Conservation Assessment for Featherbells (Stenanthium gramineum)

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This Conservation Assessment was prepared to compile the published and unpublished information and serves as a Conservation Assessment for the Eastern Region of the Forest Service. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the

subject community, please contact the Eastern Region of the Forest Service - Threatened and Endangered Species Program at 310 Wisconsin Avenue, Suite 580 Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

Barrens and glades occur at scattered sites on the Hoosier and Shawnee National Forests, and are found widely on the Mark Twain National Forest. Expressions of the barrens community on National Forest System lands are currently recognized on the Hoosier at a few sites within the Brown County Hills and the Crawford Escarpment, and at several sites in the Crawford Uplands. On the Shawnee, barrens are found as small remnants in the Cretaceous Hills, and the Greater Shawnee Hills, Lesser Shawnee Hills, and the Illinois Ozarks have more and somewhat larger communities. Barrens and glades are often large within most of the natural divisions found on the Mark Twain.

Barrens are characterized by species of canopy trees tolerant of xeric conditions having a stunted, open-grown appearance, the dominance of native warm-season grasses and prairie forbs, and, in glades, significant exposures of bedrock. The mix of plants and animals inhabiting these sites varies with the canopy openness, internal structure of the stands, slope, aspect, and other less tangible variables. The barrens is an ecosystem, not merely a hole in the forest filled with prairie plants.

The purpose of this assessment is to bring together the best available information about

this community, provide a summary of the character and distribution of barrens across the three Forests, and provide similar information about six RFSS found in this habitat. An additional purpose is to provide the background information necessary to prepare a Conservation Strategy, including management actions to conserve species discussed in this assessment.

(Barrens and glades conservation assessment)

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NOMENCLATURE AND TAXONOMY

Stenanthium gramineum (Ker) Morong, Mem. Torrey Club 5:110. 1894.

Synonyms include the following:

Helonias graminea Ker (Gawler), Bot. Mag. pl. 1599. 1813.
Stenanthella occidentalis (Gray) Rydb.
Stenanthium angustifolium (Pursh) Kunth, Enum. 4:190. 1843.
Stenanthium robustum Wats. Proc. Am. Acad. 14:278. 1879.
Stenanthium gramineum var. *typicum* Fern. Rhodora 48:151. 1946.
Stenanthium gramineum (Ker Gawl.) Morong. var. *gramineum* (Yatskievych 1999).
Veratrum angustifolium Pursh, Fl. Am. Sept. 242. 1814.
Veratrum (subgen. *Stenanthium*) *angustifolium* (Pursh) Gray. Ann. Lyc. N. Y. 4:120. 1837.
Xerophyllum gramineum (Ker) Nutt. Gen. 236. 1818.

The most widely used vernacular name for *S. gramineum* is featherbells, however, several other common names are used including the following: grass-leaved lilly

(Mohlenbrock 1986), Eastern Featherbells (Yatskievych 2000), and Featherfleece (Newcomb 1977, Small 1933).

Stenanthium is classified by most botanists as a member of Liliaceae, which is comprised of almost 300 genera and over 4,000 species globally (Gleason and Cronquist 1991). However, Liliaceae is so widespread, diverse, and taxonomically complex that there are numerous classifications (Yatskievych 1999). Some botanists separate the Liliaceae into two families: species with superior ovaries are placed into Liliaceae, including *Stenanthium*, and members with inferior ovaries are classified as Amaryllideaceae (Voss 1972). Dahlgren *et al*. (1985 *in* Yatskievych 1999) delineates 14 families. Dahlgren *et al*. (1985 *in* Yatskievych 1999) classifies *Stenanthium* along with four other genera (*Amianthum*, *Melanthium*, *Veratrum*, and *Zigadenus*) into Melanthiaceae (Yatskievych 1999).

DESCRIPTION OF SPECIES

Small, white flowers with slender, pointed star-like petals and sepals hang downward in a many-flowered branched inflorescence that resembles a long, feathery plume. The tepals are up to four times longer than wide. The pedicels are shorter than the flowers. Flowers on lateral branches are mostly staminate, whereas those in the main or terminal spike are perfect. Most of the slender leaves (over 30cm long) are at the base of the 1.8m flower stalk and are slightly folded along the midvein. The stem is smooth. This description was compiled from Grimm 1993, Hunter 1984, Justice and Bell 1968, Newcomb 1977, Peterson and McKenny 1968, Smith 1998, and Yatskievych 2000. For a complete species description, see Appendix IV.

Deam (1940) originally recognized two separate species of *Stenanthium*, *i.e*., *S. gramineum* and *S. robustum*. However, *Stenanthium* is classified by most taxonomists as a monotypic genus (Mohlenbrock 1970, Mohlenbrock 1986, Voss 1972, Radford *et al*. 1968, Gleason and Cronquist 1991, Grimm 1993, Swink and Wilhelm 1994, Gleason 1963), although some recognize up to three separate varieties: *S. gramineum* var. *gramineum*, *S. gramineum* var. *robustum*, and *S. gramineum* var. *micranthium* (Fernald 1946, Fernald 1950, Smith 1994). Yatskievych (1999) states that intermediates between *S. gramineum* and *S. robustum* have been documented, indicating that the two taxa may not be distinct species or varieties.

If two species or varieties of *Stenanthium* are recognized, then *S. gramineum* (or *S. gramineum* var. *gramineum*) has been distinguished from *S. robustum* (or *S. gramineum* var. *robustum*) by the following characteristics: *S. gramineum* has a white perianth verses the green perianth of *S. robustum* (Small 1933); the capsules n *S. gramineum* are deflexed as opposed to erect (Small 1933, Yatskievych 1999); the capsule is longer in *S. robustum* (in AR 6 to 8mm vs.10mm) (Deam 1940, Smith 1994); *S. robutsum* usually has broader leaves (Deam 1940, Yatskievych 1999); longer floral segments are found in *S. robustum* (in AR perianth is 6 to 8mm vs. 4.0 to 4.5mm) (Deam 1940, Smith 1994); an earlier blooming time for *S. gramineum* in Indiana: June to early July vs. Aug. (Deam 1940); a drier habitat for *S. gramineum* (dry acidic woods and hillsides vs. acidic swamps) (Small 1933); and *S. robustum* was described by Deam (1940) as a plant that

is “larger and more robust in all parts.”

Gleason (1963) stated that the most reliable characteristic was the deflexed capsule and that the other differences were not constant.

Stenanthium has been differentiated from other closely related lilies by the following characteristics: absence of tepal glands (Mohlenbrock 1986, Voss 1972, Yatskievych 1999); a glabrous stem (Yatskievych 1999); pedicels absent or shorter than flowers (Voss 1972, Yatskievych 1999); perianth segments long-acuminate apically (Smith 1994); infloresence a panicle (Gleason 1963, Mohlenbrock 1986, Smith 1994, Voss 1972); ovary with three styles, one on each lobe (Voss 1972); tepals adnate to base of ovary (Fernald 1950); perianth segments greater than or equal to 44mm long (Gleason 1963); plants bulbous (Mohlenbrock 1986); and principally cauline leaves (Fernald 1950, Mohlenbrock 1986).

HABITAT

The habitat of *S. gramineum* is variable but the species often is found in mesic woodlands, especially in connection with a stream or pond, floodplains, and bottomland forests (Mohlenbrock 1970, Mohlenbrock 1986, Gleason 1963, Yatskievych 1999, Natural Land Institute 1981); bogs and marshy areas (Grimm 1993, Voss 1972); and on wet-mesic prairies and at the base of bluffs (Yatskievych 1999). In contrast, Deam (1940) found it on sandy soil in Indiana and Small (1933) found it on dry acidic woods in the southeastern U.S. Although most commonly found in forested areas, it apparently can tolerate sunlight because it has been found on an open oak ridge in Indiana (Deam 1940); thin woods, cut-over woodland borders, and meadows in North Carolina (Radford *et al*. 1968); and wet-mesic prairies in Missouri (Yatskievych 1999). It is most abundant in Missouri on acidic soils (Steyermark 1963).

LIFE HISTORY

Stenanthium gramineum is a polygamous perennial herb. Its flowering period extends from June through September or October.

DISTRIBUTION AND ABUNDANCE

Stenanthium gramineum is found throughout the southeastern U.S., extending into southern Indiana, southern Illinois, and westward to Missouri (Figure 65). It is presumed to be extirpated from the District of Columbia (NatureServe 2001).

In Indiana, *Stenanthium gramineum* is known from six sites (Indiana Department of Natural Resources 2002) (Figure 66). Four of the six extant populations have been discovered since 2000. *Stenanthium gramineum* is scattered in southern Illinois along the northwest margin of its range. It is known from three counties within the Shawnee National Forest and probably one population extends into a state park (Natural Land Institute 1981). According to the Illinois Natural History Survey Database (2002) there

are seven extant populations that occur in six counties (Figure 67). Steyermark (1963) reported *Stenanthium* from 26 counties, primarily within the Ozark region (Figure 68). According to Yatskievych (1999), it currently is found in 18 counties mostly in the Ozark and Osage Plains Natural Division. Yatskievych (1999) reports it from Howell County, although Steyermark (1963) did not. Apparently, it has been extirpated from nine counties in Missouri. Yatskievych (2001) suggested *Stenanthium* should have a listing of at least S4 indicating that the species is secure and has many occurrences in Missouri.

PROTECTION STATUS

The species is ranked as G4G5 indicating that it is widespread, abundant, and apparently secure.

Status by individual states is: Alabama (SR), Arkansas (S3), District of Columbia (SX), Florida (SR), Georgia (SR), Illinois (S1), Indiana (S1), Kentucky (S2S3), Louisiana (S5), Maryland (S1), Michigan (S?), Mississippi (S1S2), Missouri (SR), North Carolina (S3?), Ohio (S2), Oklahoma (S1), Pennsylvania (S1S2), South Carolina (SR), Tennessee (SR), Texas (SR), Virginia (SR), West Virginia (S?) (NatureServe 2002).

It is listed as endangered in Illinois (Illinois Endangered Species Protection Board 1991, Yatskievych 2000) and Indiana (Indiana Department of Natural Resources 2002). Swink and Wilhelm (1994) give it a coefficient of conservatism of 10, which indicates it is an important presettlement indicator species. Ladd (2000) stated that in Missouri it has a coefficient of 6, but suggested it may be underrated.

REFERENCES

Deam, C.C. 1940. Flora of Indiana. W. B. Burford Printing, Inc. Indianapolis, IN. 1236 pp.

Fernald, M.L. 1946. *Stenanthium* in the eastern United States. Rhodora 48:148-152.

Fernald, M.L. 1950. Gray's manual of botany, 8th ed. American Book Co. New York. 1632 pp.

Gleason, H.A. 1963. The new Britton and Brown illustrated flora of the northeastern U. S. and adjacent Canada, Vol I. Hafner Pub. Co, Inc. New York. 595 pp.

Gleason, H.A., and A. Cronquist. 1991. Manual of vascular plants of northeastern U. S. and adjacent Canada, 2nd ed. New York Botanical Garden. Bronx, NY. 910 pp.

Grimm, W.W. 1993. The illustrated book of wildflowers and shrubs, revised and updated by J. T. Kartesz. Stackpole Books. Harrisburg, PA. 637pp.

Hunter, C.G. 1984. Wildflowers of Arkansas. The Ozark Society Foundation. Little Rock, AR. 296 pp.

Illinois Endangered Species Protection Board. 1999. Checklist of endangered and threatened animal and plants of Illinois. Illinois Dept. of Natural Resources. Springfield. 19 pp.

Illinois Natural History Survey Database. 2002. Urbana, IL.

Indiana Department of Natural Resources. 2002. Division of Nature Preserves Database. Indianapolis, IN.

Justice, W.S., and C.R. Bell. 1968. Wildflowers of North Carolina. University of North Carolina Press. Chapel Hill. 217 pp.

Ladd, D. 2000. Personal communications. The Nature Conservancy. St. Louis, MO.

Mohlenbrock, R.H. 1970. The illustrated flora of Illinois: Flowering plants: lilies to orchids. Southern Illinois University Press. Carbondale. 288 pp.

Mohlenbrock, R.H. 1986. Guide to the vascular flora of Illinois. Southern Illinois University Press. Carbondale, IL. 507 pp.

Natural Land Institute. 1981. Endangered and threatened vertebrate animals and vascular plants of Illinois. Illinois Department of Conservation. Springfield. 189 pp.

NatureServe Explorer: An online encyclopedia of life [web application]. 2001. Version 6.1. Arlington, VA, USA: NatureServe. Available: http://www.natureserve.org/explorer . Accessed July 11, 2002.

Newcomb, L. 1977. Newcomb's wildflower guide. Little, Brown, and Co. Boston. 490 pp.

Olson, S. 1999. Regional forester sensitive species risk evaluation for *Stenanthium gramineum*. Hoosier National Forest. Tell City, IN.

Peterson, R.T., and M. McKenny. 1968. Northeastern wildflowers. The Easton Press. Nowalk, CT. 420 pp.

Radford, A.E., H.E. Ahles, and C.R. Bell. 1968. Manual of the vascular flora of the Carolinas. University of North Carolina Press. Chapel Hill. 1183 pp.

Small, J.K. 1933. Manual of the southeastern flora. Science Press Printing Co. Lancaster, PA. 1554 pp.

Smith, E. 1994. Keys to the flora of Arkansas. University of Arkansas Press. Fayetteville. 363 pp.

Smith, R.M. 1998. Wildflowers of the southern mountains. University of Tennessee Press. Knoxville. 262 pp.

Steyermark, J.A. 1963. Flora of Missouri. Iowa State University Press. Ames, IA. 1725 pp.

Swink, F., and G. Wilhelm. 1994. Plants of the Chicago region. Southern Illinois University Press. Carbondale. 921 pp.

Voss, E.G. 1972. Michigan flora, part I: Gymnosperms and monocots. Cranbrook Institute of Science. Bloomfield Hills, MI. 488 pp.

Yatskievych. G. 1999. Steyermark's flora of Missouri, Vol I, revised ed. Missouri Botanical Garden Press. St. Loius. 991 pp.

Yatskievych, G. 2001. Personal communications. Missouri Botanical Gardens. St. Louis, MO.

Yatskievych, K. 2000. Field guide to Indiana wildflowers. Indiana University Press. Bloomington. 357 pp.