



Forest: Dry hardwood

Description

Dry hardwood forests have dry soils and are generally dominated by such trees as white oak (*Quercus alba*), black oak (*Quercus velutina*), northern pin oak (*Quercus ellipsoidalis*), black cherry (*Prunus serotina*), bigtooth aspen (*Populus grandidentata*), and quaking aspen (*Populus tremuloides*). Dry hardwood forests generally have relatively open canopies that allow for the regeneration of shade-intolerant species, especially oaks. Fire is an important natural disturbance in many dry hardwood forests, where the frequency and magnitude of fires play a major role in determining species composition, successional stage, forest structural characteristics, and configuration. Dry forest openings are also created by high winds or disease (e.g., oak wilt). These gaps are often colonized by less vigorous species such as aspen (aspen also colonize disturbed dry conifer gaps). Dry hardwood forests have a high diversity of shrub and woody vine species. These shrub species are represented in early successional stages as well as within the understory of more advanced stages. With fire suppression, many dry hardwood forests are colonized by shade-tolerant maples and thus succeed to mesic forests.

General Condition of Feature

About half of the dry hardwood in the Southern Lower Peninsula is considered to be in fair to good condition. Most of the remaining areas are considered degraded or very degraded (~45%). Much of this habitat is being lost to development and forest succession. Some of these natural communities are classified as rare or uncommon in the State.

Associated Natural Communities

Dry Southern Forest
Dry-mesic Southern Forest

Associated Species of Greatest Conservation Need

INSECTS

post-oak grasshopper (*Dendrotettix quercus*)
woodland camel cricket (*Ceuthophilus uhleri*)
woodland meadow katydid (*Conocephalus nemoralis*)
conehead grasshopper (*Neoconocephalus retusus*)
American burying beetle (*Nicrophorus americanus*)
black lordithon rove beetle (*Lordithon niger*)
northern hairstreak (*Fixsenia favonius ontario*)
Karner blue (*Lycaeides melissa samuelis*)
Henry's elfin (*Callophrys henrici*)
frosted elfin (*Callophrys irus*)
gorgone checkerspot (*Chlosyne gorgone carlota*)
barrens buckmoth (*Hemileuca maia*)
Sprague's pygarcia (*Pygarcia spraguei*)
three-staff underwing (*Catocala amestris*)
quiet underwing (*Catocala dulciola*)
Robinson's underwing (*Catocala robinsoni*)

AMPHIBIANS

blue-spotted salamander (*Ambystoma laterale*)
marbled salamander (*Ambystoma opacum*)
smallmouth salamander (*Ambystoma texanum*)

REPTILES

black rat snake (*Elaphe obsoleta obsoleta*)
eastern hognose snake (*Heterodon platirhinos*)
smooth green snake (*Liochlorophis vernalis*)
copperbelly water snake (*Nerodia erythrogaster neglecta*)
eastern massasauga (*Sistrurus catenatus catenatus*)

REPTILES cont.

eastern box turtle (*Terrapene carolina carolina*)

BIRDS

Bald Eagle (*Haliaeetus leucocephalus*)
Cooper's Hawk (*Accipiter cooperii*)
Northern Goshawk (*Accipiter gentilis*)
Red-shouldered Hawk (*Buteo lineatus*)
Chuck-will's-widow (*Caprimulgus carolinensis*)
Whip-poor-will (*Caprimulgus vociferus*)
Red-headed Woodpecker (*Melanerpes erythrocephalus*)
Northern Flicker (*Colaptes auratus*)
Acadian Flycatcher (*Empidonax vireescens*)
Least Flycatcher (*Empidonax minimus*)
Wood Thrush (*Hylocichla mustelina*)
Brown Thrasher (*Toxostoma rufum*)
Cerulean Warbler (*Dendroica cerulea*)
Worm-eating Warbler (*Helmitheros vermivorus*)
Connecticut Warbler (*Oporornis agilis*)
Eastern Towhee (*Pipilo erythrophthalmus*)

MAMMALS

red bat (*Lasiurus borealis*)
hoary bat (*Lasiurus cinereus*)
northern bat or northern myotis (*Myotis septentrionalis*)
Indiana bat or Indiana myotis (*Myotis sodalis*)
eastern pipistrelle (*Pipistrellus subflavus*)
least weasel (*Mustela nivalis*)
woodland vole (*Microtus pinetorum*)
southern bog lemming (*Synaptomys cooperi*)

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Grazing and mowing patterns
- Altered fire regime: Lack of fire may lead to vertical simplification due to a dearth of natural regeneration.

- Fragmentation

HABITAT CONVERSION

- Industrial, residential, and recreational development: Forested stands are being developed to create wooded house lots.

CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Forestry practices: Oak stands may convert to maple or beech after harvest due to the difficulty of regeneration of oak. Forest cultivation may lead to monoculture stands.
- Incompatible natural resource management

BIOLOGICAL INTERACTIONS

- Invasive plants and animals: Invasive species like garlic mustard (*Alliaria petiolata*), gypsy moth (*Lymantria dispar*), and emerald ash borer (*Agrilus planipennis*) may alter species composition.
- Disease, pathogens and parasites: Oak wilt, Dutch elm disease, and other diseases may alter species composition.
- Other biological interactions: White-tailed deer (*Odocoileus virginianus*) browse may hinder regeneration, especially of oaks.

Conservation Actions Needed [Threats addressed]

LAND & WATER PROTECTION

- Expand conservation easement programs [variety of threats]
- Support and expand conservation purchase of high quality occurrences [variety of threats]

LAND, WATER & SPECIES MANAGEMENT

- Manage to approximate natural disturbance regimes using managed grazing and mowing and prescribed fire. [Grazing and mowing patterns; Altered fire regime]
- Assess management goals to ensure that they provide for a diversity of communities across the landscape. [Altered fire regime, Forestry practices, Incompatible natural resource management]
- Institute invasive species monitoring, prevention and control programs. [Invasive plants and animals]
- Implement disease monitoring and control programs. [Disease, pathogens, and parasites]
- Manage white-tailed deer densities to allow for regeneration. [Other biological interactions]
- Develop timber best management practices to address wildlife needs of dry hardwood systems, specifically issues of regeneration and cultivation after harvest. [Forestry practices]
- Manage for representation of all successional stages. [Incompatible natural resource management; Forestry practices]
- Promote the closure of non-essential resource management roads and seek other road closure opportunities that do not conflict with other appropriate uses. [Fragmentation]
- Where large diameter tree snags and coarse woody debris are occasional or rare, seek to increase their volume. [Forestry practices]
- Support Landowner Incentive Programs to foster conservation on private land [variety of threats]

LAW & POLICY

- Work with municipalities to promote planning and zoning insuring adequate protection for dry hardwood systems. [Fragmentation; Industrial, residential, and recreational development]

Research and Survey Needs

- An inventory needs to be conducted to determine the location, condition, and classification of dry hardwoods and of the opportunities for restoration.
- Test the assumption that remnants are widely dispersed and becoming more fragmented resulting in a loss of species diversity.
- A better understanding is needed of the management needs and appropriate management techniques to maintain and improve dry hardwood features.
- A better understanding is needed of the temporal and spatial distribution of disturbance and its influence. What factors provide disturbance within dry hardwood communities?
- Identify the characteristics of dry hardwood systems that contribute to their value to wildlife and which species may be affected by changes in these characteristics.
- Identify invasive species and diseases that may degrade the value of dry hardwood sites for wildlife. Develop techniques to control invasive species. Develop treatments for diseases that threaten dry hardwoods. Common invasive species and diseases include emerald ash borer (*Agrilus planipennis*), oak wilt, and beech bark disease.
- Document the historic and current range of variation between dry hardwood sites. This includes variables such as species composition, age or size class, and stand size.
- Evaluate the influence of mast in dry hardwoods on wildlife population size and health. Can high or low mast crops have a significant impact on species abundance? Are there regional differences either in mast crops or the wildlife response to changes in the mast crop?

MICHIGAN'S WILDLIFE ACTION PLAN
TERRESTRIAL SYSTEMS: SOUTHERN LOWER PENINSULA

Monitoring

- Track woody species composition and diversity, with attention to structure and age class.
- Track the presence and abundance of invasive species.
- Track acreage and distribution of dry hardwoods.
- Track mast production and oak regeneration.