

SCHOENOPLECTUS HALLII (CYPERACEAE),
A GLOBALLY THREATENED SPECIES NEW FOR TEXAS

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ABSTRACT

Schoenoplectus hallii (A. Gray) S. Galen Smith. Hall's bulrush, has been discovered in the Lyndon B. Johnson National Grasslands, Wise County, Texas. Previous reports of this species in Texas were based on misidentified specimens, and the current report apparently represents the first record for the state.

RESUMEN

Schoenoplectus hallii (A. Gray) S. Galen Smith, ha sido descubierto en los Lyndon B. Johnson National Grasslands, Wise County, Texas. Las citas Previas de esta especie en Texas estaban basadas en especímenes mal identificados, y la presente cita es aparentemente la primera para el estado.

Schoenoplectus hallii (A. Gray) S. Galen Smith, Hall's bulrush, has been discovered during an extensive floristic survey of the Lyndon B. Johnson National Grasslands (LBJGL), 15.6 km north of Decatur, Wise County, Texas. The LBJGL are managed by the U.S. National Forest Service and comprise numbered "units" scattered throughout much of north-central Wise County. *Schoenoplectus hallii* grows in Unit 66 primarily along the moist sandy-clay margins of three small ponds that merge during periods of high water. The populations are approximately 100 meters apart and comprise about two hundred individuals each.

Specimens of *Schoenoplectus hallii* were collected in May 2003 through April 2004 and their identity was confirmed by Galen Smith of the University of Wisconsin. Earlier reports of the species in Texas (Correll & Johnston 1970; Hatch et al. 1990) and various herbarium vouchers (later correctly annotated) were based on misidentifications of *S. saximontanus* (Fern.) Raynal and *S. erectus* (Poir.) Palla ex Raynal (Schuyler 1969, Smith 1995). Because *S. hallii* had not been confirmed for Texas, it was not included in the recently published Illustrated Flora of North Central Texas (Diggs et al. 1999). Smith (2002) reported the occurrence of the species in Georgia, Illinois, Indiana, Kansas, Kentucky, Massachusetts, Michigan, Missouri, Oklahoma, and Wisconsin.

Schoenoplectus hallii (A. Gray) S. Galen Smith, Novon 5:101. 1995. *Scirpus hallii* A. Gray; *Scirpus supinus* L. var *hallii* (A. Gray) A. Gray.

Voucher specimens. **TEXAS. Wise Co.:** Along margin of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 12", W097° 32' 28", 17 May 2003, O'Kennon and McLemore 18344 (BRIT,

WIS); Along margin of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 12", W097° 32' 28", 23 August 2003, *O'Kennon and McLemore*, 18853 (BRIT); Along margin of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 15", W097° 32' 26", 29 August 2003, *O'Kennon and McLemore*, 18892 (BRIT, WIS); Along margin of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 12", W097° 32' 27", 3 Oct 2003, *O'Kennon and McLemore*, 19070 and 19071 (BRIT) Along margin of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 12", W097° 32' 28", 1 Nov 2003, *O'Kennon and McLemore*, 19141 and 19142 (BRIT); Submerged plants at bottom of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 15", W097° 32' 26", 19 Dec 2003, *O'Kennon and McLemore* 19180 (BRIT); Submerged plants at bottom of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 15", W097° 32' 26", 23 Jan 2003, *O'Kennon and McLemore* 19191 (BRIT); Submerged plants at bottom of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 15", W097° 32' 26", 28 Feb 2004, *O'Kennon and McLemore* 19197 (BRIT); Submerged plants at bottom of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 15", W097° 32' 26", 17 Mar 2004, *O'Kennon and McLemore* 19223 (BRIT); Emergent plants at bottom of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 15", W097° 32' 26", 9 Apr 2004, *O'Kennon and McLemore* 19256 (BRIT); Muddy pond margin (previously submerged) in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 15", W097° 32' 26", 21 Apr 2004, *O'Kennon and McLemore* 19279 (BRIT); Muddy pond margin (previously submerged since Sept. 2003) in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 15", W097° 32' 26", 21 Apr 2004, *O'Kennon and McLemore* 19290 (BRIT); Seedling along margin of pond in Unit 66 of the Lyndon B. Johnson National Grasslands, N33° 22' 15", W097° 32' 26", 21 Apr 2004, *O'Kennon and McLemore* 19291 (BRIT). Duplicates to be distributed.

Identification of the Texas plants.—The following key to species of *Schoenoplectus* sect. *Supini* in Texas is modified from Smith (2002). *Schoenoplectus hallii* found elsewhere are usually annual, but in Texas many perennial plants have been observed.

1. Achenes in spikelets nearly equilaterally sharply trigonous; styles all 3-fid; from pan-handle to central and far south Texas _____ ***Schoenoplectus saximontanus***
1. Achenes in spikelets biconcave to plano-convex or obscurely compressed-trigonous; styles 2-fid or a few 3-fid.
 2. Achenes adaxially longitudinally convex or horizontally slightly convex with convex center; spikelet scale flanks often distally orange- or red-brown; in Texas known only from south coastal counties inland to Atascosa Co. _____ ***Schoenoplectus erectus***
 2. Achenes adaxially concave or sometimes nearly plane; spikelet scale flanks pale orange to nearly colorless; known from one site in north central Texas ___ ***Schoenoplectus hallii***

Habitat of the Texas plants.—*Schoenoplectus hallii* has a narrow habitat tolerance (Beatty et al. 2004). Although it is found in various soil types in other states, in Texas it is found along widely fluctuating margins of small sandy clay ponds where conditions apparently are more suitable for *S. hallii* than for many of its associates (Schuyler 1969). Many plant species occur with *S. hallii* in Texas (Table 1). These associates appear and disappear throughout the year as water levels fluctuate, but *S. hallii* can be found along pond margins from April to December. It is most closely associated nearly year-round with the rare *Pilularia americana* (Marsiaceae). During periods of normal water levels *P. americana*

TABLE 1. Species associated with *Schoenoplectus hallii* in Texas, ranked by abundance.

<i>Pilularia americana</i> A. Braun	<i>Veronica peregrina</i> L. var. <i>xalapensis</i> (Kunth) Pennell
<i>Eleocharis obtusa</i> (Willd.) J.A. Schultes	<i>Ludwigia glandulosa</i> Walter
<i>Rotala ramosior</i> (L.) Koehne	<i>Heteranthera limosa</i> (Sw.) Willd.
<i>Cyperus acuminatus</i> Torr. & Hook. ex Torr.	<i>Eleocharis atropurpurea</i> (Retz.) J. & K. Presl
<i>Fimbristylis vahlilii</i> (Lam.) Link	<i>Potamogeton diversifolius</i> Raf.
<i>Ludwigia peploides</i> (Kunth) Raven	<i>Cyperus retrorsus</i> Chapm. var. <i>cylindricus</i> (Ell.) Fern. & Grisc.
<i>Ammannia coccinea</i> Rottb.	<i>Cyperus squarrosus</i> L.
<i>Eleocharis palustris</i> (L.) Roem. & Schult.	<i>Panicum rigidulum</i> Nees
<i>Fuirena simplex</i> Vahl	<i>Juncus texanus</i> (Engelm.) Coville
<i>Eleocharis quadrangulata</i> (Michx.) Roem.	<i>Echinodorus berteroi</i> (Spreng.) Fassett
<i>Lindernia dubia</i> (L.) Pennell var. <i>anagallidea</i> (Michx.) Cooperider	<i>Juncus diffusissimus</i> Buckl.
<i>Eleocharis coloradoensis</i> (Britt.) Gilly	<i>Spirodela polyrhiza</i> (L.) Scheid.
<i>Callitriche heterophylla</i> Pursh	<i>Limnoscadium pinnatum</i> (DC.) Mathias & Constance
<i>Ammannia robusta</i> Heer & Regel	<i>Anagallis minima</i> (L.) Krause
<i>Eleocharis engelmannii</i> Steud	<i>Marsilea vestita</i> Hook. & Grv
<i>Najas guadalupensis</i> (Spreng.) Magnus	

is a submergent and can be conspicuous just below the surface around the entire margin of the pond. However, during periods of extended drawdown it becomes a marginal plant. The ponds occur in the West Cross Timbers of north central Texas at an elevation of 254 meters.

During the first year of our LBJGL survey, twelve other species undocumented for Texas, in addition to *S. hallii*, were discovered (O'Kennon et al. 2003; O'Kennon & McLemore in prep.). We believe that this probably reflects previous undercollecting rather than particularly unique habitats in this area.

Overall distribution.—*Schoenoplectus hallii* is a globally threatened species (Nature Conservancy ranking of G-2) known recently from only 8 states and fewer than 100 sites in the U.S.A. Texas Parks and Wildlife Department has assigned a ranking of S-1 (critically imperiled) for the species (Jackie Poole, pers. comm.), based on the discovery in Wise County. The closest populations of *S. hallii* to the Wise Co. populations are in Comanche Co., Oklahoma, about 190 kilometers northwest.

Prior to 1973, *Schoenoplectus hallii* was reported in 9 states, 15 counties, and 29 sites. During 1973–1997, it was reported in 8 states, 17 counties, and 46 sites. During 1993–1997, it was reported in only 6 states, 11 counties, and 37 sites (McKenzie 1998). Since not all sites are being monitored each year, it is difficult to ascertain the actual number of existing populations.

Plants in Massachusetts have not been seen since 1931 and are considered extirpated. *Schoenoplectus hallii* has not been collected in Georgia since 1966. It has not been confirmed in Iowa since 1890. There is a record from Iowa from 1960, but that specimen has not been seen nor confirmed (McKenzie 1998). Populations in these states are considered "possibly extirpated."

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