Ecological Site Description

Sandy/Loamy Floodplain Forest F107BY015MO

- *(Populus deltoides - Platanus occidentalis /Salix interior/Laportea canadensis)*
- (eastern cottonwood – sycamore/sandbar willow/Canadian woodnettle)

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: 107B – Iowa and Missouri Deep Loess Hills

Introduction

The Iowa and Missouri Deep Loess Hills (area outlined in red on the map) encompass the Missouri River floodplain and associated loess-covered uplands, from about Sioux City Iowa in the north to central Missouri. Elevation is about 1,565 feet on the highest ridges, to about 600 feet along the Missouri River near Glasgow in central Missouri. Local relief varies from 10 to 20 feet in the major river floodplains, to 50 to 100 feet in the dissected uplands, with loess bluffs of 200 to 300 feet along the Missouri River. The loess thins with distance from the Missouri river, and local relief decreases. The loess caps pre-Illinoian till, which crops out on lower hillslopes near the edges of the MLRA. The underlying bedrock is mainly Pennsylvanian and Cretaceous-aged shale, mudstone and sandstone.

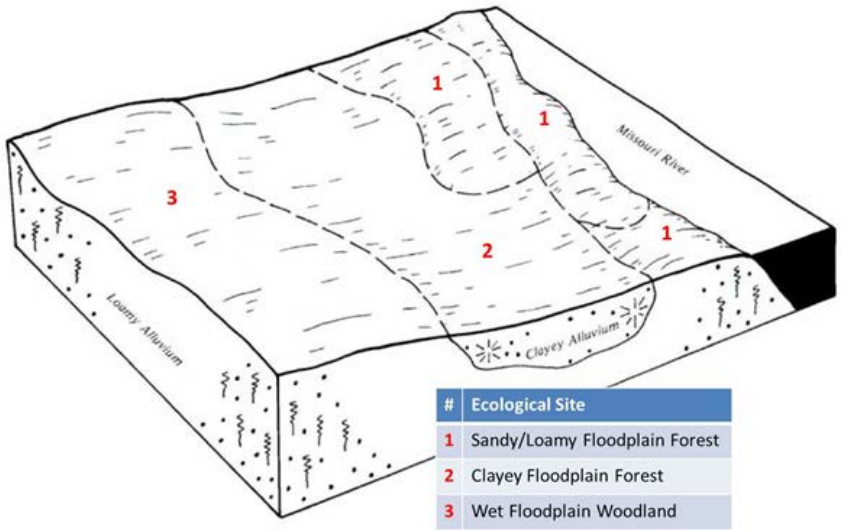
Sandy/Loamy Floodplain Forests are within the green areas on the map (Missouri portion only; Iowa distributions are currently under review). These sites are on the Missouri River floodplain, primarily adjacent to the current river channel. Sites are commonly adjacent to the Clayey Floodplain Forest ecological sites. Soils are very deep, and are sandy to very fine sandy loam throughout. The reference plant community is forest dominated by black willow, eastern cottonwood, hackberry, river birch, sycamore, silver maple, and American elm.

Physiographic Features

This site is on the Missouri River floodplain, with slopes of less than 2 percent. Most areas are adjacent to the current river channel. Areas not protected by levees are subject to frequent flooding.

The following figure (adapted from Young & Kowalewycz. 1994) shows the typical landscape position of this ecological site, and landscape relationships with other ecological sites. The site is

within the area labeled “1”, on natural levees in the Missouri Floodplain, typically adjacent to the current channel. The dashed lines within the Sandy/Loamy Floodplain Forest indicate different soils within this site. Clayey Floodplain Forest sites (labeled “2”) are closely associated with this ecological site, and are typically farther from the current river channel, as shown.



Soil Features

These soils are very deep and coarse-textured throughout, with moderate to low plant-available water capacity. The soils were formed under woodland vegetation, and have thin, light-colored surface horizons. Parent material is alluvium. They have very fine sandy loam to fine sand surface layers, with calcareous subsurface layers that range from very fine sandy loam to sand. These soils are not affected by seasonal wetness. Soil series associated with this site include Grable, Haynie, Hodge, Kenmoor, Sarpy and Waubonsie.

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 Missouri river was a very dynamic system with frequent flooding and multiple braided channels shifting back and forth across the floodplain. Loamy, coarse loamy and sandy deposits of sediment were common, occurring along the floodplains in the lower part of the region, and the sandy materials were the youngest, most recently deposited substrate in this matrix. This ecological site is located on former streamside areas where frequent swift currents dumped the heavier sandy sediment load next to the river. It is normally surrounded by Loamy Floodplain Riverfront Forest on slightly higher natural levees.

Flooding of Sandy/Loamy Floodplain Forest occurred annually or at least once every 3 years. Sand bar succession to forest is dominated by flood tolerant, pioneer tree species such as willow and cottonwood. Young stands of these species tend to stabilize the riverfront floodplain and continue to accumulate coarse materials. Consequently, many Sandy/Loamy Floodplain Forests tend to be even aged. Young stands are often dense with a sparse understory and ground flora. As the forest

matures, canopy gaps provide more light while more fine sediments accumulate on the forest floor, resulting in a dense ground flora of grasses and nettles.

Over the long term, these sites may become so elevated and isolated that they begin to accumulate even more fine sediments. Ultimately, shade tolerant elm, ash, and hackberry will accumulate in the understory and the forest may succeed to a Loamy Floodplain Forest dominated by these species. However, catastrophic floods will often partially or completely knock down the early successional species and regenerate this ecological system. Consequently, this ecological site is often made up of a mosaic of early to late successional floodplain forest.

Today many floodplain forests in Missouri have been cleared and converted to agriculture and are often cleared right up to the bank. In such cases, flooding may cause stream bank erosion and complete loss of this ecological site. Grazing by domestic livestock in the remaining strips of forest, can also kill trees and remove the ground cover, resulting in de-stabilization and potential loss of this ecological site as well. Remaining remnants still exist along un-leveed areas, within levees and on islands. They often occur as a rather narrow band of trees and shrubs traversing the stream edge. These bands of forest play an important role as a source of food and shelter for migrating birds. In addition, isolated large sycamore and cottonwood trees that rise above the canopy are important nesting sites for bald eagles and herons.

Re-establishment of these riparian forests is important for stream quality and health, as well as for migratory birds. Planting of early successional pioneer species on these sites has proven to be quite successful.

Reference State Plant Community

Canopy Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
BLACK WILLOW	*Salix nigra*	5-20	60
EASTERN COTTONWOOD	*Populus deltoides*	5-30	90
HACKBERRY	*Celtis occidentalis*	5-20	70
RIVER BIRCH	*Betula nigra*	5-20	70
SYCAMORE	*Platanus occidentalis*	5-20	90
SILVER MAPLE	*Acer saccharinum*	5-20	80
AMERICAN ELM	*Ulmus americana*	5-20	70

Understory Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
BOX ELDER	*Acer negundo*	10-20	50
OHIO BUCKEYE	*Aesculus glabra*	10-20	40

Shrubs

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
GRAY DOGWOOD	*Cornus foemina*	5-10	12
SANDBAR WILLOW	*Salix interior*	10-20	20
PEACH-LEAVED WILLOW	*Salix amygdaloides*	10-20	20

Vines

Common Name	Botanical Name	Cover % (low-high)
VIRGINIA CREEPER	*Parthenocissus quinquefolia*	10-20
RACOON GRAPE	*Ampelopis cordata*	10-20
POISON IVY	*Toxicodendron radicans*	10-20

Forbs

Common Name	Botanical Name	Cover % (low-high)
WHITE WOODLAND ASTER	*Aster lateriflorus*	10-20
TALL NETTLE	*Urtica dioica*	10-20
WOOD NETTLE	*Laportea canadensis*	10-20
GOLDENGLOW	*Rudbeckia laciniata*	10-20
LATE GOLDENROD	*Solidago gigantea*	10-20
BROWN-EYED SUSAN	*Rudbeckia triloba*	10-20
TOUCH-ME-NOT	*Impatiens pallida*	10-20

Grasses and sedges

Common Name	Botanical Name	Cover % (low-high)
HAIRY WILD RYE	*Elymus villosus*	5-20
SCOURING RUSH	*Equisetum hyemale*	5-20
INDIAN WOODOATS	*Chasmanthium latifolium*	5-20
VIRGINIA WILD RYE	*Elymus virginicus*	5-20

Site Interpretations

Wildlife

- This community provides important streamside attributes such as: riparian stability; stream shading, important floodplain connectivity between the river and interior sloughs, and inputs to streams of coarse woody debris.
- Tall emergent sycamores and cottonwoods along with an uneven canopy structure and canopy gaps are important for heron colonies, eagle nesting, Mississippi kites, cerulean warblers and other bird species and are important migratory songbird stopover sites.
- Bird species associated with early-successional Floodplain Forests include: White-eyed Vireo, Yellow-breasted Chat, Common Yellowthroat, Indigo Bunting, Gray Catbird, Willow Flycatcher, Orchard Oriole, and Brown Thrasher.
- Birds associated with mid-successional Floodplain Forests include: American Redstart, Northern Parula, and Willow Flycatcher.
- Birds associated with late-successional Floodplain Forests include: Great Blue Heron (colonies especially in large sycamores and cottonwoods), Bald Eagle, Belted Kingfisher, Red-shouldered Hawk, Northern Parula, Louisiana Waterthrush, Wood Duck, Hooded Merganser, and Swainson's Warbler (sites with giant cane or dense sapling/brambles in the understory).
- Amphibian and reptile species associated with Floodplain Forest include: small-mouthed salamander, central newt, midland brown snake, gray treefrog, and southern leopard frog.

Forestry

- Management: Site index values may exceed 80. Soil fertility and available water capacity may be low to moderate. Timber management opportunities are fair to 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. Harvest methods that leave some mature trees to provide shade and soil protection may be desirable. Maintain adequate riparian buffer areas.

- Limitations: Seasonal wetness; sandy profile. The sandy upper layer may hinder the use of wheeled equipment especially when the soil is saturated or very dry. Seedling mortality may occur because of lack of adequate soil moisture during dry 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

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