

Scientific Name: *Eleocharis palustris* L.

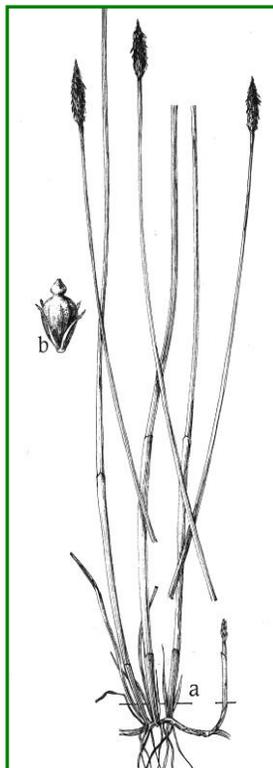
Family: *Cyperaceae*

Common Names: creeping spikerush, common spikerush, spike sedge

Plant Description

Perennial, graminoid in growth, with stout creeping rhizomes, forming dense mats (stands can be 30 cm to 2 m in diameter (Hauser 2006)); tufted culms, somewhat flattened stems 10 to 100 cm high; leaves are bladeless sheaths at base of stems; single, narrowly ovoid to lanceolate spikelet at stem tip, conical and brown, 0.5 to 2 cm long; 1 to 3 sterile scales at base of spikelet, fertile scales are lanceolate and acute and usually have firm mid vein to the apex; 2 stigmas.

Fruit/Seed: Yellow-brown lens-shaped achenes 1 to 1.5 mm long, conical swelling at tip (half the width of the achene), usually 4 barbed bristles somewhat longer than achene.



Eleocharis palustris
a. showing roots and rhizomes and flowering stems and leaves. b. achene

Habitat and Distribution

Wet places, marshes, wet meadows, ditches, mud flats, along stream banks, lakeshores and flood areas. It is shade tolerant and drought intolerant (Hauser 2006). Adapted to saturated sites or areas of seasonal inundation.

Seral Stage: Early colonizer on newly developed wetlands; decreases with competition but can be found in all seral stages. Grows well on disturbed sites (Hauser 2006).

Soil: Grows in a variety of soils: alkaline, sandy loams, sedimentary peat, organic loams (Hauser 2006).

Soil pH ranges from 4 to 8 (Hauser 2006). Adapted to coarse and fine textured soils, it can withstand anaerobic soil conditions and is found on heavy clays (Hauser 2006).

Distribution: Common and widespread across Alberta and across North America, north to the tree line. Circumpolar: Alaska, Yukon to Hudson Bay, northern Quebec and Newfoundland (Moss 1983, USDA NRCS n.d.).



Phenology

Active growth period is spring, with moderate growth rate (USDA NRCS n.d.). Flowers from June to September. Seeds ripen in late August to October (USDA NRCS n.d.).

Pollination

Wind-pollinated (Hauser 2006).

Seed Dispersal

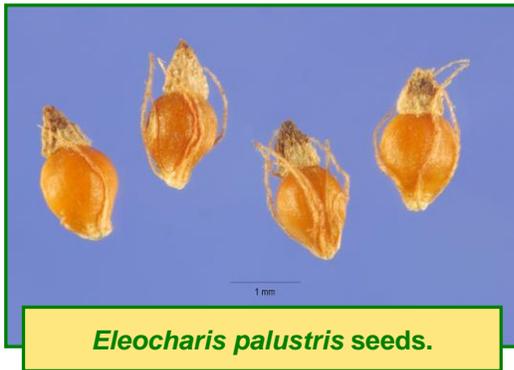
Seed from *Eleocharis sp.* do not float so are not carried very far unless water in the area is flowing (Leck and Schutz 2005).

Genetics

2n=10 to 96 (USDA NRCS n.d.).

Symbiosis

Colonized by vesicular-arbuscular mycorrhizal fungi (Bohrer et al. 2004). According to Ogle et al. (2012) common spikerush is associated with VA mycorrhizae and has the ability to fix atmospheric nitrogen and make it available to other plant species in the wetland community.



Seed Processing

Collection: Harvest by hand, stripping or clipping with hand shears (USDA NRCS n.d.). Power seed harvesters may also be used (Ogle et al. 2012). Handheld seed strippers can be used in dense patches. Can produce prodigious amounts of seed but viability is low (Hauser 2006).

Seed Weight: 0.76 g/1,000seeds (Royal Botanic Gardens Kew 2008).

Cleaning: Hammer mill can be used to break up large debris and free seeds (Ogle et al. 2012).

Storage/Longevity: Orthodox, long term with IPGRI preferred storage conditions (Royal Botanic Gardens Kew 2008).

Propagation

Natural Regeneration: Spreads rapidly by rhizomes and occasionally by seed (Ogle et al. 2012). Rhizomes are most productive in mid to late summer (Hauser 2006). Establishes areas by colonization when not able to seed (Rook 2002).

Germination: Should start germinating after 7 to 14 days (Ogle et al. 2012). Light, moisture, and heat are required for seed germination (USDA NRCS n.d.). 75% germination success average (Royal Botanic Gardens Kew 2008).

Promoted by stratification (Hauser 2006).

Pre-treatment: Light seed scarification followed by 30 to 45 days cold stratification (2°C) in a mixture of water and sphagnum moss (Ogle et al. 2012). 8% germination after 30 days following a 9-month cold stratification at 4°C (Shiple and Parent 1991).

Direct Seeding: 5% germination rate, after 5 years of growth, germinated seeds were firmly established and thriving (Hauser 2006).

Maximum seeding density of 47,000 seeds/ha (USDA NRCS n.d.).

Vegetative Propagation: 63% survival of rhizome sprigs (Tannas 1997) the first year and 42% survival by year 2; spreads extensively in wet areas.

Use of plugs with spacing of 30 to 45 cm to allow for fill will provide suitable establishment (Ogle et al. 2012).

Wildlife/Forage Uses

Wildlife: Important food source and cover for waterfowl (Hauser 2006). Also provides cover for many small mammals. Seeds, stems and rhizomes are an important food source for a variety of waterfowl, marsh and songbirds. Seeds are eaten by



ducks and the shoots by geese (Ogle et al. 2012). *E. palustris* has fair food value for elk and mule deer (Hauser 2006).

Livestock: Tops are heavily grazed by livestock especially after seed set. *E. palustris* may increase in response to grazing (Hauser 2006).

Low palatability (Hauser 2006).

Grazing Response: Although Tannas (1997) notes it is fairly resistant to heavy grazing and trampling, Hauser (2006) states it is highly susceptible to trampling in wetland areas.

Reclamation Potential

Common spikerush can be used for wetland restoration and for development and improvement of plant diversity in wetland and riparian habitats (USDA NRCS n.d.). Reported to naturally colonize reclaimed wetland sites in the oil sands region of Alberta (Cooper et al. 2006). Because of its extensive rhizome formation, it is good for erosion prevention and for soil building (Tannas 1997).

Commercial Resources

Availability: Not available commercially in Alberta or Saskatchewan (Tannas 1997).

Cultivars: Numerous cultivars are available in the U.S. but these are not suitable for reclamation in Alberta.

Notes

Because of its sprouting rhizomes, the common spikerush is well adapted to fire. The underground rhizomes usually remain undamaged by fire because the common spikerush grows in saturated or flooded soils (Hauser 2006).

Negatively affected by invasive *Elaeagnus angustifolia* and found to be in association with Canada thistle at some locations (Hauser 2006).

Shade intolerant (Rook 2004).

Photo Credits

Photo 1: Kristian Peters @ Fabelfroh 2007 (UTC).

Photo 2: Steve Hurst

http://plants.usda.gov/java/profile?symbol=ELPA3&photoID=elpa3_003_ahp.tif

Line Diagram: John Maywood, used by permission of Bruce Peel Special Collections, University of Alberta.

References

Bohrer, K.E., C.F. Friese and J.P. Amon, 2004. Seasonal dynamics of arbuscular mycorrhizal fungi in differing wetland habitats. *Mycorrhiza* 14: 329-337.

Cooper, D.J., E.C. Wolf and E.A. Gage, 2006. Plant establishment for wetland reclamation: A review of plant establishment techniques, and species tolerances for water level and salinity. Department of Forest, Rangeland and Watershed Stewardship, Colorado State University, Fort Collins, Colorado. 115 pp.

Hauser, A.S., 2006. *Eleocharis palustris*. IN: Fischer, W.C. (compiler). The fire effects information system. United States Department of Agriculture, Forest Service, Intermountain Research Station, Intermountain Fire Sciences Laboratory, Missoula, Montana. <http://www.fs.fed.us/database/feis/plants/graminoid/elepal/introductory.html> [Last accessed July 18, 2013].

Leck, M.A. and W. Schutz, 2005. Regeneration of Cyperaceae, with particular reference to seed ecology and seed banks. *Perspectives in Plant Ecology, Evolution and Systematics* 7(2): 95-133.

Moss, E.H., 1983. *Flora of Alberta*. A manual of flowering plants, conifers, ferns, and fern allies found growing without cultivation in the province of Alberta, Canada. 2nd edition. University of Toronto Press, Toronto Ontario. p. 158.



Ogle D., D. Tilley and L. St. John, 2012. Common Spikerush *Eleocharis palustris* (L.) Roem. & Schult. USDA NRCS Plant Guide. 3 pp.

http://plants.usda.gov/plantguide/pdf/pg_elpa3.pdf

[Last accessed December 3, 2013].

Rook, E.J.S., 2002. *Eleocharis palustris* Common Spike Rush. IN: Plants of the North.

<http://www.rook.org/earl/bwca/nature/grass/eleocharis.html> [Last accessed July 18, 2013].

Royal Botanic Gardens Kew, 2008. *Eleocharis palustris* (L.) Roem. & Schult. Seed Information Database.

<http://data.kew.org/sid/SidServlet?ID=8539&Num=6> [Last accessed June 14, 2013].

Shipley, B. and M. Parent, 1991. Germination responses of 64 wetland species in relation to seed size, minimum time to reproduction and seedling relative growth rate. *Functional Ecology* 5: 111-118.

Tannas, K., 1997. Common plants of the western rangelands. Volume 1 – Grasses, grass-like species, trees and shrubs. Lethbridge Community College, Lethbridge, Alberta. 311 pp.

USDA NRCS, n.d. *Eleocharis palustris* (L.) Roem. & Schult. common spikerush. The PLANTS Database. National Plant Data Center, Baton Rouge, Louisiana.

<http://plants.usda.gov/core/profile?symbol=ELPA3> [Last accessed June 24, 2013].

