

PROPERTY PLANNING COMMON ELEMENTS

COMPONENTS OF MASTER PLANS

HABITATS AND THEIR MANAGEMENT

Central Hardwoods

Description

This page describes management of the central hardwoods cover type. Central hardwoods are comprised of variable associations of hardwood tree species, typically oaks (red, white, and black) with common dominants and co-dominants including shagbark and bitternut hickories, American and slippery elms, black cherry, red and sugar maples, white ash, basswood, hackberry, aspens, white birch, black walnut, and butternut. Ironwood is often common in the understory and lower canopy. Other associated species include black locust, box elder, and white pine.

Central hardwoods share many characteristics of species composition and structure with several other cover types. Stands are typed as central hardwood when they do not meet the criteria for these other cover types, particularly oak or northern hardwood but also red maple and black walnut. As with these cover types, central hardwoods can occur on a variety of sites, ranging from mesic to dry, and stand structure and species composition of canopy, subcanopy, shrub, and herbaceous layers can vary similarly according to forest habitat type, site conditions, and land use history. In general, oaks are the most common overstory dominants in central hardwood stands, although many of these stands are transitioning towards sugar maple, with basswood, white ash, and ironwood increasing in importance due to failure of oaks to regenerate. These northern hardwood species are most prominent on dry-mesic and mesic sites. On sites where northern hardwood seed sources have not become established, central hardwood stands increasingly are dominated by red maple, black cherry, elms, shagbark hickory, bitternut hickory, and ironwood.

Historically, it's likely that the central hardwood cover type was very limited in extent, as it now occurs predominantly in areas once occupied by oak forests, woodlands, and savannas. With Euro-American settlement these areas were cleared for agriculture and development. The cutting and burning used to clear the land, subsequent farming and pasturing, and then abandonment of land that was marginal for cultivation created conditions favoring oaks over more shade-tolerant, less fire-adapted species. Fire suppression, high white-tailed deer herbivory, competition from native and non-native species, and unsustainable logging in the oak forests that regenerated from those conditions have created the situation observed today, where the oak component is steadily being lost from southern Wisconsin forests. This loss is accelerating as mature oaks, originating from cutting, burning and post-savanna succession 100-150 years ago, are being lost to logging and senescence. As a result, the composition of these forests is shifting to more shade-tolerant species characteristic of later-successional central hardwoods or, where sugar maple seed sources exist, northern hardwoods.

Ecological Landscape Opportunities

Ecological Landscape	Opportunity*
Central Sand Hills	M
Southeast Glacial Plains	M
Western Coulee and Ridges	M



Ecological Landscape	Opportunity*
Central Lake Michigan Coastal	I
Southern Lake Michigan Coastal	I
Southwest Savanna	I
Western Prairie	I
Central Sand Plains	P

*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 opportunities exist elsewhere.

Rare Species

Many Species of Greatest Conservation Need (SGCN) are associated with central hardwoods based on the findings in [Wisconsin’s 2015 Wildlife Action Plan](#). To learn more, visit the [Southern Forest communities page](#) and click on “Southern Dry-mesic Forest” and “Southern Mesic Forest”.

Threats

- Past and current land use changes, fire suppression, unsustainable management practices (e.g., high-grading) or lack of management, excessive herbivory, and competition from both native and non-native species have contributed to the loss of mature oaks from, and lack of oak regeneration in, central hardwood stands, a change which is likely to be detrimental to wildlife.
- Fragmentation threatens central hardwood forests. Much of southern Wisconsin is characterized by “permanent” fragmentation, or the long-term conversion of native habitats to agricultural, residential, or urban uses. This isolates and degrades forest tracts, limits management options, and reduces habitat for species that require large forest blocks.
- Many central hardwood forests suffer from ecological simplification – a lack of species and structural diversity needed to support a robust community of plants and animals – due to past and current management practices, invasion by non-native species, and excessive deer herbivory. This reduces habitat for a variety of species and makes forests more vulnerable to pests, diseases, and other environmental stresses.
- Invasive species are a significant threat to central and northern hardwood forests. Problematic species currently include non-native honeysuckles and buckthorns, garlic mustard, Japanese barberry, multiflora rose, autumn olive, non-native earthworms, gypsy moth, and emerald ash borer.
- Predicted changes in climate may affect some species associated with central hardwoods. Warmer, drier conditions in southern Wisconsin may be less favorable for species like sugar maple and yellow birch but beneficial for black oak, black walnut, and hickories. Warmer temperatures may also allow insect pests and pathogens to increase.

Management Techniques

- [Group selection](#)
- [Overstory removal](#)



- [Patch selection](#)
- [Shelterwood](#)
- [Clearcut](#)
- [Prescribed fire](#)
- [Site preparation](#)
- [Intermediate treatments](#)
- [Pesticide treatments](#)

Management Considerations

- Consider landscape composition and structure (species composition; successional stage; age structure; stand/patch size; degree of fragmentation, etc.) when deciding on a management technique. Either even-aged or uneven-aged systems may be used for central hardwoods, depending on the tree species being favored. A variety of management techniques may be applied depending on the management objectives, including old-growth reserves, managed old forest, extended rotation, un-even-aged management, even-aged management, and maintenance of reserve trees.
- Where possible, manage for larger stands, larger blocks, and to increase connectivity with surrounding forest.
- Wherever feasible, maintain or increase the oak component in these stands.
- In appropriate sites, consider using prescribed fire in combination with silvicultural prescriptions (e.g., shelterwood, group selection, thinning) to regenerate oak.
- In stands containing mature oaks where management to regenerate oak is not feasible, consider deferring harvest, or apply extended rotation or old-growth management to retain oaks as long as possible.
- Manage for composition and structural diversity by: retaining some large-diameter trees, living and dead cavity trees, snags, and coarse woody debris; creating canopy gaps of varying sizes; maintaining or increasing tree species diversity; creating and maintaining a diversity of age and size classes; and applying extended rotation or managed old-growth management to some stands.
- Increase representation of older trees and older stands.
- Protect special features such as ephemeral ponds, seeps, riparian areas, cliff faces, and rock outcrops.
- Limit permanent fragmentation caused by development (roads, landings, etc.).
- Control and limit deer herbivory.

