Minnesota County Biological Survey
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Division of Fish and Wildlife
Section of Ecological Services
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Minnesota County Biological Survey Map Series No. 18 (1998)
Carver, Hennepin and Scott Counties, Minnesota

NATURAL COMMUNITIES AND RARE SPECIES OF CARVER, HENNEPIN, AND SCOTT COUNTIES, MINNESOTA

by the

Minnesota County Biological Survey[1]

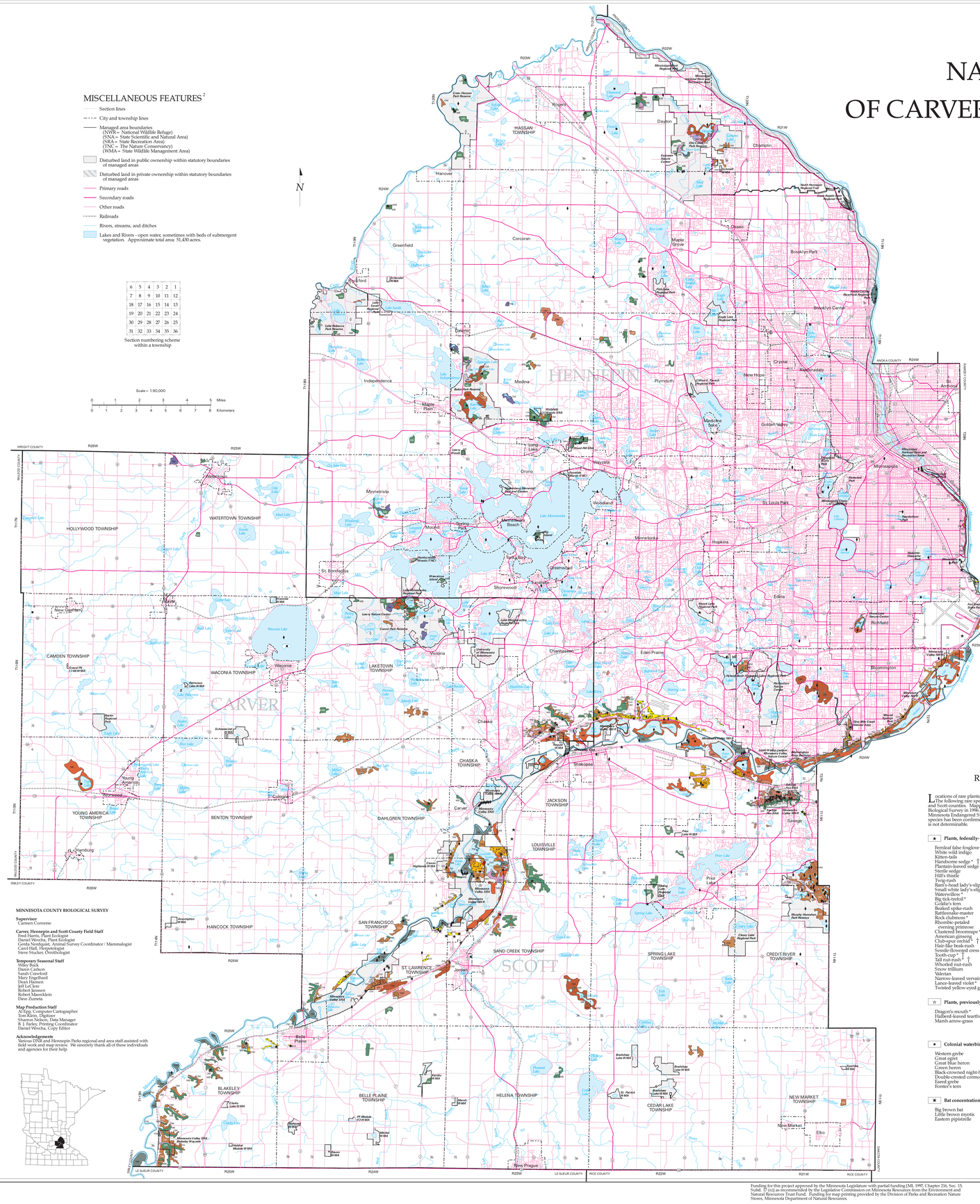
MISCELLANEOUS FEATURES[2]

- Section lines
- City and township lines
- Managed area boundaries
  - (NWR= National Wildlife Refuge)
  - (SNA= State Scientific and Natural Area)
  - (SRA= State Recreation Area)
  - (TNC = The Nature Conservancy)
  - (WMA= State Wildlife Management Area)
- Disturbed land in public ownership within statutory boundaries of managed areas
- Disturbed land in private ownership within statutory boundaries of managed areas
- Primary roads
- Secondary roads
- Other roads
- Railroads
- Rivers, streams, and ditches
- Lakes and Rivers - open water, sometimes with beds of submergent vegetation. Approximate total area: 51,430 acres.

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Section numbering scheme within a township

Scale = 1:90,000
0 1 2 3 4 5 Miles
0 1 2 3 4 5 6 7 8 Kilometers



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NATURAL COMMUNITIES

Natural communities are groups of native plants and animals that interact with each other and their abiotic environment in ways not greatly altered by modern human activity or by introduced organisms. These groups of native species form recognizable units, such as an oak forest, a prairie, or a marsh, that tend to repeat over space and time. Natural communities are generally classified and described by considering vegetation, hydrology, landforms, soils, and natural disturbance regimes. The natural community types and subtypes on this map are classified primarily by vegetation and major habitat features. The Minnesota County Biological Survey located areas of natural communities in Carver, Hennepin, and Scott counties from 1995 to 1997 using aerial photos interpretation followed by field survey of selected sites. The description and approximate acreage of each natural community type and subtype given below are based on the results of the Survey. White or light-gray areas on the map are predominantly areas that were destroyed or highly altered by modern human activities (such as cultivation, livestock grazing, draining, logging, and residential and commercial development) and did not constitute natural communities at the time the Survey was conducted. Natural communities covered approximately 18,520 acres, or 2.3% of the land area of Carver, Hennepin, and Scott counties at the time of the Survey.

UPLAND FORESTS

DECIDUOUS FOREST

OAK **Oak Forest - mesic subtype** - Dry-mesic to mesic forests on moist, well-drained soils on glacial till or on north-facing slopes on outwash sands. Canopy typically dominated by red oak (*Quercus rubra*); other important canopy trees include white oak (*Quercus alba*), northern pin oak (*Quercus ellipsoidalis*), bur oak (*Quercus macrocarpa*), and basswood (*Tilia americana*). Common subcanopy trees and tree seedlings consist mostly of shade-tolerant species, particularly sugar maple (*Acer saccharum*) and ironwood (*Ostrya virginiana*), but also include trees that readily colonize canopy gaps such as bitternut hickory (*Carya cordiformis*), black cherry (*Prunus serotina*), and big-toothed aspen (*Populus grandidentata*). Shrub layer sparse and commonly includes gooseberries (*Ribes* spp.) and chokecherry (*Prunus virginiana*). Ground layer composed of shade-tolerant herbs such as pointed-leaved tick-trefoil (*Desmodium glutinosum*), wild geranium (*Geranium maculatum*), honewort (*Cryptotaenia canadensis*), lopseed (*Phryma leptostachya*), sweet-cicely (*Osmorhiza claytonii*), and white snakeroot (*Eupatorium rugosum*). Approximate total area: 2,670 acres.

OSS **Oak Forest - dry subtype** - Dry forests typically on coarse-textured, dry soils formed in glacial till or on glacial river terraces, often on south- to west-facing slopes. Many stands have succeeded from oak savanna or oak woodland since European settlement and fire suppression; these have continuous but often thin canopies composed of open-grown trees; canopy typically dominated by a combination of bur oak, northern pin oak, and white oak, sometimes with lesser amounts of quaking aspen (*Populus tremuloides*) and red oak. Shrub layer moderately dense and commonly includes gray dogwood (*Cornus foemina* ssp. *racemosa*), American hazel (*Corylus americanus*), gooseberries, and downy arrowwood (*Viburnum rafinesquianum*). Ground layer composed of plants tolerant of moderate to heavy shade and dry soils, such as elm-leaved goldenrod (*Solidago ulmifolia*), hog-peanut (*Amphicarpaea bracteata*), sharp-scaly spikerush (*Eleocharis acicularis*), Canada bluegrass (*Poa compressa*). Some of the more common forbs are flower (*Polanisia trachysperma*), larkspur (*Delphinium virescens*), hoary frostweed (*Helianthemum bicknellii*), white sage (*Artemisia ludoviciana*), narrow-leaved puccoon (*Lithospermum incisum*), prairie bird-foot violet (*Viola pedatifida*), bluets (*Hedyotis longifolia*), and harebell (*Campanula rotundifolia*). Approximate total area: 530 acres.

MB **Maple-Basswood Forest** - Mesic to wet-mesic forests on moist soils formed in glacial till or on cool, north-facing slopes on outwash terraces. Dense canopy dominated by sugar maple, basswood, and red oak, with lesser amounts of slippery elm (*Ulmus rubra*), green ash (*Fraxinus pennsylvanica*), and black ash (*Fraxinus nigra*). American elm (*Ulmus americana*) was once codcmon in the canopy but is present today mostly as standing dead snags. Subcanopy and shrub layers are usually dominated by sugar maple and often contain ironwood, bitternut hickory, bladdernut (*Staphylea trifolia*), pagoda dogwood (*Cornus alternifolia*), red-berried elder (*Sambucus pubens*), or gooseberries. Ground layer includes early-spring ephemeral species such as Dutchman's-breeches (*Dicentra cucullaria*), false rue-anemone (*Isopyrum biternatum*), toothwort (*Dentaria laciniata*), and white trout-lily (*Erythronium albidum*); other common herbs are plants adapted to deep shade such as white bear sedge (*Carex albursina*), putty-root (*Aplectrum hyemale*), Virginia waterleaf (*Hydrophyllum virginianum*), wild leek (*Allium tricoccum*), and zig-zag goldenrod (*Solidago flexicaulis*), as well as several species present in mesic oak forests. Approximate total area: 3,430 acres.

LHF **Lowland Hardwood Forest** - Wet-mesic bottomland forests on seasonally saturated alluvial soil above normal flood levels in small valleys. Canopy and subcanopy dominated by any combination of basswood, black ash, green ash, American elm, hackberry (*Celtis occidentalis*), bur oak, or sugar maple. Ground layer often dominated by cleavers (*Galium aparine*), Virginia waterleaf, wood nettle (*Laportea canadensis*), and eastern marshwood sedge (*Carex amphibola* var. *turgida*); also includes many herbaceous plants present in maple-basswood forests. Approximate total area: 550 acres.

DECIDUOUS WOODLANDS / SAVANNAS

DECIDUOUS WOODLAND

DWF **Oak Woodland-Brushland** - Dry woodlands on well-drained, dry to mesic soils formed on glacial till or glacial river outwash, often on south- to west-facing slopes. Patchy to interrupted canopy (30-70% cover) dominated by open-grown northern pin oak, bur oak, and/or white oak, with lesser amounts of paper birch (*Betula papyrifera*), eastern red cedar (*Juniperus virginiana*), quaking aspen, basswood, and big-toothed aspen. Shrub layer often dense and composed of hazel, American hazel, gray dogwood, and prickly ash (*Zanthoxylum americanum*). Ground layer sparse (*Rhus glabra*), and gray dogwood. Ground layer species are similar to those of oak forest - dry subtype but also include prairie species in scattered small open areas. Many stands have succeeded from oak savanna since European settlement and fire suppression. Approximate total area: 1,140 acres.

AWC **Aspen Woodland** - Wet to wet-mesic woodland in poorly drained, shallow depressions on mineral or organic soil, often on former wet prairie where fire has been excluded. Interrupted canopy (30-70% cover) dominated by quaking aspen, with lesser amounts of bur oak and green ash. Shrub layer often dense and composed of willows (especially *Salix discolor* and *Salix exigua*) and red-osier dogwood (*Cornus sericea*). Ground layer similar to wet prairie or wet meadow. Approximate total area: 70 acres.

DECIDUOUS SAVANNA

DNS **Dry Oak Savanna - barrens subtype** - Dry savanna on excessively drained soils on wind-blown sand dunes on terraces along the Minnesota River. Open tree canopy (10-50% cover) composed of open-grown bur oak and northern pin oak. Leadplant (*Amorpha canescens*), prairie willow (*Salix humilis*), and prairie rose (*Rosa arkansana*) are common shrubs. Ground layer dominated by forbs and graminoids typical of dry prairie - barrens subtype. Approximate total area: 240 acres.

DSF **Dry Oak Savanna - sand-gravel subtype** - Dry savanna on level to steeply sloping sites on excessively drained sandy soils on glacial river terraces. Open canopy (10-50% cover) composed of open-grown bur oak or northern pin oak; eastern red cedar is often abundant in sites that have not burned recently. Smooth sumac, leadplant, prairie rose, and American plum (*Prunus americana*) are common shrubs. Ground layer dominated by forbs and graminoids typical of dry prairie - sand-gravel subtype. Approximate total area: 220 acres.

PRAIRIES

UPLAND PRAIRIE

DJA **Dry Prairie - barrens subtype** - Dry prairies on excessively drained soils on windblown sand dunes on terraces along the Minnesota River. Dominant grasses are little bluestem, June grass (*Koeleria macrantha*), hairy grama (*Bouteloua hirsuta*), and porcupine grass (*Stipa spartea*); common associated graminoids include sand reed grass (*Calamovilfa longifolia*), Schweinitz's nut-sedge (*Cyperus schweinitzii*), sand dropseed (*Sporobolus cryptandrus*), and Wilcox's panic-grass (*Panicum wilcoxianum*). Leadplant, wormwood (*Artemisia campestris* ssp. *caudata*), prairie willow, and prairie rose are common shrubs. Typical plants not commonly seen in dry subtype include beardgrass (*Bhpidium illinitiense*), snake cotton (*Froelichia floridana*), silky prairie clover (*Petalostemon villosum*), western spiderwort (*Tradescantia occidentalis*), and rock-spikemoss (*Selaginella rupestris*). Approximate total area: 40 acres.

DPS **Dry Prairie - sand-gravel subtype** - Dry prairies on level to steep terrain on sandy outwash deposits on terraces within major river valleys. Dominant grasses are little bluestem and sideoats grama (*Bouteloua curtipendula*); associated grasses include Indian grass, prairie dropseed, porcupine grass, and sand reed grass. Common forbs are slender mountain mint (*Pycnanthemum virginianum*), white prairie flower (*Padustia nuttalliana*), larkspur (*Delphinium virescens*), hoary frostweed (*Helianthemum bicknellii*), white sage (*Artemisia ludoviciana*), narrow-leaved puccoon (*Lithospermum incisum*), prairie bird-foot violet (*Viola pedatifida*), bluets (*Hedyotis longifolia*), and harebell (*Campanula rotundifolia*). Approximate total area: 530 acres.

DH **Dry Prairie - hill subtype** - Dry to dry-mesic prairies on well-drained soils on slopes and hilltops on glacial till. Dominant grasses are little bluestem, side-oats grama, big bluestem, porcupine grass, and prairie dropseed. Typical forbs include prairie smoke (*Geum triflorum*), purple prairie clover (*Petalostemon purpureum*), prairie phlox (*Phlox pilosa*), silverleaf scurfpea (*Psoralea argophylla*), buffalo bean (*Astragalus crassicarpus*), sky blue aster (*Aster oolentangiensis*), sweetlag (*Acorus calamus*), water parsnip (*Sium suave*), wild mint (*Mentha arvensis*), and American water-horehound (*Lycopus americanus*). Approximate total area: 3,140 acres.

MP **Mesic Prairie** - Prairies on moist soil of level to shallowly sloping terrain on glacial till or outwash. Dominant grasses are big bluestem, Indian grass, and prairie dropseed; common associated graminoids include little bluestem, Leiberg's panic grass (*Panicum leibergii*), and switch grass (*Panicum virgatum*). Typical forbs include gray-headed coneflower (*Ratibida pinnata*), heart-leaved alexanders (*Zizia aptera*), blazing stars (*Liatris/gaiafeathers* and *L. aspera*), purple prairie clover, and ironweed (*Vernonia fasciculata*). Approximate total area: 20 acres.

FORESTED WETLANDS

FLOODPLAIN FOREST

FMF **Floodplain forest - silver maple subtype** - Lowland forests on seasonally flooded alluvial soil on river bottoms along larger rivers. Canopy often consists of a tall, open supercanopy of cottonwood (*Populus deltoides*) above a continuous canopy of silver maple (*Acer saccharinum*); other important canopy and subcanopy trees include basswood, American elm, green ash, and peach-leaved willow (*Salix amygdaloides*). Shrubs sparse or absent. Common ground-layer species include wood nettle, tall coneflower (*Rudbeckia laciniata*), honewort, false nettle (*Boehmeria cylindrica*), cow-parsnip (*Heracleum lanatum*), white snakeroot (*Eupatorium rugosum*), and eastern marshweed sedge. Approximate total area: 1,950 acres.

HARDWOOD SWAMP FOREST

MH **Mixed Hardwood Swamp** - Lowland forests on saturated mineral or shallow organic soil in shallow basins on glacial till or outwash. Canopy dominated by black ash with a mix of other lowland hardwood species, including green ash, red maple (*Acer rubrum*), quaking aspen, and elms (*Ulmus* spp.). Shrub layer variable in cover, commonly including red osier dogwood, pussy willow (*Salix discolor*), and wild black currant (*Ribes americanum*). Ground layer contains a diverse assemblage of wetland herbs, such as cattails (*Typha* spp.), lake sedge (*Carex lacustris*), fowl managrass (*Glyceria striata*), northern marsh fern (*Thelypteris palustris*), swamp aster (*Aster puniceus*), spotted jewel weed (*Impatiens capensis*), boneset (*Eupatorium perfoliatum*), and marsh-marigold (*Caltha palustris*). Approximate total area: 350 acres.

BS **Black Ash Swamp - seepage subtype** - Forested swamps in ground-water seepage zones at the bases of steep slopes, often with deep deposits of soft, saturated muck. Canopy with moderate to high cover and dominated primarily by black ash, but basswood, red maple, green ash, and silver maple are often present. Shrubs are sparse and usually include wild black currant. Ground layer typically has large patches of skunk-cabbage (*Symplocarpus foetidus*); other common species include spotted jewel weed, meadow horsetail (*Equisetum pratense*), blue flag (*Iris versicolor*), marsh-marigold, clearweed (*Pilea* spp.), and fowl manna grass. Approximate total area: 10 acres.

CONIFER SWAMP FOREST

TSF **Tamarack Swamp - minerotrophic subtype** - Forested swamps on saturated muck or peat in small ice-block basins. *Sphagnum* mosses are limited to small patches in acidic microhabitats; ground layer is dominated by species that prefer slightly acid to circumneutral, fen conditions. Canopy consists of a moderate to high cover of tamarack (*Larix laricina*), sometimes mixed with black ash, paper birch, American elm, or red maple. Understory typically contains low to moderate cover of shrubs including speckled alder (*Alnus rugosa*), red-osier dogwood, highbush cranberry (*Viburnum trilobum*), and willows (*Salix* spp.). Ground-layer contains many species present in mixed hardwood swamp. Less minerotrophic sites may also contain fen associates such as bog birch (*Betula pumila* var. *glandulifera*), winegrass sedge (*Carex lasiocarpa*), tussock sedge (*Carex stricta*), marsh St. John's-wort (*Triadenum fraseri*), and Loesel's twayblade (*Liparis loeselii*). Approximate total area: 310 acres.

SHRUB WETLANDS

SHRUB SWAMP

WI **Willow Swamp** - Swamps on saturated mineral or shallow organic soil in wetland basins. Dense shrub layer (> 70% cover) dominated by slender willow, pussy willow, Bebb's willow (*Salix bebbiana*), and red-osier dogwood. Graminoids and forbs consist of common wetland species present in wet meadow or mixed emergent marsh communities. Approximate total area: 220 acres.

SC **Seepage Shrub Swamp** - Wet, shrub-dominated communities on organic soils on slight slopes saturated by upwelling calcareous groundwater. Dense shrub layer dominated by bog birch, pussy willow, slender willow, and red-osier dogwood. Herb layer dominated by sedges, particularly prairie sedge (*Carex prairea*), tussock sedge (*Carex stricta*), and woolly sedge (*Carex lanuginosa*). Many species typical of calcareous seepage fen and wet meadow are present. Approximate total area: 70 acres.

OPEN WETLANDS

EMERGENT MARSH

ME **Mixed Emergent Marsh** - Open, flooded wetlands on mineral or shallow organic soils at lake or river margins. Persistent emergent vegetation the canopy but is present today mostly as standing dead snags. Subcanopy and shrub layers are usually dominated by sugar maple and often contain ironwood, bitternut hickory, bladder-nut (*Staphylea trifolia*), pagoda dogwood (*Cornus alternifolia*), red-berried elder (*Sambucus pubens*), or gooseberries. Ground layer includes early-spring ephemeral species such as Dutchman's-breeches (*Dicentra cucullaria*), false rue-anemone (*Isopyrum biternatum*), toothwort (*Dentaria laciniata*), and white trout-lily (*Erythronium albidum*); other common herbs are plants adapted to deep shade such as white bear sedge (*Carex albursina*), putty-root (*Aplectrum hyemale*), Virginia waterleaf (*Hydrophyllum virginianum*), wild leek (*Allium tricoccum*), and zig-zag goldenrod (*Solidago flexicaulis*), as well as several species present in mesic oak forests. Approximate total area: 3,430 acres.

CMF **Cattail Marsh** - Open, flooded wetlands on mineral or shallow organic soil in shallow basins or along lake or river margins. Dominated by cattails (*Typha latifolia* and *T. angustifolia*), typical associated graminoid and forb species include those of mixed emergent marsh. (This type was not mapped except where very large examples (> 160 acres) were present or where it was an important component of a complex of natural communities.) Approximate total area: 1,300 acres.

WET MEADOW / FEN

WM **Wet Prairie** - Wet prairies on poorly drained, mineral or shallow organic soil in shallow depressions. Dominant graminoids are prairie cordgrass (*Spartina pectinata*), bluejoint grass, woolly sedge, and Sartwell's sedge (*Carex sartwellii*). Scattered clumps of willows and red-osier dogwood present. Typical forbs include gayfeather (*Liatris pycnostachya*), sneezeweed (*Helenium autumnale*), Virginia mountain-mint (*Pycnanthemum virginianum*), New England aster (*Aster nova-angliae*), and great lobelia (*Lobelia siphilitica*). Approximate total area: 120 acres.

WME **Wet Meadow** - Open wetlands on wet, seasonally flooded mineral or shallow organic soil in shallow basins or along the margins of marshes within large river valleys; groundwater seepage is present in some cases. Dominant graminoids are lake sedge, tussock sedge, and bluejoint grass; common associated graminoids include fowl manna grass (*Glyceria striata*), fox sedge (*Carex vulpinoidea*), and blunt broom sedge (*Carex tribuloides*). Typical forbs are (typically include red-osier dogwood, slender willow, and pussy willow. Common forbs are swamp-loosestrife (*Lysimachia thyrsiflora*), spotted jewel weed (*Impatiens capensis*), northern marsh fern, American water-horehound (*Lycopus americanus*), and Labrador bedstraw (*Galium labradoricum*). Approximate total area: 1,100 acres.

CF **Calcareous Seepage Fen - prairie subtype** - Open wetlands on organic soil on slight slopes that are continuously saturated by upwelling calcareous groundwater. Shallow domes of peat with small, mucky pools are typical in areas of greatest groundwater flow. Dominant graminoids include prairie sedge, sterile sedge (*Carex sterilis*), tussock sedge, hardstem bulrush, and marsh muhly grass (*Muhlenbergia glomerata*). Low shrubs are often common and typically include sage-leaved willow (*Salix candida*), bog birch, and shrubby cinquefoil (*Potentilla fruticosa*). Typical forb and graminoid species are adapted to cold, mineral-rich groundwater; many of which are rare in other habitats; these include grass-of-parnassus (*Parnassia glauca*), lesser fringed gentian (*Gentianopsis procera*), Kalm's lobelia (*Lobelia kalmii*), Riddell's goldenrod (*Solidago riddellii*) , beaked spike-rush (*Eleocharis rostellata*) , and whorled nut-rush (*Scleria verticillata*). Approximate total area: 120 acres.

SPF **Poor Fen - sedge subtype** - Open wetlands on saturated peat in small basins that receive minimal run-off from surrounding uplands. Surface water acidic. Continuous mat of *Sphagnum* mosses present. Scattered shrubs include bog birch, slender willow, and bog willow. Sedges, particularly wiregrass sedge and large cranberry, are abundant; contains many of the same acid-loving species present in tamarack swamp - sphagnum subtype. Approximate total area: 30 acres.

PRIMARY COMMUNITIES

ROC **Rock Outcrop** - Sparsely vegetated communities on shallow soil patches on level exposures of Jordan sandstone, a habitat subject to frequent, extreme drought. Characteristic plants are brittle cspuntia (*Opuntia fragilis*), rock spikemoss (*Selaginella rupestris*) , three-awn grass (*Aristida basiramea*), flatsedge (*Cyperus straticus*) , Schweinitz's nut sedge, poverty grass (*Sporobolis neglectus*) , Carolina grass-limb (*Geranium carolinianum*) , bluets, Blood milkwort (*Polygala sanguinea*) , and red cedar (*Rames actinoclad*). Lichens cover most of the bare rock surfaces. Areas of deepest soil have dry prairie - sand-gravel subtype. Approximate total area: 10 acres.

RARE SPECIES AND ANIMAL AGGREGATIONS

Locations of rare plants, rare animals, and selected animal aggregations are maintained in the Natural Heritage Information System[5]. The following rare species and animal aggregations (that include rare and non-rare species) have been found in Carver, Hennepin, and Scott counties. Mapped locations include both historical records and the results of field surveys conducted by the Minnesota County Biological Survey in 1996 and 1997. Most rare species are protected under the provisions of the Federal Endangered Species Act or the Minnesota Endangered Species Statute and associated Rules[6]. An asterisk (*) indicates that no recent observation (1970-1997) of that species has been confirmed. A dagger (†) indicates that the species has been documented in one of the counties but its exact location is not determinable.

★ Plants, federally- or state-listed

Fernleaf false foxglove * †	(*Aureolaria pedicularia*)
White wild indigo	(*Baptisia alba*)
Kitten-tails	(*Besseya bullii*)
Handsome sedge* †	(*Carex formosa*)
Plantain-leaved sedge *	(*Carex plantaginea*)
Sterile sedge	(*Carex sterilis*)
Hill's thistle	(*Cirsium hillii*)
Twig-rush	(*Cladium mariscoides*)
Ram's-head lady's-slipper †	(*Cypripedium arietinum*)
Small white lady's-slipper	(*Cypripedium candidum*)
Waterwillow *	(*Decodon verticillatus*)
Big tick-trefoil *	(*Desmodium cuspidatum* var. *longifolium*)
Goldie's fern	(*Dryopteris goldiana*)
Beaked spike-rush	(*Eleocharis rostellata*)
Rattlesnake-master	(*Eryngium yuccifolium*)
Rock clubmoss *	(*Huperzia porophila*)
Rhombic-petaled evening-primrose	(*Oenothera rhombipetala*)
Clustered broomrape * †	(*Orobanche fasciculata*)
American ginseng	(*Panax quinquefolius*)
Club-spur orchid * †	(*Platanthera clavellata*)
Hair-like beak-rush †	(*Rhynchospora capillacea*)
Seaside-flowered cress * †	(*Rorippa sessiliflora*)
Tall rush †	(*Scirpus tennisoni*)
Tall nut-sedge †	(*Scleria triglomerata*)
Whorled nut-rush	(*Scleria verticillata*)
Snow trillium	(*Trillium nivale*)
Valerian	(*Valeriana edulis* var. *ciliata*)
Narrow-leaved vervain * †	(*Verbena simplex*)
Lance-leaved violet * †	(*Viola lanceolata*)
Twisted yellow-eyed grass * †	(*Xyris torta*)

☆ Plants, previously state-listed *

Dragon's-mouth *	(*Arethusa bulbosa*)
Halberd-leaved tearthumb	(*Polygonum arifolium*)
Marsh arrow-grass	(*Triglochin palustris*)

● Colonial waterbird nesting site

Western grebe	(*Aechmophorus occidentalis*)
Great egret	(*Ardea alba*)
Great blue heron	(*Ardea herodias*)
Green heron	(*Butorides virescens*)
Black-crowned night-heron	(*Nycticorax nycticorax*)
Double-crested cormorant	(*Phalacrocorax auritus*)
Eared grebe	(*Podicyps nigricollis*)
Forster's tern	(*Sterna forsteri*)

▣ Bat concentration

Big brown bat	(*Eptesicus fuscus*)
Little brown myotis	(*Myotis lucifugus*)
Eastern pipistrelle	(*Pipistrellus subflavus*)

♦ Animals, federally- or state-listed

Mammals

Prairie vole *	(*Microtus ochrogaster*)
Plains pocket mouse	(*Perognathus flavescens*)
Eastern pipistrelle	(*Pipistrellus subflavus*)
Eastern spotted skunk * †	(*Spilogale putorius*)

Birds

Henslow's sparrow	(*Ammodramus henslowii*)
Red-shouldered hawk	(*Buteo lineatus*)
Cerulean warbler	(*Dendroica cerulea*)
Acadian flycatcher	(*Empidonax virescens*)
Peregrine falcon	(*Falco peregrinus*)
Common moorhen	(*Gallinula chloropus*)
Bald eagle	(*Haliaeetus leucocephalus*)
Loggerhead shrike	(*Lanius ludovicianus*)
Hooded warbler	(*Wilsonia citrina*)

Reptiles

Smooth softshell	(*Apalone mutica*)
Blanding's turtle	(*Emydoidea blandingii*)
Western hognose snake	(*Heterodon nasicus*)
Gopher snake	(*Pituophis catenifer*)

Fish

Skipjack herring *	(*Alosa chrysochloris*)
Blue sucker	(*Cycleptus elongatus*)
Least darter	(*Etheostoma microperca*)
Pugnose shiner	(*Notropis anogenus*)

Mussels

Mucket mussel	(*Actinonaias ligamentina*)
Elktoe mussel	(*Alasmidonta marginata*)
Rock pocketbook mussel	(*Arcidens confragosus*)
Ebonyshell mussel	(*Fusconaia ebena*)
Higgins-eye mussel	(*Lampsilis higginsi*)
Yellow sandshell mussel	(*Lampsilis teres*)
Creek heelsplitter mussel	(*Lasmigona compressa*)
Fluted-shell mussel	(*Lasmigona costata*)
Black sandshell mussel	(*Ligumia recta*)
Hickorynut mussel	(*Obovaria olivaria*)
Round pigtoe mussel	(*Pleurobema coccineum*)
Monkeyface mussel	(*Quadrula metanevra*)
Wartyback mussel	(*Quadrula nodulata*)
Pistolgrip mussel	(*Tritogonia verrucosa*)

◊ Animals, previously state-listed *

Birds

Upland sandpiper	(*Bartramia longicauda*)
American bittern	(*Botaurus lentiginosus*)
Osprey	(*Pandion haliaetus*)

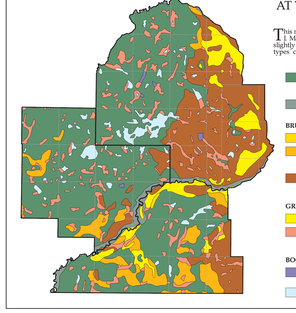
Reptiles

Fox snake	(*Elaphe vulpina*)
Eastern hognose snake	(*Heterodon platyrhinos*)
Milk snake	(*Lampropeltis triangulum*)

Fish

American brook lamprey	(*Lampetra appendix*)
Shovelnose sturgeon	(*Scaphirhynchus platorynchus*)

THE VEGETATION OF CARVER, HENNEPIN, AND SCOTT COUNTIES AT THE TIME OF THE PUBLIC LAND SURVEY



This map shows the vegetation of Carver, Hennepin, and Scott counties as interpreted by Francis J. Marschner using Public Land Survey records from 1853-1856. The legend descriptions are slightly modified from Marschner's as appropriate for eastern Minnesota. Extant natural community types[3] corresponding to Marschner's categories are listed in parentheses.

HARDWOOD FOREST

Upland Deciduous Forest - bur oak, white oak, red oak, northern pin oak, elm, basswood, ash, maple, hackberry, aspen, birch (Oak Forest, Maple-Basswood Forest, Lowland Hardwood Forest, Black Ash Swamp).

River Bottom Forest - elm, ash, cottonwood, boxelder, silver maple, willow, aspen, hackberry (Floodplain Forest).

BRUSHLAND

Brush Prairie - grass and brush of oak and aspen (Oak Woodland-Brushland, Dry Oak Savanna).

Aspen-Oak Land - aspen, generally dense, and small in most places, with scattered oaks and few elms, ash and basswood (Aspen Woodland, Oak Woodland-Brushland; includes areas that have succeeded to Oak Forest).

Oak Openings and Barrens - scattered trees and groves of oaks of scrubby form with some brush and thickets (Dry Oak Savanna. Mesic Oak Savanna; includes many areas that have succeeded to Oak Woodland-Brushland or Oak Forest).

GRASSLAND

Prairie - (Dry Prairie, Mesic Prairie).

Wet Prairies, Marshes and Sloughs - marsh-grasses, flags, rushes, wild rice, with willow in some places (Calcareous Seepage Fen, Wet Prairie, Wet Meadow, Mixed Emergent Marsh, Cattail Marsh).

BOGS AND SWAMPS

Conifer Bogs and Swamps - Tamarack (Tamarack Swamp, White Cedar Swamp, Rich Fen, Poor Fen).

Open Water

FOOTNOTES

1. The Minnesota County Biological Survey is a systematic survey of rare biological features. The goal of the Survey is to identify significant natural areas and to collect and interpret data on the distribution and ecology of rare plants, rare animals, and natural communities.
2. Civil division, transportation, water features, and state-owned managed area boundary data were obtained from the Department of Natural Resources, St. Paul, Minnesota. National Wildlife Refuge boundary data were obtained from the U.S. Fish and Wildlife Service. Every effort was made to obtain current versions of these data; however, errors may exist on this map. Land ownership within managed areas is sometimes obscured by natural community map units.
3. Minnesota Natural Heritage Program. 1993. *Minnesota's Native Vegetation: A Key to Natural Communities, Version 1.5*. Minnesota Department of Natural Resources, St. Paul, Minnesota. 111 pp.
4. Natural community boundaries were delineated by photo-interpretation of 1:18,540 color infrared (CIR) aerial photography taken in October, 1994 (Minnesota DNR Division of Forestry) and 1:40,000 CIR aerial photography taken 20 April and 13 May, 1991 (National Aerial Photography Program, USGS, U.S. Department of the Interior). Natural community boundaries were digitized at a scale of 1:24,000.
5. Acreage figures for mapped types are approximate to the nearest 10 acres.
6. Data are available from the Minnesota Natural Heritage Information System, Department of Natural Resources, St. Paul, Minnesota. Phone (612) 296-2835.
7. Endangered Species Act of 1973 (16 USCA 1531 et seq.); Minnesota Statutes, section 84.0895, and Minnesota Rules, Part 6212.1800 to 6212.2300. Additional information on rare species is available in *Minnesota's Endangered Flora and Fauna* , edited by B. Coffin and L. Pfannmuller, University of Minnesota Press, Minneapolis, 1988.
8. These species were listed under the provisions of the Minnesota Endangered Species Statute when the Minnesota County Biological Survey was conducted in these counties. New information on their distribution and abundance has since resulted in their removal from the state list.
9. Marschner, F. J. 1974. The original vegetation of Minnesota (map, scale 1:500,000). USDA Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota (redraft of the original 1930 edition). The Public Land Survey records include information on trees that were marked as "witness" or "bearing" trees at the section, quarter-section, and meander corners; the kind of tree, its diameter at breast height, and its distance and compass direction from the corner. Also included are notes about features encountered along section lines, and summary descriptions of each township.

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