

## *Triphysaria versicolor* – Bearded Owl-clover

**English name:** Bearded Owl-clover, Yellowbeak Owl-clover (perhaps incorrectly).

**Other English name:** N/A

**Scientific name:** *Triphysaria versicolor* Fischer & C.A. Meyer ssp. *novum*

**Other scientific name:** N/A

**Family:** *Orobanchaceae* (Broomrape Family)

### Risk status

BC: imperilled (S1); red-listed

Canada: Endangered

Global: vulnerable (G?)

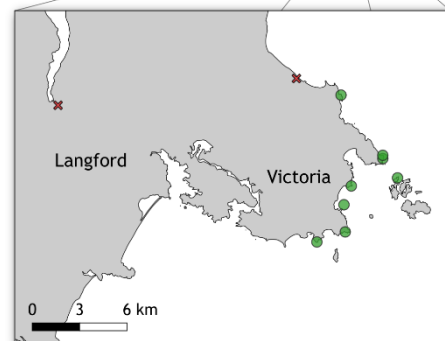
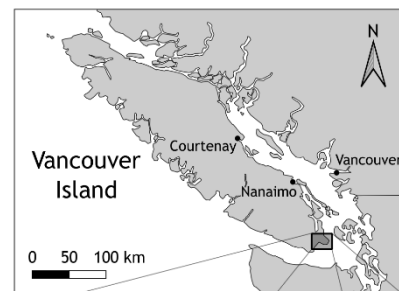
Elsewhere: uncertain

**Taxonomic Notes:** The existence of this anomalous Owl-clover in the Victoria area has been noticed at least since 1927, when Keck studied the taxonomy of Owl-clovers. Nevertheless, various authors have referred to it as *Triphysaria versicolor* ssp. *versicolor* = *Orthocarpus faucibarbus* ssp. *albidus*, a plant known from southern Oregon and California.

Egger (n.d.) provides a discussion of the characters of this undescribed Canadian taxon, its apparent situation with respect to closely-related taxa, and other notes. It appears that all of the Canadian populations, though presently called Bearded Owl-clover, belong to an undescribed taxon which should be ranked as globally endangered. Until this new taxon has been scientifically described, we shall treat the Canadian populations as if they are Bearded Owl-clover.

**Range/Known distribution:** In Canada, Bearded Owl-clover has been reported from nine locations in the Victoria area, of which seven are extant.

In the United States, Bearded Owl-clover (in the broad sense) is known from coastal areas of southern Oregon and California, south to Monterey Bay. It also occurs sporadically in interior valleys of southwest Oregon and northwest California.



Distribution of *Triphysaria versicolor* ssp. *versicolor*  
● Confirmed Sites  
× Extirpated Sites

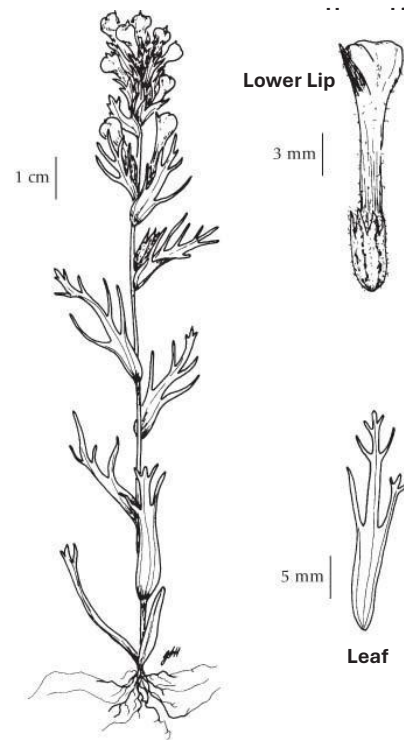
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**Field description:** Bearded Owl-clover is an annual herb with a single, smooth, slender stem that, in larger individuals, is branched. Mature plants are usually 10-50 cm tall although Canadian plants are usually 3-35 cm tall. The leaves are hairless, alternate, unstalked, spear-shaped and pinnately divided into five to nine narrow, elongate lobes. The flowers are arranged in a dense prominently bracted terminal raceme. The space between flowers increases as they develop into fruit, so the fruiting raceme is elongated. The lower floral bracts resemble the upper leaves but the bracts above become gradually less divided and the bract lobes wider. The flowers, white at first but fading to pink, are two-lipped. The upper lip is beaked and slightly longer than the lower lip. The lower lip is swollen, 3-pouched and minutely 3-toothed. The fruits are ellipsoid capsules, 6-9 mm long, containing numerous seeds. The seeds have a tight-fitting, netted seed coat. As one of the alternate common names indicates, the beak on the upper lip of a typical Bearded Owl-clover is yellow, however, the beaks of Canadian plants are purple (this is one of the reasons why it's believed to be a different species).

**Identification tips:** Bearded Owl-clover is the only species of *Triphysaria* in Canada with white flowers. Its white flowers also distinguish it from other Canadian species of owl-clovers in the genera *Castilleja* and *Orthocarpus*.



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**Life history:** Bearded Owl-clover is an annual species (adults live less than one year) that germinates in early spring, flowers in April and May and completes its life cycle in late May or June as the summer drought deepens. Bearded Owl-clover is an outcrossing species (i.e., it must be fertilized by pollen from a different individual). The two-lipped flower structure found in Bearded Owl-clover is often associated with bee pollination, and bees in the family Andrenidae have been found to pollinate Bearded Owl-clover in California. As an annual plant, Bearded Owl-clover is incapable of vegetative propagation or asexual reproduction

The capsules of Bearded Owl-clover begin to split and shed seeds in late May or June. The seeds are gradually dispersed from dried plants through the summer and autumn, as they are shaken out of the partially open capsule. Most of the seeds have been shed by the time autumn storms break down the dead shoots. Bearded Owl-clover is found in the same patches year after year, which indicates that successful long-distance dispersal to create new patches is very rare.

Bearded Owl-clover is a hemiparasite (root parasite) that extracts water and nutrients from host plants, but produces most of its own photosynthates. While it does much better with a host, it can grow without host connections. As with most related hemiparasites, Bearded Owl-clover is a generalist that attacks a broad spectrum of host species. As an annual, Bearded Owl-clover must be able to parasitize new hosts each year. The ability to infect a diversity of host species is thought to help annual hemiparasites persist, especially in sites such as those where Bearded Owl-clover occurs in British Columbia, which are dominated by annual plants whose relative abundance varies greatly among years and that have become increasingly dominated by non-native species.

Not all hosts are equally beneficial to hemiparasites and the growth and reproduction of owl-clovers may even be reduced when attached to particularly unsuitable hosts. A single owl-clover plant may invade multiple host plants of the same or different species. It appears that owl-clovers may actually hinder the growth of their most favoured host species. Some hemiparasites, including some species closely related to Bearded Owl-clover, also extract alkaloid substances from host plants, and translocate them to their leaves and outer floral tissues. These alkaloids may reduce insect herbivory, but because they do not accumulate in pollen or nectar, they do not appear to reduce pollination.

**Habitat:** In Canada, Bearded Owl-clover is limited to a macroclimate only found in the vicinity of Victoria, British Columbia and requires mesoclimatic conditions only found within 50 m of the shoreline. This habitat specialist is restricted to vernal moist maritime meadows and seeps, as well as the margins of vernal pools. It is restricted to landscapes of level to hummocky bedrock along shorelines, where it occupies level to gently sloping microhabitats bearing a thin, stable veneer of soil. The microhabitat is usually moderately well to imperfectly drained. The small area of southeastern Vancouver Island where Bearded Owl-clover occurs has mild winters, dry cool summers, and has the greatest annual amount of sunshine in British Columbia. Strong moisture deficits turn the meadows brown in mid-summer. Bearded Owl-clover occurs in unshaded areas

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and the Canadian populations occur in open meadows dominated by low grasses and forbs with little or no cover of native trees or shrubs. The use of fire by First Nations may have maintained some sites clear of shrubs and trees but the majority of the Canadian habitat occupied by Bearded Owl-clover remains free of native woody species even without fire, as a result of the contrasting combination of waterlogged soils in winter and severe moisture deficits in summer.

**Why this species is at risk:** The amount of potential habitat has declined greatly over the past century as coastal areas in southeastern Vancouver Island have been developed for residential and recreational use. Bearded Owl-clover habitat is especially rare because the plant prefers shoreline situations, which are particularly sought after for residential development.

Recreational activities are a major threat to occurrences of Bearded Owl-clover and to habitat suitable for the recovery of the species. Several populations receive extremely heavy foot traffic in spring and summer. Substantial portions of all of these populations are regularly crushed before they can produce ripe fruit. The recreational use has also led to habitat degradation, as soils in the vernal seeps are both compacted and eroded. Light trampling may be beneficial, however, because it may reduce competition from invasive plants and stop some sites from being completely overrun by weeds.

Some populations are grazed by a non-migratory introduced population of Canada Geese which has increased dramatically throughout the region over the past 20 years. Not only does grazing by Canada Geese lead to trampling damage and loss of plant tissue, they also deposit an abundance of faeces which has been implicated in an explosion of exotic annual grasses on grazed meadow sites of Bearded Owl-clover.

Almost all habitat occupied by Bearded Owl-clover, and habitat suitable for its recovery, has been heavily altered due to invasion by alien plants. In most populations, competition from invasive plants is the most serious threat to the persistence of Bearded Owl-clover. The most common invasive plants include several grasses such as Early Hairgrass\* (*Aira praecox*), Silver Hairgrass\* (*A. caryophylla*), Sweet Vernal Grass\* (*Anthoxanthum odoratum*), Soft Brome\* (*Bromus hordeaceus*), Common Velvet Grass\* (*Holcus lanatus*), Perennial Ryegrass\* (*Lolium perenne*), Annual Bluegrass\* (*Poa annua*), Squirrel-tail Fescue\* (*Vulpia bromoides*) and Hedgehog Dogtail\* (*Cynosurus echinatus*); and a number of forbs including Crow Garlic\* (*Allium vineale*), Smooth Cat's-ear\*, Hairy Cat's-ear\* (*Hypochaeris radicata*), Ribwort Plantain\* (*Plantago lanceolata*), Sheep Sorrel\* (*Rumex acetosella*), Small-flowered Catchfly\* (*Silene gallica*), Common Vetch\* (*Vicia sativa*), Tiny Vetch\* (*V. hirsuta*) and Small Hop-clover\* (*Trifolium dubium*). The driest microsites where Bearded Owl-clover occurs, if the soil is deep enough or the bedrock sufficiently fissured, have often been invaded by exotic shrubs—primarily Scotch Broom\* (*Cytisus scoparius*).

The invasive, exotic species appear to have displaced a native bunchgrass community dominated by California Oatgrass (*Danthonia californica*) and Tufted Hairgrass (*Deschampsia cespitosa*), which was characterized by many open microsites between the bunchgrasses where Bearded Owl-clover may have thrived. More generally, invasive alien plants impede the survival and recovery of

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Bearded Owl-clover through suppression, competition and the pre-emption of space. Suppression occurs when shrubs and medium to tall grasses and forbs reduce the amount of light reaching the leaves of Bearded Owl-clover, thereby reducing its ability to produce photosynthates. Competition occurs when the roots of invasive alien plants capture moisture and nutrients and thereby reduce the availability of these resources to Bearded Owl-clover. The availability of safe germination sites suited to Bearded Owl-clover is directly reduced when invasive alien plants (particularly perennial rosette and mat-forming species) pre-empt space. The availability of safe germination sites may also be indirectly reduced by alien species when the litter they produced creates an impenetrable thatch

Altered hydrological regimes also threaten Bearded Owl-clover because it is dependent upon winter seepage. Any actions that disrupt the hydrological regime, whether due to construction or soil compaction, may eliminate this essential process. Climate change may have devastating effects on vernal moist environments. Small, shallow vernal seeps including those which support Bearded Owl-clover are at greatest risk, particularly to changes in precipitation and evaporation losses which determine the duration of continuous inundation, the frequency of inundation events suited to the reproduction of vernal pool/seepage species, and the seasonal distribution of inundation. While the loss of some vernal seepage environments may be offset by the improved quality of currently marginal habitats, the latter are unlikely to develop populations of Bearded Owl-clover without human intervention because of the species' apparently weak powers of dispersal.

**What you can do to help this species:** Management practices should be tailored to the needs of the site. Potential management tools will depend on the specific circumstances and may require experimentation prior to implementation. Before taking any action, expert advice should be obtained, and no action taken without it. Public and private landowners should be made aware of new populations of this species if they are discovered, and appropriate management practices suggested.

Management needs include protection of the populations from trampling through the use of fences and the control of non-native, non-migratory Canada Geese. Little can be done to control the herbaceous invasive species which occur in the same vernal pools and seeps where Bearded Owl-clover occurs, but invasive woody species such as Scotch Broom\* can be removed from the periphery of these habitats to prevent it from being shaded out.

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For further information, contact the Garry Oak Ecosystems Recovery Team, or see the web site at: [www.goert.ca](http://www.goert.ca)

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\*Refers to non-native species