



Best Survey Period



Status: State special concern

Global and state rank: G4/S3

Other common names: black-fruit spike-rush, spike-rush

Taxonomy: This species is placed within *Eleocharis* subgenus *Eleocharis*, the largest of the four subgenera delineated in the genus (Flora of North America 2003).

Range: *E. melanocarpa* is largely restricted to the Atlantic Coastal Plain and Gulf Coast, ranging from Massachusetts to Texas. It is notably disjunct in the Midwest generally around the southern region of Lake Michigan. This species is considered rare in Alabama, Delaware, Georgia, Indiana, Maryland, Mississippi, New Jersey, New York, North Carolina, Rhode Island, Texas, and Virginia (NatureServe 2006).

State distribution: Back-fruited spike-rush occurs in 13 Michigan counties, largely in southwestern Lower Michigan, ranging from Mason and Lake counties in the north to Berrien, Cass, and St. Joseph counties at the southern end of its state range. Of the more than 50 occurrences documented, the primary counties in which this species is concentrated are Allegan (13 localities), Newaygo (9 localities), Kent (6 localities), and Muskegon (6 localities), with from 1-4 localities

known from the remaining counties in the distribution shown above.

Recognition: *Eleocharis melanocarpa* is a clump forming spike-rush, sometimes growing in dense tufts. The clumped, **strongly flattened to somewhat wiry stems, which have basal sheaths with a minute tooth at the summit**, range to about **20 cm or more in height**, and terminate in a single elliptic spike with brownish scales. Voss (1972) notes that the stems tend to arch over and tip root to form new plants, similar to the well-known growth pattern of a common spike-rush, *E. rostellata*. The fruit is a **shiny, dark brown to blackish achene that is three-sided (trigonal)** and topped with a **pale, flattened cap (tubercle) of equal width**. The minute perianth bristles — which can be observed with a hand lens — arise from the base of the achene, and **are shorter than or barely reach the summit of the achene but do not exceed it**.

The combination of characters, especially the flattened stem, toothed sheath, and distinctive achene, makes it unlikely to confuse this spike-rush with another species. Although *E. rostellata* is similar in growth habit as noted above (and usually occurs in more alkaline habitats), its sheaths are truncate and untoothed, and thus *E. melanocarpa* can be distinguished from *E. rostellata* even when sterile or otherwise lacking mature achenes.



Best survey time/phenology: This species occurs in wetlands with seasonally fluctuating water tables, and usually is dependent on annual drawdowns for emergence from the seed bank. Observations and collections of this species range from as early as late June through October. Based on occurrence data, the most reliable survey period ranges from about mid-July to mid-October, with some flexibility based on local conditions on either end of the indicated optimal survey period.

Habitat: Black-fruited spike-rush grows most frequently on moist to dry, peaty-sands on the shores of inland seepage lakes and ponds comprising what is known in Michigan as a coastal plain marsh community (see related MNFI natural community abstract). Pierce (1974) reported it consistently from mineral sand above normal high-water lines, corroborating the wide-ranging observations of others, though some collections are from mucky, organic sand. This species typically occurs in coastal plain marshes with a diverse association of rare coastal plain disjuncts and many common indicator species, several of which are known as disjuncts as well. Frequent associates include such indicator species as *Rhynchospora capitellata* (beak-rush), *Aster dumosus* (bushy aster), *Stachys hyssopifolius* (hedge hyssop), *Panicum rigidulum* (panic grass), *Euthamia remota* (flat-topped goldenrod), *Viola lanceolata* (lance-leaved violet), *Eleocharis robbinsii* (Robbins' spike-rush), *Spartina pectinata* (prairie cordgrass), *Rotala ramosior* (tooth-cup), *Juncus biflorus* (two-flowered rush), and such rare associates such as *Rhexia virginica* (meadow beauty), *Rhynchospora macrostachya* (large beak-rush), *R. scirpoides* (beak-rush), *Scleria triglomerata* (nut-rush), *Schoenoplectus hallii* (Hall's bulrush), *Hemicarpha micrantha* (dwarf bulrush), and *Eleocharis tricostata* (spike-rush), among many additional rarities.

Biology: *E. melanocarpa* is a perennial and produces mature achenes from approximately late July through August. Its stems often arch and root at the tips, especially where plant competition is sparse (Hanes 1947). Because in part it is a perennial, the annual abundance of this species is not as strongly influenced by water table and lakeshore fluctuations as other coastal plain disjuncts, many of which are annuals and depend on seasonal and yearly drawdowns for emergence and growth.

Conservation/management: The habitat of this species is particularly vulnerable to lakeshore

development, and several stations have been thus destroyed or seriously disturbed. Conservation efforts should focus on preventing damage to the best remaining populations. Fortunately, many of the state's localities for this species lie on small, shallow, peaty lakes or ponds with relatively low development value or occur on public lands, both state and federal. One exemplary tract lies partially within a Michigan Nature Association sanctuary. Another large coastal plain marsh complex with this species in southwestern Lower Michigan is protected and managed within a Nature Conservancy preserve. Additional threats to sites include ORV use, the application of herbicides in lakes to control both native and non-native aquatic plant growth, and activities such as dredging and filling without permits by private landowners attempting to "improve" marshy habitats for swimming, fisheries, and other recreational uses.

Comments: The discovery of black-fruited spike-rush by Hill (1894) in Indiana was the first documentation of this disjunct species in the Great Lakes area.

Research needs: There is a considerable literature on coastal plain marshes, their origins, and their significance, including the Atlantic disjunct flora (e.g. Reznicek 1994 Peattie 1922) yet the life history of many species associated with this community is poorly known. The flora of coastal plain marshes is generally well documented owing to the longstanding and particular interest of botanists and ecologists in this community type, but there are few long term monitoring studies in Michigan and little specific research on the natural history of many of the species of this habitat. An understanding of population structure and diversity, including genetic studies, coupled with ecological monitoring, would begin to provide the information to assist in the management and long-term conservation of coastal plain marshes and their rare flora.

Related abstracts: Coastal plain marsh, intermittent wetland, northern appressed clubmoss, meadow-beauty, Hall's bulrush, few-flowered nut-rush, zig-zag bladderwort, American bittern, Eastern massasauga, Marsh wren, Spotted turtle



Selected references:

- Flora of North America Editorial Committee. 2002. Flora of North America, North of Mexico. Volume 23: *Magnoliophyta: Commelinidae (in part): Cyperaceae*. Oxford Univ. Press. New York, N.Y. 608 pp.
- Hanes, C. R. 1947. Observations on the habitats of some of the native plants of Kalamazoo County, Michigan. Pap. Mich. Acad. 31: 25-31.
- Hill, J.J. 1894. *Eleocharis melanocarpa* a proliferous plant. Bull. Torr. Bot. Club. 25: 392-394.
- NatureServe. 2006. NatureServe Explorer: an online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: December 15, 2006).
- Peattie, D.C. 1922. The Atlantic coastal plain element in the flora of the Great Lakes. Rhodora 24: 57-70, 80-88.
- Pierce, G. J. 1974. The coastal plain floristic element in Michigan. M.S. thesis, Western Michigan University.
- Reznicek, A.A. 1994. The disjunct coastal plain flora in the Great Lakes region. Biol. Cons. 68: 203-215.
- Svenson, H. K. 1937. Monographic studies in the genus *Eleocharis*. IV. Rhodora 39: 269-271.
- Voss, E. G. 1972. Michigan Flora. Part I. Gymnosperms and Monocots. Bull. Cranbrook Inst. Sci. 55 and Univ. of Michigan Herbarium. xv + 488 pp.

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