



**Garry Oak
Ecosystems
Recovery Team**

**Stewardship Account for
Brook Spike-primrose
*Epilobium torreyi***

Prepared for the
Garry Oak Ecosystems Recovery Team
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by

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**NATURE
CONSERVANCY**
C A N A D A

STEWARDSHIP ACCOUNT

Epilobium torreyi (S. Wats.) Hoch & Raven

Species information:

Kingdom: Plantae
Subkingdom: Tracheobionta
Superdivision: Spermatophyta
Division: Magnoliophyta
Class: Manoliopsida
Subclass: Rosidae
Order: Myrtales
Family: Onagraceae
Tribe: Epilobieae
Genus: *Epilobium*
Species: *torreyi*

Epilobium torreyi (S. Wats.) Hoch & Raven
Brook spike-primrose

Synonyms:

Boisduvalia stricta (A. Gray) Greene
Gayophytum strictum Gray

(from U.S.D.A. Natural Resources Conservation Service Plants Database)

Epilobium is derived from the Greek words *epi* (upon) and *lobos* (pod) meaning that the corolla is borne on the end of the ovary (Coombes, 1985).

Description:

An annual herb from a taproot. Stems ascending to erect, 10-60 cm tall, usually branched from the base and peeling below. Plants are greyish with spreading hairs. Leaves are opposite only near the base, linear or narrowly lanceolate, reduced above, entire or remotely fine-toothed, hairy but nearly glabrous near the base and nearly stalkless. Flowering inflorescence is loose to somewhat crowded in a leafy, terminal spike, glandular, flower-leaves similar to others but entire and smaller. Flowers are fertilized in the bud and do not open. Petals are 1-3 mm long, pink or white. Sepals are 0.7-2 mm long. Stigmas rarely 4-lobed. Capsules are cylindrical, about 8-13 mm long, flexible, curved near the tip, long-hairy, short-beaked and 4-chambered. The valve adheres to the partitions and the axis breaks up as the seeds are shed. Seeds 6-8 per chamber, 1-1.5 mm long. Seeds are glabrous and without a tuft of hairs (Douglas et al. 1999).

Range and Known Distribution:

Brook spike-primrose occurs in North America in British Columbia and is reported to occur in south central and eastern Washington, Oregon (on both sides of the Cascades), northwest California (rare in the Central Valley and along the coast), western Idaho and northeastern Nevada (Hitchcock et al. 1961; Raven and Moore 1965; Hickman 1993). Hickman (1993) reports this species to occur at elevations from sea level to 2600 metres. In Canada it is found only on southeastern Vancouver Island at two localities (CDC, HERB database). Davis (1952) states that the species occurs in Washington, Idaho to Nevada and California.

Habitat Description:

Epilobium torreyi occurs on moist grasslands and open slopes in the lowland zone (CDFmm) (Douglas et al. 2002; Douglas et al. 1998). In California, it occurs along streambanks and on moist slopes below 2600 metres (Hickman, 1993). Hitchcock et al. (1961) Raven and Moore (1965) state that the species occurs along edges of streams and in washes in hills up to mid-elevations where it occurs in forests. Also, it occurs in valley floors at low elevations. Raven and Moore (1965) further state that *E. torreyi* grows in seasonally moist sites that dry out by flowering time. In Oregon (Peck 1961; Gilkey 1967) the species occurs on moist, low ground on both sides of the Cascades. Davis (1952) also states that the species occurs on streambeds and in places that become dry in the summer.

Status of Species:

Global rank: G5

Canada Heritage Rank: N1

British Columbia: S1

California, Idaho, Nevada, Oregon and Washington: SR

(from NatureServe web site)

Other related species that are threatened *Epilobium densiflorum* (dense spike-primrose).

There are no other known pharmacological, ethnobotanical or horticultural uses for *Epilobium torreyi* (Bailey and Bailey, 1976).

Life History:

- a) General - A small-flowered autogamous flower that germinates in seasonally wet habitats in hills or low to middle elevations (Seavey, 1992). It often inhabits seasonally moist habitats that are xeric by flowering time (Raven and Moore, 1965).

- b) Phenology – This is an annual species that produces seedlings with glabrous, round, opposite connate leaves similar to other *Epilobium* species. The mature leaves differ from the juvenile in that they are spiralled, narrow and villous (Raven and Moore, 1965). Flowers in June – July (Hitchcock et al. 1961).
- c) Pollination Biology – Predominantly by bees and also to a lesser extent by syrphid flies (Raven 1979).
- d) Reproductive ecology – Annual species completing its life cycle in one year, 4-lobed stigma, seeds with no coma and a uniform loculicidal caspules that dehisce late fall. Pollen is shed in tetrads (Raven, 1976). Chromosome number $n = 9$ (Raven and Moore, 1965).
- e) Survival – Seedlings germinate when there is abundant water, and maybe submerged for a time (Raven and Moore, 1965; Raven, 1976). Crosses between species *E. torreyi* and *E. densiflorum* only produced capsules 33% and 43% of the time. This parallels the annual *Clarkia* which is difficult to hybridize and in which mature progeny are sterile (Seavey, 1992).
- f) Physiology – Nothing known.
- g) Dispersal – Since there is no coma, the seeds are not likely wind dispersed. They are potentially knocked to the ground by winter rains (Raven, 1976). The seeds are irregularly angular and fusiform (Raven, 1976), and they differ from other species of *Epilobium* (except for *E. densiflorum*), which are obovoid, flattened, and having a coma. In *E. torreyi* the seed surface cells are concave with radial walls that are longitudinally striate and irregularly thickened (Seavey et al. 1977).
- h) Nutrition & Interspecific Interactions – Nothing known.
- i) Behaviour/Adaptability – Germinates in moist places but matures under xeric conditions and is therefore adapted to drought conditions. *E. torreyi* exhibits aneuploidy and these changes in chromosome number are correlated to be adaptations to increasing drought conditions (Raven, 1979).

How the species is at risk:

There are only 2 known occurrences in Canada, all of which are on southeastern Vancouver Island. Populations of *E. torreyi* are potentially under threat in some localities to development pressures, the invasion of non-native species, and a change in hydrological patterns due to development in surrounding areas. Only one population is in a regional park.

Management Recommendations:

There are no current management policies or actions for the occurrences of *Epilobium*

torreyi. This species needs to be protected at the two localities, particularly the population that lies outside of the regional park.

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<http://137.99.27.45/journals.html>

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California Academy of Sciences: <http://www.calacademy.org/>

California Native Plant Society: <http://www.cnps.org/>

California Natural Diversity Database: <http://www.dfg.ca.gov/whdab/html/cnddb.html>

Canadian Journal of Botany (through e-journals)

Center for Urban Horticulture: <http://depts.washington.edu/urbhort/>

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Flora of North America: <http://hua.huh.harvard.edu/FNA/>

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International Organization for Plant Information: <http://iopi.csu.edu.au/iopi/>

Internet Directory for Botany: <http://www.botany.net/IDB/>

IUCN Species survival commission: <http://iucn.org/themes/ssc/index.htm>

Jepson Flora Project: <http://ucjeps.herb.berkeley.edu/jeps-list.html>

Missouri Botanical Garden: <http://www.mobot.org/welcome.html>

National Agriculture Library: <http://www.nal.usda.gov/>

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<http://www.nbii.gov/search/sitemap.html>

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Oregon Flora Project: <http://www.oregonflora.org/index.html>

Oregon Natural Heritage Program <http://www.abi.org/nhp/us/or/index.htm>

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University of British Columbia, Herbarium: <http://www.botany.ubc.ca/herbarium/>

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Washington Rare Plant Care and Conservation: <http://depts.washington.edu/rarecare/>

US Parks, Species in Parks: <http://ice.ucdavis.edu/nps/>

Authorities Consulted/Personal Communications:

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