Wetlands

Wetlands are transition areas between dry land and open waters and contain plant-life adapted to survive in water-saturated soils. They provide a rich and unique ecosystem for many species that rely on both the land and the water for survival. They are home to many species of migratory and resident birds, reptiles and amphibians, fish, and insects. Wetlands tend have a great deal of biological diversity. Nearly half of Missouri’s total plant species are associated with wetlands and more than a quarter of Missouri’s nesting and migratory birds depend on wetlands for part of their life cycle.

As their name implies, wetlands are lands that are wet for significant periods of time. Although wetlands are often wet, a wetland might not be wet year-round. They can be large flat areas or relatively small and steep areas. Only specialized plants are able to grow in these conditions.

Wetlands provide recreation opportunities for fishing, paddling, hiking on board-walks and bird-watching. They are also excellent outdoor classrooms for people of all ages to experience. Wetlands benefit society by storing water to help with flood control. Wetlands have the ability to remove excess nutrients, pollution and sediment from water that flows through them, helping to improve downstream water quality and the overall health of waters for our communities. But, wetland ecosystems can also be fragile systems that are sensitive to the quantity and quality of water present within them. Maintaining and protecting healthy wetlands is valuable for all of us and that is why it is important to understand the benefits that they provide people and the plants and animals that reside there.

Wetlands in Missouri

Wetlands were a substantial and diverse component of Missouri’s original landscape, covering almost 11% of its surface area. Of Missouri’s original 4.8 million acres of wetlands, more than 87% have been lost. Approximately one-half of Missouri’s original wetlands were located in the southeast part of the state, in an area known as the Bootheel. The area was dominated by forested swamps subject to frequent flooding from the Mississippi and other local rivers. The landscape was drastically altered by draining the water from the land or elevating the land surface for agricultural use and human development.

The hardwood swamps were so extensive that the Bootheel area was nicknamed "Swampeast" Missouri. Of the original 2.4 million acres of forested wetlands in southeast Missouri, less than 60,000 acres or 2 percent remain intact. Statewide, 13 percent of the original wetland resource remains. Wetlands, historically referred to as swamps and overflow lands, presented a physical challenge to the early settlers. Other than being useful for the hunting and trapping trade, these lands were regarded as a burden to their owners. Early settlers were interested in building
towns and cultivating crops. In order to make use of the land for these purposes, the landscape was significantly changed by draining the water or building up useable land.

**Missouri's Natural Wetland Types**

The following categories of Missouri wetlands describe naturally occurring ecosystems that have not been disturbed by man's activities. Each wetland type is described in terms of its undisturbed soil, **hydrology**, and vegetation, as well as where in Missouri it may be found.

**Swamp**

Swamps are forested areas where **surface water** is present for most of the year, including significant portions of the growing season. Their soils are very poorly drained, and include thick layers of **peat** or muck. Swamps are dominated by bald cypress and water tupelo, with understories open or filled with plants such as buttonbush, water elm and swamp privet. Although this type of wetland is considered to be the "wettest," even swamps undergo drawdown periods that are essential for the reproductive cycle of the trees adapted to survive in them. Swamps are limited to Missouri's southeast lowlands, but may also be found in sinkhole ponds and depressions in uplands or river terraces within the southeast Ozarks region. The geographic limitation of swamps is the result of the extent that cypress and water tupelo's may be found to naturally exist.

**Shrub Swamp**

Shrub swamps are non-forested wetlands, dominated by woody vegetation that is flooded or contains water all or most of the year, including significant portions of the growing season. The hydrology of shrub swamps is essentially the same as that of the swamp. The difference being that shrub swamps are found above the latitude that swamp vegetation naturally exists. The soil is deep and very poorly drained, consisting of peat or muck over **alluvial** deposits. Shrub swamps are dominated by buttonbush in either scattered clumps or dense thickets, in association with scattered **herbaceous** or free-floating aquatic plants. Shrub swamps are found statewide in **inundated** depressions of oxbow ponds and sloughs of stream and river flood-plains, as well as in the basins of sinkholes or other depressions in upland settings.

**Forested Wetland**

Forested wetlands are sometimes referred to as flood-plain or riparian wetlands. They are forested areas that periodically flood or contain standing water or saturated soils for short to prolonged periods during the dormant season. Forested wetlands remain dry for the greatest portion of the growing season. These wetlands are characterized by a combination of high species diversity, density, and high productivity. Examples of forested wetland tree species include black willow, pin oak, sycamore, American elm, green ash, silver maple, pecan, and river birch. Vegetation on the forest floor varies from abundant and diverse during drier periods to scarce during the wettest periods. Forested wetlands are typically adjacent to, and influenced by streams and rivers statewide. With their character species composition and structure varying according to their location within the landscape and the hydrology of the site.

**Marsh**

Marshes are a diverse group, unified by the fact that they are deep-soil wetlands dominated by herbaceous **emergent** plants that are primarily grasses and **sedges**. They contain standing water, or saturated soils, for prolonged periods of the growing season. Dominant plant species include reed canary grass, cattail, bulrush, spike rush, arrowhead, smartweed, and sedges. Most marshes are found along flood-plains of larger streams and rivers. They may also be found along the borders of natural ponds and lakes, sinkhole ponds and other upland depressions.
Wet Meadow

Wet meadows typically have deep, moist-to-saturated soils. Standing or flowing water is present for only brief to moderate periods during the growing season. Vegetation is dominated by a variety of sedges and rushes, forbs, and grasses, and is mostly prairie in nature. Wet meadows are found along river and stream flood-plain, along the narrow draws and headwaters of small streams, and in upland depressions throughout Missouri. They are less common in the Ozark regions.

Fens and Seeps

While fens and seeps are two distinct types of wetlands, they are described together because of their common water source and their relative scarcity in Missouri. Fens and seeps are distinctive from the other wetland types described herein. Their formation and existence is driven by groundwater, not surface water. Consequently, fens and seeps are characteristically saturated (not inundated) throughout the growing season of most years. As groundwater bubbles up, it provides oxygen and mineral-rich water to fens and seeps that is generally not available to the other wetland types with stagnant water. Water chemistry may vary from alkaline to acidic, depending on the geology of the area. Fens and seeps are covered by grasses, sedges, or reeds, but may occasionally be forested. Because of these diverse and unique conditions, fens and seeps are home to a number of the state’s rare and endangered plant species like the snake-mouth orchid and the queen of the prairie. Both fens and seeps are generally small, mostly one-half to ten acres in size, with variable soil depths. Fens and seeps are scattered throughout the Ozark region of Missouri, along stream terraces and at the base of slopes.

Pond and Lake Borders

Ponds and lakes do not have agreed-upon scientific definitions. Generally, a larger, deeper body of water is considered a lake and a smaller shallow body a pond. Most ponds are wetlands. The borders of lakes are often vegetated by submerged, aquatic, and floating vascular plants, algae, and perennial vegetation characteristic of wetlands. Examples of possible vegetation include lotus, arrowhead, rose mallow, pickerelweed, and a variety of sedges and rushes. The water in these wetlands occasionally draws down during the growing season, creating mud flats that support herbaceous, annual flowering plants, and seedlings of perennial herbs, shrubs, and trees. Natural ponds and lakes form when a stream or river changes its course, leaving a natural depression which contains water. They are found in flood-plains of larger rivers and streams throughout Missouri. This category also includes sinkhole ponds of karst regions in the Missouri Ozarks.

Stream Beds

Wetlands may also exist within the channels of Missouri’s streams and rivers where frequent flooding constantly
scours and redeposits substrates of mud, silt, sand, gravel or boulders. Streambed wetland vegetation ranges from a wide variety of pioneering annuals, perennials, and tree seedlings that establish on muds, silts, and sands between flood events. There are also more permanent shrub and young tree communities that form on gravel washes of Ozark streams. Examples of vegetation might include willow, cottonwood, and sycamore saplings, smartweed, and water willow.

The Value of Wetlands: Why It’s Important to Preserve Them

Wetland values may be defined as the economic or environmental benefits that humans receive from them. Wetlands offer a variety of critical services to people and wildlife in Missouri.

Water Quality Improvement: Wetlands are important to maintaining water quality because they remove sediment and excess nutrients and pollutants from the water that flows through them.

Flood Damage Reduction: Many of Missouri’s remaining wetlands occur in river flood- plains. These riparian wetlands have the natural ability to moderate the effects of a flood event. Reductions in the height and volume of flood water result in a decrease in damage to life and property.

Water Supply Stabilization: Some wetlands help to stabilize surface and ground water supplies by promoting infiltration and aquifer recharge. Recharge to important aquifers is more likely following a major storm or flood event in which the water was retained in the wetland for more than a brief period of time.

Open Space and Passive Recreation: Open space generally refers to natural undeveloped areas. Many people value undeveloped wetland areas to enjoy passive recreation, which includes activities such as nature study, bird watching, hiking, and nature photography.

Fish and Wildlife: As one of the most productive ecosystems in the world, wetlands are the life support system for an incredible diversity of plant and animal species. Resources such as food, breeding and nesting grounds, and safety from predators attract a wide variety fish and wildlife. Recreation and tourism are closely tied to fish and wildlife resources which are in turn tied to wetlands.

Maintaining Missouri’s Biodiversity: Wetlands play a critical role in preserving the great variety and abundance of the world's life forms. In Missouri alone, nearly one-quarter of the state's native plant species and their diverse genetic varieties rely directly on wetlands.

Missouri Rare and Endangered Species: The feeding, breeding, nesting, spawning, and cover habitat provided by wetlands is even more critical for rare and endangered plants, fish and wildlife species. The "Rare and
Endangered Species of Missouri Checklist provides the following statistics: 100 percent of the fish species, 68 percent of the bird species, 27 percent of mammals, and 43 percent of the flowering plants depend on wetlands for survival (MDC, 1991).

Education and Research Opportunities: Wetlands offer great opportunities for education. The highly diverse nature of a wetlands challenges students, teachers, and research scientists to integrate the disciplines of zoology, botany, hydrology, agronomy and ecology.

Endangered Ecosystems

Each of the eight wetland types can still be found in Missouri. Some are more abundant than others, but all are substantially diminished in terms of their original extent. Swamps are the hardest hit wetland type in terms of wetland loss. There are still a few significant acres of marsh, forested wetland, and wet meadow left in Missouri.

It is important to realize that wetlands do not exist in isolation. They interact with the myriad of other wetland and non-wetland ecosystems within the watershed. These interactions influence wetland formation and continued viability. Because of the variety of land-use management practices in the state, the sustainability of the remaining wetlands is threatened by a number of factors, including channelization, levee development, sedimentation, overloading of nutrients, chemical runoff, and stream bank erosion. However, by applying responsible land management practices to our farms, factories, towns, and cities, we can preserves these critical natural resources for the future.
Glossary of Terms

**Acidic:** Having a pH below 7.

**Agronomy:** The science of soil management and crop production.

**Alkaline:** Having a pH of more than 7

**Alluvial:** Made up of or found in the materials that are left by the water of rivers, floods, etc.

**Annual (plant):** Plants with a life cycle that lasts only one year. They grow from seed, bloom, produce seeds and die in one growing season.

**Aquifer:** An underground layer of sand, gravel, or rock that holds water in pores or crevices.

**Botany:** The scientific study of plants.

**Diversity:** The number and variety of species found within a specified geographic region.

**Ecology:** The study of living things and their relation to one another and to their physical environment.

**Ecosystem:** The whole group of living and nonliving things together with their physical environment and the relationships between them.

**Emergent:** A plant rooted in shallow water and having most of its vegetative growth above water.

**Endangered:** Animals or plants that may soon not exist because there are very few now alive.

**Forbs:** A herbaceous (non-woody) flowering plant other than a grass.

**Groundwater:** Water that flows or collects beneath the earth’s surface in saturated soil or aquifers.

**Herbaceous:** Plants having little or no woody tissue and persisting usually for a single growing season.

**Hydrology:** A science dealing with the properties, distribution, and circulation of water on and below the earth’s surface and in the atmosphere.

**Infiltration:** The process by which precipitation or water soaks into subsurface soils and moves into rocks through cracks and pore spaces.

**Inundated:** To cover something with a flood of water.

**Migratory:** To pass periodically from one region or climate to another; like some birds, fish and animals.

**Oxbow lake:** A crescent-shaped lake formed when a bend of a stream is cut off from the main channel.

**Ozarks:** A group of low mountains in Southern Missouri, Northern Arkansas, and Northeast Oklahoma.

**Peat:** A highly organic material found in marshy or damp regions, composed of partially decayed vegetable matter.

**Perennial:** An herbaceous plant that lives for more than two years.

**Pollutant:** A substance or condition that contaminates air, water, or soil.

**Rare:** Animals or plants not found in large numbers and consequently of interest or value.

**Recharge:** A hydrologic process where water moves downward from surface water to groundwater.
**Rushes**: Several species of flowering plants that have cylindrical stocks or hollow, stemlike leaves.

**Saturated**: Soaked with moisture; having no pores or spaces not filled with water.

**Sedges**: Grasslike flowering plants that have stems with sharp edges.

**Sediment**: Material such as silt, sand, stones, and other material that is carried and deposited by water, wind, or glaciers.

**Slough**: A backwater or secondary channel of a stream.

**Surface water**: Water found on the surface of the earth (not underground or in the atmosphere), for example rivers, lakes, reservoirs, and oceans.

**Vascular**: Seed plants and ferns having well-developed vascular tissues consisting of phloem to transport sucrose and other organic nutrients and xylem to transport water and minerals.

**Zoology**: The scientific study of animals.