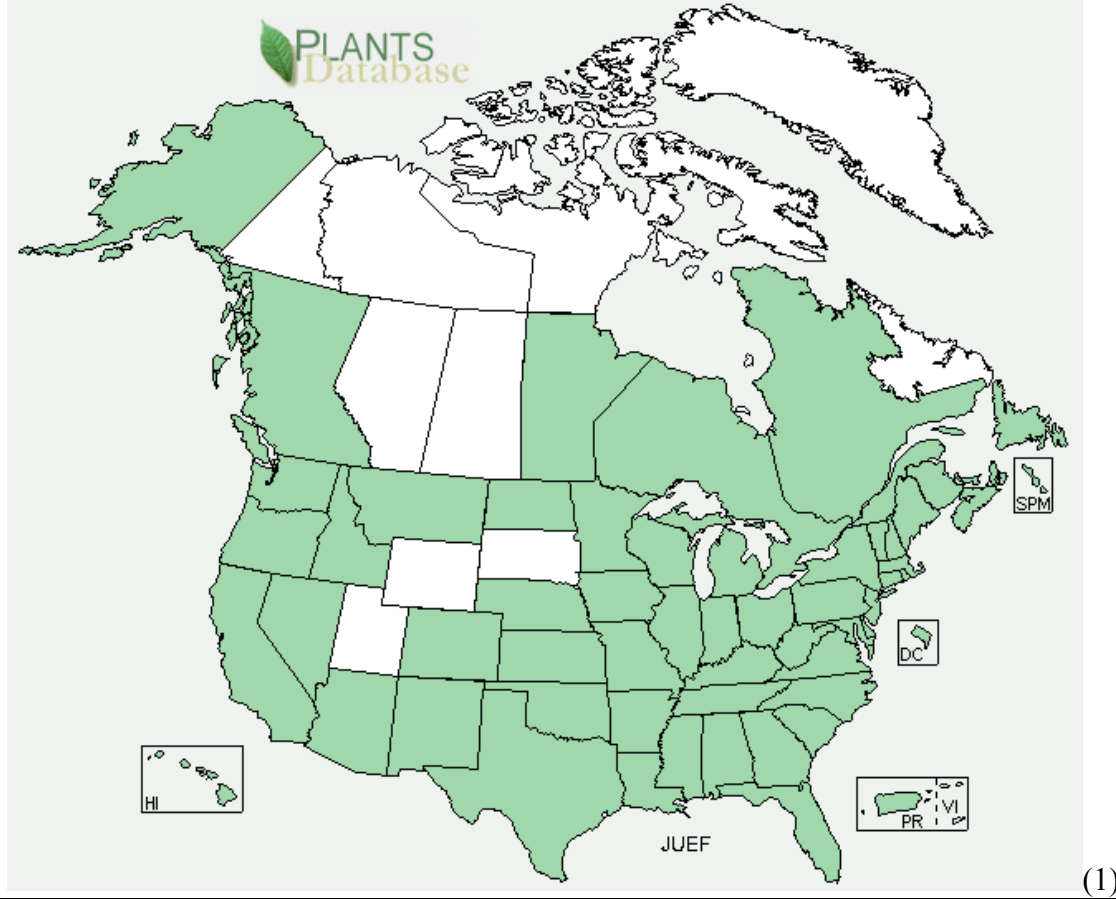


**Plant Propagation Protocol for *[Insert Species]***  
 ESRM 412 – Native Plant Production

<b>TAXONOMY</b>	
<b>Family Names</b>	
Family Scientific Name:	Juncaceae
Family Common Name:	rushes
<b>Scientific Names</b>	
Genus:	<i>Juncus</i>
Species:	<i>effusus</i>
Species Authority:	Linnaeus
Variety:	-
Sub-species:	-
Cultivar:	-
Authority for Variety/Sub-species:	-
Common Synonym(s)	5 varieties are found in Washington: <i>Juncus effusus</i> var. <i>brunneus</i> <i>Juncus effusus</i> var. <i>conglomerates</i> <i>Juncus effusus</i> var. <i>effuses</i> <i>Juncus effusus</i> var. <i>gracilis</i> <i>Juncus effusus</i> var. <i>pacificus</i> (1)
Common Name(s):	soft rush, common rush, pacific rush, candle rush
Species Code:	JUEF
<b>GENERAL INFORMATION</b>	
Geographical range	Grows from southern Alaska, along the coast to Mexico and east across North America. (4)

	
Ecological distribution:	<p>According to Pojar and Mackinnon <i>Juncus effusus</i> is distributed in “moist to wet fields, pastures, roadsides, ditches, clearings, tideflats, and pond margins and bogs.” It is often found in disturbed habitats. (2) It is an indicator of very moist and wet soils and nitrogen-medium soils. (5)</p>
Climate and elevation range	<p>Found at low to mid elevations, below 8,000 feet. (2) Grows in subalpine boreal, temperate and mesothermal climates. (5)</p>
Local habitat and abundance:	<p><i>Juncus effusus</i> is the most common tufted rush in Pacific Northwest. (3) Common associates include <i>Scirpus microcarpus</i>, <i>Juncus acuminatus</i>, <i>Ranunculus repens</i> var. <i>repens</i> (3), <i>Carex</i>, <i>Deschampsia caespitosa</i>, and <i>Scirpus microcarpus</i> (5)</p>
Plant strategy type / successional stage	<p>Common and often dominant in early-seral communities, disturbed sites, and on exposed and compacted mineral soil. (5) Can become invasive in marshes, swamps and wet meadows. (3)</p>
Plant characteristic	<p>Perennial graminoid with clumps of round stems can grow up to 1 meter in length with 1 cm thick stems. Bright green stems persist year round, turning brown or grayish in autumn. The plant has stout rhizomes. Flowers are arranged in panicles, located laterally on the culms. Fruits are small three-parted capsules. (4) (8)</p>
<b>PROPAGATION DETAILS</b>	
Ecotype	<p>Reference protocols for <i>Juncus effusus</i> were propagated in the Tennessee Valley, California (9) and in Bend, Oregon (10).</p>

Propagation Goal:	Plants/plugs
Propagation Method:	Seeds germinate easily. Rhizome cuttings and divisions of mature clumps are also effective. (7)
Product Type:	Leach tubes measuring 1.5"x8". (9) Bareroot stock, seedlings, container stock, direct seeding (11) or divisions of mature clumps can also be used. (7)
Stock Type:	No information found
Time to Grow:	Seeds sown in August will be ready for outplanting in November. (11)
Target Specifications:	Roots should be firmly established in plug container. (9)
Propagule Collection:	Collect seeds between June 1st and September 1st, when mature inflorescences are brown and tiny seeds are dark reddish brown. (9) In the Pacific Northwest flowers bloom June through August. (3) Seeds can be collected by hand with sheers or a gas-powered harvester. (11)
Propagule Processing/ Propagule Characteristics:	Seed cleaning was not required. Seeds should be kept dry and stored in a refrigerator as soon as possible. Fresh seed will resulting significantly greater germination rates than older seed (9) Seeds were cleaned with a Westrup Model LA-H laboratory brush machine, then sized and cleaned using Laboratory Test Sieves. Number of Seeds per Pound: 45,360,000, Purity: 75%. (10) I hammermill and forced air can be used to clean the chaff. (11)
Pre-Planting Propagule Treatments:	Physiological dormancy required. Cold stratification for a duration of 270 days is used as a dormancy breaking treatment. (6) Soaking seeds 1-7 days will decrease germination rates. (11)
Growing Area Preparation / Annual Practices for Perennial Crops:	Media used in flats and to cover seeds: Sunshine Mix #4 Aggregate Plus (peat moss, perlite, major and minor nutrients, gypsum, and dolomitic lime). (9) Sow seeds on soil surface, cover slightly with soil, keep moist. (7)
Establishment Phase:	Seeds germinate 30 days after sowing. Optimum germination temperature is 30/20 degrees C. Germination % is greater in light rather than dark conditions. (6) Germination rates are 80 % (9)
Length of Establishment Phase:	30 days
Active Growth Phase:	Seedlings should be transplanted 30 days after germination into leach tubes containing standard potting mix (peat moss, fir bark, perlite, and sand). 2 seedlings should be transplanted into each container with survival rate averaging 80%. Seedlings should be moved to a shadehouse. (9) Moderate fertilization will increase growth and seed production. (11)
Length of Active Growth Phase:	100-120 days are required for plugs to mature.

Hardening Phase:	No information found
Length of Hardening Phase:	No information found
Harvesting, Storage and Shipping:	Clip stems 15-25 cm to bring energy into roots. Outplanting is most successful when plants are dormant. (11)
Length of Storage	Seedlings should be transported and stored in a cool location and planted as soon as possible. (11)
Guidelines for Outplanting / Performance on Typical Sites:	<i>Juncus effusus</i> becomes dominant in areas with standing water and can out-compete other natives, but clumps will remain more isolated in shallow marshes. It can exist in non-wetland areas where there is no competition. It is tolerant of trampling and generally not palatable for grazers. (8) Can grow in full sun or part shade with wet to moist soil. (4) Plugs should be planted in late fall after first rains. Summer irrigation may be necessary 1-4 times per month. Plugs should be spaces 25-30 cm. (11)
Other Comments:	-

### INFORMATION SOURCES

References:	<ol style="list-style-type: none"> <li>1. "Plant Profile: common rush." USDA: Natural Resources Conservation Services on-line. <a href="http://plants.usda.gov/java/name">http://plants.usda.gov/java/name</a> Accessed: April 20, 2010.</li> <li>2. Pojar, Jim and Andy MacKinnon. <i>Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia &amp; Alaska</i>. Vancouver: Lone Line, 1994.</li> <li>3. Cooke, Sarah Spear. <i>A Field Guide to the Common Wetland Plants of Western Washington &amp; Northwestern Oregon</i>. Seattle: Seattle Audubon Society, 1997.</li> <li>4. Robson, Kathlen A, Alice Richter and Mariane Filbert. <i>Encyclopedia of Northwest Native Plants for Gardens and Landscapes</i>. Portland: Timber Press, Inc., 2008.</li> <li>5. Klinka, K., V. J. Krajina, A. Ceska, and A. M. Scagel. <i>Indicator Plants of Coastal British Columbia</i>. Vancouver: University of British Columbia Press, 1989.</li> <li>6. Baskin, Carol C. and Jerry M. Baskin, <i>Seeds: Ecology, Biogeography, and Evolution of Dormancy and Germination</i>. San Diego: Academic Press, 1998.</li> <li>7. Leigh, Michael <i>Grow Your Own Native Landscape: A Guide to Identifying, Propagating &amp; Landscaping with Western Washington Native Plants</i>. Native Plant Salvage Project, WSU Cooperative Extension-Thurston County, 1999.</li> <li>8. <i>Wetland Plants of the Pacific Northwest</i>. US Army Corps of Engineers, Seattle District, 1984</li> </ol>
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	<p>9. Young, Betty 2001. Propagation protocol for production of container <i>Juncus effusus</i> L. <i>pacificus</i> Fern. &amp; Weig. plants (Leach Tube); , San Francisco, California. In: Native Plant Network. URL: <a href="http://www.nativeplantnetwork.org">http://www.nativeplantnetwork.org</a> (accessed 20 April 2010). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.</p> <p>10. Barner, Jim 2007. Propagation protocol for production of <i>Juncus effusus</i> L. seeds; USDA FS - R6 Bend Seed Extractory, Bend, Oregon. In: Native Plant Network. URL: <a href="http://www.nativeplantnetwork.org">http://www.nativeplantnetwork.org</a> (accessed 20 April 2010). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.</p> <p>11. “soft rush, <i>Juncus effusus</i> L.” United States Department of Agriculture, Natural Resources Conservation Service, <i>National Plant Data Center</i>. Stevens, Michelle.</p>
Other Sources Consulted:	Moore, Michael. <i>Medicinal Plants of the Pacific West</i> . Santa Fe: Red Crane Books, Inc., 1993.
Protocol Author:	Roen Hohlfeld
Date Protocol Created or Updated:	04/20/10

*Plant Data Sheet from 2003*

**Common Rush, *Juncus effusus***

**Range**

Throughout most of North America, from Alaska to Newfoundland and south to California (1)

**Climate**

Freshwater wetlands

**Elevation**

Below 8,000 feet (1)

**Local occurrence**

Common in wet prairies, meadows, pastures and fields as well as in shallow water at the edges of ponds and lakes (2) and in disturbed sites

**Habitat preferences**

Full sun, moist to wet fields, disturbed sites, seasonally standing water to 3" (1)

**Plant strategy type/successional stage**

Extremely hardy and adaptable, can be invasive in some areas

**Associated species**

Buttercup (2), *Carex* species, *Deschampsia caespitosa* and *Scirpus microcarpus* (3)

**Collection restrictions or guidelines**

Flowers persist from March to September or October (1)

**Seed germination**

Spring germination, full sun

**Vegetative regeneration**

Division

**Seed life**

Up to 60 years (1)

**Recommended seed storage conditions**

**Propagation recommendations**

Spring division (4)

**Soil or medium requirements**

Prefers acidic soils, wet (4), medium nitrogen, exposed and compacted mineral soils with fluctuating ground water (3)

**Installation form**

Bare rootstock, keep moist and cool until planting, bury to the crowns in a moist, sunny spot in late fall (1)

**Recommended planting density**

Height and width of mature plant – 18-48” by 12-24” (3)

**Care requirements after installed (water weekly, water once etc.)**

None

**Normal rate of growth or spread; lifespan**

Moderate

**Sources cited**

- 1) Hansen, W.W. 2003. Native Plants of the Northwest, Native Plant Nursery & Gardens. Common Rush (*Juncus Effusus*).  
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