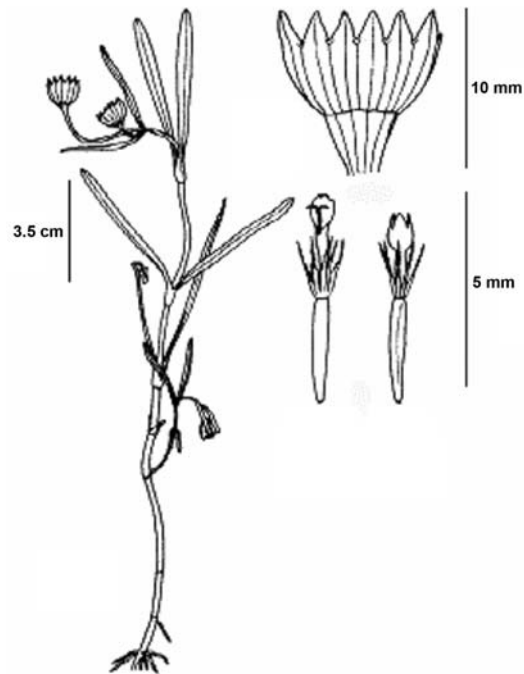


COSEWIC Assessment and Status Report

on the

Rayless Goldfields *Lasthenia glaberrima*

in Canada



ENDANGERED
2008

COSEWIC
Committee on the Status
of Endangered Wildlife
in Canada



COSEPAC
Comité sur la situation
des espèces en péril
au Canada

COSEWIC status reports are working documents used in assigning the status of wildlife species suspected of being at risk. This report may be cited as follows:

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Rayless Goldfields — Illustration by John H. Rumley in Hitchcock *et al.* 1955, with permission.

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COSEWIC Assessment Summary

Assessment Summary – April 2008

Common name

Rayless goldfields

Scientific name

Lasthenia glaberrima

Status

Endangered

Reason for designation

A single very small population of an annual flowering plant that is at continued risk from a number of limiting factors including the spread of exotic plants.

Occurrence

British Columbia

Status history

Designated Endangered in April 2008. Assessment based on a new status report.



COSEWIC
Executive Summary

Rayless Goldfields
Lasthenia glaberrima

Species information

Rayless goldfields (*Lasthenia glaberrima*) is a member of the aster family (asteraceae). It is a fibrous-rooted annual herb with sprawling to erect growth form with simple to freely branched and hairless shoots. The stems may form adventitious roots from their lower nodes. The leaves are oppositely arranged, 2-10 cm long, linear and lack hairs or teeth. The flowering structure consists of numerous flowering heads, each of which is bell-shaped and contains tightly packed flowers. The pale yellow flowers are inconspicuous and may be easily overlooked. The achenes (characteristic dry fruitlets of the aster family) are less than 4 mm long, linear and hairy. The species is morphologically quite variable and is self-pollinated, so there is a significant possibility of distinct genetic composition, particularly in isolated populations like the one in Canada.

The only plants within its range that might be confused with rayless goldfields are brass buttons (*Cotula coronopifolia*) and fleshy jaumea (*Jaumea carnosa*). All three species may form mats, have small yellow composite flowers, and may appear superficially similar at a distance. Brass buttons is easily distinguished by its alternate leaves (which are often toothed) and separate (rather than united) floral bracts. Fleshy jaumea is easily distinguished by its thick, succulent leaves and separate floral bracts. Both brass buttons and fleshy jaumea are plants of saline, tidal areas while rayless goldfields is restricted to freshwater seeps and pools.

Distribution

In Canada, rayless goldfields is known from a single site near Victoria, British Columbia. Globally, it ranges from Vancouver Island south, mostly west of the Cascade Mountains, to central California. The nearest United States record is from Klickitat County (Washington State) about 300 km to the south. The population occupies an area of less than 40 m². The Extent of Occurrence and Area of Occupancy, as per COSEWIC methodology, are each a maximum of 1 km² when determined using a 1 km square grid overlay.

Habitat

The single British Columbia site is a rock-bound vernal pool on a shoreline rocky bluff about 15 m above sea level. The vernal pool has a thin layer of medium-textured soil above gneissic bedrock. It begins to moisten with the first rains in late summer or early fall and remains saturated or inundated for long periods throughout the winter and early spring. The soil gradually dries out with the onset of summer drought and is quite dry from mid-June to late August or early September. The amount of potential habitat has declined greatly over the past century as coastal areas in southeast Vancouver Island have been developed for residential and recreational use. Much of the remaining habitat suitable for rayless goldfields has been heavily altered due to invasion by alien weeds including several grasses and forbs.

Biology

The species is a short-lived annual. Germination appears to begin in April and end in early May. Plants continue to grow until they succumb to summer drought. Mortality normally occurs in late May or June and summer rainfall events appear to be too rare to trigger renewed vegetative growth, flowering and fruiting. Flowering begins in early May and peaks by mid-month. The species is self-fertilizing. Seed dispersal begins in mid-May and most plants have shed their achenes by late June.

Population sizes and trends

Suitable sites have been surveyed repeatedly since the early 1980s in a series of projects designed to document the distribution of rare plants of seepage sites and vernal pools on southeast Vancouver Island and the Gulf Islands. Despite this, the Canadian population was not discovered until 2003. Targeted surveys in 2003, 2004, 2005 and 2006 failed to discover any further populations.

The Canadian population consisted of 20 mature plants in 2006, a decline from about 200 plants when first discovered. Plants occupy an area of habitat varying between 4 and 20 m².

Limiting factors and threats

In Canada, rayless goldfields is threatened by trampling, threats associated with invasive alien plants, habitat loss, demographic collapse and threats associated with altered hydrological regimes that could impact water availability and alter site characteristics.

Special significance of the species

The British Columbia occurrence of rayless goldfields represents a small disjunct population separated by about 300 km from the main range of the species.

Existing protection pr other status designations

Rayless goldfields is not covered under the Convention on International Trade in Endangered Species (CITES), the *Endangered Species Act* (USA) or the IUCN Red Data Book. NatureServe globally ranks it as G5 (secure).

In British Columbia, it is currently ranked as S1 (critically imperiled). It does not occur elsewhere in Canada. British Columbia does not provide any legal protection for this species.



COSEWIC HISTORY

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. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS (2008)

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.



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Canadian Wildlife Service

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Canada

The Canadian Wildlife Service, Environment Canada, provides full administrative and financial support to the COSEWIC Secretariat.

COSEWIC Status Report

on the

Rayless Goldfields

Lasthenia glaberrima

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2008

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SPECIES INFORMATION

Name and classification

Scientific name: *Lasthenia glaberrima* A.DC.

Synonym: *L. minima* Suksd.

English common names: Rayless Goldfields, Smooth Goldfields

Family: Asteraceae (aster family)

Major plant group: Eudicot flowering plant

Lasthenia glaberrima is a clearly defined taxon that presents no classification problems. Dwarfed plants with small heads have been called *L. minima* Suksd. but that name has been rejected in modern floras because the differences appear to merely be a response to environmental differences (Ornduff 1966).

Morphological description

Lasthenia glaberrima is a fibrous-rooted annual with sprawling to erect, simple to freely branched and hairless shoots (Figure 1). The species may form adventitious roots from the lower stem nodes. Its leaves are oppositely arranged, 2-10 cm long, linear and lack hairs or teeth. The flowering structure consists of numerous flowering heads that are erect at anthesis but may bend down after flowering. Each bell-shaped head is 5-7 mm long and consists of an outer ring of 5-10 fused, hairy bracts. The individual flowers are tightly packed on a cone-shaped base within the fused bracts. The outer ring of 6-13 flowers have pale yellow, petal-like structures (ligules) which are so inconspicuous that they may easily be overlooked. The inner (disc) flowers are more numerous, pale yellow and lack showy petal-like structures. The fruits (achenes) are less than 4 mm long, linear and hairy. Each fruit bears a cap (pappus) of up to 10 narrowly tapered to elliptic scales (Ornduff 1966, 1993).

Genetic description

Lasthenia has a base chromosome number of $x=8$. The genus is monophyletic and appears to have undergone an initial rapid radiation followed by long periods of adaptation and speciation. Evidence suggests that the substantial morphological, ecological, cytological and biochemical differences among species may be associated with the accumulation of rather few genetic differences (Ornduff 1976). *Lasthenia glaberrima* has a chromosome count of $2n=10$ (Ornduff 1993). Ornduff (1966) felt that *L. glaberrima* was a rather advanced member of the genus but Desrochers and Dodge (2003) concluded that it was a primitive member of the genus based on Internal Transcribed Spacer (ITS) sequence data. The species is morphologically quite variable and is self-pollinated so there is a significant possibility of distinct genetic composition, particularly in isolated populations like the one in Canada (Chan pers. comm. 2005).

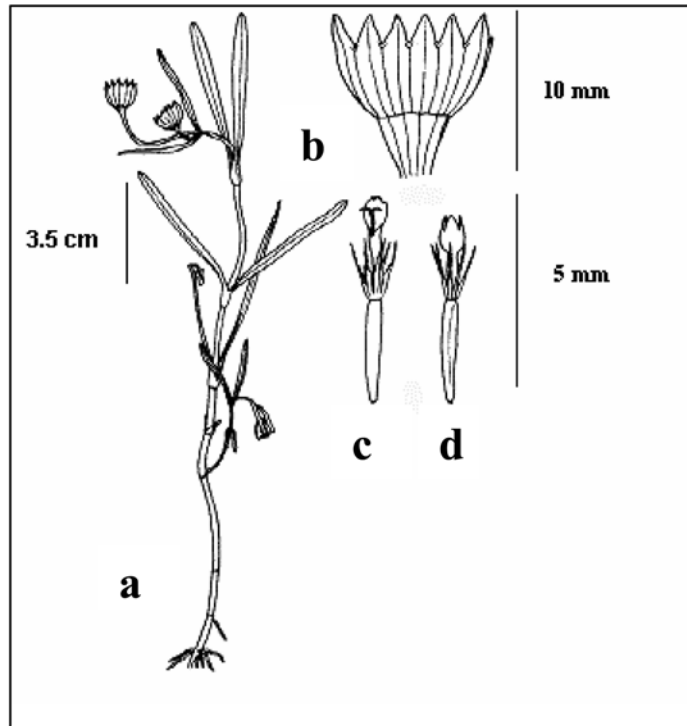


Figure 1. Illustration of *Lasthenia glaberrima* showing growth form (a), flower head involucre of bracts (b) a single flower with a short ligule from the outer ring of flowers in the head (c), and a single flower from the center of the flower head without a petal-like ligule (d). Illustration by John H. Rumley in Hitchcock *et al.* 1955, with permission.

Designatable units

There is but a single occurrence and, therefore, a single designatable unit is recognized for this species in Canada.

DISTRIBUTION

Global range

Lasthenia glaberrima ranges from Vancouver Island south, mostly west of the Cascade Mountains, to central California (Figure 2) (Hitchcock *et al.* 1955, Ornduff 1993). The nearest United States record is from Klickitat County, Washington (Björk *pers. comm.* 2005). There is a historic record from Clark County, also in Washington. Both of these populations are over 300 km south of the Canadian population and neither is situated along the coast (Washington Natural Heritage Program *n.d.*). In Oregon, the species occurs in the Willamette Valley but has not been found along the coast (Segotta *pers. comm.* 2004).

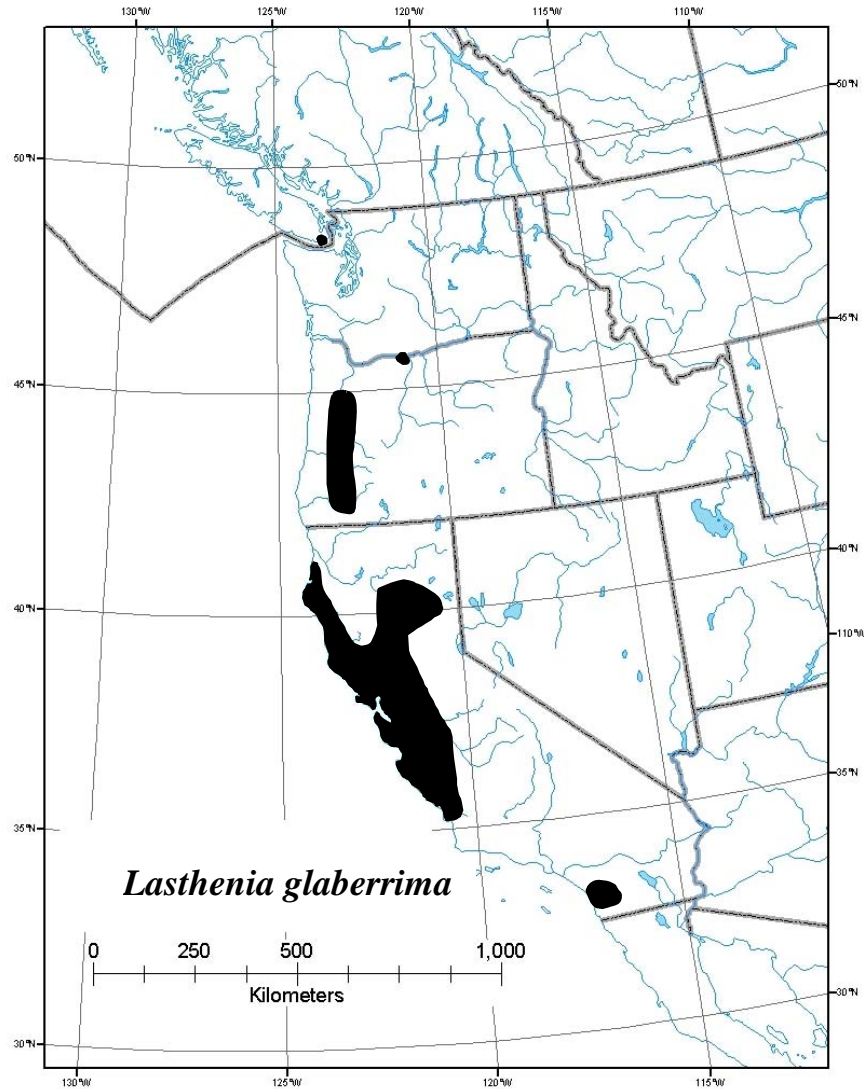


Figure 2. Global range of *Lasthenia glaberrima*

Canadian range

In Canada, *Lasthenia glaberrima* is known from a single population in southwestern British Columbia, near Victoria (Figure 3). The population occupies an area of less than 40 m². Since there is only one Canadian population this constitutes both its Extent of Occurrence and its Area of Occupancy. This is considerably less than 1% of the species' global range. The Extent of Occurrence and Area of Occupancy, as per COSEWIC methodology, are each 1 km² when based on using a 1 km square overlay grid.

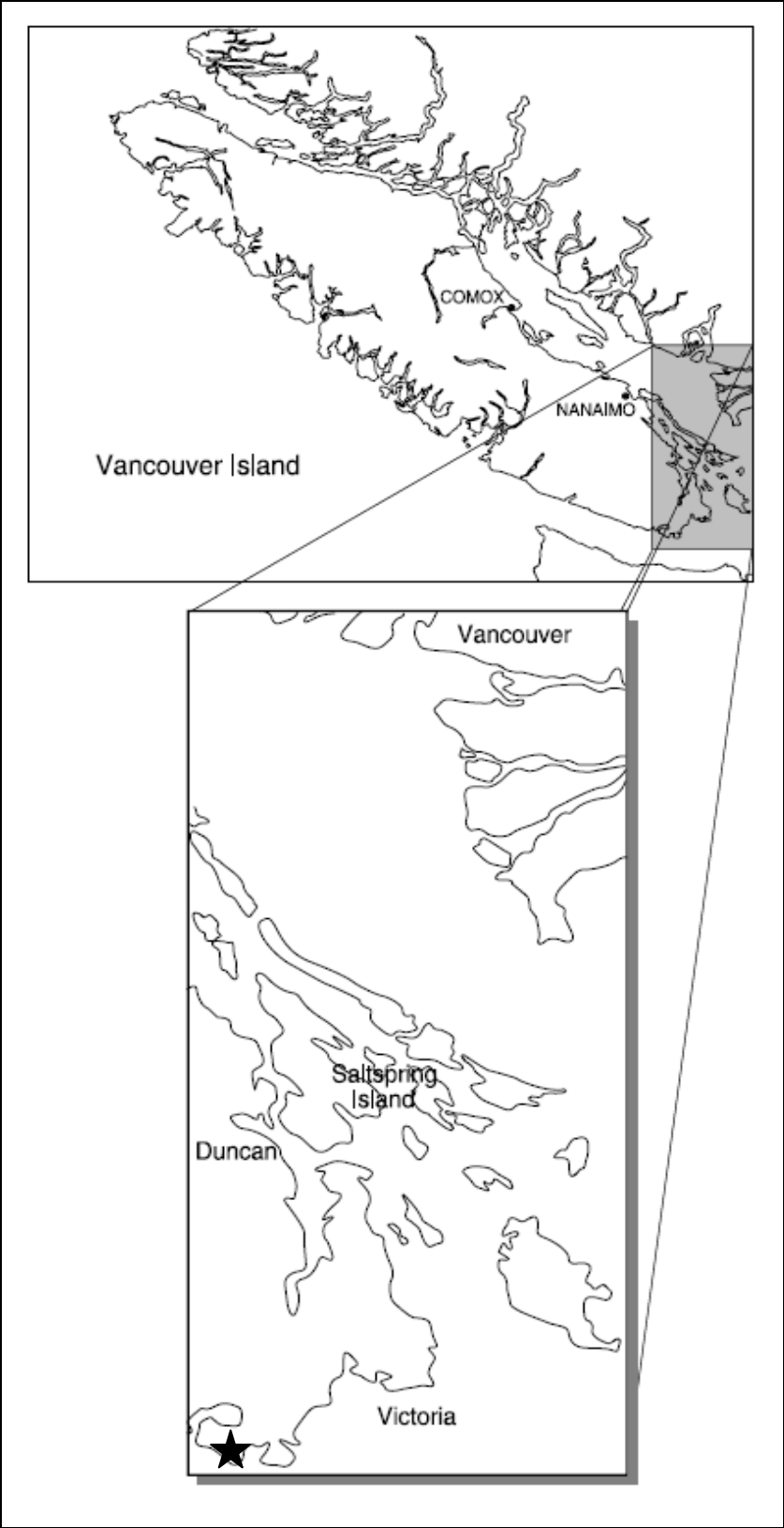


Figure 3. Canadian distribution of *Lasthenia glaberrima*

Although *Lasthenia glaberrima* was not reported in Canada before 2003 there is no evidence that it is a new arrival. The site where it occurs had received relatively little attention from botanists prior to 2003 and most of the earlier botanical exploration in its vicinity occurred in early spring, when winter annuals including *Limnanthes macounii* (Threatened) are in flower. Even in flower, the species is unlikely to attract attention because of its lack of showy inflorescences. *Lasthenia glaberrima* is not the only example of a species known from a single widely disjunct location in the Victoria area. *Orthocarpus bracteosus* is another vernal pool species known from a single location in Canada and, as with *Lasthenia glaberrima*, the next nearest population is in the Columbia Gorge of southern Washington State. For these reasons, and in the absence of evidence to the contrary, it is prudent to assume that *L. glaberrima* is a native element of the Canadian flora.

HABITAT

Habitat requirements

Lasthenia glaberrima generally occurs in wet open places, often in muddy vernal pools or on muddy ground on perched water tables (Hitchcock et al. 1955, Peck 1941, Segotta pers. comm. 2004, Ornduff 1993). The single British Columbia site is a rock-bound vernal pool on a shoreline rocky bluff about 15 m above sea level. The vernal pool has a thin layer of medium-textured soil above gneissic bedrock. It begins to moisten with the first rains in late summer or early fall and remains saturated or inundated for long periods throughout the winter and early spring. The soil gradually dries out with the onset of summer drought and is quite dry from mid-June to late August or early September. Annual herbaceous species including water meadow-foxtail (*Alopecurus geniculatus*), large water-starwort (*Callitriche heterophylla*), rayless goldfields (*Lasthenia glaberrima*) and annual coastal plantain (*Plantago bigelovii*) dominate the site.

Habitat trends

The amount of potential habitat has declined greatly over the past century as coastal areas in southeast Vancouver Island have been developed for residential and recreational use.

Lasthenia glaberrima occurs in a rare type of vernal pool generally associated with Garry oak ecosystems, so the decline of these ecosystems provides an indirect measure of the loss of habitat for *L. glaberrima*. Overall, Garry oak systems have, over the past century, been reduced to less than 5% of their original extent in the Victoria area (Lea 2002). Garry oak ecosystems persist largely as isolated communities that are heavily fragmented and lack connections that would allow substantial genetic interchange. *Lasthenia glaberrima* appears to prefer shoreline sites, which are also sought for residential development, while Garry oak ecosystems are more broadly distributed, so the actual decline in suitable habitat is probably even higher.

Much of the remaining habitat suitable for *Lasthenia glaberrima* has been heavily altered due to invasion by alien weeds including several grasses and forbs.

The location of *Lasthenia glaberrima* in Canada lies at the heart of one of North America's fastest growing regions. The population of metropolitan Victoria has increased from approximately 180,000 in 1966 to 318,000 in 1996 and is projected to increase to more than 400,000 by 2026. The Capital Regional Plan adopted in 1959 led to expansion into rural areas surrounding Victoria over the past 44 years and this pattern of expansion may continue in order to accommodate population increases (Capital Regional District 2003a). During past the 18 years, average prices for single family residences in Metropolitan Victoria have increased 330% from \$94,000 to \$313,000 in 2003, reflecting the pent-up demand for property (Capital Regional District 2003b). Since then, the average price has accelerated, climbing by about 50% to approximately \$470,000 (Victoria Real Estate Board 2005). The most expensive and sought-after properties are ocean frontage, apparently the favoured habitat of *Lasthenia glaberrima*.

Habitat protection/ownership

The sole Canadian population occurs within East Sooke Regional Park. The Capital Regional District (CRD) has recently given the conservation and management of rare threatened and endangered plants and wildlife, and their supporting habitats, precedence over all other park uses (Capital Regional District Parks 2000). Despite its occurrence within a park, the population was subject to heavy trampling damage, at least until recently. In September 2005 Capital Regional District Parks established a fence around the population to protect it from visitor traffic.

BIOLOGY

Little has been written about the biology of *Lasthenia glaberrima*, apart from the taxonomic treatment Ornduff (1966) provides for the genus. The following information, unless otherwise cited, is based on the unpublished field observations of Matt Fairbarns.

Life cycle and reproduction

Lasthenia glaberrima is a short-lived annual. Germination appears to begin in April and end in early May. Despite numerous visits in 2003, 2004 and 2005, no seedlings were observed in the field later than May. Ornduff (1966) reports that in some species of *Lasthenia* all viable seed germinated following a thorough watering, and thus fail to produce a long-term seed bank.

Flowering begins in early May and peaks by mid-month. The species is self-fertilizing (Chan pers. com. 2005, Ornduff 1966). This is unusual within the genus and likely explains the reduction of the ray flowers. Seed dispersal begins in mid-May and most plants have shed their achenes by late June. Plants tend to produce several heads although some smaller plants produce as few as 1 or 2 heads. Most heads produce numerous ripe achenes at maturity.

Plants continue to grow until they succumb to summer drought. Mortality normally occurs in late May or June and summer rainfall events appear to be too rare to trigger renewed vegetative growth, flowering and fruiting.

Herbivory

There is no published information on herbivory, nor was any evidence of foliar herbivory observed during numerous visits to the Canadian population over a three-year period although flower heads were grazed in 2005 and 2006.

Physiology

Lasthenia glaberrima survives summer drought and winter cold by persisting as seeds. Like many other annual members of the genus, plants probably die by mid-summer even if watered continuously (Ornduff 1966).

Dispersal

The pappus of the achenes is unlikely to aid in wind-dispersal but probably helps attach the achenes to the fur of passing mammals (Ornduff 1966). This may only affect a small proportion of the achenes as evidenced by a study of *Lasthenia californica* which has a similar achene and pappus. Achenes of *Lasthenia californica* do not disperse very far; a gentle tap or current of air will cause its mature achenes to separate from the receptacle. Seeds either fall to the ground or get trapped in nearby tufts of grass (Rajakaruna and Bohm 1999). Nevertheless, *Lasthenia glaberrima* is one of the most widely distributed members of its genus and its awned pappus (as well as its self-compatible breeding system) may have been critical to its wide distribution.

Interspecific interactions

There are no known interspecific interactions that increase the susceptibility of *Lasthenia glaberrima* to extirpation in Canada.

Adaptability

Lasthenia glaberrima is well-adapted to the strong seasonal fluctuations in moisture regime characteristic of rock-bound vernal pools. It is tolerant of the saturated conditions that prevail during its period of germination and early growth, conditions that limit the growth of competing perennial vegetation. It conducts its early growth as a submerged plant with short internodes and long, flaccid leaves. The lower stems may be lax and develop an aerenchymatous cortex in response to the poorly aerated environment. Its tolerance of flooding allows it to grow rapidly and mature before the onset of the summer drought. As the pool dries, the aerial stems grow rapidly. They tend to have longer internodes and bear shorter, more rigid leaves. *Lasthenia glaberrima* survives the intense and prolonged summer drought characteristic of vernal pool habitats by persisting in the soil in a transient seed bank. Like many other vernal pool annuals, species of *Lasthenia* tend to vary considerably depending on fluctuations in precipitation, flowering and producing seed under a variety of circumstances. In a single locality, the plants may be small, few-leaved and few-flowered in a dry year and immense and highly branched in a more favourable year. Plants generally produce a single, terminal head early in the flowering season and additional heads are produced on lateral branches if moist conditions continue. Paradoxically, in dry years (when plants tend to be quite small) their population numbers may be very large even though biomass and seed production may be well below levels reached in moist years. Plant size is also heavily influenced by the degree of crowding (Ornduff 1966).

Transplanting has not been attempted. The species' reliance on a taproot, the fact that it is an annual, and its specialized habitat requirements suggest that transplantation from horticultural sources would be unsuccessful.

POPULATION SIZES AND TRENDS

Search effort

The range of potential habitats for rayless goldfields was determined by reference to herbarium label information associated with specimens from Oregon and California. Although the species may range inland in Oregon and California it, like many other vernal pool species, is quite unlikely to occur more than a few metres from the ocean's edge in Canada.

Over the past decade, virtually all intact shoreline areas have been examined, from Whiffen Spit (8 km northwest) to Swartz Bay (45 km northeast). However, the specific area where the population was found had received only limited attention from local botanists prior to 2003. The search effort included most islands and islets offshore of Victoria and the Saanich Peninsula. Within this search area most large complexes of vernal pools and seeps on shoreline sites have been examined several times. Suitable habitat is scarce or absent west of Whiffen Spit because of differences in coastal geomorphology and sharp climatic gradients. Shoreline vernal pool and seepage habitats are also relatively uncommon beyond the northeast limits of the main search area. Most of the vernal pools and seeps northeast of the main search area that have known occurrences of other rare plants have been searched for rayless goldfields, as have most vernal pool complexes large enough to be identified using air photographs. The most northerly sites searched are near Nanoose Bay (a little over 100 km to the north). While it is possible that there are undiscovered Canadian populations of rayless goldfields, almost all suitable sites have been surveyed.

Suitable sites have been surveyed repeatedly since the early 1980s in a series of projects designed to document the distribution of rare plants of seepage sites and vernal pools on southeast Vancouver Island and the Gulf Islands. The principal investigators included Adolf and Oldriska Ceska, Matt Fairbarns, Hans Roemer, Jenifer Penny, Harvey Janszen, Frank Lomer and the late George Douglas.

Although *Lasthenia glaberrima* is a relatively inconspicuous plant easily overlooked during casual botanical inventories, this status report was only prepared after a directed survey by botanists familiar with the species. This survey effort includes annual searches specifically for it (approximately 6 person-days in 2003, 8 person-days in 2004, 4 person-days in 2005 and 5 person-days in 2006). These efforts included unsuccessful surveys of the many sites that had other rare plants of vernal pools and seeps (Figure 4). Despite the concentrated effort, no new populations were discovered.

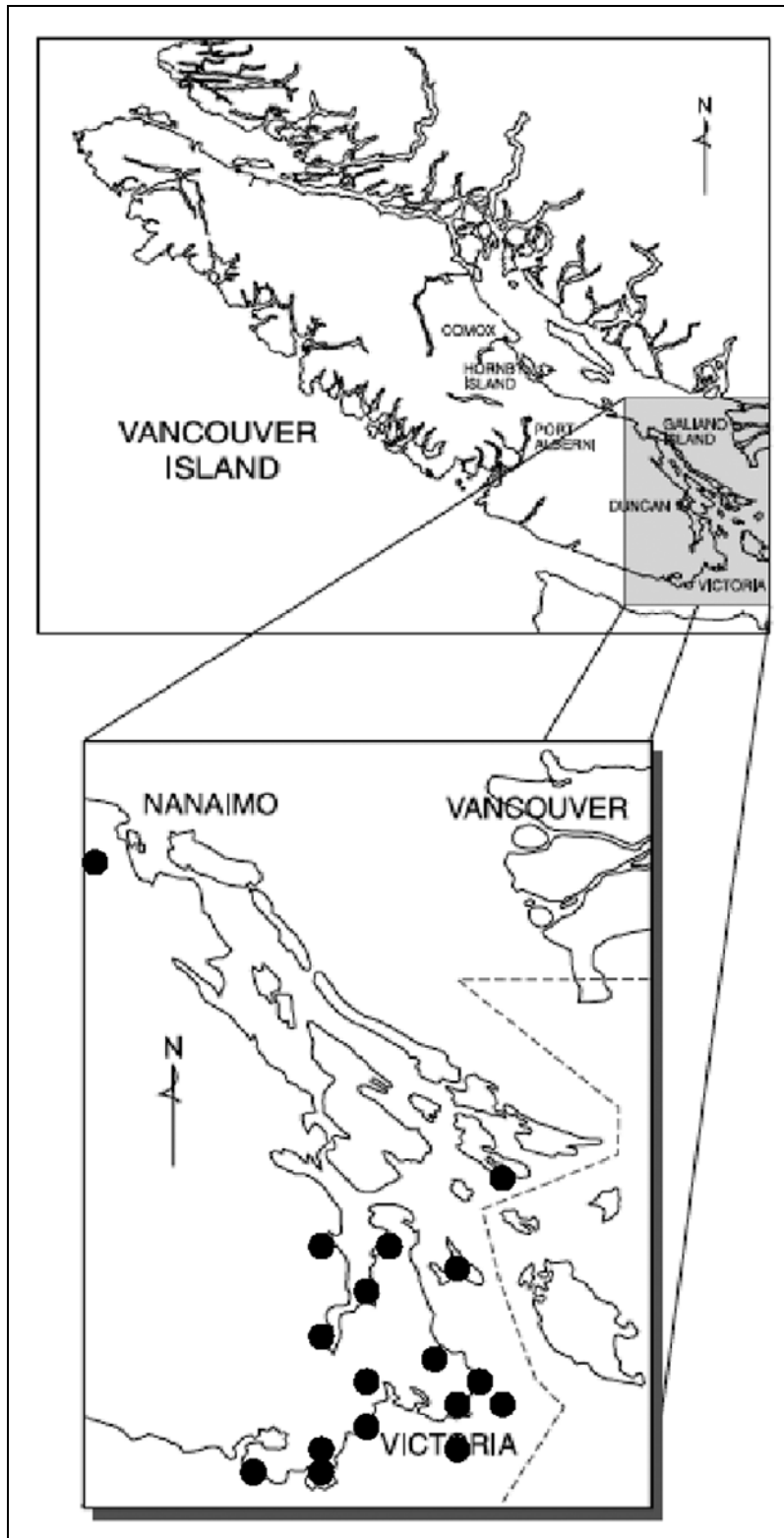


Figure 4. Negative search results for *Lasthenia glaberrima*, 2003-2006.

Abundance

The single Canadian population, at East Sooke Regional Park, consisted of 21 mature plants in 2006 (Table 1) as compared to about 200 plants when first discovered in 2003.

Observation Date	Population Extent (actual area occupied)	Number of Individuals
May 25, 2003	20 m ²	180 +/- 20
May 18, 2004	8 m ²	75 +/- 10
June 3, 2005	4 m ²	20
June 8, 2006	10 m ²	21

Fluctuations and trends

There is no long-term monitoring record but short-term data indicate a decline in population size (Table 1). It is uncertain whether this reflects a decline that may continue or if the most recent population size reflects a low point in a fluctuating population. It is known that other annuals may experience significant natural fluctuations in population sizes (Harper 1977). Species of *Lasthenia* are particularly prone to dramatic fluctuations in response to variations in annual rainfall and duration of ponded water as exemplified by *L. conjugens* at Ford Ord, where population sizes varied from 500-1500 in 1998; 56,000 in 1999 and 162,500 in 2000 (U.S. Federal Register 2003).

Rescue effect

The nearest reported population is from near the Columbia River in southern Washington. The site is about 300 km from the nearest point in Canada and about the same distance from the only known site in Canada. There is little chance of seed dispersal across such distances since the seeds lack a coma or any other structure to aid in long-distance dispersal.

LIMITING FACTORS AND THREATS

Trampling

Trampling and related activities present a major threat to *Lasthenia glaberrima*. The sole Canadian occurrence is adjacent to a hiking trail and footprints have been observed among the plants during the critical growing season in April and May and in 2005, six of the twenty plants were crushed by trampling. The Capital Regional Parks Department established a fence around the vernal pool in Sept. 2005 which will probably reduce casual damage but may attract undesirable attention of some hikers.

Threats associated with invasive alien plants

A number of alien plant species have invaded existing and potential habitat for *Lasthenia glaberrima*. These include several invasive grasses: creeping bentgrass (*Agrostis stolonifera*), water meadow-foxtail (*Alopecurus geniculatus*), sweet vernalgrass (*Anthoxanthum odoratum*), annual bluegrass (*Poa annua*), forbs hairy cat's-ear (*Hypochaeris radicata*), and sheep sorrel (*Rumex acetosella*). Invasive shrubs such as Scotch broom (*Cytisus scoparius*) are unable to establish on the microsite occupied by *Lasthenia glaberrima* but can root in adjacent pockets of deep soil and shade out the small patches.

Grazing

There are no long-term data on grazing damage but grazing removed some or all of the heads from eight of twenty plants in 2005 and two of twenty-one plants in 2006.

Habitat loss

Habitat loss has been the leading factor in the disappearance of suitable habitat. Much of the suitable shoreline in the Victoria Metropolitan Area was developed and most of this development (primarily residential and industrial) occurred before 2003, when *Lasthenia glaberrima* was first discovered in Canada.

Demographic collapse

The single Canadian population of *Lasthenia glaberrima* is threatened simply by its small size and very small area of occurrence. This predisposes it to extirpation through chance events that would not pose a risk to larger or more extensive populations.

Threat associated with altered hydrological regimes

Lasthenia glaberrima is dependant upon winter and spring seepage. Any actions that disrupt the hydrological regime may eliminate this essential process.

SPECIAL SIGNIFICANCE OF THE SPECIES

The British Columbia occurrence of *Lasthenia glaberrima* represents a small disjunct population separated by 400 kilometres from the main range of the species.

Other members of the genus (in particular *Lasthenia glabrata*, *L. californica* and *L. coronaria*) have a niche role in native plant horticulture. They are favoured because they are easily cultivated, provide quick colour and effective ground cover, their nectar attracts butterflies, their fragrance is attractive in mass plantings and their achenes attract goldfinches. In contrast, *Lasthenia glaberrima* provides little colour, is an ineffective ground cover because of its specialized soil requirements and does not produce nectar. Consequently the species has little value to the nursery trade.

No traditional knowledge, including First Nations use for crafts or for medicine, has been documented for *Lasthenia glaberrima* or any other members of the genus.

EXISTING PROTECTION OR OTHER STATUS DESIGNATIONS

Lasthenia glaberrima is not covered under the Convention on International Trade in Endangered Species (CITES), the *Endangered Species Act* (USA) or the IUCN Red Data Book. NatureServe globally ranks it as G5 (secure). The Washington State Natural Heritage Program (Washington natural Heritage Program 2005) ranks it as S1 (critically imperilled) in their state. The Oregon Natural Heritage Information Center lists the species as SNR (not ranked) but had considered placing it on the state Review List. They decided against this because it is very abundant in some places such as Lane County in the southern Willamette Valley (Vrilakas pers. comm. 2003). It is also ranked SNR in California (NatureServe 2005).

In British Columbia, it is currently ranked as S1 (critically imperilled). It does not occur elsewhere in Canada. The British Columbia Conservation Data Centre also places it on the provincial Red List, which consists of species that are provincially threatened or endangered (B.C. Conservation Data Centre 2005). British Columbia does not provide any legal protection for *Lasthenia glaberrima*.

TECHNICAL SUMMARY

Lasthenia glaberrima

Rayless goldfields

Lasthénie glabre

Range of occurrence in Canada: British Columbia

Demographic Information

Generation time (average age of parents in the population)	3 months
<i>Population trend and dynamics</i>	
Observed percentage of reduction in total number of mature individuals over the last 10 years.	>>50 %
Projected percentage of reduction in total number of mature individuals over the next 10 years.	Unknown
Observed percentage reduction in total number of mature individuals over any 10-year period, over a time period including both the past and the future.	Unknown
Are the causes of the decline clearly reversible?	Unknown
Are the causes of the decline clearly understood?	Yes
Have the causes of the decline clearly ceased?	No
Observed trend in number of populations	Stable
Are there extreme fluctuations in number of mature individuals?	Unknown but likely
Are there extreme fluctuations in number of populations?	No

Number of mature individuals in each population

Population	N Mature Individuals
East Sooke Regional Park: approximately 21 left (in 2006) representing a decline from an initial size of about 200 plants	21
Grand Total	21

Extent and Area Information

Estimated extent of occurrence (km ²)	1 km ²
Observed trend in extent of occurrence	Unknown
Are there extreme fluctuations in extent of occurrence?	No
Estimated area of occupancy (km ²) Actual area occupied is < 40 m ² but based on an overlay of a 1x1 km grid is 1 km ² .	1 km ²
Observed trend in area of occupancy	Stable
Are there extreme fluctuations in area of occupancy?	No
Is the total population severely fragmented?	Yes
Number of current locations	1
Trend in number of locations	Stable
Are there extreme fluctuations in number of locations?	No
Observed trend in quality of habitat	Decline

Quantitative Analysis

	[0.00% probability of extirpation in years]
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Threats (actual or imminent, to populations or habitats)

1. Trampling (past threat; population enclosed by a fence in 2006)
2. Invasive alien plants
3. Habitat loss (historical)
4. Demographic collapse (potential threat)
5. Altered hydrological regimes (potential threat)

Rescue Effect (immigration from an outside source)

Status of outside population(s)?	USA: secure
Is immigration known or possible? Unknown and unlikely	Unlikely
Would immigrants be adapted to survive in Canada?	Unknown
Is there sufficient habitat for immigrants in Canada?	Yes
Is rescue from outside populations likely?	No

Current Status

COSEWIC: Endangered 2008

Status and Reasons for Designation

Status: Endangered	Alpha-numeric code: B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D1
Reasons for Designation: A single very small population of an annual flowering plant that is at continued risk from a number of limiting factors including the spread of exotic plants.	

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): Not applicable.
Criterion B (Small Distribution Range and Decline or Fluctuation): Meets Endangered B1ab(iii,v)+2ab(iii,v) with EO and AO well below threshold levels and only a single population known with continued impacts on its habitat and inferred loss of mature individuals.
Criterion C (Small and Declining Number of Mature Individuals): Endangered C2a(i,ii) with a single population with <2500 plants and continued decline inferred based on the presence and spread of exotic plants.
Criterion D (Very Small Population or Restricted Distribution): Endangered D1; fewer than 250 plants at the single site.
Criterion E (Quantitative Analysis): None available

Uncertainties

Other annual species of the genus *Lasthenia* are known to fluctuate greatly in the number of mature individuals and it is possible that *L. glaberrima* may do so.

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BIOGRAPHICAL SUMMARY OF REPORT WRITER

Matt Fairbarns has studied the conservation biology of plants for over 25 years. He has a special interest in the flora and vegetation of British Columbia and Alberta. He was a botanist with the British Columbia provincial government until 2003 and now manages Aruncus Consulting, an independent biological conservation research company.

COLLECTIONS EXAMINED

The single Canadian collection of *Lasthenia glaberrima* was made by Ansell, identified by M. Fairbarns and submitted to the herbarium of Royal British Columbia Museum (V).