

# Conservation Evaluation of the Small-flowered Tonella, *Tonella tenella*, in Canada\*

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In Canada, the Small-flowered Tonella, *Tonella tenella*, is restricted to the west side of Saltspring Island in the Gulf Islands of southwestern British Columbia. This population represents the northern limits of the species which is disjunct from its main range in southern Washington (Columbia River gorge), through Oregon to central California. In British Columbia, *Tonella tenella* is associated with rock outcrops and dry, steep, sparsely forested talus slopes at elevations of 50 to 300 m. The population on Saltspring Island is on private property and not directly imperilled at this time. There is, however, a potential for housing development in the future on this waterfront site, thus the authors consider the species endangered.

Key Words: Small-flowered Tonella, *Tonella tenella*, endangered, distribution, population size, British Columbia.

The Small-flowered Tonella, *Tonella tenella* (Benth.) Heller<sup>†</sup>, is a member of a genus of only two species occurring in western North America (Hitchcock et al. 1959). It is the only species found in British Columbia and Canada (Pojar 2000). *Tonella tenella* was first recorded in Canada by Douglas and Ruyle-Douglas (1978).

*Tonella tenella* is a slender, ascending to prostrate, annual herb from a delicate taproot (Figure 1; Pojar 2000). The smooth, often branched stems are 5–25 cm long with opposite leaves 1–2 cm long. The leaves are stalked, simple, ovate to round, and few-toothed or lobed below and unstalked and deeply 2–3 lobed above. The blue or white flowers are small, slightly zygomorphic and long-stalked with deeply five-lobed calyces. The corollas are also five-lobed. There are four, epipetalous stamens and one pistil with 2 ovules. Anthers are 0.4 mm long. The fruits are obtuse to globe-shaped capsules containing 2 to 4, 1–1.5 cm long, wingless seeds.

## Distribution

The southwestern British Columbia occurrence of *Tonella tenella* is disjunct from its main range in southern Washington (Columbia River gorge), through Oregon to central California (Wetherwax 1993; Pojar 2000). In Canada, *T. tenella* is known only from the west side of Saltspring Island in the Gulf Islands of southwestern British Columbia (Figure 2; Pojar 2000; Douglas et al. 2002a, 2002b).



FIGURE 1. Illustration of *Tonella tenella* (Line drawing from Douglas et al. 2000)

\* The field work for *Tonella tenella* 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.

<sup>†</sup> Taxonomy and nomenclature follows Douglas et al. (1998a, 1998b, 1999a, 1999b, 2000, 2001) and Schofield (1992).

TABLE 1. Locations and sizes of *Tonella tenella* subpopulations on Saltspring Island, British Columbia.

Collection site	Last Observation	Collector	Number of plants/area (m <sup>2</sup> )
1- Upper slope, south	1976	Douglas	unknown
2- Upper slope, north	2002	Lomer	56+ /40.18
3- Mid-slope	2002	Lomer	100-150/15
4-Lower slope	2002	Douglas	65+/-15/6
5- ca. 10 m uphill from beach	2002	Lomer	30 /1

### Habitat

*Tonella tenella* sites in British Columbia are found in a climatic and floristic anomaly in coastal British Columbia, the dry Coastal Douglas-fir (*Pseudotsuga menziesii*) Zone (Nuszdorfer et al. 1991) of southeastern Vancouver Island. This area is in a rainshadow belt created by the Olympic Mountains to the south, resulting in a relatively warm and dry Mediterranean climate.

Within this region, *Tonella tenella* occurs on west-facing slopes on stable talus. This talus occurs in open Big-leaf Maple (*Acer macrophyllum*)-Arbutus (*Arbutus menziesii*) forests, where associates include Cleavers (*Galium aparine*), Little Western Bitter-cress (*Cardamine oligosperma*), Miner's-lettuce (*Claytonia perfoliata*), Common Vetch (*Vicia sativa*), Barren Brome (*Bromus sterilis*), and Large-flowered Blue-eyed Mary (*Collinsia grandiflora*) or in open Douglas-fir – Arbutus – Garry Oak forests with Oregon Beaked Moss (*Kindbergia oregana*), heron's-bill moss (*Dicranum* species), Harford's Melic (*Melica harfordii*), *Galium aparine*, Upright Hedge-parsley (*Torilis japonica*) and Barren Brome (*Bromus sterilis*).

### Biology

Species of *Tonella*, along with its sister genus, Blue-eyed Mary (*Collinsia*) of the tribe Collinsieae, are self-compatible annuals (Armbruster et al. 2002). *Tonella tenella* is considered a small-flowered type and according to Armbruster et al. (2002), large- and small-flowered taxa appear to have differences in timing of self-pollination. Large-flowered taxa maintain herkogamy (spatial separation of anthers and stigmas) early in anthesis by differential elongation of staminal filaments, while small-flowered taxa do not show this elongation pattern. As a result, large-flowered taxa experience a delay in self-pollination whereas in small-flowered taxa, anther-stigma contact and self-pollination occur early. Furthermore, the stigmas are receptive to pollen-tube growth early in *Tonella* species. Small-flowered populations are almost certainly autogamous (Armbruster et al. 2002). Low elevation pollinators for the tribe include the insects *Bombus*, *Anthophora*, *Empyropsis*, *Synhalonia* and *Osmia* (Armbruster et al. 2002).

### Population Attributes

Four small subpopulations of *Tonella tenella* were recently confirmed in 2002 at the Saltspring Island site. These subpopulations, plus an earlier (1976) collection

record, occur in a narrow band extending up the mountainside for about 425 m. The subpopulations consisted of 6 to 356 plants with areas of 1 to about 40 m<sup>2</sup> (Table 1). Since the plant is inconspicuous and extremely difficult to detect, it is quite likely other subpopulations occur on the slope.

### Provincial, National and Global Ranks

Globally, *Tonella tenella* has a rank of G5 indicating that in most of its range the plant is common. Since the species is restricted to British Columbia it has a national rank of N1. Provincially, *T. tenella* has been ranked as S1 by the Conservation Data Centre and appears on the British Columbia Ministry of Environment 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".

### Threats and Protection

The most immediate threat to *Tonella tenella* in British Columbia is habitat destruction through a housing development on waterfront private property. Suppression of both natural and human-induced fires in the last century may also have had an effect on the survival of *T. tenella*. The vegetation in this region would naturally be maintained by fires; however, in their absence, high fuel loads build and catastrophic fires could result. This may result in unsuitable conditions for *T. tenella*. Introduced species are also a problem. The vegetation characterizing the *T. tenella* site has been altered by the introduction of European species. Although a large number of native forbs occur in these areas, much of the vegetation is dominated to a large extent by introduced species, particularly grasses, including a number of species of *Bromus*. The *Tonella tenella* site occurs on private land.

*Tonella tenella* is not formally protected in British Columbia; however, it could be in the future since this species is a potential candidate for listing under the provincial *Wildlife Amendment Act* (2004). 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. It is on Schedule 1 of the federal *Species at Risk Act* and a recovery strategy will be required.

## Evaluation of Status

The British Columbia Conservation Data Centre considers *T. tonella* to be Endangered in British Columbia (Douglas et al. 2002a). The Committee on the Status of Endangered Wildlife in Canada has also assigned this species to the Endangered category (COSEWIC 2003\*). Only one extant population of *Tonella tenella* is known in British Columbia; thus, the loss of the one site would result in the loss of the species from British Columbia and Canada. Potential housing developments threaten *T. tenella* in Canada since the one site occurs on private oceanside property.

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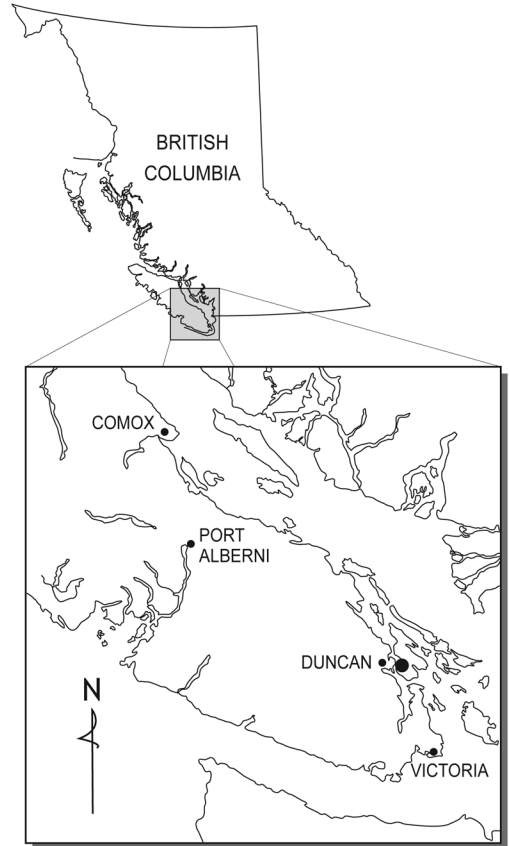


FIGURE 2. Distribution of *Tonella tenella* in British Columbia.

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