

Callitriche marginata

English name winged water-starwort

Scientific name *Callitriche marginata*

Family Callitrichaceae

Other scientific names none

Risk status

BC: critically imperilled (S1); red-listed

Canada: not yet assessed

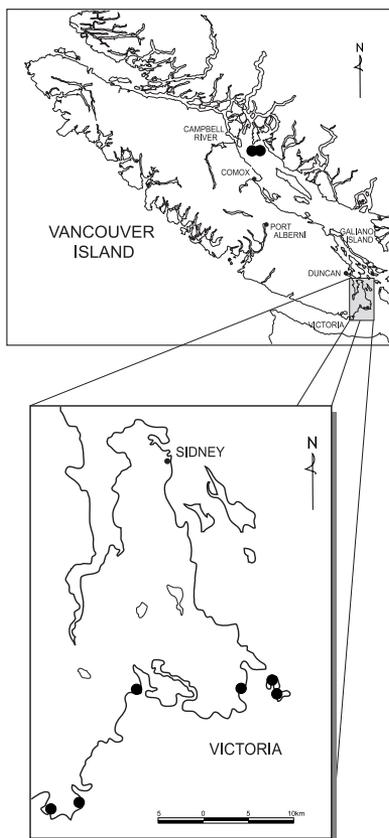
Global: apparently secure (G4)

Elsewhere: California – reported (SR); Oregon – threatened (S2)

Range/Known distribution

Winged water-starwort is endemic to western North America. In the southern part of its range, it occurs from Mexico to western California. Disjunct populations occur in Josephine and Wasco Counties in Oregon, and on southeast Vancouver Island in British Columbia. The species is not known to occur in the state of Washington. British Columbia occurrences of winged water-starwort may be remnants of a previously more widespread population.

There are eight extant occurrences of winged water-starwort in British Columbia.



Distribution of *Callitriche marginata*

● recently confirmed sites

Callitriche marginata

Field description

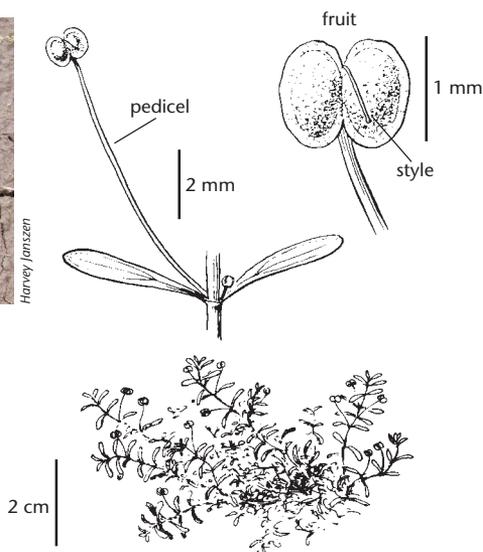
An aquatic or semi-aquatic annual herb found only in vernal pools. Slender stems, 5-10 cm long, are limp and matted, forming dense patches of numerous individuals with floating rosettes of leaves. All of the leaves are opposite. The submerged leaves are single-nerved and narrowly linear with a slight terminal notch, while emergent leaves are wider and incompletely 3-nerved. Leaf bases are joined with an **inconspicuous winged ridge**. The tiny flowers are aerial rather than submerged and are borne in leaf axils. The pedicels (stalks) of female flowers are **many times longer than the fruits**. Fruits are oval with winged margins and comprised of four single-seeded nutlets.

IDENTIFICATION TIPS

This is the only *Callitriche* species in British Columbia that produces female flowers with styles that are bent sharply back and with conspicuous pedicels that are longer than the fruits. This characteristic gave rise to the former species synonym of *C. longipedunculata*.



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Life history

In California, flowering begins in February. Most flowers are fertilised by pollen from other flowers on the same plant. Pollen is probably transferred by contact between male and female flowers, by gravity, or by wind. Seeds are set by March and are forced into the soil as turgor pressure stiffens the fruiting pedicels. Seeds may be dispersed by waterfowl and small mammals foraging in the muddy vernal pool substrate. For much of the year, *C. marginata* exists only as dormant seeds in the soils of dry vernal pools. Seed germination occurs during December and January and appears to be highly sensitive to the timing of the first fall rains. Seedlings are readily uprooted and can float, a secondary method of plant dispersal.

The phenology of *C. marginata* in British Columbia is not well-documented. Collections and field observations indicate that flowering may occur in late April or May and fruits mature in May as the vernal pools slowly dry out.

Habitat

Callitriche marginata can only grow in vernal pools or similar wetlands. In British Columbia, it is restricted to vernal pools in open, rocky, low-lying areas within Garry oak (*Quercus garryana*) and associated ecosystems. In general, vernal pools occur as small depressions with shallow soils underlain by bedrock. Sites are inundated by fall and winter rains and dry by late spring or early summer. Species most commonly associated with *C. marginata* in British Columbia include sedges (*Carex* spp.) and Scouler's popcornflower (*Plagiobothrys scouleri*). The vernal pools inhabited by *C. marginata* tend to occur within open meadows or rocky bluffs dominated by native herbs and exotic grasses including camas (*Camassia* spp.), dogtail grasses* (*Cynosurus* spp.), orchard grass* (*Dactylis glomerata*), common velvet-grass* (*Holcus lanatus*), sea blush (*Plectritis congesta*), bulbous bluegrass* (*Poa bulbosa*), and white triteleia (*Triteleia hyacinthina*).

C. marginata may be associated with a number of other red- or blue-listed species: Muhlenberg's centaury (*Centaurium muhlenbergii*), Nuttall's quillwort (*Isoetes nuttalli*), Macoun's meadow-foam (*Limnanthes macounii*), seaside birds-foot trefoil (*Lotus formosissimus*), bearded owl-clover (*Triphysaria versicolor*), and poverty clover (*Trifolium depauperatum*). Elevations in British Columbia: 5-25 m.

Forest encroachment and the invasion of non-native weedy species pose serious threats to the hydrology and light regimes of the open, well-lit vernal pools where *C. marginata* occurs. In the past, periodic natural or human-set fires controlled encroaching vegetation and maintained open habitats.

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Why the species is at risk

C. marginata in British Columbia encounters the same threats faced by Garry oak ecosystems in general: land conversion; encroachment by invasive non-native plant species; and fire exclusion. Its vernal pool habitats are further threatened by changes to hydrology due to encroachment by introduced grasses and other vegetation; by foot and bicycle traffic; and by exposure to herbicides. Populations of this species on Mittlenatch Island are potentially threatened by eutrophication from seabird guano and encroachment by invasive species (particularly Himalayan blackberry* *Rubus discolor*).

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. Please refer to the introductory section of this manual.**

C. marginata and other rare plants restricted to vernal pools and other ephemeral wetlands will benefit from actions that maintain these specialised habitats. Management recommendations include taking steps to preserve the hydrology of these sites. Urban sites could also be evaluated for the potential impacts of herbicide and fertiliser runoff, and those that are heavily used should be monitored for effects of trampling. Mittlenatch Island populations can be managed for guano runoff, and encroaching Himalayan blackberry* should be removed. Sites should be monitored for population trends and weed encroachment where possible.

References

Miller, M. 2002. Stewardship Account: *Callitriche marginata* (Winged Water-starwort). Garry Oak Ecosystems Recovery Team, Victoria, British Columbia.

For further information, contact the Garry Oak Ecosystems Recovery Team, or see the web site at: www.goert.ca.

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*Refers to non-native species.