

Conservation Evaluation of Slender Collomia, *Collomia tenella*, in Canada*

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Douglas, George W., and Jenifer L. Penny. 2006. Conservation evaluation of Slender Collomia, *Collomia tenella*, in Canada. *Canadian Field-Naturalist* 120(2): 175–178.

In Canada, Slender Collomia, *Collomia tenella*, is restricted to the Princeton area in southwestern British Columbia. The single population represents the northern limits of the species, which ranges from southwestern British Columbia, south in the western United States to Wyoming, Utah, Nevada and Oregon. In British Columbia, *C. tenella* is associated with an eroded section of a steeply sloping, southeast-facing sandy ridge. Population numbers fluctuate and in some years plants fail to appear. The major threats to *C. tenella* are through drilling for coalbed methane gas, sand removal for road construction, housing development and off-road recreational vehicles.

Key Words: Slender Collomia, *Collomia tenella*, endangered, distribution, population size, British Columbia.

Slender Collomia, *Collomia tenella* A. Gray[†] (Polemoniaceae), is 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). *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. The fruits consist of capsules with 1-seeded chambers; the seeds become sticky when moistened.

North American and Provincial Ranges

Collomia tenella ranges from southwestern British Columbia, south in the western United States to Wyoming, Utah, Nevada and Oregon (Hitchcock et al. 1959). In Canada, *C. tenella* is known only from the Princeton area in British Columbia (Figure 2; Pojar 1999; Douglas 2002a).

Habitat

Collomia tenella occurs in the southwestern interior of British Columbia, along the Similkameen River valley in the Interior Douglas-fir biogeoclimatic zone

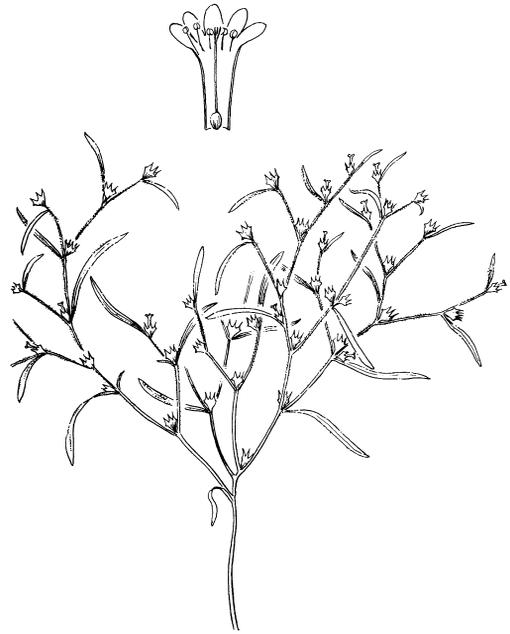


FIGURE 1. Illustration of *Collomia tenella* (line drawing from Douglas et al. 1999b).

(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 rain-

* The field work for the *Collomia tenella* project was funded by the British Columbia Conservation Data Centre. The results appear in the British Columbia Conservation Data Centre database and a rare plant manual (Douglas et al. 2002a). This information formed the basis for a Committee on the Status of Endangered Wildlife in Canada status report (Douglas and Penny 2003*) and the subsequent assessment of *Endangered* (COSEWIC 2003*). This paper includes more recent information that did not appear in the original status report.

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

shadow effect prevails in this area due to the presence of the Coast-Cascade Mountains to the west.

Within this region, *Collomia tenella* occurs on an eroded, steeply-sloped, southeast-facing section of a sandy ridge (Figure 3). The sandy ridge, formed by fluvial processes during recent 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 Arrow-leaved Balsamroot (*Balsamorhiza sagittata*), Timber Milk-vetch (*Astragalus miser*), Narrow-leaved Collomia (*Collomia linearis*), Thread-leaved Phacelia (*Phacelia linearis*), Silky Lupine (*Lupinus sericeus*), Saskatoon (*Amelanchier alnifolia*), Dalmation Toadflax (*Linaria genistifolia* ssp. *dalmatica*), Cheatgrass (*Bromus tectorum*), and Bluebunch Wheatgrass (*Pseudoroegneria spicata*). Scattered Douglas-fir (*Pseudotsuga menziesii*) and Ponderosa Pine (*Pinus ponderosa*) also occur on the ridge (Figure 3).

Biology

There is no information available on the biology and ecology of *Collomia tenella* in the literature. Since it is an annual plant it appears to be absent in some years if environmental conditions for seed germination and/or seedling survival are not favourable. Other annual members of the genus are self-compatible and self-pollinating (Wilken 1993). Seeds may be dispersed by animals since they are sticky when moistened.

Population Attributes

The single population of *Collomia tenella*, covering an area of less than 60 m², was discovered in 1997 in the Similkameen River valley, west of Princeton, British Columbia (Figure 2; Douglas et al. 1998a). Counts for the population in 1997, 2000, 2002, 2003 and 2004 were 10, 1, 0, 127 and 0, respectively. In 2003, the area occupied was ca. 56 square metres, with plants in four groups of 56, 67, 1 and 3 plants. These fluctuations indicate that seed germination and/or seedling success of this annual species is highly variable and thus, trends are difficult to determine. A fairly thorough search in adjacent areas in southern British Columbia have not revealed similar habitats or other populations of this species.

Provincial, National and Global Ranks

The British Columbia Conservation Data Centre has ranked *Collomia tenella* as S1 and placed it on the British Columbia Ministry of Environment Red list (Douglas et al. 2002a). This is the most critical category for imperilled rare native vascular plants in British Columbia. A rank of S1 is considered "critically imperilled because of extreme rarity (5 or fewer occurrences or very few remaining individuals) or because of some factors making it especially vulnerable to extirpation or extinction" (Douglas et al. 2002a). Since the species is restricted in Canada to British Columbia, the Nation-

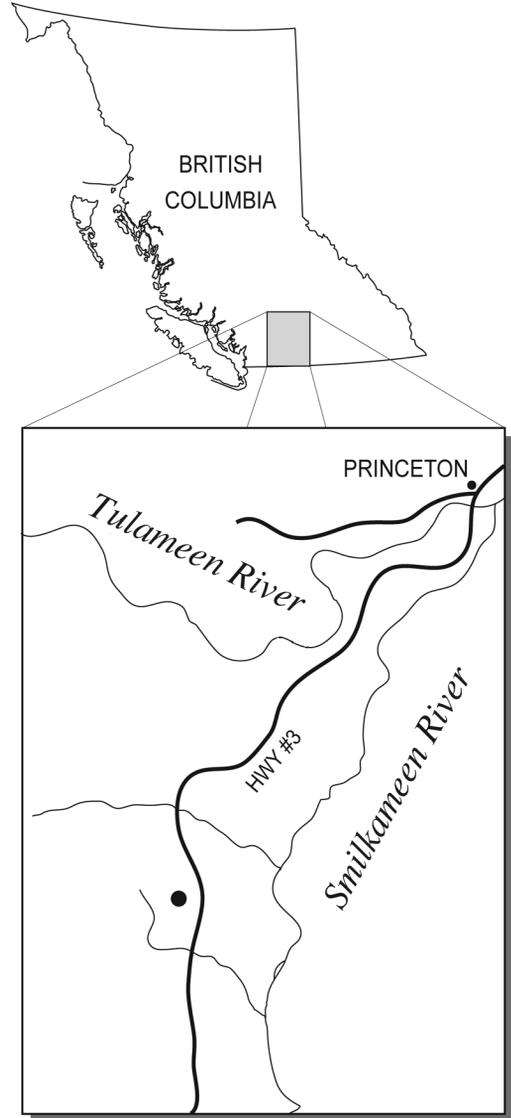


FIGURE 2. Distribution of *Collomia tenella* in British Columbia.

al rank is N1. Globally, *C. tenella* is ranked "G4?" or apparently secure but with a range of uncertainty which includes the possibility it is more vulnerable or conversely that is more widespread, abundant, and secure.

Threats and Protection

The major threats to *Collomia tenella* are through drilling for coalbed methane gas, sand removal for road construction, housing development and off-road recreational vehicles. In 2002, three test holes targeting coalbed methane gas deposits were drilled in the Similkameen River valley.



FIGURE 3. *Collomia tenella* habitat occurs on the eroded section near the top of this sandy ridge south of Princeton, British Columbia. Prominent trees on the ridge are *Pseudotsuga menziesii* and *Pinus ponderosa*.

kameen area. If brought into production, the drilling, access roads and pumping stations could cause extensive degradation to the natural habitat in the area.

Other potential threats result from activities that are permitted in the Agriculture Land Reserve. The private property where *C. tenella* occurs is in the Agricultural Land Reserve, where primary land use is agriculture. For instance, some types of fill/soil removal are allowable without application to the Agricultural Land Commission (Provincial Agricultural Land Commission 2003^{*}). On these lands, development pressures may not appear to be an issue at this time. The Agricultural Land Reserve status may prevent subdivision development, but does allow other activities that could also potentially threaten the populations. In recent years many tracts of Agricultural Land Reserve land in southern British Columbia has 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.

Another threat likely to have a negative impact is recreational off-road vehicle use. The authors observed evidence of all-terrain vehicles 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 off-roaders.

Although weeds are not a major threat to *C. tenella* populations, weed control activities do constitute a minor potential threat to populations. Under the *Weed Control Act*, an occupier must control noxious weeds growing or located on land and premises. Marginally specific chemical weed control compounds that kill broad-leaved plant species would likely also kill *C. tenella*. Noxious weeds such as Dalmation Toadflax (*Linaria genistifolia* var. *dalmatica*) and Cheatgrass (*Bromus tectorum*) occur in the *C. tenella* habitat and could increase. Currently the habitat is not highly invaded, but a variety of other introductions could also eventually take root there as they have in adjacent habitats in the surrounding landscape. Therefore, the ecological integrity of the *C. tenella* habitat could eventually become as comprised as some of these other surrounding habitats are.

An additional threat to the population of *C. 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 colonisation are also limited.

Collomia tenella is on Schedule 1 of the federal *Species at Risk Act*. As part of its commitment to the National Accord (*National Accord for the Protection of Species at Risk*), the province is required to take measures to protect this species. A recovery strategy will be required under this commitment. Additionally, *C. tenella* is a potential candidate for listing under the provincial *Wildlife Amendment Act*.

Evaluation

The British Columbia Conservation Data Centre considers *Collomia tenella* to be Endangered in British Columbia (Douglas et al. 2002a) and the Committee on the Status of Endangered Wildlife in Canada has also assessed the species as Endangered (COSEWIC 2003*; Douglas 2005*). The single population is small and vulnerable to a number of threats. The small number of plants also reduces the potential for genetic variation which may be necessary to respond to environmental changes in the future. Without research on growth requirements and more demographic information, the stability of the present populations will remain unknown, but the population appears to be quite vulnerable.

Acknowledgments

We thank Frank Lomer for providing information on his original discovery of *Collomia tenella* in 1997 and for his help in finding the site in 2002. Thanks also to Shyanne J. Smith who assisted with fieldwork in 2004.

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Received 4 November 2002

Accepted 10 April 2006