BASKET RUSH

Juncus textilis Buch.

Plant Symbol = JUTE2

Contributed by: USDA NRCS National Plant Data Center

Used with permission of the publishers

Abrams & Ferris (1960)

Uses

Ethnobotanic: Coiled basketry prevails in Southern California, with the mottled yellowish brown of *Juncus textilis* providing a natural colored and variegated background (Turnbaugh and Turnbaugh 1986). *Juncus* stems are used in the coiled baskets of Southern California 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 sewing material is made of *Juncus textilis* and the foundation material is made of *Juncus balticus*.

Rushes are cut off at ground level, or at the length desired. The rush, in its natural state, furnishes a variety of colors; a deep red near the base, lightening in color upwards passing through several shades of light brown, and ending at the top in a brownish yellow. *Juncus* stems can be bleached in the summer sun for several months to assure a light tan uniform

color. According to some Diegueño basket weavers, the deep brick-red color found in many mission baskets was obtained from *Juncus* species harvested in the higher elevations, 3,000 feet or above, and in canyons usually under sycamores or willow trees (Moser 1993). The red color occurs under the leaf thatch or blanketing vegetation mat and varies from several inches to nearly 12 inches in length at the base of the *Juncus* stalk, and is often used alone as a design element.

The Cahuilla, Diegeño, 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 has a fetid, disagreeable smell. *Juncus* species are also dyed yellow in an infusion of indigo bush (*Psorothamnus emoryi*) (Barrows 1967; Merrill 1970).

Juncus stalks can be harvested throughout the year. Preparation for basket weaving involves splitting each rush stalk into three equal portions. The base of the reed is split using either a thumbnail or pocket knife, then one piece is grasped in the teeth and one in each hand and equal pressure is applied. One Digeño basket weaver describes a point about half way through the reed when the splitting starts to "stutter" and feels like its going to break. At this point he throws the remaining parts away. The pith is removed after soaking the plant in water prior to weaving. The individual pieces are then trimmed to a uniform thickness. The stems are soaked in water before using.

Other Uses: *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, and small mammals such as jackrabbits, cottontails, muskrats, porcupines, and gophers (Martin 1951). Rushes help improve habitat for amphibians and spawning areas for fish. Muskrats feed on the roots and rhizomes, and various wetland wading birds find shelter among the stems.

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. The rhizomes form a matrix for many beneficial bacteria, making this plant an excellent addition for wastewater treatment. Rushes tend to be resistant to grazing pressure and fairly unpalatable to cattle, so tend to increase in species composition in stock water ponds and troughs. Basket rush is useful for stabilization and revegetation of disturbed areas.

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). Basket rush is a perennial, rhizomatous wetland plant. It is a grasslike, usually tufted herb 10-20 dm tall, with stout, rigid, pale green culms. The leaf sheaths are terete, clustered at the base, 2-15 cm long, multi-colored from red to tan to dark brown, and bladeless. The inflorescence forms a lax panicle with many flowers. The brown, oblong-ovoid capsule is as long as or slightly shorter than the perianth, and contains many seeds. *Juncus textilis* is closely related to *Juncus balticus*; basket rush can be distinguished from baltic rush by its much stouter habit, its paler green stems, and its somewhat larger, more numerous-flowered panicle. The stems of *Juncus textilis* are more woody in texture, retain their terete shape when dried, and do not tend to flatten as do those of *Juncus balticus*. From this description of their growth forms, it is obvious why *Juncus textilis* is used for the sewing material and *Juncus balticus* is compressed inside the coils of baskets.

Distribution

For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site. *Juncus textilis* grows in marshy areas and along streams below an elevation of 1800 m. Basket rush grows in coastal and montane southern California, north to San Luis Obispo and Kern Counties. Often these plants are found on drier or seasonally fluctuating wetland sites (for example, desert playas) and can tolerate both seasonal drought and flooding.

Establishment

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 *Juncus balticus* is provided by J. Chris Hoag and Mike Zierke (USDA, NRCS, Plant Materials Center, Aberdeen, Idaho). Due to their taxonomic and habitat similarity, it is likely that *Juncus textilis* establishes in a similar manner. Planting plugs 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. Fluctuating the water level during the establishment period may speed the spread of *Juncus*. Water levels can be managed to enhance spread and control weeds.

Clip leaves and stems to 15 to 25 cm (6 to 10 inches) before planting; 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. The roots should always remain moist or in water until planted.

Ideally, plants should be planted in late fall just after the first rains (usually late October to November). Survival is highest when plants are dormant and soils are moist. 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. Fertilization is very helpful for plant growth and reproduction. Many more seeds are produced with moderate fertilization.

Seed Collections: The flowering period is late May to August, occasionally to September. Seed ripens in early August. Phenology will change by area, aspect, elevation, and specific site conditions.

- 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 air flow to blow off the chaff. The cleaning process can be speeded up

by shaking the hammer milled 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 (Hoag et al. 1995). *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 either enhance or reduce spread as well as control terrestrial weeds.

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.

Traditional Resource Management: Management of *Juncus textilis* stands includes the following: ownership of prime basket rush sites, stimulation of new growth through harvesting stalks, periodic burning, and not harvesting when soils are very mucky and likely to be compacted. According to one Northern Diegueño basket weaver, most weavers have favorite collecting areas where the basket rush is plentiful and having characteristics valued by basket weavers (long, flexible, tough stems, deep red color, access is available and relatively easy). Any *Juncus* stand will have immature plants, mature but still in seed, and those starting to senesce. The stalks are cut above the rhizomes and roots, leaving plenty of buds to re-grow new shoots. As with other rhizomatous species, harvesting stimulates new growth and maintains the clone in a juvenile or immature growth phase, where productivity is highest. The only harvesting prohibition might be during times of heavy rain or flooding, when deep water and mud make many plants inaccessible.

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

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."

References

Abrams, L. & R.S. Ferris 1960. *Illustrated flora of the Pacific states*. 4 Vols. Stanford University Press, Palo Alto, California.

Hickman, J.C. (ed.) 1993. *The Jepson manual. Higher plants of California*. University of California Press. 1399 pp.

Hoag, J.C. n.d. *Wetland plant fact sheet - baltic rush (Juncus balticus)*. Interagency Riparian/Wetland Project. USDA, NRCS, Plant Materials Center, Aberdeen, Idaho. 3 pp.

Hoag, J.C. & M. Zierke (February) 1998. *A reference guide for the collection and use of ten common wetland plants of the Great Basin and Intermountain West*. Riparian/Wetland Project Information Series No. 13. USDA, NRCS, Plant Materials Center, Aberdeen, Idaho. 13 pp.

Hoag, J.C. & M.E. Sellers (April) 1995. *Use of greenhouse propagated wetland plants versus live transplants to vegetate constructed or created*

wetlands. Riparian/Wetland Project Information Series No. 7. USDA, NRCS, Plant Materials Center, Aberdeen, Idaho. 6 pp.

Hurd, E.G., N.L. Shaw, & L.C. Smithman 1992. *Cyperaceae and Juncaceae - selected low-elevation species*. Proceedings of Symposium of Ecology, Management, and Restoration of Intermountain Annual Rangelands, Boise, Idaho. May 18-22, 1992. Pages 380-383.

Manning, M.E., S.R. Swanson, T. Svejcar, & J. Trent 1989. *Rooting characteristics of four Intermountain meadow community types*. Journal of Range Management 42(4):309-312.

Martin, A.C., H.S. Zim, & A.L. Nelson 1951. *American wildlife and plants: A guide to wildlife food habits*. Dover Publications, Inc., New York, New York. 500 pp.

Merrill, R.E. 1970. *Plants used in basketry by the California Indians*. Acoma Books, Ramona, California.

Moser, C.L. 1993. *Native American basketry of southern California*. Riverside Museum Press. 155 pp.

Murphy, E.V.A. 1959. *Indian uses of native plants*. Mendocino County Historical Society. 81 pp.

Strike, S.S. 1994. *Ethnobotany of the California Indians. Volume 2. Aboriginal uses of California's indigenous plants*. Koeltz Scientific Books, USA/Germany. 210 pp.

Timbrook, J. (June) 1997. *California Indian Basketweavers Association newsletter*.

Turnbaugh, S.P. & W.A. Turnbaugh 1986. *Indian baskets*. Schiffler Publishing, Ltd., West Chester, Pennsylvania. Pages 194-205.

Prepared By
Michelle Stevens
formerly USDA, NRCS, National Plant Data Center

Species Coordinator
M. Kat Anderson
USDA, NRCS, National Plant Data Center
c/o Plant Sciences Department, University of California, Davis, California

Edited: 05dec00 jsp; 21may03 ahv; 060801 jsp

For more information about this and other plants, please contact your local NRCS field office or Conservation District, and visit the PLANTS Web site<http://plants.usda.gov> or the Plant Materials Program Web site <http://Plant-Materials.nrcs.usda.gov>