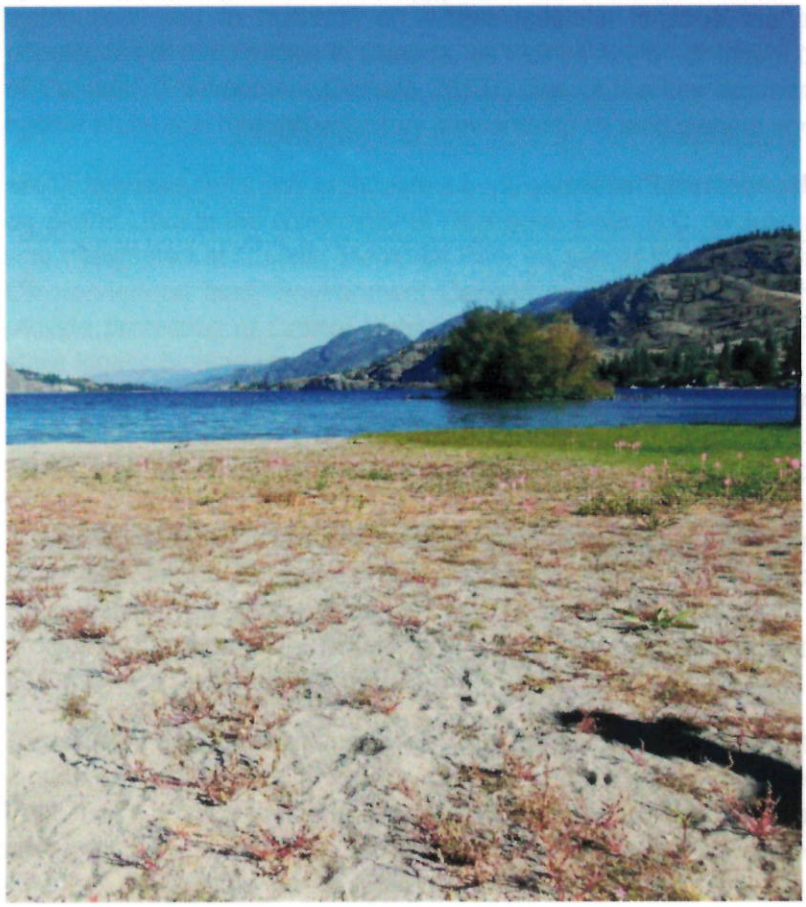
Stewardship Agreement for Short-rayed Alkali Aster at Christie Memorial Park, Okanagan Falls, B.C. (2017-2021)



Approval Date: June 29/2017

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TABLE OF CONTENTS

LIST OF APPENDICES

COVER PHOTOS

Clockwise from left: Christie Memorial Park during 2014 monitoring, flowering and senescing short-rayed aster individuals (©*Josie Symonds*)

1.0 INTRODUCTION

Short-rayed alkali aster (SRAA; *Symphyotrichum frondosum*) is a small annual plant in the sunflower family that uses seasonally flooded foreshore habitats in the South Okanagan area of British Columbia (B.C.). Much of this habitat has been lost or degraded over the last century due to urban development, recreational use and lake level management. As a result of these and other factors, SRAA is federally Endangered under the *Species at Risk Act* (SARA) and provincially red-listed (i.e., endangered or threatened) by the B.C. Conservation Data Centre. The population and distribution objective for this species, as identified in the federal recovery strategy, is to "maintain the distribution, and to maintain or (where feasible) improve the abundance, of all known extant populations of this species in Canada, as well as any other extant populations that may be identified in Canada" (Environment Canada 2013). One of the key approaches to meeting this objective is habitat protection through voluntary stewardship by land owners and managers.

SRAA is known from only eight extant populations in Canada, one of which is Christie Memorial Park on Skaha Lake in the community of Okanagan Falls, B.C. In July of 2013, Critical Habitat for SRAA was designated at Christie Memorial Park as part of the federal recovery strategy for this species. On non-federal land, Environment Canada looks first to the province and local governments to provide protection of Critical Habitat. Non-federal protection mechanisms include laws, bylaws or other legally binding instruments, as well as voluntary stewardship agreements, operating practices and other non-binding measures, with the outcome being that destruction of Critical Habitat is prevented. The purpose of this SRAA Stewardship Agreement between the Ministry of Forests, Lands and Natural Resource Operations (FLNR) Ecosystems Section and the Regional District of Okanagan Similkameen (RDOS) Community Services Department is to promote the long term maintenance of the SRAA population at Christie Memorial Park by planning and sharing information, protecting important habitat features, managing identified threats and providing effective stewardship. The approach taken here is consistent with FLNR's shared stewardship model to protect B.C.'s natural resources through collaboration, information sharing, education and use of best management practices (BMPs).

This SRAA Stewardship Agreement is a living document between FLNR and RDOS to address threats to, and provide protection for, the endangered short-rayed aster within Christie Memorial Park. The guidance in this document is based on the information available at the time of publishing and may require periodic updates as new information becomes available. This agreement is voluntary, and does not supersede any existing legislative requirements[1]. The actions in this agreement are consistent with, or based upon, *Management Practices to Avoid Destruction of Critical Habitat for Short-rayed Alkali Aster at Christie Memorial Park* (Environment Canada and FLNR 2014), as well as the recovery strategies for this species (Environmental Canada 2013, Short-rayed Alkali Aster Recovery Team 2009). The following sections describe the biology and threats of the SRAA (Section 2.0), and the commitment and terms of the Stewardship Agreement, including the operational BMPs for maintenance activities within the Stewardship Agreement area (Section 3.0). Maps of the Stewardship Agreement area are provided in Appendix A and relevant provincial fact sheets are provided in Appendix B.

[1] A Management Plan with similar management practices as this Stewardship Agreement is legally tied to the portion of Christie Memorial Park under lease (File No. 3412345) from the Province of British Columbia; see Appendix A for location of lease area.

2.0 SHORT-RAYED ALKALI ASTER BIOLOGY AND THREATS

The status, species description, habitat requirements and threats of SRAA are described in the following sections.

2.1 Status

At the provincial level, SRAA is critically imperiled (S1; last assessed in 2011) and red-listed (i.e., endangered or threatened). Under the B.C. Conservation Framework, this species has a conservation priority of 1 (highest priority) under Goal 3, which is to "maintain the diversity of native species and ecosystems." At the federal level, this species was assessed by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Endangered in 2006 and designated as Endangered under SARA in 2007. At the global level this species is apparently secure (G4; last assessed in 1987).

2.2 Species Description

SRAA is a small (2 to 30 cm tall) annual herb in the Sunflower Family (Asteraceae) with flower heads composed of pink or white narrow, strap-like ray flowers surrounding yellow tubular disk flowers. This species is characterized by its broad, leaf-like floral bracts beneath the flower heads, and its low, sprawling growth habit. Germination of this plant typically occurs in May or June following spring freshet, although germination may occur earlier. Flowering occurs between late July and early October when lake levels are lower. Following flowering, seeds are released from the plant and are dispersed by wind, water, and small animals. Some of the seeds fall to the substrate below, where they stay dormant over the winter. Only those seeds in the top few centimeters of sand can germinate the following year. Seeds can also remain in the substrate over several years as part of the seed bank, which is important for population viability, particularly if unfavourable environmental conditions preclude seed production in the previous year(s). This annual species is adapted to open sandy shoreline environments that receive fluctuating water level, which reduces competition from other plant species (Short-rayed Alkali Aster Recovery Team 2009). The plants are sensitive to disturbance while they are germinating, growing, flowering, and setting seed (i.e., May 1 to October 31). A Fact Sheet for this species is provided in Appendix B.

2.3 Critical Habitat

SRAA is found in the Bunchgrass Biogeoclimatic Zone, in semi-arid steppe environments of south-central British Columbia. Within these environments, the species is associated with shoreline habitats including sandy beaches, and the drawdown zone of ponds, lakes, and rivers (i.e., the area at the edge of the waterbody that is frequently and seasonally exposed to the air). Critical Habitat[2] is identified as the area occupied or historically by individual plants or patches of plants, including the associated location uncertainty distance (GPS error), and 50 m radius distance, to encompass immediately adjacent areas. Ecosystem processes that occur along shorelines are also integral to the production and maintenance of suitable microhabitat conditions. The distinct ecological features that provide context for occurrences, including seasonally-flooded shorelines, as well as the

[2] Critical habitat, as defined by SARA, is the habitat necessary for the survival or recovery of a listed species and that is identified in a finalized recovery strategy or action plan. Critical habitat for Short-rayed Alkali Aster is identified at five locations, including Christie Memorial Park, in the final recovery strategy for the species, which was posted on the Species at Risk Public Registry on July 9, 2013.

associated draw-down zone adjacent to shorelines, are identified as Critical Habitat. Where sub-populations occur close together, and where there is consistent intermediate habitat, connective habitat is also identified as Critical Habitat. Appendix A shows an outline of the area (4.6 ha) within which Critical Habitat occurs at Christie Memorial Park. Existing roads, buildings, lawns, and permanent water (below the lowest documented water line) are not identified as Critical Habitat.

2.4 Threats

The SRAA provincial recovery strategy identifies six potential threats related to direct destruction of the species and habitat loss or degradation, four of which are present at Christie Memorial Park:

- Habitat degradation and direct mortality from seasonal recreational activities (e.g., sunbathers, boat launching, and storage) due to trampling and soil compaction by people
- Habitat degradation and direct mortality from beach management activities (e.g., rototilling the beach)
- Habitat degradation due to invasive plant species
- Habitat loss and changes in ecological dynamics due to water level alteration in the lakes, which could potentially reduce the available habitat and alter the persistence or emergence of seeds from the seed bank and any subsequent recruitment

The following threats have further been refined for Christie Memorial Park as activities likely to result in the destruction of Critical Habitat:

- Deliberate destruction of natural shoreline for recreation including: creation of structures, removal of vegetation or natural substratum (i.e., the seed bank propagules required to perpetuate the species, and/or sandy soils required for growth) or deposition of new substrates or vegetation such as for landscape development
- Introducing detrimental patterns of disturbance including: excessive recreational use such as boat damage, trampling by swimmers, or inappropriate landscape maintenance including rototilling, raking, application of fertilizers or any other substance altering sand/soil chemistry (influences success of seed set, dormancy, germination, and growth
- Introduction of alien invasive plants (causes reduction of habitat available for SRAA), or efforts to control existing invasive species that would be detrimental to SRAA (i.e., use of herbicides and/or pesticides)

3.0 THE AGREEMENT

This Stewardship Agreement between FLNR Ecosystems Section and RDOS Community Services Department promotes the careful management of SRAA and its habitat. The term of this Stewardship Agreement is five years (January 1, 2017 to December 31, 2021), effective from the date of approval on the cover of this agreement. Benefits of the Stewardship Agreement to both agencies are as follows:

- Promote long term viability of known SRAA population in Christie Memorial Park
- Develop a working relationship between FLNR Ecosystems Section and the RDOS Community Services Department as well as with other partners and stakeholders
- Develop, promote and deliver educational and interpretive information on SRAA and foreshore habitat protection to the public and park users

- Develop and refine operational BMPs specifically for Christie Memorial Park to balance the needs for SRAA habitat protection and public safety and recreation

The Stewardship Agreement is applicable to suitable habitat (identified in Section 2.3) within Christie Memorial Park, located on 7th Avenue, Okanagan Falls, B.C. A map of this area is provided in Appendix A.

3.1 Commitment

The commitments for each party are set out below. The signing of this agreement commits the FLNR Ecosystems Section and RDOS Community Services Department to follow these commitments for the duration of this Stewardship Agreement.

FLNR Ecosystems Section agrees to the following commitments:

- Share data on SRAA inventory, habitat mapping and anecdotal observations as new information comes available, subject to applicable data-sharing agreements
- Provide updates on SRAA status, and conservation and restoration priorities as information comes available
- Provide SRAA educational materials if requested, including presentations on SRAA biology and status
- Assist with identification of sensitive habitat areas
- Advise RDOS Community Services Department if FLNR Ecosystems Section cannot follow the commitments of the Stewardship Agreement

RDCO Community Services Department agrees to the following commitments:

- Adhere to operational BMPs (see Section 3.2) when conducting beach maintenance activities
- Incorporate protection measures for SRAA into Christie Memorial Park management and operational plans, including new information as it comes available
- Inform and train new/seasonal staff and contractors on SRAA identification, habitat stewardship and the commitments of this Stewardship Agreement
- Support initiatives that promote the protection of SRAA habitat, including but not limited to monitoring, outreach, inventory, research and restoration
- Advise FLNR Ecosystems Section if RDOS Community Services Department cannot follow the commitments of the Stewardship Agreement and/or the operational BMPs

3.2 Operational Best Management Practices

The following operational BMPs have been developed for Christie Memorial Park in reference to timing and seasonal considerations of the SRAA life history (see Section 2.2), and are consistent with existing guidance documents (i.e., Ministry of Environment 2014, Environment Canada 2013, Short-rayed Alkali Aster Recovery Team 2009).

Preventing Destruction of Critical Habitat

Within the entire area shown as containing Critical Habitat (i.e., black polygon in Appendix A), the following activities must be avoided in all areas, at all times of year:

- Any activities resulting in sandy beach areas being compacted, disturbed or removed by introduced features such as structures, boat launches, and landscaping (including development of new lawns, gardens, or pathways)
- Deposition of any new substrates including sand or soil, and application of nutrient fertilizers, herbicides, pesticides or any other substance resulting in alteration of sand/soil chemistry
- Any activities resulting in introduction of invasive plants including planting aggressive ornamental species, and using equipment or machinery that do not meet clean equipment standards

Within the area indicated as Low Impact Zone (i.e., green polygon in Appendix A), detrimental patterns of disturbance that result in the compaction, removal, or disturbance of sandy beach areas must be avoided between May 1 and October 31, including the following activities

- Rototilling or raking (by hand or machine)
- Operation of any type of motorized vehicle including landscape maintenance vehicles
- Concentrated beach user traffic, to the extent that SRAA plants are negatively impacted
- Mechanical removal of invasive plants

Permitted Activities

For clarity, the best available knowledge at this time indicates that the following activities are unlikely to result in destruction of Critical Habitat within the Low Impact Zone area, in the May 1 – October 31 time frame:

- Pickup of garbage (including large pieces of debris) by hand

In all other areas of the Critical Habitat polygon (i.e., outside of the Low Impact Zone), the best available knowledge at this time indicates that the following activities are unlikely to result in destruction of Critical Habitat, at all times of year:

- Regular beach maintenance (e.g., rototilling, raking, garbage pickup including by motorized landscape maintenance vehicles 1x per day)
- Appropriately placed skidoo and/or boat rentals (i.e., placed below the low water mark, so that boats and human traffic do not compact or disturb the sandy beach area), and appropriately concentrated areas for boat dragging
- Appropriately concentrated swim and beach traffic (e.g., via strategic placement of swimming buoys to limit boat access to the Low Impact Zone)
- Implementation of appropriate mitigation/avoidance strategy for alien invasive species introduction, including use of only authorized landscape maintenance vehicles that meet clean equipment standards

Delineating Low Impact Zone

RDOS has expressed interest in using natural materials such as logs or drift wood to delineate the southern border of the Low Impact Zone with in an aesthetically pleasing arrangement. This activity is permitted provided encroachment into the Low Impact Zone is limited, all equipment works outside of the Low Impact Zone, and works are conducted after October 31 and before May 1. See Figure 2 in Appendix A for example. Interpretive signage is recommended at this site and may also be placed outside of the logs.

Additional Management Recommendations

Recommended activities that support SRAA at Christie Memorial Park include the following:

- Rototill the entire beach in April (i.e., prior to SRAA germination) to remove competitive vegetation and create optimal opportunities for growth; this activity likely mimics historical disturbance regimes and may also help control invasive plants
- Monitor, and if necessary, control the spread of invasive plants; this may involve hand-pulling or cutting with a hand scythe at appropriate times of year
- Use interpretive signage to:
    - Educate the public about the SRAA and needs for conservation (e.g., which areas beach users should avoid, and what activities would be considered damaging)
    - Explain the role of RDOS in helping to promote conservation of this unique species at risk (e.g., rationale for lack of tilling and raking)
- Ensure all park maintenance staff are aware of the site management protocols and the reason for them, and that implementation is successfully applied
- Support annual inventory and monitoring of SRAA abundance and distribution in August or September, while plants are flowering (i.e., in collaboration with the FLNR and/or Environment Canada's Canadian Wildlife Service (EC-CWS))
- Support assessment of trends, distribution and abundance of plants, and suitable habitat availability (as above, in collaboration with FLNR and/or EC-CWS); if population numbers and/or distributions should change, or where they appear to be in decline, support assessment of (a) whether further measures such as fencing off the Low Impact Zone (to exclude foot traffic or other types of damage) would be appropriate, and/or (b) whether the designated Low Impact Zone area needs to be reconfigured or revised to include additional areas

3.3 Evaluation

The commitment and operational BMP evaluation of this agreement will be ongoing by both parties. However, at a minimum, there will be a review once a year by both parties. Monitoring the effectiveness of the stewardship agreement will be the responsibility of both parties. At the end of the term, the stewardship agreement will be evaluated to determine the effectiveness of a subsequent stewardship agreement.

3.4 Key Contacts

The key contacts for this Stewardship Agreement are as follows:

- Josie Symonds, Ecosystems Biologist, Josie.Symonds@gov.bc.ca, 250-490-2254
  Ministry of Forests Lands and Natural Resource Operations | Ecosystems Section
  102 Industrial Place, Penticton, BC V2A 7C8

- Justin Shuttleworth, Parks & Facilities Coordinator, jshuttleworth@rdos.bc.ca, 250-490-4136
  Regional District of Okanagan-Similkameen | Community Services Department
  101 Martin Street, Penticton, BC V2A 7Z3

5.0 ACRONYMS

B.C.	British Columbia
BMP	Best Management Practice
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
EC-CWS	Environment Canada, Canadian Wildlife Service
FLNR	Ministry of Forests, Lands and Natural Resource Operations
RDOS	Regional District of Okanagan-Similkameen
SARA	Species at Risk Act
SRAA	Short-rayed alkali aster; *Symphyotrichum frondosum*

6.0 REFERENCES

Environment Canada. 2013. Recovery Strategy for the Short-rayed Alkali Aster (*Symphyotrichum frondosum*) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. ON. xix pp. + Appendix. http://www.sararegistry.gc.ca/virtual_sara/files/plans/rs_short-rayed_alkali_aster_e_final.pdf

Environment Canada and Ministry of Forests, Lands and Natural Resource Operations. 2014 Management Practices to Avoid Destruction of Critical Habitat for Short-rayed Alkali Aster at Christie Memorial Park. Unpublished document.

Ministry of Environment. 2014. Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia. http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/index.html

Ministry of Forests, Lands and Natural Resource Operations. 2014. *Symphyotrichum frondosum* Plant Species at Risk Fact Sheet. Thompson Okanagan Region, Ecosystems Section, Penticton, B.C. http://www.env.gov.bc.ca/okanagan/documents/Plant_SAR_Fact_Sheets/Symphyotrichum_frondosum.pdf

Short-rayed Alkali Aster Recovery Team. 2009. Recovery Strategy for the short-rayed alkali aster (*Symphyotrichum frondosum*) in British Columbia. Prepared for the BC Ministry of Environment, Victoria, BC, 16 pp. http://a100.gov.bc.ca/pub/eirs/finishDownloadDocument.do;jsessionid=f2LcJjldSvP6pX7ny6GD1C6499L9bl7ztpnmnBvnFx468Wyv2x5R!932399469?subdocumentId=7201

APPENDIX A: STEWARDSHIP AGREEMENT AREA

Figure 1 Christie Memorial Park showing Area Containing Critical Habitat (black polygon), Crown Lease Area (blue polygon), Low Impact Zone (green polygon) and SRAA Occurrence Area (red polygon; based on data from 2005 to 2016)

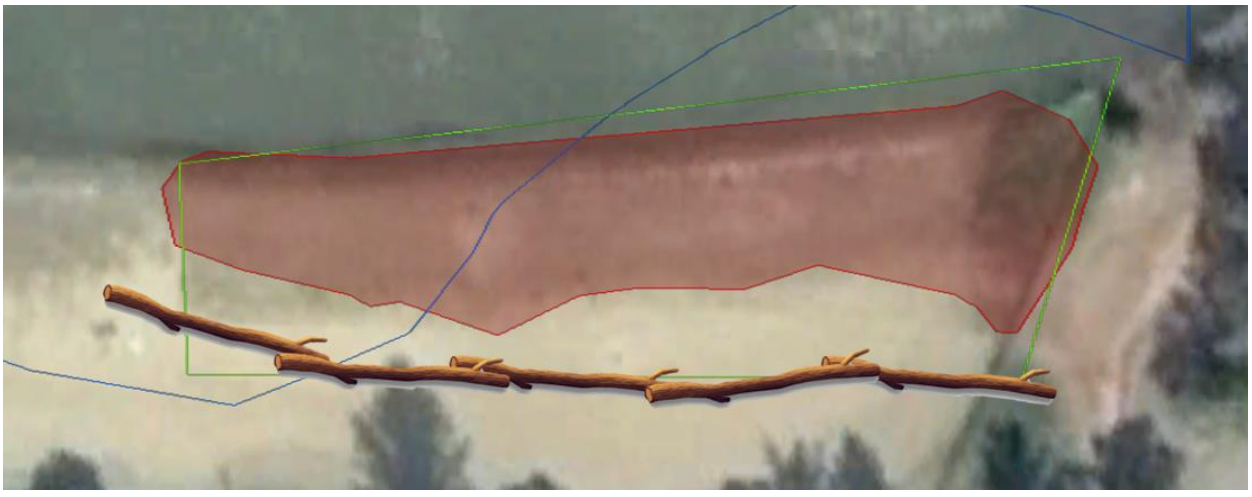

Figure 2 Close up of Low Impact Zone (green polygon) showing example of log delineation along southern border

APPENDIX B: PROVINCIAL FACT SHEETS

Thompson Okanagan Region *Symphyotrichum frondosum* Plant Species at Risk Fact Sheet
http://www.env.gov.bc.ca/okanagan/documents/Plant_SAR_Fact_Sheets/Symphyotrichum_frondosum.pdf

Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia: Fact Sheet #5 Parks
http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/Fact-Sheet-5-Parks.pdf

Short-rayed Aster (*Symphyotrichum frondosum*) Asteraceae (Sunflower Family)

Status: Red / Endangered
Best Survey Time: Jul to Sep
General Habitat: Foreshore

RANGE

- Widespread in North America from British Columbia east to Colorado (USA) and south to Baja California (Mexico)
- In B.C., found in the south Okanagan Valley at Osoyoos Lake, Vaseux Lake, Skaha Lake and Max Lake

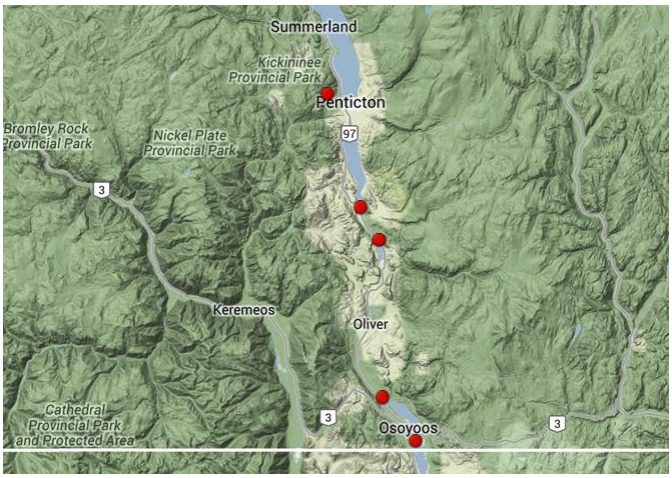

Figure 1 B.C. distribution of *S. frondosum* (BC CDC 2013)

HABITAT

- Open sandy soil along lakeshores in the Bunchgrass Biogeoclimatic Zone, including moist to dry drawdown zones of sandy beaches and saline zones around lakes and ponds that become exposed in summer and early fall
- Associates include rayless alkali aster (*S. ciliatum*), tufted white prairie aster (*S. ericoides*, spike-rushes (*Eleocharis* spp.) and rare foreshore plants

Figure 2 Open sandy lakeshore habitat along Vaseux Lake, B.C.

Figure 3 Sandy lakeshore habitat along Skaha Lake, B.C.

LIFE HISTORY

- Annual species that grows each year from seed, germinating following water drawdown in late June or July and flowering from July into September
- Achenes (containing seeds) produced from September to October, then released into seed bank
- Does not reproduce vegetatively, so population survival depends on seeds and seed bank
- Seed dispersal by wind, water, waterfowl or small mammals
- May be subject to annual population fluctuations due to varying environmental conditions

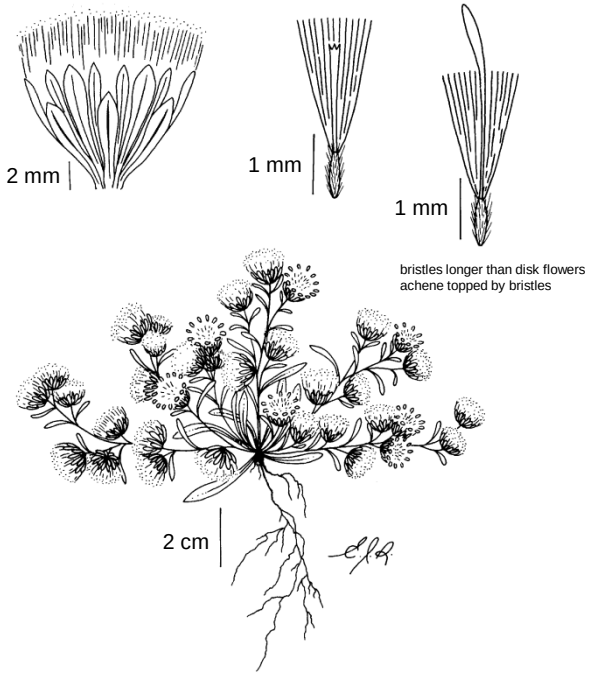

Figure 4 Illustration of *S. frondosum* (Douglas et al. 1998)

Symphyotrichum frondosum (continued)

DESCRIPTION

General

- Small to medium-sized annual herb
- Branched, usually 2 to 30 cm (up to 60 cm) tall stems grow annually from a small taproot
- Branches may be erect or spreading out over soil

Leaves

- Alternate, oblanceolate (broader towards to top) or narrowly elliptic leaves, up to 6 cm long
- Often fringed with small hairs along margins

Flowers

- Flower heads borne on larger plants in open, short-branched inflorescences, each surrounded by overlapping, green, oblanceolate leaf-like bracts, 5 to 9 mm long
- Flower heads composed of two types of flowers, pink or white narrow and strap-like ray flowers each 1.5 to 2 mm long, and yellow tubular disk flowers

Fruits

- Fruits are achenes, each topped by numerous soft bristles that are longer than the disk flowers and highly conspicuous in the autumn

Figure 5 Branched, somewhat prostrate plant

IDENTIFICATION TIPS

- Characterized by broad, leaf-like floral bracts, narrow ray petals, and low, sprawling growth habit
- Rayless alkali aster (*S. ciliatum*) often co-occurs in the same habitats but has erect, taller stems, much shorter often inconspicuous rays, and narrow sharply pointed floral bracts
- Hybrids with *S. ciliatum* occur in mixed populations; these are recognizable by their intermediate traits: showier rays than *S. ciliatum*, but a more erect growth form than *S. frondosum*, and involucre bracts that are intermediate in shape, size and how tightly they overlap

Figure 6 Close up of flower head with pink ray flowers

GENERAL THREATS AND GUIDANCE

- **Avoid development in areas with known occurrences of *Symphyotrichum frondosum* through project relocation or redesign**
- Protect open lakeshore habitats by minimizing beach maintenance activities, avoiding permanent trail creation, excluding livestock and ATV, and removing invasive species
- Follow provincial methods for when and how to conduct plant species at risk surveys
- Follow provincial policy and guidance on how to avoid, minimize, restore and offset impacts to plant species at risk and their habitats
- Report any sightings to the B.C. Conservation Data Centre (cdcdata@gov.bc.ca) and FLNR Ecosystems Section (josie.symonds@gov.bc.ca)

REFERENCES

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ACKNOWLEDGEMENTS

Symphyotrichum frondosum Plant Species at Risk Fact Sheet developed by Josie Symonds, based on content produced under contract by Terry McIntosh and review comments from Brenda Costanzo, Orville Dyer and Curtis Bjork

Develop with Care 2014

FACT SHEET #5 Parks

Environmental Guidelines for Urban and Rural Land Development in British Columbia



Municipal and regional parks can make significant contributions to community greenspace and wildlife habitat. This fact sheet provides information on ways to maximize these benefits.

There are many guidelines that can be followed to protect environmental values during the design, construction and maintenance of parks. These are described in more detail in *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia*.

Municipal and regional parks include many types of landscapes: from ballfields and children's playgrounds to natural areas. The environmental benefits—or impacts—from parks vary according to the type of park. By keeping parks as natural as possible, fish and wildlife habitats are protected and visitors are given an enjoyable and pleasurable experience.

Ballfields and Playgrounds

Reduce water wastage

☑ Design playing fields to minimize irrigation needs, for example using drought-tolerant grasses.

☑ Set up highly efficient irrigation systems. For more information see www.irrigationbc.com

Create and maintain wildlife habitat

☑ Enhance areas around smaller ballfields and playgrounds with native plantings. Native plants will require little maintenance (once established) and will provide food sources for local wildlife and high value edge habitats for many bird species. Smaller ballfields surrounded by natural screening will help to discourage use by geese and other problem wildlife.

☑ Top hazard trees at 3–5 m or higher rather than completely removing them. This creates a standing dead snag, a food source for a variety of bird species and potential nesting sites for owls and other wildlife.

☑ Maintain turf in good condition to minimize weed invasions.

☑ Use integrated pest management approaches. Avoid, or minimize, the use of pesticides or other chemicals that can harm local wildlife or pollute waterways.

☒ Avoid, or minimize, the use of pressure treated lumber, which contains toxics that can leach into the soil or nearby waterways.

☑ Minimize the amount of impervious surfaces and compacted soils, allowing rainwater to soak into the ground and replenish ground water supplies.

☑ Establish setbacks and measures for trails consistent with the Riparian Areas Regulation methods.

Avoid undesirable human-wildlife encounters

☒ Avoid planting species that attract bears, or deer (which in some areas may attract cougar). Keep plantings low and open to avoid creating hiding places for undesirable wildlife.

☑ Use garbage containers that are resistant to local wildlife, such as bears, racoons and crows.

☑ Require that dogs be kept on a leash or under close control outside established leash-free zones.

☒ Never let dogs chase wildlife.

Natural Parks

Design trails carefully

☑ Place trails near the edges of parks rather than through the centre. Maintaining a large undisturbed area in the centre of the park creates safe habitat for shyer species that prefer to avoid humans.

☒ Do not build trails in areas of high environmental sensitivity (e.g., close to heron nesting areas or streams). Discourage the use of existing trails in sensitive areas by decommissioning these trails, placing downed wood across the trail, and by using interpretive signage.

Create narrow, well-defined trails

☑ Keep trails as narrow as possible to limit the amount of space used. Create well-defined trails that encourage people to stay on the designated path.

☑ Use narrow boardwalks in damp areas, rather than fill which destroys wetland habitats.

☑ If stream crossings are required, use clear-span bridges rather than culverts. This helps to protect fish habitats.

Protect wildlife habitats

☑ If hazard trees have to be removed for public safety reasons, top them at 3–5 m or higher and leave the stump as a wildlife tree.

☑ Leave dead trees and large branches on the ground to rot in place. Downed wood habitat provides habitat for salamanders and small birds.

☑ Maintain shrubby vegetation that is used by small birds for nesting and as cover.

☑ Maintain riparian vegetation (ground cover as well as trees and shrubs). These areas provide important wildlife habitats for feeding and breeding.

☑ Create well-defined, limited access to streams, lakes and coastal shorelines at key locations rather than a trail along the entire shoreline. Children and dogs that play in the streams can inadvertently destroy fish spawning and bird nesting habitats.

☑ Keep beach areas small. Public access to shorelines destroys and disturbs bird nesting habitat, and the sand in the water supports very few fish or other aquatic species. Obtain permits from Fisheries and Oceans Canada and Ministry of Forests, Lands and Natural Resource Operations before creating beach areas.

☑ Find ways to 'connect' the park to other greenspaces, for example along riparian corridors or through treed boulevards. Small parks can make significant contributions to a network of wildlife habitats.

For more information see:

Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia **and other Guideline documents** http://www.env.gov.bc.ca/wld/BMP/bmpintro.html

Riparian Areas Regulation: http://www.env.gov.bc.ca/habitat/fish_protection_act/riparian/riparian_areas.html

Photos: Judith Cullington