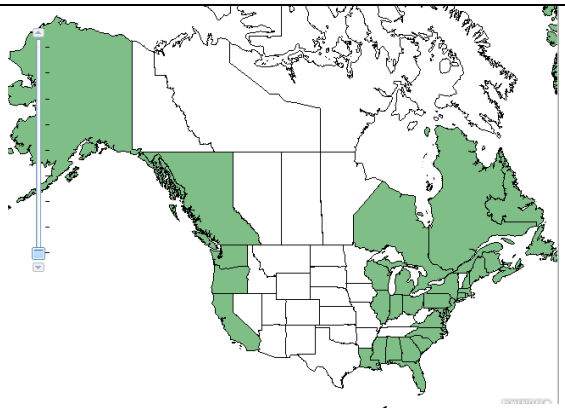
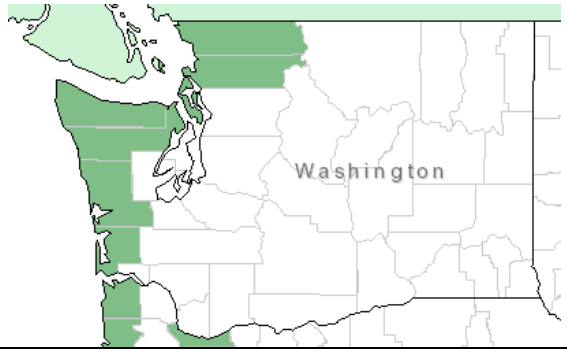
Plant Propagation Protocol for *Cakile edentula* (Bigelow) Hook.
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/CAED.pdf

TAXONOMY	
Plant Family	
Scientific Name	Brassicaceae
Common Name	Mustard family
Species Scientific Name	
Scientific Name	*Cakile edentula* (Bigelow) Hooker
Varieties	*Cakile edentula* (Bigelow) Hook. var. *edentula* *Cakile edentula* (Bigelow) Hook. var. *Iacustris* Fernald
Sub-species	*Cakile edentula* (Bigelow) Hook. subsp. *edentula* *Cakile edentula* (Bigelow) Hook. subsp. *harperi* (Small) Rodman
Cultivar	N/A
Common Synonym(s)	N/A
Common Name(s)	American searocket[1,9,10] and Sea Rocket[5]
Species Code (as per USDA Plants database)	CAED
GENERAL INFORMATION	
Geographical range	 North American Distribution[1] 

	Washington State Distribution (Counties highlighted: Whatcom, Skagit, Clallam, Jefferson, Grays Harbor, Pacific)[1]
Ecological distribution	*C. edentula* occurs along coastlines and can be found on beaches or dunes.[2,11] It is usually found on sandy substrates but is sometimes on gravel or rocky shorelines.[3] The American searocket's sandy coastline distribution makes up the majority of its habitat but on occasion it can be found in wetland ecosystems.[2]
Climate and elevation range	The American searocket is in areas with coastal climates, it likes sun exposure and can tolerate both dry or moist conditions.[5] *C. edentula* is found on beaches and occurs at elevations less than 50m that are at or near sea level.[4,11]
Local habitat and abundance	The habitat is sandy coastal beaches with well-drained soils that can be nutrient poor and have sunny conditions.[5] Specific information on overall abundance could not be found but the species is becoming rarer in parts of its range in North America. The American searocket is listed as Threatened in Illinois, considered Rare in Pennsylvania, and is being outcompeted by *Cakile maritima* in California.[1,11] Some associated species with the American searocket in its Illinois populations are *Phyllotreta chalybeipennis* (flea beetle), *Euxoa deters* (Rubbed Dart), and other beetle species.[3]
Plant strategy type / successional stage	*C. edentula* is a pioneer species that inhabits sandy beaches where not many other plant species can grow, once it becomes established it stabilizes and provides structure to the sand from its root system and it provides nutrients to the otherwise nutrient poor soil. American searocket's presence allows for other species to come to the area and it helps early successional species colonize, beginning ecological succession.[3] Being a pioneer species *C. edentula* is stress tolerant and an adaptation to water stress is its succulent leaves that allow for water storage in dry conditions with harsh sunlight.[3,5]
Plant characteristics	The American searocket is an annual forb/herb.[1,7] Some key characteristics are it grows to be 6 to 20 inches tall, it has simple green leaves that can be lobed and are alternately arranged, the leaves are succulent. *C. edentula* has small lavender/white flowers with 4 petals that are found together at the end of stems, the fruits develop from the flowers and are segmented seedpods that can float. The ability of the seedpod fruit to float helps the searocket establish at other beaches.[3,4]
PROPAGATION DETAILS	
Ecotype	Seed for *C. edentula* can be collected from wild populations, for propagation being done in Washington seed sources should be taken from local populations along the coast (see Washington State distribution map above for *C. edentula* population locations).
Propagation Goal	To produce *C. edentula* plants from wild collected seed.
Propagation Method	Seed propagation
Product Type	Propagules (seeds)
Stock Type	*C. edentula* seeds
Time to Grow	American searockets are an annual plant with short life spans that last one year and the time to grow from seeding should be the length of a growing

	season.
Target Specifications	Target size would be a height that falls within the normal height range of 6 to 20 inches. Target characteristics would be the presence of flowers and fruits to allow for natural reproduction of the plant.[4,5]
Propagule Collection Instructions	Collect propagules when *C. edentula* is in bloom and there are fruits on the plant. The time of year *C. edentula* is in bloom is June through November and the fruits are usually present during that time.[7] To collect seeds take the seedpod off the plant, make sure to collect from multiple individuals, in different locations, and in a random fashion to protect the genetic diversity of the plants being propagated.
Propagule Processing/Propagule Characteristics	The American searocket seeds are in a segmented seedpod. At time of maturity, the two segments break apart from each other. The top segment has one seed and will break off from the plant where it can float and be deposited to a new area or beach. The lower segment has one or more seeds and stays on the plant and the seeds will fall near the mother plant to germinate.[3] No information on seed longevity or density could be found.
Pre-Planting Propagule Treatments	Seeds do not seem to have to be treated before planting. Naturally the seeds readily disperse and germinate, minimal preparation work has to be done.[3,5] For seedpods that are collected before they mature or break open the seedpod would need to be manually opened and can probably be done by hand.
Growing Area Preparation / Annual Practices for Perennial Crops	Growing media for the American searocket is loose sandy media or media that is well drained. Little preparation to the growing area needs to be done as the species can live in nutrient poor conditions.[5]
Establishment Phase Details	The exact time of the year for the growing season could not be found but the blooming period is from mid-summer to fall where it flowers from June to August and its fruits ripen from August to September.[2,5] Establishment phase would most likely be from seed dispersal when the plants are fruiting during August to September to seed germination in the spring. Germination for American searocket is rapid.[5]
Length of Establishment Phase	Establishment phase for *C. edentula* from time of germination to flowering is after the reproductive cycle of one season to the start of the next growing season.
Active Growth Phase	The active growth phase would be during the growing season from which could not be directly found but is most likely just before the blooming period that is from mid-summer to fall.[5,6]
Length of Active Growth Phase	The length of the active growth phase would be from to the next year around the same time where the seeds that were dispersed the year before germinate and become a new plant that reproduces then ends its life cycle.[3]
Hardening Phase	The American searocket does not go through a proper hardening phase and dies after it grows and flowers in the spring. Information on *C. edentula* during the winter months was not found but most of the growth happens during spring and summer, seeds may lay dormant for the winter.
Length of	No hardening length information was found.

Hardening Phase	
Harvesting, Storage and Shipping	No information on harvesting, storage, and shipping could be obtained. Storing these plants in the right environmental conditions like adequate sunlight since *C. edentula* does not like shade or too much moisture.
Length of Storage	Information on length of storage could not be found.
Guidelines for Outplanting / Performance on Typical Sites	For propagating collected seed, seeds should be sown late spring or fall.[5] American searocket performance on a typical site is good as the species is considered to be pioneers and can grow in ecosystems with harsh conditions that do not favor most plant most growth.[3]
Other Comments	Due to the nature, short life cycle and easy establishment of the America searocket in natural settings this species may not be highly sought after or profitable to propagate so limited material was found about propagation methods or techniques. The American searocket is competitive and responds depending on the plant species nearby. If the neighboring species is unrelated the searocket will undergo a rapid root growth to outcompete the neighboring plant for resources and if the neighboring plant is more closely related the searocket will not respond the same way.[2] *C. edentula* has some edible and medicinal purposes. The leaves and young stems can be eaten cooked or eaten raw as a salad ingredient. As part of the mustard family the American searocket is said to taste like spicy mustard.[8]

INFORMATION SOURCES

References

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