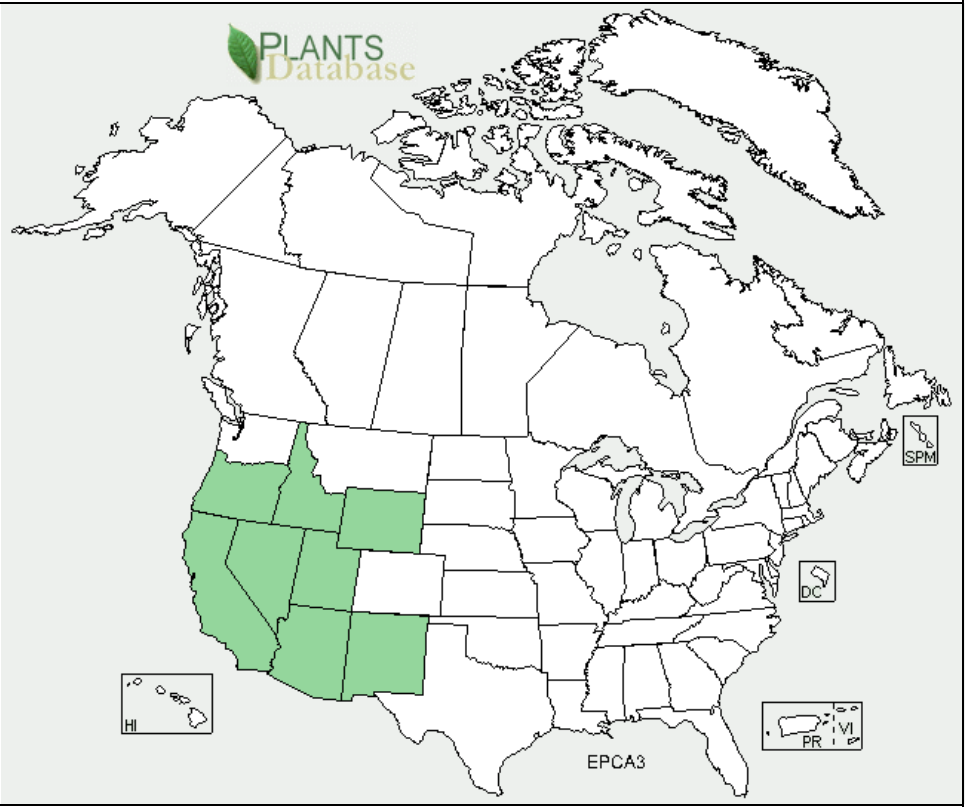
Plant Propagation Protocol for *Epilobium Canum*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/EPCA3.pdf

Source: CC BY-SA 2.5, https://commons.wikimedia.org/w/index.php?curid=716094

TAXONOMY	
Plant Family	
Scientific Name	Onagraceae
Common Name	Evening primrose
Species Scientific Name	
Scientific Name	*Epilobium canum* (Greene) P.H Raven
Varieties	.
Sub-species	*Epilobium canum ssp. angustifolium* (D.D. Keck) P.H Raven E. canum ssp. *garrettii* (A. Nelson) P. H. Raven *E. canum ssp. latifolium* (Hook) P.H. Raven *E. canum ssp. canum* (Greene) P.H. Raven
Cultivar	*Epilobium canum* Bowman's hybrid *Epilobium canum* "Catalina"

	Epilobium canum "Cloverdale" *Epilobium canum"* Eel River White" *Epilobium canum* "Marin Pink" *Epilobium canum ssp. Latifolium* "Everett's choice"
Common Synonym(s)	*Zauschernia latifolia* (P.H. Raven)
Common Name(s)	Hummingbird trumpet, hummingbird-flower, wild fuchsia, zauschneria, firechalice, kolibritrumpet, California fuschia
Species Code (as per USDA Plants database)	EPCA3
GENERAL INFORMATION	
Geographical range	
Ecological distribution	Found in most of the western and southwestern states in arid and mountainous areas.[1,2,3,4,6] Prefers dry areas, rocky slopes and cliffs, montane and coniferous forest and coastal scrub. Prefers well-drained alkaline soil (pH: 7-8.5) and full sun, though it can tolerate partial shade. [4,5,7]
Climate and elevation range	Occurs from 0-10,000 ft. Tolerates cold to -4°C but prefers a temperate climate [6]
Local habitat and abundance	Abundant in many diverse habitats. On the coast, it is associated with bluffs as part of sage scrub habitat, often found with manzanitas (*Arctostaphylos spp.)* and *Ceanothus spp.* In mountainous areas, it is near seasonal creeks, often associated with pine or fir forests [2,3,5,6]
Plant strategy type /	Tolerates drought, sun and wind stress. [4,5,6] Unpalatable for

successional stage	deer.[5]Extended flowering and fruiting period. [3]
Plant characteristics	Perennial herb to subshrub with toothed, green lanceolate to ovate leaves. The lower leaves are opposite while the upper leaves are alternate. Foliage is wooly and with toothed margins. The size of the plant varies incredibly based on conditions; it can grow as a lot matt to a small sub-shrub three feet in height. Herbaceous, dies back in the fall and regrows from rhizomes each spring. [2,3,4] The flowers are scarlet and are tubular in shape. The corolla tube is swollen at the base where it unites with the inferior ovary, making the flower resemble a trumpet. [2,3,4] The flower blooms from August to October. The fruit is a dehiscent pod that split laterally to release the seeds. Seeds have wings to aid in wind dispersal. Due to the extended flowering period, often there are flowers, developing pods and mature pods on the same plant. [2,3,4] Important nectar source for hummingbirds, especially due to the late season blooms in times when other food sources are scarce. [4,5]
PROPAGATION DETAILS (Seed)	
Ecotype	
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	D40 Containers
Time to Grow	1 year
Target Specifications	
Propagule Collection Instructions	Seeds are collected near the out-planting site when fruits have fully matured in early fall. [8,11]
Propagule Processing/Propagule Characteristics	Seed density: 1000 seeds/0.017 lbs. [8] Seed do retain 100% viability when dried to 15% moisture content and stored at a relative humidity of 15% at -4 for 30 days. [5,8]
Pre-Planting Propagule Treatments	Seeds are stored in sealed containers under refrigeration between 40 and 60 F. Cold moist stratification is required. Normally, seeds are sown in Dyna flats and left outdoors for natural stratification. Trays should not be allowed to dry out during stratification. [8]
Growing Area Preparation / Annual Practices for Perennial Crops	Sow seed into Dyna flats with drainage holes using a medium of 1.5 parts vermiculite, 1 part coarse perlite, 1 part sterile sand and 2 parts peat moss. Water trays and keep moist during the germination phase. Bottom heat improves germination (Prop book). Once seedlings emerge they are transplanted to D40 pots filled with the same germination media to prevent root deformation. A 13:13:13 NPK Osmocote time release fertilizer can be used early on. [7]
Establishment Phase Details	Seedlings are transplanted into D40 pots as soon as the cotyledons emerge to prevent root deformation. Seedlings are grown in a shade

	house from March to October. [7]
Length of Establishment Phase	2-4 weeks. [7]
Active Growth Phase	Plants are hand-watered throughout the active growth phase and are not allowed to go dry. [7]
Length of Active Growth Phase	6 months. [7]
Hardening Phase	At the end of the active growth phase the plants are only irrigated when the containers are nearly dry to harden the plants to slightly xeric conditions. [7]
Length of Hardening Phase	1-2 months. [7]
Harvesting, Storage and Shipping	Care should be taken when transplanting young plants as they are especially vulnerable to breakage [5]
Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	In the Pacific Northwest and at high elevations in California, individuals should be planted in the spring or early summer. Plants should not be sowed on flat ground as they will rot in these locations during a wet winter. A well-drained soil is particularly important in the Pacific Northwest. Survival is low on heavily wet or overly fertile soils due to root rot. [5]
Other Comments	Any plant expected to grow taller than eighteen inches should be lightly sheared during late spring, promoting the development of more side shoots that will enable the plant to hold itself together. Otherwise, the weight of the blossoms will cause the plants to flop open. [5,7] Established plants should be cut back hard every winter. This pruning should be done after the plants have finished flowering and before new growth appears. Plants should be cut to the ground, leaving stubs about one inch long. Fertilizer should be applied annually to plants receiving pruning; it is recommended to apply the fertilizer at one quarter of the recommended dose. [5] Used by native Costanoan Indians to cure infants' fever and infected sores. [9] Important nectar source for hummingbirds, especially due to the late season blooms in times when other food sources are scarce during annual migration of hummingbirds to South America in the fall. [5] Rhizome divisions can be taken from large growing individuals in the fall and winter and out-planted in other locations. Little to no information concerning specific methods available. [4,7,10,11]
INFORMATION SOURCES	
References	[1]*Plants Profile for Epilobium canum (hummingbird trumpet)*. United

States Department of Agriculture, n.d. Web. 18 May 2017. <https://plants.usda.gov/core/profile?symbol=EPCA3>.

[2]Turner, Mark, and Phyllis Gustafson. *Wildflowers of the Pacific Northwest*. Portland, Or.: Timber Press, 2006. Print.

[3]Peter C. Hoch 2017. *Epilobium canum*, in Jepson Flora Project (eds.) *Jepson eFlora*, http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=24343, accessed on May 20, 2017.

[4]Lundgren, J. and M. Smither-Kopperl. 2016. Plant Guide for California Fuchsia (*Epilobium canum*). USDA-Natural Resources Conservation Service, Lockeford Plant Materials Center, Lockeford, CA, 95237 Plant sheet

[5]O'Brian, B. 2007. Enjoying Zauschnerias. Pacific Horticulture 68 (4).http://www.pacifichorticulture.org/articles/enjoying-zauschnerias/ (accessed 05/17/2017)

[6] *Calscape.com. "California Fuchsia, Epilobium canum."* Calscape. *California Native Plant Society, n.d. Web. 20 May 2017. <http://calscape.org/Epilobium-canum-(California-Fuchsia)>*.

[7]Rideout, S. 2011. California Fuchsia. Master Gardener Newspaper article. University of California Cooperative Extension. http://ucanr.edu/datastoreFiles/268-507.pdf (accessed 05/20/17).

[8]Decker, C. 2003. Propagation protocol for production of Container (plug) *Epilobium canum* (Greene) plants; USDI NPS - Zion National Park Springdale, Utah. In: Native Plant Network. URL: https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=onagaceae-epilobium-2745 (accessed 05/22/2017). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

[9]Bocek, B.R., 1984, Ethnobotany of Costanoan Indians, California, Based on Collections by John P. Harrington, Economic Botany 38:240-255,

[10]Robson, Kathleen A., Alice Richter, and Marianne Filbert. *Encyclopedia of northwest native plants for gardens and landscapes*. Portland, Or.: Timber Press, 2008. Print.

[11]Anderson, Peter, and Alan R. Toogood. *Plant propagation*. Toronto: DK, 2004. Print.

Other Sources Consulted	Snow, A.A. "Pollination Dynamics in Epilobium canum (Onagraceae): Consequences for Gametophytic Selection." Am. J. Bot 73.1 (1986) Snow, A.A., 1991. Effects of Pollen-load Size on Sporophyte Competitive Ability in Two Epilobium Species. American Midland Naturalist, 125, 2, 348-355. Theodore Payne Foundation for Wild Flowers Baskin, Carol C., and Jerry M. Baskin. *Seeds: Ecology, Biogeography, and Evolution of Dormancy and Germination (2nd Edition)*. N.p.: Elsevier Science, 2014. Print. Pettinger, April, and Brenda Costanzo. *Native plants in the coastal garden: a guide for gardeners in the Pacific Northwest*. Portland, Or.: Timber Press, 2003. Print. Anderson, R.M. and Rupp, L.A. (2013). *Selecting and Evaluating Accessions of Epilobium Sect. Zauschneria (Onagraceae)* Acta Hortic. 1014, 147-149 DOI: 10.17660/ActaHortic.2013.1014.30 https://doi.org/10.17660/ActaHortic.2013.1014.30
Protocol Author	Jasna Hodzic
Date Protocol Created or Updated	06/05/2017