Plant Propagation Protocol for *Salix orestera*

ESRM 412 – Native Plant Production

URL: https://courses.washington.edu/esrm412/protocols/2023/SAOR.pdf

Fig. 1

North American Distribution

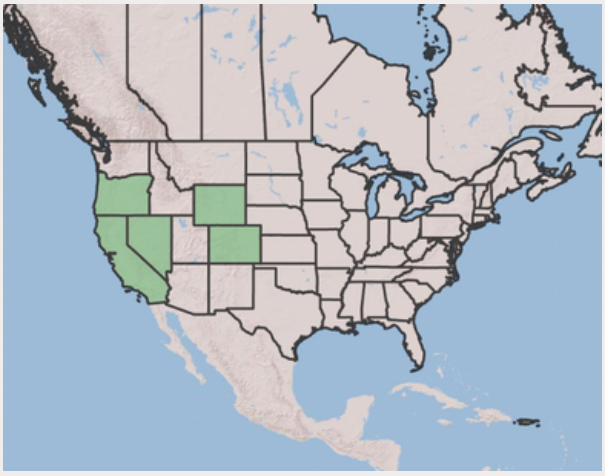

Fig. 2

Pacific Northwest Distribution

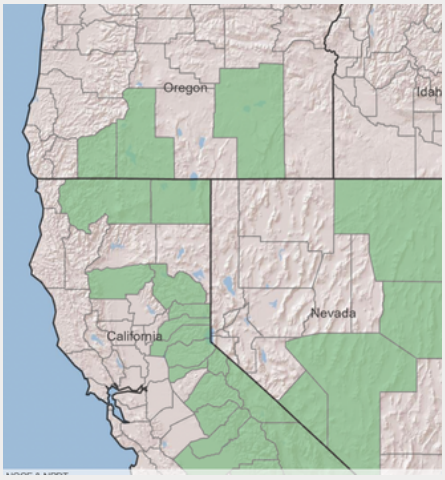

Fig. 3

TAXONOMY	
Plant Family	
Scientific Name	Salicaceae
Common Name	Willow family
Species Scientific Name	
Scientific Name	*Salix orestera* C.K. Schneid
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonyms	*Salix commutata* Bebb var. *rubicunda Jeps* *Salix glauca* L. ssp. *orestera* (C.K. Schneid.) Youngberg *Salix glauca* L. var. *orestera* (C.K. Schneid.) Jeps
Common Names	Sierra willow, gray-leaved willow
Species Code	SAOR

GENERAL INFORMATION	
Geographical Range	*Salix orestera* can be found in the White and Inyo Mountains, the High Sierra Nevada, the Sierra Nevada East regions of Central and Northern California, and throughout Oregon and Nevada[9].
Ecological Distribution	Found on moderately to steeply sloped montane to mid-elevation subalpine meadows, stream terraces, and lakesides[3].
Climate and Elevation Range	Thrives in a Mediterranean climate, with cool, wet winters and warm, dry summers. Found at elevations ranging from 7,000 to 13,000m[1].
Local Habitat and Abundance	*Salix orestera* is dominant in the shrub canopy alongside *Phyllodoce breweri, Rhamnus alnifolia, Ribes montigenum, Salix eastwoodiae, Sorbus californica, Spiraea splendens,* and *Vaccinium cespitosum*. This species has a high fire tolerance, and grows in soils at a pH between 5.8 and 7.4[6].
Plant Strategy Type / Successional Stage	With a rapid growth rate in the form of multiple stems[6], *Salix orestera* would most likely be considered a colonizer since it is able to quickly establish and expand their populations by generating new shoots from their root systems.
Plant Characteristics	Forms a dense shrub canopy between 0.5 and 2 m in height, and is characterized by yellow to reddish-brown stems, lanceolate leaves that grow up to 9.5cm long, and an inflorescence that consists of a stoat catkin of flowers with a reduced perianth that blooms in mid-spring. Salix orestera is also wind pollinated and grows in silt or clay loam soils[8].

PROPAGATION DETAILS

Willows are well adapted to vegetative propagation due to the high concentration of the rooting hormone Indolebutryic acid in the growing tips of branches. Due to the ease of propagating by cuttings, there is minimal information regarding seed propagation of Salix orestera.

Ecotype	Crater Lake National Park, 6,500 ft elevation, along edges of streams and wet meadows near park headquarters[5].
Propagation Goal	Cuttings
Propagation Method	Vegetative
Product Type	Container (plug)
Stock Type	1-gallon containers
Time to Grow	1 year

Target Specifications	Multi-stemmed shrubs with a well-developed root system.
Propagule Collection Instructions	Collect summer softwood cuttings, after flowering has completed.
Propagule Processing/Propagule Characteristics	No special processing; keep in cool, moist peat during collection and transport.
Pre-Planting Propagule Treatments	None
Growing Area Preparation / Annual Practices for Perennial Crops	Cuttings were grown in 1-gallon cans with a "standard" potting mix of Fisons' Sunshine #1 potting mix modified with small amounts of bark compost. Osmocote 3-month slow release fertilizer ,and Micromax trace elements. For plants held over for a second summer, extensive root and shoot pruning was required.
Establishment Phase Details	In late summer, cuttings were misted and rooted in 1-gallon cans of a light, soil-less peat and perlite mix. Bottom heat was also applied to stored cuttings that were rooted later in the fall. Cuttings kept on the propagation bench until February shed leaves immediately after "sticking time," but rooted easily and vigorously, with new bud break following soon after.
Length of Establishment Phase	3 to 7 weeks depending on greenhouse temperatures and length of cold storage.
Active Growth Phase	During the growing season, plants were kept in a shade house with drip irrigation and fertilized every two weeks with Peters' Triple-20 NPK at half-strength. In June, shoot pruning was carried out to manage height and encourage stem branching.
Length of Active Growth Phase	May to July
Hardening Phase	Fertilizer was no longer applied at the end of June, watering intervals were gradually increased, and the shade cloth was removed in late August to encourage good stem maturity.
Length of Hardening Phase	2 months
Harvesting, Storage, and Shipping	Plants were brought to Crater Lake in their containers via refrigerated van towards the end of August of the second year, where they were kept in a sheltered location for a few weeks of acclimation before outplanting.

Length of Storage	Plants outgrow their pots after one season, thus they can be root/shoot pruned, or cuttings can be collected at the end of the growing season and stored in a cooler to repropagate the following spring.
Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	Where smaller transplants are suitable, 10 inch "cone-tainer" starts could easily be generated in one year by inserting cuttings directly into cones in the early spring; heading back new growth in early June and outplanting in September.
INFORMATION SOURCES	
References	See below
Other Sources Consulted	Fig 1: *Gray-leafed Sierra Willow (Salix orestera) · iNaturalist*. (n.d.). iNaturalist. https://www.inaturalist.org/taxa/78949-Salix-orestera Fig 2 and 3: *Salix orestera C.K. Schneid.* (2019, May 7). United States Department of Agriculture. https://plants.usda.gov/home/plantProfile?symbol=SAOR
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Date Protocol Updated	May 24, 2023

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3. CNPS Alliance: Salix orestera. (n.d.). CNPS Vegetation. https://vegetation.cnps.org/alliance/286

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6. Salix orestera C.K. Schneid. (2019, May 7). United States Department of Agriculture. https://plants.usda.gov/home/plantProfile?symbol=SAOR

7. Salix orestera in Flora of North America @ efloras.org. (n.d.). eFloras. http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242445805

8. Salix orestera Wet Shrubland Alliance. (2022, October 29). NatureServe Explorer. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.899205/Salix_orestera_Wet_Shrubland_Alliance

9. Sierra Willow, Salix orestera - All plants for California. (n.d.). Calscape. https://calscape.org/Salix-orestera-(Sierra-Willow)