

Management Plan for the Vancouver Island Beggarticks (*Bidens amplissima*) in Canada

Vancouver Island Beggarticks



2015



Government
of Canada

Gouvernement
du Canada

Canada

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For copies of the management plan, or for additional information on species at risk, including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports, residence descriptions, action plans, and other related recovery documents, please visit the [Species at Risk \(SAR\) Public Registry](http://sararegistry.gc.ca)¹.

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¹ <http://sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>

MANAGEMENT PLAN FOR THE VANCOUVER ISLAND BEGGARTICKS (*Bidens amplissima*) IN CANADA

2015

Under the Accord for the Protection of Species at Risk (1996), the federal, provincial, and territorial governments agreed to work together on legislation, programs, and policies to protect wildlife species at risk throughout Canada.

In the spirit of cooperation of the Accord, the Government of British Columbia has given permission to the Government of Canada to adopt the *Management Plan for the Vancouver Island Beggarticks (Bidens amplissima) in British Columbia* (Part 2) under section 69 of the *Species at Risk Act* (SARA). Environment Canada has included an addition (Part 1) which completes the SARA requirements for this management plan.

The federal management plan for the Vancouver Island Beggarticks in Canada consists of two parts:

Part 1 - *Federal Addition to the Management Plan for the Vancouver Island Beggarticks (Bidens amplissima) in British Columbia*, prepared by Environment Canada.

Part 2 - *Management Plan for the Vancouver Island Beggarticks (Bidens amplissima) in British Columbia*, prepared by the Vancouver Island Beggarticks Working Group for the British Columbia Ministry of Environment.

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Part 2 - *Management Plan for the Vancouver Island Beggarticks (Bidens amplissima) in British Columbia*, prepared by the Vancouver Island Beggarticks Working Group for the British Columbia Ministry of Environment

Part 1 - Federal Addition to the *Management Plan for the Vancouver Island Beggarticks (Bidens amplissima) in British Columbia*, prepared by Environment Canada

Preface

The federal, provincial, and territorial government signatories under the [Accord for the Protection of Species at Risk \(1996\)](#)² agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c. 29) (SARA), the federal competent ministers are responsible for the preparation of management plans for listed species of special concern and are required to report on progress five years after the publication of the final document on the SAR Public Registry.

The Minister of the Environment is the competent minister under SARA for the Vancouver Island Beggarticks and has prepared this management plan (Part 1) as per section 65 of SARA. To the extent possible it has been prepared in cooperation with the B.C. Ministry of Environment. SARA section 69 allows the Minister to adopt all or part of an existing plan for the species if it meets the requirements under SARA for the content. The B.C. Ministry of Environment led the development of the attached management plan for the Vancouver Island Beggarticks (Part 2) in cooperation with Environment Canada.

Success in the conservation of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this plan and will not be achieved by Environment Canada or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this plan for the benefit of the Vancouver Island Beggarticks and Canadian society as a whole.

Implementation of this management plan is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

² <http://registrelep-sararegistry.gc.ca/default.asp?lang=En&n=6B319869-1%20>

ADDITIONS AND MODIFICATIONS TO THE ADOPTED DOCUMENT

The following sections have been included to address specific requirements of SARA that are not addressed in the “Management Plan for the Vancouver Island Beggarticks (*Bidens amplissima*) in British Columbia” (Part 2) and/or to provide updated or additional information.

Under SARA, there are specific requirements and processes set out regarding the protection of species and their habitats. Therefore, statements in the provincial management plan referring to protection of species and their habitats may not directly correspond to federal requirements, and are not being adopted by Environment Canada as part of the federal management plan.

1.0 Effects on the Environment and Other Species

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the [Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals](#)³. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making and to evaluate whether the outcomes of a recovery planning document could affect any component of the environment or achievement of any of the [Federal Sustainable Development Strategy](#)'s⁴ (FSDS) goals and targets.

Conservation planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that implementation of management plans may inadvertently lead to environmental effects beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental effects, with a particular focus on possible impacts upon non-target species or habitats. The results of the SEA are incorporated directly into the management plan itself, but are also summarized below in this statement.

The provincial management plan for Vancouver Island Beggarticks contains a section describing the effects of recovery activities on other species (i.e., Section 8). Environment Canada adopts this section of the provincial recovery plan as the statement on effects of recovery activities on the environment and other species. The distribution of Vancouver Island Beggarticks overlaps with that of several other federally-listed species at risk in the Lower Mainland of British Columbia as well as south-eastern Vancouver Island and the adjacent Gulf Islands. Restoration and enhancement actions for Vancouver Island Beggarticks may include reduction of plant cover or canopies, in order to reduce vegetation succession in the open habitats used by this species. Recovery planning activities for Vancouver Island Beggarticks will be

³ <http://www.ceaa.gc.ca/default.asp?lang=En&n=B3186435-1>

⁴ www.ec.gc.ca/dd-sd/default.asp?lang=En&n=F93CD795-1

implemented with consideration for all co-occurring species at risk, such that there are no negative impacts to these species or their habitats. Some management actions for Vancouver Island Beggarticks (e.g., inventory and monitoring, threat mitigation, habitat conservation, education, and research) may promote the conservation of other species at risk that overlap in distribution and rely on similar habitat attributes.

**Part 2 - *Management Plan for the Vancouver Island
Beggarticks (Bidens amplissima) in British Columbia,*
prepared by the Vancouver Island Beggarticks Working
Group for the British Columbia Ministry of Environment.**

Management Plan for the Vancouver Island Beggarticks (*Bidens amplissima*) in British Columbia



Prepared by Vancouver Island Beggarticks Working Group



Ministry of
Environment

March 2014

About the British Columbia Management Plan Series

This series presents the management plans that are prepared as advice to the Province of British Columbia. Management plans are prepared in accordance with the priorities and management actions assigned under the British Columbia Conservation Framework. The Province prepares management plans for species that may be at risk of becoming endangered or threatened due to sensitivity to human activities or natural events, or species where management is required to meet population targets for ecosystem management, human uses, or ecological services.

What is a management plan?

A management plan identifies a set of coordinated conservation activities and land use measures needed to ensure, at a minimum, that the target species does not become threatened or endangered or is being managed for use, ecosystem goals, or ecological services. A management plan summarizes the best available scientific and traditional information on biology and threats to inform the development of a management framework. Management plans set goals and objectives, and recommend approaches appropriate for species or ecosystem conservation.

What's next?

Direction set in the management plan provides valuable information on threats and direction on conservation measures that may be used by individuals, communities, land users, conservationists, academics, and governments interested in species and ecosystem conservation.

For more information

To learn more about species at risk recovery planning in British Columbia, please visit the Ministry of Environment Recovery Planning webpage at:

<<http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm>>

**Management Plan for the Vancouver Island Beggarticks
(*Bidens amplissima*) in British Columbia**

Prepared by the Vancouver Island Beggarticks Working Group

March 2014

Recommended citation

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Brian Klinkenberg

Additional copies

Additional copies can be downloaded from the B.C. Ministry of Environment Recovery Planning webpage at:

<<http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm>>

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Disclaimer

This management plan has been prepared by the Vancouver Island Beggarticks Working Group, as advice to the responsible jurisdictions and organizations that may be involved in managing the species.

This document identifies the management actions that are deemed necessary, based on the best available scientific and traditional information, to prevent Vancouver Island beggarticks populations in British Columbia from becoming endangered or threatened. Management actions to achieve the goals and objectives identified herein are subject to the priorities and budgetary constraints of participatory agencies and organizations. These goals, objectives, and management approaches may be modified in the future to accommodate new objectives and findings.

The responsible jurisdictions and all members of the management team have had an opportunity to review this document. However, this document does not necessarily represent the official positions of the agencies or the personal views of all individuals on the management team.

Success in the conservation of this species depends on the commitment and cooperation of many different constituencies that may be involved in implementing the directions set out in this management plan. The B.C. Ministry of Environment encourages all British Columbians to participate in the conservation of Vancouver Island beggarticks.

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EXECUTIVE SUMMARY

This management plan has been developed to provide guidance for the British Columbia (B.C.) populations of Vancouver Island beggarticks (*Bidens amplissima*). The Vancouver Island beggarticks is a wetland annual plant that blooms in August through September. Plants are erect and branched, 50 to 100 cm tall, with bright yellow daisy-like flowers. The habitat for this species is the narrow edge of wetlands, estuaries, ditches, and field depressions where water tables fluctuate. The Vancouver Island beggarticks is found only in southwestern B.C. including Vancouver Island. Of the 59 locations recorded in BC, there are 38 currently extant known populations and 2 extirpated and 19 likely extirpated populations.

Vancouver Island beggarticks was designated as Special Concern by the Committee on the Status of Endangered Wildlife in Canada because of declines in populations and restricted distribution. It is listed as Special Concern in Canada on Schedule 1 of the *Species at Risk Act* (SARA). In B.C., the Vancouver Island beggarticks is ranked S3 (vulnerable) by the Conservation Data Centre and is on the provincial Blue list. The B.C. Conservation Framework ranks the Vancouver Island beggarticks as a priority 1 under goal 1 (contribute to global efforts for species and ecosystem conservation) and goal 2 (prevent species and ecosystems from becoming at risk).

Threats to Vancouver Island beggarticks include competition from invasive plants (e.g., reed canarygrass [*Phalaris arundinacea*] and purple loosestrife [*Lythrum salicaria*]), mowing, infilling of wetlands by development, alteration of hydrological regimes, and natural succession.

The management goals are:

1. To maintain or increase the distribution and abundance of all extant populations in B.C., including any new populations that may be identified.
2. To re-introduce and restore populations where feasible at protected wetland locations with suitable habitat within the species range in B.C.

The management objectives are:

1. Protect¹ known locations for Vancouver Island beggarticks from direct habitat loss, with priority given to protecting large, stable populations.
2. Mitigate threats associated with this species primarily the threat of invasive native and non-native/alien species.
3. Monitor distribution within the range of the species in B.C. at known locations and in potential habitat.
4. Investigate the feasibility of restoring populations at diminished locations and reintroduction at extirpated locations and in suitable habitat.

¹ Protection can be achieved through various mechanisms including: voluntary stewardship agreements, conservation covenants, sale by willing vendors on private lands, land use designations, and protected areas.

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1 COSEWIC* SPECIES ASSESSMENT INFORMATION

<p>Date of Assessment: November 2001 Common Name (population):** Beggarticks, Vancouver Island Scientific Name:* <i>Bidens amplissima</i> COSEWIC Status: Special Concern Reason for Designation: An annual species with fluctuating population sizes occurring at about 30 confirmed sites in wetland habitats of restricted extent with most of the species' global range present in southern British Columbia. Canadian Occurrence: B.C. COSEWIC Status History: Designated Special Concern in November 2001.</p>

* Committee on the Status of Endangered Wildlife in Canada.

** Common and scientific names reported in this management plan follow the naming conventions of the British Columbia Conservation Data Centre, which may be different from names reported by COSEWIC.

2 SPECIES STATUS INFORMATION

Vancouver Island beggarticks^a	
Legal Designation:	
FRPA: ^b No	B.C. <i>Wildlife Act:</i> ^c No
OGAA: ^b No	SARA Schedule: 1 – Special Concern (2003)
Conservation Status^d	
BC List: Blue	BC Rank: S3 (2008)
National Rank: N3	Global Rank: G3 (1988)
Other Subnational Ranks: ^e WA: SNR	
B.C. Conservation Framework (CF)^f	
Goal 1: Contribute to global efforts for species and ecosystem conservation.	Priority: ^g 1 (2009)
Goal 2: Prevent species and ecosystems from becoming at risk.	Priority: 1 (2009)
Goal 3: Maintain the diversity of native species and ecosystems.	Priority: 2 (2009)
CF Action Groups:	Compile Status Report; Monitor Trends; Planning; Send to COSEWIC; Habitat Protection; Private Land Stewardship

^a Data source: B.C. Conservation Data Centre (2013a) unless otherwise noted.

^b No = not listed in one of the categories of wildlife that requires special management attention to address the impacts of forest and range activities on Crown land under the *Forest and Range Practices Act* (FRPA; Province of British Columbia 2002) and/or the impacts of oil and gas activities on Crown land under the *Oil and Gas Activities Act* (OGAA; Province of British Columbia 2008).

^c No = not designated as wildlife under the B.C. *Wildlife Act* which offers it protection from direct persecution and mortality (Province of British Columbia 1982).

^d S = subnational; N = national; G = global; X = presumed extirpated; H = possibly extirpated; 1 = critically imperiled; 2 = imperiled; 3 = special concern, vulnerable to extirpation or extinction; 4 = apparently secure; 5 = demonstrably widespread, abundant, and secure; NA = not applicable; NR = unranked; U = unrankable. U.S. data from NatureServe (2012).

^e Data source: NatureServe (2012).

^f Data source: B.C. Ministry of Environment (2010).

^g Six-level scale: Priority 1 (highest priority) through to Priority 6 (lowest priority).

3 SPECIES INFORMATION

3.1 Species Description

Vancouver Island beggarticks (*Bidens amplissima*) is a wetland species. It is usually a robust annual flowering plant that ranges in height from 50 to 100 cm. Plants are often bushy with multiple branches and stems (Figure 1); however, height and fullness vary from year to year and with annual variation in precipitation, shading, and competition from other vegetation. The erect flower heads are relatively few and large, and have 6–11 bright yellow ray petals (Figure 2). The stems and inflorescences are glabrous to slightly hairy. The leaves are unstalked, or wing-stalked, simple in shape or some (the lower and middle leaves) are deeply three-lobed and toothed, 8-20 cm long. The seed is three sided, has a concave summit, and has barbed awns (hence the name beggarticks) that allow for easy dispersal by clinging to fur, feathers, and clothing (Douglas *et al.* 1998; Klinkenberg and Klinkenberg 2001; Ganders *et al.* 2002).

Seedlings can appear in mid to late April or May in areas of warm, shallow (2.5–5 cm) water. Plants do not mature until late August. Flowering and seed set primarily occur from late August through to late October.

This species shares traits and appears to readily hybridize with two closely related species, nodding beggarticks (*Bidens cernua*) and European beggarticks (*Bidens tripartita*), but is readily distinguished based on seed and flower head characteristics.



Figure 1. Vancouver Island beggarticks at Somass River Delta. Photo: Trudy Chatwin



Figure 2. Vancouver Island beggarticks flower. Photo: Brian Klinkenberg

3.2 Populations and Distribution

Vancouver Island beggarticks has a limited global range. It is a Pacific Northwest endemic species that is found only in B.C. and adjacent Washington State² (Ganders *et al.* 2002). B.C. populations are found on southeast Vancouver Island, in the Lower Mainland, and in one location at the mouth of Latelle Creek on the Central Coast (Figure 3). Vancouver Island beggarticks is recognized as a species of global importance because of its limited global range (Cannings *et al.* 2005). Based on locations confirmed in 2008, British Columbia supports approximately 85% of the global range of this species, and > 80% of species abundance (Klinkenberg 2008).



Figure 3. Global distribution of Vancouver Island beggarticks (after Klinkenberg and Klinkenberg 2001). Note: Latelle Creek location in Loughborough Inlet is not displayed in this map.

As of 2012 there were 59 known locations with 38 of the populations known to be extant in B.C., 2 extirpated and the other 19 populations likely extirpated (Figure 4; Table 1).

As Vancouver Island beggarticks is an annual plant, in any given year populations vary in size, area of occupancy, and viability. Klinkenberg and Klinkenberg (2001) reported 30 populations of Vancouver Island beggarticks for B.C. in the COSEWIC status report. However, since 2001, new populations have been recorded while others have become extirpated. For example, monitoring conducted in 2012 on Vancouver Island recorded

² Found in King County, Snohomish County and Whatcom County.

6 new populations, but surveys conducted in 2008 on the Lower Mainland determined that 12 of the previous 23 populations visited were likely extirpated (Table 1).

Overall the species is a seed banker³ and, like other *Bidens* species, numbers of individuals vary year to year such that population numbers fluctuate from year to year depending upon annual and seasonal environmental conditions—water levels in particular (Klinkenberg 2008). The number of individuals varies (e.g., about one-third of extant populations have fewer than 10 individuals reported; and currently 17 populations have more than 100 individuals). While some populations of this species are extensive and persistent, many locations support only a few plants. Some populations occur in tiny patches or only in small openings where bare ground is minimal. The availability of bare ground, which is used for seedling development, may limit the expansion of a population. Population trends for this species are unknown.

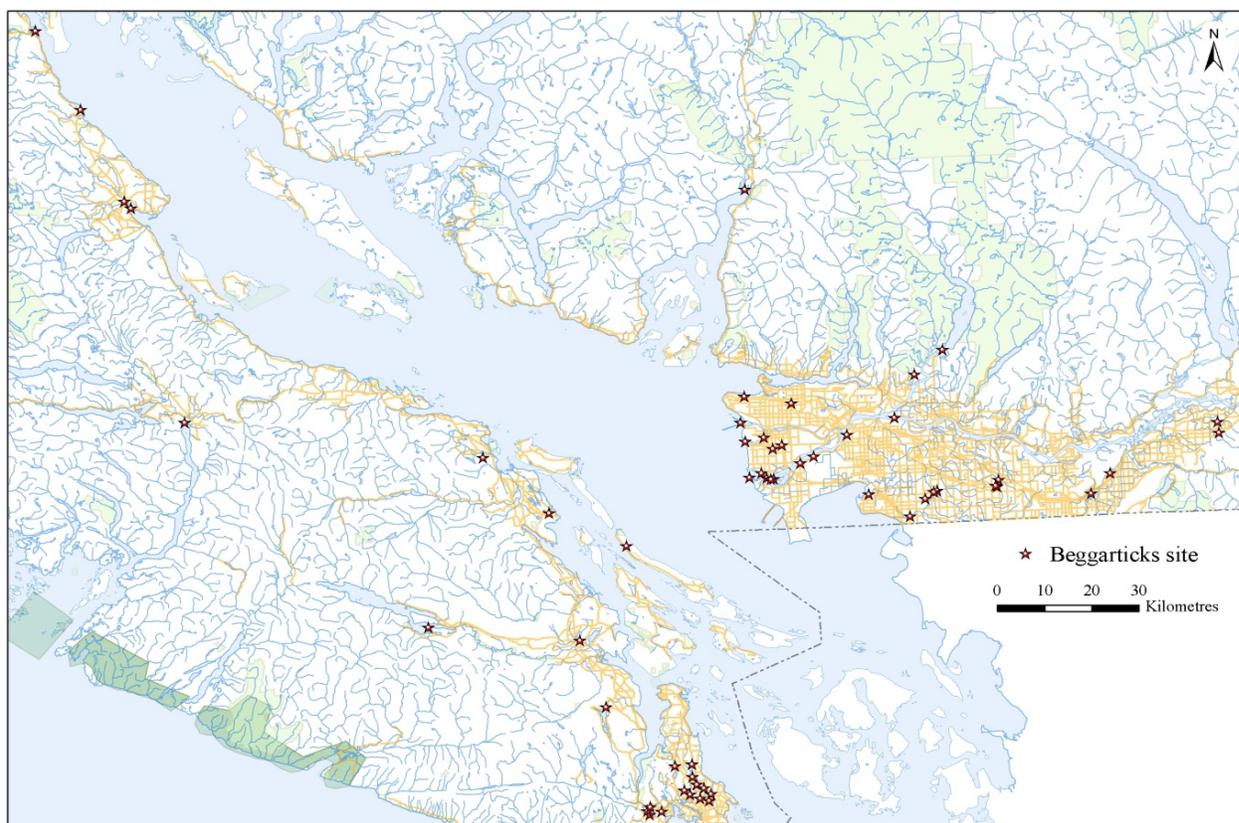


Figure 4. Vancouver Island beggarticks locations recorded in B.C. as of 2012 (B.C. Conservation Data Centre 2013b). Note: Latelle Creek location in Loughborough Inlet is not displayed on this map.

³ This term refers to species where population dynamics evolve having a persistent store of ungerminated seeds in the soil. This seed bank can provide added means of population recruitment during years when seed production is low.

Table 1. Status and description of Vancouver Island beggarticks populations in B.C. as of December 2012.

Population/ location ^a	Status and description	Land tenure ^b
Beaver Lake, East Shore	2012: No plants observed; likely extirpated (M. McCoy, pers. obs., 2012). Recreation, soil compaction, altered landscape and hydrology, browsing, mowing, competition from native and non-native/alien species likely destroyed plants and habitat.	Capital Regional District
Blenkinsop Lake	1942: Observed in ditch; likely extirpated. Remaining suitable habitat on private land. Agricultural related threats.	Unknown
*Bow Park	2012: ~75 healthy plants (M. McCoy and B. Costanzo, pers. obs., 2012). Tickseed Beetle (<i>Calligrapha californica</i>) present. Site shaded by native shrubs and weeping willow. Water levels reported as lower than previous years (J. Spearing, pers. comm., 2012). Population should persist if shrubs trimmed back, overhanging willow aggressively limbed, rush (<i>Juncus effusus</i>) completely removed, and exposed soil seeded with Vancouver Island beggarticks. Plants are protected from trampling by split rail fence.	District of Saanich
*Colquitz Creek, Panama Flats	2012: Tens of thousands of plants spanning 22.7 ha in former wetland and containment ponds, now Panama Flats Park (M. McCoy, pers. obs., 2012) with excellent viability. Density varies from scattered along western edges to 100% cover of plants 100–110 cm tall in parts of southwest old field and northern pond; 30–50% cover mixed with dense cover of scentless mayweed (<i>Tripleurospermum inodorum</i>) in eastern ponds. Plants growing among scentless mayweed were much smaller (< 20 cm tall).	District of Saanich
Colwood Lake	2012: No plants found; extirpated (M. McCoy, pers. obs., 2012). Site overgrown with native shrubs as well as non-native/alien grasses and Scotch broom (<i>Cytisus scoparius</i>), which infests much of 900 m ² fill area dumped immediately upslope.	Private
Elk Lake Regional Park	2012: No plants found; likely extirpated (M. McCoy, pers. obs., 2012). Habitat no longer suitable. Soil very compacted and mostly denuded of forbs except some knotweed (<i>Polygonum</i> spp.) and creeping buttercup (<i>Ranunculus repens</i>) due to trampling by waterfowl and people. West edge of site shaded by willow (<i>Salix</i> spp.), and common cattail (<i>Typha latifolia</i>).	Capital Regional District
Glen Lake	2012: No plants found; no remaining suitable habitat; likely extirpated (M. McCoy, pers. obs., 2012). Site is shaded under western redcedar (<i>Thuja plicata</i>), alder (<i>Alnus</i> spp.), willow, and spirea (<i>Spiraea douglasii</i>). Soil is compacted and denuded due to park users.	City of Langford
*Hull's Field	2012: 2 plants found: (a) single hybrid plant (lobed and unlobed leaves); in bloom ~30 cm above water level (b) single, robust hybrid (achenes intermediate) growing out of rip-rap (M. McCoy, pers. obs., 2012). All other potential habitat checked: no plants found. Area known as Hull's Field now fully developed (two lane divided road, industrial area, recreational facilities). Low viability.	City of Langford

Population/ location ^a	Status and description	Land tenure ^b
*King's Pond	2012: 5+ plants observed in old field/ephemeral inflow creek (M. McCoy, pers. obs., 2012). Plants observed < 20 cm tall. Full survey incomplete; however, entire shoreline and potential habitat in ephemeral outflow creek surveyed and no plants found. Trampling by waterfowl; shading from native shrubs and competition from knotweed, creeping buttercup, and rush are evident threats.	District of Saanich
*Rithet's Bog	2012: 1 plant observed at Chatterton Marsh along with thousands of nodding beggarticks (M. McCoy, pers. obs., 2012). Numbers have fluctuated dramatically over the years due to changing environmental conditions (Hartwell, pers. comm., 2007). It is threatened by reed canarygrass (<i>Phalaris arundinacea</i>) and lesser cattail (<i>Typha angustifolia</i>) and blue cattail (<i>T. x glauca</i>).	District of Saanich
*Spencer's Pond	2012: ~ 200 small plants in fair condition along east, south, and west fringe of south half of ephemeral pond (M. McCoy, pers. obs., 2012). Plants are being heavily browsed. Pond hydrology may have been affected by nearby Leigh Road overpass construction including draining of wetland upstream.	Private?
*Swan Lake	2012: ~ 40 healthy plants over approx. 1 ha (M. McCoy, pers. obs., 2012). The majority of these plants are threatened by reed canarygrass. No plants found in originally reported location. This population is protected within a municipally zoned conservation area park. The lands are managed under agreement with a nature sanctuary and under active restoration.	District of Saanich
*Tod Creek Flats	2012: ~ 250–1000 plants observed at north end, in drainage zone, mixed with nodding beggarticks (J. Penny, pers. obs., 2012). A single plant was observed in S parcel (Red Damsel Farm). Population much reduced from 2008 survey due to changes in hydrology and area is now thick with reed canarygrass and yellow iris (<i>Iris pseudacorus</i>).	Private
*Hastings Flats	2012: 11 plants in poor condition observed on the flats (J. Penny, pers. obs., 2012). Invasive species and browsing are known threats.	Private
*Maber Flats	2012: Hundreds of plants in centre of field (M. McCoy, pers. obs., 2012). Impacted by Tickseed Beetle.	Private
Shawnigan Lake	1970: A single plant was observed on Community Beach (A. Ceska, pers. obs., 1970). Recreational area in small community. Likely extirpated.	Crown land
*Somenos Marsh	2012: > 1000 plants in good condition (T. Fleming and T. Chatwin, pers. obs., 2012). Plants in open wetland found with knotweed (<i>Polygonum</i> sp.), manna grass, yellow iris. Some plants under willow thickets and tall grasses including reed canarygrass. Threats: competition for light/soil and Cowichan Valley Regional District plans to change hydrology as they undertake flood control measures.	Crown land (Somenos Garry Oak Protected Area); Private

Population/ location ^a	Status and description	Land tenure ^b
*Lakes Road Duncan	2012: A total of 9 plants found in exposed mud indicating standing water in spring (C. Schaefer, pers. obs., 2012).	Unknown
*Mesachie Lake	2012: 2 plants in poor condition were observed on the upper beach in gravelly-sandy soils with field mint (<i>Mentha arvensis</i>), self-heal (<i>Prunella vulgaris</i>), Douglas' aster (<i>Symphyotrichum subspicatum</i>), and clustered tarweed (<i>Madia glomerata</i>) (J. Penny, pers. obs., 2012). Wave action, recreational use, and trampling pose potential threats.	Crown land
*Ladysmith Bog Ecological Reserve (Long Lake)	2012: 300 plants at the wet margins of a ravine bog with pond lily (<i>Nuphar</i> spp.), skunk cabbage (<i>Lysichiton americanus</i>), and American speedwell (<i>Veronica beccabunga</i> ssp. <i>americana</i>) (T. Chatwin, I. Burnett, E. Barnewall, and K. Morgan, pers. obs., 2012). There were scattered plants along the margins of Long Lake and other wetlands in area. Most of the population is in good condition, although there is some competition with reed canarygrass and succession.	Crown land; Regional District of Nanaimo (Yellowpoint Park)
Jinglepot Marsh	2012 and 2013: No plants found; likely extirpated (T. Chatwin, pers. obs., 2012 and 2013). Wetland and trail now in filled with other non-native and native species. The area where the Vancouver Island beggarticks was found was cordoned off with a fence to prevent mountain biking and subsequently in filled with vegetation.	City of Nanaimo
*Somass River Delta	2012: > 1150 plants in over ~500 m ² area (R. Avis, L. Avis, and T. Chatwin, pers. obs., 2012), Logs in this estuary appear to be responsible for keeping area open for seed germination. Plants are in good condition, although some crowding, salt water exposure and rapidly expanding purple loosestrife pose potential threats.	City of Port Alberni
*Puntledge/ Tsolum Rivers	2012: 8–10 plants in good condition were observed in an 80 m ² area along shoreline of small muddy islet (M. Donovan, pers. obs., 2012). Higher margins of the channel dominated by reed canarygrass and purple loosestrife. Site is overgrown with non-native/alien grass and limited open conditions exist. Abundant litter, recreation, adjacent construction pose potential threats.	City of Courtenay?
*Courtenay River Estuary	2012: 2 depauperate plants in poor condition were observed in brackish, tidal muddy zone (M. Donovan, pers. obs., 2012). Competition from native and non-native introduced species (e.g., reed canarygrass, purple loosestrife) and natural wetland succession pose a potential threat.	Crown land?
*Campbell River Estuary/ Nuns Island	2012: 100's of plants in good condition with excellent seed production were observed (M. Donovan, T. Chatwin and E. Barnewall, pers. obs., 2012). Vancouver Island beggarticks occur over a 1300 m ² area of low-lying estuarine marsh and mudflat, with runnels. Invasive and non-native/alien species including purple loosestrife were observed in other areas of Campbell River Estuary. Adjacent to floatplane and RV area but no impacts observed.	Crown land?
*Woodhus Slough	2012: > 200 plants in 2 areas (T. Chatwin, pers. obs., 2012). The smaller area of 1–30 plants is in weak condition due to infilling by	Crown land (Wildlife)

Population/ location ^a	Status and description	Land tenure ^b
	willow and reed canarygrass. The larger area of 200–300 plants is in good condition and is located in a seasonally flooded depression. This area has introduced prickly sow-thistle (<i>Sonchus asper</i>), clover (<i>Trifolium repens</i>), cudweed (<i>Gnaphalium</i> spp.), and native American speedwell, and agricultural use (e.g., ploughing, grazing) and drainage may pose potential threats.	Management Area); Private (agricultural reserve)
*Galiano Bog Ecological Reserve	2012: ~150 plants in channel leading to wetland (E. Barnewall and K. Morgan, pers. obs., 2012)	Crown land (Ecological Reserve)
*Sea Island	2012: 100+ large to small plants in good condition were observed in a dry ditch (F. Lomer, pers. obs., 2012). Ditch also populated with tapered rush (<i>Juncus acuminatus</i>), emersed bur-reed (<i>Sparganium emersum</i>), three-parted beggarticks (<i>Bidens tripartita</i>), and water smartweed (<i>Persicaria amphibian</i>). Not much weed crowding but ditch excavation could be a concern.	City of Richmond
Iona Island	2012: No plants observed; likely extirpated (F. Lomer, pers. obs., 2012). Habitat is sandy, poorly drained soil along trails, on dykes, around duck pond and in area of vernal flooding adjacent to sewage treatment ponds in this Regional Park.	City of Richmond ^c
Richmond Nature Park	2012: No plants observed; likely extirpated (F. Lomer, pers. obs., 2012).	City of Richmond
*Woodward Island	2012: 200+ plants in good condition observed on north side of the island (F. Lomer, pers. obs., 2012). All plants senescent and many more exist, but are hard to see this time of year. No immediate threats to the tidal island habitat	City of Richmond
Garden City Park	2012: No plants observed and very little habitat; likely extirpated (F. Lomer, pers. obs., 2012)	City of Richmond
London Landing	2012: No plants observed in tidal marsh; likely extirpated (F. Lomer, pers. obs., 2012).	City of Richmond
*Rose Island	2008: 30 mature plants in fair condition. Substrate was classified as mud and the area is regularly inundated by tidal fluctuations.	Unknown
*Tidal Islet	2008: ~600 mature plants in good condition in a dense grouping. Substrate was classified as mud and the area is regularly inundated by tidal fluctuations.	Unknown
*Trout Lake	2012: 12 large mature plants in good condition in the park (F. Lomer, pers. obs., 2012). In moist ground near boggy shore with creeping buttercup, water-pepper (<i>Persicaria hydropiperoides</i>) and small-flowered bulrush (<i>Scirpus microcarpus</i>). Plants are in a vulnerable position due to trampling, lawn trimming, and invasive Himalayan blackberry (<i>Rubus armeniacus</i>).	City of Vancouver
*Jericho Ponds	2012: 249 plants in good condition at the West pond of this urban park (F. Lomer, pers. obs., 2012). Plants found on silty pond edge: east of	City of Vancouver

Population/ location^a	Status and description	Land tenure^b
	footbridge, north shore = 223, south shore = 11, west of footbridge, north shore = 1 plant, south shore = 14 plants.	
Swishwash Island	2008: no plants observed; likely extirpated. Natural succession by fast-growing common cattail is believed to have caused extirpation.	Unknown
*Chapman	2008: 13 mature (flowering) plants. Site recorded as being in fair to poor condition and in a shallow, dry depression with obvious plowing/tilling damage (3 plants flattened by farm equipment). Numerous invasive and non-native/alien plants present.	Unknown
Hack Brown Road	2008: no plants observed; likely extirpated. Both field and ditch were heavily choked with reed canarygrass. Tractor mowed field adjacent to ditch; farm practices evident.	Unknown
North Parallel Road	2008: no plants were observed; likely extirpated. Property owner noted that entire roadside ditch had been filled approximately 5 years ago. Additional culvert had been recently installed in 2007 near historical location. Ditching practices appear to be cause of extirpation.	Private
*South of Sumas Mountain	2008: 950 plants in fair to good condition in three distinct areas comprised of 600, 200, and 150 mature individuals. Habitat predominantly organic, cultivated fields, regularly used by waterfowl, exemplified by bird seed, peas, beans, and grains near the Vancouver Island beggarticks. Potential threats include farming activities and weed control.	Private
Canadian Forces Base 1	2008: no plants observed; likely extirpated. The bank of the creek shore was heavily armoured with rip-rap in 1998. The channel had been lined with cobble/spawning gravel likely making the habitat unsuitable.	Federal (DND ^d)
Canadian Forces Base 2	2008: no plants observed; likely extirpated. Areas around old sewage lagoons have been altered significantly. Recent soil extraction, depression/rill and heavy growth of reed canarygrass was observed.	Federal (DND)
*Canadian Forces Base - Edge of Natural Wetland	2008: 6 mature plants in an elevated area on the eastern edge of the natural wetland. Area appears to be used by waterfowl. Species confirmation required as plants were in an advanced state of decay at the time of the field visit.	Federal (DND)
*Passive Park	2008: 3 plants in poor condition in a moderately vegetated moist depression in a seasonally flooded, old gravel pit. Substrate is as a mixture of sand and gravel with lesser amounts of organics. Potential threats include recreational activities, as the park is heavily used for biking, walking, and Frisbee-golf.	City of Langley
*Old Gravel Pit	2008: 700–800 mature plants in good condition in an old gravel pit in depressions where surface water is absent by summer's end. Substrate is classified as a mixture of sand and fine gravel with lesser amounts of organics. Potential threats: recreational mountain bikers, seasonal	Unknown – B.C. MOTI ^{e?}

Population/ location ^a	Status and description	Land tenure ^b
	water fluctuations, and non-native/alien weed species (i.e., northern bog St. John's-wort [<i>Hypericum boreale</i>]).	
Pitt Lake - South End	2008: no plants found; likely extirpated. Suitable habitat in vicinity and west of boat launch. Fluctuating water levels, sedimentation, and invasive species are known threats.	Unknown
*Minnekhada Regional Park, Fraser Valley	2008: 1 mature plant in poor condition in upper marsh at pond edge. Base of Vancouver Island beggarticks was approximately 10 cm below the water level at the time of the survey. Infilling of reed canarygrass and water-pepper (<i>Polygonum hydropiperoides</i>) are potential threats.	Metro Vancouver
Douglas Island	2008: no plants found; likely extirpated. Used for peat extraction; ditch canal, and forestry (F. Lomer, pers. comm., 2008)	Unknown
Surrey - River Road /Fraser R.	2008: no plants found at this ditch; likely extirpated. Numerous areas where the plant had been found historically had been recently mowed.	Unknown - MOTI?
*Latimer Lake Park	2008: 100 plants in fair condition along the dry margins of the lakeshore and adjacent pond. Recreational threats apparent.	City of Surrey
*Chantrell Creek	2008: 2 mature plants in fair condition beside and below the boardwalk at Elgin Heritage Park. One was small and sickly, while another, growing under the boardwalk, was in full flower. This population has persisted here for over 90 years and there is evidence of ongoing reproduction. Potential threats: trampling, common cattail, reed canarygrass.	City of Surrey
Peace Portal Golf Course	2008: no plants found; extirpated.	Private
*South of Tilbury Island	2008: 150–200 healthy plants adjacent to a ditch along the edge of a cranberry field also containing three-parted beggarticks (<i>Bidens tripartita</i>) and purplestem beggarticks (<i>Bidens connata</i>). Physical damage by farm equipment and pesticide/herbicide use are potential threats.	Private Property
Tilbury Island	2012: no Vancouver Island beggarticks were observed; likely extirpated (F. Lomer, pers. obs., 2012). Only depauperate nodding beggarticks and three-parted beggarticks. Site redevelopment, encroaching vegetation (e.g., common cattail, reed canarygrass), and competition from invasive and non-native/alien weeds are believed to be the explanation.	Regional Park?
*Westham Island	2008: ~300 widespread plants in good condition in two distinct populations: 50 plants at north shore; and 50–250 at northwest shore.	Unknown
*Squamish Estuary	2008: a large population in good condition was observed. Department of Fisheries and Oceans (DFO) created channels to enhance fish habitat, which appeared to benefit Vancouver Island beggarticks by providing exposed disturbed soil (N. Page, pers. comm., 2006). Rapid	Unknown

Population/ location ^a	Status and description	Land tenure ^b
*Latelle Creek, Loughborough Inlet	expansion of cattail (<i>Typha</i> sp.) throughout the meadow is a potential threat. 2008: 50 plants at the outlet of a small creek on a small beach, south-southwest of the mouth of the Apple River (C. Bjork, pers. obs., 2008)	Unknown

^a * Indicates extant population/location. Other locations are either likely extirpated or extirpated.

^b Land tenure could not be confirmed using limited location information found in historical records.

^c Managed by Metro Vancouver Regional Park system.

^d Department of National Defense

^e Ministry of Transportation and Infrastructure

3.3 Habitat and Biological Needs of the Vancouver Island Beggarticks

Habitat for Vancouver Island beggarticks is narrow alluvial shoreline margins of lakes, ponds, creeks, bogs, tidal estuaries, and in ditches and other wet areas that undergo annually fluctuating water levels, summer drawdown, and siltation. Vancouver Island beggarticks occupies openings at the edges of wetlands (Figure 5). Vancouver Island beggarticks is known to be shade-intolerant.

As a shoreline species, Vancouver Island beggarticks is ecologically tied to seasonally fluctuating water levels, with standing water in winter and spring, light siltation, and substantial summer draw down. In tidal areas, it is found within the tidal reach, where only winter salt water inundation occurs (Figure 6).

Many, though not all locations that support Vancouver Island beggarticks are characterized by shallowly sloping wetland edges, minimal ground cover, and little competition. All locations have alluvial fine particle soils (Klinkenberg and Klinkenberg 2001). These areas receive high nutrient loading.



Figure 5. Vancouver Island beggarticks habitat.
Photo: Brian Klinkenberg

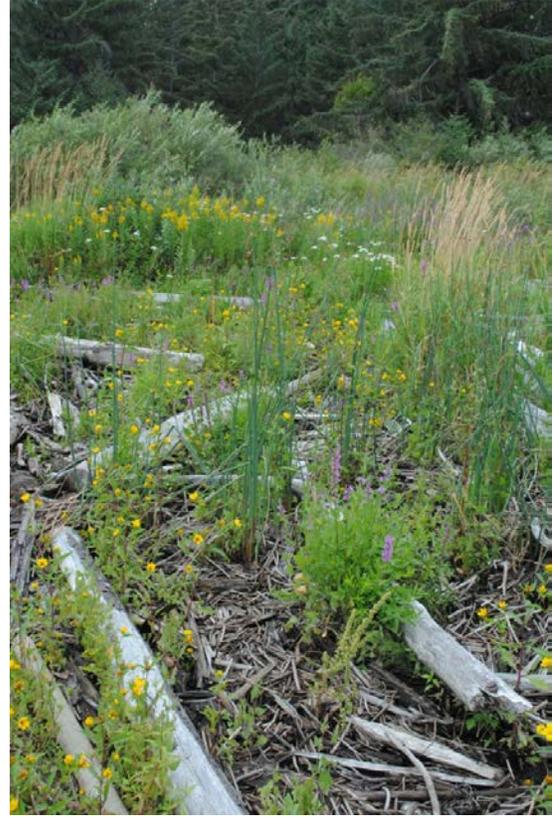


Figure 6. Vancouver Island beggarticks habitat at Somass River Delta. Photo: Trudy Chatwin

3.4 Limiting Factors

This species distribution is limited to specific open wetland habitats that require specific disturbance regimes.

4 THREATS

Threats are defined as the proximate activities or processes that have caused, are causing, or may cause in the future the destruction, degradation, and/or impairment of the entity being assessed (population, species, community, or ecosystem) in the area of interest (globe, nation, or subnation). For purposes of threat assessment, only present and future threats are considered.⁴ Threats presented here do not include biological features of the species or population such as inbreeding depression, small population

⁴ Past threats may be recorded but are not used in the calculation of Threat Impact. Effects of past threats (if not continuing) are taken into consideration when determining long-term and/or short-term trend factors (Master *et al.* 2009).

size, and genetic isolation; or likelihood of regeneration or recolonization for ecosystems, which are considered limiting factors.⁵

For the most part, threats are related to human activities but they can also be natural. The impact of human activity may be direct (e.g., destruction of habitat) or indirect (e.g., invasive species introduction). Effects of natural phenomena (e.g., fire, hurricane, flooding) may be especially important when the species or ecosystem is concentrated in one location or has few occurrences, which may be a result of human activity (Master *et al.* 2009). As such, natural phenomena are included in the definition of a threat, though should be considered cautiously. These stochastic events should only be considered a threat if a species or habitat is damaged from other threats and has lost its resilience, and is thus vulnerable to the disturbance (Salafsky *et al.* 2008) such that these types of events would have a disproportionately large effect on the population/ecosystem compared to the effect it would have had historically.

4.1 Threat Assessment

The threat classification below is based on the IUCN-CMP (World Conservation Union–Conservation Measures Partnership) unified threats classification system and is consistent with methods used by the B.C. Conservation Data Centre and the B.C. Conservation Framework. For a detailed description of the threat classification system, see the [CMP website](#) (CMP 2010). For information on how the values are assigned, see [Master *et al.* \(2009\)](#) and table footnotes for details. Threats for the Vancouver Island beggarticks were assessed for the entire province (Table 2).

⁵ It is important to distinguish between limiting factors and threats. Limiting factors are generally not human induced and include characteristics that make the species or ecosystem less likely to respond to recovery/conservation efforts.

Table 2. Threat classification table for Vancouver Island beggarticks.

Threat # ^a	Threat description	Impact ^b	Scope ^c	Severity ^d	Timing ^e	Location/population(s) ^f
1	Residential & commercial development	Low	Small	Extreme	Moderate	
1.1	Housing & urban areas	Low	Small	Extreme	Moderate	None known at this time, but maybe in near future.
1.2	Commercial & industrial areas	Low	Small	Extreme	Moderate	Tilbury Island, Puntledge/Tsolum River*, Sea Island*, and Garden City Park.
1.3	Tourism & recreation areas	Negligible	Negligible	Extreme	Low	None known at this time, but possible in future.
2	Agriculture & aquaculture	Medium-Low	Restricted	Moderate-Slight	High	
2.1	Annual & perennial non-timber crops	Medium-Low	Restricted	Moderate-Slight	High	Woodhus Slough*, Chapman*, South of Tilbury Island*, South of Sumas Mountain*, Colquitz Creek Panama Flats*, and Hack Brown Road.
6	Human intrusions & disturbance	Low	Small	Moderate	High	
6.1	Recreational activities	Low	Small	Moderate	High	Likely at 14 locations: Passive Park*, Jericho Ponds*, Beaver Lake, Elk Lake, Glen Lake, Latimer Lake Park, Old Gravel Pit*, Minnehada Regional Park*, Garden City Park, Trout Lake*, Chantrell Creek*, Shawnigan Lake, Puntledge River*, and Mesachie Lake*.
7	Natural system modifications	Low	Restricted	Moderate	High	
7.2	Dams & water management/use	Low	Restricted	Moderate	High	Likely at 14 locations: Beaver Lake, Spencer's Pond*, Colquitz Creek*, Rithet's Bog*, Tod Creek Flats*, Mesachie Lake*, Somenos Marsh*, Richmond Nature Park, Iona Island, London's Landing, Old Gravel Pit*, Pitt Lake, Sea Island*, North Parallel Road
7.3	Other ecosystem modifications	Low	Small	Extreme	High	Several populations on the mainland (e.g., Sea Island*, North Parallel Road, and South of Tilbury Island*). As well as several parks and Somass River Delta* location.

Threat # ^a	Threat description	Impact ^b	Scope ^c	Severity ^d	Timing ^e	Location/population(s) ^f
8	Invasive & other problematic species & genes	High	Pervasive	Serious	High	
8.1	Invasive non-native/alien species	High	Pervasive	Serious	High	Possibly all locations. Invasive plants are currently listed at 24 locations.
8.2	Problematic native species	Medium	Restricted	Serious	High	Likely at 15 locations: Bow Park*, Spencer's Pond*, Elk Lake, Glenn Lake, Hull's Field*, King's Pond*, Rithet's Bog*, Somenos Marsh*, Jinglepot Marsh, Courtenay River Estuary*, Campbell River Estuary*, Woodhus Slough*, Swishwash, Tilbury Island, and Squamish Estuary*.
9	Pollution	Unknown	Small	Unknown	High	
9.3	Agricultural & forestry effluents	Unknown	Small	Unknown	High	Likely at 11 locations: King's Pond*; Colwood Lake; Woodhus Slough*, Chapman*, Hack Brown Road, South of Tilbury Island*; Beaver Lake; Elk Lake; Rithet's Bog*; Colquitz Creek*; South of Sumas Mountain*
11	Climate change & severe weather	Unknown	Unknown	Unknown	Unknown	
11.1	Habitat shifting & alteration	Unknown	Unknown	Unknown	Unknown	
11.2	Droughts	Unknown	Unknown	Unknown	Unknown	

^a Threat numbers are provided for Level 1 threats (i.e., whole numbers) and Level 2 threats (i.e., numbers with decimals).

^b **Impact** – The degree to which a species is observed, inferred, or suspected to be directly or indirectly threatened in the area of interest. The impact of each threat is based on severity and scope rating and considers only present and future threats. Threat impact reflects a reduction of a species population or decline/degradation of the area of an ecosystem. The median rate of population reduction or area decline for each combination of scope and severity corresponds to the following classes of threat impact: Very High (75% declines), High (40%), Medium (15%), and Low (3%). Unknown: used when impact cannot be determined (e.g., if values for either scope or severity are unknown); Not Calculated: impact not calculated as threat is outside the assessment time (e.g., timing is insignificant/negligible [past threat] or low [possible threat in long term]); Negligible: when scope or severity is negligible; Not a Threat: when severity is scored as neutral or potential benefit.

^c **Scope** – Proportion of the species that can reasonably be expected to be affected by the threat within 10 years. Usually measured as a proportion of the species' population in the area of interest. (Pervasive = 71–100%; Large = 31–70%; Restricted = 11–30%; Small = 1–10%; Negligible < 1%).

^d **Severity** – Within the scope, the level of damage to the species from the threat that can reasonably be expected to be affected by the threat within a 10-year or 3-generation timeframe. Usually measured as the degree of reduction of the species' population. (Extreme = 71–100%; Serious = 31–70%; Moderate = 11–30%; Slight = 1–10%; Negligible < 1%; Neutral or Potential Benefit ≥ 0%).

^e **Timing** – High = continuing; Moderate = only in the future (could happen in the short term [< 10 years or 3 generations]) or now suspended (could come back in the short term); Low = only in the future (could happen in the long term) or now suspended (could come back in the long term); Insignificant/Negligible = only in the past and unlikely to return, or no direct effect but limiting.

^f * Indicates extant population/location. Other locations are either likely extirpated or extirpated.

4.2 Description of Threats

The overall province-wide Threat Impact for this species is High.⁶ The overall threat considers the cumulative impacts of multiple threats. Major threats include invasive non-native/alien species and infilling of required open habitat through successional processes (Table 2). Details are discussed below under the Threat headings.

IUCN-CMP Threat 1. Residential and commercial development

1.1 Housing and urban areas

Adjacent site development for housing can remove habitat directly and alter habitat through drainage alteration (refer to 7.2 Dams and water management/use). Currently there are no known new housing developments that are adjacent to Vancouver Island beggarticks locations. However, given the general distribution of this species on eastern Vancouver Island and the Lower Mainland, it is likely that this threat exists at other locations of Vancouver Island beggarticks that have yet to be discovered.

1.2 Commercial and industrial areas

Development results in the infilling of wetlands for the purpose of constructing commercial and industrial sites. Filling in wetlands for development purposes could extirpate an entire population. There is a development within 15 m of Puntledge/Tsolum River that may be a threat in the near future.

1.3 Tourism and recreation areas

Two locations occur within golf courses (Peace Portal Golf Course in 1928 and Royal Colwood Golf Club 1913). These populations have since been extirpated. Future development of new golf courses is possible, but not highly likely.

IUCN-CMP Threat 2. Agriculture and aquaculture

2.1 Annual and perennial non-timber crops

Some periodic ploughing can be beneficial by exposing soil for the germination of Vancouver Island beggarticks seeds. However, mowing of plants or replanting sites with cranberries, blueberries, or buildings such as greenhouses is a threat. Physical damage by farm equipment from mowing, ploughing, and reseeding at the Woodhus Slough, Chapman and Colquitz Creek (Panama Flats) locations is a possible threat.

IUCN-CMP Threat 6. Human intrusions and disturbance

6.1 Recreational activities

Walking along ponds, biking, and frisbee-golf could crush small plants and cause soil compaction. Mowing at these sites for aesthetics and fire prevention also encourages

⁶ The overall threat impact was calculated following Master *et al.* (2009) using the number of Level 1 Threats assigned to this species where Timing = High or Moderate. This includes 0 Very High, 1 High, 0 Medium, 1 Medium-Low, 3 Low, and 2 Unknown (Table 2). The overall threat considers the cumulative impacts of multiple threats.

further disturbance. Trampling by humans at shorelines and dumping (sand) can occur at many regional parks; however, these activities do not usually destroy entire populations. This threat likely occurs at 14 locations.

IUCN-CMP Threat 7. Residential and commercial development

7.2 Dams and water management/use

Vancouver Island beggarticks is a wetland species and is affected by changes in hydrology. Water level management may result in increase or decrease of drawdown zone, which affects conditions required for germination. Raising water levels reduces exposure of soil which is necessary to expose the seed bank and allow germination from within the seed bank. However, it is not known what hydrologic conditions are ideal for Vancouver Island beggarticks and it may benefit from some water fluctuation. Major pond or ditch dredging to maintain open water (e.g., at the Richmond Nature Park Pond) could remove the seed bank of Vancouver Island beggarticks. However, the primary risk to Vancouver Island beggarticks is ditching to increase drainage for flood control and agricultural purposes, which could dry out wetland habitats. Armouring of shorelines (e.g., with cobbles, rock, or dykes) removes the silty wetland margin needed for seed germination. Although currently no development for housing is known adjacent to Vancouver Island beggarticks locations, this activity can also alter its habitat through drainage alteration.

7.3 Other ecosystem modifications

Successional native shrub encroachment resulting from the control of water levels is a potential threat. Note that management activities at Rithet's Bog have shown that water level management and shrub removal can initially result in an increase in numbers of this species (e.g., in year one), but numbers may decline in following years (S. Hartwell, pers. comm., 2007).

Many municipal and regional parks are mown regularly for aesthetic reasons and to reduce the risk of fire (T. Kohler, pers. obs., 2010). Mowing during the growing season could damage the foliage, flowers, and prevent seed ripening (Erhart 2000). It has the additional effect of encouraging trampling by humans in mown areas.

Mowing and road maintenance activities conducted early in the season can prohibit seed set, weaken plants, and reduce their competitive advantage particularly by lawn grass. Both lawn grass and other species infill Vancouver Island beggarticks habitat. This infilling reduces the open ground habitat for Vancouver Island beggarticks (D. Fraser, pers. comm., 2012). This is a concern for populations on the mainland that are found in roadside ditches, which are mowed (e.g., Sea Island, North Parallel Road, and South of Tilbury Island). Mowing also occurs in parks and Somass River Delta effluent lagoons.

IUCN-CMP Threat 8. Invasive and other problematic species and genes

8.1 Invasive non-native/alien species

Invasive alien grasses and forbs outcompete many native plants and also create dense thatch. This can lead to poor reproductive success as the thatch can prevent

germination and the establishment of seedlings. Overall this will lead to a reduction in the general fitness or health of the population through reducing subsequent seed set and dispersal. Since Vancouver Island beggarticks is an annual, this leads to a reduction in abundance and distribution of populations. The most significant invasive plant species is reed canarygrass. However, purple loosestrife and yellow iris are also highly problematic in wetlands and estuarine locations.

Other problematic invasive species include Himalayan blackberry (*Rubus armeniacus*), common tansy (*Tanacetum vulgare*), Scotch broom (*Cystisus scoparius*), American black nightshade (*Solanum americanum*), policeman's helmet (*Impatiens glandulifera*), curled dock (*Rumex crispus*), prickly sow-thistle (*Sonchus asper*), creeping buttercup (*Ranunculus repens*), common St. John's-wort (*Hypericum perforatum*), bull thistle (*Cirsium vulgare*), ribwort plantain (*Plantago lanceolata*), rough pigweed (*Amaranthus retroflexus*), prickly lettuce (*Lactuca serriola*), and marshpepper smartweed (*Polygonum hydropiperoides*).

8.2 Problematic native species

Natural succession and the resulting infilling of wetlands by shrubs, forbs, and grasses results in limited open soil for seed germination, as well as loss of light through shading. Vancouver Island beggarticks is known to be shade-intolerant and the increased cover of tall woody vegetation has reduced the availability of suitable habitat. Competition for light and bare soil from natural successional wetland plants such as common cattails, other dense grasses, and forbs are a particular concern. Native willows, in particular Scouler's willow (*Salix scouleriana*) and Sitka willow (*Salix sitchensis*), shade Vancouver Island beggarticks and result in depauperate plants.

Predation by the native Tickseed Beetle was reported at Somenos Marsh (Fairbarns 2005), Bow Park (M. McCoy, pers. comm., 2012) and Rithet's Bog (M. McCoy and B. Costanzo, pers. comm. 2012). This threat needs to be assessed.

Native herbivores, in particular hyper-abundant Black-tailed Deer (*Odocoileus hemionus columbianus*), were observed grazing Vancouver Island beggarticks at Spencer's Pond and could be a threat at many Vancouver Island locations.

IUCN-CMP Threat 9. Pollution

9.3 Agricultural and forestry effluents

As Vancouver Island beggarticks occurs in agricultural areas in the Lower Mainland, run-off from fertilizers and pesticides is likely. Fertilizer run-off can lead to eutrophic wetland habitat and herbicides targeting broad-leafed plants could kill Vancouver Island beggarticks (B.C. Ministry of Environment 2012). The current potential severity of this threat is unknown.

IUCN-CMP Threat 11. Climate change and severe weather

11.1 Habitat shifting and alteration; 11.2 droughts

Succession to tall grass and shrub communities may be accelerated through climate change and could potentially increase in the long term. Since Vancouver Island

beggarticks is a wetland plant , it will be affected by climate change shifts including seasonal timing of rainfall and changes in amounts of rainfall. Sea level rise and flooding may also affect this plant in the longer term.

5 MANAGEMENT GOAL AND OBJECTIVES

5.1 Management Goal

The management goals for the Vancouver Island beggarticks are:

1. To maintain or increase the distribution and abundance of all extant populations in B.C., including any new populations that may be identified.
2. To re-introduce and restore populations where feasible at protected wetland locations with suitable habitat within the species range in B.C.

5.2 Rationale for the Management Goal

B.C.'s Vancouver Island beggarticks populations are of global importance as they represent more than 85% of the species global range. The management goals aim to ensure that no further loss occurs to the species and that the conservation status of the species does not worsen (e.g., COSEWIC designation does not become Threatened).

Where the best available information and/or long-term monitoring indicates overall population decline, deliberate attempts to improve abundance, such as through seeding or change in land use management, are appropriate. Priority for increasing population distribution and abundance will be given to protected wetland locations.

5.3 Management Objectives

The following specific objectives have been identified to facilitate management/conservation of this species in B.C.

1. Protect⁷ known locations for Vancouver Island beggarticks from direct habitat loss, with priority given to protecting large stable populations.
2. Mitigate threats associated with this species; primarily the threat of invasive native and non-native/alien species at all locations.
3. Monitor distribution and abundance within the range of the species in B.C. (at known locations and in potential habitat).
4. Investigate the feasibility of restoring populations at diminished locations and reintroduction at extirpated locations and in suitable habitat.

⁷ Protection can be achieved through various mechanisms including: voluntary stewardship agreements, conservation covenants, sale by willing vendors on private lands, land use designations, and protected areas.

6 APPROACHES TO MEET OBJECTIVES

6.1 Actions Already Completed or Underway

The following actions have been categorized by the action groups of the B.C. Conservation Framework (B.C. Ministry of Environment 2010). Status of the action group for this species is given in parentheses.

Compile Status Report (complete)

- COSEWIC report completed (Klinkenberg and Klinkenberg 2001).

Send to COSEWIC (complete)

- Vancouver Island beggarticks assessed as Special Concern in 2001 (Klinkenberg and Klinkenberg 2001). This species is due for a reassessment by COSEWIC.

Planning (in progress)

- B.C. Management Plan completed (this document, 2014).

Monitor Trends (in progress)

- Twenty-five populations on Vancouver Island were surveyed in 2012.
- Some of the potential habitat on Vancouver Island was surveyed and 6 new populations were discovered (B.C. Conservation Data Centre 2013b).
- Nine populations on the Lower Mainland were resurveyed in 2012 (B.C. Conservation Data Centre 2013b).

Habitat Protection and Private Land Stewardship (in progress)

- Discussion with the Jericho Park Stewardship group is underway.
- Nineteen Vancouver Island beggarticks locations are found in provincial, regional or municipal parks, Ecological Reserves, Wildlife Management Areas, or Nature Conservancy Lands that offer varying levels of legal protection (e.g., through provisions of the *Parks Act*, *Ecological Reserves Act*) for Vancouver Island beggarticks. Thirteen of these populations are extant.
- DND Canadian Forces Base locations have indicated that they are aware of the plants and will try to protect Vancouver Island beggarticks.
- “Develop with Care” guidelines have been published for Vancouver Island beggarticks in a fact sheet (B.C. Ministry of Environment 2012).

6.2 Recommended Management Actions

Table 3 details the recommended actions for effecting management of Vancouver Island beggarticks. Actions mostly fall under the Habitat Protection, Restoration and Land Stewardship action groups of the Conservation Framework. However monitoring actions need to be continued and fall under the Monitoring Trends objective.

Table 3. Recommended management actions and suggested implementation schedule for Vancouver Island beggarticks.

Objective	Actions to meet objectives	Performance measure^a	Threat^b or concern addressed	Priority^c
1, 2	Contact landowners and land managers and engage their cooperation to steward, protect, and manage lands for persistence of the species.	<ul style="list-style-type: none"> There is no further depletion or degradation of Vancouver Island beggarticks habitat at all extant locations by 2018. Contact is made with all land managers of public lands to educate and develop and implement site management plans. 	1.2, 1.3, 2.1, 6.1, 7.2, 7.3, 8.1, 8.2, 9.3	Essential
1, 2	Develop public outreach brochures for distribution to landowners in conjunction with wetlands initiatives that outline the importance of wetland protection.	<ul style="list-style-type: none"> Brochure developed and distributed to landowners by 2014. 	All	Beneficial
2	Prepare a restoration plan on a site-by-site basis that includes: steps needed for control of invasive species and natural plant succession, maintenance of hydrological regimes, signage, and appropriate scheduling of maintenance activities (e.g., mowing).	<ul style="list-style-type: none"> Site restoration plans are in place for 50% of populations by 2015 and 75% by 2018. Invasive species control has been initiated according to restoration plans for 50% of sites by 2015. Natural hydrological regimes are re-established at Somenos Marsh. 	6.1, 7.2, 7.3, 8.1, 8.2, 9.3	Essential
3	Monitor status of populations every 2 years to determine population and distribution trends.	<ul style="list-style-type: none"> Lower Mainland locations not inventoried in 2012 are inventoried in 2014. Populations have been monitored in 2014, 2016, 2018, etc. Potential habitats have been identified and inventoried by 2014 to document any new populations. 	Knowledge gap	Necessary
4	Conduct and encourage research on habitat needs and propagation guidelines to re-introduce extirpated populations and restore diminished populations.	<ul style="list-style-type: none"> Identify source populations for reintroduction efforts. Test techniques for reintroduction and management by establishing and monitoring experimental populations. Propagation and restoration guidelines have been established by 2014. 	Knowledge gap	Necessary

^a Performance measures set for a 5-year timeframe.

^b Threat numbers according to the IUCN-CMP classification (see Table 2 for details).

^c Essential (urgent and important, needs to start immediately); Necessary (important but not urgent, action can start in 2–5 years); or Beneficial (action is beneficial and could start at any time that was feasible).

7 MEASURING PROGRESS

The success of the management of Vancouver Island beggarticks will be determined primarily through monitoring its distribution and abundance. If monitoring indicates that the distribution and abundance is stable or increasing, then the management goal for Vancouver Island beggarticks will have been met.

Performance measures over the next 5 years are listed for each objective as they relate to specific actions in Table 3.

8 EFFECTS ON OTHER SPECIES

Proposed management/conservation activities would likely have a positive effect on most native species that co-occur with Vancouver Island beggarticks. Some threat mitigation involved with treating succession of wetlands may diminish shrubs such as native willows, which are overshadowing Vancouver Island beggarticks. It is unlikely that restoration activities would negatively affect other species at risk.

Restoration plans that include re-establishing natural fluctuations of water levels (high winter levels and summer drawdowns) in managed lakes and wetlands (e.g., Somenos Marsh, Beaver Lake, Elk Lake) will promote natural shoreline plant communities and wetland species. The annual fluctuation of water levels promotes siltation, germination, and establishment of seed banks for Vancouver Island beggarticks and other native shoreline plant species.

Reducing or eliminating chemical run-off from herbicides, pesticides, and fertilizers adjacent to ponds and creeks will reduce contamination of the water. Reduction of chemical run-off will directly benefit not only Vancouver Island beggarticks but other shoreline and aquatic species including the waterfowl that use the adjacent wetlands.

Managing for invasive plant species will be beneficial for all species at any site. However, care must be taken to avoid trampling of other species at risk, soil compaction, and opening up the site to new invasive species.

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