

Golden paintbrush (*Castilleja levisecta*)



Photo source: Left, Institute for Applied Ecology; Right: photo taken by Terry Domico

Range

C. levisecta was historically found from coastal British Columbia to the Willamette Valley in Oregon. However, primarily due to habitat destruction and fire exclusion, it is now thought to be extirpated from Oregon—occurring only in western Washington and on Vancouver Island. [2, 8]

Climate, elevation

10-300 feet [8]

Local occurrence

There are less than a dozen sites where this species persists, with the majority of those occurring in western Washington. Efforts are underway to reintroduce *C. levisecta* at appropriate locations and to expand current populations. [1, 3, 4]

Habitat preferences

Golden paintbrush is found in open grassland areas and is most successful where native prairie species still dominate. It does poorly in areas where Douglas-fir and Scot's broom are present as it is easily out-competed and cannot survive in closed canopy conditions. [8]

Plant strategy type/successional stage

C. Levisecta is a short-lived perennial (about 5-6 years) and reproduces exclusively by seed. [2] It is a hemiparasite which means that it can attach itself to the roots of other species to acquire water and nutrients, though this is not crucial for its survival. Indeed, it can grow successfully without a host, but studies have found that when grown with a host plant, *C. levisecta* grows larger and is more likely to produce flowers. [4, 5]

Associated species

Idaho fescue (*Festuca idahoensis*), red fescue (*Festuca rubra*), and woolly sunflower (*Eriophyllum lanatum*).

Collection restrictions or guidelines

Golden paintbrush is a federally listed threatened species and is listed as endangered in Washington and Oregon. There is no collecting allowed for commercial or home use. [6, 8]

Seed germination

Germination requirements may vary depending on the source of the seed. In general, seeds must be stratified for 6-8 weeks. Set seeds on a moist paper towel or germination paper in a dark place at 5° C for 6-8 weeks. Follow this by a post-chill incubation: set seeds in a warm, well-lit place for two weeks (checking for germination during this period). Keep moist. [1, 5]

Seed life

Seed life, as with viability, may vary depending on population source. It is best to use seeds within 1-2 years. [1, 5]

Recommended seed storage conditions

Store at a low-temperature (5° C) in a dry, dark place.



P. Dunwiddie/ TNC

Propagation recommendations

Once the seeds have germinated and have their first root (radicle), carefully put the seeds in soil. After 4-6 weeks, seedlings may be transplanted into a container with a host plant such as *Eriophyllum lanatum*, *Festuca roemerii*, or *Potentilla gracilis*. Outplant after at least 3 months. Make sure that the host plant is not out-competing the golden paintbrush seedling. [1, 5]

Soil or medium requirements

In its native habitat, *C. levisecta* often occurs on well-drained glacial outwash soils. Therefore, it is wise to use a well-drained soil for propagating this species. Researchers have also had success with using a liquid fertilizer (15-30-15) every two weeks when watering. [5]

Installation form

Install seedlings when they are at least 3 months old. In its natural environment, *C. levisecta* grows in clusters. Planting in this fashion may make it easier to monitor the population as well as protect from herbivory (fencing), if appropriate. [1]

Care requirements after installed

Summer drought and herbivory may be the main causes for seedling mortality. If possible, watering young seedlings during dry months and protecting them from herbivores may increase early survival rates. ^[1]

Normal rate of growth or spread; lifespan

C. levisecta lives about 5-6 years. ^[1]

Sources cited

- (1) Caplow, F. 2004. Reintroduction plan for golden paintbrush (*Castilleja levisecta*). Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA.
- (2) Center for Plant Conservation website: <http://www.centerforplantconservation.org> April 27, 2006.
- (3) Dunwiddie, P.W., Davenport, R. and Speaks, P. 2001. Effects of burning on *Castilleja levisecta* at Rocky Prairie Natural Area Preserve, Washington: a summary of three long-term studies. In Reichard, S.H., Dunwiddie, P.W., Gamon, J., Kruckenberg, A.R. and Salstrom, D.L. editors. Conservation of Washington's native plants and ecosystems. Washington Native Plant Society, Seattle, WA. Pp.161-172.
- (4) Kaye, T.N. 2001. Restoration Research for golden paintbrush (*Castilleja levisecta*), a threatened species. Institute for Applied Ecology, Corvallis, OR.
- (5) Lawrence, Beth. Master's Thesis: Studies to Facilitate Reintroduction of Golden Paintbrush (*Castilleja levisecta*) to the Willamette Valley, Oregon. OSU.
- (6) PLANTS database: <http://plants.usda.gov/>. April 23, 2006.
- (7) The Nature Conservancy website: <http://www.nature.org/wherewework/northamerica/states/washington/friends/art14537.html>. April 26, 2006.
- (8) Washington Natural Heritage Program website: http://www.dnr.wa.gov/nhp/refdesk/fguide/htm/fsp_ascu.htm April 26, 2006.

Data compiled by

Samantha Martin Sprenger April 27, 2006