Governor Laffan's Fern

Diplazium laffanianum

Bermuda Protected Species
GOVERNMENT OF BERMUDA
Department of Environment & Natural Resources

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Current Status

Endemic

BPSA: Level 2

CITES: No

Bda Red List: CR (D)

CMS: No

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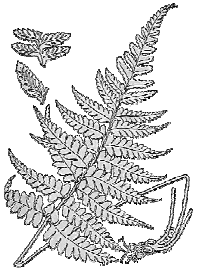
Ecology

Identification

Named after Governor Sir Robert Laffan, this species is a relatively large fern with bright green, firm textured fronds. Fronds arise from a short, scaly rootstock. Fronds are held on 4-8 inch (10-20cm) long petioles which are blackish at the base and green toward the leaf blades. Fronds have a rounded triangular outline and are 8-12 inches long (20-30 cm) and 4-6 inches wide (10-15 cm). The pinnae that make up the frond are 3.5–5 inches (7.5-13 cm) long, and less than half as wide. They are arranged alternately along the rachis (central stem).



Britton, 1918

One of the most characteristic features of this species is the sori, the clusters of spore-containing sacs on the underside of the fronds. These sori are linear in Governor Laffan's Fern, and about 4 mm long.

Range

Endemic to Bermuda.

Habitat

According to Britton this fern was found in cave mouths and rock crevices between Harrington Sound and Paynter's Vale up until 1905. Britton describes seeing this very rare fern in the wild in the autumn of 1905, but in 1913 when he returned to a location known to have the fern it could not be found.

Reproduction and Life Cycle

Ferns do not reproduce by flowers and fruits like other plants. They produce dust-like spores on the underside of a mature frond. The spores develop into a small, flat, often heart shaped, prothallus. The prothallus has organs containing eggs and sperm on its surface. Ferns mostly occur in wet habitats, where water accumulates on the surface of the prothallus, allowing the sperm to move across the surface and reach the egg. Once fertilisation has occurred the sporophyte begins to develop; this is the mature fern that we see with roots and fronds.

Why protect this species?

Governor Laffan's Fern is endemic to Bermuda, so we must take the lead in conserving it. This species was likely never abundant due to its very specific habitat requirements. As a habitat-limited, island endemic it will always be highly at risk of extinction.

The Victorian fashion for collecting ferns, led to the removal of many from the wild, and letters from 1905 suggest this was a primary reason for the wild extinction of this species. It was only about 30 years from when it was first discovered to when it was last seen in the wild.

By 2003 only 5 individuals of this species remained in pots in a greenhouse. Without active conservation actions this species would surely have become extinct. Spore germination is low, except under specific conditions, which would limit un-aided recovery in the wild. Also the habitat has changed drastically in the 100 years since this species was last seen in the wild, due to development and invasive species. This fern is only likely to re-establish wild populations with management and assistance.

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What is being done to conserve it?

Protected Species Act Listing: Level 1, 2012 re-graded to Level 2, 2016

IUCN Red List: EW, 3.1

Recovery Plan: This species is included in the fern recovery plan but the actions need are slightly different as there are no wild populations.

Public awareness: many articles have been written on this species, and lectures are given several times per year.

Research: Research has focused on environmental conditions that affect germination and survival, including long term storage of spores. Taxonomic and genetic studies have been completed.

Propagation:

- micropropagation of Governor Laffan's Fern has been ongoing since 2003 at Henry Doorly Zoo in Omaha, USA.
- Young ferns were returned to Bermuda in 2009, 2012 and 2014 and are currently housed at the Dept. of Environmental Protection and Dept. of Conservation Services.

- Protocols for propagating this species have been successfully developed and methods for keeping it in pot culture are being explored

Reintroduction: planting of nursery-raised ferns into managed habitats within protected areas began in Nov. 2014.

Protective legislation

Protected Species Act (2003)

What you can do?

Learn: Learn more about this species. Understand how destruction of habitat leads to loss of Bermuda's plant and animal diversity. Tell others what you have learned.

Control invasive plant species: Invasive plants should be managed in areas known to have the Bermuda Shield Fern so that they do not become overwhelmed by other vegetation. Control invasive plants on your property so they don't spread to nearby protected areas.

Grow and plant: Plant native and endemic plants on your property, and encourage your favourite garden centre to carry them. Do not dig up native plants from natural areas.

Information sources

To learn more please visit: www.environment.bm

Britton, Elizabeth G. 1905. Letter from Mrs. E.G. Britton at the New York Botanical Garden to Mr. W.B. Helmsley, Director at the RBG Kew. 2page letter of 12 Oct 1905: Royal Botanic Gardens, Kew Archives: Director's Correspondence folio 249.

Britton, Nathaniel Lord. 1918. Flora of Bermuda. Charles Scribner's Sons, New York.

Houser, Dilys. 2015. Taxonomic classification of an endemic Bermudian fern, using molecular and morphological data. Thesis, University of Nebraska Omaha.

Samia Sarkis. 2010. Recovery plan for six fern species from Bermuda. Department of Conservation Services, Government of Bermuda. 27 pages

For Further Information

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www.environment.bm