

PROPERTY PLANNING COMMON ELEMENTS

COMPONENTS OF MASTER PLANS

HABITATS AND THEIR MANAGEMENT

Oak Savanna (Oak Opening and Oak Woodland)

Description

“Savanna” is a term for communities that are intermediate between prairies and forests. In the Midwest, savanna generally refers to an ecosystem that historically was part of a mosaic of plant communities representing a continuum from prairie to forest; savannas were the communities in the middle of this continuum. The mosaic was maintained by frequent fires and possibly by large ungulates such as elk. Oaks were the dominant trees.

After Euro-American settlement, oak savanna as an ecosystem was fragmented and almost completely lost due to clearing and plowing for agriculture, overgrazing, or invasion by shrubs and trees due to lack of fire, lack of grazing, or both. Intact oak savannas are now extremely rare and the community, along with tallgrass prairie, is the most threatened in the Midwest and one of the most threatened in the world.

Because savannas are intermediate communities that can grade into both prairies and forests, there are no clear dividing lines between them and there is no clear-cut or widely accepted definition of what a savanna is. In Wisconsin, the more ‘open’ part of the savanna continuum is referred to as oak opening and the more ‘closed’ or wooded part is referred to as oak woodland. These are described below.

Oak Opening

This is an oak-dominated savanna having less than 50% tree canopy coverage and more than one tree per acre. Historically abundant on wet-mesic to dry sites, very few remnants exist today. Most of these occur on drier sites, often on moderate to steep south- and west-facing slopes or gravelly morainal ridges. Bur, white, and black oaks are the dominant trees, and typically are large and open-grown with distinctive limb architecture. Shagbark hickory is sometimes present. Hazelnut is a common understory shrub. The herb layer is potentially diverse, and can include species found in both oak forests and prairies as well as other species adapted to light conditions of filtered sunlight. Some plants (e.g., kitten tails) and animals (e.g., red-headed woodpecker, orchard oriole, Eastern bluebird) reach their optimal abundance in oak openings.

Oak Woodland

This community is intermediate between oak openings and oak forests. Trees typically lack the thick boles and wide-spreading crowns of oak openings and have greater crown closure, ranging from 50% to as much as 95%. Most remnants occur on moderate-to-steep west- or south-facing slopes or sites with thin or coarsely-textured soils. Dominant tree species are white oak, bur oak, and black oak, sometimes mixed with red oak and shagbark hickory. Under a characteristic fire regime of frequent (annual), low-intensity fires, oak woodland would have a very open sub-canopy and understory, with minimal shrubs and saplings. The herb layer is potentially diverse, with some species characteristic of prairie, oak savanna, and oak forest communities but also featuring grasses, legumes, composites, and other forbs best adapted to light conditions of highly filtered sunlight. Representative herbs may include boneset, violet bush-clover, Virginia bush-clover, Culver’s-root, rough-leaved sunflower,



eastern shooting-star, Short’s aster, yellow-pimpernel, bottlebrush grass, silky wild-rye, and bracted tick-trefoil. Spring ephemerals may be present but are far less frequent than those found in the denser shade of oak forests. Many of the same plants and animals reaching their optimal abundance in oak openings also occur in oak woodland, as do forest species (e.g., yellow-throated vireo, scarlet tanager, tufted titmouse, blue-gray gnatcatcher).

Ecological Landscape Opportunities

Ecological Landscape	Opportunity*	
	Oak Opening	Oak Woodland
Central Sand Hills	P	P
Central Sand Plains		P
Southeast Glacial Plains	M	M
Southern Lake Michigan Coastal	I	P
Southwest Savanna	M	M
Western Coulee and Ridges	M	M
Western Prairie	I	I

*M = Major; major opportunity exists in this Landscape; many significant occurrences are recorded, or restorations likely to be successful.

I = Important; several occurrences important to maintaining the community in the state occur in this Landscape.

P = Present; community is present in the Landscape but better opportunity exists elsewhere.

Rare Species

Many Species of Greatest Conservation Need (SGCN) are associated with oak savanna habitats based on the findings in [Wisconsin’s 2015 Wildlife Action Plan](#). To learn more, visit the [Savanna communities page](#) and click on a savanna type.

Threats

- Oak savannas historically were maintained by fire and are threatened by the lack of it. Fire limits woody encroachment, stimulates early and robust growth of plants as well as flowering and fruit production, deters growth of invasive species, and increases plant species diversity.
- Oak savannas are threatened by a variety of non-native invasive plants; the most common invaders include garlic mustard, common buckthorn, and Eurasian bush honeysuckles. Some aggressive native woody species (e.g., prickly ash) can also be a problem.
- Development and agriculture can fragment savannas, creating barriers to species movement and genetic exchange and making application of prescribed fire more difficult.
- Oak savannas suffer from ecological simplification – a lack of species and structural diversity needed to support a robust community of plants and animals – due to past fire suppression, grazing, and invasion by non-native invasive plants. This makes savannas more vulnerable to pests, diseases, and other environmental stresses.
- Climate change may make oak savannas more vulnerable to woody encroachment, particularly by mesophytic species, invasion by non-native invasive plants, and tree pests and diseases. It may also narrow opportunities to apply prescribed fire.



Management Techniques

- [Prescribed fire](#)
- [Intermediate treatments](#)
- [Mowing/brushing](#)
- [Pesticide treatments](#)
- [Grazing](#)

Management Prescriptions

- Wherever possible, manage oak savannas within a complex of interconnected, related habitats (e.g., oak forest, surrogate grasslands, prairie, sedge meadow, emergent marsh), preferably with a lowland-to-upland continuum.
- Where possible, use prescribed fire to invigorate native grasses and forbs, to suppress the encroachment of woody species, and in some cases to control non-native invasive plants. Ground flora augmentation may be used if necessary.
- Use grazing, cutting, mowing, brushing and herbicides (when necessary) to remove trees, shrubs, and invasive species. Both commercial and non-commercial timber management may be used to achieve desired structural and compositional characteristics.
- Rotate management spatially and temporally as appropriate to minimize negative impacts from any particular management technique.
- Whenever feasible, plant a diversity of native species from local seed sources when conducting savanna restorations. Oaks may be planted to establish or increase oak.
- Follow all applicable [Grassland and Savanna Management protocols](#) to minimize negative impacts of management practices on rare/sensitive species.

