

1991

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Recommended Citation

Walker, Stephen A. and Johnson, George P. (1991) "Survey and Annotated Checklist of the Later Summer Flora of the Moist Soil Units at Holla Bend National Wildlife Refuge," *Journal of the Arkansas Academy of Science*: Vol. 45 , Article 34.
Available at: <http://scholarworks.uark.edu/jaas/vol45/iss1/34>

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A SURVEY AND ANNOTATED CHECKLIST OF THE LATE SUMMER FLORA OF THE MOIST SOIL UNITS AT HOLLA BEND NATIONAL WILDLIFE REFUGE

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ABSTRACT

We conducted a floristic survey of 22 moist soil units at Holla Bend National Wildlife Refuge during September and October of 1990. The moist soil units range in size from 0.4 to 9.7 ha and are depressions manipulated to provide food and shelter for waterfowl. In total, 60 taxa representing 24 families and 42 genera were identified and are compiled into an annotated checklist. The flora was dominated by the following families and genera in decreasing order of importance: Asteraceae (*Xanthium*), Polygonaceae (*Polygonum*), and Amaranthaceae (*Amaranthus*). The Poaceae and the Cyperaceae were well represented, but were of lesser importance. Twenty-three of the collections represent new records for Pope County and voucher specimens have been placed in the Arkansas Tech University Herbarium (APCR). The checklist and abundance data will benefit Refuge personnel in management of the units.

INTRODUCTION

Holla Bend National Wildlife Refuge is located along the Arkansas River about 8 km southeast of Dardanelle, Arkansas in Pope and Yell counties. In the early 1900s, over 65 families resided in the area and farmed the rich bottomland soil. A disastrous flood inundated the area in 1927; that event and subsequent floods deposited up to four feet of sand and the land was abandoned.

The 2547 ha refuge was formed when the Corps of Engineers cut a new channel across an oxbow and transferred the land to the U.S. Fish and Wildlife Service in 1957. Farming acreage was cleared and soil conservation practices were begun, but the soils remain very sandy and drought-prone. Cropland manipulation is the current management tool on the refuge which consists of one-half cropland and one-half woodlands and water. The purposes of the refuge are to provide the following: habitat for wintering waterfowl; habitat for endangered species; habitat for resident wildlife; and interpretation and recreation for the public.

We conducted a survey of the moist soil units on the refuge to provide the U.S. Fish and Wildlife Service with a listing of plants and to estimate the abundance of each species. Within the study area, a secondary objective was to determine which of these plants, if any, are known to be of benefit to waterfowl.

A moist soil unit (MSU) is a depression on a non-wooded area that can hold standing water at least temporarily. Water levels vary with precipitation and most MSUs are not permanently wet, although a few are intentionally flooded during the winter months for the benefit of the waterfowl. Most of the MSUs are periodically cultivated.

METHODS

The first author made weekly collections from 22 of the 29 MSUs during September and October of 1990. Seven of the units were returned to cultivation before collecting began. In addition to general collections, plots of 1 m² were randomly sampled to estimate species abundance. Voucher specimens have been placed in the Arkansas Tech University Herbarium (APCR).

References used extensively for plant identification, nomenclature, and distribution data were: Steyermark (1963); Radford *et al.* (1968); Godfrey and Wooten (1979); Cronquist (1980); Godfrey and Wooten (1981); Smith (1988); and Isely (1990). Waterfowl usage of plants was determined by consulting Martin *et al.* (1961) and Ocean Data Systems (1978).

RESULTS

We have compiled a checklist of 60 taxa representing 24 families and 42 genera from the collections of the first author. Families with the largest number of species in the flora were the Poaceae (12 species), Cyperaceae (9 species), Asteraceae (5 species), Polygonaceae (4 species), and the Amaranthaceae (4 species). The largest genera in the flora include *Cyperus* (5 species) and *Polygonum* (4 species).

The Poaceae and the Cyperaceae are the dominant families and *Cyperus* and *Polygonum* are the dominant genera of the MSUs with respect to the number of taxa. But, in number of plants, the MSU flora is dominated by *Xanthium strumarium* (25%), *Polygonum* spp. (16%) and *Amaranthus* spp. (12%). The flora of the MSUs depends on management practice, precipitation and the opportunistic nature of the plants.

Not surprisingly, the flora of the MSUs consists of many "weedy" species due to the nature of the area. Although many of the plants are common and of widespread distribution, our collections include 23 additions to the known flora of Pope County, as indicated by Smith (1988).

ANNOTATED CHECKLIST

The checklist is arranged alphabetically according to family, genus, species and variety to facilitate use by interested individuals. Family concepts follow Cronquist (1988) and nomenclature follows Smith (1988) except where noted.

Entries have the following format: taxon name, author, vernacular name (when available) and an indication if the collection represents a new record for Pope County (NR). Lastly, the collection number of the first author is given which may be followed by notes on nomenclature, wildlife usage or distribution data.

ALISMATACEAE

Sagittaria latifolia Willd.; Arrowhead; NR; 288; only seeds and corms are utilized by waterfowl (Martin *et al.*, 1961).

AMARANTHACEAE

Amaranthus rudis Sauer; Water Hemp; 239.

A. tuberculatus (Moq.) Sauer; Water Hemp; NR; 223.

Amaranthus sp.; 279.

Froelichia floridana (Nutt.) Moq. var. *campestris* (Small) Fern.; Cottonweed; 266.

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APOCYNACEAE

Trachelospermum difforme (Walt.) Gray; Climbing Dogbane; 252.

ASTERACEAE

Ambrosia trifida L.; Giant Ragweed; 318.

Aster lanceolatus Willd. (incl. *A. simplex* Willd.) Tall White Aster; 235.

Eclipta alba (L.) Hassk.; Yerba de Tajo; 219; nomenclature follows Cronquist (1980).

Solidago rupestris Raf.; Goldenrod; 257; nomenclature follows Cronquist (1980).

Xanthium strumarium L.; COCKLEBUR; 203.

BORAGINACEAE

Heliotropium indicum L.; Indian Heliotrope; 322.

BRASSICACEAE

Rorippa palustris (L.) Besser subsp. *glabra* (O.E. Schultz) Stuckey var. *fernaldiana* (Butt. & Abbe) Stuckey; Marsh Yellow Cress; 250.

CAESALPINIACEAE

Chamaecrista fasciculata (Michx.) Greene; Partridge Pea; 259; nomenclature follows Isely (1990).

Senna obtusifolia (L.) Irwin & Barmeby; Sicklepod; 309; nomenclature follows Isely (1990).

CYPERACEAE

Cyperus aristatus Rottb.; NR; 311.

C. erythrorhizos Muhl.; Redroot Flatsedge; NR; 217.

C. esculentus L.; Yellow Nutsedge; NR; 245; only rhizomes are utilized by waterfowl (Ocean Data Systems, 1978).

C. iria L.; Umbrella Sedge; NR; 229.

C. odoratus L.; NR; 267V.

Eleocharis microcarpa Torr.; NR; 227; only seeds and rhizomes are utilized by waterfowl (Martin *et al.*, 1961); this collection represents a significant expansion to the known distribution in Arkansas indicated by Smith (1988).

E. obtusa (Willd.) Schultes; Blunt Spike Rush; NR; 314; only seeds and rhizomes are utilized by waterfowl (Martin *et al.*, 1961).

Eleocharis sp.; 287; only seeds and rhizomes are utilized by waterfowl (Martin *et al.*, 1961).

Fimbristylis sp.; 293.

EUPHORBIACEAE

Acalypha rhomboidea Raf.; Three-seeded Mercury; 301.

Euphorbia maculata L.; Nodding Spurge; 285.

E. supina Raf.; Milk Purslane; 238.

FABACEAE

Sesbania exaltata (Raf.) Cory; Hemp Sesbania; 299; nomenclature follows Isely (1990); only seeds are utilized by waterfowl (Ocean Data Systems, 1978).

LAMIACEAE

Hedeoma pulegioides (L.) Pers.; Pennyroyal; 255.

LYTHRACEAE

Ammannia x coccinea Rottb.; Purple Ammannia; 212.

MALVACEAE

Sida spinosa L.; Prickly Sida; 262.

MOLLUGINACEAE

Mollugo verticillata L.; Carpet-weed; 261.

NYMPHAEACEAE

Nelumbo lutea (Willd.) Pers.; American Lotus; NR; 230; only seeds and roots are utilized by waterfowl (Martin *et al.*, 1961).

ONAGRACEAE

Ludwigia decurrens Walt.; Primrose Willow; NR; 224.

L. peploides (H.B.K.) Raven subsp. *glabrescens* (Kuntze) Raven; Floating Primrose Willow; 284.

Oenothera sp.; 316.

POACEAE

Brachiaria platyphylla (Griseb.) Nash; Signalgrass; NR; 209; significant expansion of known distribution (Smith, 1988).

Digitaria filiformis (L.) Koel. var. *filiformis*; Slender Crabgrass; 295.

D. sanguinalis (L.) Scop.; Hairy Crabgrass; NR; 277.

Echinochloa crusgalli (L.) Beauv.; Barnyard Grass; 204; only seeds are utilized by waterfowl (Ocean Data Systems, 1978).

E. muricata (Beauv.) Fern.; Barnyard Grass; NR; 306.

Hordeum pusillum Nutt.; Little Barley; 255.

Leptochloa fascicularis (Lam.) A. Gray; Bearded Sprangletop; NR; 247; significant expansion of known distribution (Smith, 1988).

L. uninervia (Presl) H. & C.; Mexican Sprangletop; NR; 210; significant expansion of known distribution (Smith, 1988).

Paspalum paspaloides (Michx.) Scribn.; Knotgrass; NR; 289; significant expansion of known distribution (Smith, 1988); only seeds are utilized by waterfowl (Martin *et al.*, 1961).

Setaria geniculata (Lam.) Beauv.; Knotroot Bristlegrass; 252; only seeds are utilized by waterfowl (Ocean Data Systems, 1978).

Sorghum halepense (L.) Pers.; Johnson Grass; 321; only seeds are utilized by waterfowl (Ocean Data Systems, 1978).

Sphenopholis obtusata (Michx.) Scribn.; Prairie Wedgescale; 244.

POLYGONACEAE

Polygonum densiflorum Meisn.; Smartweed; NR; 221; only seeds are utilized by waterfowl (Martin *et al.*, 1961).

P. hydropiperoides Michx.; Wild Water Pepper; 213; only seeds are utilized by waterfowl (Martin *et al.*, 1961).

P. lapathifolium L.; Pale Smartweed; NR; 211; only seeds are utilized by waterfowl (Martin *et al.*, 1961).

P. pennsylvanicum L. var. *laevigatum* Fern.; Pinkweed; NR; 207; only seeds are utilized by waterfowl (Martin *et al.*, 1961).

P. pennsylvanicum L. var. *pennsylvanicum*; Pinkweed; NR; 206; only seeds are utilized by waterfowl (Martin *et al.*, 1961).

ROSACEAE

Rubus sp.; 286.

SAPINDACEAE

Cardiospermum halicababum L.; Balloon Vine; 236.

SCROPHULARIACEAE

Conoclea multifida (Michx.) Benth.; 254.

SOLANACEAE

Physalis angulata L.; Ground Cherry; NR; 225.

P. longifolia Nutt.; Ground Cherry; 310.

URTICACEAE

Pilea pumila (L.) A. Gray; Clearweed; NR; 302.

VITACEAE

Ampelopsis arborea (L.) Koehne; Pepper Vine; 258.

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ACKNOWLEDGMENTS

This project was supported by the U.S. Fish and Wildlife Service, and we greatly appreciate their support. Special thanks are due to Ms. Mindy Hetrick and Mr. Martin Perry of the Service. We also thank Arkansas Tech University for its support.

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