

VASCULAR FLORA OF A SALINE PRAIRIE IN WINN PARISH, LOUISIANA

Barbara R. MacRoberts
and Michael H. MacRoberts

*Bog Research, 740 Columbia
Shreveport, Louisiana 71104, U.S.A.
Herbarium, Museum of Life Sciences P.O. Box 98000
Louisiana State University-Shreveport
Shreveport, Louisiana 71115, U.S.A.*

Christopher S. Reid
and Patricia L. Faulkner

*Louisiana Natural Heritage Program
Louisiana Department of Wildlife and Fisheries
Baton Rouge, Louisiana 70898-9000, U.S.A.*

ABSTRACT

We describe the vascular flora of a saline prairie in Winn Parish, Louisiana. The prairie contains 59 species of which three are federal and/or state rare. While saline prairies are a distinct and rare community, they show certain similarities to other West Gulf Coastal Plain plant communities, notably sandstone outcrops and barrens.

RESUMEN

Se describe la flora vascular de una pradera salina en Winn Parish, Louisiana. La pradera contiene 59 especies de las que tres son raras en el estado. Mientras que las praderas salinas son una comunidad diferente y rara, muestras ciertas semejanzas con otras comunidades vegetales de la llanura costera del West Gulf, notablemente afloramientos de areniscas y tierras yermas.

INTRODUCTION

Recent research on saline prairies in Louisiana has greatly expanded our knowledge of this community (Reid et al. in prep). This community occurs in central and northwestern Louisiana, eastern Texas, and southern Arkansas (McInnis et al. 1993; Keith et al. 2004; Lester et al. 2005; Arkansas Natural Heritage Commission 2006; Diggs et al. 2006; Reid et al. in prep). In pre-settlement times, saline prairies were probably uncommon. The estimate for Louisiana is fewer than 800 ha with only 10 to 25 percent remaining (Lester et al. 2005). Because of many factors, including urban sprawl, agriculture, grazing, oil exploration, off-road vehicle activity, and agro-forestry, this community has been badly degraded and greatly reduced in extent and is now ranked globally imperiled (G1)(Lester et al. 2005).

The earliest described saline prairies in Louisiana are several in Winn Parish (McInnis et al. 1993; Lester et al. 2005). Interest in the Winn Parish saline prairies initially focused on the federally-listed *Geocarpon minimum*, which had not previously been found in Louisiana (McInnis et al. 1993).

A renewed interest in saline prairies since 2005 (MacRoberts et al. 2007; Reid et al. 2007; Reid et al. in prep) and in *Geocarpon minimum* (MacRoberts & MacRoberts 2007, 2008) led to an interest in the floristic and edaphic conditions of the Winn Parish saline prairies, which had not previously been thoroughly described (McInnis et al. 1993).

In this paper we describe the floristics of Upper Weyerhaeuser Prairie (aka Castor Creek Saline Prairie [McInnis et al. 1993]), one of the Winn Parish saline prairies.

General edaphic and community information regarding saline prairies including Upper Weyerhaeuser Prairie as well as an extensive bibliography of this community and its rare species is given in Reid et al. (in prep).

STUDY SITE AND METHODS

Figure 1 is an aerial view of Upper Weyerhaeuser Prairie (T10NR1ES2). Figure 2 is a scenic view of the prairie. The prairie measures approximately 3.9 ha. A road runs through its center with shallow ditches along its sides. We excluded the road and the ditches from the survey. We also avoided prairie edges, staying at least three meters from the edge. Upper Weyerhaeuser Prairie, unlike many other saline prairies, has no mima

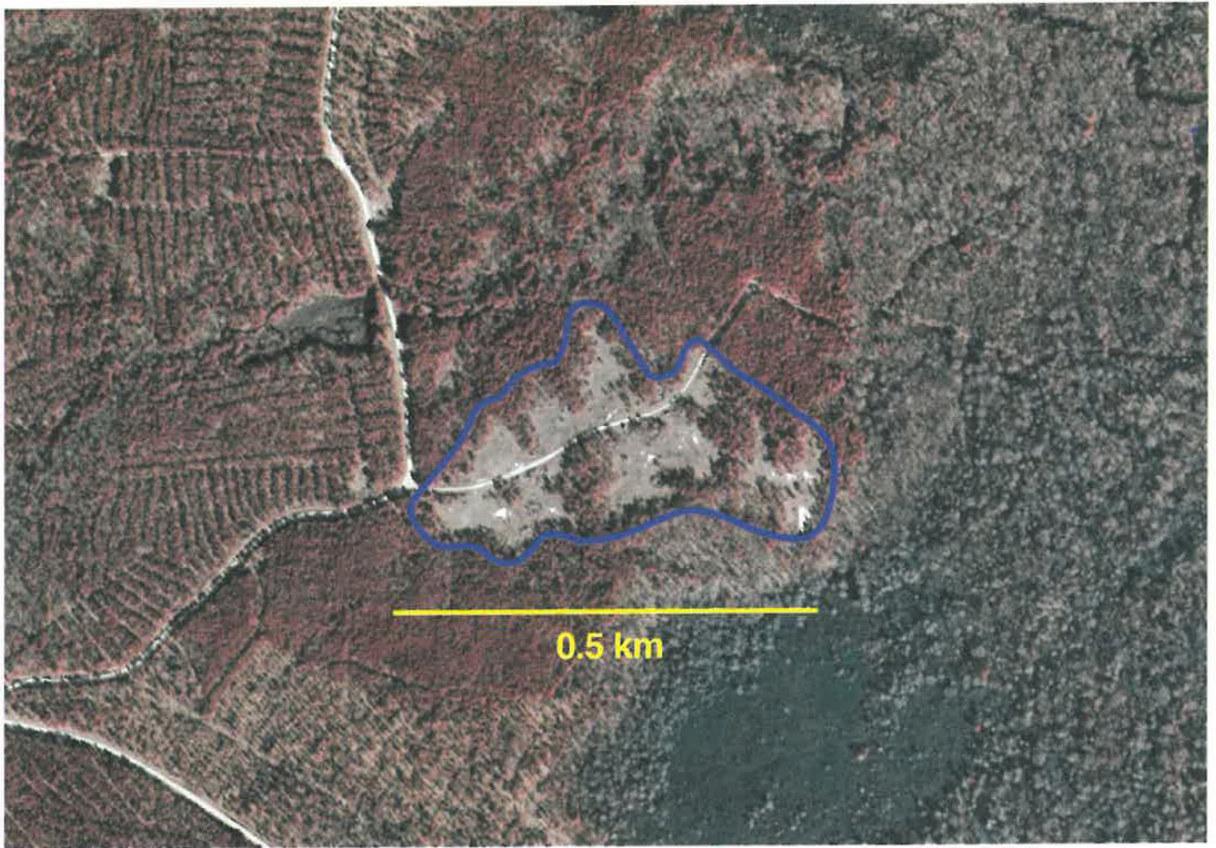


FIG. 1. Aerial view of Upper Weyerhaeuser Prairie.

(pimple) mounds or wet depressions. The soils are classified as Brimstone fine-silty, siliceous, thermic Glossic Natraqualfs. They are high in sodium and are alkaline. They resist wetting, inducing droughty conditions. Prairie substratum has physical properties similar to a dense clay hardpan that is resistant to root penetration (McInnis et al. 1993; Boyd et al. 1998; Reid et al. in prep.). Two lichens, *Cladonia caroliniana* (Schwein.) Tuck. and *Cladonia sobolescens* Nyl. ex Vain., are a common ground cover in some areas of the prairie (Fig. 3). The surrounding forest is dominated by *Pinus taeda*, *Quercus stellata*, *Quercus phellos*, *Ilex vomitoria*, *Crataegus spathulata*, and *Vaccinium* spp., with *Chasmanthium laxum* being the dominant understory species.

Upper Weyerhaeuser Prairie as a whole was collected monthly between 19 March and 5 November 2008. Specimens are deposited at the Louisiana State University Herbarium (LSU) and Louisiana State University in Shreveport Herbarium (LSUS). Nomenclature follows USDA NRCS (2008), Diggs et al. (2006), and *Flora of North America* (1993–2006).

In order to investigate species richness, two 0.1 ha plots each with two nested 0.001 ha plots and two nested 0.0001 ha plots were established within the prairie. All species in the plots were recorded.

RESULTS

Table 1 lists the vascular species found in Upper Weyerhaeuser Prairie. All collection numbers refer to B.R. MacRoberts and M.H. MacRoberts. An asterisk * indicates an exotic species. Table 2 summarizes the plot data.

Upper Weyerhaeuser Prairie had 59 species. The two 0.1 ha plots had a mean of 50 species (range 47 to 53), the four 0.001 ha plots had a mean of 19.5 species (range 15 to 28) and the four 0.0001 ha plots had a mean of 16.5 species (range 9 to 26). Only one exotic species was found in the prairie.



FIG. 2. View across Upper Weyerhaeuser Prairie.



FIG. 3. Lichens in Upper Weyerhaeuser Prairie.

DISCUSSION

Rare species at Upper Weyerhaeuser Prairie include *Geocarpon minimum* (G2S2), *Schoenolirion wrightii* (G3S2), and *Phemeranthus parviflorus* (G5S3) (Louisiana Natural Heritage Program 2008). *Geocarpon minimum* was first discovered at this prairie in 1991 when approximately 620 plants were found in four locations (unpublished field notes on file with the Louisiana Natural Heritage Program). Fewer plants were observed in 1992, but the survey was less intensive. Surveys in 2007 and 2008 discovered the species at only one location. Total number of plants was not determined but four 0.0001 ha plots had 141 and 357 plants in those two years, respectively (MacRoberts & MacRoberts 2007, 2008). *Geocarpon minimum* is now known from Caddo, DeSoto, and Winn parishes in Louisiana (MacRoberts & MacRoberts 2007, 2008). The presence of *Schoenolirion wrightii* in Upper Weyerhaeuser Prairie adds Winn Parish to the list of Caddo, Red River, Natchitoches, De Soto parishes where it had previously been found (MacRoberts & MacRoberts 1993; Louisiana Natural Heritage Program 2008). In Louisiana, *Phemeranthus parviflorus* is known from Caddo, De Soto, Natchitoches, Red River, Sabine, and Winn parishes (Louisiana Natural Heritage Program 2008). Both *Schoenolirion wrightii* and *Phemeranthus parviflorus* are known from both saline prairies and sandstone outcrops in Louisiana (MacRoberts & MacRoberts 1993; Louisiana Natural Heritage Program 2008); whereas *Geocarpon minimum* is known only from saline prairies.

Upper Weyerhaeuser Prairie is relatively uniform. The two 0.1 ha plots contained all of the species found in the prairie although the plots constituted only about five percent of the prairie. Further, it was clear from repeatedly walking the entire prairie that virtually the same species occurred throughout.

Compared with saline prairies in northwestern Louisiana (Reid et al. in prep.), Upper Weyerhaeuser prairie is relatively depauperate. It lacks mima mounds and wet depressions and thus plant species associated with them. But also it lacks many other species found in the northwestern Louisiana saline prairies such as *Cooperia drummondii*, *Evax verna*, *Gratiola flava*, *Lechea san-sabeana*, *Marshallia caespitosa*, *Minuartia drummondii*, *Minuartia muscorum*, *Opuntia humifusa*, *Phacelia glabra*, and *Saxifraga texana* (Reid et al. in prep.).

Nonetheless, floristically Upper Weyerhaeuser Prairie most resembles the northwestern Louisiana saline prairies in De Soto and Caddo parishes (Reid et al. in prep.). We found that approximately 69 percent of the Upper Weyerhaeuser flora occurred in them. Upper Weyerhaeuser next most resembles sandstone outcrop communities on the Kisatchie Ranger District of the Kisatchie National Forest in Natchitoches Parish, Louisiana, with approximately 50 percent of its flora occurring in them (MacRoberts & MacRoberts 1993). Species in common between them include *Bigelowia nuttallii*, *Evolvulus sericeus*, *Phemeranthus parviflorus*, *Polygala verticillata*, and *Schoenolirion wrightii*. Next in community resemblance is Black Branch Barrens on the Angelina National Forest in Jasper County, Texas, which has just below 50 percent of the Upper Weyerhaeuser flora (Marietta & Nixon 1983; Orzell 1990; MacRoberts et al. 1997). Interesting plants in common between Black Branch Barrens and Upper Weyerhaeuser Prairie are *Bigelowia nuttallii*, *Evolvulus sericeus*, *Phemeranthus parviflorus*, and *Schoenolirion wrightii*.

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TABLE 1. Species of Upper Weyerhaeuser Saline Prairie.

Acanthaceae <i>Ruellia humilis</i> Nutt., 8254	Iridaceae * <i>Sisyrinchium rosulatum</i> Bicknell, 8161 <i>Sisyrinchium sagittiferum</i> Bicknell, 8164
Alliaceae <i>Allium canadense</i> L., 8160, 8167	Lamiaceae <i>Hedeoma hispida</i> Pursh, 8165, 8247
Asteraceae <i>Bigelovia nuttallii</i> L.C. Anderson, 8313 <i>Coreopsis tinctoria</i> Nutt., 8166 <i>Helenium flexuosum</i> Raf., 8253 <i>Iva angustifolia</i> Nutt. ex DC., 8331 <i>Krigia dandelion</i> Nutt., 8154 <i>Krigia occidentalis</i> Nutt., 8129 <i>Liatris pycnostachya</i> Michx., 8314, 8326, 8329 <i>Senecio tomentosus</i> Michx., 8125 <i>Solidago nitida</i> Torr & A. Gray, 8307, 8330 <i>Symphotrichum dumosum</i> (L.) Nesom, 8362	Liliaceae <i>Nothoscordum bivalve</i> (L.) Britt., 8132
Brassicaceae <i>Lepidium densiflorum</i> Schrad., 8168	Linaceae <i>Linum medium</i> (Planch.) Britton, 8255
Campanulaceae <i>Triodanis perfoliata</i> L., 8158	Onagraceae <i>Oenothera linifolia</i> Nutt., 8155
Caryophyllaceae <i>Geocarpon minimum</i> Mack., (no specimen collected).	Orchidaceae <i>Spiranthes vernalis</i> Engelm & A. Gray, 8249
Cistaceae <i>Lechea tenuifolia</i> Michx., 8251	Oxalidaceae <i>Oxalis corniculata</i> L., 8134
Clusiaceae <i>Hypericum drummondii</i> (Greve. & Hook.) T.&G., 8243, 8311	Pinaceae <i>Pinus taeda</i> L., 8126
Convolvulaceae <i>Evolvulus sericeus</i> Sw., 8153, 8244	Plantaginaceae <i>Plantago pusilla</i> Nutt., 8133 <i>Plantago virginica</i> L., 8157
Cyperaceae <i>Carex complanata</i> Torr. & Hook., 8166, 8169 <i>Fimbristylis puberula</i> (Michx.) Vahl, 8163, 8246 <i>Rhynchospora globularis</i> (Chapm.) Small, 8240, 8150, 8252 <i>Rhynchospora pusilla</i> Chapm. ex M.A. Curtis, 8241	Poaceae <i>Agrostis elliottiana</i> Schult., 8149, 8162 <i>Aristida longespica</i> Poir., 8365, 8382 <i>Aristida oligantha</i> Michx., 8369, 8381 <i>Dichanthelium dichotomum</i> (L.) Gould, 8170 <i>Dichanthelium sphaerocarpon</i> (Ell.) Gould, 8171, 8248 <i>Eragrostis hirsuta</i> (Michx.) Nees, 8322, 8360 <i>Eragrostis refracta</i> (Muhl.) Scribn., 8323, 8333, 8361, 8364 <i>Paspalum setaceum</i> Michx., 8363 <i>Schizachyrium scoparium</i> (Michx.) Nash, 8371 <i>Tridens strictus</i> (Nutt.) Nash, 8366, 8368, 8383
Droseraceae <i>Drosera brevifolia</i> Pursh, 8135	Polygalaceae <i>Polygala mariana</i> Mill., 8239 <i>Polygala verticillata</i> L., 8245
Ericaceae <i>Vaccinium arboreum</i> Marshall, 8308	Portulacaceae <i>Phemeranthus parviflorus</i> (Nutt.) Kiger, 8309
Euphorbiaceae <i>Croton wildenowii</i> G.L. Webster, 8310, 8332	Rosaceae <i>Crataegus marshallii</i> Egglest., 8173, 8174
Fabaceae <i>Neptunia lutea</i> (Leavenw.) Benth., 8250	Rubiaceae <i>Diodia teres</i> Walter, 8312 <i>Houstonia micrantha</i> (Shinners) Terrell, 8127 <i>Houstonia pusilla</i> Schoepf, 8130
Gentianaceae <i>Sabatia campestris</i> Nutt., 8242	Sapotaceae <i>Sideroxylon lanuginosum</i> Michx., 8151
Hyacinthaceae <i>Schoenolirion wrightii</i> Sherman, 8172, 8131	Scrophulariaceae <i>Agalinis tenuifolia</i> (Vahl) Raf., 8367, 8370
Hypoxidaceae <i>Hypoxis rigida</i> Chapm., 8156	

TABLE 2. Species richness in Upper Weyerhaeuser Prairie.

Plot and plot size (ha)	No. of plots	Average species (range)
Plot A		
0.0001	2	20.0(14–26)
0.001	2	22.5(17–28)
0.1	1	53.0
Plot B		
0.0001	2	13.0(9–17)
0.001	2	16.5(15–18)
0.1	1	47.0

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