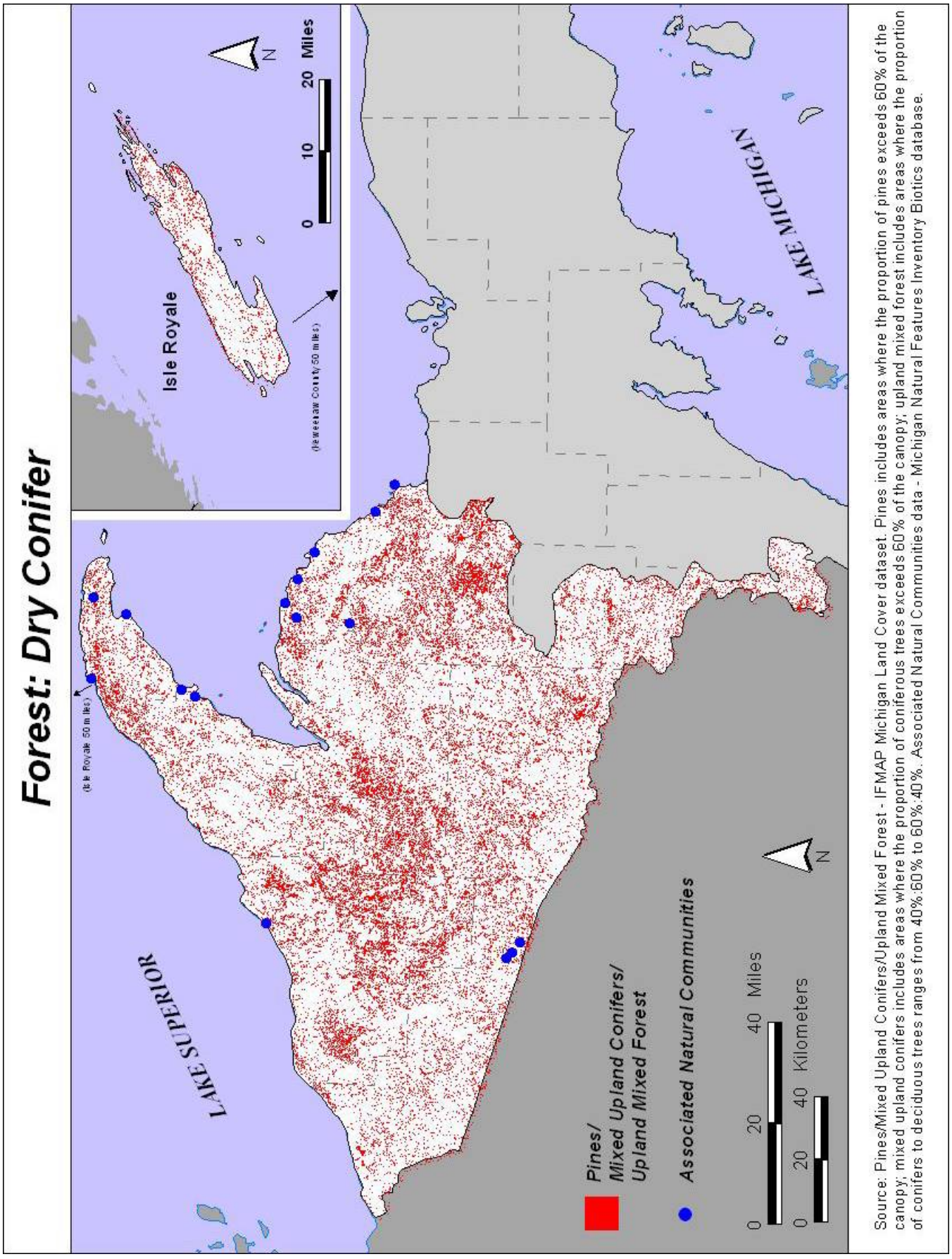
Forest: Dry Conifer
Isle Royale
(Keweenaw County 50 miles)
0 10 20 Miles
N
(Isle Royale 50 miles)
LAKE SUPERIOR
LAKE MICHIGAN
Pines/
Mixed Upland Conifers/
Upland Mixed Forest
Associated Natural Communities
0 20 40 Miles
0 20 40 Kilometers
N
Source: Pines/Mixed Upland Conifers/Upland Mixed Forest - IFMAP Michigan Land Cover dataset. Pines includes areas where the proportion of pines exceeds 60% of the canopy; mixed upland conifers includes areas where the proportion of coniferous trees exceeds 60% of the canopy; upland mixed forest includes areas where the proportion of conifers to deciduous trees ranges from 40%:60% to 60%:40%. Associated Natural Communities data - Michigan Natural Features Inventory Biotics database.

Forest: Dry conifer

Description

Dry conifer forests have dry soils and are generally dominated by such trees as jack pine (*Pinus banksiana*), red pine (*Pinus resinosa*), and white pine (*Pinus strobus*). Fire is an important natural disturbance in many dry conifer 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. With fire suppression, some dry conifer forests are colonized by shade-tolerant maples or conifers (i.e., balsam fir, white spruce) and thus succeed to mesic forests.

General Condition of Feature

Much of the dry conifer in the Western Upper Peninsula is considered to be in fair or good condition (~70%). Most of the remaining areas are considered degraded (~30%). Dry hardwood forests include natural communities that are considered rare or uncommon in Michigan.

Associated Natural Communities

Boreal Forest
Dry Northern Forest
Dry-mesic Northern Forest
Wooded Dune and Swale Complex

Associated Species of Greatest Conservation Need

INSECTS
- large marble *(Euchloe ausonides)*
- northern blue *(Lycaeides idas nabokovi)*
- frigga fritillary *(Boloria frigga)*
- freija fritillary *(Boloria freija)*
- gorgone checkerspot *(Chlosyne gorgone carlota)*
- hoary comma *(Polygonia gracilis)*
- Macoun's arctic *(Oeneis macounii)*

AMPHIBIANS
- blue-spotted salamander *(Ambystoma laterale)*

REPTILES
- western fox snake *(Elaphe vulpina)*
- eastern hognose snake *(Heterodon platirhinos)*
- smooth green snake *(Liochlorophis vernalis)*

BIRDS
- Spruce Grouse *(Falcipennis canadensis)*
- Sharp-tailed Grouse *(Tympanuchus phasianellus)*
- Bald Eagle *(Haliaeetus leucocephalus)*
- Cooper's Hawk *(Accipiter cooperii)*
- Northern Goshawk *(Accipiter gentilis)*
- Merlin *(Falco columbarius)*
- Black-billed Cuckoo *(Coccyzus erythropthalmus)*
- Common Nighthawk *(Chordeiles minor)*

BIRDS cont.
- Whip-poor-will *(Caprimulgus vociferus)*
- Black-backed Woodpecker *(Picoides arcticus)*
- Brown Thrasher *(Toxostoma rufum)*
- Kirtland's Warbler *(Dendroica kirtlandii)*
- Palm Warbler *(Dendroica palmarum)*
- Connecticut Warbler *(Oporornis agilis)*
- Eastern Towhee *(Pipilo erythrophthalmus)*
- Red Crossbill *(Loxia curvirostra)*
- White-winged Crossbill *(Loxia leucoptera)*
- Evening Grosbeak *(Coccothraustes vespertinus)*

MAMMALS
- pygmy shrew *(Sorex hoyi)*
- red bat *(Lasiurus borealis)*
- hoary bat *(Lasiurus cinereus)*
- lynx *(Lynx canadensis)*
- American marten *(Martes americana)*
- least chipmunk *(Tamias minimus)*
- northern flying squirrel *(Glaucomys sabrinus)*
- southern bog lemming *(Synaptomys cooperi)*
- deer mouse *(Peromyscus maniculatus gracilis)*
- snowshoe hare *(Lepus americanus)*

Associated Threats

MODIFICATION OF NATURAL PROCESSES
- Altered fire regime: Fire suppression increases forest vulnerability to diseases, pathogens, parasites, and invasive plants and animals.
- Fragmentation: Increased fragmentation increases forest vulnerability to diseases, pathogens, parasites, and invasive plants and animals. Road development increases fragmentation.

HABITAT CONVERSION
- Industrial, residential, and recreational development: Encroachment of development and extension of the forest/urban interface hinder the use of fire as a management tool.
- Incompatible Natural Resources

CONSUMPTIVE BIOLOGICAL RESOURCE USE
- Forestry practices: Forest cultivation has resulted in conversion of species composition and conversion to monoculture stands.

NON-CONSUMPTIVE BIOLOGICAL RESOURCE USE
- Non-consumptive recreation: Uncontrolled ATV and ORV use degrades dry conifer forest.

BIOLOGICAL INTERACTIONS

- Invasive plants and animals
- Disease, pathogens, and parasites: Bud worms (*Choristoneura pinus*) and other parasites are a threat, but outbreaks may be minimized depending on forestry practices in use and harvest cycles.

EDUCATION

- Social attitudes: Public attitudes toward fire as a management tool reduce its effectiveness.

Conservation Actions Needed [Threats addressed]

LAND & WATER PROTECTION

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

LAND, WATER, & SPECIES MANAGEMENT

- Manage to approximate natural disturbance regimes using prescribed fire. [Altered fire regime]
- Develop and implement plans for invasive species control and prevention. [Invasive plants and animals]
- Identify and implement disease control measures. [Disease, pathogens and parasites]
- Consider wildife values, timber values, and natural landcover and conditions when selecting vegetative species composition as part of management of these areas [Incompatible natural resource management]
- Develop and enforce best management practicess which address the needs and values of wildlife. [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]
- Manage for representation of all successional stages. [Forestry practices]
- Maintain and expend the eastern hemlock and white pine forest component where appropriate to better represent historic forest components and to provide for a greater diversity of plant and animal communities. [Forestry practices]
- Where large diameter tree snags and coarse woody debris are occasional or rare, seek to increase their volume. [Incompatible natural resource management; Forestry practices]
- When managing red pine plantations consider techniques that favor natural successional pathways. [Incompatible natural resource management]
- Support Landowner Incentive Programs to foster conservation on private land [variety of threats]

LAW & POLICY

- Work with municipalities to promote planning and zoning insuring the retention of larger parcel sizes in dry conifers. [Fragmentation; Industrial, residential, and recreational development]
- Develop and enforce regulations to curtail recreational activities that cause significant damage. [Non-consumptive recreation]

EDUCATION & AWARENESS

- Provide education on the value of fire as a management tool for creating and maintaining wildlife habitat.[Altered fire regime; Social attitudes]

RECREATION

- Promote responsible ATV and ORV use. [Non-consumptive recreation]

Research and Survey Needs

- An inventory needs to be conducted to determine the location, condition, and classification of dry conifers 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 conifer features.
- A better understanding is needed of the temporal and spatial distribution of disturbance and its influence. What factors provide disturbance within dry conifer communities?
- Identify the characteristics of dry conifer 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 conifer sites for wildlife. Develop techniques to control invasive species. Develop treatments for diseases that threaten mesic conifers.
- Document the historic and current range of variation between dry conifer sites. This includes variables such as species composition, age or size class, and stand size.
- Determine whether differences exist in the value to wildlife of natural stands, forest plantations, and barrens. Quantify the structural differences between these communities.

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 conifers.