# Learn to identify trees

American Elm

Black Walnut

Butternut

Ironwood

Thornapple

American Basswood

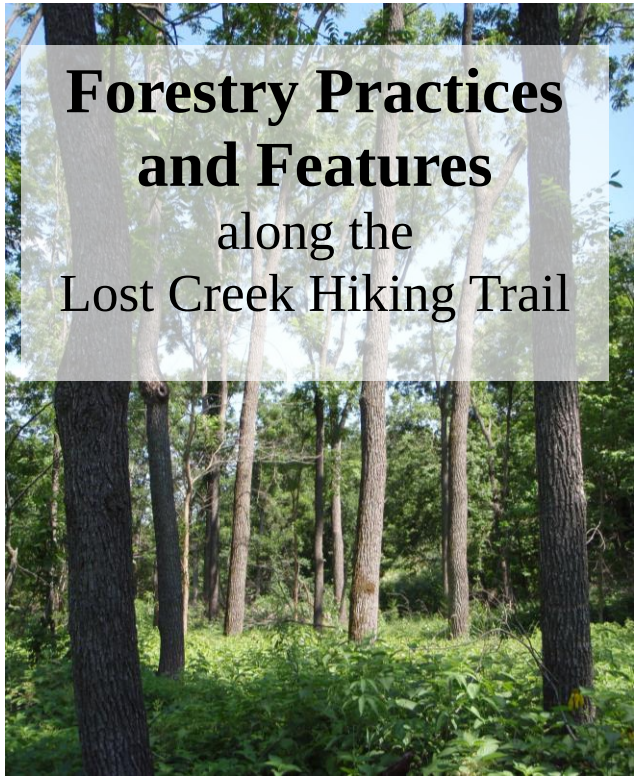
Sugar Maple

White Oak

Red Oak


Beware of contact with this increasingly widespread invasive species. It contains oils that cause painful blistering which can last for weeks.The chemical compound is photoreactive, so If you do contact wild parsnip wash the area and avoid exposure to sunlight.

ENJOY THE HIKE!



# Forestry Practices and Features
## along the Lost Creek Hiking Trail

There are many forestry practices and natural features along the Lost Creek Hiking Trail. There are signs along the trail pointing out these features, and this brochure will give you information about each one. Green signs indicate practices and yellow signs indicate features.

For further information on the practices and features highlighted in this brochure, visit www.fillmoreswcd.org.

This forestry interpretative information is provided by the
Fillmore Soil and Water Conservation District and the
Bluff Country Hiking Club.

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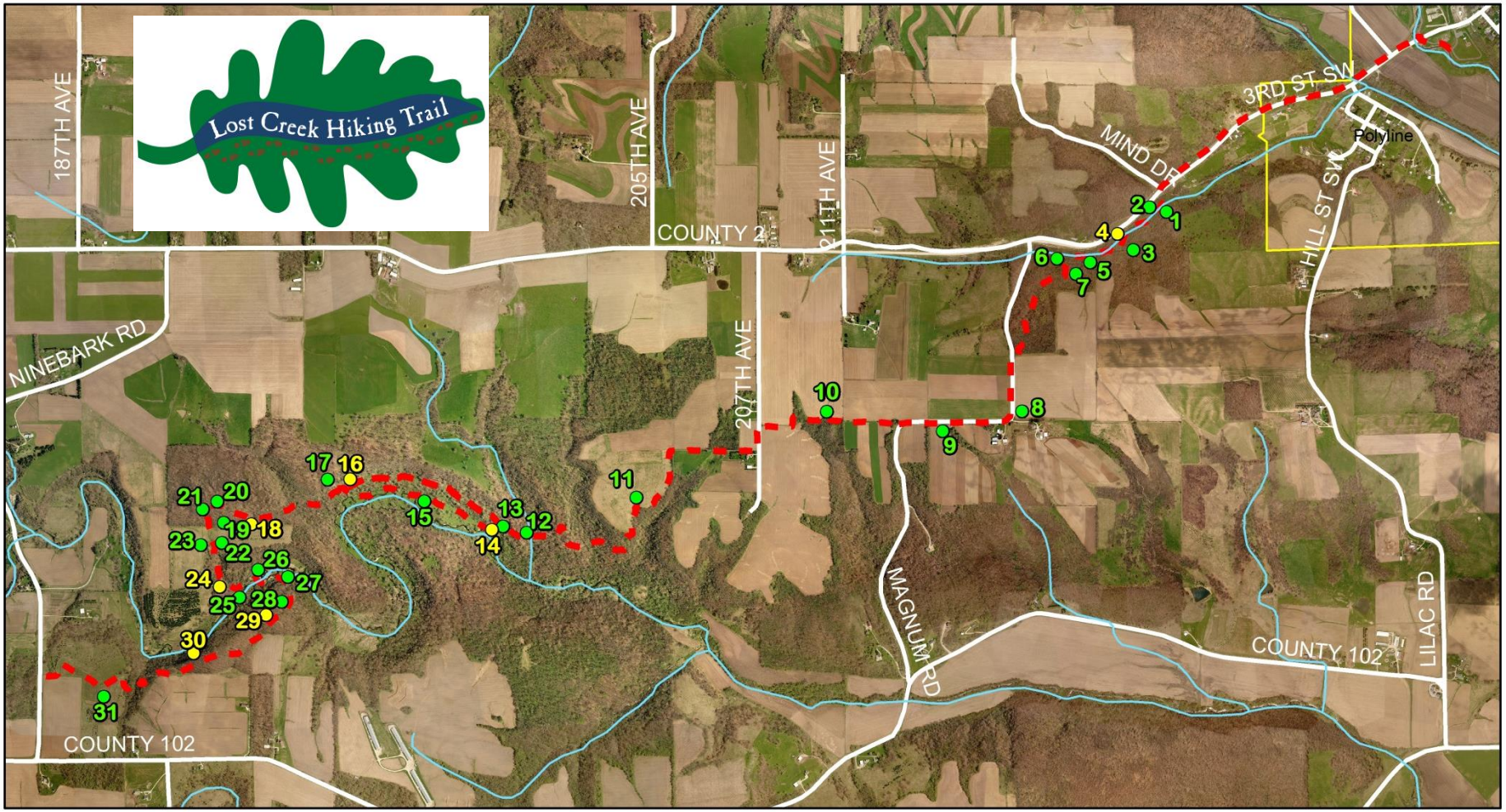


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## 1 Long-term Effects of Timber Stand Improvement

This natural walnut stand originated on open pasture land around 1945. In 1979, a Timber Stand Improvement (TSI) project removed low value elms and box elders, leaving two acres of nearly pure walnuts. Following wind damage in 2010, some damaged trees were harvested for lumber and veneer. The residual stand has been thinned, allowing the best quality walnuts to grow freely for the next few decades.

## 2 Salvage logging

This one-acre opening was the site of concentrated wind damage. Trees that could be salvaged for lumber were harvested. The other trees were too damaged to grow reliably and were cut to allow new trees to grow. Instead of cleaning up what may look like a mess, the damaged trees were left to create habitat and protect tree seedlings. Treetops and shattered stems have been cut low enough to become covered by broadleaf ground cover permitting faster decay and recycling of nutrients.

## 3 Current Timber Stand Improvement

Desirable walnut trees have been newly "released" on this half-acre site. Undesirable species and poorly formed walnuts were cut down to allow the best trees to grow freely. Though the walnut trees in this area are the same age as walnut trees on better bottomland to the east, they are distinctly shorter due to poorer soils that are visible at the creek crossing.

## 4 Decorah Shale Edge

The Decorah shale, a thin, rather impermeable layer, appears along this watercourse. Groundwater percolates downward through the soil and rock, then moves laterally when it reaches this layer. Numerous springs in the adjacent valley appear at the same elevation. Just below the Decorah outcrops, the same streams often lose water to percolation back in to the soil. This section of trail is usually wet because it is in the area between where Decorah shale is exposed and where the water filters back into the ground.

## 5 Culling by Girdling

The trees with double cut marks are girdled. The girdling cuts on the stems of these damaged trees prevent downward transport of carbohydrates to the roots, starving the tree below ground. The tree crowns die in one or two growing seasons. The standing dead tree is typically available for wildlife feeding and nesting for years to come. Limbs tend to decay first and fall independently of the stem with minimal damage to nearby trees. Girdling is preferable to cutting the tree down because it gives the understory species time to adapt to the increased amount of sunlight.

## 6 Water Bars & Cross-sloped Trail

After skidding logs on this route, the trail was regraded to shed water along the entire length, rather than let water run in the tracks. The trail is cross-sloped with water bars on the steepest parts of the trail to minimize erosion and keep the trail as dry as possible. Water bars with a smooth trench and berm crossing the trail help divert water in heavy runoff events but permit easy passage on foot or by machine.

## 7 Wolf Trees Left for Habitat

Wolf tree is a term for large trees that use a lot of sunlight and soil space with no prospect of economic use in the future. These half dozen large sugar maples are typical "open grown" trees with broad crowns and large, low limbs that are now dead stubs and knot holes. Compare to nearby "forest grown" 3- and 4-inch trees with upright narrow crowns. Many types of wildlife use wolf trees from mice and squirrels to raccoons, chickadees and woodpeckers to ducks and barred owls. While these trees have extensive decay, the crowns appear vigorous and may produce heavy seed crops for wildlife.

## 8 Bluebird houses

Bluebirds are colorful summer residents of this region. They nest in cavities excavated by other birds, and prefer trees in or near meadows and grassy areas in the uplands, where they can scan their surroundings for insects and small invertebrates. Their population suffered heavy losses during the 20th century as a result of replacement of wooden fences with metal fences and barbed wire, and the introduction of non-native bird species. These boxes, constructed as part of the Bluebird Recovery Program of Minnesota, provide ideal habitat and have helped recover Bluebird populations to a sustainable level. For more information, visit the Bluebird Recovery Program online at BBRP.org.

## 9 Hay in a crop rotation

Crop rotation is a conservation practice aimed at reducing weed and pest threats, increasing yield, improving soil quality, and reducing the need for artificial fertilizers. This field uses a corn/soybean/hay rotation taking advantage of hay's ability to fix nitrogen and filter runoff from row crops.

## 10 Strip till

This conservation practice creates 8-10" wide tilled strips for planting. The rest of the cover is not disturbed leaving residue from the previous harvest behind. This helps prevent erosion, improves soil quality, and contributes nutrients to next year's crop. Planting on strip-tilled land is often managed using GPS technology.

## 11 Native Grasses and Wildflowers

This field, planted to native grasses and wildflowers is enrolled in the Conservation Reserve Program. This voluntary cost-share and rental assistance program is designed to help agricultural landowners convert erodible cropland and environmentally sensitive areas into natural vegetation in order to reduce soil erosion, improve water quality, and improve habitat for wildlife. Contracts can provide annual rental payments for 10 or 15 years. Cost-share is available for establishing the practices. For more information, or to determine if your land would benefit from enrollment in the CRP, contact your local USDA Farm Service Agency (FSA) office.

## 12 Erosion Control Steps

This portion of the trail was prone to erosion due to lack of vegetation from foot traffic and from use by four-wheel all-terrain vehicles (ATV). In June 2013, the Bluff Country Hiking Club in cooperation with the Conservation Corps Minnesota and Iowa installed steps to control the erosion and reduce the risk of slipping in wet conditions. The steps slow the water flow downslope and direct it into the rock alongside the steps also discourage ATV traffic. The design is the same used for Minnesota state park trails.

## 13 Rotationally Grazed Pasture

A tradeoff exists between quality and quantity of grazing forage. If the forage is too short, yield will be compromised. If the forage is too tall, quality will be compromised. Rotational grazing is the managed movement of cattle and other ruminants with the intent of maximizing yield without sacrificing quality. Benefits of rotational grazing include a decrease in weeds, reduction in erosion and maintenance fertilization, more uniform manure distribution, and improvements in the cost of production coupled with enhanced animal output per acre.

## 14 "What's lost about Lost Creek?"

While many nearby streams supported by spring-fed cold water are renowned for their trout fishing, there are no such springs along this section of Lost Creek. The water here, rather than emerging, disappears into the ground. In particularly dry years in the past, the stream has reportedly disappeared, and hence was "lost". "Losing streams" are a common occurrence in karst landscapes.

## 15 Silvopasture with Walnuts

Silvopasture, the combination of timber production and grazing, can be seen on this section of the trail. Naturally occurring walnuts, old and young, are scattered in this pasture. Unlike most trees, walnut can tolerate soil compaction and root injuries from grazing without decay. Some grasses, especially bluegrass, can tolerate the toxic compound that leaches from walnut roots and foliage. Cattle can use the grass and shade, while the pasture also produces some valuable timber.

## 16 Limestone Bluff

The easily dissolvable limestone and dolostone that we live on gives this region its unique geology called karst. Common karst features include sinkholes, caves, springs and disappearing streams. This limestone cliff face displays "the fabric of the land" and shows us this process in action. While it may be just an erosion feature, the mound in front of the cliff face may have formed through fracturing and separation from the limestone wall.

## 17 Unpastured/Untilled Woodland

The forest north of this trail segment has no record of having been tilled or pastured which is unusual for southeast Minnesota. It had historically been divided into woodlots, owned by residents of Stewartville where they got their firewood.

## 18 Sinkhole

Sinkholes are a characteristic terrain feature of southeast Minnesota and a visible reminder of the "Swiss cheese" landscape below. They form when water dissolves underlying bedrock, creating a conduit into which overlying material is funneled. Sinkholes can form gradually, but if the surface does not adjust to the subsurface erosion, a void may form and ultimately collapse the material above. Sinkholes are often "sealed off" due to the safety and water quality hazards that they pose.

## 19 Hardwood Tree Seedling Planting

Along this stretch of trail, walnut and red oak seedlings were hand planted in 2011 among the dead branches of harvested trees to protect them from deer browsing. Some large or defective trees have recently been harvested to reallocate sunlight and soil space to the seedlings.

## 19 Clear Cut - 1985

Clear cutting mimics stand-replacing natural disturbance allowing growth of shade intolerant trees such as oak and cherry. In the years immediately following 1985, this area looked much like the nearby 2010 clear cut.

## 21 Sustainable Harvesting

Sustainable harvesting has taken place along this section of trail. These harvests utilize mature trees and also select some low quality trees to cut with the intention of leaving other high quality or younger trees to grow in the future.

## 22 Clear Cut - 2010

Clear cutting mimics stand-replacing natural disturbance, allowing growth of shade intolerant trees such as oak and cherry. In 25 years, this forest will progress to look much like the nearby 1985 clear cut.

## 23 Erosion control structure

Uninterrupted water flow erodes sediment creating gullies and ravines. These structures are intended to slow the water coming from the uplands, reduce these erosional forces, and prevent the gully from advancing further.

## 24 Pioneer Road

This portion of the trail follows an old pioneer road which previously connected Nine-bark Road to Lost Creek, providing access to homesteads and cabins that existed in this valley around the turn of the 20th century. Evidence of these homesteads is still visible today.

## 25 Tree Protection—Tree Tubes and Bud Capping

Young trees are always at risk of winter browsing by deer, rabbits and mice. Tree tubes protect the entire seedling until the tree grows above the tube, but they can only be used on deciduous trees. Bud caps, pieces of paper stapled to the central leading twig, protect the part of the tree that is responsible for next year's vertical growth. Bud caps are normally applied in autumn and allowed to weather away the following spring and can be used on both coniferous and deciduous trees.

## 26 Swing-Away Bridge

This bridge is permanently secured on only one of the banks. Usually, the other end rests securely on the opposite bank, but when the water rises and large debris is being carried downstream, the bridge can float out of the way to allow the water to continue flowing normally. If both ends of the bridge were permanently attached, logs and other storm debris would build up around the bridge and restrict the flow of water.

## 27 Cottonwood and Willow Pole Planting

Looking across the creek, you should see cottonwood and willow trees with 3-6-inch trunks. These trees started as fence-post sized cuttings from cottonwood and willow branches and are able to sprout roots and leaves. These cuttings, called poles, can quickly turn into trees. The large cuttings grow their first year's foliage above competing plants and deer browsing and grow roots below the roots of competing plants.

## 28 Experimental Treatment to Control Reed Canary Grass

Along this section of trail, there are multiple reforestation techniques currently being tried to overcome the reed canary grass which can crowd out tree seedlings but cannot tolerate shade. These techniques include pole planting and an experimental herbicide treatment of canary grass followed by burning, shallow tillage and direct seeding of hardwoods. Through these multiple techniques, reed canary grass is slowly being replaced with hardwood trees.

## 29 Thornapple Spring

Springs are common features throughout the karst region of southeast Minnesota. Unlike many of these springs, Thorn Apple Spring does not get turbid, or murky, following a heavy rainfall; this indicates that the water source originates from a deeper and more protected aquifer and does not have a direct connection to surface runoff.

## 30 Blowhole

This karst feature is connected to an underground network of cracks and fissures that maintain an air temperature of roughly 48 degrees year-round. The air enters this subterranean complex through upland sinkholes and is forced out at the blowhole producing rising mist during the winter and a cool draft during the summer.

## 31 Direct Tree Seeding

This area is in the process of being reforested. These young trees were not planted as seedlings, but as seeds, as part of a direct tree seeding project. Many different varieties of tree seeds were broadcast on tilled soil and have now grown into young tree seedlings.