

HARDSTEM BULRUSH *Schoenoplectus acutus* (Muhl. ex Bigelow) A. Löve & D. Löve Plant Symbol = SCAC3

Contributed by: USDA NRCS Idaho Plant Materials Program



Hardstem bulrush. Photo by Derek Tilley, USDA-NRCS.

Alternate Names

Common Alternate Names: tule

Scientific Alternate Names: *Scirpus acutus*

Uses

Wildlife:

Livestock rarely use this species when the area is flooded. They will use it as roughage or in the winter under heavy snow cover because the stems are often protruding above the snow bank. Forage value of hardstem bulrush is rated poor for cattle, sheep, horses, elk, whitetail deer, mule deer, and pronghorn antelope.

Waterfowl will feed on the seed. The dense tules provide excellent nesting cover for numerous waterfowl and wetland birds (Boggs et al., 1990).

Muskrats and beaver will eat the rootstock and young shoots. Muskrats also use the stems for building their houses.

Water Treatment/Erosion Control:

Hardstem bulrush's dense root mass makes this species an excellent choice for soil stabilization. Its above ground biomass provides protection from erosive wave action and stream currents that erode shorelines or stream banks. The rhizomatous root system also forms a matrix for many beneficial bacteria, making this plant an excellent choice for wastewater treatment (Hurd et al., 1994).

Ethnobotany:

The young sprouts and shoots of hardstem bulrush can be eaten raw or cooked, and the rhizomes and unripe flower heads can be boiled as a vegetable. Hardstem bulrush rhizomes were also sundried and pounded into a kind of flour. Bulrush pollen is eaten as flour in bread, mush or pancakes. The seeds can be beaten off into baskets or pails, ground into meal and used as flour.

Tule houses were common throughout many parts of California; the overlapping tule mats made homes well-insulated and rain-proof. The walls and roofs were thatched with mats of tule or cattail and secured to the frame. In Nevada, tules and willows were bound together in a sort of crude weaving for "Kani", the Paiute name for summerhouse. Hardstem bulrush was also used to make shoes, skirts, baby diapers, bedding, and duck decoys. Several California Indian tribes make canoes of hardstem bulrush stems bound together with vines from wild grape.

Hardstem bulrush has also been used by Native American tribes medicinally. The Cree used a poultice of stem pith to stop bleeding. Navajo and Ramah tribes used the plant as a ceremonial emetic, and the Thompson tribe placed ashes from burned stems on a newborn's bleeding naval (Moerman, 2009).

Status

Hardstem bulrush is considered threatened in Connecticut and endangered in Pennsylvania (USDA-NRCS, 2011). Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Description

General: Sedge Family (Cyperaceae). Hardstem bulrush is a perennial, rhizomatous, wetland obligate species that reaches up to 3 m (10 ft) in height and forms very dense stands. The stems are upright, gray-green to dark-green, round, 1 to 2 cm (0.4 to 0.8 in) thick and 1 to 3 m (3 to 10 ft) tall. The leaves are few and short, found at or near the base, and commonly have a well developed sheath. The inflorescence is a terminal panicle of 3 to 10 spikes which are made up of up to 50 or more spikelets. Each spike may be on a short pedicel or sessile. The inflorescence is exceeded by a 2.5 to 10 cm (1 to 4 in) lateral bract. The fruit is a dark brown lenticular achene up to 2.5 mm (0.1 in) long (Welsh et al., 2003).

Distribution:

Hardstem bulrush occurs throughout North America except for the southeastern states from Louisiana east to Florida and north to Tennessee (USDA-NRCS, 2011). For current distribution, consult the Plant Profile page for this species on the PLANTS Web site.

Habitat:

Hardstem bulrush is found at low to mid elevations, generally below 2,300 m (7,500 ft), in inundated to periodically wet areas of marshes, swamps, and meadows and along lake, reservoir, and pond shorelines.

Adaptation

Hardstem bulrush forms large, often monoculture, stands with the young plants on the outside and the older plants in the center of a stand. It is generally found in areas of standing water ranging from 10 cm to more than 1.5 m (4 in to 5 ft) in depth. It will not tolerate long periods of very deep water. Hardstem bulrush will grow on soils that range from peat to coarse substrates. It will grow and spread on alkaline, saline, and brackish sites and will re-sprout after fire. Burning increases its production and protein content. Hardstem bulrush reproduces from seed and rhizomes. Rhizomes will spread more than 45 cm (18 in) in one growing season.

Establishment

Wild transplants:

Wild plants can be collected and transplanted directly into the desired site. If less than 4 dm² is removed from any 1-m² area (1 ft² in 1 yd²), the hole will fill in within one growing season. Care should be taken not to collect plants from weedy areas as weeds can be relocated to the transplant site.

Planting plugs (either from the greenhouse or wild transplants) is the surest way to establish a new stand of this species. Plug spacing of 30 to 45 cm (12 to 18 in) will fill in the interspaces within one growing season. Soil should be kept saturated. Standing water should be no deeper than 4 to 5 cm (1.5 to 2 in) during the first growing season. Larger transplanted plugs can handle more

standing water if the stems are cut long enough to ensure they are out of the water. Raising and lowering the water level during the establishment period will speed up plant spread and can be used to control weeds (Hoag et al., 1992).

Management

Water level in a wetland should be fluctuated from saturated conditions up to a maximum depth of 30 cm (12 in) of standing water for establishing plants. The young plants can handle deeper water, but not for an extended period of time. This species can tolerate periods of drought and total inundation. It will spread into water depths of 1 to 1.5 m (3 to 5 ft). Water levels can be managed to either enhance or reduce spread as well as to control terrestrial weeds. Hardstem bulrush may be replaced by cattail (*Typha* spp.) if water levels are dropped for an extended period (Harris and Marshall, 1963). Hardstem bulrush re-establish from seed and rhizomes following fires (Smith and Kadlec, 1985).

Pests and Potential Problems

Pests are generally not a problem. Aphids will feed on the stems, but generally will not kill the plant.

Environmental Concerns

Because of its poor forage value, hardstem bulrush can be considered undesirable in flooded meadows and pastures. Hardstem bulrush is native to western North America. It can spread under favorable conditions but does not pose any environmental concern to native plant communities.

Seeds and Plant Production

Hardstem bulrush reproduces sexually by seed and asexually through vegetative spread via rhizomes.



Hardstem bulrush seed. Photo by Derek Tilley

Seed Collection and Cleaning:

Seeds ripen in late August to September. Seeds are not held tightly in the seed head, and high winds, frost, and brushing against the seed head will cause the seeds to dislodge. Seed may be collected by hand stripping from the plant or by clipping the seed head using a pair of hand shears.

A hammermill is needed to break up coarse debris and knock seed free from the panicle. Cleaning can be accomplished using a seed cleaner with a No. 12 top screen and a 1.27 mm (1/20 in) bottom screen. Screens should be sized so desired seed will fall through and debris and weed seed are removed. Air velocity should be adjusted so chaff is blown away. Air flow and screen size may require adjustment to optimize the cleaning process for each collection.

Greenhouse Plant Production:

Improved germination rates have been achieved with cold/wet stratification treatment with the seeds in a mixture of water and sphagnum moss at 2°C for 30-75 days. Others have found success using a 10% acid wash for 45 minutes followed by a thorough washing then wet pre-chilling the seed for 75 days.

Seed needs light, moisture, and heat for germination. Place seed on the soil surface and press in lightly to assure good soil contact. Do not bury the seed. Soil should be kept moist. Greenhouse temperatures should be maintained at approximately 35 to 38° C (95 to 100° F). Germination should begin within 7 to 10 days. Maintain moisture until plants are to be transplanted.

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

There are no cultivars, improved, or selected materials of hardstem bulrush. Common wildland collected seed is available from commercial sources (Native Seed Network).

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