



## FDM 24-20-1 Introduction

December 8, 1995

The major vegetation communities of Wisconsin are separated into two distinct provinces - the prairie forest province in the southwest and the northern hardwoods province in the northeast (Curtis, 1959)<sup>1</sup>. These two provinces are separated by a band of overlap, called the tension zone (see [Figure 1.1](#)). Counties within this zone have species of both southern and northern communities. Since wildlife is dependent upon vegetation for food and shelter, species distribution parallels vegetation distribution. The tension zone also delineates the range limits of many wildlife species.

Specific information on the types of vegetational communities within the state, as well as descriptions of vegetational communities, can be found in Curtis (1959). The vegetational communities have been arranged according to environmental gradients, of which moisture, light, and temperature are factors. This book is intended to supplement field observation and can serve as a resource for describing vegetational communities. Depending upon the scope of a proposal, it is usually sufficient to identify the basic community type (savanna, prairie, forest, or other) and to list dominant species observed.

### 1.1 Characteristics of Terrestrial Communities

Different terrestrial communities are characterized by their unique vegetation, soil and water conditions. A prairie is a plant community dominated by grasses. Growing with the grasses are many other species of nongrassy herbs which are known by the collective name, forbs. Woody shrubs can be present, as well as tree seedlings. A prairie is defined as an open area covered by low growing plants, dominated by grasslike species of which at least half are true grasses, and with less than one mature tree per acre.<sup>1</sup> Xeric, or dry, prairies may occur on topographies varying from flat to steep. The soil blanket is thin, a result of water or wind erosion. Both water-holding properties and nutrient supplies in the soil are good, but the thinness of the layers limits the total quantities of water and nutrients. Mesic prairies are those that have soil conditions intermediate between dry and wet. They are found on flat or gently rolling land forms. The level sites are often on glacial outwash with a stratified and very porous subsoil of sand or gravel, while the hilly sites may be on glacial till or residual or loessial soils on the rolling surfaces of dolomitic bedrock. The surface layer of soil is very rich in nutrients. The soil is moderately to well drained.

A savanna is defined as an area covered by low growing plants, dominated by grasslike species of which at least one-half are true grasses, with more than one tree per acre but with less than one-half of the total area covered by the tree canopy. The soils are generally sandy and well drained. Savannas are generally found on flat or gently rolling land, except for one type, the cedar glade, which can be found on steep hillsides of thin loess over limestone or quartzite bedrock, or a gravelly glacial moraine.

Forests are communities dominated by trees and have at least a 50 percent canopy cover. They occur from wet to well drained soils. In southern Wisconsin, soils can vary from very wet places along streams and lakes, through mesic sites with deep soils, to very dry places on the thin soils of exposed hills and bluffs. Northern forests also occur on a wide range of topographic sites, from very wet to very dry, and from thin rocky soils to deep loams and clays. Wooded areas that are considered wetlands are described in [FDM 24-5-10](#).

<sup>1</sup> Curtis, J.T. 1959. The Vegetation of Wisconsin. University of Wisconsin Press, Madison, WI.



**Figure 1.1. Map Showing Major Wisconsin Vegetation Provinces**

*Adapted from Curtis - 1959*

## **FDM 24-20-5 Forest Communities**

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### **5.1 Existing Conditions**

The immediate project area should be described in terms of the tree species present, including an estimate of maturity (e.g., seedling, sapling, mature tree). Also, indicate which species appear to be dominant. This information is useful in predicting wildlife associations.

Surrounding land use should also be discussed. The value of the woodland depends in part on how much there is in addition to that which will be converted to transportation purposes. An estimate of both the total acreage of the forest unit and the acreage to be taken should be included.

Since the value of the forest community also depends upon its current use, this information should be provided. Wildlife, recreational, forestry, home site, or other uses in the project area can be presented on a land use map exhibit.

### **5.2 Evaluating Impacts on the Forest Community**

Describe the proposed project activity in terms of its potential disturbance to the woodland. For upgrading an existing alignment, it is possible that trees will only be removed from the existing forest edge. Relocation might involve either a fringe taking or bisection of the woodland. Provide enough engineering detail to explain how wide a strip will be involved, including shoulders, medians, and ditches. Also include land acquired for auxiliary lanes, frontage and access roads, intersections and interchanges, rest areas, waysides, and weigh stations. Most reviewers are interested in a concise, easily understood explanation of the anticipated physical changes.

Determine how many trees will be affected by listing either the number of trees or the acreage of woodland affected. The types of trees and their approximate sizes should also be described.

### 5.2.1 Primary Impacts

For forested areas, primary impacts are associated with the direct removal of vegetation. Initial clearing and grubbing operations remove the mature trees, saplings, and shrubs. This retards the natural succession to a mature forest. Further, grading and stripping of topsoil clears the ground cover and increases the potential for erosion. This complete removal eliminates use by wildlife and marks the beginning of a permanent barrier--the roadbed core. Loss of humic topsoil can reduce the fertility of the site for future vegetation.

### 5.2.2 Secondary Impacts

Secondary development spurred by new access can contribute to the loss of habitat. Operation and maintenance of a completed facility can cause additional loss of vegetation due to automobile pollutants and salting operations. The creation of edges due to bisecting a woodland can have both positive and negative impacts, which should be addressed in the environmental document. One example of creating an edge effect would be the cutting of trees for highway right-of-way. The direct effect is a reduction of overstory cover and an increase in sunlight penetration into the previously forested area. The increased availability of sunlight permits the growth of a variety of understory species. This increase in understory diversity can result in an increased diversity of animal species. The increased diversity of species is a potentially positive impact on predator populations; whenever a new food base is established, it will be utilized.

While edge effects might be positive, these same conditions may prove adverse. Changes in vegetation or physical conditions of an area of disturbance can adversely affect a critical food or shelter resource for wildlife or affect human activities related to these resources (changes in game animal populations for example). A disturbance which proves beneficial to a predator species, increasing its numbers, may result in a negative impact on its prey species which had not been previously exposed to heavy predation. Increased edge favors populations of edge species such as the cowbird, which adversely affects broods of certain warbler species. In addition, the effects of wind, sun and road salt can cause tree dieback at the edges of previously undisturbed forest.

The significance of this loss can be evaluated by assuming that there is a limited number of organisms that can be supported per unit of space, based on availability of critical resources such as food and cover. Natural fluctuations and factors such as climate, migration, emigration, immigration, seasonal usage, and parameters of animal population dynamics (i.e., mortality, birth rate, age structure, sex ratios) function jointly to determine how many of which species will inhabit an area.

This concept becomes useful when one discusses a unique unit of habitat; that is, an area that can be considered to be an island of one community type surrounded by other land uses. For example, a stand of deciduous trees surrounded by agricultural land, a pine woods surrounded by a savanna, or a wetland surrounded by upland are examples of island habitats that, if reduced in size, have a greater potential for total loss of wildlife because of the reduction in the amount of critical resources needed to support an animal population.

Statements that wildlife will be lost due to habitat destruction must be made considering these concepts. Those species that inhabit island-like units distinct from similar, adjacent habitat will probably be lost. The ability to change homes is species dependent. Species that are gregarious, highly territorial, require large home ranges, have a limited supply of suitable breeding habitat, or have other unique requirements may not survive habitat disruption. Other species that have broader tolerances will likely relocate successfully if similar, adjacent habitat is available. The DNR district wildlife manager will be able to provide information on habitat requirements for specific wildlife species.

To some extent, there will be a replacement of original habitat with new habitat in the highway right-of-way. Grass and shrub successional stages and highway ditches are among some of the most productive habitat for fowl, small mammals, and songbirds. Where the right-of-way provides a new habitat, an increase in diversity of wildlife is likely to result, along with an increase in their predators. A discussion of the amount and type of right-of-way habitat that will be created should also be a part of the environmental document.

## 5.3 Determination of Significance

As with other natural systems, once the basic data have been gathered to describe the existing forest community and its uses, the significance of changing or precluding those uses should be estimated. Again, this should be done in the context of local ecology, critical resources, and the scope of the proposed project. Whenever possible, it should be explained why a particular impact is or is not expected to be significant. In many cases, it will be necessary to rely on other expertise, particularly for wildlife issues. Knowing where to obtain information is important. The DNR, the U.S. Fish and Wildlife Service, local sportsmen, and local

naturalists are often good sources of information on habitats of local interest. This type of analysis should be made for all alternatives, ranking each in terms of adverse and beneficial effects. Differences among alternatives should be pointed out. For example, all alternatives might involve woodland loss, but the site for one alternative might be away from a wildlife resting area or food source.

#### **5.4 Measures to Minimize Harm**

Where appropriate, alignments that involve fringe takings rather than severances should be selected; these are less likely to have significant impacts. Where severances are unavoidable, it is important to determine whether critical habitat exists within the proposed corridor.

If sensitive species have been identified in the project area, construction time constraints should be included in special provisions that will not interfere with mating or nesting behavior. This is particularly true where construction noise could be significant.

Maintenance practices that allow successional layers of vegetation to establish (as opposed to clear-cutting and mowing) provide habitat diversity and are more economical.

Consideration should be given to incorporating animal movement pathways into project design. Migration routes of mammals, amphibians, and reptiles should be identified. Information on methods to minimize adverse impacts can be obtained from the DNR wildlife manager.

Where forested lands are bisected, a buffer zone shrub layer should be allowed to establish itself to help prevent the side effects of drying, wind-throw, and tree dieback. In areas where heavy salting is anticipated, salt tolerant species could be planted in the buffer zone.

Grading sites should be revegetated as soon as possible. For the majority of projects, the basis for erosion control measures are outlined in WisDOT standard construction specifications. Landscape architectural services are available through the WisDOT. Before utilizing any methods to minimize harm, thought should be given to whether these methods could cause additional impacts.

### **FDM 24-20-10 Non-Forested Communities**

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#### **10.1 Existing Conditions**

Generally, non-forested upland communities may be defined as having less than 50 percent canopy cover. More than 50 percent cover would indicate a closed tree stand or forest. Canopy cover is defined as the aerial extent of branches and leaves. A complete canopy cover occurs when the ground is completely hidden by tree tops when viewed from above. Lesser percent cover refers to the canopy relative to open space within a stand of vegetation.

Non-forested communities with scattered trees are called savannahs. Oak openings, cedar glades, pine barrens, and scrub oak barrens are types of savannahs, depending upon the dominant vegetation. Other open areas (without mature trees) include prairies, grasslands, sandy shore, and rock cliff communities.

Open grass areas are often utilized as pastures adjacent to tilled agricultural land. Wildlife use is usually limited to small mammals and bird species that nest in dense grasses. If these open areas are adjacent to wooded tracts, they might be used as supplemental feeding areas by woodland species.

Grass areas that are not tilled often retain some prairie vegetation. Such areas are particularly prevalent along railroads and old highways in the southern portion of the state. Because there are so few remaining, prairie remnants may harbor threatened or endangered plant species.

#### **10.2 Evaluating Impacts on Non-Forested Communities**

Describe the proposed project activity in terms of its potential disturbance to the non-forested communities. Provide enough engineering detail to explain how wide a strip will be involved, including shoulders, medians, ditches, auxiliary lanes, frontage roads, intersections, interchanges, etc. Determine the acreage to be affected for each type of non-forested community.

##### **10.2.1 Impacts**

Impacts can be directly related to the removal of vegetation. These may be short-term impacts if the reestablished right-of-way vegetation provides similar habitat. The wildlife species may be able to relocate successfully provided that an alternate site is available and is able to support the additional population. Other impacts such as erosion, construction noise, or secondary land use changes are similar to those discussed for forest communities.

### 10.3 Determination of Significance

The significance of impacts should be viewed in terms of the functions of a particular nonforested community and how these might be affected. The size, location and local availability of a similar type of nonforested community are important considerations. The DNR and the U.S. Fish and Wildlife Service can provide information to help in determining the significance of the impacts.

### 10.4 Measures to Minimize Harm

If a unique plant community or a critical wildlife resource has been identified, steps should be implemented to avoid these or to minimize adverse effects.

These steps include, but are not limited to the following:

1. Roadway alignment designed to avoid critical habitats.
2. Construction time constraints to avoid interference with breeding or nesting behavior.
3. Erosion control measures.
4. Revegetation as soon as possible after construction.

#### 10.4.1 Factor Sheets

Factor Sheets H1 and H2 pertain to terrestrial systems evaluations and should be completed when preparing an environmental document if the project affects upland habitat.

<https://wisconsin.gov/Pages/doing-business/eng-consultants/cnslt-rsrcs/environment/formsandtools.aspx>

### 10.5 References

Curtis, J.T. 1959. The Vegetation of Wisconsin. The University of Wisconsin Press, Madison, WI.

Rosendahl, C.O. 1970. Trees and Shrubs of the Upper Midwest. University of Minnesota Press, Minneapolis, MN.

## FDM 24-20-15 Agricultural Lands

December 8, 1995

State and federal legislation and regulations have been enacted to preserve farmland. The purpose of the Federal Farmland Protection Policy Act, 1981, and the rule promulgating this Act, 7 CFR 658, is to minimize the role federal programs have in the conversion of farmland to nonagricultural uses. Farmland refers to land in any of four different categories: 1) prime farmland; 2) unique farmland; 3) farmland other than prime or unique that is of statewide importance; or 4) farmland other than prime or unique that is of local importance. Prime farmland does not include land already in or committed to urban development or water storage. The Farmland Conversion Impact Rating form establishes a method to systematically evaluate impacts on agricultural land by using specific criteria and a point rating system and is coordinated through the Natural Resource Conservation Service (NRCS). This form must be used if federal funds are used on the project. This requirement is further discussed in [FDM 5-5-5](#) and [FDM 20-45-35](#).

Wisconsin Statute (S.32.035) requires the Department of Agriculture, Trade and Consumer Protection (DATCP) to prepare an Agricultural Impact Statement if more than five acres of land from any one farm operation would be acquired. A farm operation is defined as "any activity conducted solely or primarily for the production of one or more agricultural commodities in sufficient quantity to be capable of contributing materially to the operator's support". If the total acreage is five or fewer acres, the Agricultural Impact Statement may be prepared at the discretion of the DATCP. [FDM 20-45-35](#) discusses the preparation and processing of Agricultural Impact Statements. [Chapter 20](#) further details federal and state legislation and regulations.

Soil type, series and location can be obtained from soil survey maps prepared by the U.S. NRCS. These maps consist of soil series and type contours superimposed on air photos.

For agricultural purposes, soils are grouped into capability classes, according to their potential limitations for long-term production of common crops and permanent vegetation. Assignment of any of these classifications to a particular agricultural tract is based upon the actual or potential use being important enough so that it is feasible to operate under that classification, i.e., a marketable commodity is being or could be produced. There are eight capability classes, with the risk of soil damage or limitations in use progressively greater from Class I to Class VIII.

### 15.1 Land Suitable for Cultivation and Other Uses

Nationally, farmland is categorized as prime or unique and is further designated as having either statewide or local significance. The NRCS has used capability classes and subclasses to describe several types of important

farmlands for Wisconsin. Factors considered in the classification are moisture supply, temperature, pH, water table, flooding, erosivity, permeability, and presence of rock fragments.

### 15.1.1 Prime Farmland

These are the best agricultural soils in the state. Prime refers only to the productive capacity of the land for crops as affected by soil fertility, growing season and moisture supply. All soils in capability Class I and Subclasses IIe, IIs and IIw are included in this class.

### 15.1.2 Unique Farmland

This class includes land that is used to produce specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality and/or high yields of a specific crop when treated and managed according to modern farming methods. Included are soils presently being irrigated in capability Subclasses IVs, IVe, VIs, and VIe on zero to 12 percent slopes. Also included are lands presently used for growing high value crops, such as cranberries, apples, mint, etc., on Class IV through VII land.

### 15.1.3 Farmland of Statewide Significance

These are productive soils, but when used for cultivated crops soil conserving practices are more difficult to apply and maintain. This land supports farm operations important to the state's economy, such as pastureland. NRCS considers all soils in capability Subclasses IIIe, IIIs and IIIw in this category.

### 15.1.4 Farmland of Local Importance

These are productive farmlands that have more use restrictions, and soil conserving practices are difficult to apply and maintain. This class includes specialized enterprises such as Christmas or nursery tree production. Included are soils in capability Subclasses IVe, IVs, IVw, Vw, VIe and VIIe.

The NRCS developed a list of Wisconsin soils that are prime farmland, unique farmland, and soils of statewide and local importance. The latest version (June 1984) lists the soil names, percent slopes, symbols used on soil survey maps, counties where found, and additional remarks. This information may be obtained from:

Natural Resources Conservation Service  
4601 Hammersley Road  
Madison, Wisconsin 53711

### 15.1.5 Factor Sheets

Factor Sheets D1 and D2 and the Agricultural Impact Notice Sheets pertain to agricultural land evaluation and need to be completed when preparing an environmental document.

<https://wisconsin.gov/Pages/doing-business/eng-consultants/cnslt-rsrcs/environment/formsandtools.aspx>

## FDM 24-20-20 Natural Areas

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### 20.1 Definitions

Natural areas, as defined by the Wisconsin Natural Areas Preservation Council, are tracts of land or water so little modified by human activity or sufficiently recovered from the effects of such activity that they contain intact native plant and animal communities believed to be representative of the presettlement landscape. There are two types of natural areas: dedicated and designated. Dedicated natural areas are those areas that are officially listed by the Department of Natural Resources (DNR) and the Wisconsin Natural Areas Preservation Council and have been dedicated by the Governor of Wisconsin. Designated natural areas are locations of significant pieces of habitat listed on an inventory of natural areas. Designated natural areas have not been dedicated by the Governor.

Both types of natural areas are ranked into the following three basic categories according to their quality.

1. Natural Areas of Statewide or Greater Significance: Natural areas of statewide or greater significance are those natural areas which have not been significantly modified by human activity, or have sufficiently recovered from the effects of such activity so as to contain nearly intact native plant and animal communities which are believed to be representative of the pre-settlement landscape.
2. Natural Areas of Countywide or Regional Significance: Natural areas of countywide or regional significance are defined as those natural areas which have been slightly modified by human activities or which have insufficiently recovered from the effects of such activity, but which still contain good examples of native plant and animal communities representative of the pre-settlement landscape. These natural areas are of lesser significance because their quality is less than ecologically ideal and

because there is evidence of past or present disturbances, such as logging, grazing or water level changes as a result of ditching, filling, or pollution. These natural areas may also be of insufficient size to be of statewide significance. These areas, if protected in an undisturbed condition, may be expected to increase in value over time. Therefore some of these areas may eventually become natural areas of statewide significance.

3. **Natural Areas of Local Significance:** Natural areas of local significance are defined as those natural areas which have been significantly modified by human activities but have, nevertheless, retained modest amounts of natural cover. Natural areas of local significance may reflect patterns of former vegetation or serve as examples of the influence of human settlement on vegetation. These natural areas may also be expected to increase in value if protected.

Classification of an area into one of these categories is based upon consideration of the diversity of plant and animal species and community types present; the structure and integrity of the native plant or animal community; the extent of disturbance from human activities such as logging, grazing, water level changes, and pollution; the commonness of the plant and animal communities present; any unique natural features within the area; the size of the area; and the area's educational value.<sup>2</sup>

## **20.2 Effects on WisDOT Project Activity**

Dedicated natural areas are protected from disturbance in that the land can only be altered if approved by the Governor and the Legislature. Designated natural areas have no specific protection; however, when the DNR is notified of a proposed project, it can indicate whether any designated natural areas are at or near the project site and recommend avoidance of the area. Discharge of dredged or fill material into headwaters, wetlands, or isolated water bodies within natural areas requires an individual Section 404 Permit. See [FDM 20-50](#) for permit information. Public opinion can also influence project plans by favoring preservation of a designated natural area.

Information on the locations of dedicated and designated natural areas may be obtained from local governmental offices, regional planning commissions, district DNR offices, the Office of Environmental Analysis (OEA) or the DNR Bureau of Endangered Resources in Madison.

Bureau of Endangered Resources  
Department of Natural Resources  
Box 7921  
Madison, WI 53707

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<sup>2</sup> Southeastern Wisconsin Regional, Planning Commission, Technical Report, Volume 4, Number 2, March 1981.