→ Definitions

Associate - a member or component of a plant community.

Deciduous - shedding its leaves annually.

Den tree - typically a live tree with a cavity in the trunk or limb.

Detritus - decomposing organic matter.

Forb - a broad-leaved non-grass plant or flower.

Herbivore - plant eater, for example, deer.

Mast - as in tree mast or the upper canopy of a tree.

Niche - an organism's role, function, or position in an ecosystem.

Open grown - tree growth in full sunlight.

Perennial - flows year round.

Prairie - native plant community dominated by grasses and forbs.

Structure - any component part of an ecosystem arranged together with other components, as part of the whole complex, for example, grass, tree, shrub.

Succession - a term used by ecologists to describe the gradual replacement of one plant community by another. It is brought about by changes in climate, and/or the local environment such as erosion, fire, logging, wind, influx by other species, fluctuating water levels. An example of the successional process would go something like this:

bare rock → lichens and mosses → grasses and forbs → shrubs and pioneer sun-loving trees → climax forest of sugar maple.

→ Preserve History

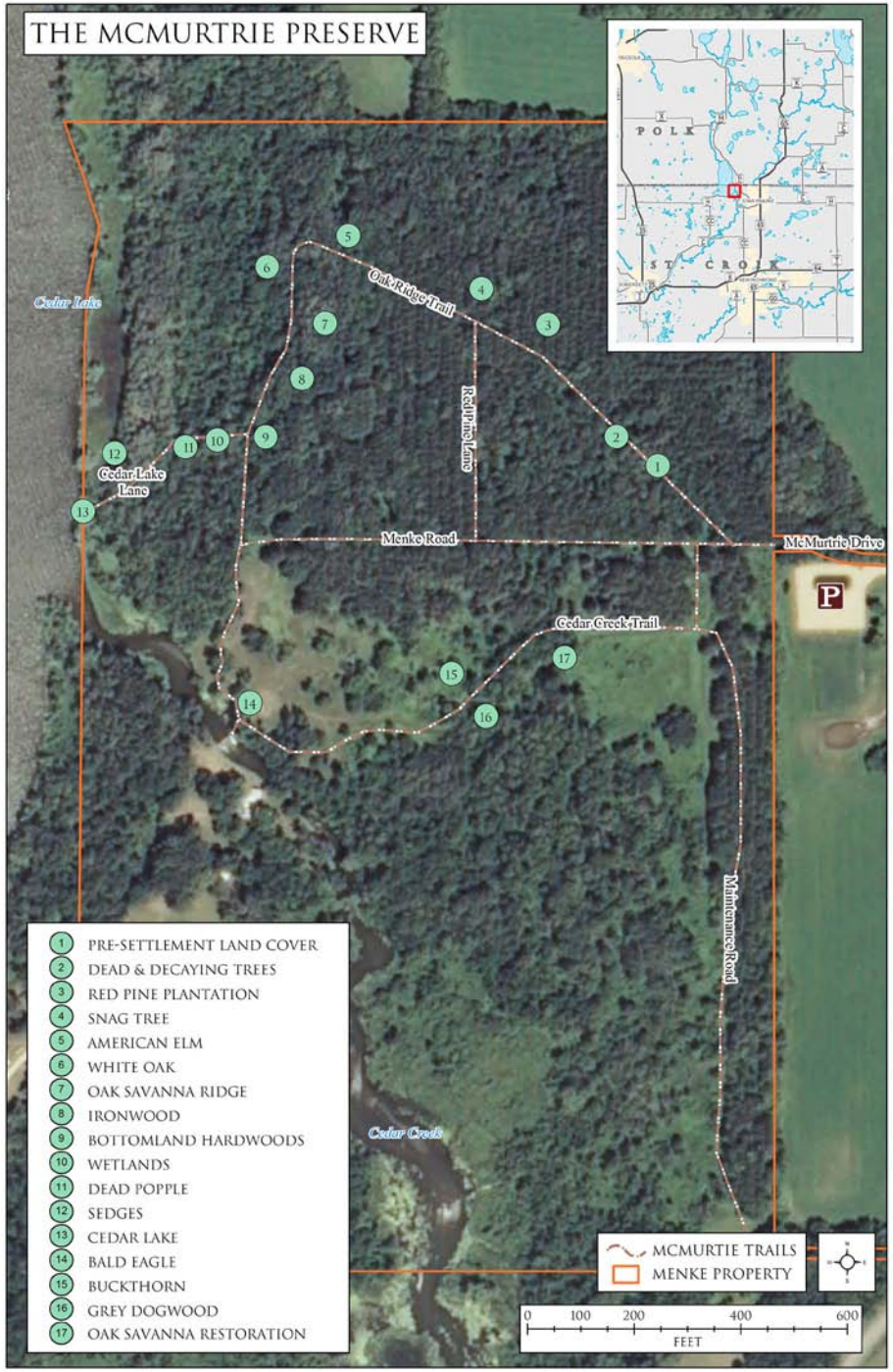
Menke Family and Land Preservation
Preserving tracts of undeveloped land along rivers and lakes is one way to protect water quality and habitat. The Menke family donated the 63 acre McMurtrie Preserve with these concerns in mind. Livestock formerly grazed these forests and fields, and a subdivision and airstrip were once considered for this site. With the donation of the land to the Star Prairie Land Preservation Trust, the property will remain in a natural state forever.

Land trusts across the state are protecting water quality, habitat, and other important land features by setting aside undeveloped areas. In this area, the Star Prairie Land Preservation Trust has protected lands along the Apple River, a rural lake and farmland, and a prairie above Star Prairie's source of drinking water.

The McMurtrie Preserve

For generations to enjoy and utilize as an educational and environmental resource.

Contributors:
Jim Riemer • Katie Goodwin • Tom Kerr • Stu Nelson • Cheryl Clemens



Note - You'll find definitions for underlined text on the back cover.

McMURTRIE POST #15

Buckthorn (*Rhamnus catharticus*)

Common buckthorn (*Rhamnus catharticus*) is a tall shrub or small tree reaching 20-25 feet in height. This European invasive is a problem species in the understory of most forests, prairies, and savannas in both northern and southern Wisconsin. Invasive, non-native plants displace native species, inhibit the growth of desirable native plants, and have no natural controls or competitors.

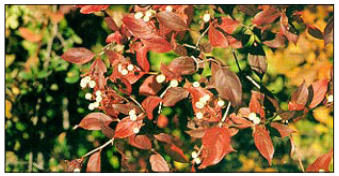
Buckthorn branch with leaves and fruit.

Common buckthorn is dioecious (male and female on different shrubs) and easy to spot when the female plants are in fruit (black, round berry). It maintains its green, glossy leaves well into November making it easier to identify for removal and treatment. The best time to cut and remove the shrub (especially fruit bearing shrubs) is from late summer through early winter. Cutting buckthorn at the base and immediately applying a glyphosphate herbicide solution will usually kill it.

McMURTRIE POST #16

Grey Dogwood (*Cornus racemosa*)

Grey dogwood is a native deciduous shrub that can grow to a height of 15 feet. It has oppositely-arranged leaves with whitish undersides. Flowering occurs from May through July, and the white fruits form in July to October. The small, white flowers occur in multi-branched clusters. White fruits are supported on red stems and are eaten by a wide variety of passerine (perching) birds and upland game birds. All dogwoods provide exceptional habitat for wildlife.



Grey Dogwood (Cornus racemosa). ***Carefully, separate a leaf and observe the "latex" threads in the leaf veins which give it strength.***

McMURTRIE POST #17

Oak Savanna Restoration

Oak savannas are stands of open grown oaks with varying densities of trees per acre and a ground layer of native forbs and grasses. Ecologists indicate that they are not oak forests and not true prairie grasslands but have floristic characteristics of both.

This area was selected for restoration because of the tree components (white and bur oaks) and the rich, diverse prairie flora remnants on the site. Prior to the settlement of European immigrants, savannas covered more than five million acres of Wisconsin. They were plowed, pastured, and cropped for agricultural purposes. Savannas that remained until the mid 1900's were eventually protected from the very thing that maintained them….periodic fires. The cessation of fires allowed trees and shrubs to grow to maturity and eventually became the oak forests of today. Presently, less than .01% of intact oak savanna remains in the entire state (approximately 500 acres) making it one of the rarest plant communities in the world.

Restoration efforts will include periodic burning, mowing, and replanting of native forbs and grasses.

McMURTRIE POST #14

Bald Eagle (*Haliaeetus leucocephalus*)

Our national symbol was once an endangered species but is now on a gradual population comeback as a result of the total ban on the organic pesticide DDT in 1969. DDT was responsible for the thinning of eggshells and the inability of the birds to produce viable offspring. An uncommon nester in the northern third of Wisconsin, bald eagles breed from mid-March to the end of May usually resulting in a clutch of 2-3 eggs.

Bald eagles are a common resident along major river systems and are a regular visitor throughout winter in most of the state. They feed on fish if open water is nearby, but will readily feast on available carrion such as road kills and discarded carcasses of trapped mammals.

Its scientific name, *Haliaeetus leucocephalus,* means white-headed (*leuco*=white, *cephalus*=head) eagle. The white head appears on mature adults after four years. The nests are usually constructed in the tallest local tree (often a white pine) and can become very large after continued use.

Look from this spot directly above the dam to see an eagle nest in a large white pine. *The first pair of bald eagles nested at this site in an adjoining white pine in 1977. This banded pair of birds had relocated from a St Croix River site. This pair has successfully averaged two eaglets per year (three in 2001) with the exception of 1996-97 when the nest was vacant. In 2007, the nest collapsed under its own weight and was rebuilt in the spring of 2008.*

Please do not disturb the eagles by going close to the nest.

Cedar Creek Water Quality

This perennial warm-water stream outlets downstream into the Apple River.

The Cedar Creek Dam regulates the water level of Cedar Lake. A grate system of vertical metal bars on the dam prevents carp from swimming upstream into Cedar Lake. Carp are benthic (bottom) feeders that eat plants and animals alike and can survive in polluted waters where native species of fish cannot. Carp present in Cedar Lake stir up bottom sediments rich in phosphorus. This phosphorus contributes to algae blooms in the lake.

Common carp are members of the minnow family, Cyprinidae, and are one of our smartest fishes.

Lake scientists look for ways to understand and control the phosphorus sources in the lake in order to limit algae growth. The major sources of phosphorus in Cedar Lake are carp suspending sediment, release from bottom sediments, and runoff water from the Cedar Lake watershed. Sediment phosphorus is released from bottom sediments in summer months when oxygen levels drop in deep water.

The watershed is the area of land from which surface water flows to the lake. Horse Creek carries much of this water flowing into the north end of Cedar Lake. How people manage the land influences how much phosphorus is carried to the lake. Fertilizers applied to farm fields and lawns and soil eroded from bare construction sites and fields all end up in the lake without proper conservation practices.

McMURTRIE POST #1

Pre-Settlement Land Cover

In 1847-48 public land surveyors established township, range, and section grids as a base for land ownership in the area you are viewing. As they traversed the land, they made notations to describe land cover types. From their original notes we can understand what type of land cover (forests, prairies, and wetlands) existed here prior to the first European settlers.

Much of this area east of Cedar Lake consisted of a combination of low (wet) forest, oak savanna, prairie, and pioneer forest. Many of the same species of trees, shrubs, and forbs can be observed on this very site today. **Note the green ash, trembling aspen (popple), and box elder.**

Green Ash Leaf
This single leaf has 7-9 individual leaflets.

Box Elder
This is actually a type of maple that grows aggressively on disturbed sites. Note the winged seed called a "samara".

Trembling Aspen
(*Populus Tremuloides*)
The leaf stem or petiole is flat allowing the leaf to "tremble" with the slightest breeze.

McMURTRIE POST #2

Dead and Decaying Trees

Dead and decaying trees (both fallen and standing) are an integral ecological component of all forests. Biologists define this as structure, and without it, the diversity and complexity of forest life forms are greatly diminished.

Birds are the most obvious benefactors of dead trees. They use them for perching, nesting, foraging, and shelter. Dead trees provide equally important niches to a host of other species such as mammals, amphibians, reptiles, and invertebrates. For example, salamanders require the damp environment beneath a rotting log for foraging and security. Mammals such as flying squirrels, white-footed mice, and bats all rely on dead wood for shelter, nesting, feeding, and food caches. Insects, spiders, and other invertebrates all play a key role in the breakdown of wood fibers into organic matter. Invertebrates are important prey for a variety of birds and shrews. Fungi (mushrooms), bacteria, mites, insects, earthworms, and herbivores are also an essential component of the forest cycle because they decompose and break down detritus material into essential nutrients for the next generation of trees.

Red-backed salamanders are very common in deciduous woodlands in the north half of the state. They prefer a forest floor with a thick leaf litter and many decaying logs or stumps. Their food is comprised mostly of small insects, worms, and spiders. Three to four inches in length, they are readily distinguished by a brick-red back stripe and white flecking on the side.

Black-capped chickadee - This year round resident and cavity nester is often seen hanging upside down on branches. In the summer chickadees catch insects in the air for a large portion of their diet. During the winter they feed on seeds and berries.

→ Black Cherry Tree

Find the black cherry tree to the left of the post. An associate of oak forests and savannas, this tree has a distinctive bark often described as having the appearance of "burnt potato chips." The barks gives off a distinctive odor of cyanide gas or bitter almonds when broken, which is true of all members of the cherry family. The cherries are quite bitter to the taste but are relished by many species of birds and mammals in summer and fall.

McMURTRIE POST #3

Red Pine Plantation

Approximately 12,000 years ago at the end of the last glacial period, Cedar Lake was much larger. The area where you are standing was once part of the glacial lake bed of Cedar Lake. As lake levels receded, forested plant communities matured and quality trees for construction and various forest products grew. Entrepreneurs sought this valuable timber in Wisconsin, and by the 1930's the northern area of our state had been cut over. This cutting was followed by very intense wild slash fires.

This indiscriminate harvest occurred in two phases. The pines were harvested first and floated down the rivers to the mills and cut into lumber to build our cities. The remaining valuable hardwoods were harvested later and shipped by railroad to populated areas in the south.

These timber harvesting events led to a culture of reforestation in the 1930's when large blocks of trees were planted by hand for saw log and pulp wood production. The tree of choice was frequently the red pine (*Pinus resinosa*), shown growing here in even rows to maximize space and growth potential. This utilitarian forest is about forty years old. Unfortunately, these artificial forests lack biological diversity and structure and are not productive for wildlife during most of their life cycle .

→ Gooseberry (left of red pine)

Find the gooseberry shrub. This small shrub is armed with distinctive thorns or bristles. Currant bushes are similar, but they have no thorns. Gooseberry is the host for white pine blister rust. This fungus, introduced from Europe, kills many thousands of our native white pine trees each year. **Look for the orange spotting fungal spores on the underside of the leaf.**

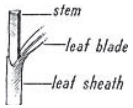
Gooseberry with yellow flower. It develops an edible fruit which has soft, spiny bristles protruding from the skin.

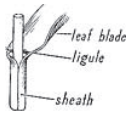
McMURTRIE POST #12

Sedges

Sedges are similar to grasses in many respects, especially in their importance to wildlife for food and habitat. Wisconsin has about 200 species of sedges, and many grow in wetlands. Sedges have solid mostly triangular stems although some are round. The stems are non-jointed, and the sheath of leaves is closed at the back. Grasses, on the other hand, have hollow, round or flat, jointed stems with the sheath of leaves open at the back.

Sedge - note the closed leaf sheath and triangular (solid) stem





Grass – note the open leaf sheath and round (hollow) stem

This wet depression in front of you has at least four species of sedges which are identifiable by their seed heads (flower or inflorescence). Yellow sedge (*Carex utriculata*) is a very common and important component of wetlands in Wisconsin.

The sedge wren is totally dependent on marshes and wet meadows for habitat.

McMURTRIE POST #13

Cedar Lake

Cedar Lake is a glacially formed, shallow (28 feet maximum depth), drainage lake of approximately 1,100 acres that empties south into Cedar Creek. Cedar Creek flows through the McMurtrie Preserve and eventually to the Apple River. Popular for fishing, Cedar Lake contains walleye, northern pike, large-mouthed bass, and a variety of pan fish. Local sportsmen and the Wisconsin DNR have installed more than 190 fish cribs to provide spawning habitat and protective cover for a variety of fish species.

Note the ice ridges formed from ice expanding over time and pushing against the shoreline. The size of the ridge depends on bank slope, temperature, lake levels and the type of soil along the shore. Although it may be tempting for lakeshore property owners to remove ice ridges, they are actually helpful structures that slow runoff, improve water quality, and stabilize shorelines.

Watch for belted kingfishers, a small robin-sized fishing bird that feeds on minnows and rough fish.

The belted kingfisher "hovers" over the water in search of prey. It nests in soil burrows along shorelines.

McMURTRIE POST #10

Wetlands

A wetland is defined as "an area where water saturates the land surface long enough to be capable of supporting hydrophytic (water-loving) vegetation and produces hydric (wet) soils." Wetlands perform numerous natural functions such as trapping sediment, uptake of nutrients, shoreline protection, flood water retention, groundwater and surface water recharge, and providing habitat for many species of plants and animals. Currently, 43% of all federally-listed threatened and endangered species use wetlands at some point in their life cycles (Feierabend 1992). In Wisconsin, 32% of the state's listed species are wetland dependent.

There are 11 species of frogs and one species of toad in Wisconsin. Collectively they're called "anurans" (without tails), and the mating call of a particular species can be heard at a certain time of the year. Tree frogs (Eastern gray and Cope's gray) have a short (30 sec) loud trill often emanating from the tree tops. Listen for them from the end of April to mid-July.

At present, Wisconsin has lost 47% of its original 10 million acres of wetlands. Many of the remaining 5.3 million acres are in the northern third of the state (Wisconsin DNR 1990). In some southern Wisconsin counties, the amount of wetland loss is well over 75%. Wisconsin's losses reflect the national status of wetlands. It is estimated that half of our nation's 221 million acres of wetlands have been lost (Feierabend 1992).
***Look for wood ducks and the occasional hooded merganser**, two of our resident waterfowl cavity nesting birds that utilize these wooded pools.*

→ Wood duck (*Aix sponsa*)
This (dabbling) duck feeds at or near the surface of shallow water by tipping its head into shallow water and probing the bottom for vegetative parts and seeds. Wood ducks eat mast crops such as grapes, berries, and nuts from the woods. Not totally vegetarians, woodies (and other dabblers) will supplement their diet (about 10%) with insects.

McMURTRIE POST #11

Dead Popple (*Populus tremuloides*)

Many ecologists consider aspen or popple the most important tree species for wildlife in North America. This sun loving, short lived tree (about 50 years) is circumboreal (world wide) in distribution and provides food, shelter, and space to countless numbers of wildlife species. **Note the elongated excavated hole created by the crow-sized pileated woodpecker in its search for food.** Hypoxylon canker (a fungus), is the number one tree disease of aspen trees. This fungus will often result in young trees "snapping off" high in the tree at the point of infection, creating many valuable snags in young forests.

Pileated woodpeckers are the largest woodpeckers in Wisconsin. Their diet consists mainly of insects (especially beetle larvae and carpenter ants) and occasionally fruits and berries. Their call can be described as a wild laugh, similar to the flicker. Their loud drumming or hammering against a tree can be heard from quite a distance.

McMURTRIE POST #4

Snag Tree

Dead or dying trees such as this American elm are home to more than thirty species of birds in Wisconsin. Woodpeckers are examples of primary excavators that create nesting holes in trees. Woodpeckers also use cavities resulting from natural decay. Some species like nuthatches and chickadees are secondary excavators that peck away at existing holes in trees. Secondary cavity users such as wood ducks nest in holes created by other species. **Find the snag tree.**

Dead trees, commonly called snags, are an integral component of any forest. Forest managers once thought snags were undesirable because they were considered in conflict with other forest management practices and thought to harbor forest insect pests and create potential fire or safety hazards.

In the past snags were often eliminated during timber sales. As a result, cavity-nesting waterfowl, such as wood ducks, hooded mergansers, and common goldeneye suffered significant population declines. Biologists have come to realize the tremendous importance of dead trees and forest structure to wildlife.

Female wood duck nesting in a wood duck house. The nesting cavity, where she lays as many as 12-15 eggs, is lined with downy, soft feathers. Soon after hatching, the young will jump from the tree or wood duck house cavity to the forest floor and eventually make their way to a woodland pond.

Managing your woodlot for snags and den trees ←

- Leave as many snags and live den trees as is practical for all species of animals. Snags create negligible amounts of shade. Leaving several den trees per acre will not negatively impact future forest regeneration.
- Leave ALL size classes and a variety of tree species for snags and live den trees.
- Maintain distribution throughout the woodlot if possible.
- Never remove fallen trees, limbs, or detritus material from a maturing forest.
- Take green, less merchantable trees for firewood. DO NOT TAKE snags or viable den trees.
- Den trees are defined as live trees, with a cavity in the trunk or limbs, which provide essential cover for many species of birds and mammals. Den trees provide critical forest structure and habitat for about a one third of our wildlife species.

Pygmy shrew (Sorex hoyi), stalking a potential meal. These tiny creatures are very reliant on woody debris and fallen trees for their survival. Wisconsin has six species of shrews and two species of moles, all in the family, Insectivora. They are one of the world's smallest mammals, some weighing as little as 6 grams (a quarter coin weighs 5.67 grams). These animals do not hibernate. Their diet consists mainly of worms, grubs, beetles and other insects. Because of their small size and high metabolic rate, they must eat frequently and will consume their own weight in insects each day.

McMURTRIE POST #5

American Elm *(Ulmus americana)*

These young elm trees are mere vestiges of the huge, towering elms that formerly grew throughout our cities and lowlands decades ago. Nearly all of these majestic trees have unfortunately died off as a result of Dutch elm disease. The Dutch elm disease micro fungi was imported from Europe in the late 1920's. It spread initially in this country by bark beetles, and unfortunately devastated most of the mature elms in the Midwest.

American elm leaf with "winged" seed.

Question… Why have trees evolved to develop winged seeds?

McMURTRIE POST #6

White Oak (*Quercus alba*)

Inspect the bark of this huge white oak, and note that it varies from deeply furrowed to somewhat smooth. On the smoother bark you will see a small, whitish cup-shaped fungus called, *Aleurodiscus oakesii*, attached. This fungus exfoliates or consumes the dead outer bark to give it a smooth rather than a deeply furrowed appearance. The process, called oak parchment or smooth patch disease, really does not harm the tree.

A white oak leaf

McMURTRIE POST #7

Oak Savanna Ridge

In the Midwest, savanna is generally used to describe a plant community ecosystem that was bordered by the prairies of the Western U.S. and the deciduous forests of the East. This "blending" of plant community types represents a transition from the grassland prairie to oak forest. An oak savanna community generally has widely scattered trees with prairie vegetation beneath.

Prairies and savannas were maintained by frequent fires and possibly by browsing and grazing by large ungulates such as elk. Oaks (white, bur, black, Hill's) were the dominant trees - hence the term oak savanna. If you look south along this ridge you'll see the representative spacing of the oaks. Note the undergrowth of other shade tolerant trees and shrubs that take hold in the absence of fire. With the passage of time and in the absence of disturbance such as timber harvest, fire, mowing, or disease, this area will develop into a shaded forest through a process ecologists call succession.

There are some plants and animals that reach their optimal abundance in these oak savanannas. For example, red-headed woodpecker, orchard oriole, eastern bluebird, and the rare forb, kittentails, may live here. Oak savannas and the more densely shaded oak woodlands also support a variety of forest birds including wild turkey, yellow-throated vireo, scarlet tanager, tufted titmouse, and blue-gray gnatcatcher. *Watch for them!*

Scarlet tanager – This brilliantly colored bird feeds on insects, wasps, beetles, and sometimes berries and resides in the upper tree canopy of Wisconsin deciduous forests.

McMURTRIE POST #8

Ironwood (*Ostrya virginiana*)

A relatively small tree, ironwood grows well in shade. Ironwood or hop-horn beam has a fruit enclosed in a leafy, inflated sac shaped like a "hop". The cone-shaped hop and male catkin are eaten by many forest birds and small mammals. Its wood is extremely hard, hence the name ironwood.

Ruffed grouse-Bonasa umbellus (commonly called partridge by many), feed heavily on ironwood, aspen, and hazelnut catkins. In the spring during courtship, the male grouse will often be heard 'drumming" from a favorite log to attract a mate and claim his territory. The drumming sound is an ascending loud thump or drum created from the compression of air as it rapidly beats its wings. Aldo Leopold, the father of modern day conservation, spoke highly of this bird and fondly referred to them as "feathered rockets" because of their explosive, quick flight when flushed in the forest.

McMURTRIE POST #9

Bottomland Hardwoods

These forested wetlands occur along lakes or streams and have poorly drained muck or mucky sand soils. Common tree species include crack willow (*Salix fragilis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), and American elm (*Ulmus americana*). Understory shrubs include speckled alder (*Alnus incana*) and beaked hazelnut (*Corylus cornuta*). The herbaceous ground layer consists of moist soil plants like marsh marigold (*Caltha palustris*), waterleaf (*Hydrophyllum virginianum*), orange jewelweed (*Impatiens capensis*), and many species of sedges (*Carex sp.*). These deciduous woodlands are extremely important for amphibians, reptiles, and forest bird species like woodpeckers and flycatchers.

Beaked Hazelnut. A very common and important native shrub of our savannas and woodlands.