

BALTIC RUSH

Juncus balticus Willd.
Plant Symbol = JUBA

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Abrams & Ferris (1960)

Uses

Ethnobotanic: Coiled basketry prevails in southern California, with the mottled yellowish brown of rush providing a natural colored and variegated background (Turnbaugh and Turnbaugh 1986). Rush stems are used in the coiled baskets of southern California and Mexican Indian basketweavers, such as the Cahuilla, Luiseño, Chumash, Diegueño, Agua Caliente, Gabrieliño, Juaneño, Death Valley Shoshone, and Fernandeno (Barrows 1967; Murphey 1959). Chumash baskets, from southern California, are made with *Juncus* stems for the tan color and roots for the black color (Timbrook 1997). The foundation material is made of *Juncus balticus* and the sewing material is made of *Juncus textilis*.

The Cahuilla, Diegueño, Luiseño, and Chumash dye the mature rushes black by steeping them for several hours in an infusion of either horned sea-blite (*Suaeda calceoliformis* or bush seepweed (*Suaeda moquinii*)). This dye is very penetrating and the color is durable, but it has a fetid, disagreeable smell.

Juncus species are also dyed yellow in an infusion of indigo bush (*Psoralea emoryi*) (Barrows 1967; Merrill 1970).

The early sprouts of Baltic rush were sometimes eaten raw by the Snuqualmi of Washington (Gunther 1973). *Juncus* shoots were eaten raw, roasted in ashes, or boiled by Maidu, Luiseño, and others (Strike 1994). Owens Valley Paiute ate the seeds.

Other Uses: Wildlife habitat and food, erosion prevention, sediment retention, basketry, food, tatami mats, and nutrient transformation. Baltic rush has nitrogen-fixing capabilities. They are useful for stabilization and revegetation of disturbed areas. These plants can be invasive.

Juncus species are used by a wide range of mammal and avian species for food and habitat (Hoag and Zierke 1998). Rush seeds are eaten by waterfowl, songbirds, small mammals, jack rabbits, cottontail, muskrat, porcupine, quail, and gopher (Martin 1951). Rushes help improve habitat for amphibians and spawning areas for fish. Muskrats feed on the roots and rhizomes of soft rush, and various wetland wading birds find shelter among the stems.

Cattle generally do not graze rushes, because they have low palatability. Cattle will graze Baltic rush late in the season after more palatable plants are eaten. Rushes provide the following conservation uses; erosion control, sediment accretion and stabilization, nutrient uptake and transformation, wildlife food and cover, restoration and creation of wetland ecosystems, and wastewater treatment applications. The rhizomatous nature, nitrogen fixation capabilities, dense root system, and phenotypic plasticity to flooding and drought stress provide high soil and slope stabilization capabilities, particularly in areas with flooded soils or fluctuating hydrology. Rushes tend to be resistant to grazing pressure and fairly unpalatable to cattle, so tend to increase in species composition in stockwater ponds and troughs. The rhizomes form a matrix for many beneficial bacteria, making this plant an excellent addition for wastewater treatment.

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status, such as, state noxious status and wetland indicator values.

Description

General: Rush Family (Juncaceae). Baltic rush is a perennial, rhizomatous, wetland plant. Rushes are grasslike, usually tufted herbs with terete leaves. The leaf sheaths are clustered at the base, 2-15 cm long, multi-colored from red to light to dark brown, and bladeless. The lowest bract of the Baltic rush inflorescence is round and 2-20 cm long. This bract appear to be a continuation of the stem. The inflorescence forms a loose to compact panicle of 10-50 flowers up to 6 cm long. Flowers are greenish or brownish, sessile to pedicellate, each subtended by a pair of hyaline-scarious bracts. Tepals are 3.5-5 mm long. The 6 stamens have anthers 1.5-2.5 mm long. Fruits are brownish red and about the size of ground pepper (0.6-0.8 mm long). The fruits are found in a capsule.

Distribution

For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site. It occurs throughout California to Alaska, eastern North America, and Eurasia. Baltic rush is the most widespread and common rush found in the Great Basin and dry Intermountain regions. It grows in standing water to seasonally dry places, with an elevation generally below 2200 m.

Establishment

Adaptation: *Juncus* species can tolerate shade and flooded, anoxic soil conditions, at least periodically. They can also tolerate mild to moderate soil salinities and alkaline to calcareous soils. Often these plants are found on drier or seasonally fluctuating wetland sites (for example, desert playas) and can tolerate seasonal drought.

Juncus species may be planted from bare rootstock or seedlings from container stalk or directly seeded into the soil. Bare rootstock or seedlings are preferred revegetation methods where there is moving water.

Live Plant Collections: The following information on Baltic rush is provided by J. Chris Hoag and Mike Zierke, USDA, Natural Resources Conservation Service, Plant Materials Center, Aberdeen, Idaho.

"Planting plugs (either from the greenhouse or wild transplants) is the surest way to establish a new stand of this species. Plug spacing of 25-30 cm will fill in within one growing season. Soil should be kept from saturated conditions up to 8 cm of standing water. Fluctuating the water level during the establishment period may speed spread. Water levels can be managed to enhance spread and control weeds."

To collect wild plants, no more than 1/4 of the plants in an area should be collected. If no more than 0.09 m² (1 ft²) should be removed from a 0.4 m² (4 ft²) area, the plants will grow back into the hole in one good growing season. A depth of 15 cm (6 in) is sufficiently deep for digging plugs. This will leave enough plants and rhizomes to grow back during the growing season.

Clip leaves and stems to 15 to 25 cm (6 to 10 inches); this allows the plant to allocate more energy into root production. Transplants should be planted as soon as possible in moist (not flooded or anoxic) soils. Plants should be transported and stored in a cool location prior to planting. Plugs may be split into smaller units, generally no smaller than 6 x 6 cm (2.4 x 2.4 in), with healthy rhizomes and tops. The important factor in live plant collections is to be sure to include a growing bud in either plugs or rhizomes. Weeds in the plugs should be removed by hand. Soil can either be left on the roots of harvested material or removed. For ease in transport, soil may be washed gently from roots. The roots should always remain moist or in water until planted.

Soil should be kept saturated after planting. Plants can tolerate 2.5 - 8 cm of standing water as long as the level fluctuates over the growing season. Allow roots to become established before flooding soils if possible. Ideally, plants should be planted in late fall just after the first rains (usually late October to November). This enables plant root systems to become established before heavy flooding and winter dormancy occurs. Survival is highest when plants are dormant and soils are moist.

Fertilization is very helpful for plant growth and reproduction. Many more seeds are produced with moderate fertilization.

Seed Collections

- For Baltic rush near Aberdeen, Idaho, the flowering period is late May to August, occasionally to September. Seed ripens in early August. Phenology will differ with plant growing in different areas, and for different *Juncus* species.
- Seed may be collected by hand, using a pair of hand shears, or with a gas-powered handheld seed harvester.
- The tiny, black seeds are easily lost from the capsules when collecting by hand. Be careful to keep capsules upright before putting in collection

bag. Use paper sacks when collecting seeds for this species.

- To clean the seed, run the collection through a hammer mill to break up debris and knock the seeds loose. Use a 1/20 inch screen on the top and a solid sheet on the bottom of the seed cleaner. Adjust the airflow to blow off the chaff. The cleaning process can be speeded up by shaking the hammermilled collection to settle seed to the bottom of the pan. The top portion of the chaff can then be discarded and the seed-rich mixture that is left in the bottom can be run through the seed cleaner.

Seed germination in greenhouse

- Seeds need light, moisture and heat for germination. Soaking the seeds in water for 1 - 7 days will decrease the time the seed takes to sprout.
- To grow seeds, place on soil surface and press in lightly to assure good soil contact. Do not cover the seed. Soil should be kept moist. Greenhouse should be kept hot (32-38°C).
- Seeds begin to germinate in approximately 1 week. Maintain soil moisture until plants are to be transplanted. Seedlings cannot withstand long periods without water while growing in the greenhouse.
- Plants are ready in 100 - 120 days to come out as plugs. By planting seeds in August, plugs are ready to plant in soil by November. These plants are very small; growing plants to a larger size will result in increased revegetation success.

Management

Hydrology is the most important factor in determining wetland type, revegetation success, and wetland function and value. Changes in water levels influence species composition, structure, and distribution of plant communities. Water management is absolutely critical during plant establishment, and remains crucial through the life of the wetland for proper community management.

Juncus species can tolerate periods of drought and total inundation. It is important to keep transplanted plugs moist, not flooded, until roots are established. Water levels can then be managed to enhance or reduce spread as well as control terrestrial weeds.

Muskrats have evolved with wetland ecosystems and form a valuable component of healthy functioning wetland communities. Muskrats use emergent wetland vegetation such as *Juncus* species for hut construction and for food. Typically, an area of open water is created around the huts. Muskrat cleared areas increase wetland diversity by providing

opportunities for aquatic vegetation to become established in the open water and the huts provide a substrate for shrubs and other plant species. Muskrats opening up the dense stands of emergent vegetation also create habitat for other species.

Traditional Resource Management: According to one Northern Diegueño basketweaver, most weavers have favorite collecting areas where the *Juncus* is plentiful, long, tough, deeply colored with red, or simply nearby. Any *Juncus* stand will have plants that are immature, mature but still in seed, and those starting to senesce. Plants can be harvested during any month or season. The stalks are cut above the rhizomes and roots, leaving plenty of buds to re-grow new shoots. As with other rhizomatous species, harvest stimulates new growth and maintains the clone in a juvenile or immature growth phase, where productivity is highest. Attempts at harvesting during times of heavy rain or flooding are likely to fail, as deep water and mud make plants inaccessible.

Juncus species tend to be fairly resilient to insect and disease problems. Aphids may feed on the stems, but rarely cause significant damage. If an insect or disease problem is encountered in the greenhouse, treatment options may be limited by cultural constraints if these plants are to be used by Indian basket weavers. *Juncus* culms are split with the mouth to process basketry materials; therefore, an unusually high degree of human exposure and risk occur with plants designated for ethnobotanic use. Rushes are perennial, rhizomatous plants. In most cases, they will out-compete other species within the wetland area of the site, eliminating the need for manual or chemical control of invasive species.

Cultivars, Improved and Selected Materials (and area of origin)

JUBA is available through selected native plant nurseries within its range. Contact your local Natural Resources Conservation Service (formerly Soil Conservation Service) office for more information. Look in the phone book under "United States Government." The Natural Resources Conservation Service will be listed under the subheading "Department of Agriculture." Listed below are some sources where these plants are known to be available:

USDA, NRCS, Plant Materials Center, Aberdeen, Idaho.

Accession Number 9067411, for Land Resource Region (LRR) B East from Sterling Wildlife Management Area, just north of the town of Aberdeen Bingham County, Idaho

Accession Number 9057580, for Land Resource Region (LRR) B West from Roswell Wildlife Management Area, just west of the town of Roswell, Canyon County, Idaho.

Accession Number 9057632, for Land Resource Region (LRR) D North from Stillwater National Wildlife Refuge, northwest of the town of Fallon, Churchill County, Nevada.

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Prepared By

Michelle Stevens

formerly USDA, NRCS, National Plant Data Center

Chris Hoag

Riparian/Wetland Plant Development Project

USDA-Natural Resources Conservation Service,
Plant Material Center, Aberdeen, Idaho

Species Coordinator

M. Kat Anderson

USDA, NRCS, National Plant Data Center
c/o Plant Sciences Department, University of
California, Davis, California

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