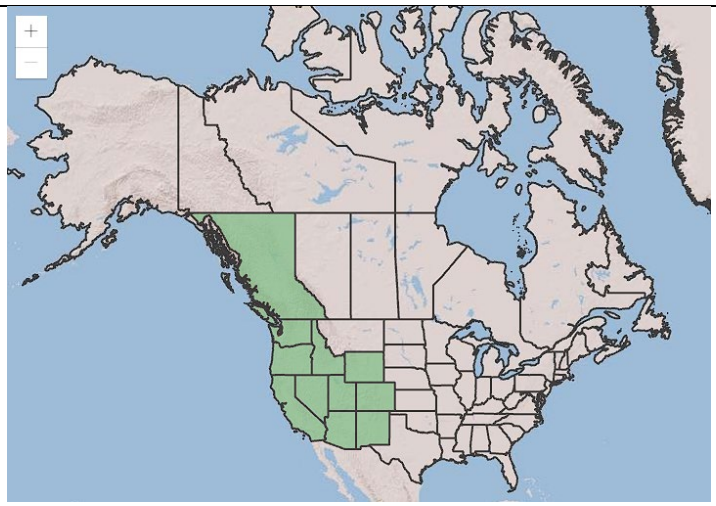
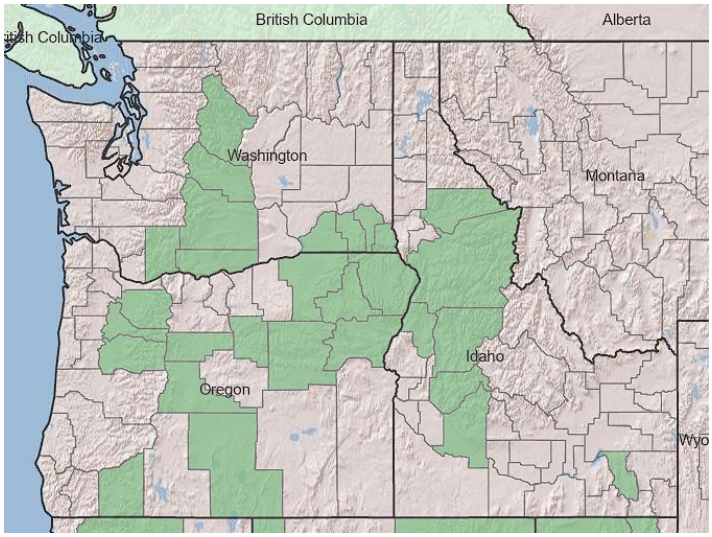
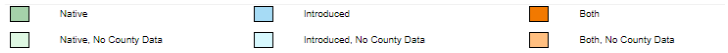
Plant Propagation Protocol for *Cardamine cordifolia*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2022/CACO6.pdf


Source: Burke Herbarium Image Collection[9]

TAXONOMY	
Plant Family	
Scientific Name	Brassicaceae / Cruciferae
Common Name	Mustard Family
Species Scientific Name	
Scientific Name	*Cardamine cordifolia* A. Gray
Varieties	*Cardamine cordifolia* A. Gray var. cordifolia *Cardamine cordifolia* A. Gray var. incana A Grey ex M.E. Jones *Cardamine cordifolia* A. Gray var. Iyallii (S. Watson) A. Nelson & J.F. Macbr.
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	Large Mountain bittercress Lyall's bittercress
Common Name(s)	Heartleaf bittercress
Species Code (as per USDA Plants database)	CACO6
GENERAL INFORMATION	

Geographical range	 North America  Pacific Northwest  Source: USDA PLANTS Database [1]
Ecological distribution	Commonly found in riparian zones ranging from the plains to alpine. Riparian zone is best defined as zones which occur adjacent to moving water.[2]
Climate and elevation range	Elevation (Meters): Min. 1040 - Avg. 1305 Max. 1641 Soil Moisture Regime (SMP) [0 – very xeric; 4 – mesic; 8 - hydric]: Min. 5, Avg. 5, Max. 6
Local habitat and abundance	*Cardamine cordifolia* occur throughout the Rocky Mountains. Often found in moist ground. Primarily in

	the shade of willows or at the edge of the montane spruce forest. [4]
Plant strategy type / successional stage	*Cardamine cordifolia* are best defined as a stress-tolerator plant. The seeds are able to survive in snowy climate and grows immediately after snowmelt.[4]
Plant characteristics	*Cardamine cordifolia* has leaves that are simple or undivided with wavy lobes and heart shaped bases. The flowers of *Cardamine cordifolia* are bright white and large, while other bittercress species have pinkish blooms or much smaller flowers.[3]
PROPAGATION DETAILS	
Ecotype	No information specifically about *Cardamine cordifolia* but it has been identified as closely related to *Cardamine pensylvanica.* Which the seeds came from three long established greenhouse populations at Duke University, North Carolina State University and a private greenhouse in Durham. [5]
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container
Stock Type	N/A
Time to Grow	The active growth period is between spring and Summer. [1]
Target Specifications	The goal of the study was to develop the plant until they flowered and dehisced seeds. [5]
Propagule Collection Instructions	To begin three seedlings sown in half the pots which were allowed to disperse to adject pots. From existing plants seeds were allowed to disperse into bare soil of adjacent remaining pots to receive natural dispersed seeds from the original. [5]
Propagule Processing/Propagule Characteristics	Since the study was looking for natural dispersal of the seeds there is no accurate count on the seed density for future generations. Other factors like seed longevity was not included since many of the seeds were natural dispersed. [5]

Pre-Planting Propagule Treatments	For certain species dormancy can be broken by removal of the seed coats, subjecting the seeds to sulfuric acid, and by use of potassium nitrate as a moistening agent. [6]
Growing Area Preparation / Annual Practices for Perennial Crops	The experiment had two different combinations of environments the first was deep soil with pots filled with fine vermiculite. The second environment had shallow soil where half was filled wither fine vermiculite. This was because arrays were watered from the bottom and lit from above and soil depth determined the position of plants within the pots. [5] Each population consisted of a number of 2.5 cm diameter by 10 cm deep tubular pots. [5]
Establishment Phase Details	Greenhouse populations of *Cardamine pensylvanica* have no specific germination or flowering requirements and are present throughout the year under a wide variety of environmental conditions. Seed from these populations can germinate within a week of reaching a suitably moist environment. [5]
Length of Establishment Phase	1 week
Active Growth Phase	Surviving seedlings were thinned to one plant per pot No other information is provided about practices to promote growth during this time. [5]
Length of Active Growth Phase	2 – 3 weeks
Hardening Phase	No information provided. Because of the specific study that was conducted the plants did not have time to experience a hardening phase before being removed after seed dispersal. [5]
Length of Hardening Phase	No information provided.
Harvesting, Storage and Shipping	To harvest *Cardamine cordifolia* it can be either hand-dug from the ground in a nursery setting or harvested as bare-root seedlings [7] Like other species of *Cardamine* seeds have low viability in storage, therefore the seed should be sown immediately after collection. [8] No information provided on shipping of seedling.

Length of Storage	No information provided. This could be related to the fact that *Cardamine cordifolia* in the nursery setting is seen as a weed. Also related to low viability in storage. [8]
Guidelines for Outplanting / Performance on Typical Sites	No information provided.
Other Comments	
INFORMATION SOURCES	
References	See Below
Other Sources Consulted	See Below
Protocol Author	Kenzo Yoshitomi
Date Protocol Created or Updated	05/24/22

References:

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