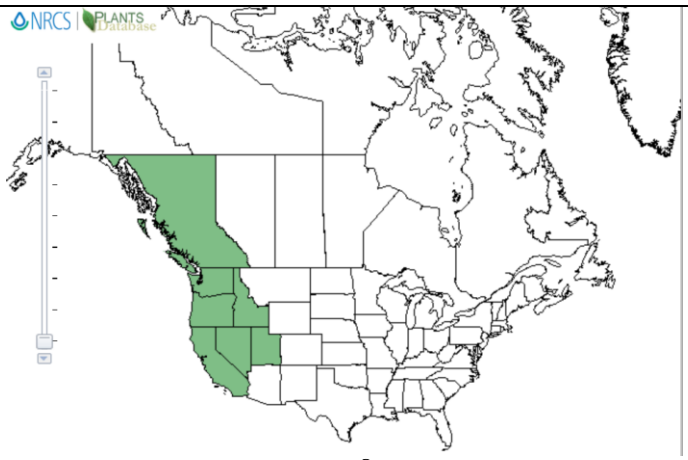
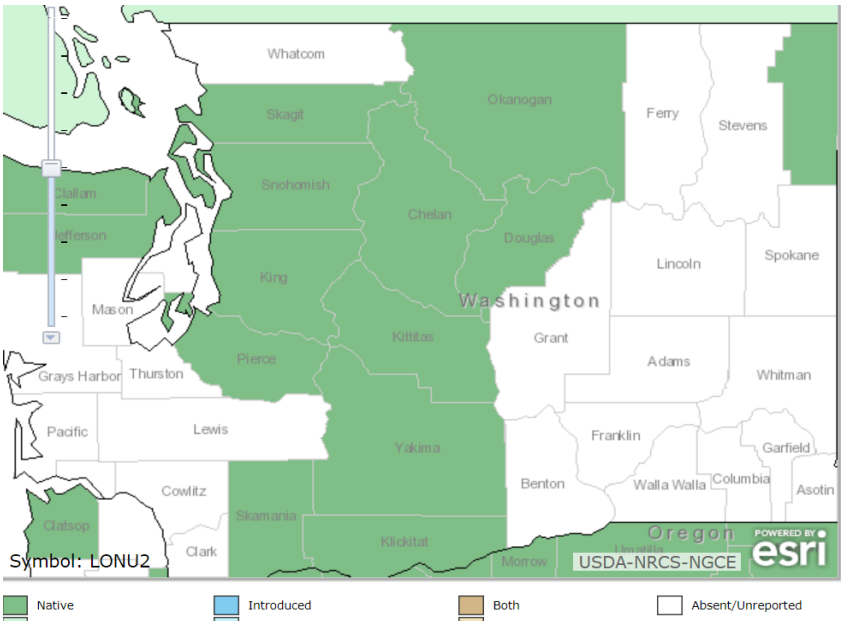
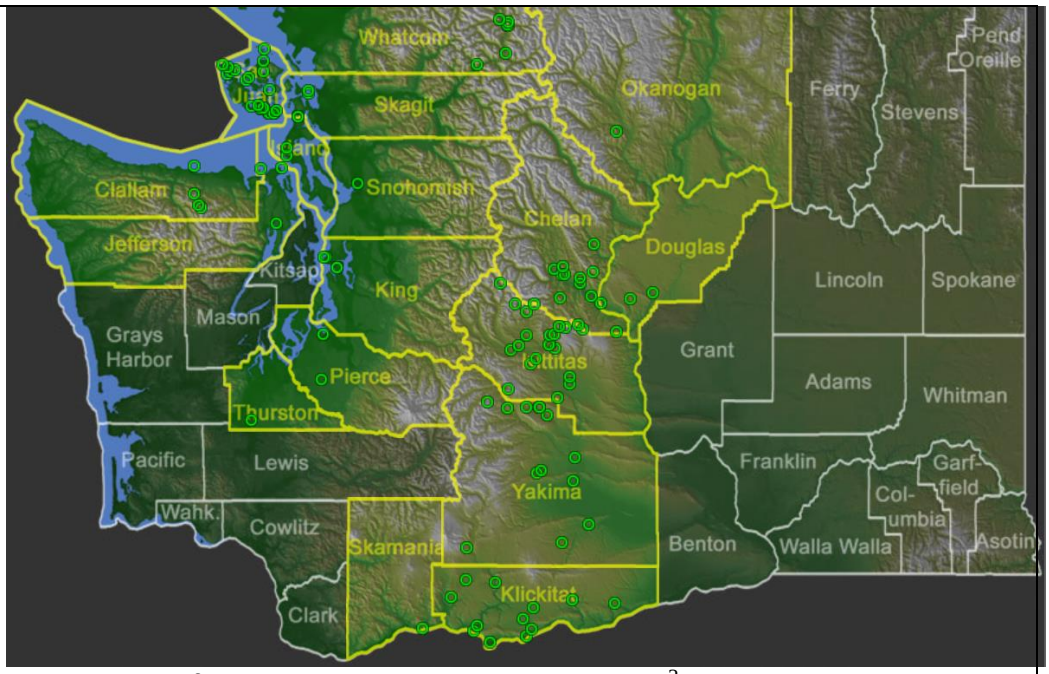
Plant Propagation Protocol for *Lomatium nudicaule*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/LONU2.pdf

TAXONOMY	
Plant Family	
Scientific Name	Apiaceae[1]
Common Name	Carrot family[1]
Species Scientific Name	
Scientific Name	*Lomatium nudicaule* (Pursh) J.M. Coult. & Rose[1]
Varieties	
Sub-species	
Cultivar	
Common Synonym(s)	*Cogswellia nudicaulis* (Pursh) M.E. Jones[1] *Peucedanum latifolium* (M. Bieb.) DC.[1] *Smyrnium nudicaule* (Pursh)[1] *Lomatium platyphyllum* (Pursh) M.E. Jones[3]
Common Name(s)	barestem buiscuitroot, Pestle lomatium, Indian celery, Pestle parsnip, Consumption plant, desert parsley, nakedstem buiscuitroot
Species Code	LONU2[1]
GENERAL INFORMATION	
Geographical range	It is generally found in the Pacific Northwest region—occurring on both sides of the Cascades crest in Washington.[3] It is also present as far north as British Columbia and as far south as Nevada, California, and Utah.[1]

	 North America Distribution[2]  Washington Distribution[2]
Ecological distribution	Common in shrub-steppe communities as well as mountain meadows[3] Found in sagebrush scrub, yellow pine forest, and chaparral[4]; lightly wooded areas[1]
Climate and elevation range	Lowland to middle elevations[1] Dry, open areas[3] Found in areas receiving 350mm or more of mean annual rainfall[1]

Local habitat and abundance	 Occurrences of *Lomatium nudicaule* in Washington[3] Locally common[5] Readily abundant[3]
Plant strategy type / successional stage	Weed competitor due to deep taproot system[3]
Plant characteristics	Perennial forb characterized by blue-glaucous perennial from a stout taproot; flowering stems 20-90 cm tall; basal, oblong-egg shaped, and toothed leaves; yellow, small flowers comprised of compact heads on stalks of varying length[5] Host plant for anise swallowtail butterfly larvae—*Papilio zelicaon*[1] Grazed by sheep and little else; grows in limited quatities[1]
PROPAGATION DETAILS Information obtained from the USDA Plant Guide for *Lomatium nudicaule*[1]	
Ecotype	
Propagation Goal	Plants[1]
Propagation Method	Seed[1]
Product Type	Conetainer[1]
Stock Type	
Time to Grow	5 months[1]
Target Specifications	20-90 cm tall (at maturity)[5]
Propagule Collection	Collect seeds following flowering period (April-June); compound umbels with unequal rays 6-20 cm long at maturity[3]

Instructions	
Propagule Processing/Propagule Characteristics	Flattened, oblong/elliptic; 7-15 mm long; broad wings and prominent ribs[5]
Pre-Planting Propagule Treatments	Greatest chance of germination with cold-moist stratification[1] High chance of success (90%) by sowing seeds into conetainers, bagging in polyethylene, and placing into cooler for 6 weeks at 35-45 degrees F[1]
Growing Area Preparation / Annual Practices for Perennial Crops	Transfer conetainers to greenhouse at 70 degrees F and 50 degrees F/ day and night, respectively[1] Updated methods are being tested that involve growing species at high densities in rooting beds before establishment—allowing less area to be sacrificed in years1-2 during nonexistent seed production[1]
Establishment Phase Details	High establishment success with dormant tubers[1] Can be broadcast or drill seeded[1] Place dormant fall seedlings into firm seed-bed devoid of weeds at depth of 0.6 to 1.2 cm for optimal seed-soil contact[1]
Length of Establishment Phase	6 weeks[1]
Active Growth Phase	
Length of Active Growth Phase	14 weeks
Hardening Phase	
Length of Hardening Phase	
Harvesting, Storage and Shipping	Seeds typically harvested mid-July[1]
Length of Storage	
Guidelines for Outplanting /	Grows in limited quatities[1]

Performance on Typical Sites	
Other Comments	Seed available in limited quantities but may be grown by contract[1]
	PROPAGATION DETAILS Propagation by the Native Plant Network (sponsored by USDA Forest Service)[6]
Ecotype	USFS, Umatilla National Forest, Ukiah, Oregon 4000-4500 ft. elevation
Propagation Goal	Seed
Propagation Method	Seed
Product Type	Propagules: seeds
Time to Grow	0
Target Specifications	
Propagule Collection Instructions	Hand collect 3.5 lb. small lot into paper bag
Propagule Processing/Pro-pagule Characteristics	Process seeds using Westrup Model LA-H lab brush technology at medium speed and #20 mantel Air screen using office clipper—top screen: 24 round / bottom screen: 8 round; medium speed; low-medium air 33,280 seeds per pound; 97% X-Ray 100 seeds—95% filled
Pre-Planting Propagule Treatments	
Growing Area Preparation / Annual Practice for Perennial Crops	
Establishment Phase	
Length of Establishment Phase	
Active Growth	

Phase	
Length of Active Growth Phase	
Hardening Phase	
Length of Hardening Phase	
Harvesting, Storage, and Shipping	Cold storage of 33-38 degrees F
Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	
Other Comments	
INFORMATION SOURCES	
References	[1] Plant Guide for barestem buiscuitroot (Lomatium nudicaule). [accessed 2018 Apr 24]. https://plants.usda.gov/plantguide/pdf/pg_lonu2.pdf [2] Plants Profile for Lomatium nudicaule (barestem biscuitroot). [accessed 2018 Apr 24]. https://plants.usda.gov/core/profile?symbol=LONU2 [3] Knoke D, Giblin D. WTU Herbarium Image Collection - Burke Museum. [accessed 2018 Apr 24]. http://biology.burke.washington.edu/herbarium/imagecollection.php?Genus=Lomatium&Species=nudicaule [4] Calflora: Lomatium nudicaule. [accessed 2018 Apr 24]. http://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=4983 [5] Pojar J., McKinnon A.,1994 Plants of the Pacific Northwest: Washington, Oregon, British Columbia and Alaska, B.C. Ministry of Forests and Lone Publishing, Canada [6] Barner, Jim. 2009. Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) Lomatium nudicaule (Pursh) J.M. Coult. & Rose seeds USDA FS - R6 Bend Seed Extractory Bend, Oregon. In: Native Plant Network. URL: http://NativePlantNetwork.org (accessed 2018/04/24). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

Other Sources Consulted	
Protocol Author	Megan Burns
Date Protocol Created or Updated	4/24/18

Lomatium nudicaule(Pursh) C. & R.
Naked desert parsley, Indian Celery

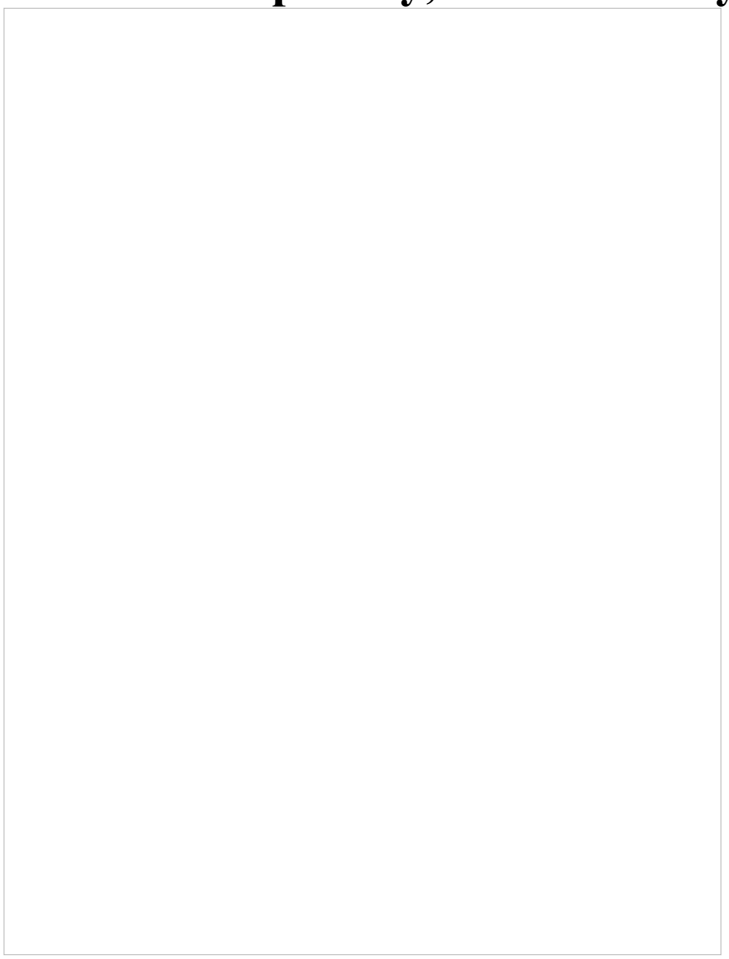
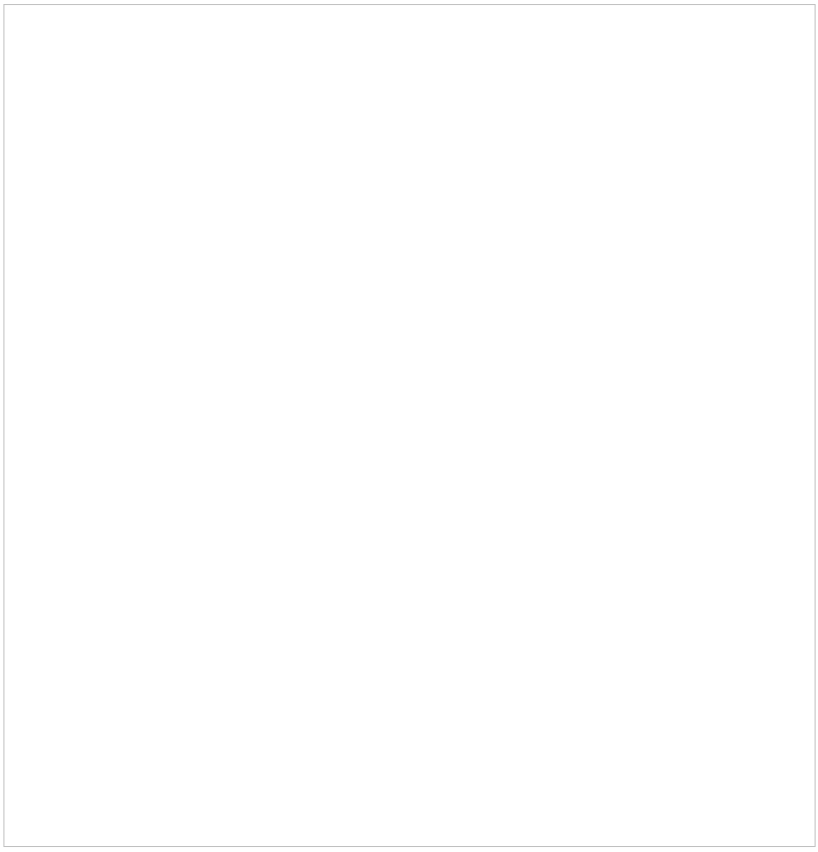


Image © 2004, Ben Legler

Range: It grows on both sides of the Cascade Mountains from southwest Canada into California and Utah.

Climate, elevation: Plants are frost hardy. Low to moderate elevations

Local occurrence (where, how common): Common



Habitat preferences: Dry, sunny sites. Dry open or lightly wooded areas. Mixed pine-oak woodland-chaparral

Plant strategy type/successional stage: A deciduous perennial. This plant is self fertile and has hermaphrodite flowers and is pollinated by insects.

Associated Species: *Ceanothus cuneatus*, *Amelanchier alnifolia, Rhus diversiloba*, *Arctostaphylos viscida*, *Salix lasiolepis, Rosa gymnocarpa*, *Fraxinus latifolius,Danthonia californica, Lomatium nudicaule, Sidalcea malvaeflora, Festuca californica, Poa secunda*, *Chlorogalum pomeridianum*

May be collected as: Seeds

Collection restrictions or guidelines: Collect seed/fruits immediately prior to or when fruit is completely ripe and dry on plant from mid-spring to mid summer

Seed germination: Best sown as soon as it is ripe in a cold frame.

Seed life: Stored seed can be rather slow to germinate.

Recommended seed storage conditions: Sow fresh

Propagation recommendations: Stored seed can take up to 12 months to germinate. Giving it a period of cold stratification reduces this time significantly. The seedlings need to be pricked out into individual pots as soon as they are large enough to handle, and should be planted out into their permanent positions in the summer. Note: Better growth may be obtained during the first year by avoiding transplanting and direct sowing into larger pots. Division may be possible in spring or autumn.

Soil or medium requirements: Perfect drainage. Nutrients can range from sterile to fertile. Recommended potting mix: approximately 1:1:1:2 sand:pumice:peat moss:fir bark mixture.

Installation form: Containers or plugs

Recommended planting density: Sparse, does not naturally form dense stands

Care requirements after installed: Very slow to establish. Initial watering may be necessary but excessive watering encourages fungal growth

Normal rate of growth or spread; lifespan: 5 months active growing period. Long period of dormancy. Perennial clumper, slow to spread

Sources cited:

Jacobson, Athur lee, Indian Celery in Seattle Tilth newsletter, 1989, http://www.arthurleej.com/a-indiancelery.html, (Accessed 5/9/06)

Permaculture Information Web, http://permaculture.info/cgi-bin/eden?search=Lomatium+nudicaule, last updated 9/12/2004, (Accessed 5/9/06)

Plants for a Future, Rich Morris 2004, England and Wales, http://www.pfaf.org/database/plants (Accessed May 7, 2006)

USDA, PLANTS database. http://plants.usda.gov (Accessed 5/9/06)

Washington State Department of Natural Resources, http://www.dnr.wa.gov/nhp/refdesk/communities/pdf/fero-seri.pdf. (Accessed 5/7/06)

Data compiled by: Sierra Smith 5/9/06