PROPOSED

Species at Risk Act
Recovery Strategy Series
Adopted under Section 44 of SARA

Recovery Strategy for the Showy Phlox (*Phlox speciosa* ssp. *occidentalis*) in Canada

Showy Phlox

2017

Government of Canada
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For copies of the recovery strategy, 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 Species at Risk (SAR) Public Registry[1].

Cover illustration: Kella Sadler, Environment and Climate Change Canada

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

RECOVERY STRATEGY FOR THE SHOWY PHLOX (*PHLOX SPECIOSA* SSP. *OCCIDENTALIS*) IN CANADA

2017

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 *Recovery Strategy for the showy phlox (*Phlox speciosa *spp*. occidentalis*) in British Columbia* (Part 2) under Section 44 of the *Species at Risk Act* (SARA). Environment and Climate Change Canada has included a federal addition (Part 1) which completes the SARA requirements for this recovery strategy.

The federal recovery strategy for the Showy Phlox in Canada consists of two parts:

Part 1 – Federal Addition to the *Recovery Strategy for the showy phlox (*Phlox speciosa *spp.* occidentalis*) in British Columbia*, prepared by Environment and Climate Change Canada.

Part 2 – *Recovery Strategy for the showy phlox (*Phlox speciosa *spp.* occidentalis*) in British Columbia*, prepared by the Showy Phlox Recovery Team for the British Columbia Ministry of Environment.

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Part 1 – Federal Addition to the *Recovery Strategy for the showy phlox (*Phlox speciosa *spp.* occidentalis*) in British Columbia*, prepared by Environment and Climate Change 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 recovery strategies for listed Extirpated, Endangered, and Threatened species and are required to report on progress within five years after the publication of the final document on the SAR Public Registry.

The Minister of Environment and Climate Change is the competent minister under SARA for the Showy Phlox and has prepared the federal component of this recovery strategy (Part 1), as per section 37 of SARA. To the extent possible, it has been prepared in cooperation with the Province of British Columbia, as per section 39(1) of SARA. SARA section 44 allows the Minister to adopt all or part of an existing plan for the species if it meets the requirements under SARA for content (sub-sections 41(1) or (2)). The Province of British Columbia provided the attached recovery strategy for the Showy Phlox (Part 2) as science advice to the jurisdictions responsible for managing the species in British Columbia. It was prepared in cooperation with Environment and Climate Change Canada.

Success in the recovery 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 strategy and will not be achieved by Environment and Climate Change Canada, or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this strategy for the benefit of the Showy Phlox and Canadian society as a whole.

This recovery strategy will be followed by one or more action plans that will provide information on recovery measures to be taken by Environment and Climate Change Canada and other jurisdictions and/or organizations involved in the conservation of the species. Implementation of this strategy is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

The recovery strategy sets the strategic direction to arrest or reverse the decline of the species, including identification of critical habitat to the extent possible. It provides all Canadians with information to help take action on species conservation. When critical habitat is identified, either in a recovery strategy or an action plan, SARA requires that critical habitat then be protected.

[2] http://registrelep-sararegistry.gc.ca/default.asp?lang=en&n=6B319869-1#2

In the case of critical habitat identified for terrestrial species including migratory birds SARA requires that critical habitat identified in a federally protected area[3] be described in the *Canada Gazette* within 90 days after the recovery strategy or action plan that identified the critical habitat is included in the Public Registry. A prohibition against destruction of critical habitat under ss. 58(1) will apply 90 days after the description of the critical habitat is published in the *Canada Gazette*.

For critical habitat located on other federal lands, the competent minister must either make a statement on existing legal protection or make an order so that the prohibition against destruction of critical habitat applies.

If the critical habitat for a migratory bird is not within a federal protected area and is not on federal land, within the exclusive economic zone or on the continental shelf of Canada, the prohibition against destruction can only apply to those portions of the critical habitat that are habitat to which the *Migratory Birds Convention Act , 1994* applies as per SARA ss. 58(5.1) and ss. 58(5.2).

For any part of critical habitat located on non-federal lands, if the competent minister forms the opinion that any portion of critical habitat is not protected by provisions in or measures under SARA or other Acts of Parliament, or the laws of the province or territory, SARA requires that the Minister recommend that the Governor in Council make an order to prohibit destruction of critical habitat. The discretion to protect critical habitat on non-federal lands that is not otherwise protected rests with the Governor in Council.

[3] These federally protected areas are: a national park of Canada named and described in Schedule 1 to the *Canada National Parks Act*, The Rouge National Park established by the *Rouge National Urban Park Act*, a marine protected area under the *Oceans Act*, a migratory bird sanctuary under the *Migratory Bird Convention Act, 1994* or a national wildlife area under the *Canada Wildlife Act* see ss. 58(2) of SARA.

Additions and Modifications to the Adopted Document

The following sections have been included to address specific requirements of the federal *Species at Risk Act* (SARA) that are not addressed in the *Recovery Strategy for the showy phlox (*Phlox speciosa *spp.* occidentalis*)*[4] *in British Columbia* (Part 2 of this document, referred to henceforth as "the provincial recovery strategy") and/or to provide updated or additional information.

Under SARA, there are specific requirements and processes set out regarding the protection of critical habitat. Therefore, statements in the provincial recovery strategy referring to protection of survival/recovery habitat may not directly correspond to federal requirements. Recovery measures dealing with the protection of habitat are adopted; however, whether these measures will result in protection of critical habitat under SARA will be assessed following publication of the final federal recovery strategy.

1. Species Population and Distribution

This section (Table 1 below) replaces the summary of known extant[5] populations and subpopulations of Showy Phlox (i.e., Table 1 in the provincial recovery strategy). It includes updated and additional information on the population and distribution of Showy Phlox in Canada.

Population and abundance information for this species indicates there are three extant populations[6] in British Columbia. All three populations are found clustered within the same general area of the south Okanagan Valley in the southern interior of British Columbia. Two reported historical populations (Summerland in 1919 and Skaha Lake in 1927) have not been reconfirmed since their initial observation despite intensive search effort, and are likely extirpated (COSEWIC 2004). Current population estimates indicate a range of 35,000 - 320,000 individuals in British Columbia (B.C. Conservation Data Centre 2014).

[4] Although there are six Showy Phlox subspecies in western North America, *Phlox speciosa* ssp. *occidentalis* is the only subspecies that occurs in Canada.
[5] An "extant" population is one which is considered to be still in existence, i.e., not destroyed or lost (extirpated).
[6] This federal recovery strategy follows the delineation of Showy Phlox populations as applied by the province of British Columbia in the provincial recovery strategy. Here "populations" are characterized following plant element occurrence specifications used by NatureServe (2004) as representing individuals, or patches of individuals, that are within 2 km of each other where suitable habitat exists between them.

Table 1. Summary of known extant populations of Showy Phlox in Canada.

Population name	B.C. CDC EO#[a]	Populations described in COSEWIC 2004	Last Obs.	Abundance
Yellow Lake	EO1	Twin Lakes, Yellow Lake East, Yellow Lake South, Yellow Lake West, White Lake, Park Rill , Yellowlake Creek	2013 (2015[b])	35,000-320,000
Ford Lake	EO7	Ford Lake	2003	14-24
McKay Creek	EO8	McKay Creek	2003	100-200

[a] Element occurrence (EO) numbers from the B.C. Conservation Data Centre. Refer to the B.C. Species and Ecosystem Explorer webpage at : <www.env.gov.bc.ca/atrisk/toolintro.html>.

[b] Showy Phlox surveys have continued in the Yellow Lake area (2013-present) to increase knowledge of extent of species' local distribution (overall abundance not quantified): observers Kella Sadler (Environment and Climate Change Canada), Nicholas Burdock (the Nature Trust of British Columbia), Josie Symonds & Orville Dyer (B.C. Ministry of Forests, Lands and Natural Resource Operations), Mark Weston (B.C. Parks), Kirk Safford (B.C. Ministry of Environment), and others.

Showy Phlox is locally abundant within its small range within Canada. Showy Phlox is a perennial plant, however it can only be positively identified (i.e., distinguished from co-occurring "not at risk" Phlox species) by internal characteristics of its flower. The onset and duration of Showy Phlox flowering is influenced by annual climate as well as local microclimatic factors (exposure, aspect), and most flowering occurs within a relatively short time window in spring. Therefore, evaluation of population size, as well as trends in abundance and distribution, is confounded by seasonal survey timing, difficulty in identifying the "peak flowering" window for surveying (i.e., accounting for factors of annual variation and microhabitat variability), the locally large area to be covered within the "optimal" survey time, and the destructive method required for positive identification.

2. Critical Habitat

This section replaces "Section 7.1: Description of Survival/Recovery Habitat" section in the provincial recovery strategy.

Section 41(1)(c) of SARA requires that recovery strategies include an identification of the species' critical habitat, to the extent possible, as well as examples of activities that are likely to result in its destruction. The provincial recovery strategy includes a description of the species' general habitat requirements (section 3.3.1 of that document). This science advice was used to inform the following critical habitat sections in this federal recovery strategy.

Critical habitat for Showy Phlox is identified in this document to the extent possible. As responsible jurisdictions and/or other interested parties conduct research to address knowledge gaps, the existing critical habitat methodology and identification may be modified and/or refined to reflect new knowledge in an amended recovery strategy or in the species' action plan.

2.1 Identification of the Species' Critical Habitat

Geospatial location of areas containing critical habitat

Critical habitat for Showy Phlox is identified for the three known extant populations in British Columbia (Figures 2-5); these align with the populations described in the provincial recovery strategy:

- Yellow Lake (Figures 2-4)
- Ford Lake (Figure 5)
- McKay Creek (Figure 5)

The geospatial area containing critical habitat for Showy Phlox is delineated based on the following methodology (see also Figure 1):

1. Mapping the area occupied by individual plants or patches of plants[7], including the associated potential location error from GPS units (ranging up to 25 m uncertainty distance);
2. Applying a 50 m distance (i.e., critical function zone distance[8]) surrounding mapped occurrences to derive core habitat areas;
3. Creating coarse-scale spatial groupings by applying a Minimum Convex Polygon[9] (MCP) around all core habitat areas that are linked by one or more Terrestrial Ecosystem Mapping (TEM) polygon[10]; and
4. Create detailed mapping within the coarse-scale groups (i.e., refine each MCP area) by selecting only portions of TEM polygons that are known to contain portions of Showy Phlox core habitat.

[7] Includes all occurrences that have been observed within the past 25 years, where habitat retains the potential to support an occurrence (currently and/or through restoration efforts).
[8] Critical function zone distance has been defined as the threshold habitat fragment size required for maintaining constituent microhabitat properties for a species (e.g., critical light, moisture, humidity levels necessary for survival). Existing research provides a logical basis for suggesting a minimum critical function zone distance of 50 m for rare plant species occurrences (see: www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=6A845288-1#_Toc285808423).
[9] A minimum convex polygon is the smallest shape, drawn with straight line segments, which will surround all essential terrestrial areas as identified in step 2. As an analogy, picture an elastic stretched around a group of pegs on a peg board.
[10] "Road surface" and "lake" polygons were excluded from this analysis. TEM mapping was available for the majority of area covered (Iverson 2010; Iverson and Haney 2012). For areas where TEM mapping was not available, visual confirmation of suitable habitat connectivity and separation distance was applied, and no further refinement of the MCP was implemented (i.e., step (4) was not applicable).

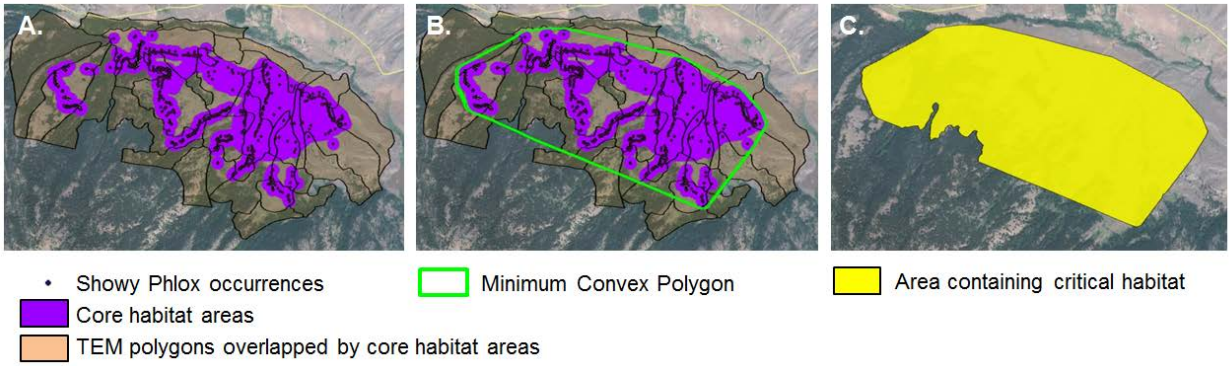

Figure 1. Schematic of methodology used to derive the area(s) containing critical habitat for Showy Phlox. **A)** 50 m critical function zone is applied to areas occupied by plants to derive core habitat areas (Steps 1 & 2) and Terrestrial Ecosystem Mapping (TEM) polygons implicated by core habitat areas are selected (Step 3); **B)** Minimum Convex Polygons (MCP) are applied around core habitat areas that are linked by one or more TEM polygon (Step 3); **C)** within MCP groups, only TEM polygons that are known to contain portions of Showy Phlox core habitat are retained as area containing critical habitat (Step 4).

Biophysical attributes of Critical Habitat

Within the area identified as containing critical habitat, critical habitat is identified wherever any of the following habitat types occur:

- Dry grasslands, shrublands, and open forests
- Open or slightly canopied sites; canopy openings and edges

Biophysical attributes of critical habitat include the vegetation (composition and abundance of plant species) and substrates that comprise the habitat types described above. The areas containing critical habitat for Showy Phlox (totalling 2115.0 ha) are presented in Figures 2-5. Critical habitat for Showy Phlox in Canada occurs within the shaded yellow polygon(s) (unit(s)) shown on each map. The biophysical attributes required by Showy Phlox overlap geospatially within suitable habitat types, in that they combine to provide an ecological context for the species at sites where it occurs. Therefore the shaded yellow polygons (units) shown on each map represent identified critical habitat, excepting only those features that clearly do not meet the needs of the species. These include: (i) existing anthropogenic infrastructure (e.g., buildings, houses, running surface of paved roads), (ii) wetland areas, and (iii) areas dominated by continuous dense forest. These features do not possess attributes required by Showy Phlox, and they are therefore not identified as critical habitat.

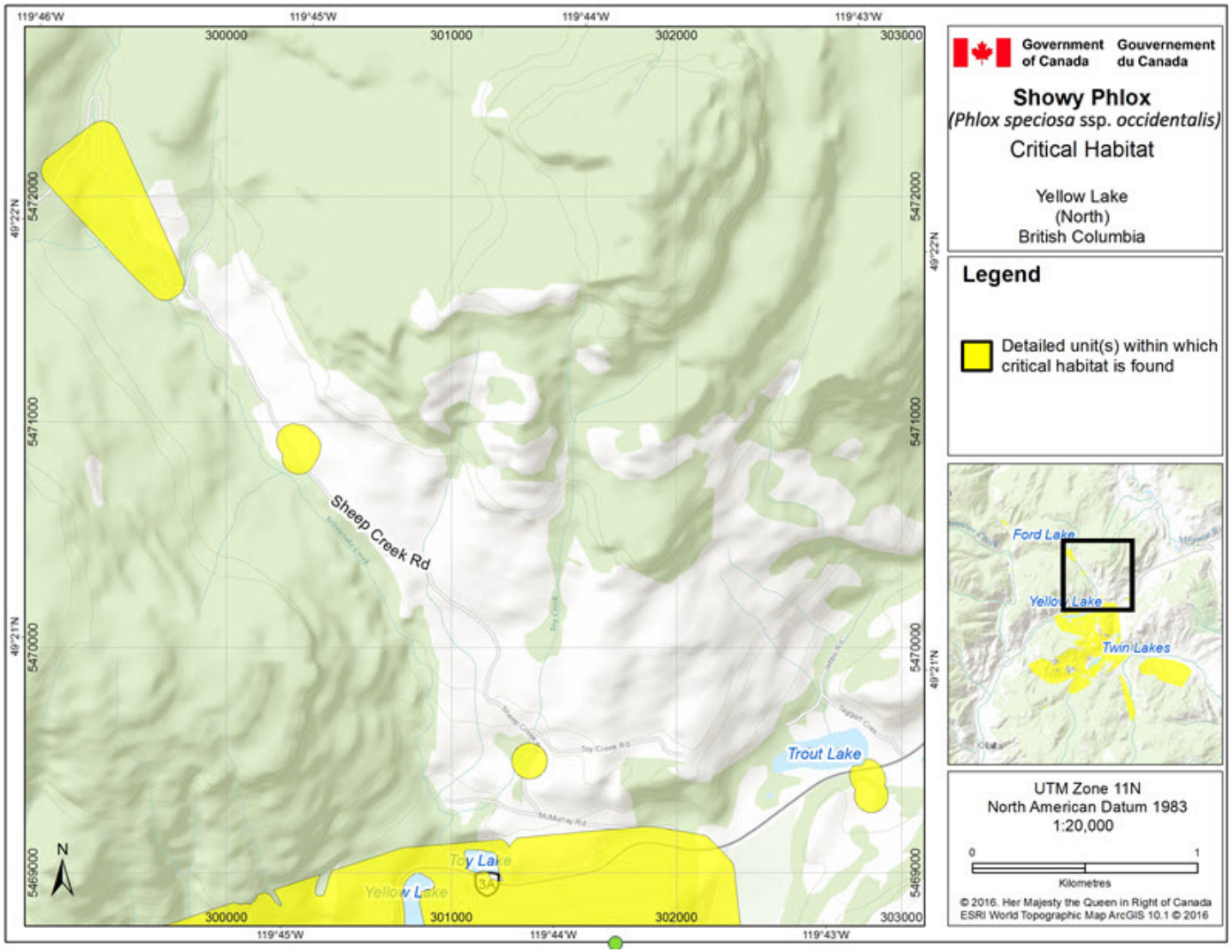

Figure 2. Critical habitat for Showy Phlox at Yellow Lake (north), British Columbia. is represented by the yellow shaded polygon(s) (unit(s)), in accordance with the criteria set out in section 2.1. Areas outside of the shaded yellow polygons do not contain critical habitat.

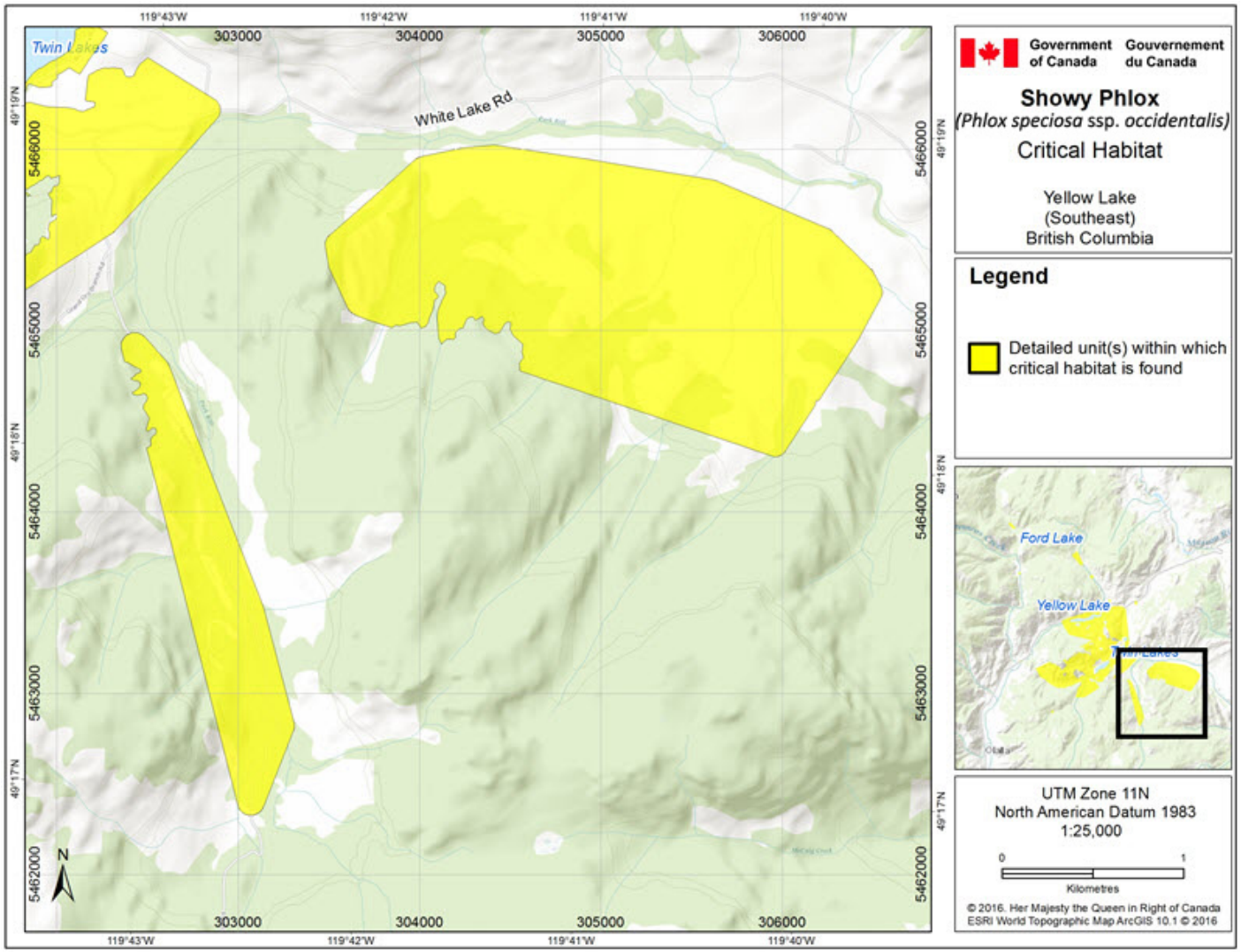

Figure 3. Critical habitat for Showy Phlox at Yellow Lake (southeast), British Columbia. is represented by the yellow shaded polygon(s) (unit(s)), in accordance with the criteria set out in section 2.1. Areas outside of the shaded yellow polygons do not contain critical habitat.

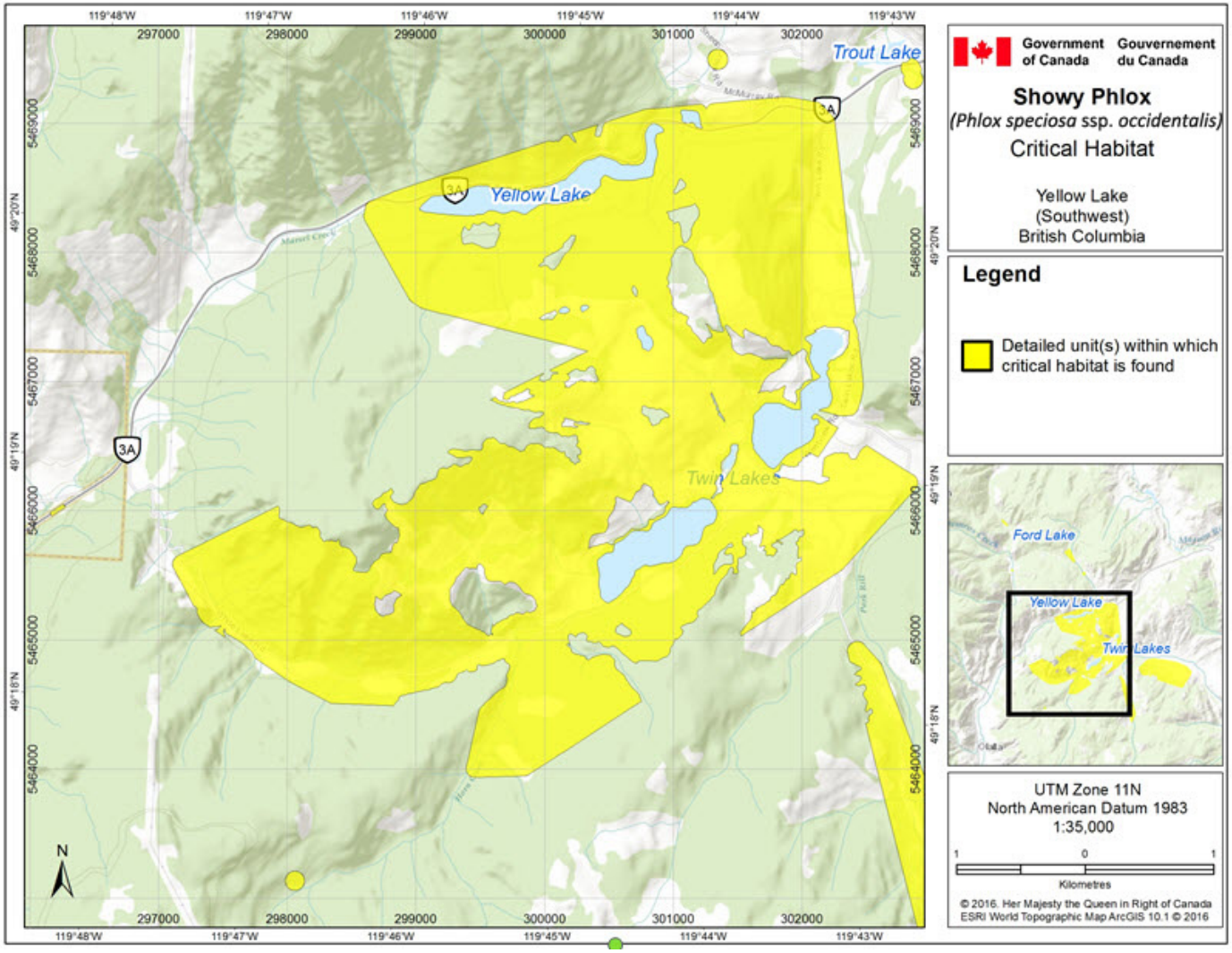

Figure 4. Critical habitat for Showy Phlox at Yellow Lake (southwest), British Columbia is represented by the yellow shaded polygon(s) (unit(s)), in accordance with the criteria set out in section 2.1. Areas outside of the shaded yellow polygons do not contain critical habitat.

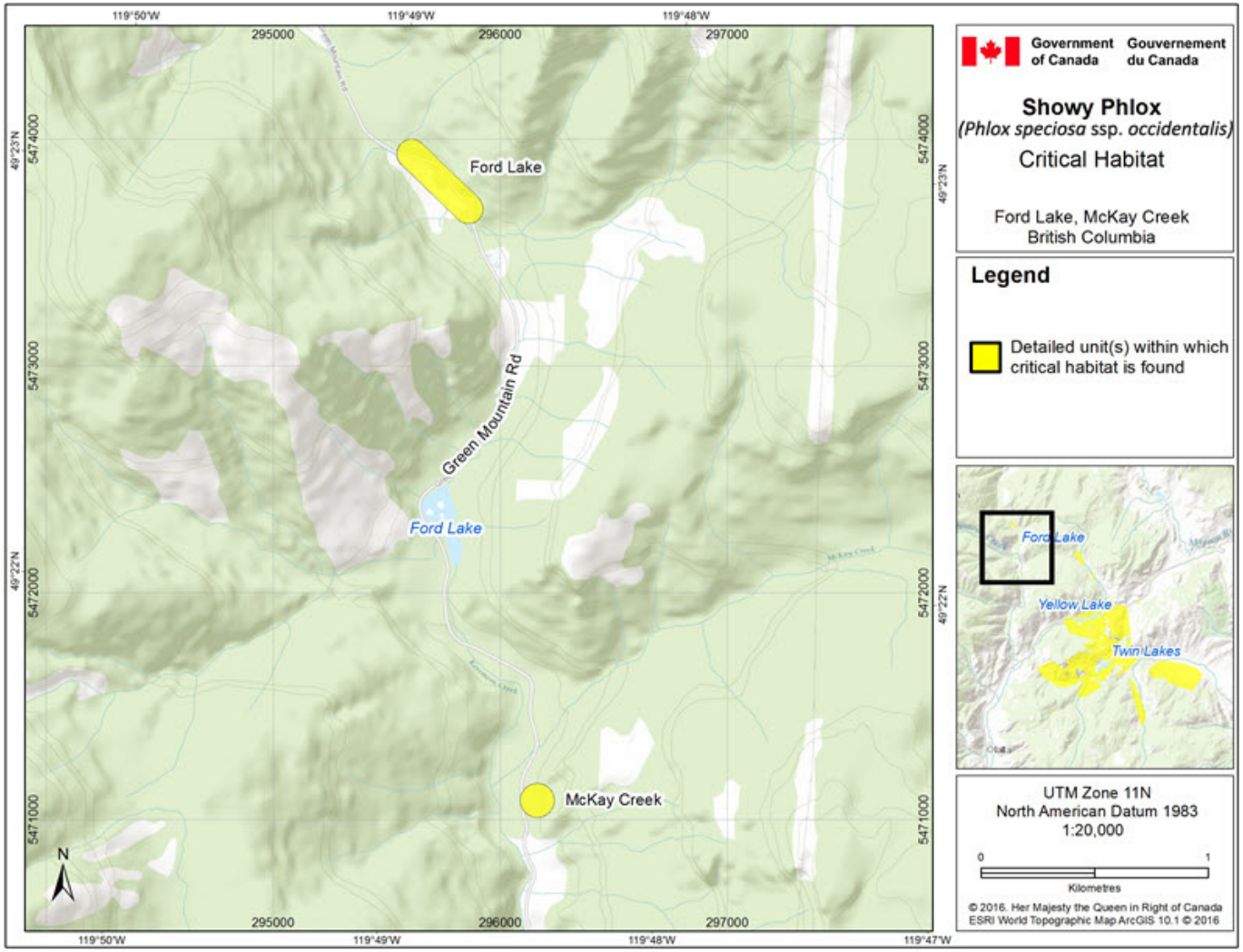

Figure 5. Critical habitat for Showy Phlox at Ford Lake, and McKay Creek, British Columbia is represented by the yellow shaded polygon(s) (unit(s)), in accordance with the criteria set out in section 2.1. Areas outside of the shaded yellow polygons do not contain critical habitat.

2.2 Activities Likely to Result in Destruction of Critical Habitat

Understanding what constitutes destruction of critical habitat is necessary for the protection and management of critical habitat. Destruction is determined on a case by case basis. Destruction would result if part of the critical habitat were degraded, either permanently or temporarily, such that it would not serve its function when needed by the species. Destruction may result from a single or multiple activities at one point in time or from the cumulative effects of one or more activities over time. The provincial recovery strategy provides a description of limitations and potential threats to Showy Phlox.

Activities described in Table 3 include those likely to cause destruction of critical habitat for the species; destructive activities are not limited to those listed.

Table 3. Activities likely to result in destruction of Critical Habitat for Showy Phlox.

Description of activity	**Description of effect on attributes of habitat**	**Additional Information including related IUCN threat[11]**
Conversion of natural landscape for residential, recreational, and/or agricultural purposes.	Results in the loss of critical habitat through removal and replacement, soil disturbance and compaction as well as indirect effects, e.g., alteration of shade and/or water.	Related IUCN Threat #1.1, 1.3, 2.1. In the Yellow Lake area, properties are being actively marketed as undeveloped sites for housing construction. Recreational areas (near McKay Creek and Yellow Lake) and a golf course (near Yellow Lake) are located in the vicinity and further tourism or recreational development is a possibility.
Human use of landscape that results in significant adverse effects[12], such as recreational use (creation of trails, roads)	Road creation and trampling through foot traffic and/or All-terrain Vehicle (ATV) use causes critical habitat loss and/or destruction via compaction or disturbance of soils, and increased possibility of invasive plant introduction.	Related IUCN Threat #6.1 Potential threat for all populations. Recreational impacts may be immediate or long-term, and cumulative. Recreational use can increase the risk of invasive plant introductions via uncleaned footwear, vehicles and other equipment.
Inappropriate level and concentration of livestock use, i.e., that results in significant adverse effects [12,13]	Intense grazing pressure causes soil and vegetation disturbance and/or removal, substratum displacement, soil compaction, and includes excessive deposition of feces.	Related IUCN Threat #2.3 Whether or not livestock graze on Showy Phlox itself is not known. Livestock impacts on critical habitat may be immediate or long-term, and cumulative.

[11] Threat classification is based on the IUCN-CMP (World Conservation Union–Conservation Measures Partnership) unified threats classification system (www.conservationmeasures.org).
[12] Significant adverse effects are those that negatively impact the species' survival and recovery. Success of the species' survival and recovery will be assessed by the adopted population and distribution (recovery) objective, and the associated performance measures set out in this document, that: the distribution and abundance of Showy Phlox has been maintained, i.e., population size and extent of occurrence or area of occupancy at each site is stable and/or increasing.
[13] Additional research is required to determine what level of livestock use is considered destructive to Showy Phlox, i.e., the level at which attributes necessary for long-term persistence are destroyed.

Description of activity	Description of effect on attributes of habitat	Additional Information including related IUCN threat[11]
Deliberate introduction of alien invasive plants, or efforts to control existing invasive species that do not follow best management practices[14]	Alien invasive species cause direct reduction of habitat available for Showy Phlox plants, and indirect effects, e.g., alteration of shade, water, and nutrients available to exclude niche range of Showy Phlox. Efforts to control invasive plants through mechanical or chemical means (non-specific herbicides) can likewise result in the destruction of critical habitat by degrading the substrates required for survival (as a consequence of weed-pulling), or microhabitat toxicity resulting from the application of herbicides.	Related IUCN Threat #8.1 Hound's Tongue (*Cynoglossum officinale*), Sulphur Cinquefoil (*Potentilla recta*), Knapweed (*Centaurea* spp.), and Dalmatian Toadflax (*Linaria dalmatica*) are all present in the species' area of occurrence.

3. Measuring Progress

This section replaces the "Section 8: Measuring Progress" section in the provincial recovery strategy.

The performance indicators presented below provide a way to define and measure progress[15] toward achieving the population and distribution objectives:

- The distribution of Showy Phlox in Canada has been maintained (i.e., extent of occurrence has not decreased); and,
- The abundance of Showy Phlox in Canada has been maintained (i.e., population sizes have not decreased).

Measurements of population size (as measured during peak flowering times) should allow for annual effects in numbers of flowering plants and related variation in annual monitoring results, i.e., trends in annual estimates are to be evaluated over the course of a longer time period, for example, over a five year interval.

4. Statement on Action Plans

One or more action plans for Showy Phlox will be posted on the Species at Risk Public Registry by 2022.

[14] E.g. see "Best Management Practices for Invasive Plants in Parks and Protected Areas of British Columbia"
[15] Priority actions for Showy Phlox are included in Table 3 of the provincial recovery strategy.

5. Effects on the Environment and Other Species

This section replaces the "Effects on Other Species" section in the provincial recovery strategy.

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*[16]. 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 any of the Federal Sustainable Development Strategy's[17] (FSDS) goals and targets.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that strategies may also 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 strategy itself, but are also summarized below in this statement.

The recovery measures proposed are not expected to negatively affect any other species. Efforts to conserve Showy Phlox could indirectly benefit several other species at risk with similar occurrences including (but not limited to): SARA-listed Great Basin Gophersnake (*Pituophis catenifer* ssp. *deserticola*), Great Basin Spadefoot (*Spea intermontana*), Western Tiger Salamander (*Ambystoma mavortium*), Western Rattlesnake (*Crotalus oreganus*), Desert Nightsnake (*Hypsiglena chlorophaea*), Western Yellow-bellied Racer (*Coluber constrictor* ssp. *mormon*), Sage Thrasher (*Oreoscoptes montanus*), and Common Nighthawk (*Chordeiles minor*). Recovery planning activities for Showy Phlox will be implemented with consideration for all co-occurring species at risk, such that there are no negative impacts to these species or their habitats.

[16] www.ceaa.gc.ca/default.asp?lang=En&n=B3186435-1
[17] www.ec.gc.ca/dd-sd/default.asp?lang=En&n=CD30F295-1

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Part 2 – *Recovery Strategy for the showy phlox (*Phlox speciosa *spp.* occidentalis*) in British Columbia*, prepared by the Showy Phlox Recovery Team for the British Columbia Ministry of Environment

Recovery Strategy for the showy phlox (*Phlox speciosa* spp. *occidentalis*) in British Columbia

Prepared by the Showy Phlox Recovery Team

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

January 2012

About the British Columbia Recovery Strategy Series

This series presents the recovery strategies that are prepared as advice to the province of British Columbia on the general strategic approach required to recover species at risk. The Province prepares recovery strategies to meet its commitments to recover species at risk under the *Accord for the Protection of Species at Risk in Canada*, and the *Canada – British Columbia Agreement on Species at Risk*.

What is recovery?

Species at risk recovery is the process by which the decline of an endangered, threatened, or extirpated species is arrested or reversed, and threats are removed or reduced to improve the likelihood of a species' persistence in the wild.

What is a recovery strategy?

A recovery strategy represents the best available scientific knowledge on what is required to achieve recovery of a species or ecosystem. A recovery strategy outlines what is and what is not known about a species or ecosystem; it also identifies threats to the species or ecosystem, and what should be done to mitigate those threats. Recovery strategies set recovery goals and objectives, and recommend approaches to recover the species or ecosystem.

Recovery strategies are usually prepared by a recovery team with members from agencies responsible for the management of the species or ecosystem, experts from other agencies, universities, conservation groups, aboriginal groups, and stakeholder groups as appropriate.

For more Information

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

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

Recovery Strategy for the showy phlox (*Phlox speciosa* spp. *occidentalis*) in British Columbia

Prepared by the Showy Phlox Recovery Team

January 2012

Recommended citation

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Cover illustration/photograph

Orville Dyer

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 recovery strategy has been prepared by the Showy Phlox Recovery Team, as advice to the responsible jurisdictions and organizations that may be involved in recovering the species. The British Columbia Ministry of Environment has received this advice as part of fulfilling its commitments under the *Accord for the Protection of Species at Risk in Canada*, and the *Canada–British Columbia Agreement on Species at Risk*.

This document identifies the recovery strategies that are deemed necessary, based on the best available scientific and traditional information, to recover showy phlox populations in British Columbia. Recovery 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 recovery approaches may be modified in the future to accommodate new objectives and findings.

The responsible jurisdictions and all members of the recovery 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 recovery team.

Success in the recovery 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 strategy. The Ministry of Environment encourages all British Columbians to participate in the recovery of showy phlox.

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RESPONSIBLE JURISDICTIONS

The British Columbia Ministry of Environment is responsible for producing a recovery strategy for showy phlox under the *Accord for the Protection of Species at Risk in Canada*. Environment Canada's Canadian Wildlife Service, Pacific and Yukon Region participated in the preparation of this recovery strategy.

ACKNOWLEDGEMENTS

The B.C. Ministry of Environment (MoE) and Okanagan University College funded the writing of this report. Ksenia Barton wrote the first draft of this strategy. Brenda Costanzo and Ted Lea of MoE provided reviews and comments. Orville Dyer of MoE provided detailed digital mapping of property ownership in the South Okanagan. The B.C. Conservation Data Centre provided guidance on the designation of populations and subpopulations. This document follows the B.C. guidance for recovery planning (Ministry of Environment 2010a).

EXECUTIVE SUMMARY

This recovery strategy has been developed to provide guidance for the recovery of British Columbian populations of showy phlox (*Phlox speciosa* spp. *occidentalis*), a vascular plant at risk. Showy phlox is a perennial herb with showy white to pink flowers.

Globally, showy phlox occurs only in western North America, extending from southern British Columbia to California. Within Canada, the plant is known only from three extant populations in the south Okanagan Valley in the southern interior of British Columbia. Canadian habitats for the species have been described as "dry grasslands, shrublands, and open forests in the steppe and lower montane zones."

Showy phlox was designated as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). It is listed as Threatened in Canada on Schedule 1 of the *Species at Risk Act* (SARA). In British Columbia, the showy phlox is ranked S2 (imperiled) by the Conservation Data Centre and is on the provincial Red list. The B.C. Conservation Framework ranks the showy phlox as a priority 2 under goal 3: maintain the diversity of native species and ecosystems. Recovery is considered to be biologically and technically feasible.

Threats to showy phlox recovery include habitat loss and degradation due to development, recreational activities (ATV use), livestock and ungulate grazing or trampling, fire suppression invasive species and climate change.

The population and distribution goal for showy phlox is to maintain the distribution, and to maintain the abundance of all known extant populations in B.C., as well as any other extant populations that may be identified.

The short-term recovery objectives for the next five years are:

1. Protect a minimum of 77 ha of occupied habitat.
2. Clarify potential threats and quantify habitat needs, population demographics, and viability including determining sizes and population trends of all known populations.
3. Confirm distribution within the known range of the species in B.C.

RECOVERY FEASIBILITY

The recovery of showy phlox in B.C. is considered technically and biologically feasible based on the criteria outlined by the Government of Canada (2009):

1. Individuals of the wildlife species that are capable of reproduction are available now or in the foreseeable future to sustain the population or improve its abundance.

   Yes, there are 3 extant populations in B.C, with approximately 16,000 – 100,000 individuals present in an optimal year. These populations have been setting seed and are capable of reproduction.

2. Sufficient suitable habitat is available to support the species or could be made available through habitat management or restoration.

   Yes, there is sufficient suitable habitat to support the existing populations in B.C.

3. The primary threats to the species or its habitat (including threats outside Canada) can be avoided or mitigated.

   Yes, recovery actions such as stewardship and cooperation with landowners and land managers can prevent major threats.

4. Recovery techniques exist to achieve the population and distribution objectives or can be expected to be developed within a reasonable timeframe.

   Yes, general restoration methods/techniques are known.

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1. COSEWIC* SPECIES ASSESSMENT INFORMATION

Date of Assessment: November 2004
Common Name (population):showy phlox
Scientific Name: *Phlox speciosa* spp. *occidentalis*
COSEWIC Status: Threatened
Reason for Designation: A showy perennial known from a very small area and from fewer than 10 locations. The species is present within a region subject to on-going habitat loss and degradation as a consequence of private property development, agricultural practices, and the spread of invasive plants.
Canadian Occurrence: British Columbia
COSEWIC Status History: Designated Threatened November 2004

* Committee on the Status of Endangered Wildlife in Canada.

2. SPECIES STATUS INFORMATION

showy phlox[a]		
Legal Designation:		
Identified Wildlife:[b] No	*B.C. Wildlife Act:*[c] No	SARA Schedule: 1-Threatened (2006)
Conservation Status[d]		
B.C. List: Red	B.C. Rank: S2 (2008)	Global Rank: G5TNR (1988)
U.S. Subnational Ranks:[e] MT: SU (2011); All other states (CA, ID, NV, OR, WA): SNR.		
B.C. Conservation Framework (CF)[f]		
Goal 1: Contribute to global efforts for species and ecosystem conservation.		Priority:[g] 6 (2009)
Goal 2: Prevent species and ecosystems from becoming at risk.		Priority: 6 (2009)
Goal 3: Maintain the diversity of native species and ecosystems.		Priority: 2 (2009)
CF Action Groups:	Compile Status Report; Send to COSEWIC; Planning; Habitat Protection; Habitat Restoration;; Private Land Stewardship	

[a] Data source: B.C. Conservation Data Centre (2010) unless otherwise noted.
[b] Identified Wildlife under the *Forest and Range Practices Act*, which includes the categories of species at risk, ungulates, and regionally important wildlife (Province of British Columbia 2002).
[c] B.C. *Wildlife Act* (Province of British Columbia 1982).
[d] S = subnational; N = national; G = global; T = refers to the subspecies level; B = breeding; 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.
[e] Data source: NatureServe (2010).
[f] Data source: Ministry of Environment (2010b).
[g] Six-level scale: Priority 1 (highest priority) through to Priority 6 (lowest priority).

3. SPECIES INFORMATION

3.1 Species Description

Showy phlox, *Phlox speciosa* spp. *occidentalis*, is a perennial herb with a somewhat shrubby base (Figure 1). Stems are erect, 15–40 cm tall, rising from a woody taproot. The plant is glandular to glandular-hairy above, and hairy below. The opposite leaves are linear to lanceolate (broadest above the base and narrowed to the apex), to 7 cm long and 1 cm wide, with well-developed internodes. The flowering part of the plant consists of loose, leafy-bracted, terminal clusters of stalked flowers. Flowers have fused petals, or corollas, that range from pink to white. The corolla tube (1–1.5 cm long) spreads to five wide lobes (1–1.5 cm long) that are notched at the tip. The green outer parts of the flowers, or calyces, are glandular, with flat, transparent segments between the five green ribs. Styles range from 0.5–2 mm long (description based on Douglas *et al.* 1999).

Showy phlox can be distinguished from other phlox species in British Columbia by its erect stature, opposite leaves (1–7 cm long), stalked flowers, glandular calyces, and styles ranging in length from 0.5–2 mm.

As its name suggests, showy phlox is a very showy and attractive plant. Its appeal to the general public is indicated by its use as a horticultural plant in appropriate North American climates.

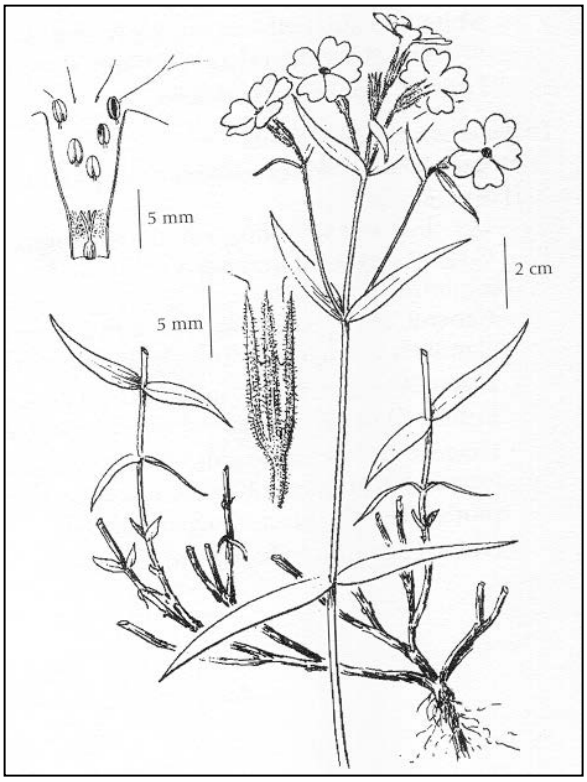

Figure 1. Illustration of showy phlox (from Douglas *et al.* 1999).

3.2 Populations and Distribution

Globally, showy phlox occurs only in western North America. The range of the taxon extends from southern British Columbia (B.C.) to California. The eastern extent of its range extends from Montana to Nevada (NatureServe 2009). Within Canada, showy phlox has a restricted range and is known only from the southern interior of B.C. (Scoggan 1979; NatureServe 2009). British Columbian populations represent the northern limit of the species' range (Figure 2).

Showy phlox is considered common, widespread, and abundant at the global scale (NatureServe 2009), yet only a relatively small number of plants occur in Canada (estimated in the 10,000s to 100,000s; COSEWIC 2004). The plant occurs throughout the western United States (California, Idaho, Montana, Nevada, Oregon, and Washington), but in Canada the extent of occurrence is approximately 57 km^2 (COSEWIC 2004). Searches in 2003 for the COSEWIC status report (COSEWIC 2004) checked historical and known occurrences and found several new subpopulations of showy phlox around Yellow Lake near Penticton, B.C. (COSEWIC 2004). The largest subpopulation to date was observed along Horn Lake Road (Yellow Lake near Pentiction, B.C.) in 2008. Although portions of the Okanagan area have been searched fairly intensively by botanists for at least the past 30 years, and even though the species is at the northern extent of its range, the likelihood of finding further occurrences in the Okanagan area is moderate. It can be presumed, therefore, that only small proportions of the species' global abundance and distribution occur in Canada, probably <1% in both cases.

The first known Canadian voucher for showy phlox was collected in 1919 in Summerland, BC. This historical population and another historical population at Skaha Lake from 1927 were not relocated in the 2003 COSEWIC surveys. As well, another unconfirmed population near Osoyoos, B.C. (perhaps based on a misidentification) was also not found at that time (COSEWIC 2004; Figure 2). The three[1] extant populations of showy phlox are all found in the Penticton, B.C. area described in Table 1.

Short-and long-term trends in the species' population sizes, extent of occurrence, area of occupancy, number of occurrences, and viability/ecological integrity of occurrences in B.C. are unknown due to lack of baseline data and monitoring. Habitat losses are occurring within the extent of occurrence because of increasing levels of property development for urban, recreational, and agricultural uses (COSEWIC 2004).

[1] In this report a location/population was defined following plant element occurrence specifications used by NatureServe (2004, see Figure 1) which defines a population as being separated by at least 2 km from one another. It is believed that habitat between sites/sub-populations does not include more than 1km of persistently unsuitable habitat which further supports the grouping of sub-populations. This resulted in three populations (compared with the nine populations listed in the COSEWIC status report).

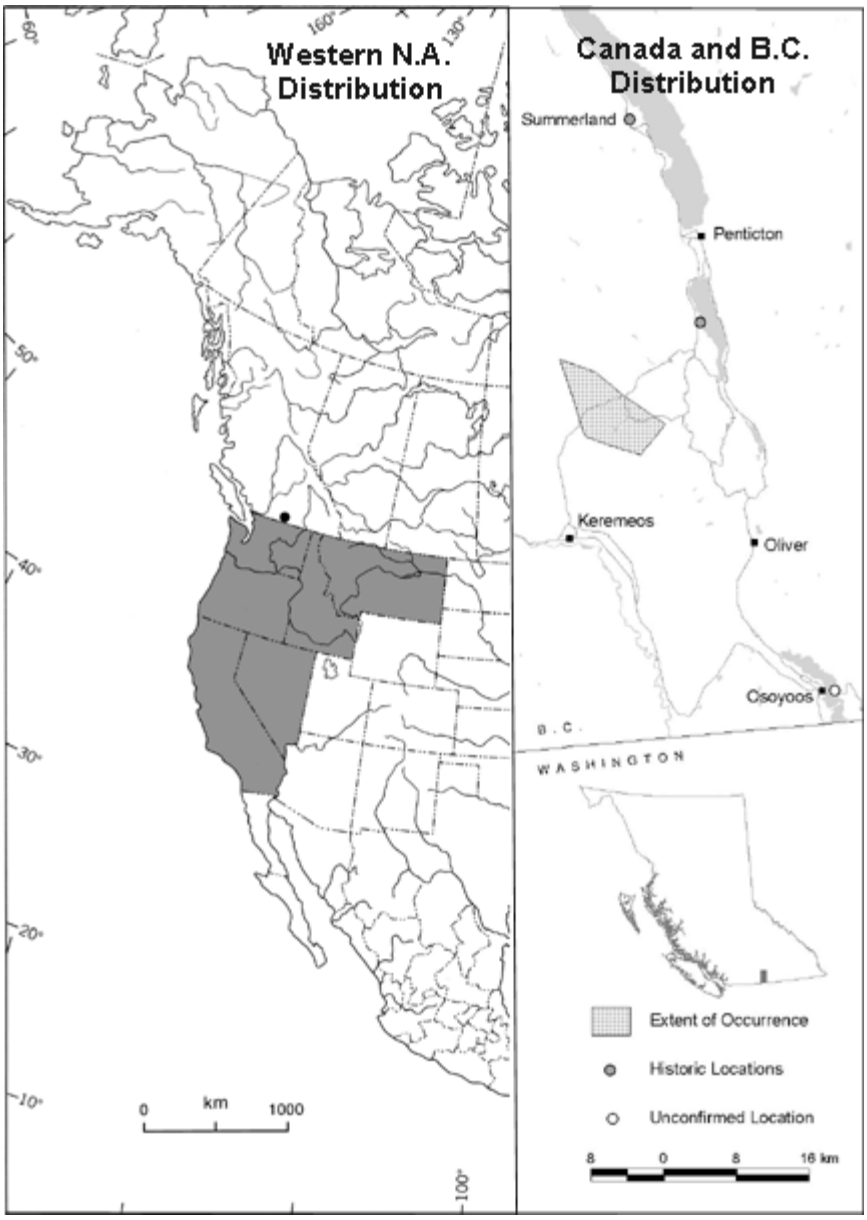

Figure 2. Distribution of all known occurrences of showy phlox (shaded).
Left, distribution in western North America (states where the species occurs are shaded); right, distribution in B.C. (locations for historical occurrences in B.C. are not exact). Source: COSEWIC 2004.

Table 1. Summary of extant populations and subpopulations of showy phlox 2010.

Population/Location,[a,b] Subpopulations	Tenure Status (approximate area)	Description	Observer(s) (Inventory Date)
Yellow Lake (EO #1)	Private and provincial Crown land	Very large population:	T. McIntosh (2006, 2007, 2008, 2009, 2010)
9 subpopulations:		White Lake sub-population has 10,000–100,000 plants (although 2010 estimate is at > 1 million plants (Dyer, pers. comm., 2010).	
Horn Lake Road	½ Crown land; ½ Private (< 1ha)	An additional 16,000 to 100,000 plants are scattered in the other eight subpopulations.	O. Dyer and L. Reiss (2010)
Yellow Lake Creek	Private (< 1ha)	Habitats include open Douglas-fir forests, big sagebrush grasslands, and dry meadows.	O. Dyer (2008)
Yellow Lake West	½ Crown land; ½ Private (6 ha)		D. Lalonde /H. Baumbrough (2007)
Yellow Lake East	Crown land; Private (< 1ha)		K. Barton /J. Taversham (2003)
Yellow Lake South	Mostly Crown; some Private[c]		F. Lomer (1997)
Park Rill Creek	Private (< 1ha)		G.W. Douglas (1994)
Twin Lakes	Private; Road ROW[d] Crown land (< 1ha)		T. C. Brayshaw (1977)
Twin Lakes South	Private (95 ha)		J. Grant (1964)
White Lake	Mainly federal land owned by the National Research Council and managed by the Dominion Radio Astrophysical Observatory. The land is leased to The Nature Trust of BC which manages grazing under the White Lake Biodiversity Ranch. (~ 62 ha)		J.A. Calder (1962)
Ford Lake (EO #7) 2 subpopulations	Private; Crown land (< 1 ha)	Very small (14–24 plants) roadside population (~11 m^2). Herbaceous clearing and open Douglas-fir forest habitats.	K. Barton /J. Taversham (2003)
McKay Creek (EO #8)	Private (< 1 ha)	Small roadside population (100–200 plants) on a residential property (< 100 m^2). Disturbed shrub-herb plant community (formerly open forest).	K. Barton /J. Taversham (2003)

[a] In this report a location/population was defined following element occurrence specifications used by NatureServe (2004, see Figure 1) which defines a population as being separated by at least 2 km from one another.

[b] An EO, or element occurrence is defined as an area of land and/or water where a species is or was present (B.C. Conservation Data Centre 2011). The EO # is a label used by the B.C. Conservation Data Centre.

[c] area unknown (older record)

[d] ROW = Right of way

3.3 Needs of the Showy Phlox

3.3.1. Habitat and biological needs

The Canadian habitats for showy phlox have been described as "dry grasslands, shrublands, and open forests in the steppe and lower montane zones" (Douglas *et al.* 1999).

Based on known locations of showy phlox, its habitat requirements can be summarized as follows (COSEWIC 2004):

- very hot, dry interior climate (BGxh1, IDFxh1, and PPxh1 biogeoclimatic units; see Lloyd *et al.* 1990);
- montane elevations (680–1120 m; Barton, pers. comm. 2005);
- lower slope macroslope position with variable mesoslope position;
- subxeric to mesic relative soil moisture regime;
- dry grasslands, shrublands, and open forests (Douglas *et al.* 1999);
- open or forested sites with 25% canopy closure or less;
- level sites and gentle to steep slopes with cool or neutral aspects (285–135°); and
- soils moderately well drained to well drained, ranging from shallow to deep with variable texture.

Little is known about the life history and reproduction of showy phlox. Although there may be intrinsic characteristics of the life history or ecology of the species that influence recovery potential, they are currently unknown.

3.3.2. Limiting Factors

Potential intrinsic limitations of Showy Phlox include restricted range, limited dispersal, population fluctuations, poor recruitment or reproduction, and inbreeding. Populations of the species are vulnerable given their relatively small range in B.C., estimated to be approximately 57 km^2 (COSEWIC 2004). The nearest known confirmed U.S. population occurs in Okanagon County, Washington (Knoke 2004). There is also a reported sighting near Nespelem, Okanagon County, Washington (Wooten, pers. comm. 2005), located approximately 130 km south of the southernmost B.C. occurrence. Such geographically restricted populations are at risk due to demographic stochasticity and loss of genetic variability (Primack 1998), although the relatively large sizes of some populations in B.C. may buffer stochastic effects. Detailed studies would be needed to assess the risks of poor recruitment / reproduction and inbreeding in the B.C. showy phlox populations.

4. THREATS

Threats are defined as the proximate (human) activities or processes that have caused, are causing, or may cause the destruction, degradation, and/or impairment of biodiversity and natural processes. Threats can be past (historical), ongoing, and/or likely to occur in the future. Threats do not include

intrinsic biological features of the species or population such as inbreeding depression, small population size, and genetic isolation, which are considered limiting factors.

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 showy phlox were assessed for the entire province (Table 2).

Table 2. Threat classification table for showy phlox.

Threat number	Threat description	Impact[a]	Scope[b]	Severity[c]	Timing[d]	Populations	Stress[e]
1	Residential & commercial development	Low	Small	Extreme	High		
1.1	Housing & urban areas	Low	Small	Extreme	High	Yellow Lake[f]; McKay Creek	Habitat loss and habitat degradation leading to reduced population size and viability and local extirpation
1.3	Tourism & recreation areas	Low	Small	Extreme	Moderate	Yellow Lake[f]; McKay Creek	Habitat loss and habitat degradation leading to reduced population size and viability and local extirpation
2	Agriculture & aquaculture	Low	Large	Slight	High		
2.1	Annual & perennial non-timber crops	Low	Small	Extreme	High	Yellow Lake[f]; McKay Creek	Habitat loss and habitat degradation leading to reduced population size and viability and local extirpation
2.3	Livestock farming & ranching	Unknown	Large	Unknown	High	White Lake sub-population of Yellow Lake	Habitat degradation leading to reduced population size and viability and local extirpation
6	Human intrusions & disturbance	Low	Small	Slight	High		
6.1	Recreational activities	Low	Small	Slight	High	Yellow Lake[f], McKay Creek, Ford Lake	Reduced numbers of plants, direct mortality
7	Natural system modifications	Low	Small	Slight	High		
7.1	Fire and fire suppression	Low	Small	Slight	High	All	Reduced habitat availability
8	Invasive & other problematic species & genes	Low	Pervasive	Slight	High		
8.1	Invasive non-native/alien species	Low	Large	Slight	High	All	Resource competition leading to reduced growth and shading of seedlings
8.2	Problematic native species	Low	Pervasive	Slight	High	All	Reduced population size; loss of seedlings, mature plants, and seeds
11	Climate change & severe weather	Unknown	Unknown	Unknown	Low		
11.2	Droughts	Unknown	Unknown	Unknown	Low	All	
11.3	Temperature extremes	Unknown	Unknown	Unknown	Low	All	

[a] **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 stress 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 is unknown).

[b] **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%)

[c] **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 three-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%)

[d] **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.

[e] **Stress** – the condition or aspect (key ecological, demographic, or individual attribute) of the conservation target that is impaired or reduced by a threat (e.g., directly or indirectly results from human activities).

[f] Not a significant threat for the White Lake sub-population

;

4.2 Description of the threats

The overall province-wide Threat Impact for this species is Medium[2]. The greatest threat is habitat loss and degradation due to development (Table 2). Details are discussed below under the Threat Level 2 headings.

IUCN-CMP Threat #1.1 Housing & Urban Areas
Current private land uses in and around showy phlox populations include a golf course, residential properties, and recreational properties. There is a potential subdivision planned for an area to the north of the Twin Lake Road subpopulation (Yellow Lake population) that may affect extant showy phlox populations. Real estate advertisements indicate that properties are being actively marketed as undeveloped sites for the construction of houses and for keeping horses in this popular area (COSEWIC 2004).

Road construction for the above development has the potential to affect the populations of showy phlox. In the past, there may have been some damage to populations at other locations due to road building, but this is undocumented.

IUCN-CMP Threat #1.3 Tourism & Recreation Areas
A golf course is located at Yellow Lake. As it is not likely that any more showy phlox habitat loss will occur due to the golf course in the future, no threat impact was calculated. McKay Creek is part private and part roadside, so tourism and recreational activities could potentially occur on the private portion in the future.

IUCN-CMP Threat #2.1 Agriculture
Land uses in and around showy phlox populations at two locations (Yellow Lake and McKay Creek) include agricultural cultivation, and hobby farms and could lead to habitat loss for the species.

IUCN-CMP Threat #2.3 Livestock Farming & Ranching
Livestock is a potential threat at the White Lake site perhaps due to trampling, but the effect of livestock grazing and trampling on showy phlox is unknown. Monitoring is required to determine the effects of grazing and trampling by livestock.

[2] 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. This includes 4 Low Level 1 Threats (Table 2). The overall threat considers the cumulative impacts of multiple threats.

IUCN-CMP Threat #6.1 Recreational Activities (ATV use)
ATV use is a potential threat at the Yellow Lake, Ford Lake and at McKay Creek.

IUCN-CMP Threat #7.1 Fire and Fire Suppression
Fire suppression is a potential threat as lack of natural fire regimes allow the open habitat that is utilized by this species to become more closed in over time due to conifer encroachment.

IUCN-CMP Threat #8.1 Invasive Non-Native/Alien Species
Invasive alien plants that may impact the showy phlox populations at White Lake include common hound's tongue (*Cynoglossum officinale*), sulphur cinquefoil (*Potentilla recta*), knapweed (*Centaurea* spp.), and Dalmatian toadflax (*Linaria dalmatica*) (Baumbrough, Dyer, McIntosh, pers. comms. 2009). Invasive species can degrade habitats through the competitive exclusion of native plants. More detailed studies are needed to assess the level of damage to the species that this threat might have on showy phlox populations, and whether herbicide use for their control would also be a potential threat to the species.

IUCN-CMP Threat #8.2 Problematic Native Species (ungulate presence)
Ungulate presence of both Mule Deer (*Odocoileus hemionus*) and White-tailed deer (*Odocoileus virginianus*), as well as domestic cows is a potential threat at the White Lake site perhaps due to trampling. Ungulates may also browse or graze on showy phlox, but the effect of this on the species is unknown. Monitoring is required to determine the effects of grazing and trampling by ungulates.

IUCN-CMP Threat #11 Climate Change (11.2 Droughts; 11.3 Temperature extremes)
Climate change is a potential threat to showy phlox because there may be resulting changes in the temperature and moisture regimes that may negatively impact the species.

5. RECOVERY GOAL AND OBJECTIVES

5.1 Population and Distribution Goal

The population and distribution goal for showy phlox is to maintain the distribution, and to maintain the abundance of all known extant populations in B.C., as well as any other extant populations that may be identified.

5.2 Rationale for the Population and Distribution Goal

Historical population size and distribution are not known. This precludes identification of a credible recovery target for the population. Habitat that has been destroyed by urban and agricultural development is unlikely to be restored to historical levels, making restoration beyond currently extant populations impractical, if targets could be determined. Potential habitat is not currently mapped and inventory of potential habitat is not complete.

Knowledge gaps prevent quantification of long-term population or habitat conservation targets at this time. The goal, to ensure persistence of extant populations, is based on ensuring that the species will not be extirpated in B.C. Short-term habitat targets are addressed in the recovery objectives. Knowledge gaps will be addressed through the action table for the species and the goal will be modified so that it is quantified when the information becomes available.

5.3 Recovery Objectives

The short-term recovery objectives for the next five years are:

1. Protect[3] a minimum of 77 ha of occupied habitat.
2. Clarify potential threats and quantify habitat needs, population demographics, and viability including determining sizes and population trends of all known populations.
3. Confirm distribution within the known range of the species in B.C.

Recovery objectives were set in the short-term that would optimize conservation return for the species. An interim habitat protection target of 77 ha was set which is approximately 80%[4] of the estimated number of individuals based on occupied habitat area[5]. The target of 77 ha includes 26 ha of provincial Crown land (i.e., all provincial Crown land at all known sites), 44 ha of NRC land leased to The Nature Trust for grazing (i.e., all federal land at this location), and 7 ha of private land (i.e., ~20% of the area known to be on private lands). The private land target reflects the voluntary stewardship success rate that three stewardship programs in the South Okanagan Valley have experienced in a 5 year timeframe.

This target of 77 ha is believed to be the habitat necessary for the survival of the species in the short term and achievable in the next 5 years, based on recovery team consensus in the absence of scientific support for a suitable population target. Further inventory in suitable habitat between the Yellow Lake location/White Lake site, and in between Ford Lake and McKay Creek is warranted to determine if the distribution of this species is perhaps one or may be two large populations. Therefore, it is expected that as threats are clarified and distribution is confirmed, the habitat necessary for the survival and recovery of the species over the long-term will be determined and recovery objectives modified (see Section 7).

[3] 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.
[4] This figure (80%) was calculated based on 2007 data (from the B.C. Conservation Centre), however it is believed that current data would provide a similar result.
[5] This target protects all or significant portions of two of the three populations: Yellow Lake and Ford Lake.

6. APPROACHES RECOMMENDED TO MEET RECOVERY OBJECTIVES

6.1 Actions Already Completed or Underway

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

Compile Status Report (complete)

- COSEWIC report completed (COSEWIC 2004). Update due 2014.

Send to COSEWIC (complete)

- Showy phlox designated Threatened (COSEWIC 2004). Re-assessment due 2014.

Planning (complete)

- B.C. recovery strategy completed (this document, 2012).

Habitat Protection and Private Land Stewardship (in progress)

- ~40% of known area of occupancy of showy phlox is on land managed by the Dominion Radio Astrophysical Observatory which is leased to The Nature Trust (TNT) for grazing under provincial grazing lease. There is no direct management for showy phlox, but they have reduced the grazing to every other year on the Range Use Plan (Carl MacNaughton, pers. comm. 2010);
- Landowner contact has been initiated by the South Okanagan-Similkameen Stewardship Program.

6.2 Recovery planning table

Table 3 details the recommended strategies for effecting recovery of showy phlox, including specific steps to be taken. All actions fall under the Habitat Protection/Restoration and the Private Land Stewardship Conservation Framework action groups.

Table 3. Recovery planning table for showy phlox.

Objective	Approaches to meet objectives	Threat[a] or concern addressed	Priority[b]	Initiate by
1	• Contact landowners and land managers and engage their cooperation to steward and manage lands for persistence of the species. (e.g., voluntary stewardship agreements, conservation covenants, sale by willing vendors, Crown land use designations, protected areas.)	1.1, 2.1, 2.3, 6.1, 8.1, 8.2	Essential	2012
	• Prepare best management practices for site-specific management plans (e.g. range use plan) for NRC lands (White Lake sub-population).	2.3, 6.1, 8.1	Essential	2012
2	• Develop a prioritized research strategy, including costs and partnerships.	Knowledge gap	Necessary	2013

Objective	Approaches to meet objectives	Threat[a] or concern addressed	Priority[b]	Initiate by
	• Conduct and encourage research to quantify habitat needs, associated vegetation, dispersal, recruitment, and species biology including population demographics and viability.	Knowledge gap	Beneficial	2015
	• Monitor status of populations every 2 years to determine population trends.	Knowledge gap	Necessary	2014
	• Clarify impacts from potential threats and mitigate impacts from invasive alien species, livestock and ungulate presence, ATV use and fire suppression.	Knowledge gap; 2.3, 6.1, 7.1, 8.1, 8.2, 11.2, 11.3	Necessary	2013
3	• Inventory potential habitats to confirm distribution of the species.	Knowledge gap	Beneficial	2016

[a] Threat numbers according to the IUCN-CMP classification (see Table 2 for details).

[b] 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).

6.3 Narrative to Support Recovery Planning Table

- Implementation should be accomplished through voluntary stewardship and partnerships such as the South Okanagan-Similkameen Conservation Program (SOSCP). A broad range of organizations and programs are currently involved in the conservation of natural biodiversity of the South Okanagan area (see SOSCP 2003 for more detail). Additional support from government and/or academic institutions may be required to address knowledge gaps. A single-species approach is required because there is limited habitat overlap with other COSEWIC-listed species or high-priority species identified by the B.C. Conservation Framework.

7. INFORMATION ON HABITAT NEEDED TO MEET RECOVERY GOAL

To meet the population and distribution goal for this species, a partial description of the habitat needed for the survival and recovery of showy phlox has been included to facilitate management and the mitigation of habitat threats.

7.1 Description of Survival/Recovery Habitat

A general description of habitat requirements for showy phlox is provided in Section 3.3.1. Additional work needs to be done so that survival/recovery for showy phlox habitat in B.C. can be spatially described using maps (see Section 7.2). However, at minimum, survival/recovery habitat should include the known area of occupancy for this species (e.g., based on mapped BC CDC element occurrences).

7.2 Studies Needed to Describe Survival/Recovery Habitat

A schedule of studies outlining the work necessary to further describe survival/recovery habitat is provided in Table 4.

Table 4. Schedule of studies for showy phlox.

Description of activity	Outcome/rationale	Initiate by
• Update element occurrence mapping with the most recent survey data to better define the boundaries of the extant populations.	• Currently occupied habitat is described and mapped.	2014
• Clarify habitat needs, population dynamics and viability	• Optimal habitat conditions are described. • Population viability requirements are clarified.	2015
• Inventory potential habitat (especially between populations) and map any occupied habitat.	• Additional occupied habitat is described and mapped. • Population boundaries are refined/confirmed	2016

8. MEASURING PROGRESS

The following performance indicators provide a way to define and measure progress toward achieving the population and distribution goal and recovery objectives. The overall indication that the population and distribution goal is being met is if the population monitoring over an appropriate amount of time (i.e. 5 years) indicates that the numbers of plants at all locations are stable. Performance measures are also listed below for each objective for the next five years.

Objective 1
- Seventy-seven hectares of showy phlox habitat have been protected by 2017.

Objective 2
- Impact of threats to the populations has been investigated by 2015 and threat reduction and/or mitigation at all extant populations have been initiated by 2017.
- Research initiated on quantifying habitat needs, determining associated vegetation, dispersal, recruitment, and species biology including population demographics and viability has been initiated by 2015.
- Assess trends in population and changes to area of occupancy (to the extent possible) by 2017.

Objective 3
- Inventory of potential habitats has been conducted and documented by 2017.

9. EFFECTS ON OTHER SPECIES

Proposed recovery activities would likely have a positive effect on native species that co-occur with showy phlox. Recovery activities are designed to prevent habitat loss and degradation, which threaten many native species and natural communities in the South Okanagan. However, any

activities such as threat mitigation (e.g., removal of alien plant species) must be done in a manner that does not negatively affect other species at risk or habitats.

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