Ecological Site Description

Loamy Terrace Woodland

- *Quercus alba - Quercus velutina/Cercis canadensis - Rhus aromatica/Elymus virginicus - Schizachyrium scoparium*)
- (white oak – black oak/red bud – aromatic sumac/Virginia wildrye – little bluestem)

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](http://websoilsurvey.nrcs.usda.gov).)*

Major Land Resource Area: 116B – Springfield Plain

Introduction

The Springfield Plain (area outlined in red on the map) is in the western part of the Ozark Uplift. It is primarily a smooth plateau with some dissection along streams. Elevation is about 1,000 feet in the north to over 1,700 feet in the east along the Burlington Escarpment adjacent to the Ozark Highlands. The underlying bedrock is mainly Mississippian-aged limestone, with areas of shale on lower slopes and structural benches, and intermittent Pennsylvanian-aged sandstone deposits on the plateau surface.

Loamy Terrace Woodlands (green areas on the map) occur on floodplain steps and low stream terraces throughout the Springfield Plain. Soils are very deep and loamy, and are subject to flooding.

Physiographic Features

This site is on floodplain steps with slopes of 0 to 1 percent. The site generates some runoff to adjacent lower floodplain sites, and receives some runoff from higher stream terraces and uplands. Although this site is subject to flooding, ecological processes more closely resemble those of stream terrace systems.

The following figure (adapted from Kichler & Henderson, 1999) shows the typical landscape position of this ecological site, and landscape relationships with other ecological sites. This site is within the area labeled “4”, and is typically on floodplain steps, above the level of the most active floodplain, labeled “5”, and adjacent to the uplands, labeled “1”. In some areas a Wet Terrace Woodland ecological site is present, directly above the Loamy Terrace site, labeled on the figure as “3”.

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Soil Features
These soils have no rooting restriction. They were formed under a mixture of prairie and woodland vegetation. Parent material is alluvium. They have silt loam surface horizons, and loamy subsoils that may be skeletal below 5 feet. They are not affected by seasonal wetness. Soil series associated with this site include Bearthicket and Secesh.

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.

Loamy Terrace Woodlands occur along most streams throughout the region. The historic reference condition is woodland dominated by an overstory of black oak and white oak, with scattered post oak and bur oak. The canopy is moderately tall (60 to 80 feet) but rather open (55 to 75 percent closure) with a dense understory of native grasses and forbs. Increased light from the more open canopy causes a diversity of woodland ground flora species to flourish. Woodlands are distinguished from forest, by their relatively open understory, and the presence of sun-loving ground flora species. Characteristic plants in the ground flora can be used to gauge the restoration potential of a stand along with remnant open-grown old-age trees, and tree height growth.

Because of their proximity to prairies, fire played a significant role in the maintenance of these systems, more so than the sites to the south. It is likely that these ecological sites burned at least once every 3 to 5 years. These periodic fires kept woodlands open, removed the litter, and stimulated the growth and flowering of the grasses and forbs. During fire free intervals, woody
understory species increased and the herbaceous understory diminished. The return of fire would open the woodlands up again and stimulate the abundant ground flora.

Loamy Terrace Woodlands were also subjected to occasional disturbances from wind and ice, as well as grazing by native large herbivores. Wind and ice would have periodically opened the canopy up by knocking over trees or breaking substantial branches off canopy trees. Grazing by native herbivores would have effectively kept understory conditions more open, creating conditions more favorable to oak reproduction and woodland ground flora species.

Today, these ecological sites have been cleared and converted to pasture or cropland or have undergone repeated timber harvest and domestic grazing. Most existing forested ecological sites have a younger (50 to 80 years) canopy layer whose species composition and quality has been altered by timber harvesting practices. In the long term absence of fire, woody species, especially hickory and sugar maple, encroach into these woodlands. Once established, these woody plants can quickly fill the existing understory increasing shade levels with a greatly diminished ground flora. Removal of the younger understory and the application of prescribed fire have proven to be effective restoration means.

These ecological sites are moderately productive. Oak regeneration is typically problematic. Maintenance of the oak component will require disturbances that will encourage more sun adapted species and reduce shading effects. Single tree selection timber harvests are common in this region and often results in removal of the most productive trees (high grading) in the stand leading to poorer quality timber and a shift in species composition away from more valuable oak species. Better planned single tree selection or the creation of group openings can help regenerate and maintain more desirable oak species and increase vigor on the residual trees.

Clearcutting also occurs and results in dense, even-aged stands dominated by oak. This may be most beneficial for existing stands whose composition has been highly altered by past management practices. However, without some thinning of the dense stands and application of prescribed fire, the ground flora diversity can be shaded out and diversity of the stand may suffer.

### Reference State Plant Community

#### Canopy Trees

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Cover % (low-high)</th>
<th>Canopy Height (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHITE OAK</td>
<td>Quercus alba</td>
<td>30-60</td>
<td>70</td>
</tr>
<tr>
<td>BLACK OAK</td>
<td>Quercus velutina</td>
<td>10-30</td>
<td>80</td>
</tr>
<tr>
<td>CHINKAPIN OAK</td>
<td>Quercus muehlenbergii</td>
<td>10-20</td>
<td>60</td>
</tr>
<tr>
<td>POST OAK</td>
<td>Quercus stellata</td>
<td>10-20</td>
<td>60</td>
</tr>
<tr>
<td>SHAGBARK HICKORY</td>
<td>Carya ovata</td>
<td>10-20</td>
<td>60</td>
</tr>
<tr>
<td>NORTHERN RED OAK</td>
<td>Quercus rubra</td>
<td>5-20</td>
<td>80</td>
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</tbody>
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#### Shrubs

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Cover % (low-high)</th>
<th>Canopy Height (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AROMATIC SUMAC</td>
<td>Rhus aromatica</td>
<td>10-20</td>
<td>5</td>
</tr>
<tr>
<td>AMERICAN HAZELNUT</td>
<td>Corylus americana</td>
<td>10-20</td>
<td>5</td>
</tr>
<tr>
<td>DWARF HACKBERRY</td>
<td>Celtis tenuifolia</td>
<td>10-20</td>
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<tr>
<td>RED BUD</td>
<td>Cercis canadensis</td>
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Forbs

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Cover % (low-high)</th>
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<tbody>
<tr>
<td>YELLOW PINPERNEL</td>
<td>Taenidia integerrima</td>
<td>5-20</td>
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<tr>
<td>ORANGE PUCCOON</td>
<td>Lithospermum canescens</td>
<td>5-20</td>
</tr>
<tr>
<td>BENT MILK VETCH</td>
<td>Astragalus distortus</td>
<td>5-20</td>
</tr>
<tr>
<td>BUTTRFLYWEED</td>
<td>Asclepias tuberosa</td>
<td>5-20</td>
</tr>
<tr>
<td>ELM-LEAVED GOLDENROD</td>
<td>Solidago ulmifolia</td>
<td>5-20</td>
</tr>
<tr>
<td>POINTED LEAF TICK-TREFOIL</td>
<td>Desmodium glutinosum</td>
<td>5-20</td>
</tr>
<tr>
<td>EASTERN BEEBAKLM</td>
<td>Monarda bradburiana</td>
<td>5-20</td>
</tr>
<tr>
<td>PURPLE CONEFLOWER</td>
<td>Echinacea purpurea</td>
<td>5-20</td>
</tr>
<tr>
<td>HAIRY SUNFLOWER</td>
<td>Helianthus hirsutus</td>
<td>5-20</td>
</tr>
<tr>
<td>BLAZING STAR</td>
<td>Liatris aspera</td>
<td>5-20</td>
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Grasses and sedges

<table>
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<th>Common Name</th>
<th>Botanical Name</th>
<th>Cover % (low-high)</th>
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</thead>
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<tr>
<td>SLENDER WOODLAND SEDGE</td>
<td>Carex digitalis</td>
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<tr>
<td>OVAL-LEAF SEDGE</td>
<td>Carex cephalophora</td>
<td>10-20</td>
</tr>
<tr>
<td>LITTLE BLUESTEM</td>
<td>Schizachyrium scoparium</td>
<td>10-30</td>
</tr>
<tr>
<td>WOODLAND BROME</td>
<td>Bromus pubescens</td>
<td>10-20</td>
</tr>
<tr>
<td>BOTTLEBRUSH GRASS</td>
<td>Elymus hystrix</td>
<td>10-20</td>
</tr>
<tr>
<td>VIRGINIA WILDRYE</td>
<td>Elymus virginicus</td>
<td>10-30</td>
</tr>
</tbody>
</table>

Site Interpretations

**Wildlife Species**

- Wild turkey, white-tailed deer, and eastern gray squirrel depend on hard and soft mast food sources and are typical upland game species of this type.
- Birds associated with late-successional woodlands are Whip-poor-will, Great Crested Flycatcher, Ovenbird, Pileated Woodpecker, Yellow-billed Cuckoo, Summer Tanager, Wood Thrush, Red-eyed Vireo, Scarlet Tanager, Black-and-white Warbler (Ozark Border), Northern Parula (near streams), and Louisiana Waterthrush (near streams).
- Reptiles and amphibians associated with these sites include: ringed salamander, spotted salamander, marbled salamander, central newt, long-tailed salamander, dark-sided salamander, southern red-backed salamander, small-mouthed salamander, three-toed box turtle, ground skink, western worm snake, western earth snake, and American toad.

**Forestry**

- **Management**: Site index values range from 60 to 80. Timber management opportunities are good. Create group openings of at least 2 acres. Large clearcuts should be minimized if possible to reduce impacts on wildlife and aesthetics. Uneven-aged management using single tree selection or small group selection cuttings of ½ to 1 acre are other options that can be used if clear cutting is not desired or warranted. Maintain adequate riparian buffer areas.
- **Limitations**: No major limitations or restrictions. Occasional periods of seasonal wetness; Use of equipment may be restricted in spring and other excessively wet periods. Equipment use when wet may compact soil and damage tree roots. Tree planting may be difficult during spring flooding periods.
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


