage. It would also meet Endangered D based on the small number of mature individuals (ca.<100).

Geographic Range

Range Description:

Loxospora assateaguensis is a recently described species known only from a single remnant mature maritime forest off the coast of Delmarva in the Virginian Barrier Islands of eastern North America. It occurred only on the bark of mature American holly (*llex opaca*) at this site, and was encountered as part of a large scale biodiversity inventory of the Mid-Atlantic Coastal Plain (New Jersey south to Florida; Lendemer & Allen 2014) that inventoried 300+ sites and generated 17,000+ specimens. Remnant mature maritime forests are rare in the Virginian Barrier Islands (see Lendemer 2013), and other endemic lichen species have been found in comparable habitats further south in the Carolinian Barrier Islands.

Despite extensive inventories by multiple specialists of suitable habitats elsewhere in the Coastal Plain over a period spanning +20 years (e.g., Florida: W.R. Buck, R. Commons, R.C. Harris, F.&J. Seavey; Georgia: S.Q. Beeching, M.F. Hodges, J.C. Lendemer), no additional populations have been located.

Country Occurrence:

Native: United States (Virginia)

Distribution Map

Loxospora assateaguensis



Range

• Extant (resident)

Compiled by: IUCN





The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

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Population

The sole know location is within a protected management unit (Assateague Island National Seashore). At this location the species occurs as less than approximately 100 mature individuals growing in scattered patches on the trunks of a group of ten *llex opaca*.

Current Population Trend: Stable

Habitat and Ecology (see Appendix for additional information)

Loxospora assateaguensis is a recently described species known only from a single remnant mature maritime forest off the coast of Delmarva in the Virginian Barrier Islands of eastern North America. It occurred only on the bark of mature American holly (*llex opaca*) at this site, and was encountered as part of a large scale biodiversity inventory of the Mid-Atlantic Coastal Plain (New Jersey south to Florida; Lendemer & Allen 2014) that inventoried 300+ sites and generated 17,000+ specimens. Remnant mature maritime forests are rare in the Virginian Barrier Islands (see Lendemer 2013), and other endemic lichen species have been found in comparable habitats further south in the Carolinian Barrier Islands.

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Systems: Terrestrial

Threats (see Appendix for additional information)

This species may have been more widespread in the Virginian Barrier Islands Ecoregion before the historical large scale deforestation that occurred in the Mid-Atlantic Region of the eastern United States. Mature maritime forests are a naturally rare habitat extent because they occur on transient and ever changing barrier islands and in coastal areas that are subject to frequent changes with erosion and sea-level. These already rare habitats have been significantly impacted and reduced in extent as a result of large scale development along the Atlantic Coast. The remnant forest where this species occurs is protected within a national park, however it is imperiled by sea-level rise (site will be inundated under most conservative estimates for sea-level rise by 2100).

Maritime forests, particularly mature communities, are threatened throughout eastern North America and have been greatly impacted by habitat loss and degradation, particularly post-1960 (e.g., Bellis 1995, Berman & Berquist. 2007). Now these coastal habitats are further threatened by climate change, particularly sea-level rise (Lendemer & Allen 2014, Sallenger et al. 2012) and increasing frequency and intensity of storms including hurricanes (U.S. Army Corps of Engineers 2015, Villarini & Vecchi 2012).

Conservation Actions (see Appendix for additional information)

There are many conservation actions that can be taken including monitoring for the presence of laurel wilt which if introduced would impact a dominant tree in the forest and potentially change microhabitats thus impacting the species, educating and training land managers and local botanists to identify the species so we can monitor its health, federally listing the species as endangered in the

United States, and improving air quality regulation, monitoring changes associated with sea-level rise. Policy and legislation considering biodiversity threatened by sea-level rise is also needed.

This species is well documented not to occur north and south of the Virginian Barrier Islands, however further inventories of remote/difficult to access islands in the ecoregion are needed. Further research that will aid in the conservation of this species includes population assessments and monitoring, population genetics studies, and ecological studies that incorporate threats to the species. Additionally, a species recovery plan needs to be written.

In addition to formal listing as an endangered species, given the threats posed by sea-level rise, monitoring is warranted and translocation is needed.

Credits

Assessor(s): Lendemer, J., Allen, J. & McMullin, T.

Reviewer(s): Scheidegger, C.

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External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

| Habitat | Season | Suitability | Major Importance? |
|--------------------------------------|----------|-------------|----------------------|
| 1. Forest -> 1.4. Forest - Temperate | Resident | Suitable | Yes |

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

| Threat | Timing | Scope | Severity | Impact Score |
|---|---|---|----------------------------------|---------------|
| 1. Residential & commercial development -> 1.1. Housing & urban areas | Ongoing | Minority (50%) | Slow, significant declines | Low impact: 5 |
| | Stresses: | 1. Ecosystem stresses -> 1.1. Ecosystem conversion | | |
| | | 2. Species Stresses -> 2.1. Species mortality | | |
| 1. Residential & commercial development -> 1.2. Commercial & industrial areas | Ongoing | Minority (50%) | Slow, significant declines | Low impact: 5 |
| | Stresses: | 1. Ecosystem stre | esses -> 1.1. Ecosyster | n conversion |
| | | 2. Species Stresses -> 2.1. Species mortality | | |
| 11. Climate change & severe weather -> 11.1. Habitat shifting & alteration | Ongoing | Minority (50%) | Causing/could cause fluctuations | Low impact: 5 |
| | Stresses: | 1. Ecosystem stresses -> 1.2. Ecosystem degradation | | |
| | | 2. Species Stresses -> 2.1. Species mortality | | |
| | | 2. Species Stresses -> 2.2. Species disturbance | | |
| 5. Biological resource use -> 5.3. Logging & wood harvesting -> 5.3.4. Unintentional effects: (large scale) [harvest] | Ongoing | Minority (50%) | Slow, significant declines | Low impact: 5 |
| | Stresses: | 1. Ecosystem stre | esses -> 1.1. Ecosyster | n conversion |
| | 1. Ecosystem stresses -> 1.2. Ecosystem degradation | | | |
| | | 2. Species Stresses -> 2.1. Species mortality | | |

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

| Conservation Actions in Place |
|---|
| In-Place Research, Monitoring and Planning |
| Action Recovery plan: No |
| In-Place Land/Water Protection and Management |
| Conservation sites identified: Yes, over entire range |

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

| Conservation Actions Needed |
|---|
| 2. Land/water management -> 2.1. Site/area management |
| 2. Land/water management -> 2.2. Invasive/problematic species control |
| 4. Education & awareness -> 4.1. Formal education |
| 4. Education & awareness -> 4.2. Training |
| 4. Education & awareness -> 4.3. Awareness & communications |
| 5. Law & policy -> 5.1. Legislation -> 5.1.2. National level |
| 5. Law & policy -> 5.2. Policies and regulations |

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

| Research Needed |
|---|
| 1. Research -> 1.2. Population size, distribution & trends |
| 1. Research -> 1.3. Life history & ecology |
| 1. Research -> 1.6. Actions |
| 2. Conservation Planning -> 2.1. Species Action/Recovery Plan |
| 3. Monitoring -> 3.1. Population trends |
| 3. Monitoring -> 3.4. Habitat trends |

Additional Data Fields

| Distribution |
|--|
| Estimated area of occupancy (AOO) (km ²): 4 |
| Estimated extent of occurrence (EOO) (km ²): 4 |
| Number of Locations: 1 |
| Lower elevation limit (m): 0 |
| Upper elevation limit (m): 0 |
| Population |
| Number of mature individuals: 100 |
| Extreme fluctuations: No |
| No. of subpopulations: 1 |
| All individuals in one subpopulation: Yes |

Habitats and Ecology

Continuing decline in area, extent and/or quality of habitat: Yes

Generation Length (years): 35

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