

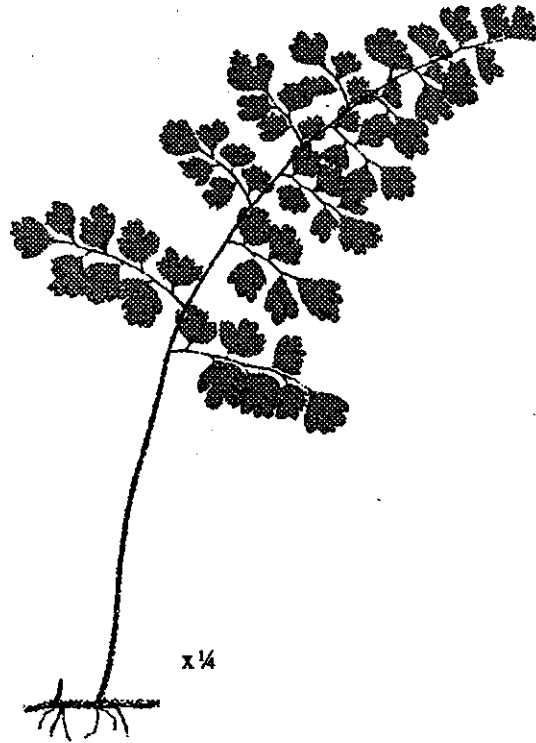


Update COSEWIC STATUS REPORT

on

Southern Maidenhair Fern (*Adiantum capillus-veneris*)

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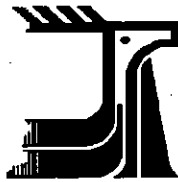


David J. White & George W. Douglas

ENDANGERED
1998



COSEWIC
COMMITTEE ON THE STATUS
OF ENDANGERED WILDLIFE
IN CANADA



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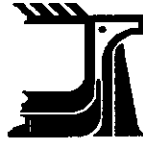
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Cover illustrations:

Southern Maidenhair Fern - Adapted from an illustration courtesy of the British Columbia Conservation Data Centre.



Southern Maidenhair Fern

Reason for status: Single remaining small non-reproductive colony with significant historic decline in size and continued threat from habitat alteration. [Designated endangered in 1984 and reconfirmed as endangered in 1998.]

Occurrence: British Columbia

NOTES

COSEWIC status reports are working documents used in assigning status. Reports are released in their original form in the interest of making scientific information available to the public.

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White, David J. and George W. Douglas. 1998. Update COSEWIC Status report on Southern Maidenhair Fern, *Adiantum capillus-veneris*. Committee on the Status of Endangered Wildlife in Canada. 14 pp.

COSEWIC

A committee of representatives from federal, provincial and private agencies that assigns national status to species at risk in Canada and the chairs of the scientific species specialist groups

COSEPAC

Un comité de représentants d'organismes fédéraux, provinciaux et privés qui attribue un statut national aux espèces canadiennes en péril ainsi que des président(e)s des groupes des spécialistes scientifiques.

Update
COSEWIC Status Report

on

Southern Maidenhair Fern
(Adiantum capillus-veneris)

by

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Environment Canada**

Executive Summary

Description

Southern Maidenhair Fern (*Adiantum capillus-veneris*) is a delicate fern spreading by a thin branched rhizome covered with slender, small, brown scales. Leaves arise scattered along the rhizome and are lax or drooping. The central axis of the blade is continuous with the purplish-black leaf stalk. Blades are commonly twice compound, with each leaf consisting of a series of 5-12 alternate pinnae per side of the leaf, each pinna has a central axis and bears up to about 6 pinnules. Each of these smallest leaf segments (pinnules) is broadly rounded at the end and incised into rounded teeth; the base tapers to a small delicate leaflet stalk. These pinnules are reminiscent of miniature ginkgo leaves. The spore sacs (in fertile leaves) are clustered on the lower pinnule surface within crescent-shaped protective flaps of tissue (indusia).

Distribution

The fern is a common and widely distributed species, found throughout the warmer southern portion of the US and Mexico; it also occurs in South America, South Africa, Australia and warmer parts of Eurasia. In Canada it is found at only one site in southeastern British Columbia, the Fairmont Hot Springs, about 1000 km north of its main range.

Habitat

In Canada it is found on lime-rich, wet, porous rock formed from the mineral deposits of a hot spring. The warm water of the hot spring also produces a mild microclimate that promotes the growth of the fern.

General Biology

Southern Maidenhair Fern is a delicate fern that is normally found in seepage areas and on wet cliffs in tropical or warm temperate climates. It is able to subsist at the Canadian locality because of the suitable microclimatic and substrate conditions provided by the hot springs. Due to the lack of adequate flow of spring water, the fern has decreased in vigour and now no longer reproduces by spores that produce the small plantlets that bear the sexual organs. Because of its delicate appearance, the fern is commonly grown as a greenhouse plant.

Population Size and Trends

The fern was relatively abundant around the hot springs over 50 years ago. By 1996 only 16 sterile leaves remained in one small patch.

Limiting Factors and Threats

The main limiting factor for this fern appears to be the lack of adequate hot spring water needed to maintain the warm microclimate and continued development of the wet mineralized rocky substrate needed by the fern.

Existing Protection

No formal protection exists. It is a red-listed species in the province of British Columbia.

Evaluation and Status

Because of its occurrence at only a single site and its near extinction over the last several decades, it is considered to be an endangered species in Canada.

Résumé

Description

L'adiante cheveux-de-Vénus (*Adiantum capillus-veneris*) est une fougère délicate qui se multiplie par son rhizome mince, ramifié, couvert d'écailles brunes, fines et petites. Les frondes, dispersées le long du rhizome, sont laxifoliées ou tombantes. L'axe central de la fronde est continu, avec des pétioles allant du violacé au noir. Les limbes sont habituellement doubles, composés, et chaque feuille est formée d'une série de cinq à douze pennas alternes sur chaque côté de la feuille. Chaque penna possède un axe central et porte jusqu'à six pinnules. Chacun des plus petits segments foliaires (les pinnules) est fortement arrondi à son extrémité et découpé en dents arrondies, la base se rétrécissant en un pétiole petit et délicat. Bien qu'elles soient beaucoup plus petites, les pinnules rappellent les feuilles du ginkgo. Les sacs de spores (des feuilles fertiles) sont regroupés sur la face inférieure des pinnules, à l'intérieur de rabats protecteurs en forme de croissant (les indusies).

Distribution

Cette fougère est une espèce commune et très répandue partout dans les régions les plus chaudes du sud des États-Unis et au Mexique. On la retrouve également en Amérique du Sud, en Afrique du Sud, en Australie et dans les régions les plus chaudes d'Eurasie. Au Canada, on ne la trouve qu'à Fairmont Hot Springs, au sud-est de la Colombie-Britannique, à environ 1 000 km au nord de son aire principale de répartition.

Habitat

Au Canada, on l'a trouvée dans la roche calcaire, humide et poreuse créée par les dépôts minéraux d'une source thermale. La source produit également le microclimat doux qui permet la croissance de la fougère.

Biologie générale

L'adiante cheveux-de-Vénus est une fougère délicate que l'on rencontre habituellement dans des zones de suintement et sur des falaises humides, dans des régions tempérées chaudes ou tropicales. Elle peut vivre dans la localité canadienne en raison du microclimat propice et du sol adéquat créés par les sources thermales. Cependant, à cause du débit trop faible de la source, la fougère a déperissé et, à l'heure actuelle, elle ne se reproduit plus par les spores qui produisent les petites plantes portant les organes sexuels. En raison de son apparence délicate, on cultive beaucoup cette fougère comme plante de serre.

Taille et tendances de la population

Il y a 50 ans, cette fougère était relativement abondante près des sources chaudes. En 1996, il ne restait que 16 frondes stériles sur une petite parcelle de terrain.

Facteurs limitants et menaces

Le principal facteur limitant de cette fougère semble être le débit trop faible de la source thermale pour le maintien du microclimat chaud et l'expansion du sol rocheux humide et minéralisé dont a besoin la fougère.

Protection actuelle

La plante ne jouit d'aucune protection officielle. Elle figure sur la *liste rouge* de la Colombie-Britannique.

Évaluation et statut de l'espèce

Parce qu'on ne la retrouve que sur un site et qu'elle frôle la disparition depuis quelques décennies, on la considère comme une espèce en danger de disparition au Canada.

Introduction

Adiantum capillus-veneris L. was designated as endangered in 1984 due to its decline at the only known Canadian station at the Fairmont Hot Springs in southeastern British Columbia (Brunton, 1984). Southern Maidenhair Fern is a tropical-subtropical species whose North American distribution is mainly in the southern United States. To survive at the disjunct British Columbia site—that is over 1000 km north of the main range of the species—the fern requires a humid, calcareous habitat that is warm year-round (Brunton, 1984). Suitable conditions occur at the Fairmont Hot Springs where warm, lime-rich, spring water flows over tufa—a rock that is mostly calcium carbonate precipitate (Brunton, 1984).

Distribution

Southern Maidenhair Fern occurs in the United States from central California across to Virginia and south to Florida and Mexico (Brunton, 1984). There is a small, disjunct population in South Dakota at a hot spring. The fern also occurs in South America and Eurasia. Its only Canadian occurrence is in southeastern British Columbia (Figure 1).



Figure 1. Distribution of Southern Maidenhair Fern in British Columbia.

Protection

Since the designation of Southern Maidenhair Fern as an endangered species, no steps are known to have been taken to enhance the species' chances of survival in Canada. The fern occurs on private property owned by the Fairmont Hot Springs resort.

Population Size and Trend

Southern Maidenhair Fern has been known at the Fairmont Hot Springs since 1888. As late as the 1940's, the fern was noted as abundant around the resort at several sites (Brunton, 1984). Further resort development has caused the elimination of the species at all but one site and this remaining colony continues to decline. In 1974, the colony covered 3 m of rock ledge, but by 1982 the colony only occupied 0.4 m of ledge and consisted of 68 sterile fronds (Brunton, 1984). In 1996, only 16 sterile fronds remained on about four plants (G. Douglas, pers. obs., 1996) and the site's status is extremely precarious.

Habitat

In British Columbia, Southern Maidenhair Fern is a long-range disjunct from the species' main range in the southern United States. In order to survive more than 1000 km north of its main range, the fern requires a steady supply of hot spring water to provide a warm and very humid year-round climate (Brunton, 1984). The plant's substrate is lime-rich, porous rock—such as the tufa deposits that are found at the Fairmont Hot Springs (Brunton, 1984).

Biology

Southern Maidenhair Fern is a very attractive plant (several forms are cultivated as greenhouse ornamentals) that could be desirable to would-be gardeners (Brunton, 1984). Since the colony is now so small, any plant removal could be catastrophic.

Limiting Factors

Adiantum capillus-veneris occurs in Canada only because of the presence of hot spring water that ameliorates the local microclimate. Without the hot water, the fern simply cannot survive at this latitude. Fern habitat loss has been due primarily to the redirecting of hot spring water by the owners of the Fairmont Hot Springs resort to the developed bathing pools. In 1982, the last known colony was surviving due to a leak in the pipe that transports hot water from the source to the resort pools (Brunton, 1984).

Due to the plant's high profile as a very rare fern, the site has been visited by many naturalists and fern enthusiasts. This could put the plant at some risk from inadvertent site damage.

Evaluation and Status Recommendation

When the status designation of endangered was assigned in 1984, Southern Maidenhair Fern was known from only one colony of about 68 sterile fronds. By 1996, it was still only known at the one site and the colony had declined to only 16 sterile fronds. Thus, there is no reason to change the designation of endangered status for Southern Maidenhair Fern.

Acknowledgements

Beth Rogers, British Columbia Conservation Data Centre, provided a listing of known Southern Maidenhair Fern specimens and records.

Literature Cited

Brunton, D. 1984. Status report on the Southern Maidenhair Fern (*Adiantum capillus-veneris*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Canadian Wildlife Service, Ottawa. Unpublished report. 27 pp.

Biographical Summary of Authors

David J. White has a B.Sc. in biology and has been conducting natural area inventories and evaluating the status and significance of rare plants for more than 25 years. He began doing field surveys in 1972 for the International Biological Program. From 1973 to 1983, David was employed by the Canadian Museum of Nature as a research technician. During that period he co-authored a number of publications on rare plants. From 1984 to the present, David has worked as a self-employed life science consultant. He has completed projects ranging from natural area inventories and evaluations to reports on invasive species. David has previously written COSEWIC Status Reports on Ginseng (*Panax quinquefolium*), Golden-seal (*Hydrastis canadensis*), and Branched Bartonian (*Bartonia paniculata*).

George W. Douglas has a Ph.D. in Plant Ecology and has worked with rare plants for over 15 years. He was senior author of *The Rare Plants of the Yukon* (1981) and co-authored *The Rare Plants of British Columbia* (1985). George was also chief editor of the manual, *The Vascular Plants of British Columbia* (1989-1994). In 1991, George joined the British Columbia Conservation Data Centre, Ministry of Environment as the senior program botanist. Since then, he has been responsible for the documentation and tracking of the rare native vascular plants, bryophytes and lichens of the province. George has written or co-written 15 COSEWIC status reports during this period.



MANDATE

COSEWIC determines the national status of wild species, subspecies, varieties and nationally significant populations that are considered to be at risk in Canada. Designations are made on all native species for the following groups: fish, amphibians, reptiles, birds, mammals, molluscs, lepidoptera, vascular plants, mosses and lichens.

MEMBERSHIP

COSEWIC is comprised of representatives from each provincial and territorial government wildlife agency, four federal agencies (Canadian Wildlife Service, Parks Canada, Fisheries and Oceans, Canadian Museum of Nature), three national conservation organizations (Canadian Nature Federation, Canadian Wildlife Federation, and World Wildlife Fund Canada) and the chairs of the scientific species specialist groups. The Committee meets annually in April to consider status reports on candidate species.

DEFINITIONS

Species	- Any indigenous species, subspecies, variety or geographically defined population of wild fauna and flora.
Extinct (X)	- A species that no longer exists.
Extirpated (XT)	- A species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	- A species facing imminent extirpation or extinction.
Threatened (T)	- A species likely to become endangered if limiting factors are not reversed.
Vulnerable (V)	- A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk (NAR)	- A species that has been evaluated and found to be not at risk.
Indeterminate (I)	- A species for which there is insufficient scientific information to support status designation.



The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. COSEWIC meets annually in April each year. Species designated at this meeting are added to the list.



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