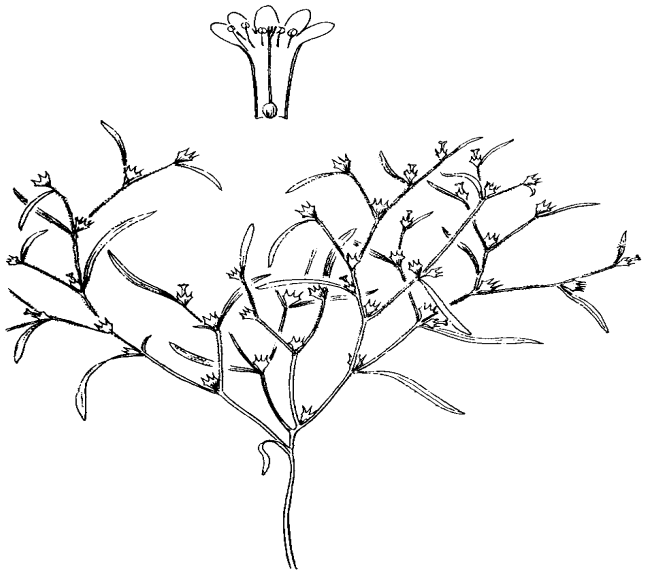
COSEWIC
Assessment and Status Report

on the

Slender Collomia
Collomia tenella

in Canada



ENDANGERED
2003

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE
IN CANADA

COSEPAC
COMITÉ SUR LA SITUATION DES
ESPÈCES EN PÉRIL
AU CANADA

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COSEWIC 2003. COSEWIC assessment and status report on the slender collomia *Collomia tenella* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 14 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

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Cover illustration:
Slender collomia — line drawing in Douglas *et al*.1999b, 2002b.

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COSEWIC
Assessment Summary

Assessment Summary – November 2003

Common name
Slender collomia

Scientific name
Collomia tenella

Status
Endangered

Reason for designation
An annual herb present at a single sandy site near Princeton, British Columbia. The population fluctuates widely from year to year. At risk to stochastic events, roadside development, sand removal, and invasion by alien species.

Occurrence
British Columbia

Status history
Designated Endangered in November 2003. Assessment based on a new status report.

COSEWIC
Executive Summary

Slender Collomia
Collomia tenella

Species information

Collomia tenella is an ascending to spreading, freely branched, annual, taprooted herb up to 15 cm tall. The leaves are alternate, linear, entire, 1-5 cm long and 1.5 mm wide. Flowers are single or in pairs at the branch tips, in the leaf axils or at the forks of the branches. The pinkish to white corollas are five-lobed. The calyces, which bow out and often form purplish knobs at the sinuses, have 1-2 mm long, triangular teeth. The seeds become sticky when moistened.

Distribution

C*ollomia tenella* ranges from southwestern British Columbia, south in the western United States to Wyoming, Utah, Nevada and Oregon. In Canada, *C. tenella* is known only from the Princeton area in southwestern British Columbia along the Similkameen river valley in the Interior Douglas-fir biogeoclimatic zone.

Habitat

Collomia tenella occurs under climatic conditions that are continental, characterized by hot, dry summers, a fairly long growing season and cool winters.

The species occurs on eroded, southeast-facing sections of a steep, sandy ridge. The soils consist of fine-textured sands. The eroded sections of the slopes are sparsely vegetated with about 20% cover. The vegetation consists of a variety of herbs and shrubs including *Balsamorhiza sagittata* (arrow-leaved balsamroot), *Astragalus miser* (timber milk-vetch), *Bromus tectorum* (cheatgrass), and *Pseudoroegneria spicata* (bluebunch wheatgrass). Scattered Douglas-fir (*Pseudotsuga menziesii*) and Ponderosa Pine (*Pinus ponderosa*) also occur on the ridge.

Biology

There is no information available on *Collomia tenella* in the literature. Since it is an annual plant it may not occur above ground on a yearly basis if environmental conditions are not favourable. Other annual members of the genus are self-compatible and self-pollinating. Vectors for seed dispersal are likely animals since the seeds are sticky when moistened.

Population sizes and trends

The single population of *C. tenella*, consisted of only 127 plants in 2003. Ten plants were observed in 1997 when it was first discovered in the Similkameen River valley. In 2000, the population was reduced to a single plant. The authors surveyed the site in 2002 but failed to locate any plants.

Limiting factors and threats

Threats to the persistence of *C. tenella* in British Columbia include housing developments, road-building, off-road recreation vehicle use, and the possibility of further advancement of weeds into the habitat as has occurred in adjacent habitat types.

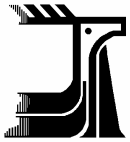
Special significance of the species

The steep, southeasterly sections of the sandy ridges in which *C. tenella* grows are relatively infrequent in the Princeton area and are not significantly invaded by introductions. The population of *Collomia tenella* is at the northern extent of its geographic range and may represent a pool of genetically and morphologically divergent characteristics that may have an evolutionary and ecological significance for the species as a whole. The protection of genetically distinct peripheral populations may be important for the long-term survival of the species.

Existing protection or other status designations

Provincially, *C. tenella* has been ranked as S1 by the Conservation Data Centre and appears on the British Columbia Ministry of Sustainable Resource Management red list. This is the most critical rank that can be applied to species at the provincial level.

There is currently no specific legislation for the protection of rare and endangered vascular plants in British Columbia given this critical rank. The population of *C. tenella* in British Columbia, however, may be afforded some protection against certain types of property development because it occurs on a private property that falls within the Agricultural Land Reserve. Conversion to intensive uses is not prohibited. The Agricultural Land Reserve status also subjects the properties to the Soil Conservation Act of British Columbia, which prohibits removing soil or placing fill on land in the Agricultural Land Reserve. The latter Act, however, is not always followed. As a result, in the absence of active stewardship, populations of rare plants on this private land are not secure.



COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

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

COSEWIC MEMBERSHIP

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

DEFINITIONS
(After May 2003)

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

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

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

*** Formerly described as “Indeterminate” from 1994 to 1999 or “ISIBD” (insufficient scientific information on which to base a designation) prior to 1994.

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

COSEWIC Status Report

on the

Slender Collomia

Collomia tenella

in Canada

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2003

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SPECIES INFORMATION

Name and classification

Scientific name: *Collomia tenella* A. Gray
Common name: Slender Collomia
Family: Polemoniaceae (Phlox family)
Major plant group: Dicot flowering plant

Description

Slender Collomia, *Collomia tenella* A. Gray[1] is a member of a genus of about 13 species found in North and South America (Hitchcock *et al*. 1959). Four species occur in British Columbia and Canada (Scoggan 1979; Pojar 1999; Douglas *et al.* 2002b). *Collomia tenella* was first recorded in Canada by Douglas *et al*. (1998a).

Collomia tenella is an ascending to spreading, freely branched, annual, tap-rooted herb up to 15 cm tall (Figure 1; Pojar 1999). The leaves are alternate, linear, entire, 1-5 cm long and 1.5 mm wide. Flowers are single or in pairs at the branch tips, in the leaf axils or at the forks of the branches. The pinkish to white corollas are five-lobed. The calyces, which bow out and often form purplish knobs at the sinuses, have 1-2 mm long, triangular teeth. Fruits are capsules with 1-seeded chambers; seeds become sticky when moistened.

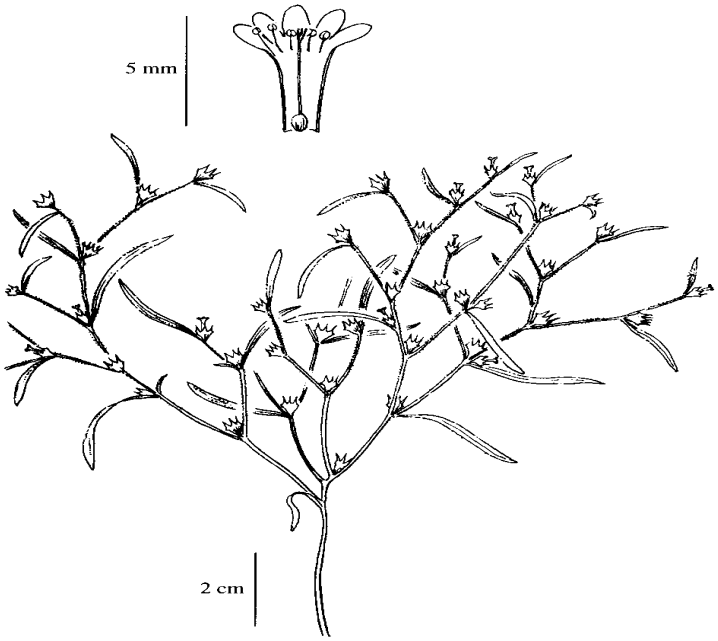

Figure 1. Illustration of *Collomia tenella* (Line drawing in Douglas *et al*. 1999b, 2002b).

[1]Taxonomy and nomenclature follow Douglas *et al*. (1998b, 1999a, 1999b, 2000, 2001).

DISTRIBUTION

Global range

Collomia tenella ranges from southwestern British Columbia, south in the western United States to Wyoming, Utah, Nevada and Oregon (Hitchcock *et al*. 1959; Figure 2). The nearest known location to the BC populations is in Washington state in Chelan County (University of Washington Vascular Plant Database, 2003) about 140 km to the south. It is not known how readily this species is dispersed over long distances, so United States populations should not be relied upon for rescue effect.

Canadian range

In Canada, *C. tenella* is known only from the Princeton area in southwestern British Columbia (Figure 3; Pojar 1999; Douglas *et al*., 1998a, 2002a, b).

This species was discovered in British Columbia in 1997. It grows in a natural habitat type of eroded sand ridges with other native species in an undeveloped area, so it is unlikely that it was introduced to this site. Furthermore, the region has been generally under-collected so it was likely over-looked. Only one of the other 10 rare plant species that occur in the Princeton area was collected (on one other occasion) prior to 1996. The Princeton area may have been passed by many collectors who were en route from the coast to collecting destinations in the biologically rich Okanagan Valley further east. Another argument that favors this species as a native element is the existence of numerous taxa whose distribution follows a similar pattern in the Pacific Northwest with the northern limit of the species range in British Columbia. The shrub steppe and open forests of southern British Columbia are part of a much larger ecological unit that extends south to Washington, Oregon and other intermountain states.

Finally, in the Species at Risk Act (Section 2.2), it states that for the purposes of a wildlife species in subsection 1, "a species, subspecies or biologically distinct population is, in the absence of evidence to the contrary, presumed to have been present in Canada for at least 50 years" (Government of Canada 2003). Therefore, since there is no support for the argument that it is a non-native species, it should be assumed native.

Frank Lomer was the first collector to intensively investigate this area. He has searched for new sites for this species ever since he found it in 1997 (Lomer, pers. com., 2003). He regularly collects throughout the interior of British Columbia in unique or interesting habitats with hopes of new discoveries and keeps an eye out for several rare species including *Collomia tenella*. He has found no other locations during this time. In both 2002 and 2003, he was contracted to do specific searches for new sites for the rare species known in the Princeton area. He surveyed the east side of the Similkameen River opposite the known sites and along the US border near Grand Forks, Anarchist Mountain, and Midway, but did not find any new sites.

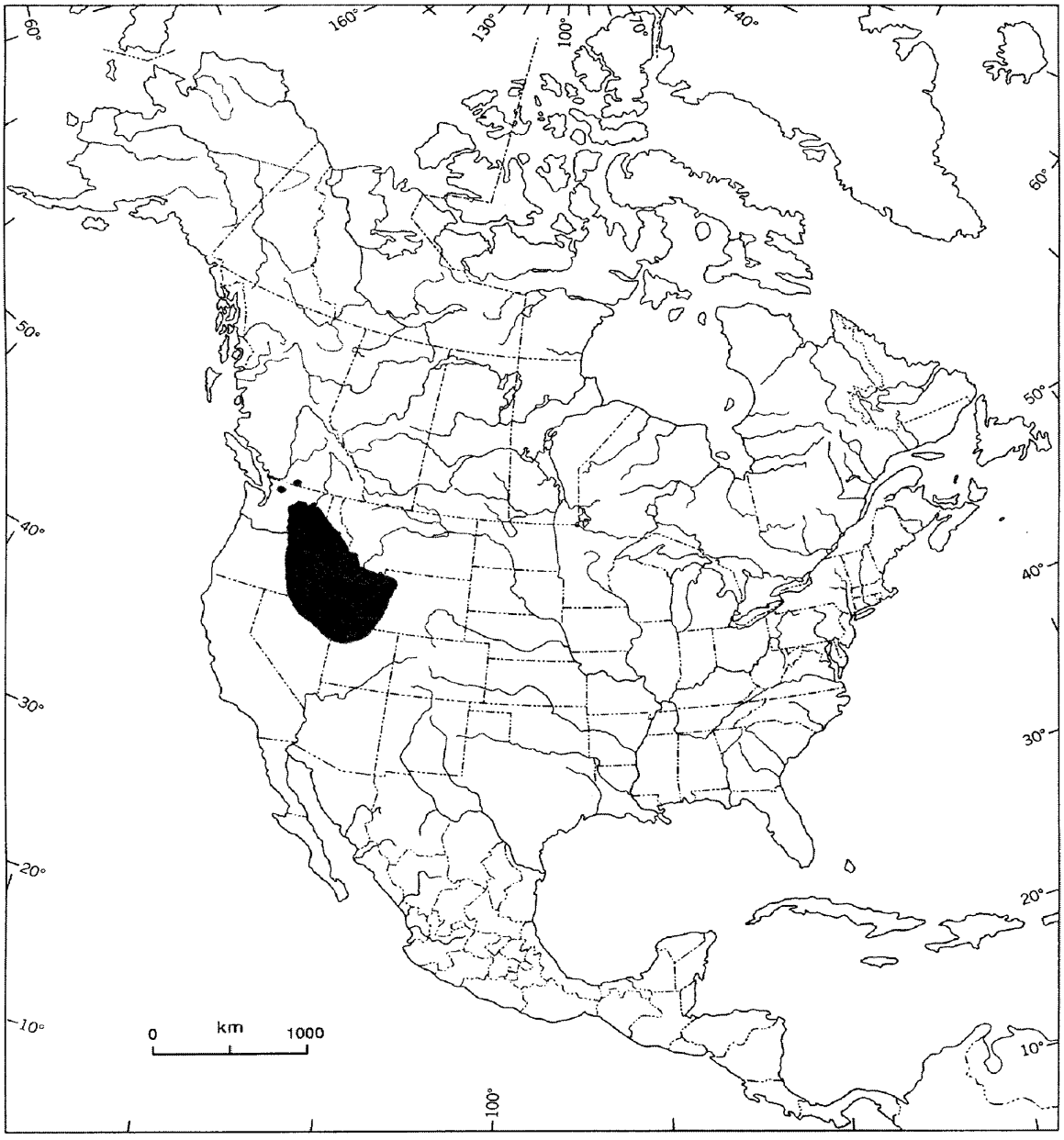

Figure 2. Distribution of *Collomia tenella* in North America.

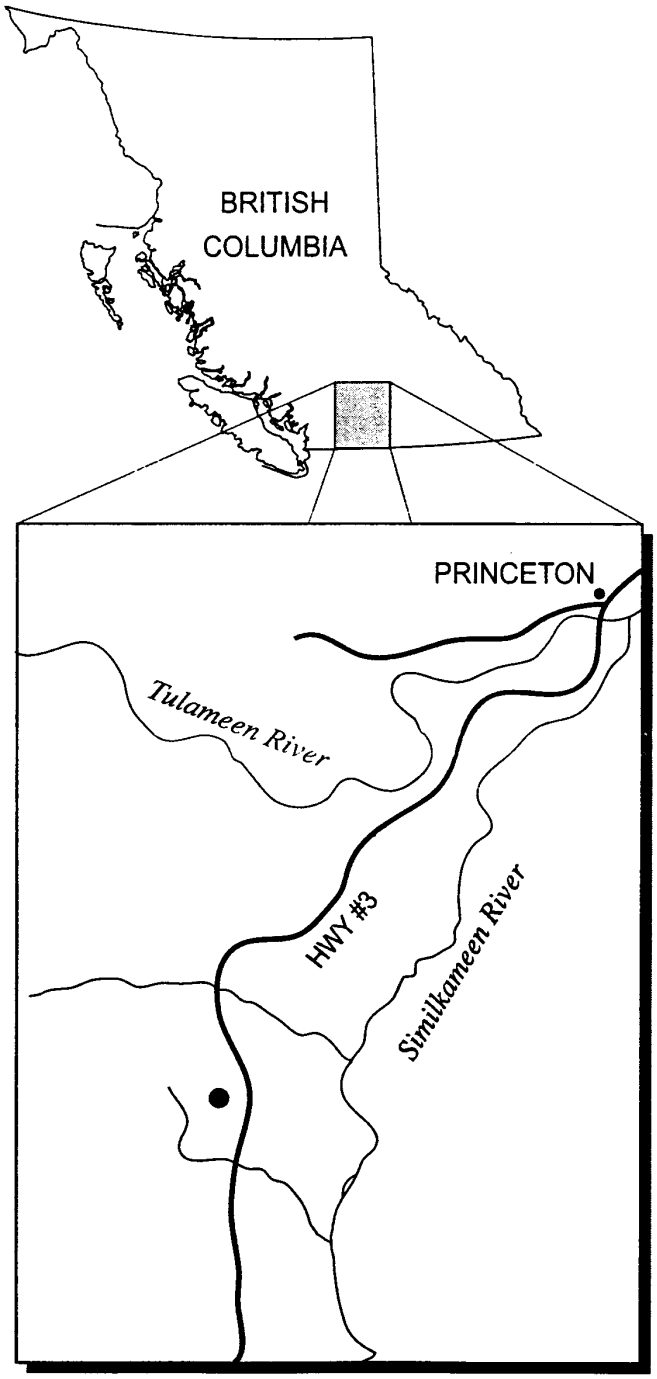

Figure 3. Distribution of *Collomia tenella* in British Columbia.

HABITAT

Habitat requirements

Collomia tenella occurs in the southern interior of British Columbia along the Similkameen river valley in the Interior Douglas-fir biogeoclimatic zone (Hope *et al*. 1991). Climatic conditions in this region are continental, characterized by hot, dry summers, a fairly long growing season and cool winters. A rainshadow effect prevails in this area due to the presence of the Coast-Cascade Mountains to the west.

Within this region, *Collomia tenella* occurs on eroded, steeply-sloped, southeast-facing sections of a sandy ridge. The sandy ridge, formed by fluvial processes during the last glaciation, consists of fine-textured sands. The eroded sections of the slopes are sparsely vegetated with about 20% cover. The vegetation consists of a variety of herbs and shrubs including *Balsamorhiza sagittata* (arrow-leaved balsamroot), *Astragalus miser* (timber milk-vetch), *Collomia linearis* (narrow-leaved collomia), *Phacelia linearis* (thread-leaved phacelia), *Lupinus sericeus* (silky lupine), *Amelanchier alnifolia* (Saskatoon), *Linaria genistifolia* ssp. *dalmatica* (Dalmation toadflax), *Bromus tectorum* (cheatgrass), and *Pseudoroegneria spicata* (bluebunch wheatgrass). Scattered Douglas-fir (*Pseudotsuga menziesii*) and Ponderosa Pine (*Pinus ponderosa*) also occur on the ridge.

Trends

Noxious weeds, such as *Linaria genistifolia* and *Bromus tectorum* could increase at the site as they have in many other areas in the southern interior of British Columbia and potentially decrease the available habitat.

Protection/ownership

The population of *Collomia tenella* in British Columbia occurs on private property in the Agricultural Land Reserve.

BIOLOGY

General

Little specific information is available on the biology and ecology of *C. tenella.* Since it is an annual plant it does not occur on a yearly basis if environmental conditions are not favourable for seed germination. Other annual members of the genus are self-compatible and self-pollinating (Wilken 1993). Seeds are sticky when moistened and may, therefore, be animal-dispersed.

POPULATION SIZES AND TRENDS

The single population of *Collomia tenella* consisted of 127 plants over 56 m^2 in 2003. It was discovered in 1997 in the Similkameen River valley, west of Princeton, British Columbia (Figure 3). When it was found in 1997, there were 10 plants, and in 2000, this population consisted of a single plant. The authors and Frank Lomer surveyed the site in 2002 and failed to locate any plants. The plants reappeared in 2003 when environmental conditions were apparently more favourable. Since the habitat for this species in British Columbia is extremely limited it is not likely that many more sites will be found.

Short- and long-term trends for these populations are unknown but can be expected to vary markedly due to differences in yearly seed germination and seedling success. Conditions on the sandy ridge may or may not be ideal from year to year based on normal climatic fluctuations.

LIMITING FACTORS AND THREATS

In general, only 2% of BC grassland areas had protected status in 1992 (The Land Conservancy of BC 2002), however grassland and open forest habitats are threatened by a number of factors. Development pressure from the expanding population, habitat fragmentation, degradation due to weed invasion, and off-road vehicle activity have been identified as threats (BC WLAP 2002).

The most imminent threat to the population of *Collomia tenella* is its vulnerability to extirpation due to the extremely small, occupied area and population size. Such small populations are at risk of inbreeding depression (Primack 1998). Due to lack of genetic variation, these small populations are vulnerable to demographic and environmental variation. Furthermore, suitable habitats for *C. tenella* in the southern interior of British Columbia are extremely limited and thus opportunities for colonization are also limited.

Another threat that is likely to have an impact is recreational off-road vehicle use. The authors observed evidence of ATV and dirt bike use in the area of the sites in 2002. The steep and relatively unstable slopes where *C. tenella* occurs are highly susceptible to disturbance but, at the same time, present a desirable challenge for users of off-road recreational vehicles.

Other potential threats result from activities permitted in the Agriculture Land Reserve. The private property where *C. tenella* occurs is on the Agricultural Land Reserve (ALR), where primary land use is agriculture. On these lands, development pressures may not appear to be an issue at this time. There have been no applications to have the private property taken out of the ALR for development (Wallace, pers. com., 2003), but the land owners may decide to apply in the future. Housing sales have trended upwards in the last 12-18 months in the Princeton area in tandem with markets in the Okanagan Valley (Fabri, pers. com., 2003).

The ALR status may prevent subdivision development, but does allow other activities that could also potentially threaten the populations. For instance, some types of fill/soil removal are allowable without application to the Agricultural Land Commission (Provincial Agricultural Land Commission 2003). In recent years many tracts of ALR land in southern British Columbia have been converted to housing developments, shopping malls and golf courses, either by decisions of the Agricultural Land Commission or very rarely by an 'order in council' by the sitting provincial legislature.

In addition, in the future, agriculture tourism may be permitted since it is a developing business in the area (Town of Princeton 2003). According to the University of California Small Farm Centre, agriculture tourism operations provide a bridge between urban and rural dwellers (University of California Small Farm Centre 2003). Potential enterprises include festivals, agriculture food and craft shows, guest lodging, off-road motorcycling, ATV recreation, mountain biking, rodeos, tours, and horseback riding. These enterprises could include some intensive land use in the future. Motorcycling, ATV use and horseback riding could all potentially have serious impacts on rare plants if in they occur in areas occupied by plants.

Weed control activities also constitute a potential threat to populations. Under the Weed Control Act, an occupier must control noxious weeds growing or located on land and premises, thus marginally specific chemical weed control substances that kill broad-leaved plant species would likely kill *C. tenella*. Noxious weeds such as *Linaria genistifolia* and *Bromus tectorum* occur in the habitat occupied by *C. tenella* and could increase as has been witnessed in other southern interior locations. In addition, a variety of other introductions threaten the long-term ecological integrity of the surrounding landscape and may invade the habitat of *C. tenella*, as they have in other adjacent habitat types. The close proximity of the populations to the highway and powerline right-of-ways also presents a problem in terms of weed control.

SPECIAL SIGNIFICANCE OF THE SPECIES

The steep, southeasterly section of the sandy ridge in which *Collomia tenella* grows is relatively infrequent in the Princeton area and are is significantly invaded by introductions, unlike much of the surrounding habitat. Therefore, the site represents a relatively pristine community within a more extensively disturbed landscape.

In addition, the population of *Collomia tenella* is at the northern extent of its geographic range. Peripheral populations are often genetically and morphologically divergent from central populations and may have an evolutionary and ecological significance out of proportion to the percentage of the species they represent (Mayr 1982; Lesica and Allendorf 1995). The protection of genetically distinct peripheral populations may be important for the long-term survival of the species as a whole (Lesica and Allendorf 1995).

EXISTING PROTECTION OR OTHER STATUS

International status

Collomia tenella is not covered under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Endangered Species Act (USA) or the IUCN Red Data Book. Globally, *C. tenella* has a rank of G4? indicating that in most of its range the plant is apparently secure. In the western United States, *C. tenella* is common. It is considered possibly imperiled or imperiled in both Utah and Wyoming (S2? and S2 respectively; NatureServe Explorer, 2001).

National and provincial status

Nationally, *C. tenella* has been given the rank N1. Provincially, *C. tenella* has been ranked as S1 by the Conservation Data Centre and appears on the British Columbia Ministry of Sustainable Resource Management red list (Douglas *et al*. 2002a). This is the most critical rank that can be applied to species at the provincial level and indicates that the species is "critically imperiled because of extreme rarity (typically five or fewer occurrences or very few remaining individuals) or because of some factor(s) making it especially vulnerable to extirpation or extinction".

There is currently no specific legislation for the protection of rare and endangered vascular plants in British Columbia given this critical rank. In the absence of federal or provincial rare species legislation or active stewardship, populations of rare plants on private lands are not secure. However, the private property on which *C. tenella* occurs does fall within the Agricultural Land Reserve and is therefore afforded some protection against certain types of property development.

SUMMARY OF STATUS REPORT

Collomia tenella occurs in only one location in a very small, occupied area (56 m²) in the Princeton area of British Columbia, thus the loss of the one site results in the loss of the species from British Columbia and Canada. Suitable habitats for *C. tenella* are probably infrequent in the southern interior of British Columbia, therefore opportunities for colonization are likely limited. Recreational off-road vehicle and activities allowable in the Agricultural Land Reserve where the population occurs on a private property may threaten this species. An increase in housing starts in recent times indicates that the area may be seeing growth and warns of future developments into the future. In addition, noxious weeds are present in the *C. tenella* habitat and may increase in the future as they have in adjacent habitats. Lastly, the population of *C. tenella* in British Columbia is at the northern extent of its range and may represent a population that is genetically distinct and important for the long-term survival and evolution of the species. By not protecting peripheral species at the margins of their range, the result could be a significant and irreversible loss of Canada’s genetic resources.

TECHNICAL SUMMARY

Collomia tenella
Slender Collomia collomia délicat
Range of Occurrence in Canada: British Columbia

Extent and Area Information	
• *Extent of occurrence (EO)(km²)* Based on area of the single site.	<<1 (56 m^2)
• *Specify trend in EO*	Unknown
• *Are there extreme fluctuations in EO?*	Unknown
• *Area of occupancy (AO) (km²)* Based on an approximation of habitats occupied.	<<1 (56 m^2)
• *Specify trend in AO*	Unknown
• *Are there extreme fluctuations in AO?*	Unknown
• *Number of known or inferred current locations*	1
• *Specify trend in #*	Unknown
• *Are there extreme fluctuations in number of locations?*	Unknown
• *Specify trend in area, extent or quality of habitat*	Unknown
Population Information	
• *Generation time (average age of parents in the population)*	1 year
• *Number of mature individuals*	0-127
• *Total population trend:*	fluctuating numbers of plants
• *% decline over the last/next 10 years or 3 generations.*	N/A
• *Are there extreme fluctuations in number of mature individuals?*	Yes
• *Is the total population severely fragmented?*	1 population known and considerably disjunct from nearest site in WA state
• *Specify trend in number of populations*	Unknown
• *Are there extreme fluctuations in number of populations?*	Unknown
List populations with number of mature individuals in each: *Princeton, Stevenson Lake area - 127 individuals*	
Threats (actual or imminent threats to populations or habitats)	
- Development - roads, housing, sand removal - Introduced species encroachment	
Rescue Effect (immigration from an outside source)	
• *Status of outside population(s)?* **USA:** Unknown status in 4 jurisdictions (WA, OR, ID & NV) and imperiled in WY and UT.	
• *Is immigration known or possible?*	Unknown
• *Would immigrants be adapted to survive in Canada?*	Unknown
• *Is there sufficient habitat for immigrants in Canada?*	Unknown
• ***Is rescue from outside populations likely?***	Unlikely
Quantitative Analysis	N/A
Current Status COSEWIC: Endangered	

Status and Reasons for Designation

Status: Endangered	**Alpha-numeric code: Met criteria for Endangered, B1ac(iv)+2ac(iv); D1.**
Reasons for Designation: An annual herb present at a single sandy site near Princeton, British Columbia. The population fluctuates widely from year to year. At risk to stochastic events, roadside development, sand removal, and invasion by alien species.	

ACKNOWLEDGEMENTS

We thank Frank Lomer for providing information on his original discovery of *Collomia tenella* in 1997 and for his assistance in relocating the site in 2002 and additional surveys in 2003.

Funding for the preparation of this status report was provided by the British Columbia Conservation Data Centre.

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George W. Douglas has an M.Sci. (Forestry) from the University of Washington and a Ph.D. (Botany) from the University of Alberta, Edmonton. George has worked with rare plants for over 20 years. He was senior author of *The Rare Plants of the Yukon* (1981), co-authored *The Rare Plants of British Columbia* (1985) and was senior author of the *Rare Native Plants of British Columbia* (1998, 2002). He is also the senior editor for the *Illustrated Flora of British Columbia* (1998-2002) and has been the program botanist for the British Columbia Conservation Data Centre since its inception in 1991. George has written or co-written 33 COSEWIC status reports during this period.

Jenifer L. Penny has a B.Sc. in Biology from the University of Victoria. She has been employed by the British Columbia Conservation Data Centre as assistant program botanist since 1995. Jenifer has extensive field work in botany and has co-authored six COSEWIC status reports. She is also senior author for the family Primulaceae in the *Illustrated Flora of British Columbia* (1999) and co-author of the *Rare Native Vascular Plants of British Columbia*, second edition (2002).

COLLECTIONS EXAMINED

Herbarium specimens housed at the Royal British Columbia Museum in Victoria (V) were viewed and verified.

FIELDWORK

During 2002 and 2003, fieldwork was conducted within south-central British Columbia for a number of rare species including *Collomia tenella*.