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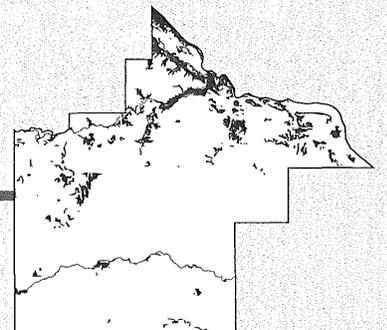


MINNESOTA DEPARTMENT OF NATURAL RESOURCES

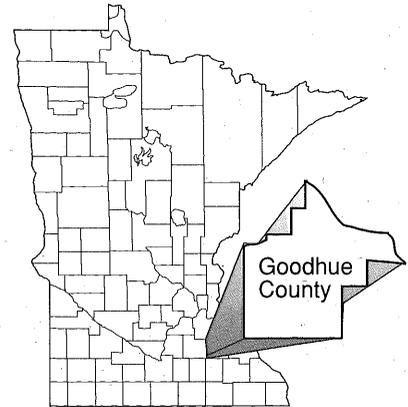
SUMMARY OF GOODHUE COUNTY 1990 – 1992

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MINNESOTA COUNTY BIOLOGICAL SURVEY



Between 1990 and 1992, the Minnesota County Biological Survey (MCBS) inventoried Goodhue County for natural communities and rare species. This report summarizes the most significant findings of the MCBS, along with previously known information on the county's rare biological features.



MCBS Procedures

In surveying a county, MCBS follows a multi-level process consisting of:

- Identification of potential natural areas using aerial photos. Potential natural areas are places where the land and vegetation have not been altered significantly by human-related activities such as cultivation, grazing, or logging, and are referred to as "MCBS sites."
- Assessment of the quality and condition of the MCBS sites using aircraft and ground surveys.
- Additional specialized field surveys of selected rare species or groups of species (for example, vascular plants, birds, mammals, reptiles, and amphibians).
- Entry of data collected into the Natural Heritage Information System, where it is available for distribution in the form of lists and brief reports.
- Production of interpretive and educational material, including county maps, county summary reports, and evaluation reports of ecologically significant sites.

When identifying and assessing natural areas and their component communities, MCBS ecologists rely on *Minnesota's Native Vegetation: A Key to Natural Communities*, produced by the Natural Heritage Program of the DNR. Minnesota's rare plant and rare animal species are listed and described in *Minnesota's Endangered Flora and Fauna*, edited by Barbara Coffin and Lee Pfannmuller and available in area bookstores. MCBS also obtains information from local naturalists and resource

managers, and incorporates data from previous surveys, such as forest inventories, geologic surveys, wildlife habitat inventories, nongame wildlife research, soil surveys, and the collection locations of specimens in herbaria and museums.

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Results

In the mid-1800s, native prairies, oak savannas, deciduous forests, emergent marshes and other communities covered Goodhue County (figs. 1, 2). In 1992, 7% of the county (about 33,000 acres) remained covered by intact natural communities (fig. 3). These natural communities are grouped into 136 sites, located primarily in areas too wet or too steep to farm.

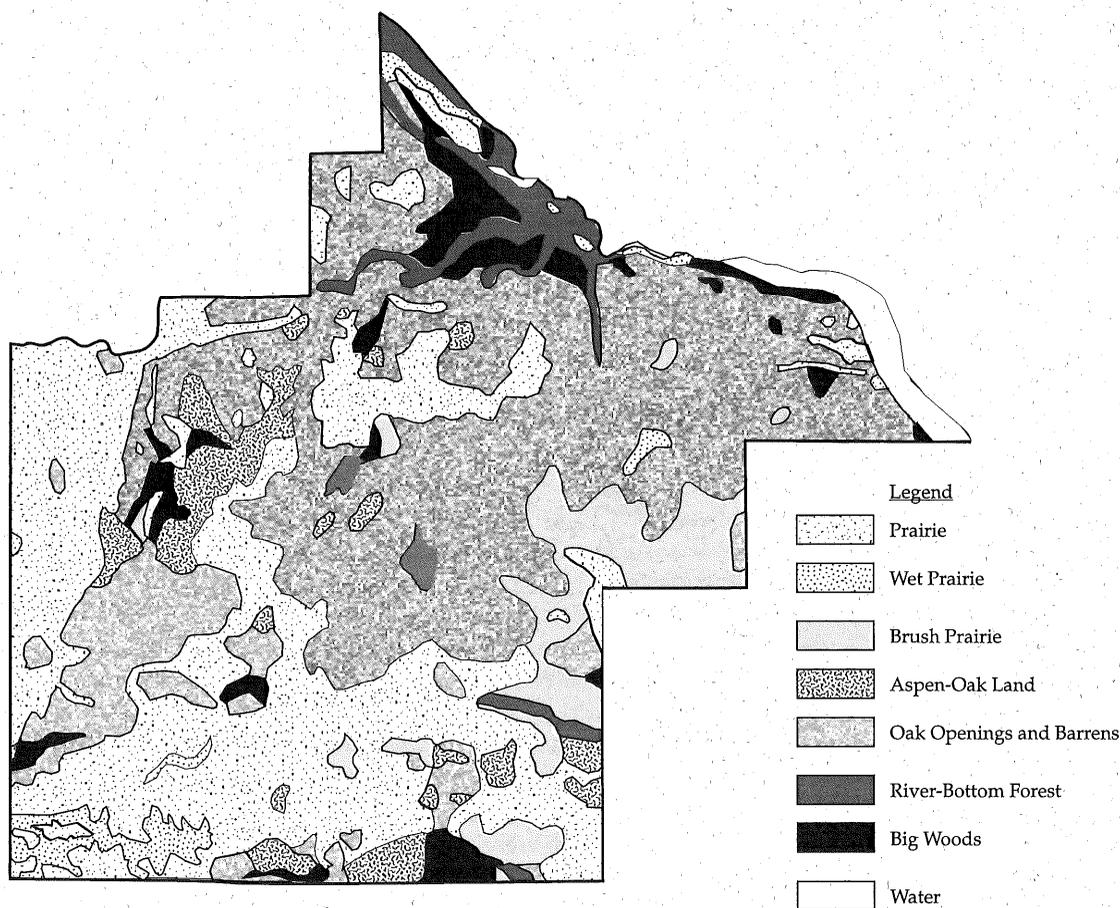


Figure 1. The original vegetation of Goodhue County as interpreted by Francis Marschner using Public Land Survey records from 1853-1856. The legend contains slight modifications of Marschner's original descriptions, as appropriate for southeastern Minnesota.

Figure 2. An idealized transect across a portion of southeastern Minnesota as it may have appeared in the mid-1800's. This transect would be typical of the bluffslands area along the Mississippi River in northeastern Goodhue County. In general, prairies and savannas were present on level or gently-rolling uplands and on river terraces, while forests occurred in hilly areas, on steep slopes, or adjacent to lakes, streams, or wetlands. The river floodplains contained extensive floodplain forests and emergent marshes

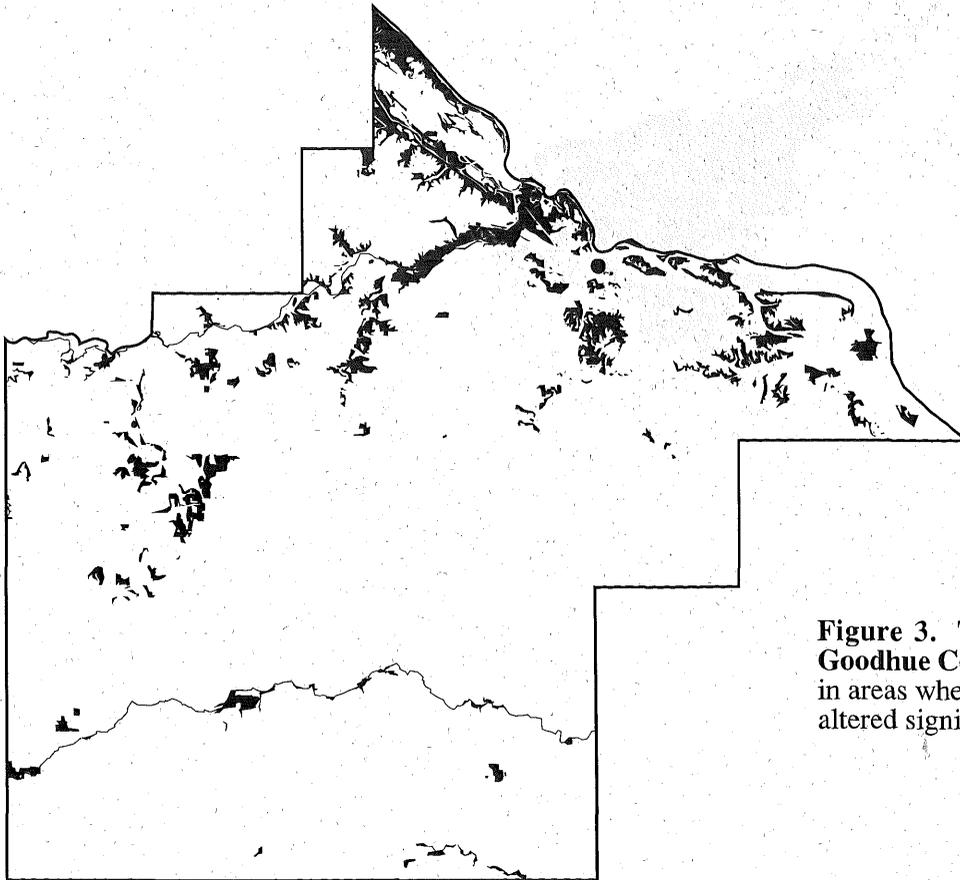
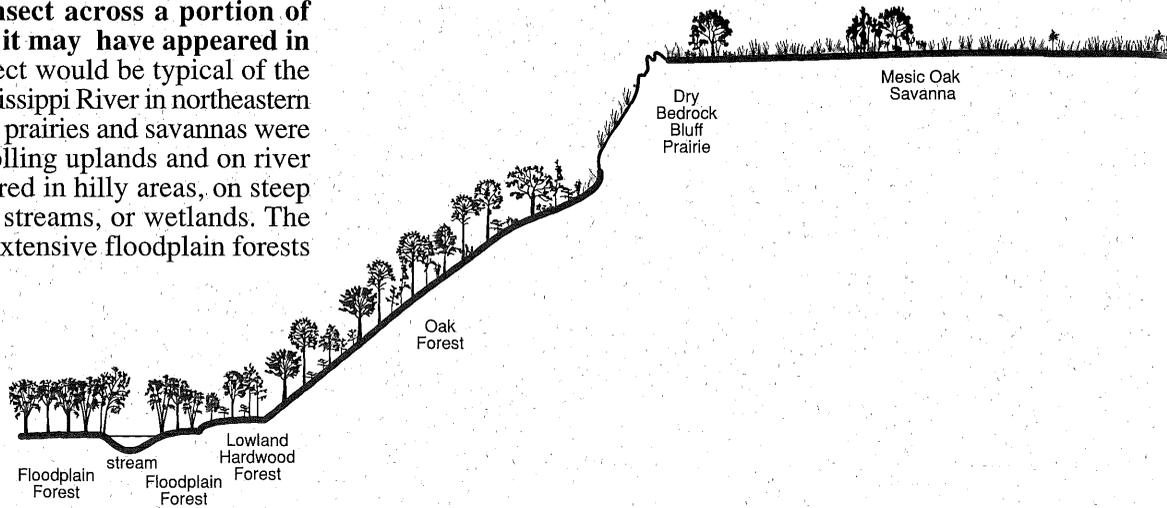
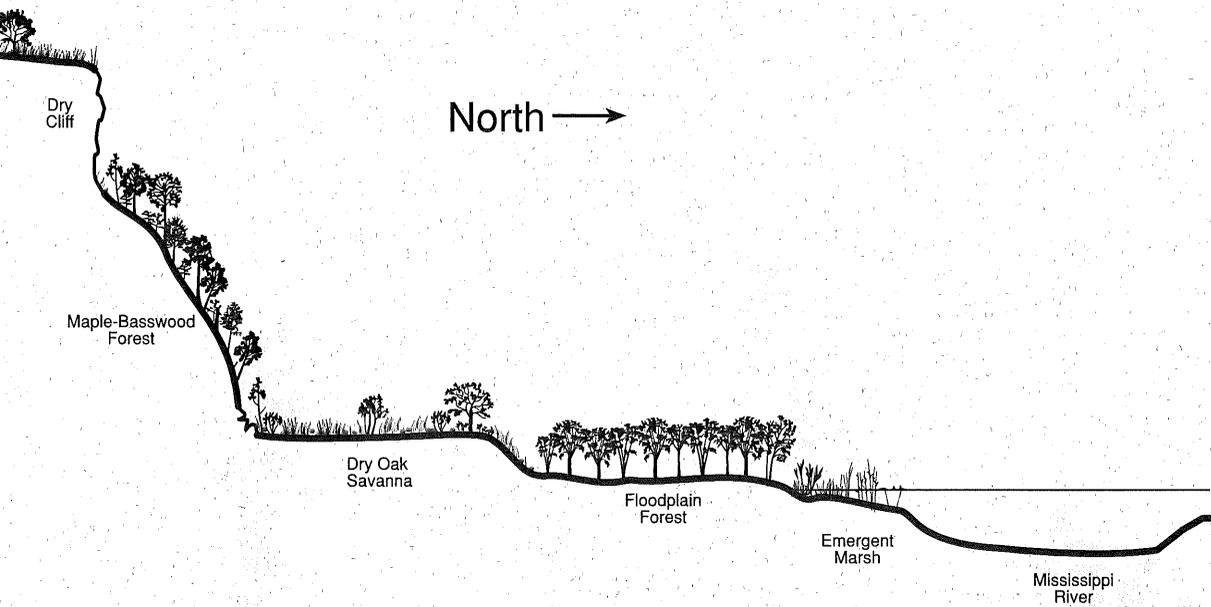


Figure 3. The present natural communities in Goodhue County. These natural communities occur in areas where the land and vegetation have not been altered significantly by human activity.



The following descriptions summarize the most significant natural features inventoried in Goodhue County. In all, 57% of the known locations of natural communities, rare plants, and rare animals in the county were recorded between 1990 and 1992 during the MCBS. A listing of all known natural communities and rare species appears on the final MCBS map of Goodhue County or can be obtained from the Natural Heritage Information System of the Minnesota DNR.

Prairies, common throughout much of the county in the mid-1800s, are now quite rare; most have been converted to cropland or pasture. Mesic prairies (also called tallgrass prairies) are virtually gone. These prairies were largely responsible for the development of the rich soils present on uplands across the county and were rapidly plowed up for cropland as Euro-American settlement proceeded. At present, just one small tract of mesic prairie remains in Goodhue County. Dry prairies are more common, with sixty-one occurrences remaining in the county. They develop on droughty sites, such as bedrock bluffs, gravel and sand deposits, and hills of old glacial till (fig. 4). Because of the harsh growing conditions of these sites; dry prairies tend to have sparser and shorter vegetation than mesic prairies. Most of the present prairies in Goodhue County have been disturbed by intense, localized grazing or are being invaded by brush in the absence of frequent prairie fires or large native grazers such as bison and elk. These small prairie remnants provide habitat for many rare plants and rare animals.

Natural Communities

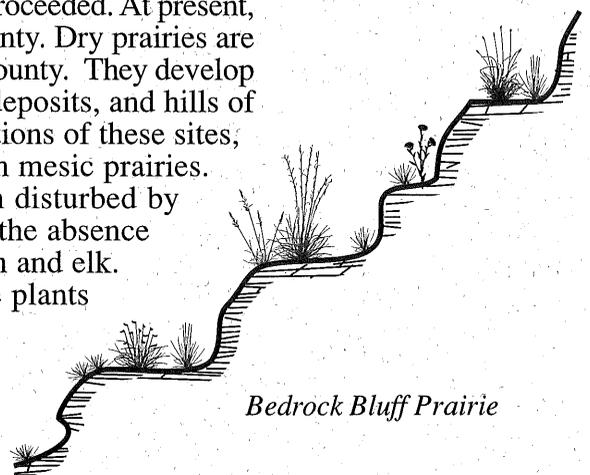




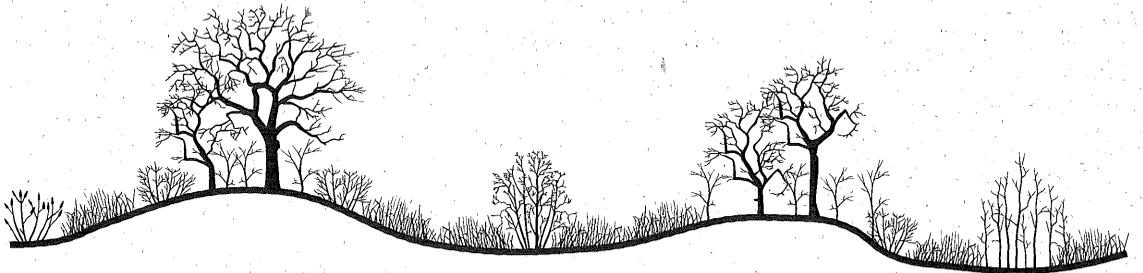
Figure 4. This bedrock bluff prairie is on top of Barn Bluff, a well-known landmark within the city limits of Red Wing. The prairie is much as it might have appeared in the mid-1800's, except for areas eroded by hiking trails. It is dominated by grasses, such as little bluestem (*Schizachyrium scoparium*), hairy grama (*Bouteloua hirsuta*), and plains muhly (*Muhlenbergia cuspidata*), and contains many species of native forbs, including dotted blazing-star (*Liatris punctata*), pasque-flower (*Pulsatilla nuttalliana*), downy painted cup (*Castilleja sessiflora*), bladderpod (*Lesquerella ludoviciana*), and ground-plum (*Astragalus crassicaarpus*). It also contains several small patches of bur oak trees, such as the one in the depression in the background.

Oak savannas, once common in the county on flat upland areas with rich soils and moderately frequent fires and on gravel terraces above the Mississippi River, have rarely been destroyed. Only six areas of savanna remain. None of these is larger than 40 acres and all have been disturbed by intensive past grazing.

Calcareous seepage fens, extremely rare wetland communities that develop in undisturbed areas with mineral-rich groundwater springs, occur in two places in Goodhue County. The fens provide habitat for several rare plants.

Native *white pine-hardwood forests* are presently very rare in southeastern Minnesota, although they were common here thousands of years ago during a period of cooler climate. Three white pine-hardwood forests remain in Goodhue County. All are associated with steep cliffs along small streams.

Oak Savanna



Maple-basswood forests occur in the county on moist soils on old glacial till along the Little Cannon River and on north-facing slopes along the Mississippi, Cannon, and Zumbro rivers. Maple-basswood forests provide habitat for numerous rare plants, such as snow trillium, ginseng, and squirrel-corn. The community is threatened throughout Minnesota by logging pressure and development.

Oak forests of good quality are surprisingly rare in southeastern Minnesota. Fifty occurrences of oak forest were documented in Goodhue County by MCBS, but many are small tracts and most have had some logging or grazing in parts of them.

Floodplain forests occur in the county primarily along the Cannon and Mississippi rivers (fig. 5). Those along the Mississippi have been heavily impacted by altered flooding regimes resulting from the system of locks and dams on the river. Additionally, there is increasing logging pressure on many of the forests. The remaining floodplain forests in Goodhue County provide extremely important habitat for red-shouldered hawks, bald eagles, heron nesting colonies, and migratory songbirds.

Emergent marshes have been greatly impacted in southern Minnesota by draining and other agricultural activities. Those along the Mississippi River have also suffered from siltation, exotic species invasions, and the disruption of natural flood cycles caused by the locks and dams along the river. As a result, there are relatively few large emergent marshes in southern Minnesota that have a good diversity of native species. Five sites in Goodhue County contain intact emergent marsh communities.

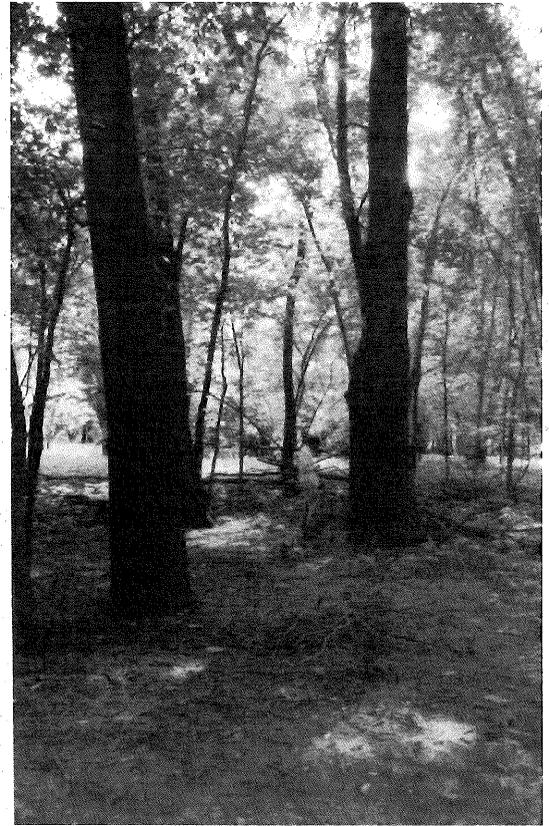


Figure 5. Although floodplain forests remain along much of the Cannon River below Welch, and much of the Mississippi River above Red Wing, most have been disturbed by logging or alteration of river flood cycles. The large trees and open understory of this forest along the lower Cannon River are characteristic of intact floodplain forests.



Maple-Basswood Forest

Rare Plants

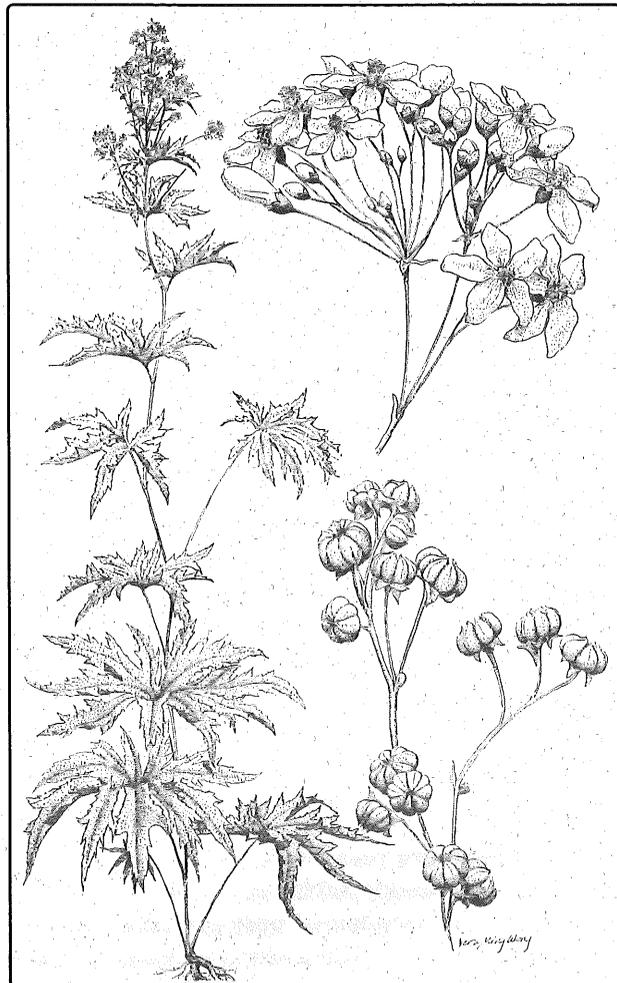
30 rare plant species were documented in Goodhue County by MCBS (fig. 6), including:

The state-endangered *lesquerella or bladderpod* which is limited in Minnesota to bedrock bluff prairies in the Red Wing and Hay Creek area. Eight separate populations have been documented in this area.

The *Minnesota dwarf trout lily* the only endemic plant species in Minnesota (meaning it occurs nowhere else in the world). In Goodhue County, the dwarf trout lily grows in maple-basswood and floodplain forests at a few sites along the Zumbro, Cannon, and Little Cannon rivers.

The federally threatened *prairie bush clover* which occurs in bedrock bluff prairies near Dennison.

Glade mallow, which is endangered in Minnesota and limited in its range to the midwestern United States. It was documented in Goodhue County in 1883, but had not been seen since, until several populations were discovered by MCBS in floodplain forests along the Zumbro River and Prairie Creek.



Drawing by Vera Ming Wong ©1988 Minnesota DNR

The state-endangered glade mallow had not been seen in Goodhue County since 1883, until rediscovered by MCBS.

Rare Animals

Goodhue County has five areas that MCBS found to be especially significant for rare animals:

Lower Cannon River-Red Wing Backwaters-Vermillion Slough

This area has extensive tracts of floodplain forest, emergent marsh, and adjacent forested uplands, which provide habitat for several rare birds. The floodplain forests along the Lower Cannon River between Welch and Highway 61 have one of the highest breeding densities of red-shouldered hawks in Minnesota. Cerulean warblers are present in mature floodplain forests along the Cannon River east of Highway 61, at Vermillion Slough, and in the Red Wing Backwaters. The cerulean warbler is a candidate for the federal endangered species list. Additional rare but non-listed species documented in the area by MCBS are the Acadian flycatcher and the prothonotary warbler. The area also serves as a feeding and nesting site for bald eagles. The Lower Cannon River is an important location in southeastern Minnesota for the state-threatened wood turtle. Wood

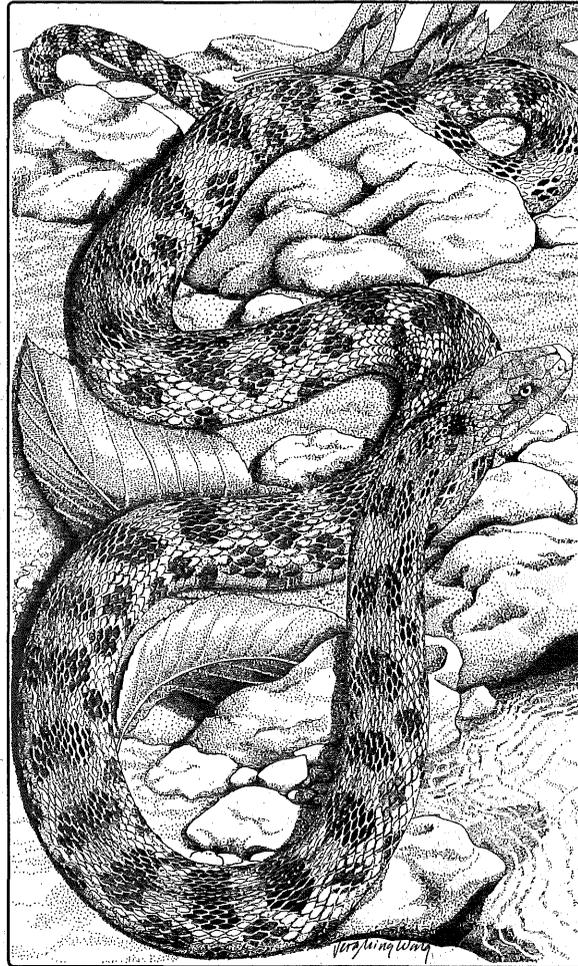
turtles use the floodplain forests and upland forests along the river as foraging grounds, and use sandbars along the river as nesting sites.

Wacouta Bay

An old-growth maple-basswood forest on a slope overlooking Wacouta Bay houses one of two bald eagle winter roost sites in Minnesota. For each of the past five winters, an average of 20 to 40 bald eagles have been observed in the vicinity of the roost site. Bald eagles also nest in a mature floodplain forest along the edge of the bay during the spring and summer.

Blufflands

The combination of native bedrock bluff prairie and oak forest on many slopes in the blufflands area of Goodhue County provides important habitat for several reptile species. MCBS documented five rare snake species in the blufflands including the timber rattlesnake, the milk snake, and the fox snake. The blufflands also contain natural and human-made caves and mines formed in the underlying sandstone bedrock. These are ideal hibernating sites for bats. MCBS documented all four of Minnesota's cave bat species in the area, including two rare species, the eastern pipistrelle and the northern myotis, both of which are of special concern in Minnesota.



Drawing by Vera Ming Wong ©1988 Minnesota DNR

The blufflands in Goodhue County provide important habitat for rare animals such as the fox snake.

Mississippi River Valley

The Mississippi River Valley is a major migration and dispersal corridor for birds. Large tracts of floodplain forest, together with maple-basswood and oak forests on adjacent slopes, provide cover and feeding areas for birds during annual spring and fall migrations. The Frontenac area, in particular, is renowned among birders in Minnesota for the large numbers of songbirds visible there during the spring migration period. The river valley is also an important migration and dispersal corridor for reptiles and amphibians, including soft-shell turtles and map turtles.

Dennison Area

This area, together with adjacent portions of Rice and Dakota counties, is one of the most important areas in southeastern Minnesota for rare small mammals and for rare bird species. The prairie vole, of special concern in Minnesota, and the

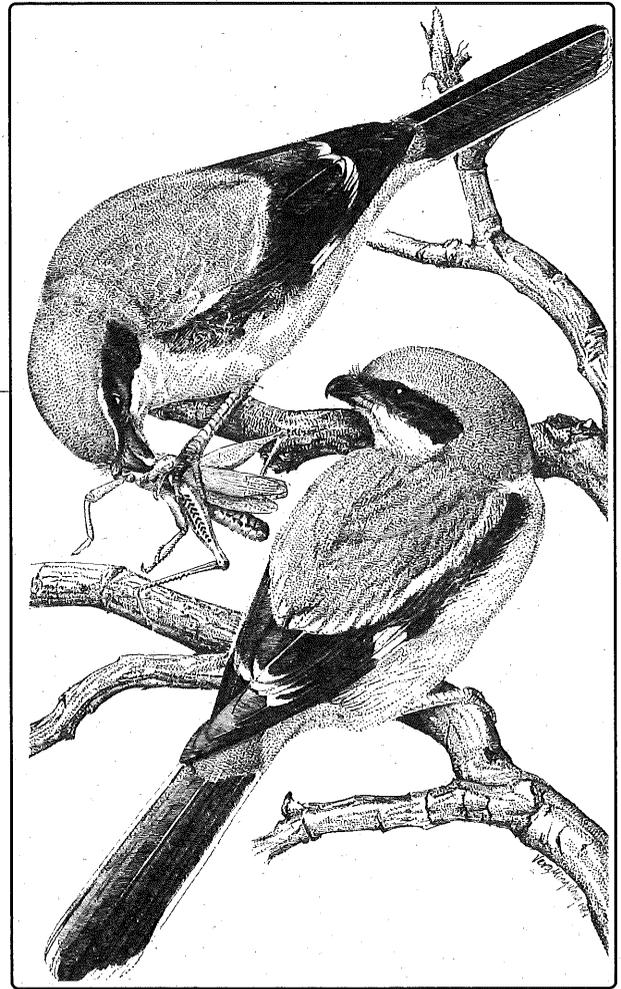
non-listed but rare western harvest mouse and plains pocket mouse inhabit bedrock bluff prairie remnants in the area. The bedrock bluff prairies, together with adjacent pasture land, provide the relatively large tracts of permanent grassland required by the loggerhead shrike, a threatened bird species in Minnesota. The upland sandpiper, of special concern in Minnesota, was also documented in the area by MCBS. Like the loggerhead shrike, the upland sandpiper appears to require large tracts of permanent grassland.

Conservation

Because the total acreage of intact natural communities is so small in Goodhue County, each of the 136 sites identified by MCBS is considered to be ecologically significant. However, to help with conservation planning, the sites have been prioritized according to their significance. This was done by considering site size, the amount of human-related disturbance, the relative county-wide or state-wide rarity of the natural features present at the site, and the presence of rare plants or rare animals. Thirteen sites in the county are considered to be of the highest priority for conservation action, 42 sites of high priority, 56 of medium priority, and 25 of lower priority.

Among the options available for promoting preservation of the natural areas in Goodhue County are:

- education of and management assistance for private and public landowners;
- the purchase of conservation easements by the state or the county to provide land protection and some financial return to private landowners;
- protection as state, county, or city parks or wildlife areas;
- enrolling appropriate lands in prairie or wetland tax exemption programs;
- the purchase of land by private conservation organizations.



Drawing by Vera Ming Wong ©1988 Minnesota DNR

The state-threatened loggerhead shrike requires large tracts of permanent grassland for its continued survival.

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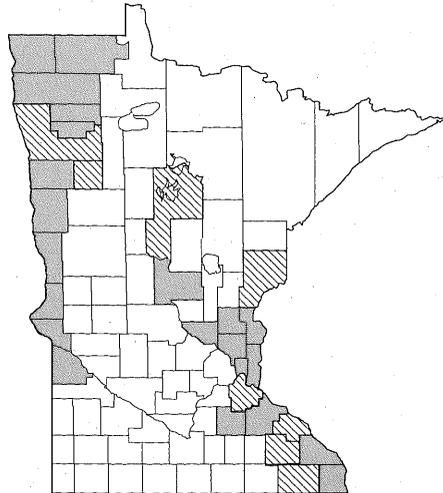
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The MCBS is a statewide, systematic inventory of rare biological features. The goal of MCBS is to identify significant natural areas and collect and interpret data on the distribution and ecology of natural communities, rare plants, and rare animals. The information gathered by MCBS serves as a foundation for the conservation of critical components of Minnesota's biological diversity.

MCBS Statewide Status



■ COUNTY SURVEY COMPLETED 1987-1993

▨ SURVEY IN PROGRESS 1994

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