CHAPTER 1

A Mandate for Sustainable Resource Management

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CHAPTER 1

A Mandate for Sustainable Resource Management

The Rationale for Sustainable Resource Management

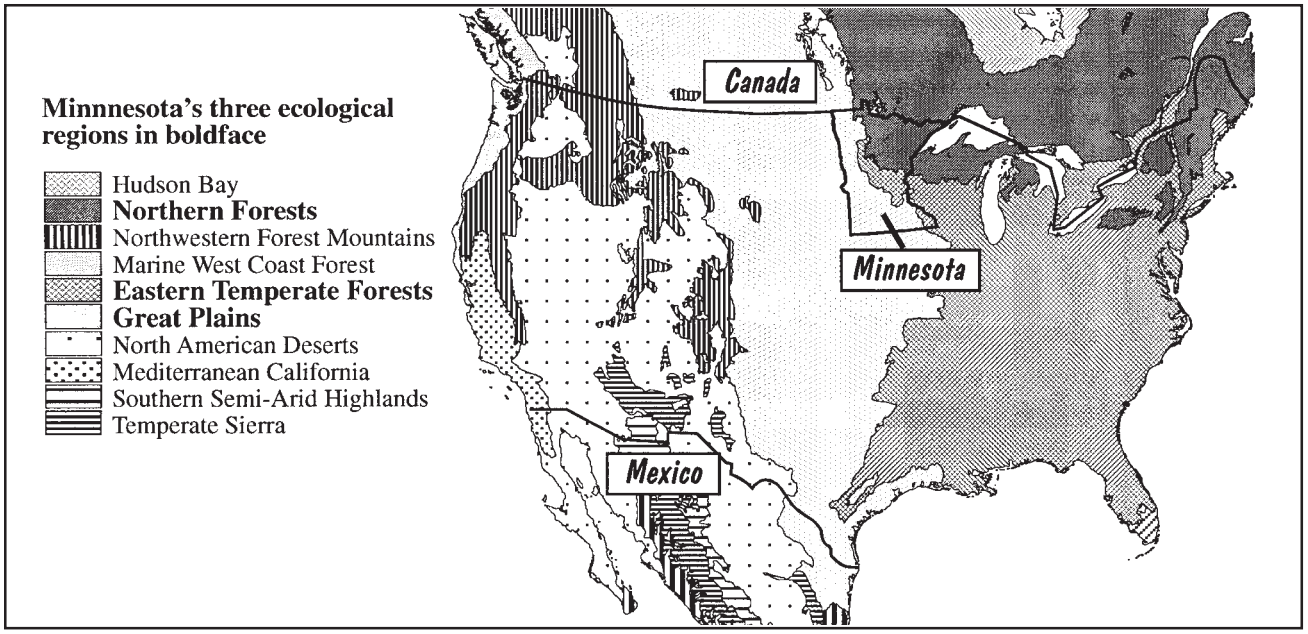
Minnesota's state trails, canoeing and boating routes, and water access sites provide recreational opportunities for Minnesota residents and visitors throughout the seasons:

These recreational facilities enable users to experience Minnesota's natural and cultural landscapes.

- ❒ State trails link urban places to country spaces and other recreation facilities, such as state parks and state forests.
- ❒ Designated canoeing and boating routes provide many miles of river recreation.
- ❒ Public water access sites provide boating and fishing opportunities on numerous Minnesota lakes and rivers.

These recreation facilities enable users to experience Minnesota's natural and cultural landscapes, as exemplified by the state's diverse geologic features and rich vegetation patterns. Unlike many other states, Minnesota is blessed with three major ecological regions, or biomes, which provide a high diversity of experiences for recreational users. (See Figure 1.)

Figure 1: Ecological regions of North America



A Vision for a Sustainable Quality of Life

In its *Directions for Natural Resources 2000,* the Minnesota Department of Natural Resources (DNR) established two sustainability goals:

- ❒ **Maintain, enhance or restore the health** of Minnesota ecosystems, so that they can continue to serve environmental, social and economic purposes.

- ❒ **Foster an ethic of natural resource stewardship** among all Minnesotans.

A land ethic changes the role of homo sapiens from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such.

Aldo Leopold
A Sand County Almanac

DNR Resource Management Principles

In consideration of the above goals, the following resource management principles were identified:

- ❒ **Expand the use of partnerships** to develop cooperative resource management approaches.

- ❒ **Promote a systems approach** to managing resources.

- ❒ **Accelerate the collection, interpretation and dissemination of scientific information** describing Minnesota's ecosystems and natural resources.

- ❒ **Improve communications** with all stakeholders and citizens.

- ❒ **Expand efforts to provide information and technical assistance** to citizens and local government.

- ❒ **Implementing the recommendations from the DNRs Corner stones Report** would effectively deliver natural resources stewardship education to all Minnesotans.

- ❒ **Establish performance measures** that will provide a comprehensive assessment of the DNR's success in managing for long-term ecosystem sustainability.
(See the *DNR Performance Report 2001.*)

- ❒ **Integrate resource management priorities** into existing discipline planning and budget development across area, regional and state levels and place more authority with area staff to manage budgets and staffing priorities.

Trails and Waterways Responsibilities

The guidelines are designed to assist resource managers in conducting management activities that enhance the quality of natural plant communities, wildlife habitat, regional landscape integrity and visual quality. DNR Trails and Waterways will strive to accomplish the following objectives:

❒ **Identify, manage and restore natural plant communities** during planning and development of new trails and water access sites.

❒ **Manage natural plant communities** according to ecological principles.

❒ **Expand partnerships with citizens and local government** to enhance the ecological quality of state trails, canoeing and boating routes, and water access sites.

❒ **Engage recreational users** in management activities.

❒ **Inform recreational users** about management successes and continuing challenges.

Before We Get Started: What the Guidelines Are... and What They Are Not

Wild ginger

What the Guidelines Are...

❒ **The guidelines are designed to be flexible**, recognizing that site conditions vary. Determining the most appropriate guidelines for implemention on a particular site depends on the informed judgment of the resource manager responsible for that site.

❒ **The guidelines are designed to help** resource managers conduct management activities that enhance the quality of natural plant communities, wildlife habitat, regional landscape integrity and visual quality.

❒ **The guidelines represent practical and sound practices** based on the most current scientific information.

❒ **The guidelines are designed to assist with site-level management.**
While they are not designed to provide broad-based landscape direction, site-level management efforts can be expected to enhance the larger landscape.

...and What They Are Not

❒ **The guidelines are not a substitute** for a natural communities management plan. They are intended to support implementation of a plan once it is in place.

❒ **The guidelines are not intended to replace** any existing rules or regulations, such as Operational Orders.

❒ **The guidelines are not intended as a substitute** for obtaining professional assistance as needed to achieve management objectives.

❒ **The guidelines are not designed to help determine** whether a particular management activity should or should not occur. They are designed instead to provide guidance in **how** to implement a particular management activity.

❒ **The guidelines do not cover all management options** in detail related to a particular resource. Additional references provided will assist in more intensive study of various management options.

The Ecological Classification System: A Framework for Sustainable Resource Management

The Ecological Classification System (ECS) is part of a nationwide mapping initiative developed to improve our ability to manage all natural resources on a sustainable basis.

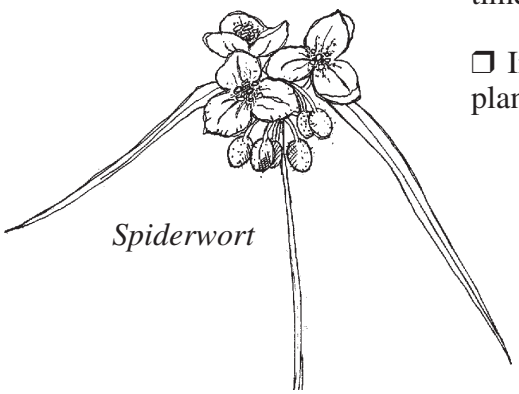
The ECS scientifically delineates and describes meaningful units of the natural landscape to form a basic framework for research and management. It identifies interrelationships and interactions among ecological components, such as climate, geomorphology, soil, topography, vegetation, hydrology, animals and land history.

As a framework for sustainabile natural resource management, the ECS:

- ❒ Provides a common means of communication among a variety of resource managers, as well as with the public.

- ❒ Improves predictions about how vegetation will change over time in response to various influences.

- ❒ Improves our understanding of the interrelationships among plant communities, wildlife habitat, water quality and human needs.



Spiderwort

A Framework for Managing Natural Resources

The Minnesota Ecological Classification System (ECS) identifies six ecological units in its classification and mapping. It follows the methodology used by the U.S. Forest Service and is part of the Great Lakes Region ECS. The classification is hierarchical or nested; small ecological units are contained within larger units.

The six ecological units are province, section, subsection, land type association (LTA), land type (LT) and land type phases (LTP).

Minnesota's Four Provinces

Prairie Parkland
about 16 million acres

Tallgrass Aspen Parklands
about 3 million acres

Eastern Broadleaf Forest
about 12 million acres

Laurentian Mixed Forest
about 23 million acres

Figure 2: ECS province map

Minnesota's Ten Sections

Figure 3: ECS section map

Level 1: Province

Minnesota has four provinces. Provinces are defined by climate (temperature and moisture), geology, and associated major vegetation patterns. The state's four provinces represent four broad climate/vegetation patterns: prairie/savanna, deciduous forest and boreal forest. (See Figure 2.)

Prairie Parkland Province: The Prairie Parkland Province covers about 16 million acres of southern and southwestern Minnesota. Before settlement, this area was primarily covered by tall grass prairie. Its topography is mostly level to gently rolling, and major landforms include lake plains and ground moraines.

Tallgrass Aspen Parklands Province: This Province covers about 3 million acres in northwestern Minnesota. Part of an extensive lake plain, it is level in the western portion with small dunes and a series of low beach ridges and swales to the east. Before settlement the vegetation consisted of aspen savannah, tallgrass prairie, wet prairie, gravel prairie, and floodplain forest along rivers.

Eastern Broadleaf Forest Province: The Eastern Broadleaf Forest Province covers another 12 million acres through the heart of the state. It forms a transitional zone between the prairie to the west and the boreal forest (conifer, conifer-hardwood mix or hardwood forest) to the northeast. Topography varies from level lake plains to very steep slopes in the Paleozoic Plateau of the southeast. Major landforms include lake plains, outwash plains, moraines and drumlin fields.

Laurentian Mixed Forest Province: The Laurentian Mixed Forest Province covers the northeastern 23 million acres of Minnesota. It is the boreal forest region of our state. Before settlement, this area consisted primarily of coniferous forest, coniferous-hardwood mix or northern hardwood forest. Topography is variable. Landforms range from lake plains and outwash plains to ground and end moraines.

Level 2: Section

Provinces are subdivided into sections. Sections are defined by the origin of glacial deposits, regional elevation, distribution of plants and regional climate. Minnesota has 10 sections. (See Figure 3.)

Level 3: Subsection

Sections are further divided into subsections. These county-sized areas within sections are defined by glacial land-forming processes, bedrock formations, local climate, topographic relief and the distribution of plants. Minnesota has 25 subsections. (See Figure 4.)

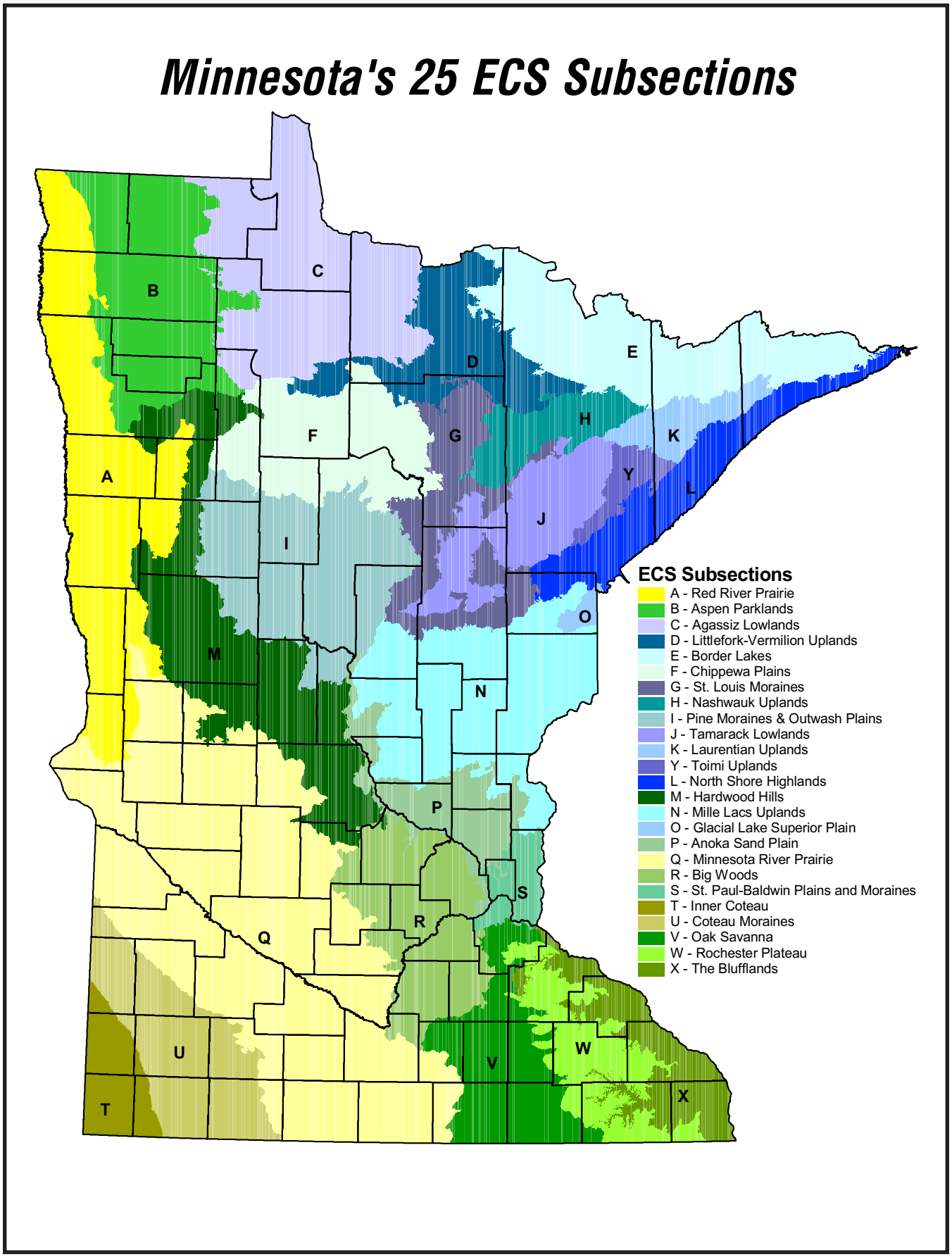


Figure 4: ECS subsection map

Upper Three ECS Levels for Minnesota

Province	Sections	Subsections
Prairie Parkland Province	2	4
Tallgrass Aspen Parklands Province	1	1
Eastern Broadleaf Forest Province	2	7
Laurentian Mixed Forest Province	5	13
	10	25

Level 4: Land Type Association (LTA)

Land type associations are landscapes within subsections. Land type associations (or LTAs) are characterized by glacial formations, bedrock types, topographic roughness, lake and stream patterns, depth to groundwater table and soil material. For example, the Alexandria Moraine is an LTA characterized by a particular glacial formation.

Level 5: Land Types (LT)

Land types are the individual elements of an LTA. Land types (or LTs) are defined by recurring patterns of uplands and wetlands, soil types, plant communities and fire history. For example, a fire-dependent dry pine-hardwood association is an example of a land type.

Level 6: Land Type Phases (LTP)

Land type phase or habitat type is a unique combination of plants and soils within a land type (LT). Land type phases are defined by characteristic trees, shrubs and forbs, by landscape position, and by soil texture and moisture. A sugar maple-basswood forest is an example of a land type phase.

Each biotic province needs its own wilderness for comparative studies of used and unused land.

Aldo Leopold
A Sand County Almanac

The Importance of Understanding the ECS

State trails are artificial long-distance corridors, and canoeing and boating routes are natural long-distance corridors. Trails and canoeing/boating routes range from a few miles to several hundred miles in length. They often extend across several different units of the Ecological Classification System (ECS). Water access sites are also located in various ECS units throughout the state.

A basic understanding of the ECS is essential for effective management of natural resources along these corridors and sites, as well as understanding their relationship to the surrounding landscape.

The ECS can also help us understand the interrelationships among plant communities, wildlife habitat and water quality, thereby helping us recognize the potential impact of recreational activities on natural resources.

The ECS also serves as a framework for planning and development of new trails and water access sites, and for the management and restoration of natural plant communities on existing sites.

The Guiding Principles

The Rationale for Our Actions

Three guiding principles provide the rationale for actions related to managing and restoring natural plant communities on Trails and Waterways sites:

Three guiding principles provide the rationale for actions related to managing and restoring natural plant communities on Trails and Waterways sites.

1. Restoration and management of natural plant communities:

- Enhances the ecological quality of all sites
- Contributes to the integrity and aethestic quality of the regional landscape
- Improves the quality of the recreational experience
- Reduces air and water pollution induced by motor driven maintenance procedures

2. New development should occur primarily in environments already influenced by human activity, with emphasis on restoring and re-establishing native vegetation in these environments for the benefit of people, and remaining natural systems.

3. New development must avoid:

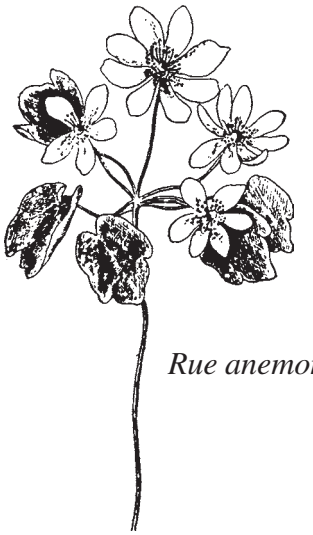
- Critical habitat of endangered, threatened and special concern species (as identified by the Natural Heritage Program)
- Large remaining natural areas
- Patches of high quality habitat

Action Steps To Implement Guiding Principles

❒ **Collaborate with an interdisciplinary team of resource managers** during all stages of new development, including site selection, planning and development.

❒ **Consider existing landscape-level and watershed-level planning activities,** which engage citizens in defining desired resource conditions.

❒ **Site new trail alignments** consistent with regional landscape management goals.



Rue anemone

❒ **Incorporate guiding principles** into existing management objectives and activities.

❒ **Minimize the crossing of natural corridors,** such as stream corridors, which are important for wildlife movement.

❒ **Use native plant material** that is landscape and site appropriate to revegetate areas disturbed by construction.

❒ **Strive to enhance the overall quality of remnant native plant communities** by applying appropriate management practices.

❒ **Collect and use native seed from existing sites** for restoration and expansion of native plant communities.

❒ **Encourage adjacent landowners** to become partners in managing existing natural plant communities beyond Trails and Waterways sites.

❒ **Foster user awareness** through information and interpretation regarding natural plant communities and associated management practices.

❒ **Engage local communities** to become better stewards of their natural resources.

❒ **Provide a safe recreational environment** by removing hazardous trees, creating buffer plantings, and assuring that vegetation does not impede visibility.

For Further Information

Ecology of Greenways: Design and Function of Linear Conservation Areas, by Daniel S. Smith and Paul Cawood Hellmund. University of Minnesota Press, Minneapolis, Minnesota, 1993.

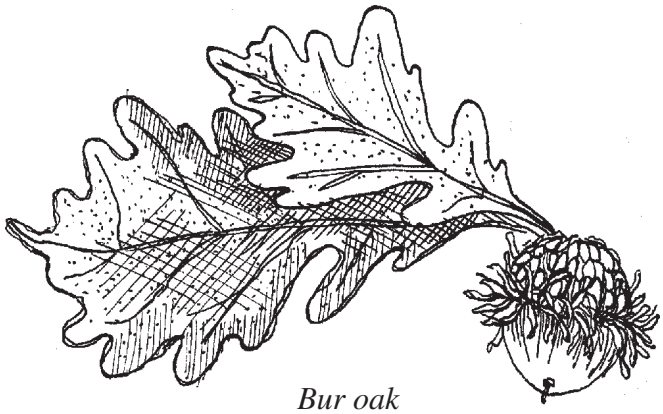
Field Guide to the Native Plant Communities of Minnesota, The Laurentian Mixed Forest Province, Minnesota Department of Natural Resources, Division of Ecological Services, 2003.

Landscape Ecology, by Richard T. T. Forman and Michel Godron. John Wiley & Sons, New York, 1986.

Minnesota's Native Vegetation: A Key to Natural Communities in Minnesota, Version 1.5. Minnesota Department of Natural Resources, Natural Heritage Program, St. Paul, Minnesota, 1999.

Minnesota's Natural Heritage: *An Ecological Perspective,* by John R. Tester. University of Minnesota Press, Minneapolis, Minnesota, 1995.

The Upper Levels of an Ecological Classification System for Minnesota (ECS), General Description of Sections and Subsections, Minnesota Department of Natural Resources, St. Paul, Minnesota, 1996. Web: www.dnr.state.mn.us/ecological_services/ecs/index.html



Bur oak