

Sanicula arctopoides

English name Bear's-foot Sanicle

Scientific name *Sanicula arctopoides*

Family Apiaceae (Carrot)

Other English names Snake-root Sanicle, Footsteps of Spring

Risk status

BC: critically imperilled (S1); red-listed; Conservation Framework Highest Priority – 1 (Goal 3, Maintain BC diversity)

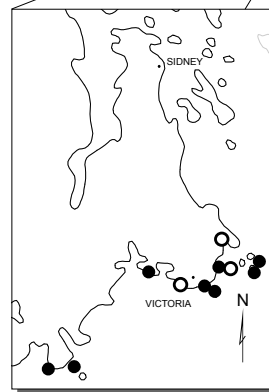
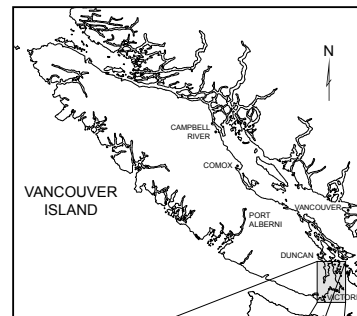
Canada: National General Status – at risk (2010); COSEWIC – Endangered (2001)

Global: secure (G5)

Elsewhere: Washington – critically imperilled (S1); California, Oregon – reported (SNR)

Range/Known distribution

Bear's-foot Sanicle grows on coastal bluffs from central California to central Washington, with a disjunct set of populations on southeastern Vancouver Island. In Canada, the species only occurs in the Victoria area and on nearby islands. This species is not known from Puget Sound, and the British Columbia populations are separated from the rest of the range by at least 150 km: the nearest known occurrence south of Victoria is in Pacific County, southern Washington. There are 8 recently confirmed populations of Bear's-foot Sanicle and 3 extirpated sites. BC populations of Bear's-foot Sanicle are extremely fragmented, and only Trial Island and Saxe Point have populations which have more than 100 plants.



Distribution of *Sanicula arctopoides*

- Recently confirmed sites
- Extirpated or historical sites

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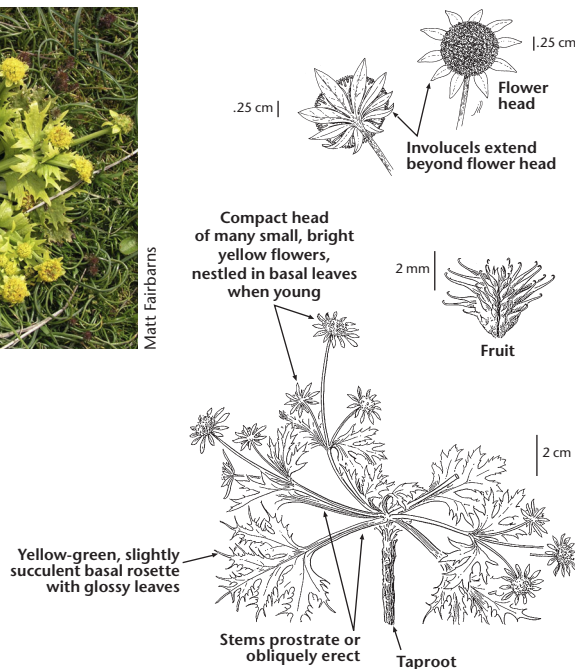
Field description

A **low-growing**, long-lived perennial herb with **conspicuous heads of bright yellow flowers** that form in its final year. Bear's-foot Sanicle grows from a taproot and the stems branch widely at the base. Stems either **lie on the ground or grow obliquely upwards** (ascending); stems range from 5-30 cm long. The **green to yellowish-green basal leaves** form a rosette (cluster) and **are somewhat succulent**. Each 3-cleft leaf is irregularly toothed with a spiny tip to each tooth. Leaves are 2.5 cm long and 2.5-9 cm wide. The inflorescence consists of several to many compact, head-like umbels (flat-topped cluster of flowers) which at first form dense, pincushion-like clusters nestled in the basal rosette; once the flowers are fertilized, the main stem elongates above the rosette. The small, **bright yellow flowers** have conspicuous involuclers (a group of small leaf-like structures) below them. These involuclers are either smooth-edged or three-lobed and **extend out beyond the flower heads**. Fruits are egg-shaped, 2-5 mm long and covered with stout, hooked prickles. The whole plants are yellow, rosette-like and very short at the start of the flowering time and only stretch out to their final size later during seed set.



Matt Fairbairns

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IDENTIFICATION TIPS

Later in the season, Bear's-foot Sanicle may be confused with Purple Sanicle (*S. bipinnatifida*) or Pacific Sanicle (*S. crassicaulis*), both of which may grow with it. Unlike Bear's-foot Sanicle, these plants do not grow prostrate, and do not have involucels that extend beyond the flower head. Purple Sanicle has leaves that are pinnately divided (leaflets on both sides of the central stem, like a feather), a toothed leaf axis, and purple flowers. The leaves of Bear's-foot Sanicle and Pacific Sanicle are palmately divided (leaflets arising from a single place at the top of the leaf stem, like fingers around a palm). Although Pacific Sanicle has similar, yellow to pink flowers, they are not nestled in the basal rosette when young. In Canada, Bear's-foot Sanicle is found strictly in seasonally dry maritime meadows, whereas Pacific Sanicle tends to grow in slightly deeper soil and over a broader range of habitats, but may grow with Bear's-foot Sanicle.

Life history

Bear's-foot Sanicle grows for several years, forming increasingly large rosettes, until it is big enough to flower (possibly 5-15 years on southeastern Vancouver Island). Seed germination begins in December or January and peaks in February or March. Plants usually reach full size by April or May and then begin to fade in May or June, dying back during the summer drought periods before re-sprouting in the autumn and growing slowly through the winter. Bear's-foot Sanicle usually flowers in its final year, with flowering sometimes beginning as early as February but usually not until March; flowering can extend into May but generally peaks in March and April. Fruits become evident in mid-May and ripen in June, and then the plant dies once it has flowered and set seed. The prickly fruits are dispersed by sticking to animal fur or feathers, or by wind when dried stems break off, and dispersal can continue into October. Bear's-foot Sanicle tends to produce abundant seed but a significant proportion of the seeds may fail to mature if summer drought arrives early. In general, Bear's-foot Sanicle appears to have high mortality in the first year, but once plants survive the first summer's drought there is a high rate of survival to maturity. Only the largest plants will reproduce; plants produce large numbers of seed but as much as 95% of the seed may be lost to predation and decay.

Habitat

In Canada, Bear's-foot Sanicle occurs on low, dry coastal bluffs above shorelines in the Victoria area and favours southern, eastern, or northeastern aspects. Bear's-foot Sanicle is shade intolerant and is generally restricted to exposed maritime and upland meadows with little or no shrub or tree cover. Some sites are in vernal seeps on gravelly or rocky banks near the ocean, where water seeps from winter and spring rains. Bear's-foot Sanicle is not

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dependent upon seepage but may require habitats exposed to salt spray, sun, or wind, which prevent encroachment by woody species. Summer drought, often exacerbated by rapidly-drained soils, probably plays a major role in limiting competition from less drought-tolerant species. In other parts of its range, Bear's-foot Sanicle is known from sand dunes.

Bear's-foot Sanicle is often found with Puget Sound Gumweed (*Grindelia stricta*), Fool's Onion (*Triteleia hyacinthina*), Common Camas (*Camassia quamash*), Red Fescue (*Festuca rubra*), Pacific Sanicle (*Sanicula crassicaulis*), Barestem Desert-parsley (*Lomatium nudicaule*), California Oatgrass (*Danthonia californica*), and introduced grasses including Early Hairgrass* (*Aira praecox*), Sweet Vernalgrass* (*Anthoxanthum odoratum*), Common Velvet-grass* (*Holcus lanatus*), and bromes* (*Bromus hordeaceus*, *B. rigidus*). The introduced forbs Hairy Cat's-ear* (*Hypochaeris radicata*) and Ribwort* (*Plantago lanceolata*) are abundant at some sites. Elevations: 0-20 m.

Why this species is at risk

The primary and most immediate threat is the conversion and degradation of waterfront habitat on both public and private property in the Greater Victoria region. All existing Bear's-foot Sanicle populations occur in small, isolated fragments of grassy meadow habitat. Habitat fragmentation is a serious, imminent threat at all but one site, and may be a barrier to seed dispersal and colonization to other suitable sites.

Although all extant populations are protected from development, they are subjected to varying degrees of impacts from recreation and land management activities. Lawn grasses and ornamental horticultural plants have often been planted in parks where suitable habitat for Bear's-foot Sanicle may once have existed. Trampling (by dogs and people), soil compaction and/or accelerated bank erosion due to foot traffic, trail and bench construction, and other recreational activities may impact populations in high traffic areas. Herbivory by deer and rabbits (and geese at one site) may occasionally have a major impact on Bear's-foot Sanicle. In some years, herbivores have caused heavy grazing damage to flowering shoots of plants.

The species is also threatened by site alterations and competition from aggressive introduced species such as Scotch Broom* (*Cytisus scoparius*), Gorse* (*Ulex europaeus*), Orchard-grass* (*Dactylis glomerata*) and Barren Brome* (*Bromus sterilis*). These exotic invaders, and competitive native forbs, may change soil moisture and chemistry as well as shading the site and competing for nutrients.

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What you can do to help this species

Management practices should be tailored to the needs of the site and specific measures should be related to local factors. **Before taking any action, expert advice should be obtained, and no action taken without it. Please refer to the introductory section of this manual.**

Public and private landowners should be made aware of new populations of this species if they are discovered, and of appropriate management practices. Management needs include reducing human disturbance, removing invasive species, and limiting access to sensitive habitat. Regular inventories of known populations should be conducted to monitor their status and identify any negative impacts from land development, recreational pressure, and invasion by shrubs and non-native grasses. Effective long-term control and reduction in competition from invasive or aggressively spreading vascular plants must form part of strategies to protect and recover populations.

References

- B.C. Conservation Data Centre. 2011. Conservation Status Report: *Sanicula arctopoides*. B.C. Ministry of Environment. Available: a100.gov.bc.ca/pub/eswp/ (accessed Mar 22, 2011).
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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.

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