

## *Ecological Site Description*

### Swamp

**F131AY013MO**

- (*Taxodium distichum* - *Nyssa aquatica*/*Cephalanthus occidentalis*/*Hottonia inflata* - *Lemna minor*)
- (bald cypress – swamp tupelo/buttonbush/water violet – lesser duckweed)

An Ecological Site Description (ESD) is a reference document of ecological knowledge regarding a particular land area (ecological site). An ESD describes ecological potential and ecosystem dynamics of land areas and their potential management. Ecological sites are linked to soil survey map unit components, which allows for mapping of ecological sites. *(NOTE: This is a “provisional” ESD, and is subject to change. It contains basic ecological information sufficient for conservation planning and land management in Missouri. After additional information is developed and reviewed, a “Correlated” ESD will be published and will be available via the Web Soil Survey <http://websoilsurvey.nrcs.usda.gov> .)*

**Major Land Resource Area:** 131A – Southern Mississippi River Alluvium

### Introduction

The Southern Mississippi River Alluvium (area outlined in red on the map; northern portion only) is a vast alluvial plain, stretching from the confluence of the Mississippi and Ohio Rivers to tidewater areas of the Gulf of Mexico. The area is formed primarily in sediments deposited by the Mississippi River, with significant contributions from the St Francis and Black Rivers west of Crowley’s Ridge,



in the northern part of the area. A variety of alluvial landforms are present, including natural levees, sand splays, backswamps, channels, swales, stream terraces and braided terraces. Dunes have formed from wind redistribution of alluvial sands and loess deposits overlie older terraces to the west. Elevation ranges from about 330 feet in the north to sea level in the south. Local relief is low, and much of the area appears flat, although low escarpments and other slight changes in elevation often indicate major changes in hydrology and soils.

Swamps are within the green areas on the map (Missouri portion only; distributions farther south are currently under review). These sites are widely scattered but are locally abundant in several counties. They are often associated with Wet Backswamp and Clayey Floodplain ecological sites. Soils are very deep, wet, and subject to ponding.

### Physiographic Features

These sites are on nearly level, broad depressions on floodplains and stream terraces of the Mississippi River. Areas not protected by levees are subject to flooding.

## Soil Features

These soils are very deep, with high water tables, and are subject to ponding for extended periods. The soils were formed under forest vegetation. Organic matter content is generally high, and some areas are formed primarily in organic material. Parent material is alluvium. They have silty clay loam to clay surface layers, with clayey subsurface layers. These soils are affected by seasonal wetness, and are subject to ponding. Soil series associated with this site include Allemands, Forestdale, Jackport, and Sharkey.

## Ecological Dynamics

*Information contained in this section was developed using historical data, professional experience, field reviews, and scientific studies. The information presented is representative of very complex vegetation communities. Key indicator plants, animals and ecological processes are described to help inform land management decisions. Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and aspect. The Reference Plant Community is not necessarily the management goal. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.*

The reference community is a nearly continuously ponded wetland dominated by trees. Historically, Swamps were on floodplain positions that flooded annually and floodwaters stood for 6 to 12 months. The canopy is tall (90 to 110 feet) and is variably open (50 to 90 percent cover) depending on depth of water. Swamps are inundated most, if not all of the year. Canopy dominance is highly correlated to water depth. Bald cypress dominates the deepest water, water tupelo the moderate depths, and mixed wet bottomland hardwood species the shallower inundations. The understory may be filled with buttonbush and water elm, and wide varieties of aquatic plants occur in the open water.

This ecological site was once widespread across the Bootheel in the lowest backwater areas, including old river channels and oxbows. Today they are limited to isolated fragments. Flooding, ponding, wind and perhaps ice storms were likely the most important disturbances in this region. All would have created occasional canopy gaps. Occasional dry periods were necessary to recruit cypress and tupelo regeneration.

Most swamps have been cleared, drained and converted to cropland or destroyed by excessive siltation resulting from erosion and stream channelization. Most remaining swamps are small remnants of a once vast complex of wetlands in the Bootheel regions. These remaining remnants occur in deep depressions that are unsuitable for agricultural purposes. Since bald cypress wood is highly resistant to decay, making it valuable for a multitude of uses, some logging is still occurring in the remaining areas.

Restoring these ecological sites may require intensive water control management to emulate natural flood patterns and reduce siltation.

**Reference State Plant Community****Canopy Trees**

<b>Common Name</b>	<b>Botanical Name</b>	<b>Cover % (low-high)</b>	<b>Canopy Height (ft)</b>
BALD CYPRESS	<i>Taxodium distichum</i>	30-60	110
WATER TUPELO	<i>Nyssa aquatica</i>	20-40	90
SWAMP COTTONWOOD	<i>Populus heterophylla</i>	5-20	100
PUMPKIN ASH	<i>Fraxinus profunda</i>	5-20	90
WATER OAK	<i>Quercus nigra</i>	5-20	80
WATER HICKORY	<i>Carya aquatica</i>	5-20	80
WATER LOCUST	<i>Gleditsia aquatica</i>	5-20	80
BLACK WILLOW	<i>Salix nigra</i>	5-20	60
SWAMP RED MAPLE	<i>Acer rubrum v. drummondii</i>	5-20	70

**Understory Trees**

<b>Common Name</b>	<b>Botanical Name</b>	<b>Cover % (low-high)</b>	<b>Canopy Height (ft)</b>
SWAMP PRIVET	<i>Forestiera acuminata</i>	5-20	12
DECIDUOUS HOLLY	<i>Ilex decidua</i>	5-20	12
WATER ELM	<i>Planera aquatica</i>	5-20	25

**Shrubs**

<b>Common Name</b>	<b>Botanical Name</b>	<b>Cover % (low-high)</b>	<b>Canopy Height (ft)</b>
BUTTONBUSH	<i>Cephalanthus occidentalis</i>	10-20	8
SWAMP DOGWOOD	<i>Cornus obliqua</i>	5-10	10
SWAMP ROSE	<i>Rosa palustris</i>	5-10	4

**Grasses and sedges**

<b>Common Name</b>	<b>Botanical Name</b>	<b>Cover % (low-high)</b>
CREEPING LOVE GRASS	<i>Eragrostis hypnoides</i>	5-10
WHITE GRASS	<i>Leersia virginica</i>	5-10
CATCHFLY GRASS	<i>Leersia lenticularis</i>	5-10

**Forbs**

<b>Common Name</b>	<b>Botanical Name</b>	<b>Cover % (low-high)</b>
GREATER MARSH ST. JOHN'S WORT	<i>Triadenum walteri</i>	5-10
COONTAIL	<i>Ceratophyllum demersum (open water)</i>	5-10
SWAMP LEATHER FLOWER	<i>Clematis crispa</i>	5-10
WATER VIOLET	<i>Hottonia inflata (open water)</i>	5-10
CURSED CROWFOOT	<i>Ranunculus sceleratus</i>	5-10
LIZARD'S TAIL	<i>Saururus cernuus</i>	5-10
LESSER DUCKWEED	<i>Lemna minor (open water)</i>	5-10
WATERMEAL	<i>Wolfia gladiata (open water)</i>	5-10
WATER SHIELD	<i>Brasenia schreberi (open water)</i>	5-10
SWAMP BEGGAR TICK	<i>Bidens connata</i>	5-10
SWAMP SMARTWEED	<i>Polygonum hydropiperoides</i>	5-10
AMERICAN SNOWBELL	<i>Styrax americanum</i>	5-10

## Site Interpretations

### Wildlife

- Bird species associated with Swamps include Wood Duck, Hooded Merganser, Barred Owl, Cerulean Warbler, Prothonotary Warbler, Pileated Woodpecker, Red-headed Woodpecker, Yellow-throated Vireo, Brown Creeper, Yellow-crowned Night Heron, Black-crowned Night Heron, and Tree Swallow.
- Reptile and amphibian species associated with Swamps include: broad-banded water snake, western mud snake, western cottonmouth, Mississippi green water snake, three-toed amphiuma, green treefrog, Mississippi mud turtle, and western lesser siren.

### Forestry

- **Management:** Estimated site index values range from 50 to 90. Frequent flooding or permanent ponding severely restricts timber management opportunities. Harvesting may be possible only in very dry years or during winter periods when the ground or water is completely frozen. Widespread regeneration may require a prolonged dry cycle. These areas are best maintained for wildlife and water quality purposes. Maintain adequate riparian buffer areas.
- **Limitations:** Wetness from flooding, long term ponding and high water table; Soils are not suitable for the use of ordinary crawler tractors or rubber-tired skidders. Special harvesting equipment may be needed. Access to forests is easiest during periods in late summer or winter when soils are frozen or dry. Planting is extremely difficult during spring periods. Seedling mortality will be high due to excess wetness and ponding.

## Glossary

*Backslope* – a hillslope profile position that forms the steepest and generally linear, middle portion of the slope.

*Backswamp* – marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces

*Calcareous* – the presence of calcium carbonate in the soil parent material within the rooting zone; relatively alkaline

*Claypan* – a dense, compact, slowly permeable layer in the subsoil having much higher clay content than the overlying material

*Chert* – hard, extremely dense or compact crystalline sedimentary rock, consisting dominantly of interlocking crystals of quartz

*Cliff* – a significant vertical, or near vertical, rock exposure

*Dolomite* – a type of sedimentary rock that is a carbonate mineral composed of calcium magnesium carbonate

*Drainageway* – the upper most reach of a stream channel system characterized by little meandering

*Dry* – a site where soil moisture is limiting during the growing season; low available water capacity

*Dune* – a low mound, ridge, bank or hill of loose, wind-blown sand

*Exposed* – steep, south and west-facing slopes, which are warmer and drier than other slope aspects

*Flatwoods* – a type of woodland that occurs on soils with a root restricting subsoil layer within 20 to 30 inches, resulting in very slow runoff and ponding that remains saturated for most of the winter and early spring months but dries out and becomes very dry in the summer months; plants that grow there must be adapted to both conditions

*Floodplain* – the nearly level plain that borders a stream and is subject to inundation under flood-stage conditions

*Footslope* – a hillslope position at the base of a slope where hillslope sediment (colluvium) accumulates

*Forest* – a vegetative community dominated by trees forming a closed canopy and interspersed with shade-tolerant understory species

*Fragipan* – a dense, brittle subsoil horizon that is extremely hard and compact when dry

*Glade* – open, rocky, barren vegetative community dominated by drought-adapted forbs and grasses, typically with scattered, stunted woody plants

*Igneous* – bedrock formed by cooling and solidification of magma. Granite and rhyolite are typical igneous bedrocks in Missouri

*Limestone* – a type of sedimentary rock composed largely of calcium carbonate

*Loess* – material transported and deposited by wind and consisting predominantly of silt-size particles

*Loamy* – soil material containing a relatively equal mixture of sand and silt and a somewhat smaller proportion of clay

*Marsh* – a type of wetland that is dominated by herbaceous rather than woody plant species

*Moist* – a site that is moderately well to well drained and has high available water capacity, resulting in a well-balanced supply of moisture (neither too dry nor too wet).

*Mudstone* – blocky or massive, fine-grained sedimentary rock in which the proportions of clay and silt are approximately equal

*Natric* – a soil horizon that displays a blocky, columnar, or prismatic structure and has a subhorizon with an exchangeable-sodium saturation of over 15%

*Outwash* – stratified sediments of sand and gravel removed or “washed out” from a glacier by melt-water streams

*Prairie* – a vegetative community dominated by perennial grasses and forbs with scattered shrubs and very few trees

*Protected* – steep, north- and east-facing slopes, which are cooler and moister than other slope aspects

*Residuum* - unconsolidated, weathered, or partly weathered mineral material that accumulates by disintegration of bedrock in place

*Riser* – a component of terraces and flood-plain steps consisting of the steep side slope; the escarpment

*Riverfront* – a vegetative community in the floodplain immediately adjacent and generally parallel to a river or stream channel

*River hills* – a geographic area characterized by thick, dissected loess deposits, formed immediately adjacent to the edges of the Missouri and Mississippi River floodplains

*Sandy* – a coarse-sized soil containing a large mixture of sand and gravels and a somewhat smaller proportion of silts and clays with excessive drainage

*Sandstone* – a sedimentary rock containing dominantly sand-size particles

*Savanna* – grasslands interspersed with open-grown scattered trees, groupings of trees, and shrubs

*Shale* – a sedimentary rock formed from clay, silty clay, or silty clay loam deposits and having the tendency to split into thin layers

*Shallow* – a site with bedrock within 20 inches of the surface

*Shoulder* – the slope profile position that forms the convex surface near the top of a hill slope; it comprises the transition zone from summit to backslope

*Sinkhole* – a closed, circular or elliptical depression, commonly funnel-shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock or by collapse of underlying caves within bedrock

*Summit* – the top or highest area of a hillslope

*Swale* – shallow, closed depressions irregularly spaced across a floodplain or terrace with an irregularly undulating surface.

*Swamp* – an area of low, saturated ground, intermittently or permanently covered with water, and predominantly vegetated by shrubs and trees.

*Talus* – rock fragments of any size or shape (usually coarse and angular) derived from and lying at the base of a cliff or very steep rock slope.

*Terrace* – a step-like surface, bordering a valley floor that represents the former position of a flood plain

*Till* – dominantly unsorted and unstratified soil material deposited directly by a glacier

*Upland* – a general term for the higher ground of a region, in contrast with a low-lying, adjacent land such as a valley or floodplain

*Wet* – a somewhat poorly, poorly or very poorly drained site that has an oversupply of moisture during the growing season

*Woodland* – a highly variable vegetative community with a canopy of trees ranging from 30 to 100 percent closure with a sparse midstory and a dense ground flora of grasses, sedges and forbs

### **References**

Missouri Department of Conservation. 2006. Missouri Forest and Woodland Community Profiles. Missouri Department of Conservation, Jefferson City, Missouri.

Natural Resources Conservation Service. 2002. Woodland Suitability Groups. Missouri FOTG, Section II, Soil Interpretations and Reports. 30 pgs.

Natural Resources Conservation Service. Site Index Reports. Accessed May 2014.  
[https://esi.sc.egov.usda.gov/ESI\\_Forestland/pgFSWelcome.aspx](https://esi.sc.egov.usda.gov/ESI_Forestland/pgFSWelcome.aspx)

NatureServe. 2010. Vegetation Associations of Missouri (revised). NatureServe, St. Paul, Minnesota.

Nelson, Paul W. 2010. The Terrestrial Natural Communities of Missouri. Missouri Department of Conservation, Jefferson City, Missouri.

Nigh, Timothy A., & Walter A. Schroeder. 2002. Atlas of Missouri Ecoregions. Missouri Department of Conservation, Jefferson City, Missouri.