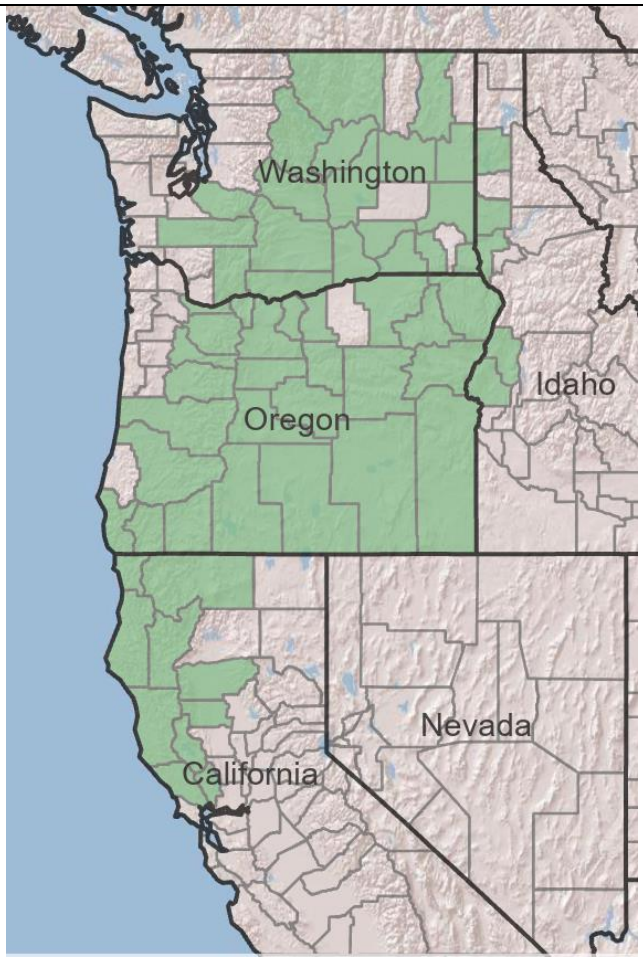
Plant Propagation Protocol for *Eriogonum compositum*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2022/ERCO12.pdf

Eriogonum compositum (Gilbert 2005)

TAXONOMY	
Plant Family	
Scientific Name	Polygonaceae
Common Name	Buckwheat
Species Scientific Name	
Scientific Name	*Eriogonum compositum* Douglas ex Benth.
Varieties	*Eriogonum compositum* Douglas ex Benth. var. *compositum* *Eriogonum compositum* Douglas ex Benth. var. *lancifolium* H. St. John & Warren *Eriogonum compositum* Douglas ex Benth. var. *leianthum* Hook.
Sub-species	Not applicable for *E. compositum*.
Cultivar	Not applicable for *E. compositum*.
Common Synonym(s)	var. *compositum*: *Eriogonum compositum* Douglas ex Benth. var. *citrinum* S. Stokes *Eriogonum compositum* Douglas ex Benth. var. *pilicaule* H. St. John & F.A. Warren *Eriogonum johnstonii* *Eriogonum pilicaule* (Knoke & Gilbin 2022) var. *lancifolium*: *Eriogonum compositum* Douglas ex Benth. ssp. *lancifolium* (H. St. John & F.A. Warren) S. Stokes (Knoke & Giblin 2022)

Common Name(s)	arrowleaf buckwheat (USDA 2022) var. *compositum*: northern buckwheat var. *lancifolium*: wild buckwheat var. *leianthum*: smooth arrow-leaf wild buckwheat (Knoke & Giblin 2022)
Species Code (as per USDA Plants database)	ERCO12
GENERAL INFORMATION	
Geographical range	 *E. compositum* distribution map (USDA 2022) Chiefly east of the Cascades in Washington; Washington south to California, east to Idaho (Riley & Klocke 2018). var. *compositum*: northern California, west-central Idaho, Oregon, and Washington var. *lancifolium*: Chelan, Kittitas, Okanogan, and Yakima counties, Washington var. *leianthum*: west-central Idaho, northeast Oregon, and eastern Washington (eFloras 2005)

Ecological distribution	Dry, open areas, rocky slopes and cliffs (Riley & Klocke 2018).
Climate and elevation range	Low to moderate elevations in the mountains (Riley & Klocke 2018; Knoke & Giblin 2022).
Local habitat and abundance	In California, grows in yellow pine forests and red fir forests (Calflora 2022). In eastern Washington, grows in sandy and well-drained soils from sagebrush flats and scablands to ponderosa pine forests and open ridges in the mountains (Roché & Roché 1991).
Plant strategy type / successional stage	No specific information found for *E. compositum*.
Plant characteristics	Stout perennial from a woody taproot, the broad crown somewhat shrubby, the several stems and leaves forming a plant to 5 cm high and broad. Leaves basal, lanceolate to deltoid, more or less cordate-based, white-woolly beneath and bluish-green above, on petioles as long to several times as long as the blade. Flowers May–July, creamy-white to lemon-yellow, stems stout and naked, the inflorescence a compound umbel 2–20 cm broad, with linear bracts at the base of both primary and secondary umbels (Knoke & Giblin 2022; Pojar & MacKinnon 2016). var. *lancifolium*: leaf blades lanceolate var. *compositum*: leaf blades ovate to deltoid, involucres sparsely to densely lanate var. *leianthum*: leaf blades ovate to deltoid, involucres glabrous or weakly glandular-puberulent (eFloras 2005)
PROPAGATION DETAILS	
Ecotype	Rogue River-Siskiyou National Forest, Josephine County, Oregon
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	262 mL (16 in^3) container
Time to Grow	16 weeks (Riley & Klocke 2018)
Target Specifications	Stock type: container seedling Root system: firm plug in container (Riley & Klocke 2018)
Propagule Collection Instructions	The three-sided achene can be hand-stripped from the plant (Riley & Klocke 2018).
Propagule Processing/Propagule Characteristics	Propagate only by seed as it is nearly impossible to transplant or divide the long taproots of mature plants. Plant seed thickly as germination is low (Riley & Klocke 2018).
Pre-Planting Propagule Treatments	Seeds are placed into a 1% hydrogen peroxide (3:1 water:3% hydrogen peroxide) soak for 24 hours, rinsed, and placed in

	water for an additional 24 hours. Seeds are then placed in fine mesh bags and layered in peat in a covered container. The containers are then placed in refrigeration at 1–3ºC for 60 days. It is very important to check seeds in peat weekly. If mold is evident, seeds should be treated with 1% hydrogen peroxide (Riley & Klocke 2018).
Growing Area Preparation / Annual Practices for Perennial Crops	Greenhouse growing facility. Seeds are directly sown into 262 mL containers. Seeds are lightly covered with nursery grit. Growing medium used is 40:20:20:20 peat:composted fir bark:perlite:pumice with Nutricote controlled release fertilizer (18N:6P2O5:8K2O) with minors; 180-d release rate at 21ºC) at the rate of 1.5 g Nutricote/262 mL container. Seedlings remain in the greenhouse for 16 weeks and are then moved to an outdoor growing area to induce dormancy. Average growing season of nursery is from mid-March until early October (Riley & Klocke 2018).
Establishment Phase Details	Germination can be low, depending on seed quality (Riley & Klocke 2018).
Length of Establishment Phase	It is usually complete in 2–3 weeks (Riley & Klocke 2018).
Active Growth Phase	Seedlings grow rapidly throughout the active growth phase. When secondary leaves have formed (approximately 2 weeks following germination), soluble fertilizer is applied. During the growing season, fertilization depends on weather. Soluble 90-20-20 NPK, 20-18-18 NPK, or 17-5-24 NPK at a range of 100–150 ppm is applied weekly throughout the growing season (Riley & Klocke 2018).
Length of Active Growth Phase	14 weeks (Riley & Klocke 2018)
Hardening Phase	No dry-down is done to induce dormancy. Seedlings are moved to an outdoor growing area in early-September (Riley & Klocke 2018).
Length of Hardening Phase	2 weeks (Riley & Klocke 2018)
Harvesting, Storage and Shipping	Harvest date: Mid-October Storage conditions: No storage except in outdoor growing area. Plants are well irrigated prior to shipping and shipped in containers (Riley & Klocke 2018).
Length of Storage	Storage in outdoor growing area until outplanting (Riley & Klocke 2018).
Guidelines for Outplanting / Performance on Typical Sites	Seedlings are usually outplanted in fall to early winter (Riley & Klocke 2018).
Other Comments	The seeds are important food for small wildlife, including ants (Riley & Klocke 2018). The butterfly *Euphilotes enoptes* is a pollinator of this species (eFloras 2005). Does well in cultivation (eFloras 2005).

INFORMATION SOURCES	
References	Calflora: Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. [web application]. 2022. Berkeley, California:The Calflora Database [a non-profit organization]; [accessed 2022 May 25]. https://www.calflora.org/app/taxon?crn=9928. eFloras. 2005. St. Louis, MO: Missouri Botanical Garden; Cambridge, MA: Harvard University Herbaria. http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=250060224. Gilbert R. 2005. *Eriogonum compositum*. WA. Knoke D, Gilbin D. Burke Herbarium Image Collection – Eriogonum compositum. Seattle, WA: Burke Museum Herbarium; 2022; [accessed 2022 May 25]. https://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Eriogonum compositum. Pojar J, MacKinnon A. 2016. Plants of the Pacific Northwest coast. Vancouver, BC: Lone Pine Publishing. Buckwheat; p 128–128. Riley LE, Klocke A. 2018. Propagation protocol for production of Container (plug) *Eriogonum compositum* Plants 262 ml (16 in^3) container; USDA FS - Dorena Genetic Resource Center Cottage Grove, Oregon. In: Native Plant Network. US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources; [accessed 2022 May 25]. https://NativePlantNetwork.org. Roché BF Jr, Roché CT. 1991. Eastern Washington Range Plants. USDA, NRCS. 2022. The PLANTS Database, 05/25/2022. National Plant Data Team, Greensboro, NC USA; [accessed 2022 May 25]. https://plants.usda.gov/home/plantProfile?symbol=ERCO12.
Other Sources Consulted	Archibald C. 2006. Seed production protocols for Anaphalis margaritacea Eriophyllum lanatum and Eriogonum umbellatum. Native plants journal. 7(1):47–51. doi:10.1353/npj.2006.0002.

	Croft AA. 2003. The production of native and adapted plants for the intermountain west using the pot-in-pot nursery production system. Ann Arbor: Utah State University. Fisk MR, Apostol KG, Ross-Davis AL, Cahoy DO, Davis AS. 2018. Informing native plant sourcing for ecological restoration: cold-hardiness dynamics, flowering phenology, and survival of Eriogonum umbellatum. Restoration Ecology. 27(3):616–625. doi:10.1111/rec.12912.
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Date Protocol Created or Updated	05/25/2022