

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Forest Certification Work Instruction

DRAFT

FINAL

Date of Draft Document:

Effective Date: 6-01-16

Revision Number: 9

Supersedes Version Dated: 6-23-15

Work Instruction Title: 1.4 Biodiversity Management on State Forest Lands

Work Area Group: 1 - Planning, Monitoring, Review

Purpose: To provide direction for addressing biological diversity conservation objectives.

Work Instruction:

The intent of this work instruction is to provide direction for cataloging areas within the state forest that have been identified for a variety of biodiversity values. It is also intended to provide management options that are compatible with conservation objectives.

1. Definitions

Biological Diversity: *means the full range of variety and variability within and among living organisms and the natural associations in which they occur. Biological diversity includes ecosystem diversity, species diversity, and genetic diversity (Part 355, NREPA).*

Special Conservation Areas (SCAs). The SCAs are areas of state forest which have had one or more conservation objectives, interests, or elements identified. Conservation objectives listed in the SCA category have been identified through a variety of methods and mechanisms, and it is important to understand how the objective was determined. The type and strength of recognition—and possible management options—will vary depending on the process used to identify the conservation value. For example, some objectives are detailed in the Land Use Orders of the Director (force of law) while others may be identified through cooperative agreements (administrative direction). There are also conservation objectives that are specified through DNR guidelines for areas such as deer yards and riparian buffers. The SCA category may also be used to document areas identified by an external group or organization, such as National Audubon Society's Important Bird Areas Program. The SCA definition is purposefully broad to encompass a spectrum of conservation interests and elements. It is a descriptor that provides the land manager and/or stand examiner with natural resource information to make informed management decisions. Some SCA categories are reviewed and updated through the compartment review process, while others are generally static. Those SCA categories related to biodiversity conservation include Non-Dedicated Natural Areas and National Natural Landmarks, Type 1 and Type 2 Old Growth, Habitat Areas and Corridors, and Great Lakes Islands.

High Conservation Value Areas (HCVAs)¹. The HCVAs are areas of state forest¹ which have been recognized for their contribution to specific conservation values, objectives and ecological attributes or significant social values, and have a significant public consultation and/or public review as part of their identification process². Examples are areas designated through legislation, administrative rule, Director's

¹ HCVAs address Principle 6 and Principle 9 of the Forest Stewardship Council and Objective 4 of the Sustainable Forestry Initiative certification standards.

² Although an important public process, the Compartment Review Process is not a final approval forum for designating HCVAs. It is a key process for identifying potential conservation areas.

and Natural Resource Commission Orders, and project-specific public reviews. The HCVA's are Ecological Reference Areas, Legally Dedicated Natural, Wilderness or Wild Areas, Natural and Wild and Scenic Rivers, Critical Dune areas, Dedicated Habitat Areas (e.g. Kirtland's Warbler Management Areas, and interior core forest habitats), Dedicated Management Areas (landscape-level forests like the Sand Lakes Quiet Area), and Coastal Environmental Areas. Type 1 and Type 2 Old Growth areas will become a HCVA category upon completion of the public review and approval process for future revisions to RSFMPs.

Dedicated Habitat Areas (DHA). The DHAs are a category of High Conservation Value Area. They identify geographic areas on the landscape where there is an emphasis on species-specific habitat, with a long-term goal of ensuring that these species are conserved as examples of our State's biodiversity. These include:

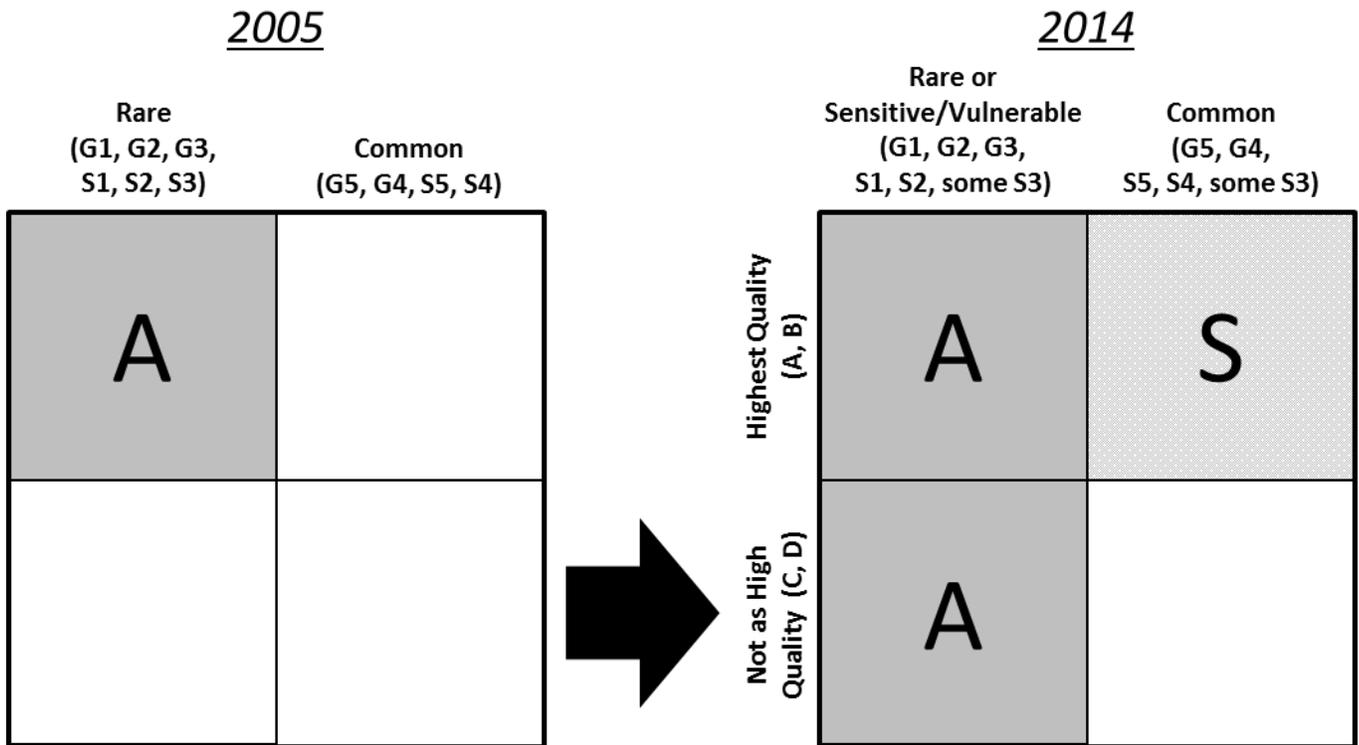
- a. Habitat areas for threatened or endangered species, such as the Kirtland's warbler and piping plover, in association with species management plans that have been developed in cooperation with the U.S. Fish and Wildlife Service and other federal land managing entities such as the U.S. Forest Service; and
- b. Habitat areas for species requiring interior core forest habitat, including American marten, cerulean warblers, red-shouldered hawks, and northern goshawks.

Ecological Reference Area (ERA). The ERAs are a category of High Conservation Value Area (as defined by the Forest Stewardship Council certification standard) and are Forests with Exceptional Conservation Value (as defined by the Sustainable Forestry Initiative certification standard). An ERA identifies a geographic area on the landscape where there is an emphasis on biodiversity conservation achieved through maintaining and/or restoring high quality native natural communities, with a long-term goal of ensuring that these natural communities are conserved as examples of our State's biodiversity. They serve as models of ecological reference within the state. They are higher quality examples of functioning ecosystems that are primarily influenced by natural ecological processes. The ERAs are based on the Michigan Natural Heritage database of known natural community sites (Element Occurrences³). Operationally, ERAs are comprised of two categories (Figure 1):

- a. Common Communities. A representative selection of natural communities with a Global (G) or State (S) Rank of S3 (vulnerable) if less sensitive to typical forest management practices, G4 and S4 (apparently secure and uncommon), and G5 and S5 (secure and common) and usually an Element Occurrence (EO) Rank of A or B (The site is an 'excellent or good' example of the natural community), and;
- b. Rare Communities. All natural communities with a Global (G) or State (S) Rank of G1 and S1 (critically imperiled), G2 and S2 (imperiled), and G3 (vulnerable), and S3 (vulnerable) if more sensitive to typical forest management practices, with an Element Occurrence (EO) Rank of A, B, C, or D.

The ERAs are primarily located on DNR-administered State Forests, State Parks, or State Wildlife Areas. Not all high quality natural communities occur on DNR lands, and ERAs also recognize other owners (National Forests, National Parks, National Wildlife Refuges, conservancy lands, and local government conservation lands) that have protective designations on exemplary natural communities.

³ Natural Community Rank and Element Occurrence in Michigan are determined by Michigan Natural Features Inventory using internationally recognized natural heritage methodology developed and used by NatureServe.



A = All natural community element occurrences
 S = Selected examples of documented natural community occurrences

Figure 1. Ecological Reference Areas on in-scope certified State Forest lands.

Potential Old Growth (POG). The POG areas were identified in the state forest after the 1994 NRC approval of the ‘Old Growth on State Forest Lands’ addendum to the 1983 Statewide Forest Resources Plan. Formal designation of POG areas was never achieved across the entire state forest, as was intended to occur under the 1979 NRC Policy 2207 key value management planning process for individual state forests (e.g. Pere Marquette State Forest). Areas that were identified as POG were coded as ‘Stand Condition 8’ under the old Operations Inventory (OI) system, and if retained for the next compartment review cycle, are coded as a category of Special Conservation Area in the Michigan forest inventory system (MiFI).

Type 1 and Type 2 Old Growth. Old-Growth forest (also termed primary forest, ancient forest, virgin forest, or primeval forest) is an area of forest that has few or no signs of human disturbance and that exhibits unique ecological features related to age, composition and associated structure. Old growth forests are of natural origin. They may be dominated by late successional forest species (i.e. sugar maple and American beech), or may be a very old example of a stand dominated by long-lived early- or mid-seral species (i.e. oak, or red pine).

Actively or passively managed second growth forest stands (of natural or planted origin) which were effectively clearcut in the late 1800s and early 1900s, but have subsequently developed late-successional or old growth structure, composition, and function are not considered to be Type 1 or Type 2 Old Growth.

Old-growth stands and forests include:

- **Type 1 Old Growth:** A forested area 3 acres or more in size that has never been logged and that display old-growth characteristics (Table 1).
- **Type 2 Old Growth:** A forested area 20 acres or more acres in size that has been logged (minor cutting), but which does not result in the elimination of any major canopy species and that retains (never lost) significant original elements of old-growth structure and functions (Table 1).

Legacy Tree. An individual tree of a long-lived species, usually mature or remnant of old growth, which provides a biological legacy. It is an individual old tree (or occasionally a small group of old trees) that function(s) as a refuge or provides other important structural habitat values. By definition, relatively short-lived species (including big-tooth and trembling aspen, balsam fir, balsam poplar, and paper birch) cannot be legacy trees.

Legacy trees must be 150+ years old or diameter at breast height is 26+ inches, and in either case will exhibit some of the following characteristics:

- Presence of hollows and cavities
- Super-canopy crown position
- Broken tops with crown debris accumulations and/or partial snag formation
- Plate-like or thick fire-resistant bark
- Fire scars and basal burn cavities

2. Direction for Reviewing SCAs and HCVAs During Compartment Review

The database of SCAs and HCVAs is located within the Geographic Decision Support Environment (GDSE), and maintained by the FRD GIS Certification Specialist. Some SCA boundaries are static data layers (e.g. Concentrated Recreation Areas) and are non-editable by DNR field staff through the compartment review process, or they may be non-static data layers (e.g. Possible Type 1 and 2 Old Growth areas) that may be edited by field staff during the compartment review process. All HCVAs are static data layers.

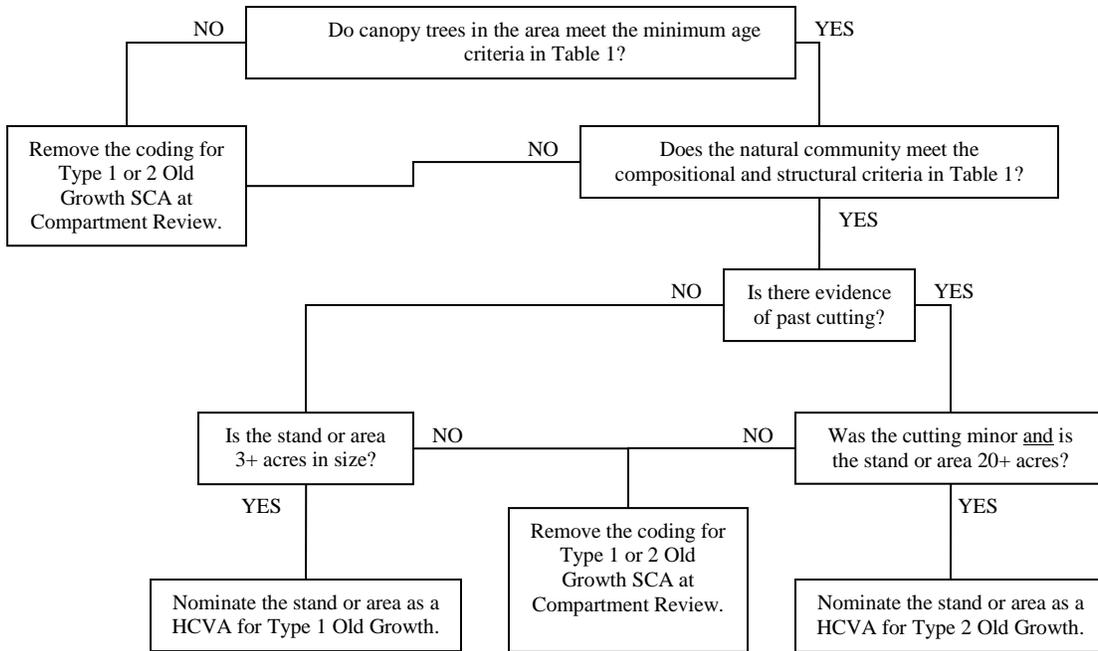
Through the course of conducting forest inventory stand examiners should, prior to the initiation of field inventory, evaluate the database of SCAs and HCVAs for completeness and accuracy. Any changes in the designation of or edits to non-static SCAs shall be documented in the MiFI using the coding instructions provided in Appendix H of the MiFI manual. Edits to static SCA and HCVA data layers may only be accomplished through direct consultation between field staff, the FRD GIS Certification Specialist, and other staff specialists with interest in the data layer.

- a. Ecological Reference Areas:** Recommendations for changes to the ERA layer in the GDSE may come from DNR field staff or DNR Lansing staff, and they may come through the compartment review process, as a result of observations during implementation of management activities, through opportunistic observations, or as a result of formal survey. Regardless of from whom or how the recommendations are provided, the following guidance is provided:
- 1) On the basis of updated Michigan Natural Heritage data, ERAs on state forest lands may be recommended for deletion (if the Element Occurrence no longer exists) or modification (if the Element Occurrence boundary has changed). All recommendations for deletions or modifications of this nature and resulting edits to the ERA layer in the GDSE shall be coordinated through the FRD Biodiversity Conservation Program Leader and FRD GIS Certification Specialist.
 - 2) On the basis of DNR field review of boundaries and/or site conditions, ERAs on state forest lands may be recommended for deletion (if site conditions are no longer consistent with ERA designation), modification (if site conditions do not match the existing ERA boundary), or addition (if site conditions suggest an undocumented high quality natural community). All field recommendations for deletions, modifications or additions of this nature will require further review, potentially including a formal survey, and shall be coordinated through the FRD Biodiversity Conservation Program Leader, working with a consultant, such as Michigan Natural Features Inventory.
 - i. Any need for deletion or modification edits to the ERA layer in the GDSE that are confirmed following review shall be subsequently coordinated through the FRD Biodiversity Conservation Program Leader and FRD GIS Certification Specialist.
 - ii. Any need for addition edits to the ERA layer in the GDSE that are confirmed following review shall be held until the next formal review and approval process for an updated network of ERAs (see '3.' below). However, if the addition is for a rare natural community, the FRD Biodiversity Conservation Program Leader in coordination with

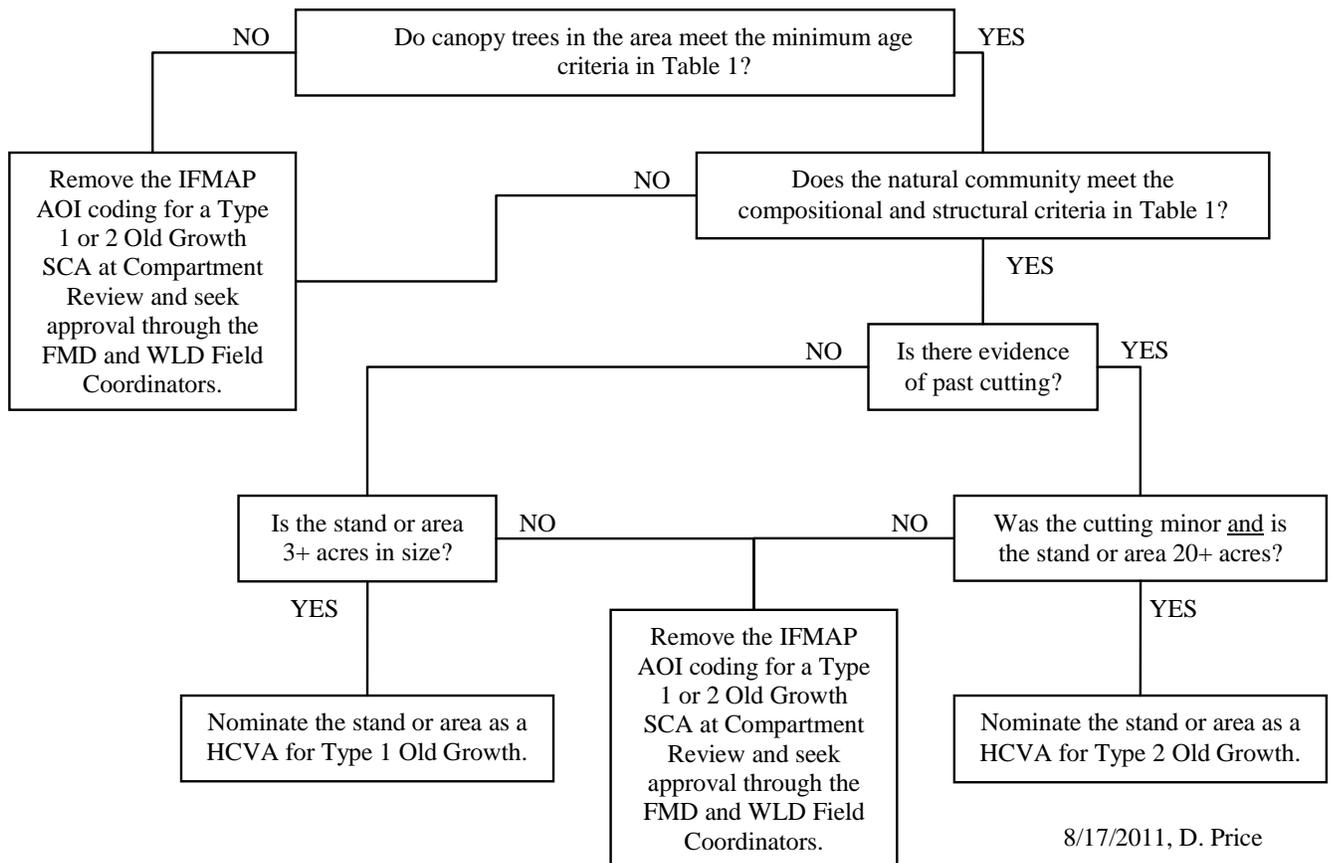
the FRD GIS Certification Specialist shall place a polygon into the 'Habitat Areas and Corridors - Other Habitat Area' SCA layer in the GDSE and add a '3B' site condition to the same spatial extent in MiFI to ensure the rare natural community is conserved.

- 3) As part of each 5-year review and approval process for an updated network of ERAs, a summary of all deletions and modifications to the ERA network shall be provided as part of the publicly available review materials. Additionally, a summary of pending additions of ERAs for rare natural communities on state forest lands (see '2.ii.' above) shall be provided. Potential new ERAs for common natural communities will be incorporated into the overall re-assessment of the ERA network during the 5-year review.
- b. Dedicated Habitat Areas:** Recommendations for changes to the DHA layer in the GDSE may come from DNR field staff or DNR Lansing staff, and they may come through the compartment review process, as a result of observations during implementation of management activities, through opportunistic observations, or as a result of formal survey. Regardless of from whom or how the recommendations are provided, the following guidance is provided:
- 1) On the basis of DNR field review of boundaries and/or site conditions, DHAs on state forest lands may be recommended for full or partial deletion (if site conditions are no longer consistent with DHA designation), modification (if stand boundaries do not match the existing DHA boundary) or addition (if staff identify additional areas of interior core forest habitat). All field recommendations for deletions, modifications or additions of this nature will require further review, potentially including a formal survey, and shall be coordinated through the FRD Biodiversity Conservation Program Leader.
 - i. Any minor boundary modification edits to match stand and DHA boundaries in the GDSE DHA layer that are confirmed following review shall be subsequently coordinated through the FRD Biodiversity Conservation Program Leader and FRD GIS Certification Specialist.
 - ii. Any additions, deletions and significant boundary modifications to the DHA layer in the GDSE that are confirmed following review shall be held until the next formal review and approval process for an updated network of DHAs (see '2.' below).
 - 2) As part of each 5-year review and approval process for an updated network of ERAs a summary of all additions, deletions and significant boundary modifications to the DHA network shall be provided as part of the publicly available review materials.
- c. Potential Old Growth:** Potential Old Growth stands must be evaluated for re-designation to another type of SCA (such as a specific Habitat Area) or removed through the compartment review process. Those areas that meet criteria for classification to another SCA category shall have the site condition coding and comments changed accordingly. Those areas that do not meet criteria for classification to another SCA category shall have the site condition coding and comments as potential old growth removed.
- d. Type 1 and 2 Old Growth:** Areas that might meet the definition of Type 1 and 2 Old Growth have been identified in the SCA layer in the GDSE. This set of areas originated from a subset of forested natural communities within some state Natural Areas, and all A/AB-ranked Natural Heritage database Element Occurrences.

Type 1 and 2 Old Growth SCAs and other possible areas that may be identified by field staff (primarily using stand year of origin inventory data) will be assessed and validated through the compartment review process over the next decade. Figure 2 and Table 1 (Minimum criteria for assessing stand characteristics and classifying Type 1 and 2 Old Growth on the State Forest) should be used to assess and validate Type 1 and 2 Old Growth areas as potential HCVAs. Those validated areas will become HCVAs in the next planning cycle. Those areas that are reviewed and determined not to meet the definition and criteria as Type 1 or 2 Old Growth will be removed from the GDSE SCA layer. Any other assessed and validated SCA or HCVA designation may be retained for the area.



10/22/2015, D. Price



8/17/2011, D. Price

Figure 2. Identification of Type 1 and 2 Old Growth during inventory.

Table 1. Minimum criteria for assessing stand characteristics and classifying Type 1 & 2 Old Growth on the State Forest¹.

Community	Age ²	Composition	Structure	Disturbance	Size	Type
Boreal Forest	Canopy trees are 150+ years.	Most species from MNFI abstract. Conifer canopy is greater than 80%.	Canopy trees are greater than 8 inches dbh. CWD and pit and mound microtopography present.	No evidence of cutting. ³ Windthrow occurs.	3+ acres.	1
				Minor cutting. ⁴ Windthrow occurs.	20+ acres.	2
Dry-mesic Northern Forest	Canopy Red and White Pine and Oak are 150+ years.	Most species from MNFI abstract.	Wide variation in tree size and spacing, with multiple canopy layers. Canopy trees are greater than 22 inches dbh. CWD present.	No evidence of cutting. ³ Evidence of fire.	3+ acres.	1
				Minor cutting. ⁴ Evidence of fire.	20+ acres.	2
Dry Northern Forest (Red Pine Variant)	Canopy Red Pine are 150+ years ² .	Most species from MNFI abstract.	Canopy Red Pine are greater than 20 inches dbh. Canopy Jack Pine are greater than 10 inches dbh. CWD present.	No evidence of cutting. ³ Evidence of fire.	3+ acres.	1
				Minor cutting. ⁴ Evidence of fire.	20+ acres.	2
Floodplain Forest	Canopy trees are 140+ years.	Most species from MNFI abstract. FQI greater than 35.	Canopy trees are greater than 24 inches dbh. CWD and pit and mound microtopography present.	No evidence of cutting. ³ Windthrow and flooding occurs.	3+ acres.	1
				Minor cutting. ⁴ Windthrow and flooding occurs.	20+ acres.	2
Hardwood-Conifer Swamp	Canopy Hemlock are 220+ years. Canopy Yellow Birch are 150+ years.	Most species from MNFI abstract. FQI greater than 35.	Canopy trees are greater than 14 inches dbh on wettest sites; greater than 24 inches dbh (hardwoods) and greater than 26 inches dbh (conifers) on drier sites. CWD and pit and mound microtopography present.	No evidence of cutting. ³ Windthrow occurs.	3+ acres.	1
				Minor cutting. ⁴ Windthrow occurs.	20+ acres.	2
Mesic Northern Forest	Canopy Sugar Maple are 170+ years. Canopy Hemlock are 220+ years.	Most species from MNFI abstract.	Uneven-aged, with multiple canopy layers and gaps. Canopy Sugar Maple are greater than 20 inches dbh. CWD and pit and mound microtopography present.	No evidence of cutting. ³ Windthrow occurs.	3+ acres.	1
				Minor cutting. ⁴ Windthrow occurs.	20+ acres.	2
Poor Conifer Swamp	Canopy Black Spruce and Tamarack are 140+ years.	Most species from MNFI abstract. Canopy cover is greater than 50%.	Canopy trees are greater than 10 inches dbh. CWD and pit and mound microtopography present.	No evidence of cutting. ³ Windthrow occurs.	3+ acres.	1
				Minor cutting. ⁴ Windthrow occurs.	20+ acres.	2
Rich Conifer Swamp	Canopy Northern White Cedar are 140+ years.	Most species from MNFI abstract. FQI greater than 35. Conifer canopy is greater than 90%.	Canopy trees are greater than 14 inches dbh on wettest sites and greater than 26 inches dbh on drier sites. CWD and pit and mound microtopography present.	No evidence of cutting. ³ Windthrow occurs.	3+ acres.	1
				Minor cutting. ⁴ Windthrow occurs.	20+ acres.	2
Rich Tamarack Swamp	Canopy Tamarack and Northern White Cedar are 140+ years.	Most species from MNFI abstract. FQI greater than 35. Canopy cover is greater than 50%.	Canopy Tamarack are greater than 10 inches dbh. CWD and pit and mound microtopography present.	No evidence of cutting. ³ Windthrow occurs.	3+ acres.	1
				Minor cutting. ⁴ Windthrow occurs.	20+ acres.	2
Wooded Dune and Swale Complex	See criteria for component forested natural communities: Mesic Northern Forest, Dry-mesic Northern Forest, Dry Northern Forest, Hardwood-Conifer Swamp, Rich Conifer Swamp, or Poor Conifer Swamp.			No evidence of cutting. ³ Windthrow occurs.	3+ acres.	1
				Minor cutting. ⁴ Windthrow occurs.	20+ acres.	2

¹ Criteria are largely based upon those for A-ranked natural communities, as defined in *Draft Criteria for Determining Natural Quality- and Condition Grades, Element Occurrence Size-Classs and Significance Levels for Palustrine and Terrestrial Natural Communities*, Michigan Natural Features Inventory, 17 February 1988.

² Ages are species-specific and are roughly based upon years of origin between 1790 and 1870. Age can be less than the minimum criteria in fire dependent ecosystems, when documented stand origin is due to natural fire events.

³ Evidence of cutting determined by sign of human disturbance (including the physical presence of stumps, rail grades, and roads), geographic isolation, old aerial photography, or by written historical reference.

⁴ Minor cutting is defined as having been logged but not effectively clearcut; does not result in the elimination of any major canopy species; and that retains (never lost) significant original elements of old-growth structure and functions.

FQI: Floristic Quality Index, as determined by procedures in: Herman, K. D., L. A. Masters, M. R. Penskar, A. A. Reznicek, G. S. Wilhelm, W. W. Brodovich, and K. P. Gardner. 2001. Floristic Quality Assessment with Wetland Categories and Examples of Computer Applications for the State of Michigan - Revised, 2nd Edition. Michigan Department of Natural Resources, Wildlife, Natural Heritage Program. Lansing, MI. 19 pp. + Appendices.

CWD: Corase Woody Debris (standing and downed large diameter decadent trees).

3. Management Direction for Compartment Review

Forests are managed for a broad array of biological, ecological, social and economic benefits, values, goals and objectives. Strategic and long term planning that includes biological diversity conservation is addressed through the Michigan State Forest Management Plan and other DNR planning processes. Biodiversity conservation objectives and determinations are conducted at several scales (State, eco-regional, and/or FMU/Compartment/Stand), identified in several specific categories (Special Conservation Areas, and High Conservation Value Areas), and are linked through planning and operational activities. Elements of biodiversity are also addressed through within-stand retention of specific compositional and structural habitat features (snags, coarse woody debris, and live trees – including legacy trees) in forest stands that are scheduled for harvest treatments.

Forest compartments or portion of compartments or stands that contain either of the following elements may have significant biodiversity values that should be considered during the course of compartment review:

- a. A SCA or HCVA in the GDSE.
- b. An area with no previous designations but potentially possessing other biodiversity values.

Stand examiners are required to determine how potential management activities may positively or negatively impact the biodiversity values of the area under consideration for management, and identify specific elements that protect, maintain or enhance biodiversity. The references section of this work instruction may be used in this determination. Management prescription decisions should be recorded in the MiFI treatments comments, and any necessary biodiversity specifications should be included in timber sale contracts or Forest Treatment Proposals.

a. Management Direction for SCAs and HCVAs

It is the responsibility of the DNR land management staff to understand the intent of the SCA and HCVA designation and the implications for management activities. Identified SCAs and HCVAs will be managed to conserve, protect, maintain, and/or enhance their defined conservation objectives or values. Management direction will vary depending on the objective and type of designation, as provided in the Michigan State Forest Management Plan, Regional State Forest Management Plans, and any local plans. When a treatment is prescribed for an SCA or HCVA with an intent to implement management direction given in a DNR plan or this work instruction, this intent will be captured in the 'Treatment Comments' within MiFI. Additional management direction for some select SCA and HCVA categories is provided below:

- 1) **Ecological Reference Areas:** ERAs will generally not be managed for timber harvest. Management activities or prescriptions in Ecological Reference Areas are limited to low impact activities compatible with the defined attributes and values of the community type, except under the following circumstances:
 - i. Harvesting activities where necessary to restore or recreate conditions to meet the objectives of the ERA, or to mitigate conditions that interfere with achieving the ERA objectives. In this regard, forest management activities (including timber harvest) may be used to create and maintain conditions that emulate an intact, mature forest or other successional phases that may be under-represented in the landscape.
 - ii. Road building only where it is documented that it will contribute to minimizing the overall environmental impacts within the FMU and will not jeopardize the purpose for which the ERA was designated.

- iii. Existing and new land use activities should be evaluated in the context of whether they detract from achieving the desired future conditions of the natural community for which the ERA was designated. The acceptability of land use activities within DNR-administered ERAs will be evaluated using severity, scope, and irreversibility criteria, as established in DNR IC4199, Guidance for Land Use Activities within DNR-Administered Ecological Reference Areas.
- iv. Threats such as fire, natural or exotic pests or pathogens may warrant other management measures.
- v. Harvesting and other management activities in presently accessible areas located within the peripheral boundary of an ERA that are NOT the natural community of focus and which may or may not be typed as a separate stand or forest type (e.g. an upland island of previously managed aspen within a bog complex) may be prescribed for treatments, contingent upon a determination of no anticipated direct or indirect adverse impact to the defined attributes and values of natural community for which the ERA was designated. The FRD Biodiversity Conservation Program leader shall be consulted regarding the determination of any direct or indirect adverse impact.
- vi. Land management activities immediately adjacent to an ERA should consider any anticipated direct or indirect adverse impact to the defined attributes and values of natural community for which the ERA was designated.

Management will be adaptive. ERAs will be monitored to determine if implemented management activities are moving the natural communities forward, or maintaining them at their desired future condition. The network of ERAs will be evaluated every five years for their contribution to the overall goal of biodiversity conservation. This review cycle will allow for the potential addition or subtraction of lands from an ERA, designation of new ERAs, or removal of the ERA planning designation.

- 2) **Dedicated Habitat Areas:** Dedicated Habitat Areas can be managed for timber production, consistent with natural disturbance regimes, and forest composition and structure required for the species of interest, specifically:
- i. For species-specific habitat areas: Forest management and timber harvesting activities (including prescribed fire) are conducted to maintain, restore or create the composition and structural forest conditions necessary to provide the habitat needs of the specific species, using silvicultural techniques to emulate the frequency and severity of natural disturbance regimes.

The Strategy for Kirtland's Warbler Habitat Management provides detailed direction for management.

Existing land use activities and seasonal restrictions on access and use may be governed by DNR Land Use Orders of the Director, including those specifically for Kirtland's warbler (LUOD 3.10) and piping plover (LUOD 3.8 and 5.7) nesting areas.
 - ii. For interior core habitat areas: Areas that also have some other designation (such as an Ecological Reference Area, Natural Area, or Natural River) shall be managed for those purposes following management direction provided in DNR policies and procedures and plans.

For all other areas, forest management and timber harvesting activities (including prescribed fire) should be used to create and maintain the compositional and structural conditions that emulate an intact, mature forest or other successional phases that provide necessary habitat for interior core forest-dependent species.

Specific emphasis is given to minimizing fragmentation of the forest by limiting the size, spatial distribution, and number of forest openings to that characteristic of the natural disturbance regimes associated with the specific forest type. This may be accomplished through the use of temporary access roads, by minimizing the number and size of permanent access roads and trails, and/or by mitigating the impact of roads, trails, and pathways through the maintenance of forest canopy closure over such infrastructure.

Management direction may be provided by Regional State Forest Management Plans, State Park General Management Plans, State Game Area Master Plans, or other local plans.

- iii. Threats such as wildfire, natural or exotic pests or diseases may warrant other management measures, such as salvage harvests.

Management will be adaptive. Management strategies may change as additional information becomes available. The network of Dedicated Habitat Areas will be monitored and evaluated for their contribution to the habitat needs of the identified species at the frequency specified in associated species-specific management plans, and every five years for other areas. This review cycle will allow for the potential addition or subtraction of lands from a Dedicated Habitat Area, designation of new areas, or removal of the Dedicated Habitat Area planning designation.

- 3) **Potential Old Growth:** No vegetative treatments shall occur in areas currently identified as Potential Old Growth until these stands are evaluated in the context of other SCA categories, excepting activities that protect immediate natural resource values (such as control of invasive species pests and wildfire suppression) or human health and safety.
- 4) **Type 1 and 2 Old Growth:** Type 1 and 2 Old Growth SCAs assessed and validated through the compartment review process shall be protected from harvesting and other timber management activities, except as needed to maintain the values associated with the stand (e.g. removal of invasive species, prescribed fire, and thinning from below for purposes of restoration).

b. Management Direction for Rare Species Review and Within-Stand Retention

1) Review for Rare Species

During the compartment review process, determine if there is a high likelihood of finding a rare species (threatened, endangered, or special concern plant or animal species) within or near the site of any proposed forest operations, by following the Michigan DNR Rare Species Protection Approach and Resources for DNR Staff on State Forest Lands (IC 4172, dated 2008), Figure 3 and the following direction for rare species review.

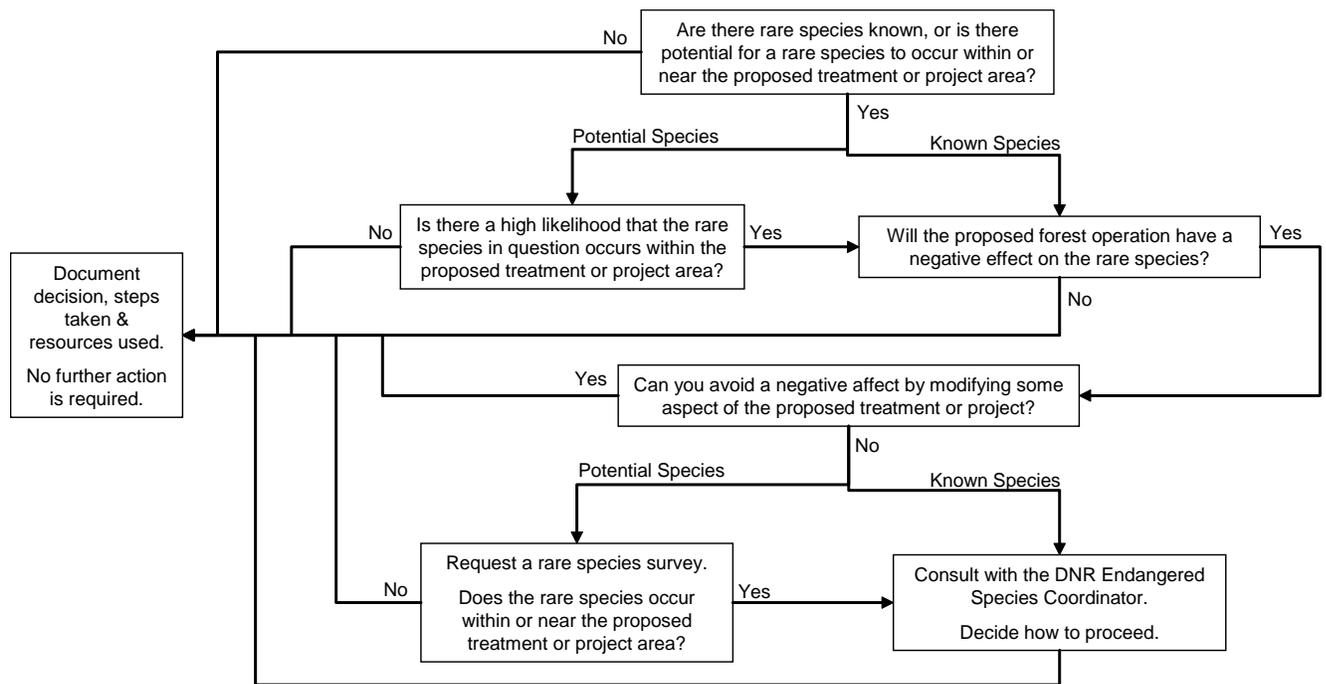


Figure 3. Review for rare species for forest operations.

Use historic Compartment Review Comments prepared by contract services (e.g., MNFI ecologists) and other information resources available to help determine the likelihood of finding a rare species. Other information resources may also include MNFI web applications, the Natural Heritage database records, MNFI species and community abstracts, Michigan Wildlife Action Plan and GAP habitat models (see references), as well as consultation with experts. A check of the Natural Heritage database records is REQUIRED in all cases because of the dynamic nature of the database. The check of the Natural Heritage Database should be recorded in the checkbox in the Inventory Status tool and the locked comments box should record whether or not any species were identified and what was done to ensure there were no impacts to those species. The Timber Sale Checklist should also record that the Natural Heritage Database was checked and should be included in the compartment file.

If yes, a rare species is confirmed to occur or there is a high likelihood of a rare species occurring within or near the site of a proposed forest operation, determine (with consideration of existing management guidelines and agreements) whether a potential conflict exists (and cannot be avoided) between proposed forest operation(s) and the rare species. Use similar resources as above (including consultation with experts, as needed) to make determination. Document in a concise manner the determination, rationale for determination, and resources used to develop rationale and place a signed and dated copy in the Compartment file.

- a. If yes, a potential conflict exists and the species is confirmed to occur within or near the site of the proposed forest operation(s), consult with the DNR Endangered Species Coordinator (and FD representative for reptiles and amphibians, if appropriate) and decide how to proceed. Document decisions, resources used to make the decisions and pertinent information from those resources and place a signed and dated copy in the Compartment file.
- b. If yes, a potential conflict exists and there is a high likelihood of finding a rare species (as determined above), but the species is not confirmed, request a survey to determine if the species occurs within or near the site of the proposed forest operation(s). Survey requests must be submitted through the Forest Management Unit Supervisors to both the FRD Forest Planning and Operations Section Manager AND the FRD Biodiversity & Conservation Program Leader. Refer to the Michigan DNR Rare Species Protection Approach and

Resources for DNR Staff on State Forest Lands (IC 4172, dated 2008) for details on requesting a survey. Place a copy of the survey results in the Compartment file. If species is confirmed, record presence of species in MiFI Opportunistic Field Survey (OFS) locked comments, and follow 'A' above.

While preparing treatments, refer to decisions recorded regarding rare species and potential conflicts with proposed forest operations. If implementation actions vary from those approved at the compartment review or new information becomes available, staff must re-assess the potential for rare species to occur and potential impacts on any species identified, make a new determination regarding potential conflicts, and follow-up with a survey and/or consultation with the DNR Endangered Species Coordinator, as appropriate.

2) Within-Stand Retention Guidance

Stand examiners shall follow *DNR Within-Stand Retention Guidance* in proposed timber harvest prescriptions for the purpose of conserving stand-level biodiversity elements (e.g. snags, coarse woody debris, edge, perches, and legacy trees).

Legacy trees shall be marked as individual "leave trees" and specifically protected from harvest in timber sale specifications, subject to forest health and human health and safety concerns. Legacy trees are not permanent features and individual trees are not tracked in inventory.

Record management prescription decisions in MiFI treatments, under review comments. Document and track area retention in the inventory system with Site Condition coding. Add biodiversity considerations to timber sale contract specifications and Forest Treatment Proposals.

Scope: (All State Forest Land and Affected Divisions): State Forest Land Other: MNFI

DNR – FRD DNR – Wildlife DNR – Fish DNR – Law DNR – Recreation

Responsibility and Role: (Staff who will implement or supervise this instruction)

Job Title/Division	Role
State Biodiversity Conservation Planning Team	Statewide biodiversity assessments, planning and review, and make final recommendation on HCVAs and ERAs.
All Divisions	Regional biodiversity assessments and planning
Unit Manager and District Planner/ FRD; Wildlife Habitat Biologist and Wildlife Ecologist / WD; Fisheries Biologist/FD	Compartment/FMU biodiversity assessments, planning, and operations
Stand Examiner/FRD	Identification of conservation elements
Michigan Natural Features Inventory/MSUE	Analysis, identification and management guidance of elements of biodiversity
Endangered Species Coordinator/WD: Fisheries representative for reptiles and amphibians	Analysis, identification and management guidance and permitting for elements of biodiversity
Program Specialists: Conservation & Biodiversity Prog., FRD Natural Areas, WD Natural Rivers, FD	Management guidance and monitoring direction for Natural Areas, Natural Rivers, High Conservation Value Areas, and Ecological Reference Areas.
Conservation Officers/LD	Enforcement on special sites (HCVAs, ERA, Natural Areas)

Training/Skills:

(Those required to accomplish work instruction)

Item	Brief Description of Skill or Course	Exists/ New
Biodiversity Approach	Training on biodiversity approach	<input checked="" type="checkbox"/> E <input type="checkbox"/> N
Biodiversity Assessments	Training on assessment techniques	<input type="checkbox"/> E <input checked="" type="checkbox"/> N
Biodiversity Guidelines	Training on related community management guidelines	<input checked="" type="checkbox"/> E <input type="checkbox"/> N
Community & Elements	Training on recognizing Michigan natural communities and elements	<input checked="" type="checkbox"/> E <input type="checkbox"/> N
Special Site Management	Training on natural rivers, natural areas, HCVA, and ERA management	<input checked="" type="checkbox"/> E <input checked="" type="checkbox"/> N

References:Federal Law:

Wilderness Act of 1964 (16 U.S.C. 1131-1136, 78 Stat. 890) - Public Law 88-577
 Wild and Scenic Rivers Act of 1968 *P.L. 90-542, as amended*(16 U.S.C. 1271-1287)

State Law:

Natural Resources and Environmental Protection Act, PA 451, 1994, as amended
 Part 005 General Powers and Duties
 Part 305 Natural Rivers
 Part 351 Wilderness and Natural Areas
 Part 355 Biological Diversity Conservation
 Part 525 Sustainable Forestry on State Forestlands

DNR Policy & Procedures

Natural Resource Commission Policy
 2207 – Management of State Forests
 2703 –Natural Rivers
 2704 –Wilderness and Natural Areas
 2706 – Sand Dune Management and Protection—Department Operations

Forest Resources Division:

Policy 441, Operations Inventory and Compartment Review Procedures
 Resource Assessment Process Flow Chart, April 2002
 Conservation Area Coding
 Guidance for Land Use Activities within DNR-Administered Ecological Reference Areas (IC4199, dated 11/03/2010)
 Within-Stand Retention Guidance (IC 4110, dated 1/27/2012) and interoffice communication providing Clarification of Within-Stands Retention Guidance for Aspen Stands dated September 3, 2014
 Michigan Woody Biomass Harvesting Guidance (IC 4069, dated May 2010)
 Natural Areas Program Strategic Plan, March 29, 2000. Michigan Department of Natural Resources, Natural Heritage Program, Wildlife Division Lansing, MI 16 Pp. Adopted By DNR Management Team 2000.
 DNR Silvicultural Guidelines
 Michigan State Forest Management Plan 2008. Mich Department of Natural Resources, Lansing MI. 276 pp.
 Mich DNR Rare Species Protection Approach and Resources for DNR Staff on State Forest Lands (IC 4172, dated 2008).

Department Programs

Endangered Species Program, Wildlife Division
 Natural Areas Program, Wildlife Division
 Natural Rivers Program, Fisheries Division
 Parks Stewardship Program, Parks and Recreation Bureau

Cooperative Agreements/Grants/MOUs

Partnership between DNR, The Nature Conservancy and the Michigan Natural Features Inventory, Michigan State University Extension to survey for, compile and update information on threatened and endangered species and high quality natural communities in Michigan.

Partnerships between the US Fish and Wildlife Service and Wildlife Division for the management of wildlife, fish and federally listed endangered and threatened species.

Electronic or Geographic Information Data

Spatial data library

FRD biodiversity information layer

MiFI database and maps

GDSE data: Areas of Interest database, Treatments database, Opportunistic Field Survey Database

Michigan Natural Features Inventory (MNFI)

Natural Communities of Michigan: Classification and Description

Community and Species Abstracts

Habitat models (under development)

U.S. Fish & Wildlife Service species recovery plans

http://ecos.fws.gov/tess_public/TESSWebpageRecovery?sort=1

The list of Michigan Federal Endangered and Threatened Species in Michigan is on the DNR Forest Certification web page.

Other Information and Resources

Burger, T. and J. Kotar. 2003. A guide to forest communities and habitat types of Michigan. University of Wisconsin, Madison, WI

Michigan Department of Natural Resources

Michigan Wildlife Action Plan. 2005. Michigan Department of Natural Resources

Michigan GAP models - Donovan, M. L., G. M. Nesslage, J. J. Skillen, and B. A. Maurer. 2004. The Michigan Gap Analysis Project Final Report. Wildlife Division, Michigan Department of Natural Resources, Lansing, MI. 184 + Appendices.

Interim Guidelines for Mesic Conifers in the West UP included in Herman, K, and M. Joseph, T. Oliver, D. Wagner, H. W. Scullon, J. Ferris, D. Kuhr. April 16, 2004. A process for implementing Mesic conifer restoration on state land, Western Upper Peninsula, Michigan. Michigan Department of Natural Resources, Marquette, MI. 38 pp.

Guidelines for Red Pine Management based on Ecosystem Management Principles for State Forestland in Michigan. 2006. Michigan Department of Natural Resources, Lansing MI. 56 pp.

USDA Forest Service

FSM 2300 - Recreation, Wilderness, and Related Resource Management, Chapter 2320 - Wilderness Management

North Central Cover Type Handbooks

Monitoring:

Monitoring biodiversity and compliance with this Work Instruction will be done through a variety of mechanisms.

- Prior to the Year-of-Entry (YOE) data revision/update deadline, Land management staff and District Planners will ensure that all stand comments and stand condition codes are compatible.
- Annual internal audits will include reviews of stand level biodiversity considerations.
- Department-wide review and documentation of high quality natural communities will be conducted as part of the 5-year review and approval of Ecological Reference Areas.

Records:

- MiFI database of State forest lands, maintained at state-wide level and recorded at local level (stands within a compartment). The database will include conservation objectives and crosswalk with protection and management directives.
- GDSE data layers for HCVAs and SCAs.
- Compartment Review packets and meeting documents.
- Monitoring reports (see Monitoring section)