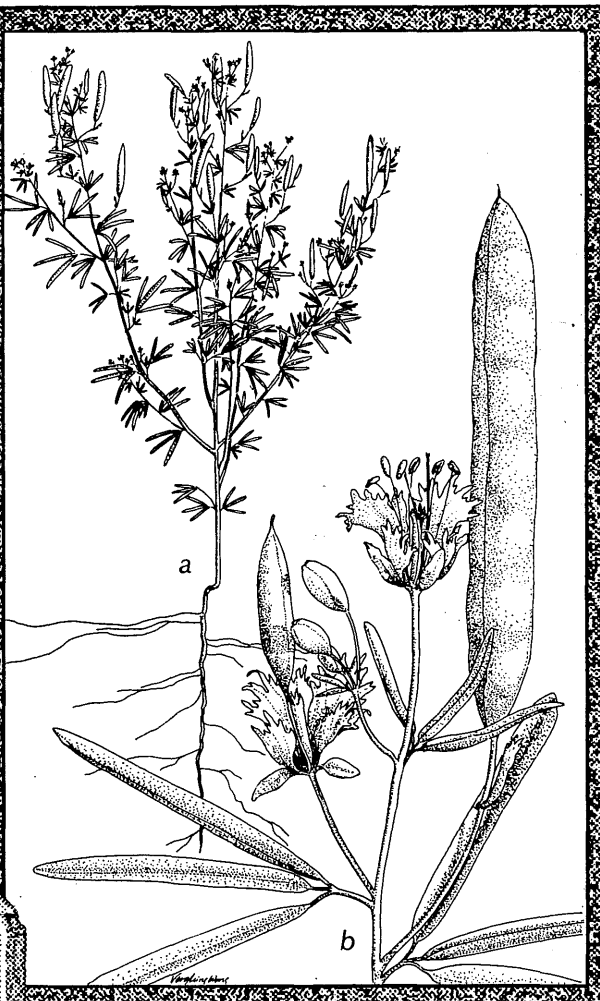


RARE BIOLOGICAL FEATURES WITHIN THE PROPOSED NEW MAJOR AIRPORT SEARCH AREA, DAKOTA COUNTY, MINNESOTA

Minnesota County Biological Survey
Department of Natural Resources

October, 1992

The Minnesota County Biological Survey (MCBS) is conducted by the Natural Heritage and Nongame Wildlife Programs, Section of Wildlife, Division of Fish and Wildlife, Minnesota Department of Natural Resources.

Funding for the survey of the Dakota Search Area provided by:

Metropolitan Airports Commission
Minneapolis-St. Paul International Airport

MCBS Staff:

Carmen Converse, MCBS Supervisor
Gerda Nordquist, MCBS Animal Survey Coordinator

Natural Communities and Plants
Barb Delaney
Thomas Morley

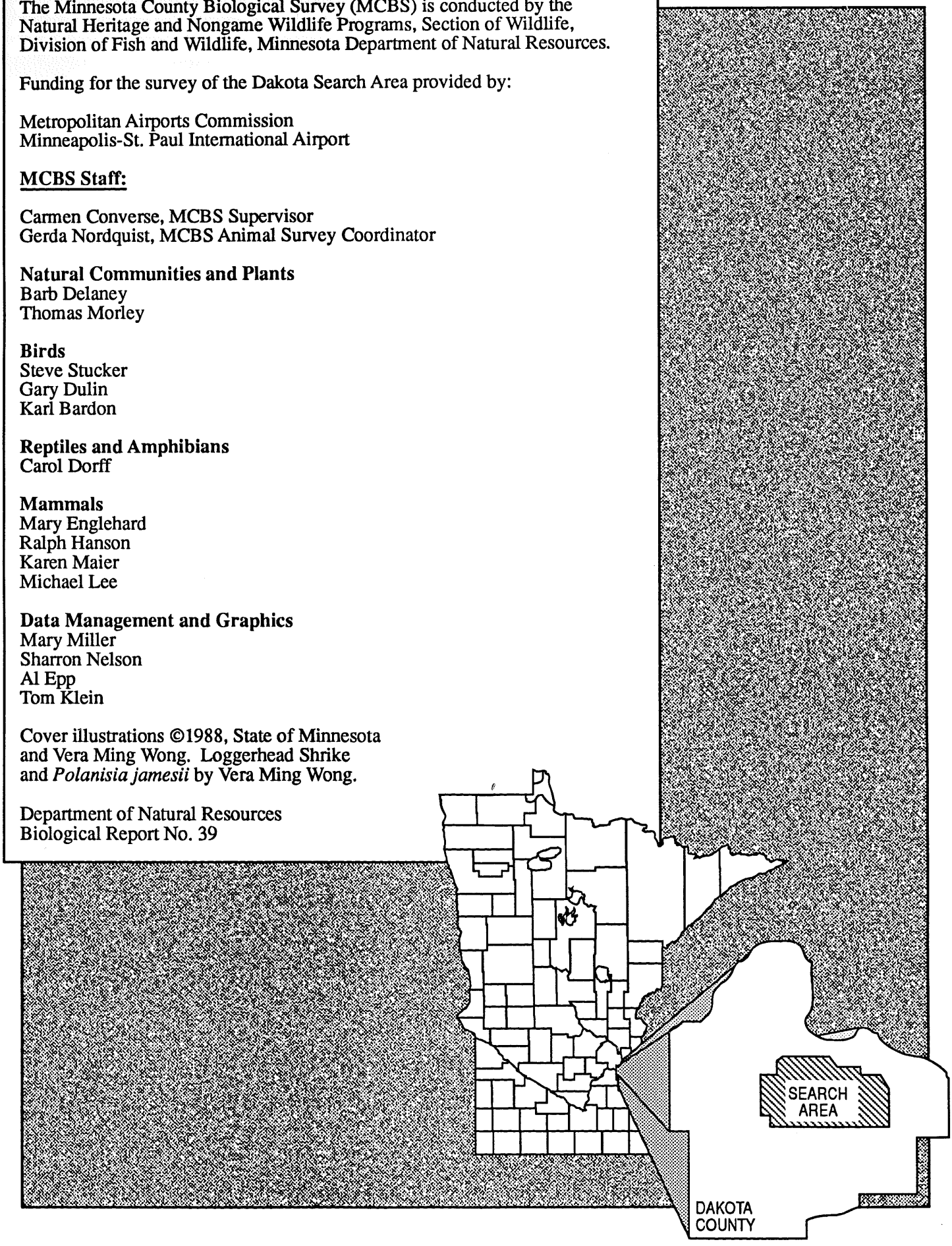
Birds
Steve Stucker
Gary Dulin
Karl Bardon

Reptiles and Amphibians
Carol Dorff

Mammals
Mary Englehard
Ralph Hanson
Karen Maier
Michael Lee

Data Management and Graphics
Mary Miller
Sharron Nelson
Al Epp
Tom Klein

Department of Natural Resources
Biological Report No. 39



RARE BIOLOGICAL FEATURES WITHIN THE PROPOSED NEW MAJOR AIRPORT SEARCH AREA, DAKOTA COUNTY, MINNESOTA

Minnesota County Biological Survey
Nongame Wildlife and Natural Heritage Programs
Section of Wildlife, Division of Fish and Wildlife
Department of Natural Resources
Box 7, 500 Lafayette Road
St. Paul, Minnesota 55155

October 1992

SUMMARY

The Minnesota Department of Natural Resources (DNR) is conducting a survey of rare biological features within the Dakota Search Area that was identified by the Metropolitan Airports Commission (MAC) as a proposed site for a new major Twin Cities airport. The DNR's Natural Heritage and Nongame Wildlife programs jointly conduct the Minnesota County Biological Survey (MCBS), a systematic inventory of rare natural communities, rare plants and rare animals on a county-by-county basis. The purpose of the survey is to assess the status of the state's biological diversity. Under an agreement with MAC, the survey of rare biological features in the Dakota Search Area began in 1992. In 1993, the survey will be completed in the Search Area, and expanded to include the entire county. The MCBS uses a multi-level survey technique. The first step is air photo interpretation, followed by aerial survey. The final step involves intensive ground surveys of selected high quality natural area sites, where biologists and ecologists document the occurrence and condition of rare features. All collected data resides in the Natural Heritage Information System and is available as computer-generated products, including digital map files.

To date, MCBS identified a total of 31 locations of rare biological features in the Dakota Search Area. These include nine rare natural communities, 11 rare plants, and 11 rare animals. MCBS identified four critical issues that need to be considered in the potential development of a new major airport. A summary of the threats and recommendations for each critical issue follows.

1. Loggerhead Shrikes. Dakota county contains over 20% of the known statewide locations of Loggerhead Shrikes *(Lanius ludovicianus)*, and 1/3 of these records are in the Search Area. Regardless of where the airport is placed, Loggerhead Shrikes will be impacted. Recommended mitigation efforts: (a) avoid placement of the airport on or near any known breeding territories; (b) position the airport to minimize the number of territories affected and the severity of impacts; (c) acquire and manage alternative breeding territories for the species elsewhere in Dakota County.

2. Hastings Sand Coulee. This area is important because of the size of the Sand prairie, the diversity of associated plants and animals and the presence of one of the three known Minnesota populations of the state endangered plant, James' polanisia *(Polanisia jamesii)*. This area should be excluded from consideration as a possible location for the airport because of the concentration of rare features. Furthermore, should the airport be constructed in the vicinity, this site is threatened indirectly by the acceleration of development. Presently, the greatest threat to the area is the continued destruction of natural habitats by residential and commercial development. Actions on a local level should be taken to notify landowners of the rare features on their land, and to encourage their involvement in protection and management.

3. Empire Wetlands. This area encompasses the largest wetland complex in the Search Area. The presence of two state threatened species, Valerian *(Valeriana edulis)*, and Blanding's turtle *(Emydoidea blandingii)* highlight the importance of this area. Current threats are related to the invasion of undesirable plants into the prairies. Placement of the airport near or including the wetlands would be acceptable, provided that existing hydrological conditions are maintained, chemical contamination is avoided, and management plans are developed for the habitat of the two state threatened species.

4. Chimney Rock. The presence of the state threatened Kitten-tails *(Besseya bullii)*, a Sand prairie, Mixed oak woodland, and a wind-eroded sandstone formation known as Chimney Rock are strong reasons to protect this site. The current threats to this site are related to the easy access from the adjacent road resulting in vandalism and trampling of the area. The inclusion of Chimney Rock within the airport boundaries is acceptable provided that the formation is protected from immediate development and a management plan is developed for Kitten-tails and the natural communities.

Further inventory and research should include 1) completion of the Dakota County survey, 2) assessment of impacts of air traffic on nesting Bald Eagles *(Haliaeetus leucocephalus)* and colonial waterbirds on the Mississippi River, and 3) long-term monitoring of Loggerhead Shrikes in Dakota County. It was also recognized that placement of an airport in the Search Area would result in the increased development of the surrounding area. Urban development typically results in an acceleration of threats to many rare features due to factors such as hydrological changes, application of herbicides and pesticides, and expansion of transportation and utility corridors.

If changes in these recommendations are necessary following completion of the survey in the Search Area in 1993, then MCBS will provide an update. The Natural Heritage and Nongame programs will also make future additional comments on specific airport placement and construction plans, if the new airport alternative is approved.

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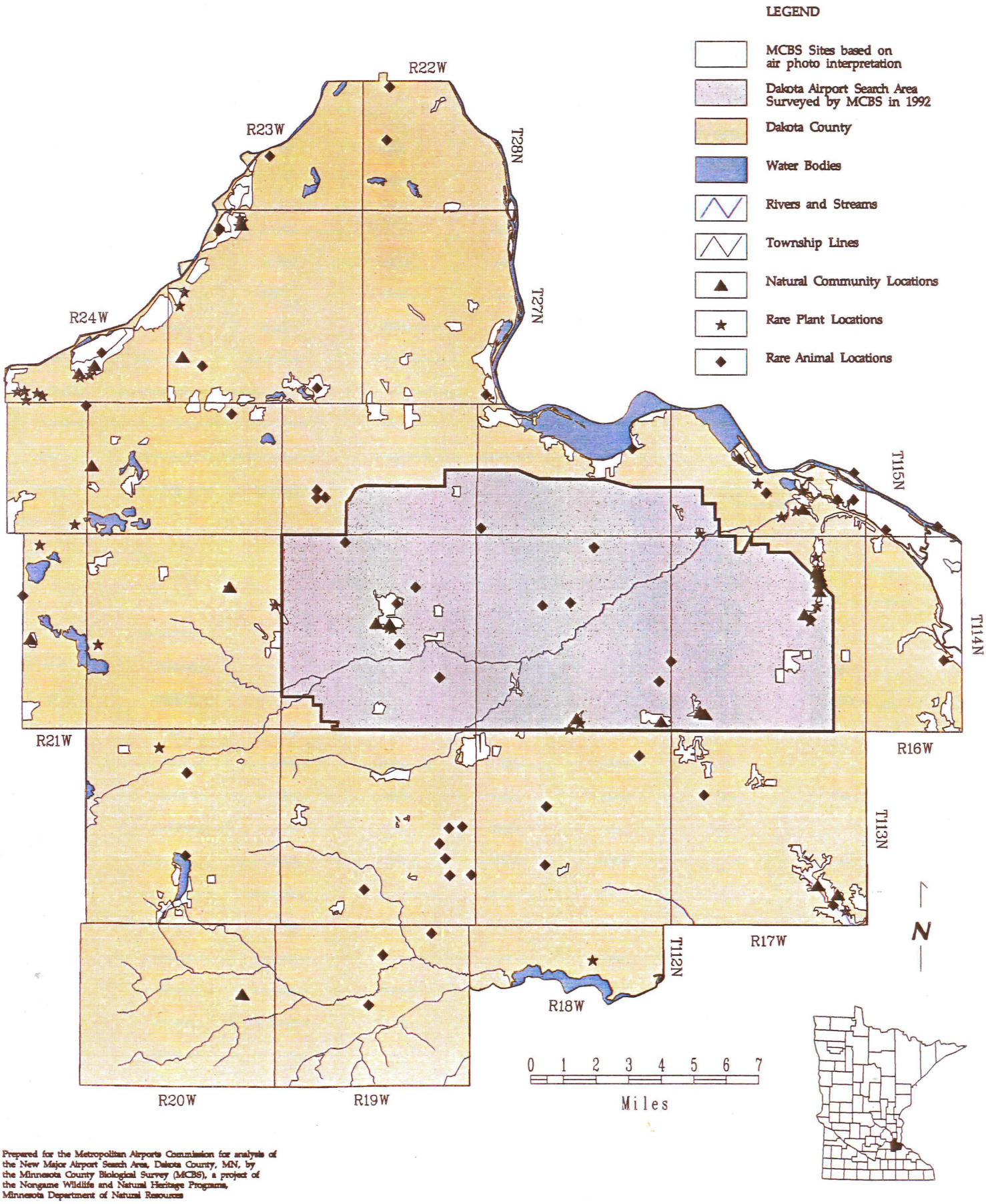


Prepared for the Metropolitan Airports Commission for analysis of the New Major Airport Search Area, Dakota County, MN, by the Minnesota County Biological Survey (MCBS), a project of the Nongame Wildlife and Natural Heritage Programs, Minnesota Department of Natural Resources

PURPOSE

Biological Survey of the Dakota Search Area

The Minnesota Legislature's Metropolitan Airport Planning Act of 1989 requires that the Metropolitan Council amend its aviation plan to include alternative plans for improvements of the existing international airport and construction of a new major airport at a new location. This Dual Track Airport Planning Process is conducted by the Metropolitan Airports Commission (MAC) and the Metropolitan Council. In December 1991, the Dakota Search Area (Figure 1) in Dakota County was selected as the proposed site for the development of a new major airport.

The Minnesota Department of Natural Resources (DNR) is conducting a survey of rare biological features within the Dakota Search Area. This information is being submitted to the MAC in order to address one of the issues identified in the Alternative Environmental Review process approved by the Minnesota Environmental Quality Board (EQB) and the Federal Aviation Administration (FAA) (MAC August 1992). The DNR has entered into a cooperative agreement with MAC (Appendix 1) to survey the Dakota Search Area for rare biological features, using the same procedures approved by the Minnesota Legislature in a 1991 work program for the Minnesota County Biological Survey. The biological survey of the Dakota Search Area began July 1, 1992, and will be concluded by June 30, 1993.

This report outlines the survey objectives and procedures, summarizes the results of the 1992 field season, discusses the possible threats to rare features as a result of airport development, and provides recommendations for rare features protection and further survey. This report is supplemented by digital ARC/INFO cartographic files submitted to MAC in October 1992.

If additional rare features data generated during the 1993 field season indicate that there should be significant changes in the comments provided in this report, an updated version of the report and the related digital files will be submitted by DNR to MAC in October 1993. If additional information does not lead to significant changes in recommendations, this 1992 report is the final document.

The Minnesota County Biological Survey

The State of Minnesota began the Minnesota County Biological Survey (MCBS) in 1987 in recognition of the need to assess the status of the state's biological diversity and its unique natural resources. It is a systematic, county-by-county survey conducted by the Natural Heritage and Nongame Wildlife programs of DNR's Section of Wildlife, Division of Fish and Wildlife. The fundamental objective of the MCBS is to systematically identify locations of Minnesota's rare natural ecosystems, their component natural communities and rare species.

This county-by-county survey identifies **natural areas**--remnants of natural vegetation that have escaped significant human alteration. Natural areas are representative of the Minnesota landscape prior to European settlement in the 1850's. Such areas are made up of **natural communities**--distinctive groups of native plants and animals living together under similar environmental conditions. The Natural Heritage Program has developed a classification of natural communities that is used by MCBS in the evaluation of potential natural areas (Minnesota Natural Heritage Program 1992a). Natural communities have no legal protection in Minnesota. The Natural Heritage Program has evaluated and ranked community types according to their relative rarity and endangerment throughout their range (Appendix 2), and considers the identification, protection, and management of natural communities and ecosystems a high priority.

MCBS also identifies locations of selected **rare plants** and **rare animals**. This includes searches for species that are officially listed under the provisions of the Federal Endangered Species Act of 1973,

Public Law 93-205, and/or Minnesota Statute 84.0895, and for those species that are proposed for state or federal listing. Federally-listed species are categorized as endangered, threatened, or candidates for listing. State-listed species are classified as endangered, threatened, or special concern (Coffin and Pfannmuller 1988). Endangered species are provided the highest level of legal protection under federal and state laws. MCBS targets several other species that are not legally protected. Some species are under consideration for listing and are in the review process. These fall into the categories of candidate species, proposed endangered, proposed threatened, and proposed special concern. Other rare species requiring further field survey to determine their status are categorized as non-listed rare species (Appendix 2).

The Natural Heritage and Nongame Wildlife programs maintain the Natural Heritage Information System that now includes more than 20 component databases. The oldest of these is the Rare Features Database that contains information on the statewide locations of rare plants, rare animals, significant natural communities, and other features such as bat caves, and noteworthy geological features. A complete list of rare features tracked in this database is available upon request (Minnesota Natural Heritage Program 1992b). Presently over 14,000 locations of rare features are documented for the state of Minnesota in this database. All rare features data collected by the MCBS is entered into this database, and each location constitutes a record. Other databases frequently used by the MCBS include a MCBS Site Database, Bald Eagle Historical Database, Colonial Waterbird Historical Database, County Flora Database, Bearing Tree Database, and Releve (vegetation samples) Database. Recently, the utility of some of these databases has been expanded by the implementation of an ARC/INFO Geographic Information System (GIS) that provides for computerized map production.

BACKGROUND

The Minnesota County Biological Survey--General Procedures

MCBS is conducted as a multi-level inventory, beginning with the identification of natural areas through interpretation of aerial photographs, followed by a combination of aircraft and ground surveys. Ecologists conduct detailed ground surveys of the selected natural areas by using a standardized methodology that verifies the quality, condition, and distribution of natural community types. Botanists and zoologists focus on priority natural areas in their surveys for rare plant and rare animal species. However, searches for rare plants and rare animals are not restricted to these sites. Additional sites are selected if a targeted rare species is known from other habitats such as pastures, old fields and roadsides. For example, the search for Loggerhead Shrikes in the Dakota Search Area included non-native grassland habitats that were not identified as potential natural areas through air photo interpretation.

Standardized forms are used to document the location, number, distribution and condition of all rare species and natural communities. Voucher plant specimens are deposited in the University of Minnesota herbarium in St. Paul. Animal specimens are added to the collections at the Bell Museum of Natural History in Minneapolis and the University of Minnesota Entomology Department in St. Paul. Location information and associated ecological data on all high quality sites, natural communities and rare species are entered into the Natural Heritage Information System. All potential natural areas and natural community boundaries are digitized into an ARC/INFO GIS, and all point locations of rare species are digitally recorded as geographic coordinates. Output from the Rare Features Database is available as printed abstracts describing the characteristics of each rare features location (e.g. observer, date of information, number of plants, eggs per nest, condition of prairie due to grazing, etc.), as plotted maps or as digital records.

Physiographic Setting and Presettlement Vegetation of Dakota County

The Dakota Search Area lies predominantly within the Mississippi Valley Outwash Geomorphic Region (University of Minnesota 1975) on a level to gently rolling outwash plain derived from both Superior

lobe and Des Moines lobe till. The flat-topped to rounded hills near the west end of the Search Area in Empire Township are loess-mantled areas of older till. The flat-topped hills near the southeast corner of the Search Area are composed of thin soil over bedrock (Balaban and Hobbs 1990). The Vermillion River and small tributary streams drain most of the area except for occasional, shallow depressions on level areas of outwash. There are no natural lakes in the Search Area. Upland soils are mostly well-drained, sandy loam or loamy sand.

Based on the original land surveys of Dakota County in the 1850's, pre-settlement vegetation was predominantly tall grass prairie and oak brushland or oak openings (Marschner 1974). Pre-settlement vegetation is used by the Natural Heritage Program as a basis for interpreting the relative "naturalness" of present natural communities with the understanding that natural dynamics may shift community boundaries from past locations. For example, oak woodland and forest communities were usually located along natural firebreaks such as north or east facing slopes. These slopes provided protection to the woody plants from the prairie fires advancing from the west. Following settlement, fire suppression has allowed forests to develop in areas that once supported prairie or savanna.

Most of the original prairie and much of the oak woodland and forest in the county has been replaced by cropland, pasture, roads, and housing. Through inventory and protection of remnants of the original vegetation we can better understand how natural communities function and provide habitat for their component plants and animals.

PROCEDURES--DAKOTA SEARCH AREA

Identification of Potential Natural Areas

Sites within Dakota County having potentially significant natural vegetation were identified in May 1992 through interpretation of color-infrared aerial photography. Positive transparencies were viewed stereoscopically (flight dates 24, 26 October 1985; scale 1:24,000) in order to determine the extent of natural vegetation throughout the county. Boundaries of potential natural areas were transcribed onto 7.5 minute USGS topographic maps, and digitized into an ARC/INFO file. These boundaries define what are called "MCBS Sites", the areas which appear to be relatively undisturbed by cultivation, housing, grazing, ditching, or other disturbance based on air photo interpretation (Figure 1). MCBS sites contain one or more natural vegetation community types (see Natural Community Surveys below), and sometimes inclusions of disturbed land. Subsequent ground survey often reveals changes in land use since the date of photography, or more serious disturbance than was evident in the photography.

Natural Community Surveys

The statewide rarity and endangerment of each of natural community type has been examined by the Natural Heritage Program. A method of ranking communities has been applied (Appendix 2) and is used to prioritize natural community survey efforts. For example, the natural community type, Mixed oak forest (State Endangered) is considered to be of greater rarity than Aspen forest (State Demonstrably Secure). Appendix 3 contains a list of potential natural communities targeted for survey in the Dakota Search Area.

The Natural Heritage program also has defined standards for the evaluation of natural communities. These standards direct the selection of potential natural areas at the time of air photo interpretation, and provide guidance for assessment of the quality of natural communities at the time of field inventory. The goal is to identify those natural communities that best exemplify the natural vegetation at the time of European settlement (Marschner 1974). In order to be considered for evaluation, natural communities must be of a minimum size to ensure some long-term viability. Forested sites must be at least 40 acres

in size. The most threatened natural communities such as Mesic prairie, or unique areas such as certain cliffs, caves, beaches, or seepage communities may be as small as 5 acres but typically have a buffer of natural vegetation for a minimum site size of 10 acres.

Natural Heritage ecologists use a grading system for natural communities that reflects the relative quality evident in the field at a particular location: A-rank is pristine, B-rank is good, C-rank is mediocre, D-rank is poor. Some factors considered in assigning a grade include native species diversity, community size, canopy age and structure, and degree of disturbance. Plant communities that have lost their natural structure and species diversity from disturbances such as plowing, heavy grazing, draining, or dominance by exotic plants and cannot be restored are not entered into the Rare Features Database. Those having a C-rank or higher are entered, and their boundaries are digitized.

Within the Search Area, ground surveys of MCBS sites were conducted to evaluate the condition of the natural communities identified during air photo interpretation. No aerial surveys were conducted because the small number of sites allowed for exhaustive ground survey. One MCBS site often contains several natural community types (Figure 2). Guided by notes compiled on topographic maps during air photo interpretation, the ecologists walked through each site, and completed standardized forms that include a written description and evaluation of the vegetation, and a plant species list. Following ground evaluation, certain sites were 'eliminated' because they did not contain any natural communities of a C-rank or higher. Data collected on each natural community were entered into the Rare Features Database, and a description of each MCBS site was entered into the MCBS Site Database.

Rare Plant Surveys

A list of rare plant species potentially occurring in Dakota County was compiled from existing Dakota County records and from current MCBS work in adjacent counties (Appendix 4). The rare plant search effort began in July 1992 and was focused on appropriate rare species habitats within MCBS sites and in several locations elsewhere in the Dakota Search Area based on recommendations by knowledgeable biologists. Rare plant locations were documented by preparing pressed, dried voucher specimens and by making notes on the size of the population and habitat conditions. All new and updated records of rare plants were entered into the Rare Features Database and specimens will be deposited in the University of Minnesota Herbarium, St. Paul, Minnesota.

Rare Animal Surveys

Species considered for field searches included all rare birds, herpetofauna (amphibians and reptiles) and mammals likely to occur within the Search Area (Appendix 5). Those species that could feasibly be surveyed during the latter half of the 1992 field season were targeted.

The locations of rare animal surveys within the Search Area were determined by the existence of previous records or reports of rare species and by the presence of appropriate habitat. Records were obtained from the Rare Features Database, museum collections and published accounts. Knowledgeable regional resource specialists were consulted for additional information on rare species. The ecological requirements of the targeted species determined what subset of habitats represented in the Search Area would be selected for surveys. Thus, wetlands with appropriate emergent vegetation were reviewed for their potential as Blanding's turtle habitat, while various grasslands were evaluated in terms of their suitability as nesting and foraging areas for Loggerhead Shrikes. MCBS animal ecologists selected habitat areas based upon vegetation structure and composition, size of habitat patch, proximity to other similar tracts, and degree of disturbance. Several areas selected for rare animal searches corresponded with MCBS sites identified by plant ecologists, however, a number of areas examined were not designated as MCBS sites (Appendix 6).

Prairie remnants and other grassland habitats were the focus of much of the animal surveys. Most of the targeted species are associated with open habitats, reflecting the predominant structure of the original vegetation in the area. Based on initial field examination, the majority of wetland and woodland tracts present within the search area were judged unsuitable for those targeted species typically associated with

these grassland habitat types. However, representative examples of wetland and forested habitats were surveyed for rare animals.

Birds: Bird surveys targeted three of the nine rare species potentially occurring within the Dakota Search Area (Appendix 5). The **Loggerhead Shrike** ***(Lanius ludovicianus)***, **Swainson's Hawk** ***(Buteo swainsoni)***, and **Upland Sandpiper** ***(Bartramia longicauda)*** are typical of grassland habitats.

The primary technique employed for bird surveys in the Search Area, as well as for MCBS bird surveys in other counties, was a modified fixed-radius point count method (Stucker 1992). At several points within a given habitat all birds heard or seen during a six-minute interval were identified, and evidence of breeding behavior or nesting was recorded. Points were spaced 200-250 meters apart and the exact number of points surveyed was determined by the size of the site. Point count surveys were conducted during late May and early June, 1992. While most areas chosen for point counts were grassland habitats, representative woodland and wetland habitats were surveyed for potential rare bird species (Appendix 6).

Road surveys are a more efficient means of detecting highly visible bird species, such as Loggerhead Shrikes and Upland Sandpipers, and for sampling large areas of open habitat typical of the Search Area. Road surveys were conducted by stopping at areas of suitable habitat and listening for singing birds and/or scanning with binoculars for five minutes. This technique was used in conjunction with the point counts during late May to early June to locate breeding pairs. Follow-up road surveys were conducted in early July to confirm successful nesting and fledging of young.

Herpetofauna: Field surveys for amphibians and reptiles targeted rare turtles and snakes potentially occurring within the Search Area (Appendix 5). Surveys in late June focused on wetland habitats that might contain **Blanding's turtle** ***(Emydoidea blandingii)*** and **Snapping turtle** ***(Chelydra serpentina)***. Two methods were utilized in surveying these species. Visual searches were conducted in wetlands having suitable habitat. Spotting scopes and binoculars enabled surveyors to identify and document basking turtles. The second method consisted of trapping turtles with hoop nets. Traps were baited with smelt, set in shallow wetlands, and checked every other day for one week.

During late August and early September, surveys focused on snakes: **Fox snake** ***(Elaphe vulpina)***, **Western hognose snake** ***(Heterodon nasicus)***, **Eastern hognose snake** ***(Heterodon platirhinos)***, **Eastern milksnake** ***(Lampropeltis triangulum)***, and **Bullsnake** or **Gopher snake** ***(Pituophis melanoleucus)***. Areas searched included grasslands, forest openings and rock outcrops (Appendix 6). Snake surveys involved road cruising and search-and-seize methods. Road cruising was conducted throughout the day, but particularly in the morning and evening when snakes were likely to bask on roads. All snakes encountered while traveling roads were documented and adjacent habitat was described. Search-and-seize techniques involved actively searching a particular habitat or area, turning over rocks, logs and debris, and hand-capturing all herpetofauna found. All herpetofauna encountered were identified and measured in the field and released. Voucher photographs were taken and are permanently stored at the DNR, St. Paul.

Mammals: Three small rodents associated with prairie and grassland habitats were targeted for field surveys. These included one state special concern species, the **Prairie vole** ***(Microtus ochrogaster)***, and two state non-listed rare species, the **Plains pocket mouse** ***(Perognathus flavescens)***, and **Western harvest mouse** ***(Reithrodontomys megalotis)*** (Appendix 5).

Surveys for these species were conducted during late August and early September, 1992. Eight sites, comprising prairie remnants and other grassland habitats, were selected (Appendix 6). On each site, a 4x10-station trap grid was established and forty traps were set, one per station. The traps included 16 Sherman live traps, 16 Museum Special snap traps, 4 cone pit-fall traps and 4 Victor rat traps. Traps were baited and set for four days and checked twice a day. All live-captured animals were processed in the field, marked and released. Other animals captured were collected, autopsied and prepared as voucher specimens for permanent storage at the Bell Museum of Natural History, University of Minnesota, Minneapolis.

Mammal survey work began too late to evaluate summer usage of the Search Area by rare bat species, and the absence of caves or underground cavities suggests that this area is not an important wintering area for cave bats. Known caves elsewhere in Dakota County will be evaluated this winter as potential bat hibernating sites and early summer surveys will be conducted for bats next season.

RESULTS AND RECOMMENDATIONS

As a result of the MCBS survey efforts during the 1992 field season, a total of 31 locations of rare biological features were identified within the Dakota Search Area. These included nine natural communities, 11 rare plants, and 11 rare animals (Table 1; Figure 2). Six MCBS sites contained some remnants of native vegetation. Four Critical Issues were identified for special consideration with respect to selection of the airport site based upon the number and quality of rare features, as well as their protection status and present threats. These include breeding territories of the Loggerhead Shrike and three critical areas. These are discussed separately in the Critical Issues section. The following summaries include a discussion of the current status of all natural communities, rare plants, and rare animals found within the Search Area, and the existing threats to these features. Where appropriate, protection recommendations have been made for specific rare features.

MCBS Site and Natural Community Surveys

In Dakota County, ninety-seven MCBS sites were identified as potential natural areas through air photo interpretation (Figure 1). Sixteen of these sites lie within the Search Area, but only six were found to contain good examples of natural communities (Figure 2). The sites that were eliminated as natural areas all had some native vegetation cover but were either too small or degraded to warrant natural area protection on a comparative, statewide basis. At a local level, eliminated sites may still have educational, recreational, or scenic value. A summary of all MCBS sites, including those having no significant natural communities is provided in Appendix 7. Brief comments about all natural communities receiving a C-rank or better are discussed below by natural community type with reference to the MCBS site in which they occur (see also Appendix 8).

Mesic prairie (State Critically Endangered). Mesic prairie is a native grassland community that was once widespread in the Search Area but is now critically endangered because it has been almost entirely converted to cropland. Remnants now occur only on slopes unsuitable for cultivation. The best remnant occurs in MCBS Site #60 (see Critical Issues). The prairie is very small and has been pastured, but has very good native plant diversity. The second best remnant is a long narrow strip occurring in MCBS Site #97 along State Highway 47. A few degraded fragments of Mesic prairie much smaller than 5 acres probably occur along roadsides, old railroad right-of-ways, or on slopes in pastures as suggested by the presence of Big bluestem *(Andropogon gerardii)* and other prairie grasses seen from the road in late-summer. These fragments are too small to be considered viable natural communities.

Sand prairie (State Endangered). Sand prairie remnants are not as rare as Mesic prairie because they occur on poorer agricultural soils. However, there are some very rare species that occur in specialized habitats in Sand prairie, particularly on dunes or wind-scoured slopes. The only remnants that occur in the Search Area are in MCBS sites #50, #51, and #55 and will be described in detail in the Critical Issues section.

Mixed oak forest (State Endangered). This community is endangered in Minnesota because of logging, grazing, and housing development. Only one small tract of Mixed oak forest in the Search Area was found to be in relatively natural condition (MCBS Site #56). All other tracts have an abundance of Prickly ash *(Zanthoxylum americanum)* or Common buckthorn *(Rhamnus cathartica)* and low overall native plant diversity, features indicative of past grazing.

DESCRIPTION OF MAP UNITS

for Figure 2.

Significant Natural Areas

A == Hastings Sand Coulee (rare species outside search area not displayed)
B == Empire Wetlands
C == Chimney Rock

55 MCBS Sites based on air photo interpretation

Natural Communities based on ground survey

- Mesic Prairie (Southeast)
- Sand Prairie (Southeast)
- Mixed Oak Forest (Southeast) Dry Subtype
- Mixed Oak Woodland (Southeast)
- Aspen Forest
- No Natural Communities

Miscellaneous Features

- Dakota Search Area
- Towns and Managed Areas
- Township Lines
- Railroads
- Major Roads
- Section Lines
- Rivers and Streams

1, 6, 31, 36 = Section #'s

Rare Species Locations

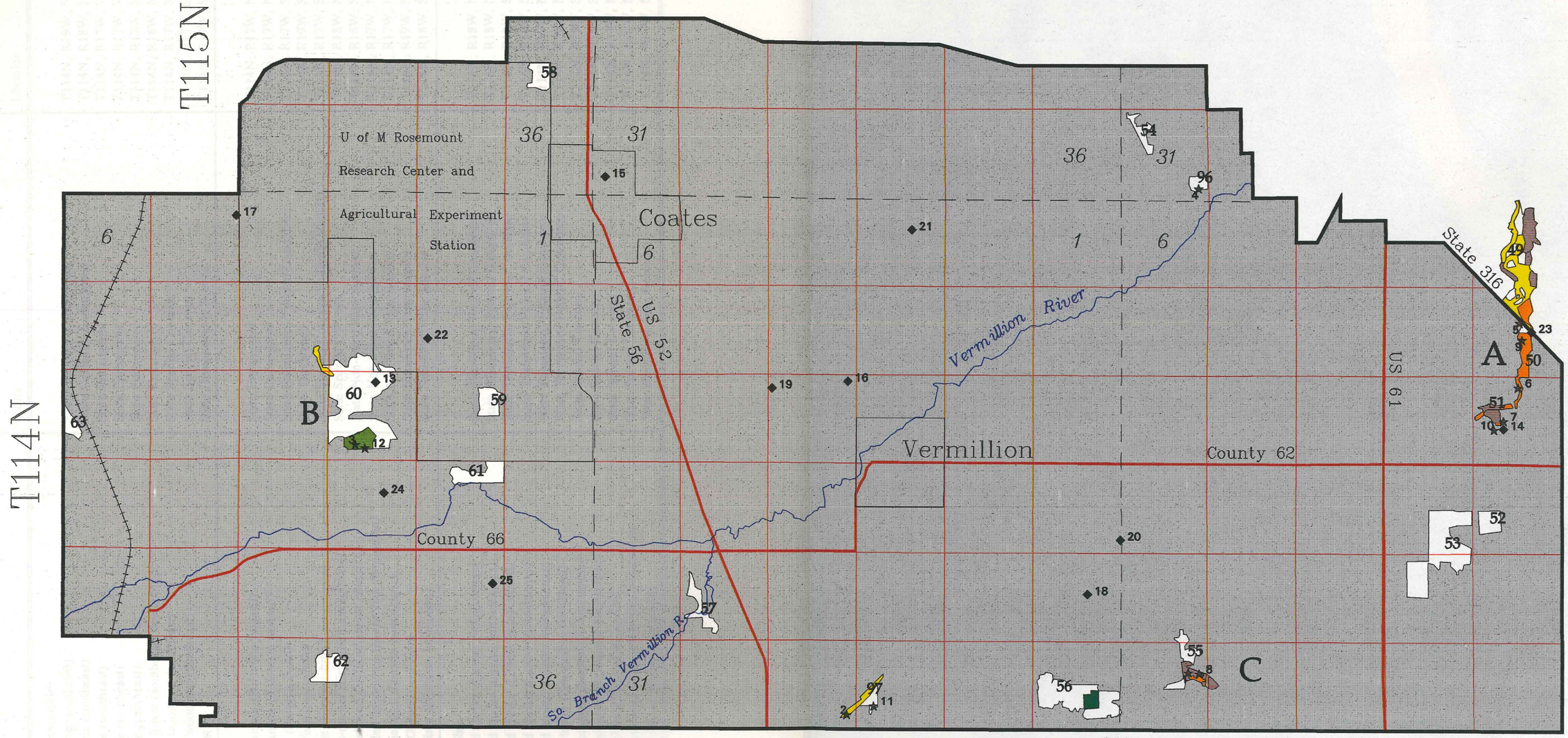
★ Plants

Map#	Common Name	Scientific Name	State Status	Year of Most Recent Record
1	CANADA FROSTWEED	HELIANTHEMUM CANADENSE	Non-listed Rare	1992
2	COMPASS-PLANT	SILPHIUM LACINIATUM	Non-listed Rare	1992
3	COWBANE	OXYPOLIS RIGIDIOR	Non-listed Rare	1992
4	HILL'S THISTLE	CIRSIUM HILLII	Special Concern	1992
5	JAMES' POLANISIA	POLANISIA JAMESII	Endangered	1979
6	JAMES' POLANISIA	POLANISIA JAMESII	Endangered	1992
7	JAMES' POLANISIA	POLANISIA JAMESII	Endangered	1992
8	KITTEN-TAILS	BESSEYA BULLII	Non-listed Rare	1992
9	LONG-BEARDED HAWKWEED	HIERACIUM LONGIPILUM	Non-listed Rare	1992
10	OLD FIELD TOADFLAX	LINARIA CANADENSIS	Non-listed Rare	1992
11	RATTLESNAKE-MASTER	ERYNGIUM YUCCIFOLIUM	Special Concern	1992
12	VALERIAN	VALERIANA EDULIS SSP. CILIATA	Threatened	1992

◆ Animals

Map#	Common Name	Scientific Name	State Status	Year of Most Recent Record
13	BLANDING'S TURTLE	EMYDOIDEA BLANDINGII	Threatened	1992
14	BULLSNAKE (GOPHER SNAKE)	PITUOPHIS MELANOLEUCUS	Special Concern	1992
15	LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	Threatened	1966
16	LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	Threatened	1992
17	LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	Threatened	1990
18	LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	Threatened	1991
19	LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	Threatened	1992
20	LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	Threatened	1992
21	LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	Threatened	1992
22	LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	Threatened	1992
23	RACER (BLUE)	COLUBER CONSTRICTOR	Non-listed Rare	1983
24	UPLAND SANDPIPER	BARTRAMIA LONGICAUDA	Special Concern	1992
25	UPLAND SANDPIPER	BARTRAMIA LONGICAUDA	Special Concern	1992

Figure 2. LOCATIONS OF RARE BIOLOGICAL FEATURES AND MCBS SITES, DAKOTA SEARCH AREA, OCTOBER 1992



Prepared for the Metropolitan Airports Commission for analysis of the New Major Airport Search Area, Dakota County, MN, by the Minnesota County Biological Survey (MCBS), a project of the Nongame Wildlife and Natural Heritage Programs, Minnesota Department of Natural Resources

Table 1. Rare biological features found within the Dakota Search Area during the 1992 field season.

Element	Status	Location
Natural Communities		
Mesic prairie (southeast)	State Critically Endangered	T114N, R19W, SESE09
Mesic prairie (southeast)	State Critically Endangered	T114N, R18W, NWSW34
Sand prairie (southeast)	State Endangered	T114N, R17W, WNE11
Sand prairie (southeast)	State Endangered	T114N, R17W, WSE11
Sand prairie (southeast)	State Endangered	T114N, R17W, SWNW14
Mixed oak forest (southeast) dry subtype	State Endangered	T114N, R18W, NWSE36
Mixed oak woodland (southeast)	State Special Concern	T114N, R17W, SWNW14
Mixed oak woodland (southeast)	State Special Concern	T114N, R17W, SWNW32
Aspen forest	State Demonstrably Secure	T114N, R19W, SESW15
Rare Plants		
James' polanisia *(Polanisia jamesii)*	State Endangered	T114N, R17W, NWNE14
James' polanisia *(Polanisia jamesii)*	State Endangered	T114N, R17W, NESW14
Kitten-tails *(Besseya bullii)*	State Endangered/Federal Candidate	T114N, R17W, SENE31
Valerian *(Valeriana edulis)*	State Threatened	T114N, R19W, SESW15
Hill's thistle *(Cirsium hillii)*	State Special Concern/Federal Candidate	T115N, R17W, SESE31
Rattlesnake-master *(Eryngium yuccifolium)*	State Special Concern	T114N, R18W, NWSW34
Canada frostweed *(Helianthemum canadense)*	State Non-listed Rare Species	T114N, R18W, SENE31
Long-bearded hawkweed *(Hieracium longipilum)*	State Non-listed Rare Species	T114N, R17W, NWSE11
Old field toadflax *(Linaria canadensis)*	State Non-listed Rare Species	T114N, R17W, NESW14
Cowbane *(Oxypolis rigidior)*	State Non-listed Rare Species	T114N, R19W, SESW15
Compass-plant *(Silphium laciniatum)*	State Non-listed Rare Species	T114N, R18W, SESE33
Rare Animals		
Loggerhead Shrike *(Lanius ludovicianus)*	State Threatened/Federal Candidate	T114N, R18W, NENE16
Loggerhead Shrike *(Lanius ludovicianus)*	State Threatened/Federal Candidate	T114N, R18W, NWNW16
Loggerhead Shrike *(Lanius ludovicianus)*	State Threatened/Federal Candidate	T114N, R18W, SESE24
Loggerhead Shrike *(Lanius ludovicianus)*	State Threatened/Federal Candidate	T114N, R18W, SWNE03
Loggerhead Shrike *(Lanius ludovicianus)*	State Threatened/Federal Candidate	T114N, R19W, NWSW11
Blanding's turtle *(Emydoidea blandingii)*	State Threatened/Federal Candidate	T114N, R19W, NWNE15
Upland Sandpiper *(Bartramia longicauda)*	State Special Concern	T114N, R19W, SWNE22
Upland Sandpiper *(Bartramia longicauda)*	State Special Concern	T114N, R19W, SENE26
Bullsnake *(Pituophis melanoleucus)*	State Special Concern	T114N, R17W, NESW14
Common snapping turtle *(Cheyldra serpentina)*	State Special Concern	T114N, R19W, NWNE15
Swainson's Hawk *(Buteo swainsoni)*	State Non-listed Rare Species	T114N, R17W, SWNE28

Mixed oak woodland (State Special Concern). This community was once common but has either succeeded to Mixed oak forest or has been cut and grazed over the years. One example of Mixed oak woodland located in MCBS Site #51 is of mediocre quality, having much Prickly ash and disturbance created by trails. However, it had several very small prairie openings and a few old open-grown Bur oaks *(Quercus macrocarpa)*, indicators of a more typical, open character of the woodland in the past. A second example occurs in MCBS site #55 where the woodland has been disturbed but still has some fine old open-grown trees.

Aspen forest (State Demonstrably Secure). The example of Aspen forest occurring in MCBS Site #60 in the Search Area is not typical of Aspen forest statewide. It appears to be a wet prairie community that has succeeded to Aspen forest. The plant community is diverse and warrants protection. It will be discussed in more detail in the Critical Issues section.

Rare Plant Surveys

Following 1992 field survey, ten new locations of rare plant locations were identified. Two known locations of rare plants existed in the Rare Features Database prior to 1992; one location was updated and one location was not re-confirmed. With the exception of those rare plant populations found within the critical areas (see Critical Issues section), most populations are on small and often disturbed fragments of habitat that do not merit protection on a statewide basis. However, local efforts to protect these populations are encouraged. Summaries of rare plant locations are provided below and in Appendix 9.

James' polanisia *(Polanisia jamesii)* (State Endangered). James' polanisia was previously known to occur in only three locations in Minnesota, two in Washington County and one in Dakota County. The population in Dakota County was recorded from the Search Area southeast of Hastings near State Highway 316. There was little existing information about the habitat conditions, or the extent and security of the population. Two new locations of this plant were found nearby, further south of the highway by searching for exposures of sparsely vegetated sand prairie and bare sand. See Critical Issues section for further details.

Kitten-tails *(Besseya bullii)* (State Endangered, Federal Candidate). One population of Kitten-tails was known to exist in the Search Area at Chimney Rock (MCBS Site #55). It was first located in 1983 and was verified in 1992. The entire range for this species is extremely limited, consisting of scattered locations in a part of the former prairie region of the Upper Midwest. Most of the locations in Minnesota occur on bluffs along the Mississippi, Minnesota, and St. Croix Rivers. This population at Chimney Rock is unusual in that it is not associated with a major river. See Critical Issues for further details.

Valerian *(Valeriana edulis)* (State Threatened). This species is rare in Minnesota because of loss of habitat to agriculture. One new population was found in the Search Area at MCBS Site #60. It occurs in an Aspen forest that was formerly a more open, wet prairie. The Aspen forest probably was not converted to cropland in the past because the organic soil was too wet. See Critical Issues for further discussion.

Hill's thistle *(Cirsium hillii)* (State Special Concern, Federal Candidate). Hill's thistle has a very limited range in the Upper Midwest and populations are typically small. There has been much recent effort to learn more about the distribution and habitat requirements of this poorly understood species. The new location at MCBS Site #96 was discovered by Tom Lewanski, Senior Naturalist at Carpenter Nature Center in Washington County. It occurs in a Bluff prairie that has been degraded by past grazing and is now greatly over-grown with Red cedar *(Juniperus virginiana)*. The diversity of native prairie species is good but these plants, including Hill's thistle, will not persist as the Red cedar canopy closes and shades the ground layer. Restoration through control of Red cedar is possible only with landowner cooperation and with the commitment of a local group, perhaps from a school in Hastings or a conservation organization.

Rattlesnake-master ***(Eryngium yuccifolium)*** (State Special Concern). This unusual plant occurs in small, mesic prairie remnants and is nowhere common because the habitat is so rare. This new population in the Search Area was found in a small Mesic prairie in MCBS Site #97 by Tom Lewanski. This is the northernmost population throughout its entire range.

State Non-listed Rare Species: There are five rare plants that occur in the Search Area that are proposed for state listing, **Canada frostweed** ***(Helianthemum canadense)***, **Long-bearded hawkweed** ***(Hieracium longipilum)***, **Old field toadflax** ***(Linaria canadensis)***, **Cowbane** ***(Oxypolis rigidior)***, and **Compass-plant** ***(Silphium laciniatum)***. The presence of these rare species is a useful measure of the quality of the sites in which they occur. All of the 1992 records are new locations for these species in the county, and the frostweed, toadflax, and Compass-plant have never been documented in Dakota County before.

Rare Animal Surveys

Eleven locations for rare animal species were obtained in 1992 within the Dakota Search Area, including three bird and three reptile species (Table 1; Appendix 9). No rare mammals were found. Summaries of survey efforts and discussion of other findings are presented separately below for each animal group.

Birds: Point count surveys were conducted at 14 localities and 15 additional areas were scanned from roads within the Search Area (see Appendix 6 for summary of survey localities). A total of 75 bird species were documented, most of which are relatively common and widespread in Minnesota (see Appendix 10 for a list of species and associated habitats). By comparison, an estimated 130 species of birds potentially nest throughout Dakota County.

One species that was not found during the bird surveys, but deserves mention is the Common Barn Owl *(Tyto alba)*. This species is not state or federally-listed and occurs irregularly in the state. It was found nesting in Vermillion Township, within the Dakota Search Area in 1990 and 1991, but not in 1992. There are three (possibly four) previous breeding records in the state, but Minnesota lies outside of this species' normal range.

Loggerhead Shrike ***(Lanius ludovicianus)*** (State Threatened, Federal Candidate). A total of five Loggerhead Shrike locations were found in the Search Area in 1992, representing five distinct breeding territories. Three of these were new locations and two were updates of known locations. The importance of this area to Loggerhead Shrikes is discussed in detail in the Critical Issues section.

Upland Sandpiper ***(Bartramia longicauda)*** (State Special Concern). Upland Sandpipers were recorded at two locations in the southwestern corner of the Search Area. One individual was found on a hillside pasture surrounded by cultivated fields on 6 July 1992. A pair was observed on a sod farm and seen on a number of occasions during June and early July, 1992.

Upland Sandpipers are typically associated with large tracts of grassland habitat. This species uses disturbed grasslands, such as pastures and hayfields, but productivity may be lower in these areas than on native grasslands (Green et al. 1988). Upland Sandpipers are distributed throughout the state except for the extreme northeast and north-central regions, with highest densities recorded in the western prairie areas. They are absent or highly localized in much of southeastern and south-central Minnesota (Janssen 1987). The two locations for Upland Sandpipers identified in the 1992 survey of the Search Area were the first records entered in the Rare Features Database for the county. Bird surveys conducted by MCBS in adjacent Goodhue and Rice counties have documented six locations for Upland Sandpipers and additional records of this species are anticipated when all of Dakota County is surveyed next year.

Large grassland tracts on which this species depends for nesting and foraging are largely absent in the Dakota Search Area. Therefore, it is probable that the low density of this species will not increase under current land use practices. Whereas destruction of existing habitat through airport development will have obvious negative impacts, it should be noted that Upland Sandpipers were found using grasslands

immediately adjacent to the Anoka County Airport (unpublished data, 1990 MCBS animal surveys). Establishment of extensive grassland areas surrounding the airport complex could potentially provide suitable Upland Sandpiper habitat. However, the level of human disturbance from development of areas adjacent to the airport and land management practices, such as application of herbicides and frequent mowing, need to be considered in terms of their detrimental effects on this species.

Swainson's Hawk *(Buteo swainsoni)* (State Non-listed Rare Species). A nesting pair of Swainson's Hawks was observed near a narrow strip of mature hardwoods surrounded by agricultural lands near State Highway 61. The nest site was located in Marshan Township, T114N, R17W, SWNE28. This species is not tracked in the Rare Features Database and thus this location does not appear on the maps of rare elements or associated summaries in this report. Swainson's Hawk is a prairie species, however, the presence of forest margins, shelterbelts, or other woody cover for nesting seems to be an important habitat component (Stewart 1975, Roberts 1932). Agricultural areas are also frequented by the hawks. In Minnesota, Swainson's Hawks were formerly common in the western region and rare to absent in the east (Roberts 1932). During the past fifty years, Swainson's Hawks have been found regularly in the southeast, as well as the west (Janssen 1987). Four previous nesting records are known from Dakota County since 1976, one of which was recorded from Nininger Township, near Hastings. This location was recorded to the precision of the township, part of which is within the Dakota Search Area.

Any decisions on airport placement should include protection of areas near known Swainson's Hawk nests and maintenance of sizeable tracts of grassland within the home range of a nesting pair. The response of Swainson's Hawks to increased human disturbance is not well understood, therefore the impacts of airport development cannot be fully assessed. Swainson's Hawks apparently are adaptable to human activity, since nests have often been found near farmhouses (Gilmer and Stewart 1984) and occasionally in urban areas (James 1992). However, sufficient suitable grassland is essential.

Herpetofauna: Three state-listed reptile species were found within the Dakota Search Area. Seven additional non-listed amphibians and reptiles were documented during 1992 field searches for rare herpetofauna (Appendix 11).

Blanding's turtle *(Emydoidea blandingii)* (State Threatened, Federal Candidate). Blanding's turtles are distributed primarily in the central and southeast portions of Minnesota. Threats to this species include the loss of wetlands, destruction of traditional nest sites, and mortality of turtles on roadways. Prior to 1992, eight records existed in the Rare Features Database for Blanding's turtles in Dakota County. None of these records existed within the Search Area. Two adult Blanding's turtles were observed in late June 1992, basking in a shallow bay at the northeast end of Lake Inferior (MCBS Site #60). One female Blanding's turtle was hand-captured and estimated to be at least 20 years old. Additional discussion of this species is included under the Empire Wetlands section of Critical Issues.

Common snapping turtle *(Chelydra serpentina)* (State Special Concern). Common snapping turtles are distributed throughout the state, occupying a wide variety of wetlands, streams, and rivers. This species is listed as special concern due to its vulnerability to commercial trapping. Snapping turtles have not been tracked by the Rare Features Database and thus are not represented on the maps of rare elements and accompanying summaries in this report. Within Lake Inferior (MCBS Site #60), one adult snapping turtle was observed basking on a stump and two subadults were captured in turtle traps. Both subadults were estimated to be eight years old. Nesting attempts by turtles were observed in the surrounding uplands and egg shells from a depredated snapping turtle nest were found on the dike on the south end of the lake. Additional discussion of this species is included under Critical Issues: Empire Wetlands.

Bullsnake (or Gopher snake) *(Pituophis melanoleucus)* (State Special Concern). In Minnesota, the distribution of Bullsnakes corresponds closely with the major rivers in the southern portion of the state (Lang and Karns 1988). Destruction of den sites, persecution by humans and over-collecting for the pet trade have contributed to their decline throughout their range. During early September, a Bullsnake was captured, measured and released at the Greenwood Campground (MCBS Site #51), in an area of sand prairie near an overgrown oak savanna. While only a single individual was found at that time, the

campground manager reported that many snakes are seen moving through the area during spring. This record is discussed further under Critical Issues: Hastings Sand Coulee.
Major land uses in the Dakota Search Area provide poor habitat for rare herpetofauna. Although, five of the six species of rare herpetofauna documented from Dakota County have been found within the last fifteen years, it is difficult to assess the status of these species because very few records exist. Suitable habitats for herpetofauna do exist within the Search Area, however, these are generally small, isolated tracts of wetland, sand prairie and woodland.

Mammals: Nine small mammal species were documented from the grassland trapping efforts, however, no targeted species were found (see Appendix 6 for summary of sites and Appendix 12 for list of species and trapping results). Previous records exist for two of the three targeted species, the **Plains pocket mouse *(Perognathus flavescens)*** and the **Western harvest mouse *(Reithrodontomys megalotis)***, in the general vicinity of the Dakota Search Area. These species were recorded from the Rosemount area in the mid-1950's, however the exact location is unknown. Despite survey efforts directed toward grassland habitats preferred by these species, no new records were obtained.

Significant alteration of the native vegetation has occurred in this area, resulting in small, widely-separated patches of prairie and mixed grasses. The landscape has undergone considerable change in the 40 years since these species were last recorded in the area. Every small grassland patch in the Search Area was not surveyed and it is possible that a remnant population of one or more of these species may exist. However, at this time, we have no evidence to suggest that this is the case. Previous MCBS mammal surveys located the Plains pocket mouse, Western harvest mouse and Prairie vole in areas adjacent to Dakota County and in habitats similar to those surveyed in the Search Area. Biologists conducting mammal surveys scheduled for Dakota County in 1993 will continue to search for these species elsewhere in the county.

CRITICAL ISSUES

Four critical ecological issues are discussed in this section in relationship to the development of a new international airport within the Dakota Search Area. These issues are the long-term persistence of Loggerhead Shrike territories that are distributed throughout the Search Area, and the impact of an airport on three specific areas of ecological importance (designated by the letters A, B and C on Figure 2). Other locations of rare features within the Search Area occur in areas that are highly disturbed, fragmented or otherwise do not merit high levels of protection.

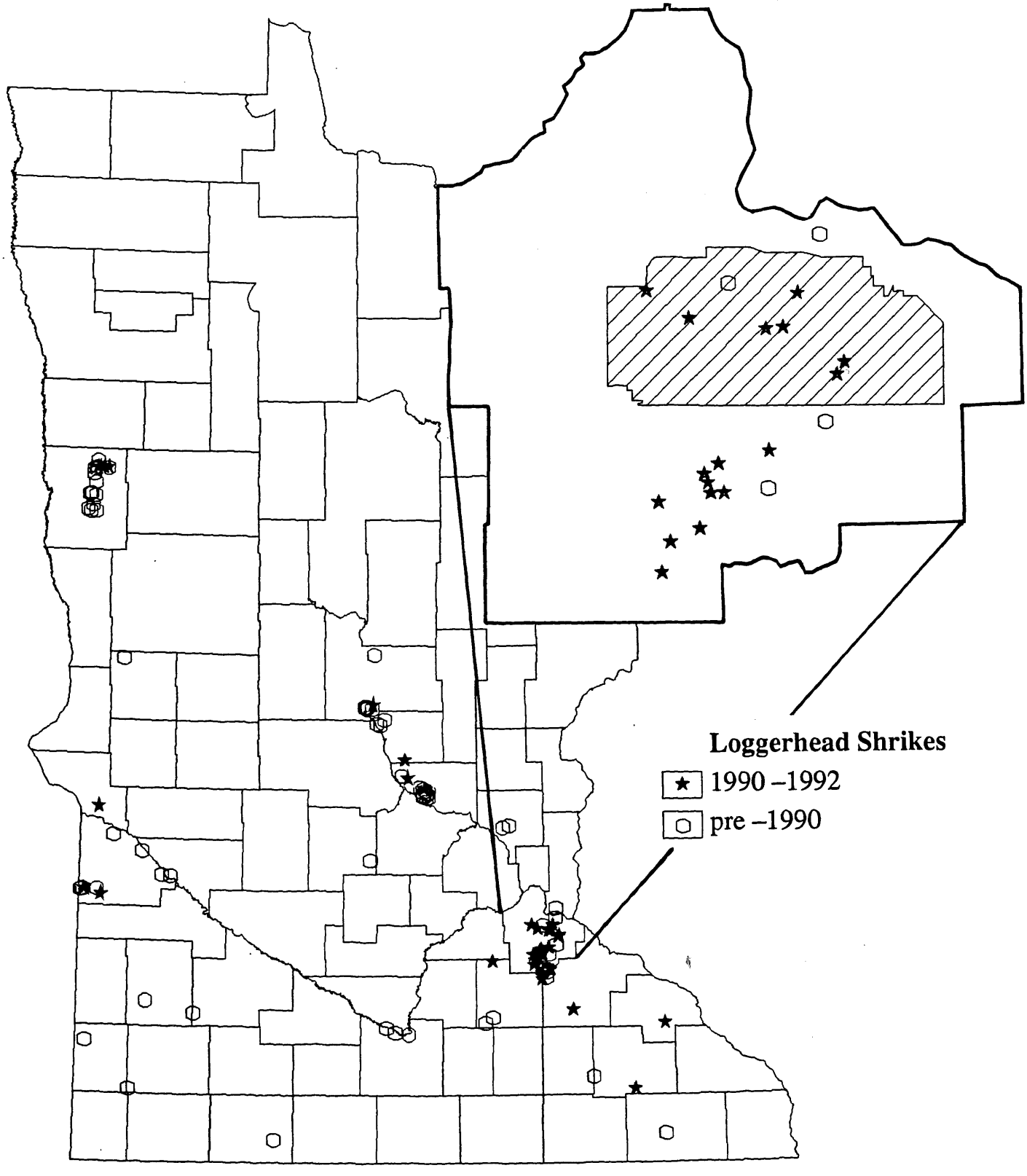
Loggerhead Shrike

Sixty years ago, Loggerhead Shrikes were among the common "wire" birds seen perched along the highways that run through Minnesota's prairies and open country (Roberts 1932). Today, they are a rare sight. In the relatively recent past, shrikes have decreased markedly in abundance throughout their breeding range. Although Loggerhead Shrikes have been the focus of considerable research, the factors responsible for their decline remain unclear. Concern over the status of Loggerhead Shrike populations has prompted Minnesota to list this species as threatened in the state and the federal government to consider adding it to the national list of endangered and threatened species.

During the breeding season, Loggerhead Shrikes are observed regularly across the southern two-thirds of Minnesota. However, they occur in very low numbers within this range and apparently suitable breeding habitat remains unoccupied (Brooks and Temple 1986). Typical breeding habitat consists of open grasslands interspersed with small trees that are used as nest sites and hunting perches. In southeastern Minnesota, including Dakota County, this habitat typically occurs as small grassland tracts within agricultural areas that are located on slopes too steep for cultivation.

Dakota County, and adjacent portions of Goodhue and Rice counties, support the highest numbers of breeding Loggerhead Shrikes in the state. Dakota County, alone, contains over 20% of the locations of Loggerhead Shrikes in the Rare Features Database, and over one-third of these records occur within

Figure 3. LOGGERHEAD SHRIKE LOCATIONS
AS OF OCTOBER, 1992



the Dakota Search Area (Figure 3, Appendix 9). Data from annual shrike surveys, conducted throughout the state by the DNR Nongame Wildlife Program, indicate that shrike numbers have remained relatively high on survey routes in Dakota, Rice, and Goodhue counties, while experiencing recent declines in western and central Minnesota.

Prior to 1992, the Rare Features Database contained four locations for Loggerhead Shrikes within the Dakota Search Area (Figure 2; map# 15, 16, 17, 21). Shrikes were documented at four localities within the Dakota Search Area during the 1992 MCBS animal surveys, and an additional location within the Search Area was recorded during the annual shrike survey by Nongame Wildlife staff. Four of the five locations identified in 1992 were new records (Figure 2; map #17, 18, 20, 22). In total, eight separate nesting territories have been identified within the Search Area and an additional 13 locations are known from the remainder of Dakota County (Figure 3). One observation made in 1992 constituted the fourth consecutive year that Loggerhead Shrikes have been documented as breeding on that site (Figure 2, map #19). Loggerhead Shrikes migrate seasonally, but exhibit a high degree of site fidelity and will return to a particular nesting territory. This use of historic breeding areas, year after year, seems to greatly enhance their reproductive success and underscores the importance of protecting the habitat around known breeding territories (pers. comm., B. Brooks-Erpelding).

The relatively high number of Loggerhead Shrikes occurring in the Dakota Search Area, coupled with the apparent decline in numbers elsewhere in the Minnesota, has elevated the statewide significance of the Dakota Search Area, as well as Dakota County, for this species. Therefore, the potential negative impact of airport placement and accompanying changes in land use to the population of Loggerhead Shrikes breeding in Minnesota must be addressed.

Recommendations

Regardless of where the airport is located within the Dakota Search Area, it is likely that Loggerhead Shrikes will be negatively affected. The area of greatest potential impact is the central portion of the Search Area, where shrike densities are the highest. Recommended mitigation measures for reducing impacts to Loggerhead Shrikes are listed below:

1. Avoid placement of the airport where any known Loggerhead Shrike breeding territory could be impacted.

2. If impact to breeding territories is unavoidable, placement of the airport should minimize the number of territories affected and minimize the severity of impacts. Layout of the airport should be configured to avoid destruction of the breeding habitat. Protection of 50 hectares of habitat (1/4 mile radius), centered on a nest, would encompass the breeding territory and home range of a shrike pair (Brooks 1988).

3. If breeding territories must be destroyed, habitat surrounding breeding territories of shrikes located elsewhere in Dakota County should be acquired and managed for Loggerhead Shrikes. Additional inventory should be supported to ensure that all breeding territories in Dakota County have been identified.

4. Little information is available concerning the response of Loggerhead Shrikes to large-scale habitat alteration that will result from airport construction and associated development of areas surrounding the airport. Therefore, long-term monitoring of all known breeding territories in Dakota County should be supported to identify any significant changes in numbers or distribution of breeding pairs in this area over time, to track reproductive success, and to recommend additional protection measures.

Hastings Sand Coulee (Figure 2, A)

This area contains three MCBS sites that form an ecological unit. Two sites (MCBS Sites #50 and 51) are within the Dakota Search Area and one (MCBS Site #49) is adjacent to the other sites but outside the Search Area (Figure 2, Appendix 1). The Hastings Sand Coulee is ecologically significant because of the size and continuity of the natural communities, the diversity of native plants and animals, and the presence of a state endangered plant, James' polanisia. This area was recommended as a significant area for protection by the Natural Heritage Program in 1985, however, no action was possible at that time due to the fragmentation resulting from housing development.

The Hastings Sand Coulee is a 2.5 mile long, steep-sided, glacial stream valley that was cut into the outwash plain near Hastings and has local deposits of well-sorted outwash and wind-blown sand on portions of the valley wall, upland margin, and valley floor. Sand deposits occur from about 0.4 miles north of State Highway (SH) 316 in MCBS Site #49, southward through MCBS Sites #50 and #51 in the headward portion of the coulee. Northward, the coulee cuts progressively deeper into glacial till and the soil becomes loamier. There is presently a small, intermittent, channelized stream that flows north through the valley to the Vermillion River.

Natural Communities

The most important natural community type occurring in the Sand Coulee is Sand prairie, an endangered plant community in Minnesota. It is the principal community type that supports the majority of native plants and animals found in the Hastings Sand Coulee area. Within the Dakota Search Area, Sand prairie remnants are small and scattered (Figure 2; Appendix 8). The larger remnant just south of SH 316 along the margin of the Search Area is of variable quality. Some portions are in very good natural condition and others have poorer plant species diversity as a result of past grazing. The largest and best area of Sand prairie (ca. 30 acres) lies just outside of the Search Area, north of SH 316.

Mixed oak woodland, a natural community listed as state special concern, occurs throughout the coulee and consists of groves of Bur oak *(Quercus macrocarpa)* with varying amounts of younger, Northern pin oak *(Quercus ellipsoidalis)* filling in the canopy. The woodland was probably more open and savanna-like in the past as indicated by the presence of Bur oaks that have an open-grown form and openings which contain prairie species. The Mixed oak woodland in MCBS Site #51 has abundant Prickly-ash *(Zanthoxylum americanum)*, an indication of past grazing. The Mixed oak woodland is a natural part of the Sand Coulee landscape and contributes to species diversity in the area.

There may be indirect threats to the Hastings Sand Coulee from a new airport. The most likely conflict is that SH 316 would be upgraded and this would reduce the size of the largest tract of Sand prairie. No other specific threats can be foreseen at this time other than increased development in the area that may further subdivide ownership along the coulee and make protection less feasible.

Rare Plants

James' polanisia *(Polanisia jamesii)*, a state endangered plant, occurs on exposed sandy soil both north and south of SH 316. This is an important occurrence for the species because there are only two other known locations of James' polanisia in Minnesota (both in Washington County), and these three locations are at the northern edge of the range for this species (Smith, 1988; Appendix 9). The Sand prairie north of SH 316 contains the largest known population in Minnesota and scattered small populations occur southward to MCBS Site #51. James' polanisia is an annual plant that requires a specialized microhabitat of bare or sparsely vegetated sand or gravelly-sand substrates. In the Hastings Sand Coulee, wind-blown sand keeps certain parts of the Sand prairie naturally barren. Unfortunately, the activity of off-road vehicles threatens all the specialized native plants that occur with James' polanisia.

Within the Dakota Search Area portion of the Hastings Sand Coulee, two non-listed rare plant species were found in 1992. One individual of Long-bearded hawkweed *(Hieracium longipilum)* was found in the Sand prairie along the coulee slope in MCBS Site #50. It typically occurs in or near Sand prairie

remnants as widely scattered individuals and it is likely that more plants exist in the Hastings Sand Coulee. The other rare plant, Old-field toadflax *(Linaria canadensis)* was locally common in a very small remnant of Sand prairie at the south end of MCBS Site #51. This small, annual plant species is difficult to detect after it flowers in June. More locations might be found if searches occurred earlier in the growing season.

Outside the Dakota Search Area in MCBS Site #49, Sea-beach needlegrass *(Aristida tuberculosa)* was found in 1992 in the high-quality Sand prairie near SH 316. State special concern species, Rhombic-petaled primrose *(Oenothera rhombipetala)* and Clasping milkweed *(Asclepias amplexicaulis)*, were collected in 1982 and 1988 in MCBS Site #49 but were not relocated in 1992. These rare plants probably still occur north of the highway because the habitat is suitable and the records are recent.

Rare animals

Two species of snakes, both listed as state special concern, have been found within or near the Hastings Sand Coulee. One Bullsnake *(Pituophis melanoleucus)* was found during 1992 MCBS animal surveys in MCBS Site #51 (Figure 2). The Rare Features Database contains a 1983 record of a Blue racer *(Coluber constrictor)* along SH 316 in the vicinity of the Hastings Sand Coulee (Appendix 9). Both snakes are associated with loose sandy soil and typically inhabit dry prairies, oak savannas or forest openings (Vogt 1981). Although only a single Bullsnake was found at Hastings Sand Coulee during surveys in 1992, the area contains good tracts of suitable habitat for snakes. Anecdotal information suggests that Bullsnakes den in this area and are quite numerous during the spring. Additional searches would likely document more individuals.

Placement of the airport on or near the Hastings Sand Coulee would destroy over-wintering (den) sites and eliminate habitat that is extremely scare in this part of the state. Other snake species associated with open habitats have been found in grassy areas surrounding airports (unpublished data, MCBS animal surveys). It is possible that Bullsnakes can also persist in these grasslands, however, Blue racers are more strongly associated with wooded areas and would likely be displaced from the area with elimination of woodlands. In addition to habitat loss and fragmentation resulting from development of the airport site, the upgrade and addition of roadways associated with the airport will lead to greater snake mortality as they attempt to cross roads.

Recommendations

The Hastings Sand Coulee should be excluded from consideration as a possible location for the airport. Even if an airport is developed some distance from the Sand Coulee, the site is threatened indirectly by upgrades or re-alignments of transportation corridors near Hastings, in particular, SH 316. In order to minimize negative impacts to the Sand Coulee, alternative transportation routes should be designed.

Presently, the greatest threat to the natural communities and rare species is the continued alteration and fragmentation of natural habitats due to residential and commercial development. Placement of the airport on or near this area would only accelerate this process. Prior to any airport development in this area, actions on the local level should be taken to encourage landowners to protect areas of importance for rare biological features.

Empire Wetlands (Figure 2, B)

MCBS Site #60, located in central Empire Township, encompasses the largest wetland complex within the Dakota Search Area (Appendix 7). A large impoundment provides about 25 acres of open water habitat. Emergent marsh surrounds the impoundment, ditches and flowages, willow thickets are found on less-frequently flooded areas, and aspen woodland on moist soils. On the north side of the site are loess-mantled hills of older till that have been grazed but still contain some prairie remnants. Much of

the native vegetation has been disturbed by altered hydrology and farming activities, resulting in a loss of plant species diversity. However, there are two areas that have escaped serious degradation: a wet prairie that has succeeded to Aspen forest, and Mesic prairie on the steepest hill slopes.

Natural Communities

Aspen forest, a common natural community type, is found along the southern end of the site (Figure 2; Appendix 8). The area has organic, wetland soils, with a surface topography of small, shallow, meter-wide channels, trending northeast-southwest between broad rises. Included within the Aspen forest are many small inclusions of the rare community types, Mesic prairie and Wet prairie. The area was apparently more open in the past because the aspen canopy is patchy, the trees are fairly young (average diameter 12 centimeters), and many of the prairie plants occurring under the aspen are not tolerant of shade. The increase in aspen and dogwood cover may be related to a lowering of the water table or the absence of wildfire. If the area succeeds further to Aspen forest, the diversity of prairie species will be lost. Burning or brushing will be necessary to maintain the prairie openings.

At the north end of Empire Wetlands is a small remnant of good quality Mesic prairie on a steep slope where native plants have survived decades of grazing (Figure 2). There is also a series of degraded Mesic prairie remnants on west-facing slopes in sections 10 and 15 that contain a good variety of native prairie plants. These patches were not included on the final map because past grazing has apparently been more severe and a restoration effort to control the exotic grass, Smooth brome *(Bromus inermis)*, and invading shrubs would be difficult.

Rare Plants

The state threatened species, Valerian *(Valeriana edulis)*, is a mesic or wet-mesic prairie plant that occurs in the Aspen forest at MCBS Site #60. It typically occurs in open prairie or fen habitats. Nearly 80 plants of Valerian were found in openings among the aspens within a 30-acre area (Appendix 9).

The state non-listed rare species, Cowbane *(Oxypolis rigidior)*, also occurs with Valerian in the Aspen forest. The presence of these prairie species, along with Big bluestem *(Andropogon gerardii)*, Prairie cordgrass *(Spartina pectinata)*, Golden alexanders *(Zizia aurea)*, New England aster *(Aster novae-angliaea)*, and others, are indicators of Wet prairie. If the aspen canopy continues to close, these shade-intolerant species will not persist.

Rare Animals

Blanding's turtles *(Emydoidea blandingii)* were found within the Empire Wetlands area (Figure 2; Appendix 9). This species, which is state-threatened and a federal candidate, typically inhabits shallow wetlands having an abundance of emergent vegetation and thick sediments. Empire Wetlands represents the only significant emergent marsh, and thus the best area of suitable habitat for this turtle, within the Search Area. The surrounding prairie slopes offer suitable nest sites for Blanding's turtles and nesting attempts were documented for Painted turtles *(Chrysemys picta)* and Common snapping turtles *(Chelydra serpentina)* in this habitat during the 1992 surveys. Common snapping turtles, a state special concern species, were also found at this site. This species may also use other wetland habitats within the Search Area, for example, those along the Vermillion River.

The greatest threat to Blanding's turtles posed by airport development in this area is the degradation of the wetland due to alteration of adjacent lands and subsequent runoff of eroded soils and pollutants associated with airport operation. There appear to be few, if any, alternative wetlands in the Search Area in which Blanding's turtles could exist.

Recommendations

Empire Wetlands (MCBS Site #60) should be protected from direct or indirect effects of future development because of the presence of rare features, as well as a good variety of native plants and animals that occur at the site. Placement of the airport near or including the wetlands would be acceptable, provided the detrimental effects are mitigated. Development plans should include methods to avoid chemical contamination of adjacent lands and waters and to minimize impacts to the hydrology of the area. Maintenance of habitat buffers around the wetlands should be part of an overall management plan to preserve the integrity of the wetland and to protect habitat for Blanding's turtles and Valerian.

Chimney Rock (Figure 2, C)

Chimney Rock is an interesting, wind-eroded, formation of St. Peter sandstone having three short chimneys perched on a bedrock knob, the total height being about 12 meters. The small, attractive rock outcrop has patches of herbs, mosses, lichens, and woody plants on the ledges, woodland on three sides, and a diversity of native sand prairie plants on the hillside to the west, including two rare species, Kitten-tails *(Besseya bullii)* and Canada frostweed *(Helianthemum canadense)*.

In 1980, a survey was conducted of natural bedrock exposures in Dakota County by Professor Edmund C. Bray. Chimney Rock was the best example that was found despite years of degradation to the rocks and surrounding prairie. An evaluation of Chimney Rock and recommendations for protection were presented to the Scientific and Natural Areas Program (DNR) and The Nature Conservancy later in 1980. In 1984, the Chimney Rock site was voluntarily protected by the landowner by listing the area in The Nature Conservancy's Registry of Natural Areas.

Natural Communities

The most important plant community at the site is Sand prairie (Appendix 8). It occurs primarily on a gently sloping apron of sand at the base of the largest hill. Plants characteristic of Sand prairie also occur on pockets of thin soil on the bedrock exposures. The diversity of native plants is quite good including two uncommon species that are generally restricted to dune habitats, False-heather *(Hudsonia tomentosa)* and Coast joint-weed *(Polygonella articulata)*. The Sand prairie has been disturbed by past grazing as indicated by the presence of Smooth brome *(Bromus inermis)* but the serious threat at present is shading by woody plants, primarily saplings of Northern pin oak *(Quercus ellipsoidalis)* and planted Red pines *(Pinus resinosa)*. Restoration of the prairie openings would require periodic burns or cutting to thin the woody cover.

The Mixed oak woodland that immediately surrounds the rock exposures is of good quality and is an important component of the site. It contains Northern pin oak, Paper birch *(Betula papyrifera)*, Bur oak *(Quercus macrocarpa)*, Black cherry *(Prunus serotina)*, and some fine old White oaks, *(Quercus alba)*. The majority of the Mixed oak woodland, however, is of marginal quality, having suffered from past grazing as indicated by the abundance of Prickly ash *(Zanthoxylum americanum)*. It is now brushy with young Northern pin oaks, and a variety of prickly shrubs. The Mixed oak woodland is important because it provides a buffer area of native vegetation around the Sand prairie, as well as wildlife habitat. There are no immediate threats to the oak woodland.

Rare Plants

In 1983, the state endangered species, Kitten-tails *(Besseya bullii)*, was found at the edge of the Sand prairie under the oaks (Appendix 9). This is typical habitat for the species, as it occurs in prairie at woodland and forest edges (Smith 1988). All locations of Kitten-tails are important because its range is so limited and many of the known populations in Minnesota occur in the Twin Cities area on small

sites that do not provide adequate protection from human disturbance. Kitten-tails is a prairie species and the population at Chimney Rock will not persist long if the prairie openings become filled in with woody plants. Burning or cutting would be required to maintain the openings.

A state non-listed rare species, Canada frostweed *(Helianthemum canadense)*, was found in 1992 in the Sand prairie. This plant, along with Sand reed grass *(Calamovilfa longifolia)*, Sand dropseed *(Sporobolus cryptandrus)*, Bird's-foot violet *(Viola pedata)*, Spiderwort *(Tradescantia occidentalis)*, and a good variety of other native plants occur on the slopewash sand. Burning would likely increase the abundance of the prairie species.

Rare Animals

No rare animals were found at Chimney Rock. Additional animal surveys will be conducted in 1993.

Recommendations

The presence of the unusual rock outcrops, the Kitten-tails, and the Sand prairie are strong reasons to protect Chimney Rock. The greatest threats are accessibility from the county road and consequent trampling and vandalism of the easily eroded sandstone outcrop, and the encroachment of woodlands onto the Sand prairie. If Chimney Rock were situated within an undeveloped portion of a future airport site, a compatible management plan should be developed to protect the Chimney Rock formation and the population of the state endangered Kitten-tails. This plan should include controlled access to the Chimney Rock formation and restoration the Sand prairie and Mixed oak woodlands by reducing woody brush.

CONCLUSIONS

A total of 31 rare biological features have been identified within the Dakota Search Area. Construction of a new major airport would have an impact on the survival of rare plant, rare animal and significant natural communities presently found within the Dakota Search Area. The Nongame Wildlife and Natural Heritage programs recommend specific actions on four critical issues to be taken by MAC if an airport plan is developed for this Search Area. These include the protection of Loggerhead Shrike territories, and the protection of three critical areas. The protection of other rare features locations within the Search Area is not given a high priority because of the current high level of disturbance and fragmentation in the landscape. Suggestions for additional survey and research are summarized below.

Some of the impacts of a major airport on rare features have not been entirely addressed in this document for two major reasons: (1) the MCBS was limited to the Search Area in 1992; and (2) some impacts to rare features resulting from airport development related to issues that were beyond the scope of an inventory. The MCBS will continue to inventory the remainder of Dakota County in 1993, possibly resulting in additional recommendations. If 1993 surveys do not result in significant changes, and the actions recommended in this document are implemented, the Natural Heritage and Nongame Wildlife programs would approve airport construction within the Dakota Search Area.

Summary of Actions and Recommendations

1. Protection of Loggerhead Shrikes. Location of the airport should minimize the number of breeding territories impacted, as well as the level of disturbance to these territories. Recommended mitigation alternatives: (a) avoid placement of the airport on or near any known breeding territories; (b) place the airport to minimize the number of territories affected and the severity of impacts; and (c) acquire and manage alternative breeding territories for Loggerhead Shrikes within Dakota County.

2. Protection of Critical Areas. (a) Of the three critical areas identified, one, Hastings Sand Coulee should be protected from the direct impacts of airport construction. Two MCBS sites that lie within the Search Area are continuous with a larger sand prairie complex that falls just outside of the area. There is a concentration of rare features, including one of the three known Minnesota populations of the state endangered James' polanisia. (b) Placement of the airport near or including Empire Wetlands is acceptable, provided that the existing hydrological conditions are maintained, chemical contamination is minimized, and management plans are developed for the two state-threatened species. (c) The inclusion of the Chimney Rock site within the boundaries of an airport is acceptable provided that the geologic feature is excluded from any immediate development, and that management plans are created for the natural communities and the population of the state endangered plant, Kitten-tails.

3. Further Inventory and Research. Sufficient data was not obtained in 1992 to address several significant issues pertaining primarily to rare animal features. Recommendations for further inventory and research are as follows: (a) Complete the survey (MCBS) of Dakota County in order to provide a more appropriate regional context for prioritizing protection issues. (b) Assess the potential effect of air traffic on nesting Bald Eagles and colonial waterbirds found along the Mississippi River. (c) Undertake long-term monitoring of all known breeding territories of Loggerhead Shrikes in Dakota County to identify any significant changes in numbers or distribution of breeding pairs over time, to track their reproductive success, and to recommend additional protection measures.

4. Influence of Associated Development. Placement of an airport in the Search Area will result in increased development of the surrounding area. This associated development is very likely a greater threat to rare features in Dakota County than the airport itself. Some issues, while outside the scope of this survey merit consideration. These include: (a) increased road mortality of herpetofauna as a result of higher traffic volume; and (b) additional loss and degradation of natural communities due to industrial and housing development, hydrological changes, application of herbicides and pesticides, and expansion of transportation and communication networks.

If changes in these recommendations are necessary, MCBS will provide an update following completion of the survey in the Search Area in 1993. The Natural Heritage and Nongame programs will also make future additional comments on specific airport placement and construction plans, if the new airport alternative is approved.

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Endangered and Threatened Wildlife and Plants; review of animal taxa for listing as endangered or threatened species; notice of review; 50 CFR. 50 Fed. Reg. 58804 (November 21, 1991).

Endangered Species Act of 1973 (Pub. L. 93-205, 81 Stat. 884, Dec. 28, 1973; current version at U.S.C. Sections 1531-1543).

Minnesota Statutes 1990, Section 84.0895.

Appendix 1.

COOPERATIVE AGREEMENT BETWEEN

THE METROPOLITAN AIRPORTS COMMISSION

MINNEAPOLIS-SAINT PAUL INTERNATIONAL AIRPORT

AND THE

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

This agreement is made and entered into by and between the Metropolitan Airports Commission, hereinafter "MAC" and the Minnesota Department of Natural Resources, hereinafter the "DNR", and becomes effective July 1, 1992.

WHEREAS, MAC has awarded the DNR a grant of $50,000 to begin the Minnesota County Biological Survey in the Dakota County Minnesota beginning July 1, 1992, and that the 1992 field survey efforts will be focused in the Dakota Search Area for a new major airport that was identified by the Metropolitan Council pursuant to Minnesota Statutes, section 473.155, subdivision 3 (1990) and

WHEREAS through this agreement, MAC is addressing part of a Natural Habitat and Wildlife issue identified for consideration in the airport siting process by the Metropolitan Council on page 8 of a document entitled Selecting a Search Area for a new airport Part four: Search Area Designation (Publication No. 559-91-156) that states "conduct biological survey comparable to a Minnesota County Biological Survey for search area and environs to establish specific locations of critical plant and animal habitat. Determine boundaries of critical plant and animal habitat." and

WHEREAS, The DNR is authorized to participate in such agreements by Minn. Stat. 84.026, 116P.08 Subd. 1(1), and 84.95 Subd. 2(6);

NOW, THEREFORE, IT IS AGREED THAT;

1. MAC will pay the DNR $50,000 no later than August 3, 1992 to cover actual costs of the survey of the Dakota Search Area. All funds will be expended by June 30 1993.

2. DNR will conduct the survey using the same procedures approved by the Minnesota Legislature (M.L. 91, Chat. 254, Art. 1, Sect. 14, Subd. 9.d) in the 1991 Work Program submitted to the Legislative Commission on Minnesota Resources with the exception that limited rare animal and plant surveys will be conducted during the 1992 field season to include: Breeding bird, Loggerhead Shrike, Mammal, Reptile and Amphibian, and rare plants identifiable after July 1st.

Appendix 1. Continued.

3. Final products of the 1992 field survey of the Dakota Search Area to be submitted to MAC by 1 October 1992 consist of: 1) a computer generated map of all rare ecological features recorded historically and during the 1992 survey within the Dakota Search Area; 2) digital ARC/INFO GIS file of the same mapped data 3) computer-generated abstracts describing the specific occurrences of each of the rare feature locations; and 3) a brief written report summarizing recommendations for specific rare features site protection and an assessment of the potential threats to rare features posed by airport development within the Search Area.

4. Final products of the 1993 field survey of Dakota county will be available on request, unless new information implies significant changes in the recommendations provided in October 1992. If there are changes, MAC will be provided with an updated version of the final products listed above by 1 October 1993 pending continued funding of the Minnesota County Biological Survey by the Minnesota Legislature.

IN WITNESS WHEREOF, the parties hereto have executed this agreement intending to be bound thereby.

Metropolitan Airport Commission

By:

Title: EXECUTIVE DIRECTOR

Date: 7-6-92

State of Minnesota

By:

Title: ASSISTANT COMMISSIONER FOR ADMINISTRATION

Date: 7-9-92

Commissioner of Administration

By: Original Signed

AUG 03 1992

Title:

Date:

As to form and execution by the Attorney General

By:

Title: Special Assistant Attorney General

Date: JUL 14 1992

Commissioner of Finance:

Encumbered
Department of Finance

By: Original Signed By Gloria A. Alt

Date: AUG 05 1992

2

Appendix 2. Federal and state protection categories for rare features in Minnesota.

FEDERAL STATUS OF RARE SPECIES

A. Categories of rare plants and rare animals are defined in the Endangered Species Act (1973).

Endangered - Any species that is in danger of extinction throughout all or a significant portion of its range.

Threatened - Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

B. Categories of rare plants and rare animals are defined in the Federal Register (1990, 1991).

Candidate, Category 1 - Any species for which there is enough substantial information to support proposals to list them as endangered or threatened species.

Candidate, Category 2 - Any species for which there is some evidence of vulnerability, but for which there are currently not enough data to support listing proposals.

Former Candidate, Category 3 - Any species that once were considered for listing as threatened or endangered but are no longer under such consideration.

MINNESOTA STATUS OF RARE SPECIES

Categories of rare plants and rare animals are defined in Minnesota Statute 84.0895 (1990).

Endangered - A species threatened with extinction throughout all or a significant portion of its range; or a species threatened with extirpation within Minnesota and dependent on a scarce, sensitive, and/or exploited habitat in Minnesota and neighboring states.

Threatened - A species likely to become endangered (based on the criteria listed for the endangered category) within the foreseeable future.

Special Concern - A species that, although not legally protected, is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status; or a species on the periphery of its range that is not listed as endangered or threatened; or a species that was once endangered or threatened but now has increasing or protected, stable populations; and /or a species whose breeding biology is affected by human activities.

MINNESOTA STATUS OF NON-LISTED RARE SPECIES

Categories of non-listed rare plants and rare animals that are tracked in the Natural Heritage Rare Features Database.

Proposed - Any species that has been proposed for one of the two preceding categories and is presently in the process of being reviewed.

No Legal Status (Non-listed Rare Species) - Other rare species requiring further field survey to determine their status.

Appendix 2. Continued.

MINNESOTA STATUS FOR NATURAL COMMUNITIES

The statewide status of natural communities are defined by the Natural Heritage Program. Minnesota's Natural Communities are not legally listed as rare features by Federal or State Endangered Species laws.

Critically Endangered in State
Endangered in State
Threatened in State
Special Concern in State
Demonstrably Secure in State
Undetermined Status in State

Appendix 3. Natural Community Types Potentially Occurring in Dakota County.
(Status of Natural Communities are defined by the Natural Heritage Program and are not listed or protected by the State of Minnesota.)

Critically Endangered

Mesic Prairie (Southeast Section)
Wet Prairie (Southeast Section)
Oak Savanna Sand - Gravel Subtype

Endangered

Oak Savanna Bedrock Bluff Subtype
Sand Prairie (Southeast Section)
Gravel Prairie (Southeast Section)
Mixed Emergent Marsh (Prairie Section)
Seepage Fen Calcareous Subtype
Mixed Oak Forest (Southeast Section) Mesic Subtype
Mixed Oak Forest (Southeast Section) Dry Subtype
Maple - Basswood Forest (Southeast Section)
White Pine - Hardwood Forest (Southeast Section) Mesic Subtype
Hill Prairie (Southeast Section)

Threatened

Bedrock Bluff Prairie
Black Ash Swamp Seepage Subtype
Mixed Hardwood Swamp Seepage Subtype
Seepage Meadow
Moist Cliff (Southeast Section)
Wet Meadow
Wet Meadow Shrub Subtype
Dry Cliff (Southeast Section)
Lake Beach (Inland Section) Sand Subtype

Special Concern

Lowland Hardwood Forest
Mixed Oak Woodland (Southeast Section)
Floodplain Forest
Black Ash Swamp
Mixed Hardwood Swamp
Lake Beach (Inland Section) Mud Subtype
Willow Swamp

Demonstrably Secure

Cattail Marsh
Aspen Forest

Undetermined Status in Minnesota

River Beach Sand Subtype
River Bed
Lake Bed
Rich Fen (Transition Section)
River Beach
Lake Beach (Inland Section)

Appendix 4. Rare Plant Species Potentially Occurring in Dakota County.

HABITAT TYPE	STATE STATUS	SCIENTIFIC NAME	COMMON NAME
Maple-Basswood	End	Erythronium propullans	Dwarf trout lily
Maple-Basswood	PThr	Carex plantaginea	Plantain-leaved sedge
Maple-Basswood	Thr	Jeffersonia diphylla	Twin leaf
Maple-Basswood	Thr	Lycopodium porophilum	Fir clubmoss
Maple-Basswood	SpC	Adoxa moschatelliana	Moschatel
Maple-Basswood	SpC	Carex woodii	a species of sedge
Maple-Basswood	SpC	Dicentra canadensis	Squirrel-corn
Maple-Basswood	SpC	Dryopteris goldiana	Goldie's fern
Maple-Basswood	SpC	Orobanche uniflora	One-flowered broom-rape
Maple-Basswood	SpC	Panax quinquefolium	Ginseng
Woodland	SpC	Scutellaria ovata ssp. versicolor	Heart-leaved skullcap
Maple-Basswood	SpC	Trillium nivale	Snow trillium
Maple-Basswood	Non	Actaea pachypoda	White baneberry
Upland forest	Non	Corallorhiza odontorhiza	Autumn coral-root
Upland forest	Non	Desmodium cuspidatum var. longifolium	a species of tick-trefoil
Upland forest	Non	Liparis lilifolia	Purple twayblade
Oak woods	Non	Taenidia integerrima	Yellow pimpernel
Hardwood swamp	End	Poa paludigena	Bog bluegrass
Hardwood swamp	SpC	Hydrocotyle americana	Water-pennywort
Hardwood swamp	SpC	Polygonum arifolium var. pubescens	Halberd-leaved tearthumb
Hardwood swamp	Non	Carex bromoides	a species of sedge
Floodplain forest	Thr	Carex conjuncta	Jointed sedge
Floodplain forest	Thr	Carex davisii	Davis's sedge
Floodplain forest	SpC	Cephalanthus occidentalis	Buttonbush
Floodplain forest	Non	Arisaema dracontium	Green dragon
Floodplain forest	PEnd	Carex crus-corvi	a species of sedge
Floodplain forest	PEnd	Carex formosa	a species of sedge
Floodplain forest	Non	Carex grayi	a species of sedge
Floodplain forest	Non	Carex muskingumensis	a species of sedge
Floodplain forest	Non	Carex typhina	a species of sedge
Floodplain forest	Non	Lycopus virginicus	Bugleweed
low woods	Non	Botrychium dissectum	Cutleaf grapefern
low woods	PSpC	Iodanthus pinnatifidus	Purple rocket
lake	Non	Potamogeton diversifolius	Variable-leaved pondweed
lake	Non	Sagittaria graminea	Grass-leaved arrowhead
Lake shore	Non	Juncus articulatus	a species of rush
lakeshore	SpC	Decodon verticillatus var. laevigatus	Water-willow
river bank	End	Napaea dioica	Glade mallow
river/lake beach	SpC	Echinochloa walteri	Walter's barnyard grass
meadow/fen	End	Agalinis auriculata	Eared gerardia
meadow/fen	End	Platanthera flava var. herbiola	Tubercled rein-orchid
meadow/fen	End	Platanthera praeclara	Prairie white fringed orchid
meadow/fen	End	Polygala cruciata var. aquilonia	Cross-leaved milkwort

End = Endangered Thr = Threatened SpC = Special Concern

P(End, Thr, SpC) = Proposed Endangered, Threatened, or Special Concern Non = non-listed rare species

HABITAT TYPE	STATE STATUS	SCIENTIFIC NAME	COMMON NAME
meadow/fen	Thr	Carex sterilis	Sterile sedge
meadow/fen	Thr	Eleocharis rostellata	Beaked spike-rush
meadow/fen	Thr	Rhynchospora capillacea	Beaked-sedge
meadow/fen	Thr	Scleria verticillata	Whorled nut-rush
meadow/fen	Thr	Valeriana edulis ssp. ciliata	Valerian
meadow/fen	SpC	Cladium mariscoides	Twig-rush
meadow/fen	SpC	Cypripedium candidum	White lady's-slipper
meadow/fen	SpC	Platanthera clavellata	Club-spur orchid
meadow/fen	SpC	Tofieldia glutinosa	False asphodel
meadow/fen	SpC	Triglochin palustris	Marsh arrow-grass
meadow/fen	Non	Carex conoidea	a species of sedge
meadow/fen?	Non	Agalinis purpurea	Purple gerardia
prairie	End	Besseya bullii	Kitten-tails
prairie	End	Lespedeza leptostachya	Prairie bush-clover
bluff prairie	End	Lesquerella ludoviciana	Bladderpod
prairie	End	Polanisia jamesii	James's polanisia
prairie	End	Ruellia humilis	Wild petunia
prairie	End	Talinum rugospermum	Rough-seeded fameflower
prairie	Thr	Agalinis gattingeri	Round-stemmed gerardia
prairie	Thr	Asclepias sullivantii	Sullivant's milkweed
prairie	Thr	Cacalia plantaginea	Tuberous Indian-plantain
prairie	Thr	Desmodium illinoense	Illinois tick-trefoil
bluff prairie	SpC	Arenaria dawsonensis	Rock sandwort
sand prairie	SpC	Aristida tuberculosa	Sea-beach needle-grass
sand prairie	SpC	Asclepias amplexicaulis	Blunt-leaved milkweed
prairie	SpC	Baptisia bracteata var. glabrescens	Wild indigo
prairie	SpC	Cirsium hillii	Hill's thistle
prairie	SpC	Eryngium yuccifolium	Rattlesnake-master
prairie	SpC	Oenothera rhombipetala	Rhombic evening-primrose
prairie	SpC	Orobanche fasciculata	Clustered broom-rape
prairie	SpC	Orobanche ludoviciana	Louisiana broom-rape
prairie	SpC	Paronychia fastigiata	Forked chickweed
prairie	SpC	Triplasis purpurea	Purple sand grass
prairie	SpC	Verbena simplex	Narrow-leaved vervain
prairie	SpC	Viola lanceolata	Lance-leaved violet
prairie	Non	Aster pilosus	White heath aster
prairie	Non	Aster prenanthoides	Crooked-stem aster
prairie	Non	Helianthemum canadense	Canada frostweed
prairie	Non	Hieracium longipilum	Long-bearded hawkweed
prairie	Non	Linaria canadensis	Old field toadflax
prairie	Non	Oenothera laciniata	Cut-leaved evening-primrose
prairie	Non	Oxypolis rigidior	Cowbane
prairie	Non	Silphium laciniatum	Compass-plant
conifer swamp/woods	End	Cypripedium arietinum	Ram's head lady's-slipper
conifer swamp	SpC	Arethusa bulbosa	Dragon's-mouth
conifer woods	Non	Botrychium matricariifolium	Matricary grape-fern

End = Endangered Thr = Threatened SpC = Special Concern

P(End, Thr, SpC) = Proposed Endangered, Threatened, or Special Concern Non = non-listed rare species

Appendix 5. Rare animals potentially occurring within the Dakota Search Area.

Species	Status
BIRDS	
Loggerhead Shrike *(Lanius ludovicianus)*	State Threatened/Federal Candidate
American Bittern *(Botarus lentiginosus)*	State Special Concern
Red-shouldered Hawk *(Buteo lineatus)*	State Special Concern
Upland Sandpiper *(Bartramia longicauda)*	State Special Concern
Forster's Tern *(Sterna forsteri)*	State Special Concern
Henslow's Sparrow *(Ammodramus henslowii)*	State Special Concern/Federal Candidate
Swainson's Hawk *(Buteo swainsoni)*	Non-listed Rare Species/Federal Candidate
Black Tern *(Chlidonias niger)*	Non-listed Rare Species/Federal Candidate
Cerulean Warbler *(Dendroica cerulea)*	Non-listed Rare Species/Federal Candidate
HERPETOFAUNA	
Five-lined skink *(Eumeces fasciatus)*	State Endangered
Wood turtle *(Clemmys insculpta)*	State Threatened
Blanding's turtle *(Emydoidea blandingii)*	State Threatened/Federal Candidate
Blanchard's cricket frog *(Acris crepitans)*	State Special Concern
Snapping turtle *(Chelydra serpentina)*	State Special Concern
Blue racer *(Coluber constrictor)*	State Special Concern
Fox snake *(Elaphe vulpina)*	State Special Concern
Western hognose snake *(Heterodon nasicus)*	State Special Concern
Eastern hognose snake *(Heterodon platirhinos)*	State Special Concern
Eastern milksnake *(Lampropeltis triangulum)*	State Special Concern
Bullsnake *(Pituophis melanoleucus)*	State Special Concern
MAMMALS	
Northern myotis *(Myotis septentrionalis)*	State Special Concern
Eastern pipistrelle *(Pipistrellus subflavus)*	State Special Concern
Prairie vole *(Microtus ochrogaster)*	State Special Concern
Eastern spotted skunk *(Spilogale putorius)*	State Special Concern/Federal Candidate
Plains pocket mouse *(Perognathus flavescens)*	Non-listed Rare Species
W. harvest mouse *(Reithrodontomys megalotis)*	Non-listed Rare Species

Appendix 6. Summary of MCBS animal survey locations in the Dakota Search Area (letters following mammals refer to trap grids in Appendix D).

MCBS#	Location	Survey Activity	Habitat Area
50	T114N, R17W, SE11	birds herpetofauna mammals (H)	sand prairie
51	T114N, R17W, W14	herpetofauna	sand prairie, oak savanna
54	T115N, R17W, NE31	herpetofauna	bluff prairie
55	T114N, R17W, NE31	herpetofauna mammals (D)	rock outcrop, oak savanna bluff prairie
56	T114N, R18W, 36	birds	deciduous forest
59	T114N, R19W, NE14	birds herpetofauna	mixed oak forest oak woodland, grassland
60	T114N, R19W, SW15 T114N, R19W, NE16 T114N, R19W, NW15 T114N, R19W, NE15	birds birds herpetofauna herpetofauna mammals (G)	shrub swamp, wet meadow mixed oak forest emergent marsh, lake grassland hill prairie
	T114N, R17W, 19	birds	pasture
	T114N, R17W, NW32	herpetofauna	mixed deciduous forest
	T114N, R17W, NE28	birds	deciduous forest
	T114N, R18W, NE3 T114N, R18W, NW3	birds birds, mammals (B)	pasture hilltop grassland
	T114N, R18W, 4	birds	alfalfa field
	T114N, R18W, 16	birds	pasture
	T114N, R18W, SW18	birds	old field
	T114N, R18W, SW25	mammals (C)	hilltop grassland
	T114N, R18W, SE27	birds	emergent marsh
	T114N, R19W, 7	birds	hayfield
	T114N, R19W, 10 T114N, R19W, SE10	birds herpetofauna	hayfield emergent marsh
	T114N, R19W, 11	birds	hayfield
	T114N, R19W, NE13	mammals (F)	sand prairie
	T114N, R19W, NW14	birds, mammals (A)	hillside grassland

Appendix 6. Continued.

MCBS#	Location	Survey Activity	Habitat Area
	T114N, R19W, SE15	birds	shrub swamp
	T114N, R19W, SE16 T114N, R19W, SW16	birds birds	wet meadow, shrub swamp pasture, old field
	T114N, R19W, 18	birds	pasture
	T114N, R19W, 21	birds	hayfield
	T114N, R19W, 25	birds	grassland
	T114N, R19W, 26	birds	sod farm
	T114N, R19W, 29	birds	wet pasture
	T114N, R19W, 34	birds	grassland
	T114N, R19W, NW36	birds mammals (E)	grassland (CRP)
	T115N, R18W, 33	birds	grassland

Appendix 7. MCBS Site evaluations within the Dakota Search Area.

Evaluations include descriptions of plant communities, protection intentions, and rare features associated with each site. Site descriptions are organized by MCBS Site numbers (#).

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: MARSHAN 11 NORTH (226 acres) Site #: 49

Primary Twp: T114N Rng: R17W Section: 02
Legal Description: EW & WE2, WNE11 T114N R17W

SITE IS FORMER STREAM VALLEY WITH MANY VERY GOOD SAND PRAIRIE REMNANTS ON STEEP SLOPES AND VALLEY FLOOR. ALSO SMALL AREAS OF RESTORABLE MESIC PRAIRIE ON LOAMIER SOIL; BUR OAK SAVANNA; OAK WOODS. PAST-GRAZED AREAS DOM BY BROMUS INER. THREATS: CONIFERS, CROPS, WOODY INVASION, HOUSES/ACTIVITY UPSLOPE. MISS OUTWASH REGION.

SITE STATUS

If Eliminated, Why:
Protection Intentions: ADDITION TO EXISTING WMA, PRIVATE REGISTRY
Protection Importance: High
Land Use Comments: HOUSES, TRAILS, OFF-ROAD VEHICLES
Adjacent Land Use Comments (below):
HOUSES, AG LAND
Information Needs (below):
MUST CONTACT OWNERS & EXPLAIN VALUE; SUGGEST SAFE POISON IVY CONTROL

RARE FEATURES

SEA-BEACH NEEDLEGRASS (ARISTIDA TUBERCULOSA)
State Legal Status: SPECIAL CONCERN
Quality: BC Date of Information: August 1992

CLASPING MILKWEED (ASCLEPIAS AMPLEXICAULIS)
State Legal Status: SPECIAL CONCERN
Quality: Date of Information: August 1988

RACER (COLUBER CONSTRICTOR)
State Legal Status: SPECIAL CONCERN
Quality: Date of Information: August 1983

LONG-BEARDED HAWKWEED (HIERACIUM LONGIPILUM)
State Legal Status: No Legal Status
Quality: Date of Information: August 1983

LONG-BEARDED HAWKWEED (HIERACIUM LONGIPILUM)
State Legal Status: No Legal Status
Quality: C Date of Information: August 1992

RHOMBIC-PETALED EVENING PRIMROSE (OENOTHERA RHOMBIPETALA)
State Legal Status: SPECIAL CONCERN
Quality: Date of Information: July 1982

JAMES' POLANISIA (POLANISIA JAMESII)
State Legal Status: ENDANGERED
Quality: B Date of Information: August 1992

SAND PRAIRIE (SOUTHEAST)
Natural Community Status: ENDANGERED
Quality: AB Date of Information: August 1992

ADDITIONAL INFORMATION

Site Photos: Slides;
Site Maps: Topographic Map;
# of Vegetation Plots (Releves): 0
Plant Data;

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: MARSHAN 11 SOUTH (49 acres) Site #: 50

Primary Twp: T114N Rng: R17W Section: 11
Legal Description: WSE 11 T114N R17W

SAND PRAIRIE OCCURS ON ROUNDED SANDY RIDGE, THE WEST SIDE OF WHICH IS PART OF THE SAND COULEE THAT CONTINUES NORTH OF HWY 316. QUALITY VARIES. PORTIONS MUCH DEGRADED BY PAST GRAZING & PAST CULTIV. STILL SOME FINE PRAIRIE REMNANTS. THREAT CONIFERS, DEVEL. SCENIC RIDGE & PRAIRIE DESERVE PROTECTION. MISS OUTWASH REGION.

SITE STATUS

If Eliminated, Why:
Protection Intentions: PRIVATE REGISTRY
Protection Importance: Medium
Land Use Comments:
Adjacent Land Use Comments (below):
CONIFER PLANTATION, AG LAND, PASTURE, HOUSES
Information Needs (below):

RARE FEATURES

LONG-BEARDED HAWKWEED (HIERACIUM LONGIPILUM)
State Legal Status: No Legal Status
Quality: C Date of Information: August 1992

JAMES' POLANISIA (POLANISIA JAMESII)
State Legal Status: ENDANGERED
Quality: B Date of Information: August 1979

JAMES' POLANISIA (POLANISIA JAMESII)
State Legal Status: ENDANGERED
Quality: BC Date of Information: August 1992

SAND PRAIRIE (SOUTHEAST)
Natural Community Status: ENDANGERED
Quality: BC Date of Information: August 1992

ADDITIONAL INFORMATION

Site Photos:
Site Maps: Topographic Map;
# of Vegetation Plots (Releves): 0
Bird Data; Herp. Data; Mammal Data;

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: MARSHAN 14 (29 acres) Site #: 51

Primary Twp: T114N Rng: R17W Section: 14
Legal Description: SWNW 14 T114N R17W

OVERGROWN OAK SAVANNA, NOW WOODLAND, OCCURS ON GENTLY ROUNDED UPLAND AT MARGIN OF SHALLOW, HEADWARD END OF COULEE. SAND PRAIRIE OPENINGS ARE SMALL BUT SEVERAL HAD POLANISIA JAMESII ESP ON EXPOSED SAND ALONG TRAILS. PARTS OF SAVANNA WITH MUCH ZANTHOXYLUM. THREATS: DEVEL, LACK OF FIRE. IN MISS VALLEY OUTWASH REGION.

SITE STATUS

If Eliminated, Why:
Protection Intentions: VOLUNTARY PROTECTION BY LANDOWNERS
Protection Importance: Medium
Land Use Comments: THREATENED INDIRECTLY BY CAMPGROUND, PLANTED CONIFERS
Adjacent Land Use Comments (below):
AG LAND, CAMPGROUND, OFF-ROAD VEHICLE TRAILS
Information Needs (below):
REPORT BACK TO LANDOWNERS

RARE FEATURES

OLD FIELD TOADFLAX (LINARIA CANADENSIS)
State Legal Status: No Legal Status
Quality: BC Date of Information: August 1992

MIXED OAK WOODLAND (SOUTHEAST)
Natural Community Status: SPECIAL CONCERN
Quality: C Date of Information: August 1992

GOPHER SNAKE (PITUOPHIS MELANOLEUCUS)
State Legal Status: SPECIAL CONCERN
Quality: Date of Information: September 1992

JAMES' POLANISIA (POLANISIA JAMESII)
State Legal Status: ENDANGERED
Quality: BC Date of Information: August 1992

SAND PRAIRIE (SOUTHEAST)
Natural Community Status: ENDANGERED
Quality: C Date of Information: August 1992

ADDITIONAL INFORMATION

Site Photos: Slides;
Site Maps: Topographic Map;
# of Vegetation Plots (Releves): 0
Herp. Data;

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: MARSHAN 23 (39 acres) Site #: 52

Primary Twp: T114N Rng: R17W Section: 23
Legal Description: NWSW 23 T114N R17W

DISTURBED OAK WOODLAND ON FLAT LAND DOM BY SMALL DIAM QUERCUS ELLIPS; OCCAS Q. MAC. OPENINGS WITH A FEW PRAIRIE SPP SUGGESTS AREA WAS ONCE SAVANNA. PORTIONS WITH MUCH ZANTHOXYLUM; OCCAS POPULUS TREM, JUNIP VIRG, RHUS GLAB, RHAMNUS CATH. PROBABLY PAST CUT AND GRAZED.

SITE STATUS

If Eliminated, Why: TOO DISTURBED; PAST CUT AND GRAZED
Protection Intentions: no specific recommendations
Protection Importance:
Land Use Comments:
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

ADDITIONAL INFORMATION

Site Photos:
Site Maps: Topographic Map;
# of Vegetation Plots (Releves): 0

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: MARSHAN 22 (226 acres) Site #: 53

Primary Twp: T114N Rng: R17W Section: 22
Legal Description: ENW27, SE22 T114N R17W

OAK WOODLAND (NOW MOSTLY OVERGROWN TO OAK FOREST) OCCURS ON LOW-ROUNDED, STREAM-CUT UPLAND AND ADJACENT FLAT PLAIN. SITE MUCH FRAGMENTED BY CULT FIELDS AND CENTRAL PORTION LOST TO GOLF COURSE DEVELOPMENT. REMAINING TRACTS DEGRADED BY PAST GRAZING. OAK WOODLAND NOW RARE IN CO. WORTH PROTECTING? MISS OUTWASH REGION

SITE STATUS

If Eliminated, Why: GOLF COURSE; PAST GRAZING. ONE GOOD WOODS IS TOO SMALL
Protection Intentions: no specific recommendations
Protection Importance:
Land Use Comments:
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

ADDITIONAL INFORMATION

Site Photos:
Site Maps: Topographic Map;
# of Vegetation Plots (Releves): 0

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: EAST NININGER 31 (28 acres) Site #: 54

Primary Twp: T115N Rng: R17W Section: 31
Legal Description: NW31 T115N R17W

SITE IS AN IRREGULAR, CA 40 FT HIGH BLUFFLINE FACING WSW. THE ENTIRE SITE HAS BEEN GRAZED, PARTS ARE PRESENTLY PASTURED. SMOOTH BROME & OTHERS EXOTICS THRUOUT BUT GOOD BLUFF PRAIRIE PATCHES REMAIN ON THE STEEPER OR ROCKIER AREAS. RECOVERY IS POSSIBLE. THIN SOIL/COLLUVIUM ON LIMESTONE BEDROCK; MISS VALLEY OUTWASH REG.

SITE STATUS

If Eliminated, Why: PATCHES OF GOOD PRAIRIE ARE TOO SMALL; HAS EDUCATIONAL VALUE
Protection Intentions: VOLUNTARY PROTECTION
Protection Importance: Low
Land Use Comments: PASTURE
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

ADDITIONAL INFORMATION

Site Photos: Slides;
Site Maps: Topographic Map;
# of Vegetation Plots (Releves): 0
Plant Data; Herp. Data;

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: CHIMNEY ROCK (76 acres) Site #: 55

Primary Twp: T114N Rng: R17W Section: 31
Legal Description: NE31 T114N R17W

CHIMNEY ROCK IS AN ATTRACTIVE, SMALL SANDSTONE COLUMN, BEST IN THE REGION, WITH UNCOMMON SAND PRAIRIE PLANTS ON THIN SOIL ON THE ROCKS AND IN SMALL OPENINGS OF SAND PRAIRIE ON SLOPE-WASH SAND; WEST SIDE OF ROAD. SMALLER KNOB ON EAST SIDE OF ROAD. PAST-GRAZED DRY OAK WOODLAND SURROUNDS. PROPOSED SCIENTIFIC NAT AREA 1980.

SITE STATUS

If Eliminated, Why:
Protection Intentions: PART IS TNC REGISTRY SITE
Protection Importance: High
Land Use Comments: PAST GRAZED; OLD QUARRY; OLD TRASH; COUNTY ROAD THROUGH SITE
Adjacent Land Use Comments (below):
AG LAND, HOUSES
Information Needs (below):

RARE FEATURES

KITTEN-TAILS (BESSEYA BULLII)
State Legal Status: ENDANGERED
Quality: B Date of Information: July 1983

CANADA FROSTWEED (HELIANTHEMUM CANADENSE)
State Legal Status: No Legal Status
Quality: B Date of Information: September 1992

MIXED OAK WOODLAND (SOUTHEAST)
Natural Community Status: SPECIAL CONCERN
Quality: C Date of Information: September 1992

SAND PRAIRIE (SOUTHEAST)
Natural Community Status: ENDANGERED
Quality: C Date of Information: September 1992

STREAM EROSION (PHANEROZOIC)

Quality: Date of Information: September 1980

ADDITIONAL INFORMATION

Site Photos: Slides;
Site Maps: Topographic Map;
# of Vegetation Plots (Releves): 0
Plant Data; Herp. Data; Mammal Data;

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: VERMILLION 36 (187 acres) Site #: 56

Primary Twp: T114N Rng: R18W Section: 36
Legal Description: SNW, S 36 T114N R18W

RELATIVELY LARGE BUT FRAGMENTED AREA OF OVERGROWN OAK WOODLAND AND DRY TO DRY-MESIC OAK FOREST. SOME INCLUSIONS OF GOOD FOREST WITHIN PORTIONS DISTURBED BY PAST & PRESENT CUTTING, PAST GRAZING, OLD-FIELD, CULT FIELD, POWER LINE CUT. ON SCENIC STEEP-SIDED HILL RISING 100 FT; ETTER-BRODALE CMPLX; KENYON-TAOPI REGION.

SITE STATUS

If Eliminated, Why:
Protection Intentions: PRIVATE REGISTRY
Protection Importance: Low
Land Use Comments: PASTURE, POWERLINE CUT THROUGH TRACT, CURRENT CUTTING
Adjacent Land Use Comments (below):
HOUSES, AG LAND
Information Needs (below):

RARE FEATURES

MIXED OAK FOREST (SOUTHEAST) DRY SUBTYPE
Natural Community Status: ENDANGERED
Quality: B Date of Information: July 1992

ADDITIONAL INFORMATION

Site Photos:
Site Maps:
# of Vegetation Plots (Releves): 0
Bird Data;

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: VERMILLION 29 (46 acres) Site #: 57

Primary Twp: T114N Rng: R18W Section: 29
Legal Description: W 29 T114N R17W

SITE WAS IDENTIFIED AS POSSIBLY HAVING PRAIRIE OPENINGS ON SLOPES BASED ON AIR PHOTOS. DRIVE-BY: OAK WOODLAND TOO OVERGROWN. OPENINGS, IF REMAINING, TOO SMALL AND NOT WORTH EFFORT. ONE LANDOWNER REFUSED ACCESS.

SITE STATUS

If Eliminated, Why: OVERGROWN OAK WOODLAND; PRAIRIE OPENINGS, IF ANY, TOO SMALL
Protection Intentions: no specific recommendations
Protection Importance:
Land Use Comments:
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

ADDITIONAL INFORMATION

Site Photos:
Site Maps:
# of Vegetation Plots (Releves): 0

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: WEST ROSEMOUNT 25 (41 acres) Site #: 58

Primary Twp: T115N Rng: R19W Section: 25
Legal Description: NESW 25 T115N R19W

DISTURBED OAK WOODLAND DOMINATED BY NO.PIN OAK AND FORMERLY OPEN-GROWN BUR OAK WITH COMMON PRUNUS SEROTINA AND PRUNUS VIRGIN. ALTHOUGH THERE ARE MANY LARGE, ATTRACTIVE TREES, THE SITE IS MUCH DEGRADED BY PAST CUTTING & GRAZING (STUMPS, ZANTHOX AMER, RHAMNUS CATH, RIBES MISS. MOD-SLOPES, SILT LOAM; MISS VALLEY OUTW.

SITE STATUS

If Eliminated, Why: TOO DISTURBED, LOW NATIVE SPECIES DIVERSITY
Protection Intentions: no specific recommendations
Protection Importance:
Land Use Comments:
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

ADDITIONAL INFORMATION

Site Photos:
Site Maps:
# of Vegetation Plots (Releves): 0

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: EMPIRE 14 (47 acres) Site #: 59

Primary Twp: T114N Rng: R19W Section: 14
Legal Description: NE 14 T114N R19W

OAK WOODLAND DOMINATED BY QUERCUS ELLIPSOIDALIS ON A CONICAL HILL ALONG THE VERMILLION RIVER LOWLANDS. LARGEST TREES NEAR BASE OF SLOPES ARE OLD, OPEN-GROWN NOW FILLED IN WITH MUCH ZANTHOXYLUM; ALSO RHAMNUS CATH. SANDSTONE OUTCROPS BORE NO UNUSUAL PLANTS. LOAMY FINE SAND SOIL IN MISS VALLEY OUTWASH REGION.

SITE STATUS

If Eliminated, Why: PAST-GRAZED; TOO DISTURBED; EXOTICS; LOW DIVERSITY
Protection Intentions: no specific recommendations
Protection Importance:
Land Use Comments:
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

ADDITIONAL INFORMATION

Site Photos:
Site Maps:
# of Vegetation Plots (Releves): 0
Bird Data; Herp. Data;

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: EMPIRE 15 (376 acres) Site #: 60

Primary Twp: T114N Rng: R19W Section: 15
Legal Description: SS10, 15 T114N R19W

LARGE, DIVERSE SITE WITH OAK WOODLAND & PRAIRIE ON ROLLING UPLANDS TO NORTH AND EXTENSIVE LOWLANDS GRADING FROM ASPEN, WILLOW, TO PHALARIS-DOMINATED CHANNELS THAT DRAIN SE INTO THE VERMILLION RIVER. MOST PORTIONS DEGRADED BUT FINE ASPEN WOODLAND WITH WET PRAIRIE OPENINGS AT SOUTH END. ON MISSISSIPPI VALLEY OUTWASH.

SITE STATUS

If Eliminated, Why:
Protection Intentions: PRIVATE REGISTRY
Protection Importance: High
Land Use Comments: LANDOWNER INTERESTED IN PROTECTING SITE
Adjacent Land Use Comments (below):
AG LAND
Information Needs (below):
CONSIDER BEST MEANS TO CONTROL ASPEN IN AREA WITH VALERIANA

RARE FEATURES

ASPEN FOREST
Natural Community Status: DEMONSTRABLY SECURE
Quality: A Date of Information: September 1992

BLANDING'S TURTLE (EMYDOIDEA BLANDINGII)
State Legal Status: THREATENED
Quality: Date of Information: June 1992

MESIC PRAIRIE (SOUTHEAST)
Natural Community Status: CRITICALLY ENDANGERED
Quality: B Date of Information: July 1992

COWBANE (OXYPOLIS RIGIDIOR)
State Legal Status: No Legal Status
Quality: B Date of Information: September 1992

VALERIAN (VALERIANA EDULIS SSP. CILIATA)
State Legal Status: THREATENED
Quality: CD Date of Information: July 1992

ADDITIONAL INFORMATION

Site Photos: Slides;
Site Maps: Topographic Map;
# of Vegetation Plots (Releves): 0
Plant Data; Bird Data; Herp. Data; Mammal Data;

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: EMPIRE 23 (68 acres) Site #: 61

Primary Twp: T114N Rng: R19W Section: 23
Legal Description: NNE 23 T114N R19W

LOWLAND SITE ALONG THE VERMILLION RIVER IS DOMINATED BY WILLOW SWAMP AND SEDGE MEADOW (MOSTLY SHRUB SUBTYPE). CANARY GRASS DOMINATES THE WETTEST AREAS NEAR THE RIVER. DIVERSITY IS QUITE GOOD ON WEST SIDE OF N/S DRAINAGE CHANNEL. SITE LACKS UPLAND BUFFER; AG LAND SURROUNDS. IN MISSISSIPPI VALLEY GEOMORPH REGION.

SITE STATUS

If Eliminated, Why: TOO SMALL; NO BUFFER; MUCH CANARY GRASS (PHALARIS)
Protection Intentions: no specific recommendations
Protection Importance:
Land Use Comments:
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

ADDITIONAL INFORMATION

Site Photos:
Site Maps:
# of Vegetation Plots (Releves): 0

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: EMPIRE 34 (63 acres) Site #: 62

Primary Twp: T114N Rng: R19W Section: 34
Legal Description: SWNW 34 T114N R19W

THIS IS A WETLAND SITE DOMINATED BY DENSE ASPEN AND COTTONWOOD FOREST ON RISES AND WILLOW SWAMP WITH OCCASIONAL OPENINGS IN LOWER AREAS. VEGETATION APPEARS QUITE NATURAL BUT HAS LOW POTENTIAL FOR RARE PLANT SPECIES. LITTLE/NO UPLAND BUFFER. SILTY SOILS OR MUCK OVER OUTWASH; MISS VALLEY OUTWASH REGION.

SITE STATUS

If Eliminated, Why: FAIRLY SMALL; NO BUFFER FROM AG LAND; LOW PRIORITY COMMUNITY
Protection Intentions: no specific recommendations
Protection Importance:
Land Use Comments:
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

ADDITIONAL INFORMATION

Site Photos:
Site Maps:
# of Vegetation Plots (Releves): 0

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: EMPIRE 18 (64 acres) Site #: 63

Primary Twp: T114N Rng: R19W Section: 18
Legal Description: ENE 13 T114N R20W, NWSW 18 T114N R19W

THIS IS A WETLAND SITE DOMINATED BY CATTAIL AND WITH A DRAINAGE DITCH THROUGH THE MARSH. FIELDS ARE CULTIVATED UP TO THE WETLAND MARGIN WITH NO UPLAND BUFFER. THERE ARE, HOWEVER, SOME GOOD WET MEADOWS AT THE EDGE OF FIELDS, PRIMARILY ALONG THE NW SIDE OF SITE. IN AREA OF LOW RELIEF IN MISS VALLEY OUTWASH REGION.

SITE STATUS

If Eliminated, Why: NO BUFFER; MUCH REED CANARY GRASS (PHALARIS)
Protection Intentions: no specific recommendations
Protection Importance:
Land Use Comments:
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

COWBANE (OXYPOLIS RIGIDIOR)
State Legal Status: No Legal Status
Quality: B Date of Information: August 1992

ADDITIONAL INFORMATION

Site Photos:
Site Maps:
# of Vegetation Plots (Releves): 0

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: EAST NININGER 32 (20 acres) Site #: 96

Primary Twp: T115N Rng: R17W Section: 32
Legal Description: SWSW32, SESE31 T115N R17W

HILLSIDE FACING SOUTH AND WEST ALONG VERMILLION RIVER WAS ONCE COVERED WITH PRAI RIE BUT IS NOW BADLY OVERGROWN W/ JUNIPERUS VIRG & PRUNUS AMER. BROME, TIMOTHY, QUACK GRASS ON PAST-GRAZED, LOWER SLOPES. BETTER ON HOT, DRY SLOPES HIGHER UP. SOME LIMESTONE OUTCROPS. WOULD REQUIRE MUCH EFFORT TO RESTORE. HAS EDUCATN VALUE

SITE STATUS

If Eliminated, Why: MUCH OVERGROWN WITH JUNIPERUS VIRG; SMALL
Protection Intentions: REGISTRY?
Protection Importance: Low
Land Use Comments: PASTURE
Adjacent Land Use Comments (below):
PASTURE, CULT FIELDS
Information Needs (below):
EVALUATE SIGNIFICANCE AS HILL'S THISTLE SITE; NEEDS MUCH RESTORATN

RARE FEATURES

HILL'S THISTLE (CIRSIUM HILLII)
State Legal Status: SPECIAL CONCERN
Quality: BC Date of Information: July 1992

ADDITIONAL INFORMATION

Site Photos:
Site Maps:
# of Vegetation Plots (Releves): 0

DAKOTA COUNTY, MINNESOTA
Minnesota County Biological Survey
OCTOBER 22, 1992

Sitename: VERMILLION 34 (38 acres) Site #: 97

Primary Twp: T114N Rng: R18W Section: 34
Legal Description: NWSW34 T114N R18W

MESIC PRAIRIE REMNANT ALONG SOUTHEAST SIDE OF ROAD IS REMARKABLE IN HAVING SILPH IUM LACINATUM IN ABUNDANCE AND A GOOD DIVERSITY OF OTHER NATIVES INCLUDING ERYNGIUM YUCCIFOLIUM AS REPORTED BY T. LEWANSKI, JULY 1992. THE SITE IS DIVIDED BY POWER LINES; THREATS FROM LEAFY SPURGE, SMOOTH BROME, HOUSES.

SITE STATUS

If Eliminated, Why:
Protection Intentions: PRIVATE LAND REGISTRY
Protection Importance: Medium
Land Use Comments: BROME, SPURGE, NO BUFFER FROM ADJACENT CULT FIELDS
Adjacent Land Use Comments (below):
AG LAND, HWY, HOUSES
Information Needs (below):
CAN NATIVES PERSIST WITH ABUNDANT BROME GRASS?

RARE FEATURES

RATTLESNAKE-MASTER (ERYNGIUM YUCCIFOLIUM)
State Legal Status: SPECIAL CONCERN
Quality: C Date of Information: September 1992

MESIC PRAIRIE (SOUTHEAST)
Natural Community Status: CRITICALLY ENDANGERED
Quality: C Date of Information: August 1992

COMPASS-PLANT (SILPHIUM LACINIATUM)
State Legal Status: No Legal Status
Quality: B Date of Information: August 1992

ADDITIONAL INFORMATION

Site Photos: Slides;
Site Maps: Topographic Map;
# of Vegetation Plots (Releves): 0
Plant Data;

Appendix 8. Records of natural communities occurring within the Dakota Search Area. Natural communities are organized by MCBS Site number (#).

NATURAL COMMUNITY ELEMENT OCCURRENCES IN SELECTED
MINNESOTA COUNTY BIOLOGICAL SURVEY SITES IN DAKOTA COUNTY
MnDNR, Natural Heritage and Nongame Wildlife Programs

*** SITE THREATENED ***
Element: SAND PRAIRIE (SOUTHEAST) #4
State NC Status: ENDANGERED
EO Size: 19 acres EO Rank: AB Current Status: Intended Status:
Site: MARSHAN 11 NORTH CBS Site #: 49
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: MORLEY,T.(CO BIOL SURVEY 1992)
Location: DAKOTA COUNTY, MN DNR Region: 6
Legal : T114N R17W OWNE11 Wildlife Area: 605
Quad Map: HASTINGS (T18A) Forestry District: 552
Latitude: 44 41' 56" Long: 92 49' 16" Last Obs.: 13 August 1992
Precision: approx. boundaries have been determined
Voucher: Verification: verified
SAND PRAIRIE ON PART OF FLOOR & NORTHWEST-FACING SLOPE OF VALLEY IS HIGH QUALITY WITH SOME DISTURBANCES. DOMINATED BY ANDROPOGON GER, LEPTOLOMA COG, ARTEMISIA CF CAMP, CYPERUS SCHWEIN, AMBROSIA CORONOP, WITH GOOD VARIETY SAND PRAIRIE SPP SUCH AS CALAMOVILFA LONG, ARISTIDA TUBERC, EUPHORBIA GEYERI, POLANISIA JAMESII. THREATS: TREE PLANTING BY LANDOWNERS; WOODY INVASION, ALREADY MUCH RHUS RADIC. ON HUBBARD LOAMY SAND. 2 MILES SE OF HASTINGS ON MISSISS RIVER OUTWASH REGION.

Element: SAND PRAIRIE (SOUTHEAST) #3
State NC Status: ENDANGERED
EO Size: 44 acres EO Rank: BC Current Status: Intended Status:
Site: MARSHAN 11 SOUTH CBS Site #: 50
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: MORLEY,T.(CO BIOL SURVEY 1992)
Location: DAKOTA COUNTY, MN DNR Region: 6
Legal : T114N R17W OWSE11 Wildlife Area: 605
Quad Map: HASTINGS (T18A) Forestry District: 552
Latitude: 44 41' 32" Long: 92 49' 16" Last Obs.: 16 August 1992
Precision: approx. boundaries have been determined
Voucher: Verification: verified
SAND PRAIRIE VARIES FROM VERY FINE (NORTH END) TO DEGRADED ALONG THE ROUNDED TOPLAND AND THE WEST-FACING SLOPE OF N-S TRENDING VALLEY. COMMON: ANDROPOGON GE, RHUS RADICANS, CONYZA CAN, CALAMOVILFA CAN; NOTABLE: FROELICHIA FLOR, CYCLOLOMA ATRIP, EUPHORBIA GEYERI, HIERACIUM LONG, POLANISIA JAMES. PORTIONS HEAVILY PASTURED. RARE SPP IN TRAILS ON EXPOSED SAND. SCENIC VIEW FROM CREST. THREATS: CONTINUED GRAZING. NEEDS OCCAS BURN. IN MISSISSIPPI VALLEY OUTWASH REGION.

Element: MIXED OAK WOODLAND (SOUTHEAST) #15
State NC Status: SPECIAL CONCERN
EO Size: 21 acres EO Rank: C Current Status: Intended Status:
Site: MARSHAN 14 CBS Site #: 51
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DELANEY,B.(CO BIOL SURVEY 1992)
Location: DAKOTA COUNTY, MN DNR Region:
Legal : T114N R17W SWNW14 Wildlife Area:
Quad Map: HASTINGS (T18A) Forestry District:
Latitude: 44 40' 57" Long: 92 49' 46" Last Obs.: 13 August 1992
Precision: approx. boundaries have been determined
Voucher: Verification: verified
OVERGROWN MIXED OAK WOODLAND DOMINATED BY QUERCUS ELLIPSOIDALIS WITH OCCASOINAL QUERCUS MACROCARPA. A FEW VERY SMALL SAND PRAIRIE OPENINGS WITHIN WOODS AND PRAIRIE PLANTS ALONG MARGIN OF WOODS AND ALONG TRAILS. APPEARS TO HAVE BEEN MORE SAVANNA-LIKE IN THE PAST AND GRAZED, NOW WITH THICKETS OF PRICKLY ASH AND YOUNG OAKS. TRAILS. MARGINAL QUALITY. ITS IMPORTANCE ARE THE PRAIRIE PATCHES. IN MISSISSIPPI VALLEY OUTWASH REGION.

*** SITE THREATENED ***
Element: SAND PRAIRIE (SOUTHEAST) #2
State NC Status: ENDANGERED
EO Size: 8 acres EO Rank: C Current Status: Intended Status:
Site: MARSHAN 14 CBS Site #: 51
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: MORLEY,T.(CO BIOL SURVEY 1992)
Location: DAKOTA COUNTY, MN DNR Region: 6
Legal : T114N R17W SWNW14 Wildlife Area: 605
Quad Map: HASTINGS (T18A) Forestry District: 552
Latitude: 45 40' 55" Long: 92 49' 49" Last Obs.: 18 August 1992
Precision: approx. boundaries have been determined
Voucher: Verification: verified
TWO SMALL SAND PRAIRIE REMNANTS SEPARATED BY OVERGROWN BUR OAK/NO.PIN OAK SAND SAVANNA (WITH VERY SMALL OPENINGS) ALONG CURVING SLOPE AND UPLAND OF OLD STREAM CHANNEL IN OUTWASH. GOOD DIVERSITY SAND PRAIRIE SPP INCLU CAREX MUHLENB, CYPERUS SCHWEIN, FROELICHIA, PETALOSTEMON VILL, VIOLA PEDATA, BOUTELOUA HIRS, POLANISIA JAMES, LINARIA CAN, SELAGINELLA RUP. THREATS: PLANTED CONIFERS, CAMPGROUND; NO BUFFER. 3 MILES S-SE OF HASTINGS. IN MISSISSIPPI VALLEY OUTWASH REGION.

NATURAL COMMUNITY ELEMENT OCCURRENCES IN SELECTED
MINNESOTA COUNTY BIOLOGICAL SURVEY SITES IN DAKOTA COUNTY
MnDNR, Natural Heritage and Nongame Wildlife Programs

Element: MIXED OAK WOODLAND (SOUTHEAST) #14
State NC Status: SPECIAL CONCERN
EO Size: 28 acres EO Rank: C Current Status: Intended Status:
Site: CHIMNEY ROCK CBS Site #: 55
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DELANEY,B.(CO BIOL SURVEY 1992)
Location: DAKOTA COUNTY, MN DNR Region: 6
Legal : T114N R17W SWNW32 Wildlife Area: 605
Quad Map: VERMILLION (T18B) Forestry District: 552
Latitude: 44 38' 15" Long: 92 53' 32" Last Obs.: 15 September 1992
Precision: approx. boundaries have been determined
Voucher: Verification: verified
DISTURBED WOODS DOMINATED BY QUERCUS ELLIPSOIDALIS. OCCAS SINGLE & MULTI-STEM OAKS AT 25-30 CM DBH; ALSO PATCHES OF POPULUS GRANDI (10 M HT/10-20 CM DBH) IN CANOPY. DENSE YOUNG NO.PIN OAKS, THICKETS OF PRUNUS VIRGIN, AND YOUNG PRUNUS SEROT; ALSO RUBUS, RIBES, RHUS RAD SUGGEST PAST GRAZING. IMPORTANCE OF WOODS IS ST.PETER SANDSTONE KNOB WITH HUDSONIA ON EAST SIDE OF ROAD AND ALSO SERVES AS BUFFER AROUND KNOBS/PRAIRIE ON WEST SIDE OF ROAD. IN KENYON-TAOPI PLAIN REGION.

Element: SAND PRAIRIE (SOUTHEAST) #5
State NC Status: ENDANGERED
EO Size: 5 acres EO Rank: C Current Status: 2 Intended Status: 2
Site: CHIMNEY ROCK CBS Site #: 55
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DELANEY,B.(CO BIOL SURVEY 1992); MORLEY,T.; MOORE,J.; CONVERSE,C.
Location: DAKOTA COUNTY, MN DNR Region: 6
Legal : T114N R17W SENE31 Wildlife Area: 605
Quad Map: VERMILLION (T18B) Forestry District: 552
Latitude: 44 38' 18" Long: 92 53' 43" Last Obs.: 17 September 1992
Precision: approx. boundaries have been determined
Voucher: Verification: verified
DRY SAND PRAIRIE OCCURS AROUND BASE AND LEDGES OF CHIMNEY ROCK AND ON SLOPEWASH APRON OF SAND. SURROUNDED BY OAK WOODLAND. GENERALLY HAS GOOD DIVERSITY OF NATIVES THOUGH MUCH BROMUS INERMIS ON LOWER SLOPE. ENCROACHMENT OF WOODY PLANTS HAS DECREASED THE SIZE OF THIS PRAIRIE. IN KENYON-TAOPI PLAIN GEOMORPHIC REGION.

Element: MIXED OAK FOREST (SOUTHEAST) DRY SUBTYPE #4
State NC Status: ENDANGERED
EO Size: 20 acres EO Rank: B Current Status: Intended Status:
Site: VERMILLION 36 CBS Site #: 56
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: MORLEY,T.(CO BIOL SURVEY 1992)
Location: DAKOTA COUNTY, MN DNR Region: 6
Legal : T114N R18W NWSE36 Wildlife Area: 605
Quad Map: VERMILLION (T18B) Forestry District: 552
Latitude: 44 38' 4" Long: 92 55' 12" Last Obs.: 06 July 1992
Precision: approx. boundaries have been determined
Voucher: Verification: verified
DRY OAK FOREST DOMINATED MOSTLY BY QUERCUS ALBA AND Q.ELLIPSOIDALIS WITH OCCAS PRUNUS SEROT. AREA HAS BEEN SELECTIVELY CUT IN THE PAST, COMMON MULTIPLE-TRUNKS, BUT MANY TREES 30 TO 60 CM DBH. ABUNDANT CORNUS RUGOSA; OCCAS RHAMNUS CATH. FEW WEEDS. SMALL ATTRACTIVE WOODS EVEN THOUGH WINTER LOGGING ROADS COMMON. LITTLE FRESH CUTTING. GRAZED WOODS, CLEAR CUT, CULT FIELD SURROUNDING. ON REL FLAT TOP-LAND OF LIMESTONE MESA. ON ESTHERVILLE SANDY LOAM. ON KENYON-TAOPI PLAIN.

Element: ASPEN FOREST #3
State NC Status: DEMONSTRABLY SECURE
EO Size: 39 acres EO Rank: A Current Status: Intended Status:
Site: EMPIRE 15 CBS Site #: 60
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DELANEY,B.(CO BIOL SURVEY 1992)
Location: DAKOTA COUNTY, MN DNR Region: 6
Legal : T114N R19W SESW15 Wildlife Area: 605
Quad Map: COATES (T17A) Forestry District: 552
Latitude: 44 40' 40" Long: 93 5' 20" Last Obs.: 15 September 1992
Precision: approx. boundaries have been determined
Voucher: Verification: verified
TRANSITIONAL COMMUNITY THAT MAY BE WET PRAIRIE OVERGROWN WITH POPULUS TREM AND CORNUS SPP. ASPEN MAX DBH 32 CM, DECREASING SIZE AROUND SMALL OPENINGS. NO SUB-CANOPY EXCEPT OCCAS RHAMNUS CATH AT 2-3 M. PATCHY SHRUBS: CORNUS FOEMINA & STOL. COMMON ANDROP, SPARTINA PECT, POA PRAT, SOLIDAGO ALTIS, GALIUM BOR; OCCAS ASTER NOV-ANG, DESMODIUM GLUT, MONARDA FIST, PRENANTHES RAC. PRESENCE OF VALERIANA SUGGESTS AREA WAS MORE OPEN. THREATS: WOODY COVER, DRAINING. MISS VALLEY OUTWASH

Element: MESIC PRAIRIE (SOUTHEAST) #14
State NC Status: CRITICALLY ENDANGERED
EO Size: 12 acres EO Rank: B Current Status: Intended Status:
Site: EMPIRE 15 CBS Site #: 60
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: MORLEY,T. (CO BIOL SURVEY 1992)

Location: DAKOTA COUNTY, MN
Legal : T114N R19W SESE09
Quad Map: COATES (T17A)
Latitude: 44 40' 41" Long: 93 5' 50"
Precision: approx. boundaries have been determined

DNR Region: 6
Wildlife Area: 605
Forestry District: 552
Last Obs.: 26 July 1992

Voucher: Verification: verified

SMALL PRAIRIE REMNANT ON THE STEEPER PARTS OF WEST-FACING SLOPES. BROMUS INERM AND POA PRAT ARE COMMON BUT NATIVES APPEAR TO DOMINATE: ANDROPOGON GER, SPOROB HET, MUHLENBERG CUSP, ASTER ERIC, SOLIDAGO NEM; NOT BEING INVADED BY SHRUBS. SIMILAR REMNANTS IN SERIES OF FOUR SOUTHWEST-FACING SLOPES IN NWNE SEC.15 BUT THESE MORE DEGRADED BY PAST GRAZING & WITH MUCH WOODY INVASION. ON STREAM-CUT TILL SLOPES HAVING MANTLE OF LOESS. IN MISS VALLEY OUTWASH REGION.

Element: MESIC PRAIRIE (SOUTHEAST) #13
State NC Status: CRITICALLY ENDANGERED
EO Size: 20 acres EO Rank: C Current Status: Intended Status:
Site: VERMILLION 34 CBS Site #: 97
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: MORLEY,T. (CO BIOL SURVEY 1992); T.LEWANSKI

Location: DAKOTA COUNTY, MN
Legal : T114N R18W NWSW34
Quad Map: VERMILLION (T18B)
Latitude: 44 38' 8" Long: 92 58' 20"
Precision: approx. boundaries have been determined

DNR Region: 6
Wildlife Area: 605
Forestry District: 552
Last Obs.: 28 August 1992

Voucher: Verification: verified

NEARLY MILE-LONG SERIES OF DEGRADED MESIC PRAIRIE REMNANTS ALONG SOUTHEAST SIDE HWY 47 AND ACROSS LOW, CULTIVATED FIELD TO EAST. REMARKABLE IN HAVING GOOD DIVERSITY NATIVE PRAIRIE SPP DESPITE VIGOROUS BROMUS INERMIS THROUGHOUT. INCLUDES ANDROPOG GER, BOUTELOUA CURT, SORGHASTRUM NUT, RATIBIDA PINN, SILPHIUM LACIN, ERYNGIUM YUC. THREATS: BROMUS INERM, CULTIVATED FIELDS, HOUSES. SITE FRAGMENTED BY POWER LINES, FILEDS, HOUSES. MISSISSIPPI VALLEY OUTWASH REGION.

Appendix 9. Records of rare plants and rare animals occurring within the Dakota Search Area.

Rare plant and animal records compiled from the Rare Features Database are organized alphabetically. Map numbers on left margin refer to mapped location of rare species on Figure 2.

T114N R17W SENE31 DAKOTA COUNTY, MN
Element: HELIANTHEMUM CANADENSE (CANADA FROSTWEED) #16
State Status: No Legal Status
EO Size: EO Rank: B Current Status: Intended Status:
1 Site: CHIMNEY ROCK CBS Site #: 55
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DELANEY,B.(92164)
Last Observed Date: 15 September 1992
Quad Map: VERMILLION (T18B)
Latitude: 44 38' 19" Long: 92 53' 44"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
GROWING IN SANDY, BLUFF PRAIRIE OPENINGS ON TOP OF AND AT BASE OF SANDSTONE OUT-CROP. LOCALLY COMMON. WITH CALAMOVILFA LONG, CYPERUS LUPULINUS, SPOROBLOUS CRYP, RUMEX ACETOSELLA, AND LECHEA SP. AREA DEGRADED FROM PAST GRAZING. THREATS: WOODY ENCROACHMENT (QUERC ELLIPS, RHUS GLAB, PLANTED PINES). SIX MILES SOUTH OF HASTINGS.

T114N R18W SESE33 DAKOTA COUNTY, MN
Element: SILPHIUM LACINIATUM (COMPASS-PLANT) #17
State Status: No Legal Status
EO Size: EO Rank: B Current Status: Intended Status:
2 Site: VERMILLION 34 CBS Site #: 97
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: MORLEY,T.(1737)
Last Observed Date: 28 August 1992
Quad Map: VERMILLION (T18B)
Latitude: 44 37' 53" Long: 92 58' 37"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
GROWING IN A SERIES OF SMALL, MESIC PRAIRIE REMNANTS SURROUNDED BY BROMUS INERMUS. SITE IS REMARKABLE IN HAVING AN ABUNDANCE OF SILPHIUM & GOOD DIVERSITY NATIVES (ANDROPOGON GER, AMORPHA CAN, ARTEMISIA LUDO, LIATRIS ASPERA, LIATRIS PUNCT, MUHLENBERGIA CUSP, SORGHASTRUM NUT). SITE IS FRAGMENTED BY POWER LINES & MUTIPLE OWNERSHIP. THREATS: BROMUS INER, EUPHORB ESUL, POP TREM, RHUS GLAB. 1.5 MILES NE OF HAMPTON ON SE SIDE OF HWY 47. IN MISS VALLEY OUTWASH REGION.

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T114N R19W SESW15 DAKOTA COUNTY, MN
Element: OXYPOLIS RIGIDIOR (COWBANE) #37
State Status: No Legal Status
EO Size: EO Rank: B Current Status: Intended Status:
3 Site: EMPIRE 15 CBS Site #: 60
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DELANEY,B.(92159)
Last Observed Date: 15 September 1992
Quad Map: COATES (T17A)
Latitude: 44 40' 36" Long: 93 5' 22"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
GROWING IN LOWLAND ASPEN WOODLAND ON DRAINED, BLACK ORGANIC SOIL. OCCASIONAL IN OPENINGS WITH ANDROPOGON GER, SPARTINA PECT, ASTER NOVAE-ANG, GALIUM BOREALE. OPENINGS VERY SMALL AND THREATENED BY COMPLETE CLOSURE BY WOODY SPP (POPULUS TREM, CORNUS STOL). NORTHEAST OF FARMINGTON, 1 MILE NORTH OF VERMILLION RIVER.

T115N R17W SESE31 DAKOTA COUNTY, MN
Element: CIRSIUM HILLII (HILL'S THISTLE) #35
State Status: SPECIAL CONCERN Federal Status: CANDIDATE, CATEGORY 2
EO Size: EO Rank: BC Current Status: Intended Status:
4 Site: EAST NININGER 32 CBS Site #: 96
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: LEWANSKI,T.(S.N.)
Last Observed Date: 09 July 1992
Quad Map: VERMILLION (T18B)
Latitude: 44 43' 7" Long: 92 53' 44"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
GROWING IN BLUFF PRAIRIE MUCH OVERGROWN WITH JUNIPERUS VIRG AND PRUNUS AMER ON SOUTH AND WEST-FACING HILLSIDE. UNCOMMON? SITE HAS BEEN GRAZED IN THE PAST AND ONLY SMALL PRAIRIE PATCHES REMAIN. THREATS: WOODY INVASION. NORTH SIDE OF THE VERMILLION RIVER 2 MILES WEST OF HASTINGS (FROM HWY 61) ON NORTH SIDE OF HWY 48. IN MISSISSIPPI VALLEY OUTWASH REGION.

T114N R17W SWNE11 DAKOTA COUNTY, MN
Element: POLANISIA JAMESII (JAMES' POLANISIA) #1 — Last Observed Date: August 1979 — DNR Region: 6
State Status: ENDANGERED — Wildlife Area: 605
EO Size: — EO Rank: B — Current Status: 0 — Intended Status: 2 — Quad Map: HASTINGS (T18A) — Forestry District: 552
5 Site: MARSHAN 11 SOUTH — CBS Site #: 50 — Latitude: 44 41' 48" Long: 92 49' 20"
Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): not managed or no record
Source: SMITH,W.R.(1356) — Voucher: MIN — Verification: verified
SW SIDE OF CO HWY 316, 1.75 MILES SE OF ITS JCT WITH STATE HWY 61 IN HASTINGS. OCCASIONAL IN SAND COULEE DOMINATED BY ANDROPOGON GERARDI AND ANDROPOGON SCOPARIUS. SWNE SEC 11, T114N R17W. (PREV COLL: OWNBEY, 1978). ALSO OCCURS IN HASTINGS WMA IN SECTION 2.

T114N R17W NWNE14 DAKOTA COUNTY, MN
Element: POLANISIA JAMESII (JAMES' POLANISIA) #5 — Last Observed Date: 16 August 1992 — DNR Region: 6
State Status: ENDANGERED — Wildlife Area: 605
EO Size: — EO Rank: BC — Current Status: — Intended Status: — Quad Map: HASTINGS (T18A) — Forestry District: 552
6 Site: MARSHAN 11 SOUTH — CBS Site #: 50 — Latitude: 44 41' 10" Long: 92 49' 21"
Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): R.J. DORER MEM. HARDWOOD STATE FOREST
Source: MORLEY,T.(1732) — Voucher: MIN — Verification: verified
GROWING IN AREA OF DEGRADED SAND PRAIRIE IN ALL-TERRAIN VEHICLE TRAIL. PLANTS RARE. WITH CYCLOLOMA ATRIPLIC, FROELICHIA FLOR, AND EUPHORBIA GEYERI. ABOUT 2 MILES SOUTHEAST OF HASTINGS ON HWY 316 AND THEN JUST OVER HALF MILE SOUTH ALONG SAND SLOPE OF COULEE. IN MISS VALLEY OUTWASH REGION.

T114N R17W NESW14 DAKOTA COUNTY, MN
Element: POLANISIA JAMESII (JAMES' POLANISIA) #6 — Last Observed Date: 18 August 1992 — DNR Region: 6
State Status: ENDANGERED — Wildlife Area: 605
EO Size: — EO Rank: BC — Current Status: — Intended Status: — Quad Map: HASTINGS (T18A) — Forestry District: 552
7 Site: MARSHAN 14 — CBS Site #: 51 — Latitude: 44 40' 47" Long: 92 49' 36"
Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): R.J. DORER MEM. HARDWOOD STATE FOREST
Source: MORLEY,T.(1735) — Voucher: MIN — Verification: verified
GROWING IN SMALL PATCH OF SAND PRAIRIE IN AREA THAT WAS ONCE PROBABLY BUR OAK SAVANNA. LOCALLY COMMON ALONG TRAIL LEADING NORTH FROM GREENWOOD CAMPGROUND. WITH BOUTELOUA HIRSUTA, EUPHORBIA GEYERI, FROELICHIA FLOR, PETALOSTEMON VIL, AND LINARIA CANADENSIS. A FEW PLANTS ARE ALSO FOUND AT SCATTERED LOCATIONS WITHIN 0.4KM TO NORTH ALONG ALL-TERRAIN VEHICLE TRAILS ON EXPOSED SAND. APPROX 2 MILES SOUTHEAST OF HASTING ON HWY 316 THEN 1.25 MILES SOUTH. MISS VALLEY OUTWASH REG.

T114N R17W SENE31 DAKOTA COUNTY, MN
Element: BESSEYA BULLII (KITTEN-TAILS) #22 — Last Observed Date: July 1983 — DNR Region: 6
State Status: ENDANGERED — Federal Status: FORMER CANDIDATE — Wildlife Area: 605
EO Size: — EO Rank: B — Current Status: 2 — Intended Status: 2 — Quad Map: VERMILLION (T18B) — Forestry District: 552
Site: CHIMNEY ROCK — CBS Site #: 55 — Latitude: 44 38' 22" Long: 92 53' 44"
8 Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): not managed or no record
Source: CONVERSE,C.(2411) — Voucher: MIN — Verification: verified
CA 60 PLANTS WITHIN 1.2 SQ METER AREA. IN PARTIAL SHADE IN OAK SAVANNA, WITH QUERCUS MACROCARPA, POA COMPRESSA, HEUCHERA RICHARDSONI, LECHEA INTERMEDIA, PENSTEMON GRACILIS. T114N R17W, ESENE SEC 31. JUNIPERUS VIRGINIANA INVASION IS A POTENTIAL THREAT TO THIS POPULATION.

T114N R17W NWSE11 DAKOTA COUNTY, MN
Element: HIERACIUM LONGIPILUM (LONG-BEARDED HAWKWEED) #53
State Status: No Legal Status
EO Size: EO Rank: C Current Status: Intended Status:
9 Site: MARSHAN 11 SOUTH CBS Site #: 50
Ownership: Private Ownership
Managed Area(s): R.J. DORER MEM. HARDWOOD STATE FOREST
Source: MORLEY,T.(1731)
Last Observed Date: 16 August 1992
Quad Map: HASTINGS (T18A)
Latitude: 44 41' 38" Long: 92 49' 18"
Precision: within 0.25 mile, confirmed
Voucher: Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
GROWING ON SANDY RIDGE IN DEGRADED SAND PRAIRIE WITH KOELERIA MAC, AMBROSIA CORONOP, CONYZA CANAD, RHUS RAD, FROELICHIA FLOR. HIERACIUM WAS RARE. ABOUT 2 MILES SOUTHEAST OF HASTINGS ON SOUTH SIDE OF HWY 316. IN MISS VALLEY OUTWASH REGION.

T114N R17W NESW14 DAKOTA COUNTY, MN
Element: LINARIA CANADENSIS (OLD FIELD TOADFLAX) #19
State Status: No Legal Status
EO Size: EO Rank: BC Current Status: Intended Status:
10 Site: MARSHAN 14 CBS Site #: 51
Ownership: Private Ownership
Managed Area(s): R.J. DORER MEM. HARDWOOD STATE FOREST
Source: DELANEY,B.(92081)
Last Observed Date: 13 August 1992
Quad Map: HASTINGS (T18A)
Latitude: 44 40' 47" Long: 92 49' 36"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
GROWING IN SMALL PATCH OF SAND PRAIRIE IN AREA THAT WAS ONCE PROBABLY BUR OAK SAVANNA. 50+ PLANTS LOCALLY ALONG TRAIL LEADING NORTH FROM GREENWOOD CAMPGROUND. WITH BOUTELOUA HIRSUTA, EUPHORBIA GEYERI, FROELICHIA FLOR, PETALOSTEMON VIL, AND POLANSIA JAMESII. APPROX 2 MILES SOUTHEAST OF HASTINGS THEN 1.25 MILES SOUTH ALONG COULEE SYSTEM. MISS VALLEY OUTWASH REGION.

T114N R18W NWSW34 DAKOTA COUNTY, MN
Element: ERYNGIUM YUCCIFOLIUM (RATTLESNAKE-MASTER) #53
State Status: SPECIAL CONCERN
EO Size: EO Rank: C Current Status: Intended Status:
11 Site: VERMILLION 34 CBS Site #: 97
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DELANEY,B.(92161)
Last Observed Date: 15 September 1992
Quad Map: VERMILLION (T18B)
Latitude: 44 38' 3" Long: 92 58' 13"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
GROWING IN LOW SPOT IN VERY SMALL FRAGMENT OF MESIC PRAIRIE. LOCAL, OCCASIONAL. ROUGHLY 10 FLOWERING STEMS PLUS 40-50 VEGETATIVE SHOOTS. WITH ANDROPOGON GER, SORGHASTRUM NUT, ASTER LAEVIS, SOLIDAGO RIG, ASTER ERIC, ZIZIA APT, RATIBIDA PINN. THREATENED BY INVASION BY BROMUS INERMIS, TRACTOR TURN-AROUND, ETC. MILE NORTH EAST OF HAMPTON ON SOUTHEAST SIDE OF HWY 47, SOUTH OF TRANSMISSION LINE, AND SEPARATED FROM HWY BY NARROW CULT FIELD IN LOWLAND.

T114N R19W SESW15 DAKOTA COUNTY, MN
Element: VALERIANA EDULIS SSP. CILIATA (VALERIAN) #46
State Status: THREATENED
EO Size: EO Rank: CD Current Status: Intended Status:
12 Site: EMPIRE 15 CBS Site #: 60
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: MORLEY,T.(1723)
Last Observed Date: 19 July 1992
Quad Map: COATES (T17A)
Latitude: 44 40' 34" Long: 93 5' 14"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
GROWING IN UNCHARACTERISTIC HABITAT: IN YOUNG, UPLAND ASPEN WOODS WITH COMMON MEADOW PLANTS, MUCH RHUS RADICANS, AND WHAT IS PROBABLY ANDROPOGON GER AND SPARTINA PECT (VEGETATIVE). POPULUS TREM MOSTLY 3-15 CM DBH; LIKELY WAS SEMI-OPEN NOT LONG AGO. ONE CLUMP SEEN NEAR SOUTH EDGE WOODS NEAR CULTIVATED FIELD. IN MISSISSIPPI VALLEY OUTWASH REGION.

T114N R19W NWNE15 DAKOTA COUNTY, MN
Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #603
State Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
13 Site: EMPIRE 15
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DORFF,C. (CO BIOL SURVEY 1992)
Last Observed Date: 25 June 1992
Quad Map: COATES (T17A)
CBS Site #: 60
Latitude: 44 41' 12" Long: 93 5' 5"
Precision: within 0.25 mile, confirmed
Voucher: Verification:
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
2 INDIVIDUALS OBSERVED. 1 FEMALE, BASKING ON A LOG, WAS CAPTURED BY HAND. SHALLOW BAY IN NORTHEAST PORTION OF LAKE INFERIOR. CARAPACE LENGTH = 241 MM; CARAPACE WIDTH = 157 MM; PLASTRON LEGNTH = 229 MM. THE SECOND INDIVIDUAL WAS SEEN BASKING, BUT NOT CAPTURED. PHOTOS TAKEN.

T114N R17W NESW14 DAKOTA COUNTY, MN
Element: PITUOPHIS MELANOLEUCUS (GOPHER SNAKE or BULLSNAKE) #57
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
14 Site: MARSHAN 14
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DORFF,C. (CO BIOL SURVEY 1992)
Last Observed Date: 03 September 1992
Quad Map: HASTINGS (T18A)
CBS Site #: 51
Latitude: 44 40' 47" Long: 92 49' 36"
Precision: within 0.25 mile, confirmed
Voucher: Verification:
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
1 INDIVIDUAL CAPTURED AND RELEASED. SUNNY, OPEN SAND PRAIRIE NW OF OFFICE IN GREENWOOD CAMPGROUND. SNAKE WAS MOVING TOWARD HOLE WHEN CAPTURED. SNOUT-VENT LENGTH 180 CM. EYES OPAQUE, INDICATING SNAKE WILL SOON SHED SKIN. CAMPGROUND MAN AGER SAID THAT BULLSNAKES ARE OFTEN SEEN IN THE SPRING CROSSING FROM THE WEST EDGE OF PROPERTY, THROUGH CAMPSITES EAST INTO PINE PLANTATION. ALSO, KIDS FIND BULLSNAKES FREQUENTLY IN TREE FARM - SOME CAPTURED AND RELEASED IN PINE COUNTY.

60

T115N R18W DAKOTA COUNTY, MN
Element: LANIUS LUDOVICIANUS (LOGGERHEAD SHRIKE) #2
State Status: THREATENED Federal Status: CANDIDATE, CATEGORY 2
EO Size: EO Rank: Current Status: Intended Status:
15 Site: site not named or no record
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: LITKEY,B. MOU FILES
Last Observed Date: July 1966
Quad Map: COATES (T17A)
Latitude: 44 43' 13" Long: 93 1' 55"
Precision: within quadrangle map
Voucher: Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
LOGGERHEAD SHRIKE. PN. 4 EGGS.

T114N R18W NENE16 DAKOTA COUNTY, MN
Element: LANIUS LUDOVICIANUS (LOGGERHEAD SHRIKE) #21
State Status: THREATENED Federal Status: CANDIDATE, CATEGORY 2
EO Size: EO Rank: Current Status: Intended Status:
16 Site: VERMILLION 16
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: BARDON,K.(CO BIOL SURVEY 1992)
Last Observed Date: 06 July 1992
Quad Map: VERMILLION (T18B)
Latitude: 44 41' 13" Long: 92 58' 34"
Precision: within 0.25 mile, confirmed
Voucher: Verification: verified
DNR Region: 6
Wildlife Area: 605
Forestry District: 552
POSITIVE NESTING. 1986: 1 NEST FOUND BY B. BROOKS IN E RED CEDAR ON MAY 3. INCU-BATION OBSERVED FOR 17 DAYS; 5 EGGS LAID AND HATCHED, 5 YOUNG FLEDGED. 1989: 1 ADULT SEEN ~2 MI NE BY T. LEWANSKI ON JULY 15. 1990: FAMILY OF 4 (3 JUVENILES, 1 NOT AGED) OBSERVED BY BARDON ON FISCHER AVE .5 MI N OF 190TH AT VERMILLION; THIS IS .25 MI S OF 1986 NEST SITE. 1992: INCIDENTAL OBSERVATION OF 1 UNAGED INDIVID-UAL PERCHED IN GRAZED PASTURE WITH SCATTERED JUNIPERS, SHRUBS AND SMALL TREES.

T114N R19W NENE05 DAKOTA COUNTY, MN
Element: LANIUS LUDOVICIANUS (LOGGERHEAD SHRIKE) #80 — Last Observed Date: 27 July 1990 — DNR Region: 6
State Status: THREATENED — Federal Status: CANDIDATE, CATEGORY 2 — Wildlife Area: 605
EO Size: — EO Rank: — Current Status: — Intended Status: — Quad Map: COATES (T17A) — Forestry District: 552
17 Site: EMPIRE 5 — Latitude: 44 42' 50" Long: 93 7' 0"
Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): not managed or no record
Source: BARDON,K.(SHRIKE SURVEY OF PROPOSED DAKOTA CO INCINERATOR SITE) — Voucher: — Verification: verified
INFERRED NESTING. FAMILY OF 4 SHRIKES OBSERVED ALONG BISCAYNE AVE. .25-.5 MILE SOUTH OF 160TH AVE. THIS LOCATION IS 3 MILES WEST OF PROPOSED INCINERATOR SITE. ON AUG. 1, 1 ADULT OBSERVED IN APPROXIMATELY SAME LOCATION AND 3 JUVENILES FOUND IN SMALL CONIFERS OF A YARD .75 MILE SOUTH OF 160TH ALONG BISCAYNE AVE. IN 1991, NO SHRIKES FOUND ON 8/8 BY S. KITTELSON DURING DAKOTA COUNTY SHURIKE SURVEY; WEATHER WAS OVERCAST WITH LIGHT RAIN.

T114N R18W SWNE25 DAKOTA COUNTY, MN
Element: LANIUS LUDOVICIANUS (LOGGERHEAD SHRIKE) #86 — Last Observed Date: 25 July 1991 — DNR Region: 6
State Status: THREATENED — Federal Status: CANDIDATE, CATEGORY 2 — Wildlife Area: 605
EO Size: — EO Rank: — Current Status: — Intended Status: — Quad Map: VERMILLION (T18B) — Forestry District: 552
18 Site: VERMILLION 25 — Latitude: 44 39' 8" Long: 92 55' 16"
Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): not managed or no record
Source: KITTELSON,S.(DNR) — Voucher: — Verification: sight rec.
BREEDING SEASON OBSERVATION. 2 BIRDS OBSERVED AT 9 AM AT A SCHEDULED STOP DURING THE DAKOTA COUNTY SHRIKE SURVEY. NO BIRDS WERE OBSERVED AT THIS STOP DURING THE FIRST SURVEY OF THE ROUTE ON JULY 17.

T114N R18W NWNW16 DAKOTA COUNTY, MN
Element: LANIUS LUDOVICIANUS (LOGGERHEAD SHRIKE) #93 — Last Observed Date: 1992 — DNR Region: 6
State Status: THREATENED — Federal Status: CANDIDATE, CATEGORY 2 — Wildlife Area: 605
EO Size: — EO Rank: — Current Status: — Intended Status: — Quad Map: VERMILLION (T18B) — Forestry District: 552
19 Site: VERMILLION 16 — Latitude: 44 41' 9" Long: 92 59' 37"
Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): not managed or no record
Source: BARDON,K.(CO BIOL SURVEY 1992) AND KITTELSON,S.(DAKOTA CO SHRIKE SURVEY) — Voucher: — Verification: verified
INFERRED NESTING. 1991: KITTELSON OBSERVED 1 BIRD APPROX 4 TIMES. 1992: KITTELSON OBSERVED 1 BIRD TWICE. BARDON HAD 2 INCIDENTAL OBSERVATIONS OF FAMILY GROUP; 1 ADULT AND 2 JUVENILES SEEN ON 6 JULY, 1 ADULT AND 3 JUVENILES SEEN ON 7 JULY; ALL INDIVIDUALS WERE FORAGING FROM POWER LINE AND OUT INTO CROPLAND IN SWSW SEC 9 AND SESE SEC 8 AND IN CRP TRACT IN NWNW SEC 16.

T114N R18W SESE24 DAKOTA COUNTY, MN
Element: LANIUS LUDOVICIANUS (LOGGERHEAD SHRIKE) #94 — Last Observed Date: 1992 — DNR Region: 6
State Status: THREATENED — Federal Status: CANDIDATE, CATEGORY 2 — Wildlife Area: 605
EO Size: — EO Rank: — Current Status: — Intended Status: — Quad Map: VERMILLION (T18B) — Forestry District: 552
20 Site: VERMILLION 24 — Latitude: 44 39' 40" Long: 92 54' 49"
Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): not managed or no record
Source: KITTELSON,S.(DAKOTA CO SHRIKE SURVEY) — Voucher: — Verification: unverified
INFERRED BREEDING. 1 INDIVIDUAL OBSERVED AT SCHEDULED STOP ON JULY 31, ONE INDIVIDUAL OBSERVED AT SAME STOP ON AUG. 6.

T114N R18W SWNE03 DAKOTA COUNTY, MN
Element: LANIUS LUDOVICIANUS (LOGGERHEAD SHRIKE) #96 — Last Observed Date: 31 May 1992 — DNR Region: 6
State Status: THREATENED — Federal Status: CANDIDATE, CATEGORY 2 — Wildlife Area: 605
EO Size: — EO Rank: — Current Status: — Intended Status: — Quad Map: VERMILLION (T18B) — Forestry District: 552
21 Site: VERMILLION 3 — Latitude: 44 42' 42" Long: 92 57' 41"
Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): not managed or no record
Source: DULIN,G.(CO BIOL SURVEY 1992) — Voucher: — Verification: sight rec.
BREEDING SEASON OBSERVATION. INCIDENTAL OBSERVATION OF ONE INDIVIDUAL IN JUNIPER WITHIN OLD PASTURE. CROPLAND ADJACENT.

T114N R19W NWSW11 DAKOTA COUNTY, MN
Element: LANIUS LUDOVICIANUS (LOGGERHEAD SHRIKE) #97 — Last Observed Date: 06 July 1992 — DNR Region: 6
State Status: THREATENED — Federal Status: CANDIDATE, CATEGORY 2 — Wildlife Area: 605
EO Size: — EO Rank: — Current Status: — Intended Status: — Quad Map: COATES (T17A) — Forestry District: 552
22 Site: EMPIRE 11 — Latitude: 44 41' 38" Long: 93 4' 22"
Ownership: University of Minnesota — Precision: within 0.25 mile, confirmed
Managed Area(s): not managed or no record
Source: DULIN,G., S. STUCKER, AND K. BARDON(CO BIOL SURVEY 1992) — Voucher: — Verification: unverified
INFERRED BREEDING. INCIDENTAL OBSERVATIONS OF ONE INDIVIDUAL AS FOLLOWS. SEEN PERCHED ON WIRE IN NESE10 ON 26 MAY 1992, SEEN PERCHED IN NWSW11 ON 30 AND 31
MAY 1992, AND AGAIN ON 23 JULY 1992. ONE OBSERVED HUNTING AND CAPTURING PREY WITHOUT FEEDING YOUNG IN SWSW11, NWSW11, AND SWNW11 ON 6 JULY 1992. HABITAT IS
62 OLD FIELD, LIGHTLY GRAZED PASTURE, AND AGRICULTURAL FIELDS WITH SCATTERED SHRUBS AND SHELTER BELTS. CLAY-COLORED SPARROW FOUND IMPALED IN SHRIKE'S PERCH TREE.

T114N R17W 11 DAKOTA COUNTY, MN
Element: COLUBER CONSTRICTOR (RACER) #20 — Last Observed Date: August 1983 — DNR Region: 6
State Status: SPECIAL CONCERN — Wildlife Area: 605
EO Size: — EO Rank: — Current Status: 0 — Intended Status: 2 — Quad Map: HASTINGS (T18A) — Forestry District: 552
23 Site: MARSHAN 11 — CBS Site #: 49 — Latitude: 44 41' 42" Long: 92 49' 10"
Ownership: Private Ownership — Precision: within 0.50 mile
Managed Area(s): not managed or no record
Source: DNR GREEN SLIP PETERSON,J.AND MCKENZIE,A. — Voucher: — Verification: sight rec.
BLUE RACER. CA 3 MI SE HASTINGS ON MN 316, DEAD ON ROAD, CA 75 CM LONG.

T114N R19W SWNE22 DAKOTA COUNTY, MN
Element: BARTRAMIA LONGICAUDA (UPLAND SANDPIPER) #367 — Last Observed Date: 06 July 1992 — DNR Region: 6
State Status: SPECIAL CONCERN — Wildlife Area: 605
EO Size: — EO Rank: — Current Status: — Intended Status: — Quad Map: COATES (T17A) — Forestry District: 552
24 Site: EMPIRE 22 — Latitude: 44 40' 7" Long: 93 4' 58"
Ownership: Private Ownership — Precision: within 0.25 mile, confirmed
Managed Area(s): not managed or no record
Source: BARDON,K.(CO BIOL SURVEY 1992) — Voucher: — Verification: sight rec.
BREEDING SEASON OBSERVATION. INCIDENTAL OBSERVATION OF ONE INDIVIDUAL CALLING (LONG WHISTLE) OVER GRASSY, PASTURED HILLSIDE SURROUNDED BY AGRICULTURAL FIELDS.

T114N R19W SENE26 DAKOTA COUNTY, MN

Element: BARTRAMIA LONGICAUDA (UPLAND SANDPIPER) #368
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: EMPIRE 26
25
Ownership: Private Ownership
Managed Area(s): not managed or no record
Source: DULIN,G. AND K. BARDON (CO BIOL SURVEY 1992)

Last Observed Date: 10 July 1992
Quad Map: COATES (T17A)
Latitude: 44 39' 14" Long: 93 3' 28"
Precision: within 0.25 mile, confirmed
Voucher: Verification: sight rec.

DNR Region: 6
Wildlife Area: 605
Forestry District: 552

INFERRED BREEDING. INCIDENTAL OBSERVATIONS OF ONE TO TWO INDIVIDUALS ON SITE AS FOLLOWS: ON 1 JUNE 1992 ONE INDIVIDUAL SEEN CALLING ON GROUND. IT FLEW UP AND WAS JOINED BY A SECOND INDIVIDUAL AS IT CALLED AND CIRCLED OVERHEAD. ON 6 JULY 1992 ONE WAS SEEN WHISTLING OUT OVER SITE, AND THEN SEEN TO LAND ON POWER POLE. ON 10 JUNE 1992 ONE WAS HEARD BUT NOT SEEN WHISTLING. SOD FARM WITH SHORT, CUT GRASS, PLUS AREAS OF BARE DIRT (CUT SOD), AND LONGER GRASS IN WETTER LOCATIONS.

Appendix 10. Bird species documented within the Dakota Search Area during 1992 field surveys and associated habitats.

Species	Forest	Grassland	Shrubland	Marsh
Pied-billed Grebe				X
Great Blue Heron				X
Mute Swan				X
Canada Goose				X
Wood Duck				X
Mallard				X
Blue-winged Teal				X
Ring-necked Pheasant		X		
Ruffed Grouse	X			
Swainson's Hawk	X	X		
Red-tailed Hawk	X	X		
American Kestrel		X		
Sora				X
Killdeer		X		X
Upland Sandpiper		X		
Rock Dove		X		
Mourning Dove	X	X	X	X
Black-billed Cuckoo	X	X	X	
Red-bellied Woodpecker	X			
Downy Woodpecker	X			
Hairy Woodpecker	X		X	
Northern Flicker	X			
Eastern Wood-Pewee	X			
Willow Flycatcher			X	
Least Flycatcher	X			
Great Crested Flycatcher	X			
Western Kingbird		X		

Appendix 10. Continued.

Species	Forest	Grassland	Shrubland	Marsh
Eastern Kingbird		X		
Horned Lark		X		
Tree Swallow			X	
Cliff Swallow				X
Barn Swallow		X		X
Blue Jay	X		X	
American Crow	X	X	X	
Black-capped Chickadee			X	
White-breasted Nuthatch	X			
House Wren	X		X	
Sedge Wren			X	
Marsh Wren			X	
Eastern Bluebird		X		
Wood Thrush	X			
American Robin	X	X		
Gray Catbird	X	X	X	
Brown Thrasher		X		
Cedar Waxwing			X	
Loggerhead Shrike		X		
European Starling			X	
Warbling Vireo	X			
Red-eyed Vireo	X			
Yellow Warbler	X	X	X	X
Ovenbird	X			
Common Yellowthroat		X	X	X
Northern Cardinal	X		X	
Rose-breasted Grosbeak	X		X	
Indigo Bunting	X			
Dickcissel		X		

Appendix 10. Continued.

Species	Forest	Grassland	Shrubland	Marsh
Chipping Sparrow		X		
Clay-colored Sparrow		X		
Field Sparrow		X		
Vesper Sparrow		X		
Savannah Sparrow		X		
Grasshopper Sparrow		X		
Song Sparrow	X	X	X	X
Swamp Sparrow			X	
Bobolink		X		
Red-winged Blackbird	X	X	X	X
Eastern Meadowlark		X		
Western Meadowlark		X		
Yellow-headed Blackbird				X
Common Grackle		X	X	
Brown-headed Cowbird	X	X	X	X
Orchard Oriole		X		
Northern Oriole	X	X		
American Goldfinch	X	X	X	
House Sparrow		X		

Appendix 11. Amphibians and reptiles found within the Dakota Search Area in 1992 and their associated habitats.

Species	Woodland	Grassland	Wetland
Tiger salamander *(Ambystoma tigrinum)*		X	
American toad *(Bufo americanus)*	X		
Chorus frog *(Pseudacris triseriata)*		X	
Leopard frog *(Rana pipiens)*			X
Snapping turtle *(Chelydra serpentina)*			X
Blanding's turtle *(Emydoidea blandingii)*			X
Painted turtle *(Chrysemys picta)*			X
Prairie skink *(Eumeces septentrionalis)*		X	
Garter snake *(Thamnophis sp.)*		X	
Bullsnake *(Pituophis melanoeucus)*		X	

Appendix 12. Summary of small mammal trapping in the Dakota Search Area. (Numbers refer to the number of individuals captured, * indicate species present at site but not captured.)

Mammal Species	Trap Grids							
	A	B	C	D	E	F	G	H
Masked shrew *(Sorex cinereus)*	3	1	1		1	1	6	
Short-tailed shrew *(Blarina brevicauda)*	9	2	3	4	3	2	7	
13-lined ground squirrel *(Spermophilus tridecemlineatus)*	2		1		1			
Plains pocket gopher *(Geomys bursarius)*	*	*	*		*			
White-footed mouse *(Peromyscus leucopus)*		1	3				4	
Deer mouse *(Peromyscus maniculatus)*		3	7	2	5	8	1	
Southern red-backed vole *(Clethrionomys gapperi)*	3						2	
Meadow vole *(Microtus pennsylvanicus)*		2	1	1	1	1		
House mouse *(Mus musculus)*			1					
Meadow jumping mouse *(Zapus hudsonius)*	8	3					3	

Minnesota Department of Natural Resources, Section of Wildlife
Natural Heritage and Nongame Wildlife Programs
Box 7, 500 Lafayette Road
St. Paul, MN 55155-4007
(612) 296-3344