

Minnesota Wetlands Conservation Plan

VERSION 1.0
1997

Based on January 1997
Work Team Recommendations

Minnesota Wetlands Conservation Plan (MWCP)

Sponsoring State Agencies:

Minnesota Board of Water & Soil Resources
Minnesota Department of Natural Resources
Minnesota Pollution Control Agency
Minnesota Department of Transportation
Minnesota Department of Agriculture

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Minnesota Wetlands Conservation Plan (MWCP)

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1. INTRODUCTION

Highlights of the Plan

Development of a Minnesota Wetlands Conservation Plan began when interested State and Federal agencies saw a need for an "umbrella" policy framework to help link their different responsibilities and to provide more guidance for administering wetlands programs, staff, and budgets. The plan was designed to start with wetlands policies already in place and to present policy guidance and enhanced information for decision-making. Therefore, this plan addresses several dilemmas in Minnesota's existing wetlands conservation system that have frustrated landowners and government officials for some time.

The Minnesota Wetlands Conservation Plan (MWCP) addresses four basic challenges for the State's wetlands conservation system in the mid-1990s:

- ★ To recognize and apply regional differences in wetlands policies and decision-making.
- ★ To simplify the permitting system and make it more accessible, responsive, and efficient.
- ★ To develop and deliver better information to people making decisions about wetlands.
- ★ To give resource agencies a common set of statewide strategies for conservation of wetlands.

REGIONAL MANAGEMENT: Getting Away from "One-Size-Fits-All" Wetland Policy

This chapter describes regional differences for 14 areas of the state based on their ecology and general landscapes, watershed features, major land use patterns, and wetland characteristics. An important bridge is made between state-level and local-level wetland conservation responsibilities. Management strategies that reflect regional differences are outlined.

STATEWIDE MANAGEMENT: Guidance For Programs & Priorities

This chapter provides guidance for wetland restoration; wetland mitigation and replacement; and four different kinds of management settings that can be found in most regions of Minnesota: urban, rural, natural environment, and unique settings. This guidance will assist with prioritizing, budgeting, and staffing decisions for state agencies. It should also provide important assurances to the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, and the U.S. Department of Interior about the quality of Minnesota's wetland conservation policies, programs, and guidelines.

REGULATORY SIMPLIFICATION: Getting Closer to "One-Stop-Shopping"

This chapter outlines a staged approach for modifying the current regulatory permitting system to streamline processes for landowners, permit applicants, and regulators so that so that greater efficiency and cost-effectiveness are realized. The approach is designed to be "universal," so that the simplification objectives can be pursued regardless of how many local, state, or federal government entities have jurisdiction or how those government units are organized.

EDUCATION & OUTREACH

The next step for education and outreach about wetlands in Minnesota is to target the needs of specific audiences, including landowners and other citizens, local government staff, local elected and appointed officials, agency staff, students, and private sector professionals in land use and development.

GOAL STATEMENT

The goal for wetland conservation in Minnesota is to maintain and restore the quality and diversity and increase the overall quantity of wetlands in the state, varying regionally in accordance with differences in the character and health of the wetland resource, in order to promote ecologically, socially, and economically sustainable communities. The purpose of the Minnesota Wetlands Conservation Plan is to guide stewardship of wetlands and it does so by using a geographic system approach to the issues.

This Goal Statement sets forth an objective of continuous improvement, always trying to do better both for the well-being of citizens and for sustainability of the natural resource. The Goal Statement does not set a target date for a precise objective, which might imply that the job would then be done. Sustainability is an aspiration and a way of "doing business" over time in a complex set of dynamic circumstances, rather than an objective that can be achieved and set aside. This theme is reflected in management actions for the strategies that follow; target dates became a moot point because nearly all of the listed actions were rated as highly important for immediate or ongoing implementation.

CONCLUSION

This state wetlands conservation plan presents ways to adapt existing administrative structures and programs in more effective and efficient ways. State and federal agencies will find guidance in this plan for dealing with wide variations in conditions and circumstances around the state. Strong and thorough local water plans and wetlands plans (prepared on a watershed-basis) and local land use plans are essential for wetlands conservation in Minnesota, and this plan can support those efforts.

The Minnesota Wetlands Conservation Plan is not just a product of science; it is also a product of "grass roots" knowledge and experience, land use conditions (community and economic), and a planning process that brought different people together to do the work. The interactive approach to plan development required scientists to stretch themselves and learn from citizens, and it gave non-scientists the opportunity to learn more about the science behind existing and proposed wetland policies. All participants got to know and understand each other better during the year. These ways of learning and relationship-building were essential for creating a wetlands plan that would have broad-based public and governmental support. Ideally, these relationships will continue and aid executive and legislative efforts to use the plan.

Project Origins & Purpose

This voluntary initiative was underway in Minnesota during 1993-97 to improve the management and conservation of wetlands. The need for a state wetlands conservation plan grew out of a recognition by agency staff that some aspects of the State's wetlands management system need improvement, such as:

- Cumbersome processes,
- Confusion about definitions and policies,
- Lack of clear guidance for achieving no-net-loss and restoration of wetlands.

The sponsoring state and federal agencies saw a need for an "umbrella" policy framework to help link their different responsibilities and to provide more guidance for administering wetlands programs, staff, and budgets. The project was designed to use existing wetlands policies as the starting point and to move forward from there to create policy improvements and enhanced information for decision-making.

OBJECTIVES OF SPONSORING STATE AGENCIES

The state wetlands conservation planning project was sponsored by the following agencies:

Minnesota Department of Natural Resources
Minnesota Board of Water & Soil Resources
Minnesota Department of Transportation
Minnesota Pollution Control Agency
Minnesota Department of Agriculture.

These were the responsible agencies for the planning grant from the U.S. Environmental Protection Agency (EPA) under its *State Wetland Protection Development Grant Program* (Clean Water Act Section 104), and state matching funds for the project.

The following needs and concerns were set forth in a Charter signed by sponsoring state agency leaders in November 1995:

- ◆ To create a wetlands conservation, restoration, and mitigation strategy that includes:
 - a) up-to-date qualitative and quantitative information on statewide wetland resources;
 - b) specific objectives for existing and former wetland resources across the state;
 - c) a framework to guide public and private sector wetlands programs and priorities; and
 - d) suggestions for improvements to Minnesota's wetland banking program.
- ◆ To improve the wetlands permitting and management system; to coordinate regulatory efforts with public and private non-regulatory programs for wetlands conservation; and to assist local government units with their responsibilities for wetlands.
- ◆ To clarify the statewide public benefits from wetlands conservation and benefits for individuals and communities; and to deal with the potential burdens of wetland conservation upon local government units and landowners which could be barriers to wetlands conservation.

PLANNING PROCESS AND OBJECTIVES CONSISTENT WITH MEPA

This voluntary wetlands planning initiative by state agencies is consistent with Minnesota Statutes §116D.03 of the *Minnesota Environmental Policy Act (MEPA)*, which requires all state agencies to, among other things:

- ❖ Seek to strengthen relationships between State, regional, local, and Federal-State environmental planning, development, and management programs.
- ❖ Utilize a systematic, interdisciplinary approach that will ensure the integrated use of the natural and social sciences and the environmental arts in planning and in decision-making which may have an impact on the environment.
- ❖ Identify and develop methods and procedures that will ensure that environmental amenities and values, whether quantified or not, will be given at least equal consideration in decision making along with economic and technical considerations.
- ❖ Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.
- ❖ Recognize the worldwide and long range character of environmental problems.
- ❖ Make available to counties, municipalities, institutions, and individuals, information useful in restoring, maintaining, and enhancing the quality of the environment.

These requirements describe much of the intent, hard work, and public-spirited collaboration that has gone into development of a wetlands conservation plan for Minnesota.

COLLABORATIVE EFFORT WAS ESSENTIAL

The Minnesota Wetlands Conservation Plan (MWCP) was created through the combined efforts and contributions of a diverse group of experienced citizens and professionals throughout Minnesota. Because the physical, social, and institutional aspects of wetlands management form a complex and dynamic system over time and space, the MWCP is not designed to be a book of absolute, final "answers." Rather, the MWCP provides guidance for anticipating future choices and the consequences of alternative decisions.

Audience for the MWCP

The MWCP provides information and guidance for decision-makers at many jurisdictional levels. The intended audiences for the MWCP are the following (in this order):

1. State agencies with environmental and resource responsibilities in wetlands management.
2. Local government units that make land use decisions affecting wetlands.
3. Federal agencies with jurisdiction over wetlands management.
4. Private sector organizations and persons interested in state wetlands policy.

The clearest example of the usefulness of this plan is the information and guidance it provides for State agencies to assist with program budgeting, staffing, and prioritizing of administrative resources. The restoration strategy in particular provides much-needed guidance for non-regulatory wetland program activities. Persons affected by the use of the MWCP or the implementation of various wetlands programs may also find this information useful.

Importance of Perspective & Meaning

The creation of plans and policies is inherently subjective because of the uncertainties and personal differences that are usually involved. Uncertainties arise from such factors as unavailable or incomplete information, differences in interpretation, complexity, and unpredictable outcomes. In addition, all participants in plan development brought along varied personal and professional skills, plus their own biases, based on different perspectives, experiences, training, and objectives. However, these differences added richness to the discussions and illuminated some of the uncertainties they faced. The complexity and controversy of wetland conservation is such that purely objective, technical answers (if available at all) provide insufficient guidance for policy and management.

Many words used in the plan have more than one meaning, which can confound the search for common understanding and common ground. Every effort has been made to state clearly the meaning of terms as they are used in this plan. A Glossary is also provided in the *Appendix*; alternate definitions that are not used in the plan were not included in the Glossary.

Implementation

Action tasks are listed in most chapters of the plan. Some action items identify a specific responsible party; in other instances, the responsible leaders and partners are listed below the tasks. A few action items have target dates, but most tasks can or should be done as soon as possible or on an ongoing basis. If a general task or objective is stated, the responsible parties should go further to specify any sub-tasks and to clear up uncertainties.

There may be some recommendations in this plan that cannot be fully implemented without adjustments to current state laws or rules. In such cases, related actions may have to be deferred until statutory or rule revisions are made.

2. CURRENT CONDITIONS

Assessment of Wetland Resources

DESCRIPTION OF WETLAND RESOURCES IN MINNESOTA¹

Wetlands are defined as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support (and that under normal circumstances do support) a prevalence of vegetation typically adapted for life in saturated soil conditions.

Minnesota has more wetland acreage than any other state except Alaska, in spite of extensive losses due to conversion for agricultural and development uses since the mid-19th Century. There are approximately 10.6 million acres of wetlands in the state (see page 9 for information on inventories). The wetlands found in Minnesota vary considerably and are distributed quite differently across the state.

Wetlands are classified by type

Two wetland classification methods are referenced in Minnesota statutes and applied in State rules:

CIRCULAR 39: The mapping method used for the initial state wetland protection program and the Protected Waters Inventory legislation of 1976 and 1979 was *Wetlands of the United States*, published as U.S. Fish & Wildlife Service Circular 39 in 1956 and reprinted in 1971. It was also used in the 1996 amendments to the Wetland Conservation Act. Eight types of wetland basins are recognized in Minnesota under this method (none assigned to rivers or lakes).

COWARDIN SYSTEM: In 1979, the U.S. Fish & Wildlife Service published the Cowardin et al. method, *Classification of Wetlands and Deepwater Habitats in the United States*. This comprehensive representation of all water and wetland habitats is used on National Wetland Inventory maps and in Minnesota's original 1991 Wetland Conservation Act. The Cowardin system provides a more detailed classification of wetland habitats than the Circular 39 method.

To keep this plan simple, data from the National Wetland Inventory was translated into the more familiar eight basin types from the Circular 39 method; riverine and industrial/municipal wetland types were added to the Circular 39 types.

The following general types of wetlands are found in Minnesota:

- Seasonally flooded basin or flat** (Type 1)
- Wet meadow** (Type 2)
- Shallow marsh** (Type 3)
- Deep marsh** (Type 4)
- Shallow open water** (Type 5)
- Shrub swamp** (Type 6)
- Wooded swamp** (Type 7)
- Bogs** (Type 8)
- Riverine** (Wetlands that are contained in natural or artificial channels periodically or continuously containing flowing water; may be perennial or intermittent. Excludes shoreland wetlands.)
- Industrial / Municipal** (Artificially flooded impoundments identified on National Wetland Inventory maps with water regime "K".)

See **Figure 1** for a comparison of wetland types by total acreage, and refer to the *Appendix* for descriptions for descriptions of wetland types.

¹ Wayne Jacobson of SEH, Inc., contributed text for this section on Minnesota's wetland resources.

Summary of wetland functions and values

Wetlands provide various direct benefits at different levels of scale; these benefits are also called wetland "functions and values." The term "benefits," as used throughout this plan, includes both qualitative and quantitative services and improvements to the quality of life for individuals, communities, the state's citizens, and to overall conditions provided through the integrity of land and water systems. Many of these benefits cannot or have not been measured in monetary terms, so the term "benefits" includes but is not limited to economic valuation in this plan. Similarly, the term "value" includes, but is not limited to, economic value in this plan.

Wetland functions are defined as natural processes that occur in wetlands, which vary according to the type (class) of wetland; the season or year; the location within a watershed; and land uses that affect the hydrological and ecological integrity of the wetland. The possible functions are not mutually exclusive; in other words, a wetland may perform one or many more functions. **Wetland values** are typically subjective, non-site-specific benefits that are realized to society and individuals through natural wetland functions occurring in wetlands.

WETLAND FUNCTIONS, in no rank order:

- A. HYDROLOGIC FLUX AND STORAGE:** includes ground water recharge and discharge; stream discharge and recharge; water storage, and evapotranspiration export.
- B. BIOLOGICAL PRODUCTIVITY:** includes primary productivity; secondary productivity; carbon storage; and carbon fixation.
- C. BIOGEOCHEMICAL CYCLING AND STORAGE:** wetlands can be a nutrient source or sink, an area for oxidation and reduction chemical transformations; an area for denitrification; and reservoirs for sediment and organic matter.
- D. DECOMPOSITION:** involves carbon release; mineralization; detritus output for aquatic organisms; and release of chemical compounds.
- E. COMMUNITY WILDLIFE HABITAT:** providing habitat for algae, bacteria, fungi, insects, invertebrates, wetland plants, fish, shellfish, amphibians, reptiles, shorebirds, waterfowl, and other wildlife. Wetlands are often critical habitat for rare and unique species enhance the diversity and resilience of plant and animal communities.

WETLAND VALUES, in no rank order, with the wetland functions that influence them [brackets]:

- ◆ Water supply and low flow augmentation [A]
- ◆ Flood water retention [4]
- ◆ Water quality protection [A,B,C]
- ◆ Sediment control [A,C]
- ◆ Wastewater treatment [B,C]
- ◆ Nutrient removal [B,C]
- ◆ Shoreline anchoring and erosion control [A,B,C]
- ◆ Education and research [A,B,C,D,E]
- ◆ Historical and archeological resources [B,E]
- ◆ Open space [A,B,E]
- ◆ Aesthetics [A,E]
- ◆ Recreation [A,E]
- ◆ Hunting and trapping [B,E]
- ◆ Plant and animal refuges [E]
- ◆ Threatened and endangered species habitat [E]
- ◆ Crop (e.g., hay) and pasture [A,B]
- ◆ Timber production [A,B]
- ◆ Peat production [B,C,D]
- ◆ Shrub crops (e.g., cranberry) [A,B]
- ◆ Wild rice gathering/production [A,B]
- ◆ Food production/aquaculture (fish, game) [B,E]
- ◆ Medical product production (streptomycin) [D,E]

Functional assessment

The **Minnesota Routine Assessment Method For Evaluating Wetland Values (MNRAM)**, is a recently developed analytical method to evaluate wetland functions and values. MNRAM is designed to be used by trained and experienced wetland scientists, because of the inherent complexity of evaluating wetland functions in different sites and different areas of the state. **The methodology is now available for use statewide.** It may be updated and improved in future editions (see *Appendix* for contact persons). Using MNRAM, an evaluator assigns a low, medium, high, exceptional, or not-applicable rating to a consolidated set of nine wetland functions and values:

- | | | |
|----------------------------|----------------------------|-------------------------------------|
| ◆ Flood and storm water | ◆ Water quality protection | ◆ Floral diversity and integrity |
| ◆ Shoreline protection | ◆ Wildlife habitat | ◆ Aesthetics, recreation, education |
| ◆ Ground water interaction | ◆ Fishery habitat | ◆ Commercial uses |

See Minnesota Rules Section 8420.0540 for other acceptable assessment methods.

WHAT DO WE MEAN BY "DEFINING" WETLANDS?

Under this plan, the term "wetlands" includes both regulated and unregulated (or exempted) wetlands. It was apparent from the early stages of plan development that there can be much confusion in discussions about "what is a wetland," because two distinct meanings are often used simultaneously in conversation. **It is important to distinguish: (a) policy decisions** about which wetlands will be regulated and managed for public policy purposes under state law and policy, **from (b) scientific determinations** about how wetlands are defined, identified, and delineated. Some wetlands are not regulated under Minnesota or federal laws.

Which wetlands are regulated?

The following statutes establish which wetlands are regulated under Minnesota law (refer to the statute or related rules for more specific details):

"Public waters wetlands" are protected under state laws governing all public waters. Under Minnesota Statutes Section 103G.005, Subd. 18, they are defined as "all types 3, 4, and 5 wetlands, as defined in United States Fish and Wildlife Service Circular No. 39 (1971 edition) . . . that are ten or more acres in size in unincorporated areas or 2-1/2 or more acres in incorporated areas." Public waters wetlands were inventoried during the 1980s by the Department of Natural Resources. The boundaries of such wetlands (and other water basins and watercourses like lakes and rivers) are set at the "ordinary high water level" (OHW), as defined in Minnesota Statutes Section 103G.005.

Wetlands protected under the Wetland Conservation Act are delineated according to the United States Army Corps of Engineers Wetland Delineation Manual (January 1987), pursuant to Minnesota Statutes Section 103G.2242, Subd. 2, except those which are public waters wetlands regulated under Minnesota Statutes Section 103G.005 Subd. 18. Exemptions apply with some kinds of current and historical land uses and where the wetland size is smaller than minimum regulatory requirements.

What is a wetland?

A wetland is an ecosystem that depends on constant or recurrent, shallow inundation or saturation at or near the soil surface. The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation at or near the surface and the presence of physical, chemical, and biological features reflective of such inundation or saturation (*National Research Council, 1995*).

"Delineation" is the process of identifying boundaries and classifying a wetland. The three elements that must be present under normal circumstances for the site to be called a wetland are:

1. A hydric soil substrate.
2. Greater than 50 percent dominance of hydrophytic plant species.
3. Wetland hydrology during the growing season.

This scientific determination is best performed by a competent wetland professional (public or private sector). See *Appendix* for a list of information sources on wetland definition and delineation.

HYDRIC SOILS DEFINITION

A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. "Anaerobic" means an absence of oxygen.

The four general types of hydric soils are:

Organic soils
Mineral soils with high or perched water tables
Ponded soils
Flooded soils

If a county has a completed soil survey, they generally will also have a county list of whole unit hydric soils which were formed in wet conditions. However, field evidence of hydric soils is the best measure of whether or not the criteria are met and often requires assessment by a competent soil scientist or wetland professional.

HYDROPHYTIC VEGETATION DEFINITION

Any macrophyte that grows in water or on a substrate [soil] that is at least periodically deficient in oxygen as a result of excessive water content.

In Minnesota, plants are classified into five general categories by the "National List of Plant Species That Occur in Wetlands: North Central (Region 3), as follows:

<u>Indicator Category</u>	<u>Symbol</u>	<u>Occurrence in Wetlands</u>
Obligate Wetland Plants	OBL	> 99% (usual definition is < 1% in upland)
Facultative Wetland Plants	FACW	67-99%
Facultative Plants	FAC	34-66%
Facultative Upland Plants	FACU	1-33%
Obligate Upland Plants	UPL	< 1%

At times, a "+" is added to the indicator, meaning that plant tends toward the wet end of the spectrum, or a "-" is added, meaning it tends toward the dry end. **When more than 50 percent of the dominant species** (at least 20 percent cover in tree, sapling, shrub, woody vine, and herb strata) **of a plant community are OBL, FACW, and FAC species (excluding FAC-), the plant community is considered hydrophytic.**

WETLAND HYDROLOGY DEFINITION

Generally, an area has wetland hydrology when it is seasonally inundated and/or saturated to the surface for a consecutive number of days for more than 12.5 percent of the growing season. Areas saturated to the surface between 5 percent and 12.5 percent of the growing season are sometimes wetlands and sometimes uplands. Areas saturated to the surface for less than 5 percent of the growing season are not wetlands. The growing season is defined as the average number of days that soil temperature at 19.7 inches $\geq 41^{\circ}\text{F}$ (biologic zero). The growing season is also approximated by the average number of days that average air temperatures exceed 28°F . The growing season is reported in county soil surveys.

Wetland hydrology sources include: precipitation; infiltration; runoff; flow from streams or lakes; ground water discharge or recharge; and evapotranspiration. A way to determine whether a site has wetland hydrology is to use a checklist at a point using the Routing On-site Determination Method in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual, as follows:

Primary Wetland Hydrology Indicators (only one required):

- ♦ Inundation - if an area is covered with water in the growing season, exclusive of recent weather conditions.
- ♦ Saturation within 12 inches of the soil surface - if upon digging a 20-inch soil pit glistening moisture is found on freshly broken soil peds (soil aggregates).
- ♦ Water marks - found most commonly as stains on woody vegetation, but can also be observed on other vegetation or on fixed objects such as bridge pillars or fences.
- ♦ Drift lines - deposits of debris in a line on the wetland surface. Debris typically consists of branches, leaves, and sediment, and is deposited parallel to the direction of water flow (often adjacent to streams).
- ♦ Sediment deposits - plants often retain thin coatings of mineral or organic matter after inundation.
- ♦ Drainage patterns - many wetlands have characteristic drainage patterns on the landscape that indicate where surface water flows during storm events.

Secondary Wetland Hydrology Indicators (two or more required):

- ♦ Oxidized root channels in the upper 12 inches of soil - these are oxidized or rust-colored channels in the soil which may form around roots and rhizomes of hydrophytic plants.
- ♦ Water-stained leaves - forested wetlands which become inundated often have grayish or blackish-appearing leaves on the forest floor, darkened from being under water.
- ♦ Local soil survey data - if a soil is mapped as a whole unit hydric soil and field observations confirm the soil profile and natural drainage characteristics, this parameter can be used.
- ♦ FAC-Neutral Test - a test in which all dominant plants on a site from all strata are listed and those rated FAC are eliminated; a site that has more dominant species rated OBL or FACW than FACU or UPL will pass the FAC-neutral test.

TRACKING THE STATUS OF MINNESOTA'S WETLANDS ²

Statewide inventories

There are four sources of statewide data on wetlands: a University of Minnesota study from 1984, two different national inventories, and a state inventory:

Anderson & Craig, *Growing Energy Crops on Minnesota's Wetlands: The Land Use Perspective* (1984)

THIS STUDY DETERMINED THAT THERE ARE 8.8 MILLION ACRES OF WETLAND IN MINNESOTA, COMPARED TO AN ESTIMATED 18.6 MILLION ACRES OF PRESETTLEMENT WETLANDS. The amount of presettlement wetlands is based on 1969 land use and soils data using 40-acre size parcels. Although this is an old study, it remains the best available statewide estimate of wetlands at the time of statehood in 1858. **Figures 2 and 3** show presettlement and current wetlands. **Table 1** shows estimates of remaining presettlement wetlands by county; losses vary from as low as 0 percent remaining in the southwest to as much as 100 percent remaining in the northeast.

The National Wetland Inventory (NWI)

NWI maps include all waters, wetlands, and rivers that have measurable area. **THE NWI SUMMARY INDICATES APPROXIMATELY 10.6 MILLION ACRES OF WETLANDS CURRENTLY EXIST IN MINNESOTA** (excluding water areas deeper than two meters). Most of this data was mapped during the period from 1982 through 1993; it is based on aerial photography done from 1974 through 1984. There are three potential and known inaccuracies in the NWI data: (1) NWI maps exclude some farmed wetlands and may contain inaccuracies because of land use changes since the maps were developed; (2) There are sometimes mistakes when identifying certain types of wetlands with remote sensing methods (e.g., very small wetlands and wetlands covered by dense forests); and (3) Missing photos for about 1,000 acres in western Minnesota were recently found, although they should not significantly alter any data or conclusions in this plan. Nevertheless, the NWI is the best and most current statewide data available for existing wetlands.

National Resources Inventory (NRI)

The Natural Resources Conservation Service has developed the National Resources Inventory (NRI), which is based on field sampling and statistical calculations. **THIS INVENTORY, which includes farmed wetlands, CONCLUDED FROM 1992 DATA THAT A TOTAL OF APPROXIMATELY 10.6 MILLION ACRES OF WETLANDS** (and 3.6 million acres of water areas deeper than two meters) **REMAIN IN MINNESOTA, COMPARED TO A PRESETTLEMENT AMOUNT OF 20+ MILLION ACRES.** The statistical model is accurate only at a very large scale and is not useful for field work or local planning efforts.

Minnesota Protected Waters Inventory (PWI) ³

PWI maps are regulatory maps, organized on a county basis, that identify the water bodies (lakes, watercourses, and wetlands) subject to the requirements of the Minnesota Protected Waters Permit Program. Wetlands included in these regulatory maps include Types 3, 4, and 5 wetlands over 10 acres in unincorporated areas and 2.5 acres in incorporated areas, as defined in United States Fish & Wildlife Circular No. 39 (1971 edition). **THIS INVENTORY LISTS A TOTAL OF 261,709 ACRES IN 10,029 BASINS CODED "W" (wetland), AND 3,311,101 ACRES IN 11,842 BASINS CODED "P" (includes lakes, except Lake Superior); some of the "P" basins would be identified as wetlands under other regulations.**

Local inventories

Some watershed districts, counties, and cities have conducted recent inventories of the wetlands within their jurisdiction in connection with local water planning or land use planning. Inventories at the regional or site-level of scale can be done to varying degrees of precision and cost. Inventory costs can be prohibitive if the study area is large, it has a large number of wetlands, or there are insufficient funds available for a study.

² Jaschke, John, *Minnesota Wetland Report 1995*, Minnesota Board of Water & Soil Resources (December 1996).

The Minnesota Department of Natural Resources (Division of Waters) also contributed information for this section.

³ Protected Waters and Wetlands Inventory Program Statistics, Minnesota Department of Natural Resources (Division of Waters).

Gains and losses

Has the State achieved its objective of no-net-loss of wetlands on a statewide basis (the state policy adopted in the Wetland Conservation Act)? The answer is "probably not," and it is difficult to estimate exactly how far Minnesota is from that goal.

Data on wetlands under the Wetland Conservation Act (WCA) is reported annually by the Minnesota Board of Water & Soil Resources. The 1995 Minnesota Wetland Report (published in December 1996) provides the following information for the year 1995 (refer to the report for additional data):

- Of the 7,673 project proposals, 71 percent were ultimately resolved with no disturbance at all to a wetland (an estimated protection of 3,493 wetland acres). There were 380.7 replacement acres for 236.7 acres of unavoidable wetland impacts.
- On the other hand, significant wetland losses take place through activities that require no approvals or permits, making them nearly impossible to track. For example:
 - There were 979 WCA exemption determinations made by local government units at the request of landowners, resulting in 1,069 acres being drained or filled. Since exempt activities do not require government approval, presumably there were unknown, unreported wetland losses.
 - Losses through non-agricultural wetland impacts approved by the U.S. Department of Agriculture for farm program participants. [Note that many WCA exemptions match federal agricultural exemptions.]
 - Exemptions and nationwide permits from the U.S. Army Corps of Engineers under the Clean Water Act Section 404 Program result in unknown wetland losses.
 - Unreported violations of all programs.

As challenging as it is to estimate gains and losses of wetland acreage, it is even more difficult to measure the functional gains and losses resulting from wetland-related projects. Quantitative and qualitative data on wetland functions and values is not available, even though it would be more valuable than acreage data. Therefore, the report concludes that **MINNESOTA'S REGULATORY PROGRAMS ARE INDEED PROTECTING WETLANDS, BUT IT IS LIKELY THAT LOSSES STILL EXCEED ANY GAINS IN WETLAND ACREAGE.**

PARTICIPANTS' VIEWS

Participants in plan development (focus groups and a plan development network during 1994-1996) did not question that severe losses of wetlands have taken place in southern and western parts of Minnesota and that north central and northeastern Minnesota retains most of its extensive wetlands. They generally believed that the greatest current threat of wetland impacts is associated with urban development and roads. Due to changes in agricultural practices and the extensive drainage systems already in place, new wetland impacts from agriculture have decreased considerably, but reports of new drain tiling (with and without permits) continued to surface throughout the planning process.

Popular themes in participants' discussions about the current situation and the direction for a state wetlands plan can be summarized as follows:

- ★ **THE IDEA OF PROTECTING AND RESTORING WETLANDS AND MANAGING THEM WISELY IS VERY POPULAR AMONG MINNESOTANS.** It isn't so much a question of whether to protect and restore wetlands anymore; most concerns now revolve around improving how wetlands are managed in this state. "We can do better" was the hopeful driving force for a variety of participants in the development of this wetlands plan.
- ★ **WE CANNOT THINK OF WETLANDS AS ISOLATED LANDSCAPE FEATURES ANYMORE.** Wetlands are connected to other water flows and basins and to surrounding uplands. They are perceived as both assets and liabilities by landowners, neighbors, developers, communities, and citizens across the state. The question of what to do with a wetland is rarely simple.

- ★ **WE HAVE TO FIND WAYS TO DO BETTER WETLAND CONSERVATION AND ALSO WORK TOWARD SUSTAINABLE COMMUNITIES AND STRONG ECONOMIES.** These two objectives do not have to be mutually exclusive and in perpetual conflict. Both objectives depend on the exercise of both rights and responsibilities by landowners, government, and other interested parties.
- ★ **WETLANDS MANAGEMENT PLANS AND PROGRAMS SHOULD COORDINATE WELL ACROSS DIFFERENT SCALES OF GEOGRAPHY AND JURISDICTION.** State wetland policies should accommodate regional differences. Local water plans and wetlands plans should address specific local and regional needs and also reflect statewide wetland policies. All regulators and other interested parties should strive to work together for optimal decisions about wetlands that meet multiple needs and concerns.

These were common reasons why so many people from different levels of government and from the private sector chose to participate in plan development. The participants' knowledge of both the state and the issues was crucial and helped frame the plan's content. [More information from participants in plan development is summarized later in this chapter.]

FIGURE 1 - COMPARISON OF WETLAND TYPES BY TOTAL ACREAGE

Totals For State of Minnesota

Source: Minnesota Board of Water & Soil Resources (December 1996)

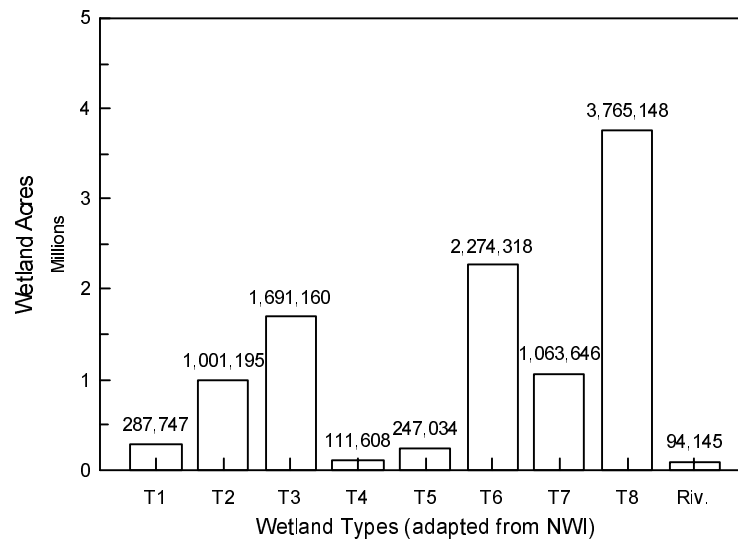


FIGURE 2 ~ ESTIMATE OF MINNESOTA WETLANDS Circa 1860s

Based on an Analysis of Hydric Soils

Source: Anderson, Jeffrey P. & William J. Craig, "Growing Energy Crops on Minnesota's Wetlands: The Land Use Perspective", Center For Urban and Regional Affairs (University of Minnesota, 1984).

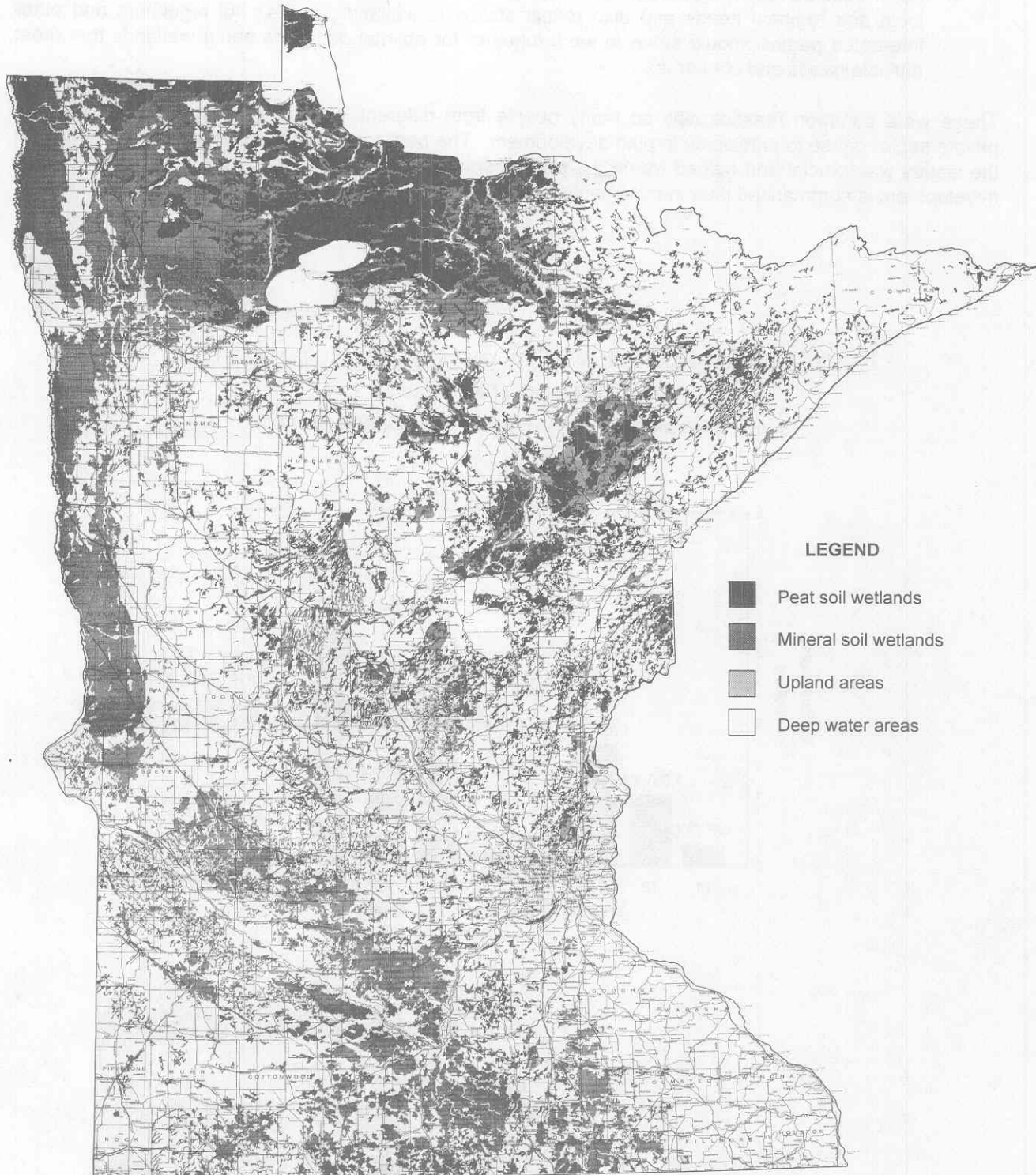


FIGURE 3 - ESTIMATE OF MINNESOTA WETLANDS CIRCA 1981

Based on an Analysis of Hydric Soils

Source: Anderson, Jeffrey P. & William J. Craig, "Growing Energy Crops on Minnesota's Wetlands: The Land Use Perspective", Center For Urban and Regional Affairs (University of Minnesota, 1984).

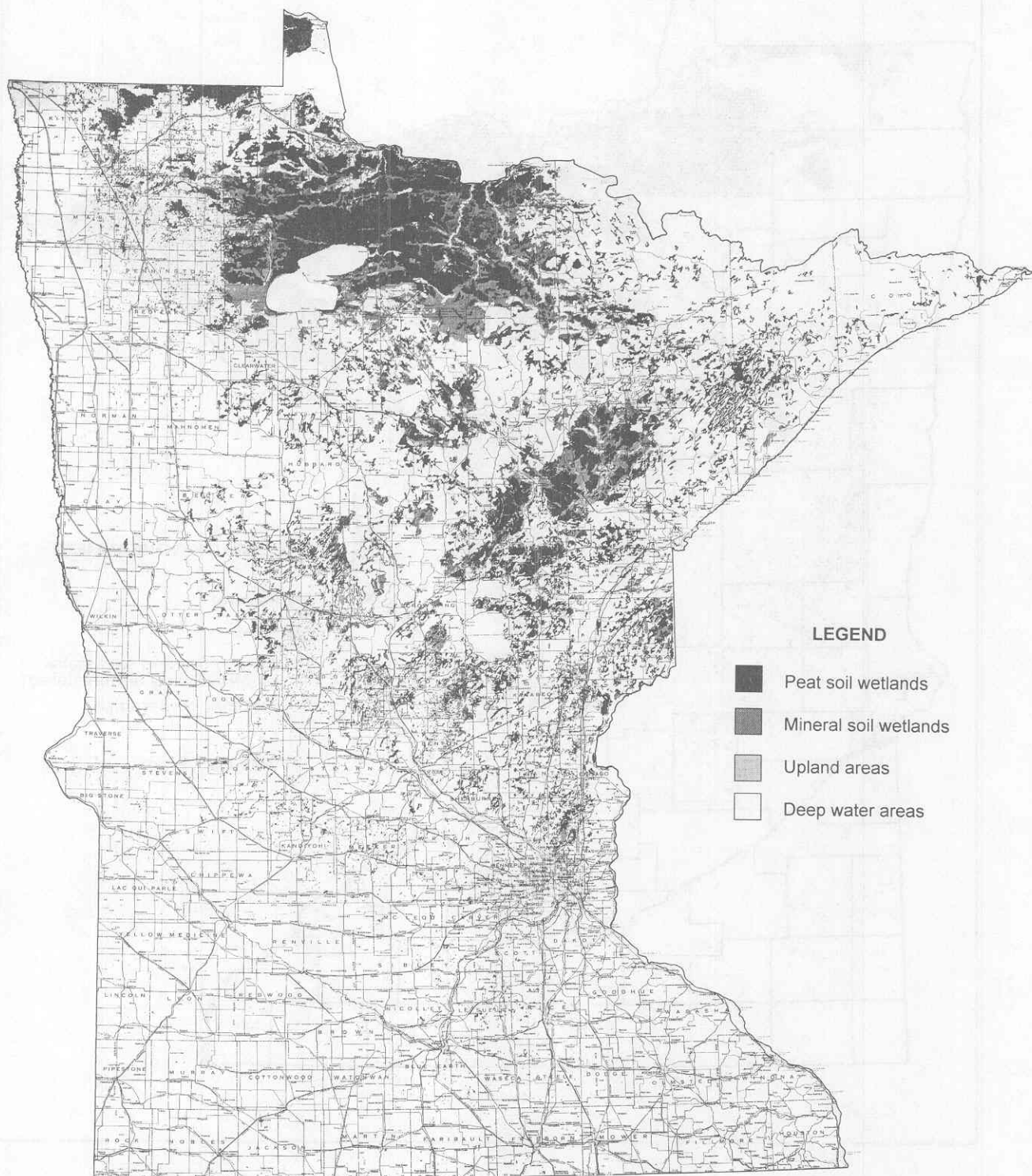
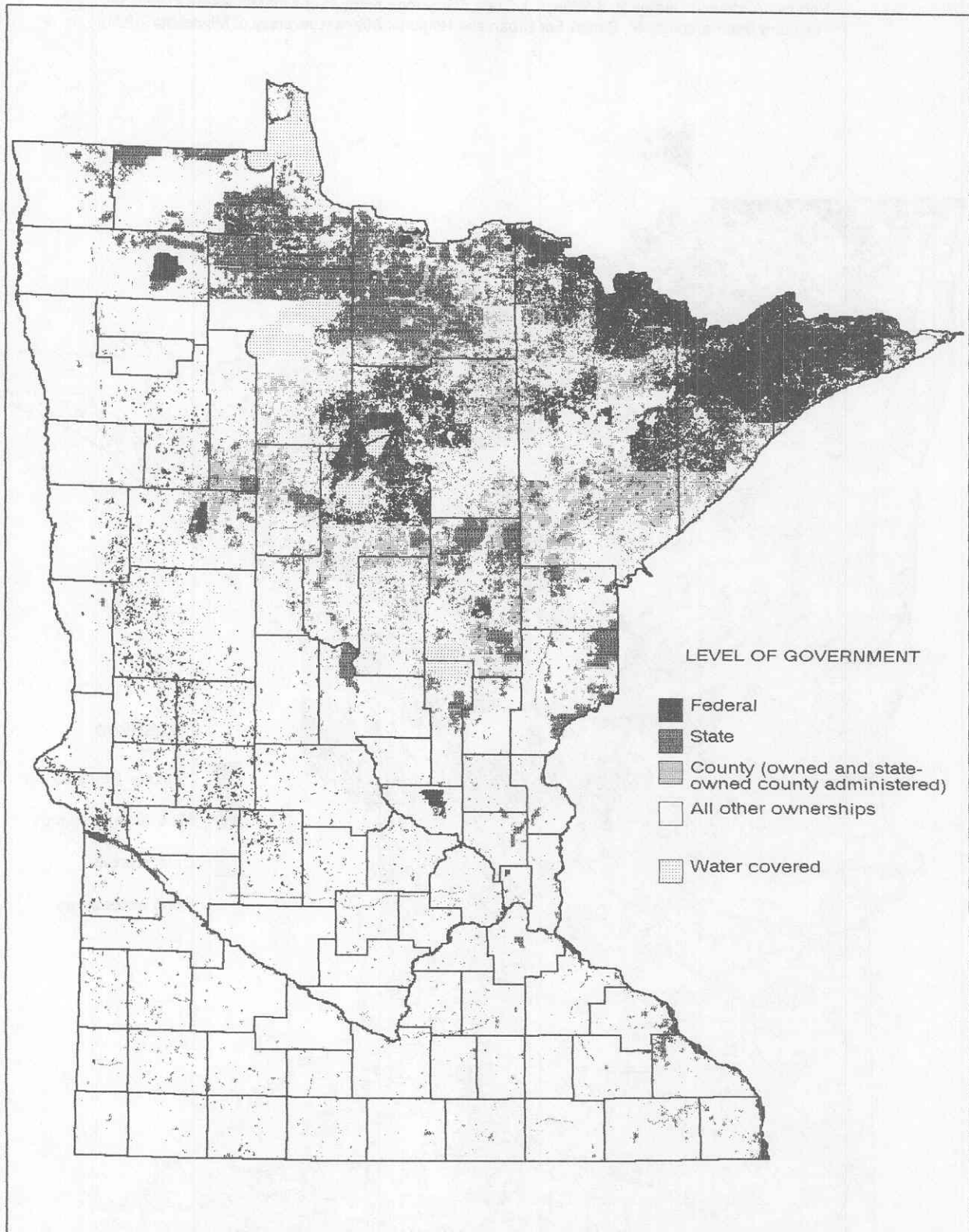


FIGURE 4 ~ PUBLIC LAND OWNERSHIP, 1983

Source: Minnesota Land Management Information System (MLMIS)



Source: Minnesota Board of Water & Soil Resources

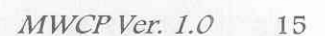


TABLE 1 - PERCENTAGE OF WETLANDS REMAINING, BY COUNTY

Source: Minnesota Department of Natural Resources (Division of Waters), January 1997.
Data: Anderson, Jeffrey P. & William J. Craig, *Growing Energy Crops on Minnesota's Wetlands: The Land Use Perspective*, Center For Urban and Regional Affairs, Publ. CURA 94-3 (University of Minnesota, 1984).

ESTIMATED			ESTIMATED		
COUNTY	WETLAND AREA IN 1981 (ACRES)	PERCENT REMAINING	COUNTY	WETLAND AREA IN 1981 (ACRES)	PERCENT REMAINING
1 Aitkin	573,000	91.1	45 Marshall	194,000	19.2
2 Anoka	61,000	70.9	46 Martin	1,000	0.6
3 Becker	47,000	54.7	47 Meeker	26,000	21.7
4 Beltrami	966,000	94.1	48 Mille Lacs	84,000	90.3
5 Benton	41,000	65.1	49 Morrison	218,000	72.7
6 Big Stone	2,000	1.7	50 Mower	1,000	0.5
7 Blue Earth	6,000	2.2	51 Murray	1,000	3.0
8 Brown	2,000	1.0	52 Nicollet	3,000	2.1
9 Carlton	125,000	93.3	53 Nobles	0	0.0
10 Carver	4,000	16.7	54 Norman	7,000	2.8
11 Cass	372,000	91.4	55 Olmsted	0	0.0
12 Chippewa	1,000	0.5	56 Otter Tail	84,000	54.9
13 Chisago	36,000	64.3	57 Pennington	29,000	8.0
14 Clay	7,000	2.4	58 Pine	279,000	92.1
15 Clearwater	191,000	77.6	59 Pipestone	0	0.0
16 Cook	42,000	100.0	60 Polk	27,000	4.5
17 Cottonwood	0	0.0	61 Pope	14,000	23.3
18 Crow Wing	131,000	86.8	62 Ramsey	1,000	33.3
19 Dakota	4,000	14.3	63 Red Lake	16,000	8.2
20 Dodge	1,000	0.9	64 Redwood	1,000	0.6
21 Douglas	12,000	35.3	65 Renville	1,000	0.4
22 Faribault	3,000	1.1	66 Rice	5,000	13.2
23 Fillmore	0	0.0	67 Rock	0	0.0
24 Freeborn	3,000	1.5	68 Roseau	361,000	44.1
25 Goodhue	0	0.0	69 St. Louis	1,136,000	93.9
26 Grant	1,000	1.1	70 Scott	2,000	11.8
27 Hennepin	9,000	31.0	71 Sherburne	31,000	72.1
28 Houston	0	0.0	72 Sibley	6,000	2.1
29 Hubbard	7,000	9.2	73 Stearns	32,000	21.9
30 Isanti	48,000	80.0	74 Steele	2,000	2.6
31 Itasca	572,000	95.0	75 Stevens	1,000	1.6
32 Jackson	2,000	1.4	76 Swift	10,000	4.2
33 Kanabec	60,000	87.0	77 Todd	112,000	53.1
34 Kandiyohi	21,000	9.9	78 Traverse	1,000	0.4
35 Kittson	96,000	18.6	79 Wabasha	0	0.0
36 Koochiching	1,677,000	98.0	80 Wadena	68,000	73.1
37 Lac Qui Parle	2,000	1.2	81 Waseca	5,000	4.3
38 Lake	198,000	97.5	82 Washington	6,000	42.9
39 Lake of the Woods	638,000	88.6	83 Watonwan	1,000	0.9
40 Le Seuer	7,000	10.1	84 Wilkin	1,000	0.2
41 Lincoln	1,000	2.5	85 Winona	0	0.0
42 Lyon	1,000	0.9	86 Wright	6,000	22.2
43 McLeod	3,000	6.1	87 Yellow Medicine	1,000	0.8
44 Mahnomen	13,000	23.2	STATEWIDE TOTALS	8,760,000	47.5

NOTE 1: This chart was derived from study data for county wetland areas around 1981 and in the 1860s. Estimated wetland areas are rounded to the nearest 1,000 acres. Data was based upon 640 acre soil landscape mapping units and interpreted for dominance with a 40-acre grid overlay. The reported value for Clearwater County (77.64 percent) was corrected by re-analyzing wetland resources upon implementation of Minnesota Rules 8420. Houston, Wabasha, and Winona counties were reported to have no presettlement wetlands.

NOTE 2: The listed acreages do not reflect gains and losses since 1984. For example, the wetland area for Jackson County is now approximately 7,000 acres. No current inventory of total wetland area by county has been compiled.

State Wetlands Policies as of 1996

This is an overview of laws and policies currently in place that directly or indirectly guide wetlands conservation and management in Minnesota; it is provided here to illustrate the fact that development of a state wetlands conservation plan did not take place in a policy void.

MINNESOTA STATUTES SECTION 103A.201 "REGULATORY POLICY"

Subd. 1 Policy. To conserve and use water resources of the state in the best interests of its people, and to promote the public health, safety, and welfare, it is the policy of the state that:

- (1) subject to existing rights, public waters are subject to the control of the state;
- (2) the state, to the extent provided by law, shall control the appropriation and use of waters of the state; and
- (3) the state shall control and supervise activity that changes or will change the course, current, or cross section of public waters, including the construction, reconstruction, repair, removal, abandonment, alteration, or the transfer of ownership of dams, reservoirs, control structures, and waterway obstructions in public waters.

Subd. 2 Wetlands Findings; Public Interest.

(a) Wetlands identified in the state under section 103G.005, subdivision 19, do not:

- (1) grant the public additional or greater right of access to the wetlands;
- (2) diminish the right of ownership or usage of the beds underlying the wetlands, except as otherwise provided by law;
- (3) affect state law forbidding trespass on private lands; and
- (4) require the commissioner [of natural resources] to acquire access to the wetlands.

(b) The legislature finds that the wetlands of Minnesota provide public value by conserving surface waters, maintaining and improving water quality, preserving wildlife habitat, providing recreational opportunities, reducing runoff, providing for floodwater retention, reducing stream sedimentation, contributing to improved subsurface moisture, helping moderate climatic change, and enhancing the natural beauty of the landscape, and are important to comprehensive water management, and that **it is in the public interest to:**

- (1) **achieve no net loss in the quantity, quality, and biological diversity of Minnesota's existing wetlands;**
- (2) **increase the quantity, quality, and biological diversity of Minnesota's wetlands by restoring or enhancing diminished or drained wetlands;**
- (3) **avoid direct or indirect impacts from activities that destroy or diminish the quantity, quality, and biological diversity of wetlands; and**
- (4) **replace wetland values where avoidance of activity is not feasible and prudent.** *[emphasis added]*

MINNESOTA STATUTES SECTION 103A.202 "WETLAND POLICY"

"The legislature finds that it is in the public interest to preserve the wetlands of the state to conserve surface water, maintain and improve water quality, preserve wildlife habitat, reduce runoff, provide for floodwater retention, reduce stream sedimentation, contribute to improved subsurface moisture, enhance the natural beauty of the landscape, and promote comprehensive and total water management planning."

PRINCIPLE OF "NO NET LOSS"

The Wetland Conservation Act established in state law the policy of "no net loss" of existing wetlands, as noted above. However, the intent of the phrase has not been clearly defined and has been variously interpreted by land managers as meaning either no net loss across the state as a whole, by administrative region, or by project. The MWCP provides clarification on this point.

State law and administrative rules and guidelines are silent, for the most part, about any policy to achieve a net gain of wetlands through restoration. The lack of policy guidance on this point was one of the driving forces for development a state wetlands conservation plan.

PRINCIPLE OF "SEQUENCING"

The term "sequencing" refers to a policy requirement that wetland impacts must first be avoided, then must be minimized, and losses must be replaced, if impacts cannot be avoided. [Minnesota Statute Sec. 103G.222(b).] This state policy is consistent with Federal policy under the Clean Water Act. Existing state laws and rules encourage or require mitigation to occur on the site of the impact, or in the same watershed or county, in order to replace the wetland types and functional benefits that were lost. The MWCP provides a framework for making regional adaptations.

EXECUTIVE ORDER 91-3

Executive Order 91-3 directs all responsible departments and agencies of the State of Minnesota to protect, enhance, and restore Minnesota's wetlands to the fullest extent of their authority; to operate under the principle of "no-net-loss" of wetlands for projects under their jurisdiction; to mitigate wetland impacts on state lands; and to apply the principle of "sequencing" when implementing this order. See *Appendix* for the full text of Executive Order 91-3.

PROPERTY RIGHTS OF LANDOWNERS IN STATE WETLANDS POLICY

As noted above, the policy language in the WCA prominently and clearly states that the protections extended to wetlands under the WCA do not extend new rights of public access to wetlands on private lands, nor are rights of ownership to those lands changed, except as now regulated under the law and subsequent rules. It is essential that regulators and other government officials recognize and respect private property rights when acting to conserve wetlands.

Compensation for governmental takings of private property is required by the state and federal Constitutions. The sufficiency and availability of financial compensation for private landowners of wetlands under the legal standard of a "regulatory taking" remains a somewhat controversial issue, however. This problem seems to be most profound for owners of agricultural land in current production and for landowners who have relied on the future value of their land for retirement income. This economic dilemma is beyond the scope of this plan and is best addressed through other forums.

Wetland Management By Indian Tribes

Each Chippewa Band and Sioux Community makes its own land management decisions and policies on reservation lands, since their jurisdictions are separate from the State of Minnesota. Therefore, each of the eleven Bands and Communities in Minnesota can choose whether to adopt the Minnesota Wetlands Conservation Plan for use on reservations; to adopt a wetlands plan that is more stringent than the state plan; or to have no plan for wetlands at all.

Most tribes that have any wetland resources generally manage them with a preservation or conservation ethic/perspective. This may or may not involve a written code. For example, the Red Lake Band has set aside many thousands of acres of wetlands for wildlife management, and the Fond du Lac Band is involved with numerous projects focused on the restoration of natural wild rice beds.

The State of Minnesota and the Indian tribes in Minnesota share a common interest in coordinating their land management efforts. The wetland policies and management practices of different governments (local, state, or federal) in shared watersheds, nearby lands, and public lands subject to treaty rights create a need for shared discussion of conservation strategies. Staff from the natural resource programs of three Chippewa Bands participated in the development of the MWCP.

Federal Laws & Policies Concerning Wetlands

NO-NET-LOSS POLICY

President Clinton's policy on wetlands, "Protecting America's Wetlands: A Fair, Flexible, and Effective Approach," was issued on August 24, 1993. The first principle of the policy supports the interim goal of no overall net loss of the Nation's remaining wetlands, and the long-term goal of increasing the quality and quantity of the Nation's wetlands resource base. Other principles deal with fairness and efficiency in regulatory programs; the importance of non-regulatory programs; expanding partnerships with state, tribal, and local governments, the private sector, and citizens; and basing federal wetlands policy on the best scientific information available.

EXECUTIVE ORDERS

Executive Order 11990, *Protection of Wetlands*, is an overall wetland policy for all federal agencies managing federal land, sponsoring federal projects, or providing funding assistance to state and local projects. It requires agencies to consider mitigation and public involvement before proposing new construction in wetlands.

Executive Order 11988, *Floodplain Management*, provides floodplain wetlands with a degree of protection by requiring each federal agency to take action to reduce the risk of flood loss; to minimize the impact of floods on human health, safety, and welfare; and to restore and preserve the natural and beneficial values served by floodplains.

SUMMARY OF FEDERAL LAWS CONCERNING WETLANDS⁴

Clean Water Act, Sections 404 and 401

The Clean Water Act (CWA) was enacted with the goal of restoring and maintaining "the chemical, physical, and biological integrity of the nation's waters," including wetlands. **Section 404** regulates the discharge of dredge or fill material into waters of the United States, making it unlawful to discharge dredged or fill materials into wetlands without first obtaining a permit. The Environmental Protection Agency (EPA) has overall responsibility for implementing all provisions of the CWA, but the U.S. Army Corps of Engineers has primary responsibility for reviewing permit applications, issuing permits, and bringing enforcement actions. Before issuing a permit, the Corps must also consult with the U.S. Fish & Wildlife Service for review under the Endangered Species Act, Section 7. **Section 401** emphasizes water quality and sets up a water quality certification program. Under the guidance of the EPA, the Minnesota Pollution Control Agency administers the Minnesota program and reviews Sec. 404 permit applications sent to the U.S. Army Corps of Engineers that may result in degradation of the water quality of wetlands.

Rivers and Harbors Act of 1899, Section 10

The Rivers and Harbors Act of 1899 protects the navigable capacity of the nation's waters. Section 10 regulates alteration or obstruction of such waterways. This includes the Great Lakes and larger waterways such as the Mississippi, Minnesota, and St. Croix Rivers; the Mississippi River Headwaters Reservoirs; and the International Boundary Waters. This Act does not cover as many water bodies as the Clean Water Act but it covers more activities. The U.S. Army Corps of Engineers is responsible for permitting and enforcement.

National Environmental Policy Act (NEPA)

NEPA requires the preparation of environmental impact statements (EIS) prior to construction to assess the impact of federal projects for all federally funded, authorized, or permitted activities that would have significant environmental effects. Wetlands are listed among the environmental parameters to be evaluated in an EIS. A very small percentage of projects under the CWA Section 404 require an EIS.

⁴ Minnesota Audubon Council, *Wetland Regulations in Minnesota*, (St. Paul, MN 1993) pp. 3-8.

Swampbuster

Swampbuster is a program of the 1985 Food Security Act, as amended by the 1990 and 1996 Farm Bills. It discourages the manipulation of wetlands for agricultural use and discourages farmers or producers who receive federal subsidies from manipulating wetlands on their land for agricultural production. If such a wetland is altered, the farmer or producer becomes ineligible for certain government price and income support programs. The U.S. Department of Agriculture, through the Farm Service Agency (FSA) and Natural Resources Conservation Service (NRCS), handle administrative and technical requirements. A number of exemptions apply for certain lands and activities.

EVOLUTION IN FEDERAL AGRICULTURAL POLICIES⁵

In the mid-1800s, according to public land survey records, one-third of the land area now called Minnesota, approximately eighteen million acres, was wetlands. As the growing number of settlers entered the region, dry land became scarcer, forcing farmers, builders, and county governments to find ways to drain and fill wet areas. Over the next 150 years, millions of acres of wetlands were drained, mostly in southwestern counties where State and Federal conservation officials estimate that 80 to 90% of the original wetlands are now gone. Since the early 1980s, however, federal agricultural policies have undergone an significant shift:

MID-1800s: The State of Minnesota provided statutory authority for public drainage ditches. The Swamp Land Act passed by the U.S. Congress granted to the territory of Minnesota the rights to "reclaim" 4.7 million acres of publicly owned "swamps." The Minnesota Legislature established a Drainage Commission to coordinate legal drainage to make land more salable and productive.

1938: The U.S. Department of Agriculture created the Soil Conservation Service to promote better land use, which includes wetland drainage.

LATE 1940s: New technology made it easier to drain wetlands. Through its Agricultural Conservation Program, formed in 1940 in addition to conservation initiatives, the U.S. Department of Agriculture began paying farmers to ditch wet areas.

EARLY 1970s: The U.S. Department of Agriculture negotiated a major grain deal with the then Soviet Union, raising grain prices. After a slowdown in the 1960s, drainage began again in earnest to free more land for crop production.

1985: Provisions were written into U.S. farm policy to discourage new drainage by farmers receiving commodity subsidies; this was a dramatic shift in Federal farm policy and a challenge for farmers accustomed to the previous system. Subsequent regulations issued by state and federal agencies attempted to control drainage. While many agricultural lands remain exempt from Federal and State wetland regulations, the change in public attitudes and policies from drainage to protection of wetlands was remarkably swift. Many farmers remain highly pressured by tight profit margins, the economic volatility of their marketplace, and other trends in agriculture.

1996: Congress passed the Federal Agriculture Improvement and Reform Act (F.A.I.R.), potentially undoing decades of Federal policies guaranteeing a degree of financial security for farmers. The prospective elimination of agricultural price supports in seven years will restructure much of the farm economy. In addition, ten-year conservation easement contracts under the Conservation Reserve Program are due to expire soon and continuation of CRP funding remains unresolved for thousands of wetland acres in the state, especially in prairie pothole areas in northwestern Minnesota.

⁵ Mark Oja of the Natural Resources Conservation Service in St. Paul reviewed this summary and contributed text. Also: Dickson, Tom, *Minnesota Wetlands: A Primer On Their Nature and Function*, Minnesota Audubon Council (St. Paul, MN 1993) pg. 18.

*NORTH AMERICAN WATERFOWL MANAGEMENT PLAN*⁶

Prairie potholes are the most valuable inland marshes for waterfowl production in North America. Although the pothole region accounts for only 10% of the continent's waterfowl breeding area, it produces 50% of the duck crop in an average year and more than that in wet years. The prairie pothole region extends from south-central Canada to north-central United States. Approximately 9 million acres of potholes have been drained in western and southern Minnesota.⁷

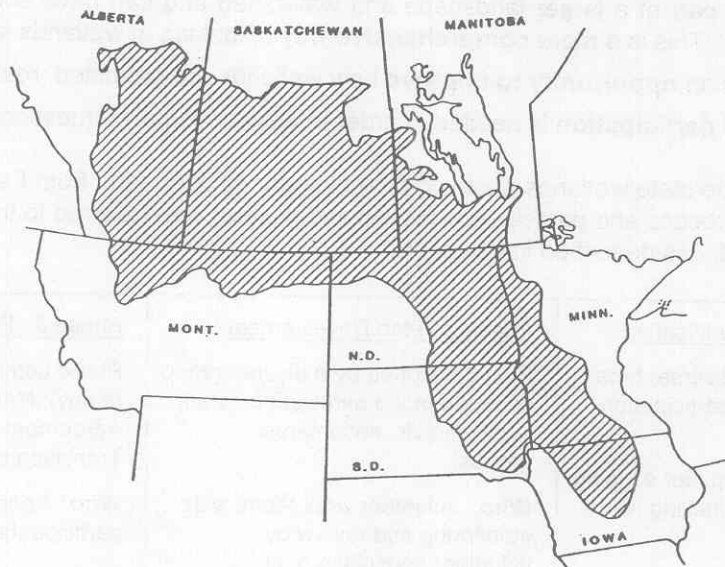
The North American Waterfowl Management Plan (NAWMP) was signed on May 14, 1986, by the United States and Canada, and in 1994 by Mexico. Recognizing that waterfowl populations are an indicator of environmental health, the NAWMP provides a framework for recovery of declining waterfowl populations, and reversing overall wetland destruction. Specific objectives are to increase and restore duck populations to the levels averaged in the 1970s, i.e., 62 million breeding ducks and a fall flight of 100 million ducks. Broad strategies outlined in the NAWMP to achieve these objectives involve reversing destruction of habitat. The NAWMP recommends joint ventures as a means for governments, private organizations, and individuals to cooperate in the planning, funding and implementation of projects to conserve and enhance waterfowl habitat.

The Prairie Pothole Region (see **Figure 6**) was identified in the NAWMP as a top priority waterfowl breeding area and the United States portion of this region was identified as one of six initial joint ventures. The remainder of Minnesota falls into the Upper Mississippi River-Great Lakes Joint Venture, a second priority waterfowl preservation area.

The Minnesota Steering Committee, a voluntary coalition of statewide organizations devoted to waterfowl and wetland conservation, guides implementation of the NAWMP in Minnesota. Among its charges is coordinating projects for funding through the North American Wetland Conservation Act. This fund has provided over \$10 million between 1990 and 1997 for wetland conservation in Minnesota, through a variety of partners and projects (e.g., Swan Lake and Heron Lake restorations). Additional projects are continually submitted for funding.

FIGURE 6 - THE PRAIRIE POTHOLE REGION OF NORTH AMERICA

Source: Minnesota Department of Natural Resources (Division of Fish & Wildlife)



⁶ Thomas Landwehr of the Minnesota Department of Natural Resources contributed most of the text on the NAWMP.

⁷ Tiner, Jr., Ralph W., *Wetlands of the United States: Current Status and Trends*, National Wetlands Inventory, U.S. Department of the Interior, Fish & Wildlife Service (Washington, D.C. March 1984), pp. 42-43.

NATIONAL WETLAND PRIORITY CONSERVATION PLAN

Section 301 of the 1986 Emergency Wetland Resources Act required the Secretary of the Interior to establish a National Wetland Priority Conservation Plan (NWPCP), which was done in 1989. The purpose of the NWPCP is to assist federal, state, and local agencies in making acquisition decisions when Land & Water Conservation Fund (LWCF) appropriations are used. It allows state and federal agencies flexibility (within certain criteria) to focus on documentable issues of wetland loss, scarcity, threat, and values that are not necessarily discernible at the national level. The National Park Service (NPS) administers the federal portion of the SCORP program.

Section 303 of the Act requires that State Comprehensive Outdoor Recreation Plans (SCORP) include wetland components consistent with the NWPCP. The Minnesota Wetlands Conservation Plan will replace the previous wetlands addendum in the State's 1995 SCORP.

How the MWCP Was Developed

STARTING POINT FOR PLAN DEVELOPMENT

The state wetlands planning project was designed to with existing wetlands policies and move forward with policy improvements and enhanced information for decision-making. It was not the purpose of this project to "start over" with the State's wetlands policy, which would have been contrary to the intent and requirements of Executive Order 91-3 for the sponsoring state agencies.

Process & Participation

The following principles set the tone for the project from the beginning:

- * The problem-solving and decision-making process must be **open, honest, and fair**. There should be a variety of opportunities for input and feedback from people who may be affected by a state wetlands conservation plan.
- * Wetlands are subject to **shared responsibility**, so the collective efforts of those who are responsible (government and citizens) should have a **shared outcome** with **shared accountability** for the results.
- * Wetlands are part of a larger landscape and watershed and can have economic value or serve certain needs. This is a more **comprehensive** way of looking at wetlands strategy.
- * This project is an **opportunity to improve** how wetlands are protected, restored, and managed.
- * **Broad-based participation** is needed in order to answer complex questions.

The three phases of the state wetlands planning project spanned the period from Fall 1993 to Spring 1997. The planning process and participation (public and private) were tailored to the needs in the different project phases, as described in this chart:

<u>Phase 1: Issues Identification</u>	<u>Phase 2: Plan Development</u>	<u>Phase 3: Plan Acceptance</u>
Project begins with diverse, broad-based, locally-sited participation. Who: 20 focus groups for scoping of issues; extensive mailing list developed.	Plan developed by a diverse group of experienced participants (staff, local officials, and interest groups). Who: volunteer work team, with monitoring and review by volunteer consulting pool; newsletters to mailing list.	Public comment period; revisions, (if any); Memorandum of Agreement by agencies; Transition into action. Who: agency leaders; other participants; concerned citizens

PHASE 1: GETTING STARTED

A planner was hired as full-time project coordinator in August 1993. Initial tasks were to develop broad-based participation from the beginning and to identify issues to be addressed by the plan.

The first phase of the project concluded in the Spring of 1995. Twenty focus groups had met at 20 locations around the state and a total of 260 people participated in the discussions. The results were summarized in a project report published and distributed in April 1995.

Range of Issues Identified

Six key issues emerged from the focus groups' discussions:

- ★ **Regional differences relating to wetlands** (*"no more one-size-fits-all wetlands policy"*)
- ★ **Simplify the regulatory process** (*"one-stop-shopping"*)
- ★ **Need a restoration strategy**
- ★ **Need a routine way to evaluate wetland functions**
- ★ **Information and education tailored for a variety of audiences**
- ★ **Economic impacts and implications of wetlands conservation**

"Regional differences" refers to significant physical and socio-economic differences across the state, in contrast to the mostly "one-size-fits-all" wetlands policies in statutes and administrative rules. There was a clear call throughout the state for wetlands management policies that would take those differences into account, and a belief that wetlands decisions would be improved through such an approach.

Regional differences, regulatory simplification, and a restoration strategy became the primary focus of plan development by the Work Team in the project's second phase.

PHASE 2: PLAN DEVELOPMENT

The Work Team had 33 diverse members from local governments, private sector interests, and State/Federal agencies (plus 33 alternates). They responded to a notice sent to local government and private sector segments of the project mailing list in the Spring of 1995 (agency participants were previously identified). Their charge was to develop recommendations for the state wetlands conservation plan (including alternatives and options, as applicable, and specific actions necessary for implementation of the plan) and to deliver those recommendations to sponsoring agency leaders.

The Work Team began by examining issues identified in Phase 1 of the wetlands planning project and described in Project Report #1 (plus any feedback received on that report). The task of the Work Team, self-described by the group, was to establish an overall goal for the management of wetlands in Minnesota and to develop a plan to achieve the goal that is fair, effective, and efficient, while addressing two fundamental issues facing landowners and government:

- Regional differences related to wetland resources,
and
- Complexity in the regulatory permitting process.

A "Consulting Pool" of approximately 70 persons was created to provide an opportunity for communication and participation by a wider array of interests and expertise than can be accommodated within small Work Teams. The Consulting Pool was intended to be an information source and a form of "peer review" to supplement and enhance the efforts of the Work Team.

Preliminary drafts of regional descriptions and management strategies received local review and feedback at 10 meetings around the state in November-December 1996, attended by 160 city and county planners, local wetland coordinators and water planners, Farm Bureau members, and previous and current participants in the planning project.

PHASE 3: PLAN REVIEW & ACCEPTANCE

The Minnesota Wetlands Conservation Plan is a Work Team product until it is accepted for use by state agencies. Public comments on the Plan will be solicited in Spring 1997. Any further adjustments to this version of the Plan will be done at the discretion of leaders of the sponsoring state agencies. At publication time, it is expected that a Memorandum of Agreement will be drafted for signature by agencies to signify their commitment to use the Plan. Local government units and private sector interests will be encouraged to use the Plan, as well.

3. GOAL STATEMENT

The goal for wetland conservation in Minnesota is to maintain and restore the quality and diversity and increase the overall quantity of wetlands in the state, varying regionally in accordance with differences in the character and health of the wetland resource, in order to promote ecologically, socially, and economically sustainable communities.

The purpose of the Minnesota Wetlands Conservation Plan is to guide stewardship of wetlands.

EXPLANATIONS OF TERMS AND PHRASES

"Conservation"

Planned management of a natural resource to prevent destruction or neglect.

"Maintain and restore the quality and diversity and increase the overall quantity of wetlands"

The ecological integrity of wetlands in Minnesota must be maintained and restored so that they perform their natural functions at the highest possible level for the long-term. It refers to the kind of structural diversity and integrity that allows wetland systems to persist and be resilient over time. It is important to recognize that many species depend on wetland areas and the interdependencies among species (including humans) and landscape features (e.g., uplands and wetlands) are not fully understood. This plan attempts to consider the ecological complexity of wetlands (types, functions, and values) in relation to multiple needs and uses for wetlands. Some areas of the state are rich in wetlands and others have had severe losses over time; these differences are addressed in the statewide and regional management strategies in this wetlands plan.

"Achieve ecologically, socially, and economically sustainable communities"

There is no single "official" definition of the term *sustainable*, but Minnesota policy and international dialogue furnish two similar versions:

From Minnesota Statutes Section 4A.07(b): *"Sustainable development means development that maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs."* [1996 Legislature.]

Gro Harlem Brundtland, former Prime Minister of Norway and international advocate for sustainable development, provides this common definition: *Sustainable development exists when "the needs of the present are met without sacrificing the ability of future generations to meet their own needs."*

People will achieve this through their collective decisions about management of wetlands and other natural resources. Ecological health is a fundamental foundation for societies and economies. A 50 to 100-year perspective is appropriate; after all, it took 100 years to get into the present condition with wetlands and many years will be needed to recapture lost wetland functions and values. This clause emphasizes mutually beneficial relationships and the importance of jobs and quality of life. These factors are interconnected and inseparable; therefore, a balanced and holistic approach to wetlands management is not only desirable, but essential.

Communities exist at multiple scales, ranging from local to international. This plan does not limit the definition of "community" to only one scale, but instead refers to anyone affected by this plan. The approach to wetlands planning here uses ecological/hydrological factors *plus* social/economic (land use) and management factors that encompass both human and biological communities.

"Stewardship of wetlands"

The term "stewardship" refers to: practicing responsible management for ecological integrity; fulfilling trust responsibilities for future generations; maintaining options for the future; keeping healthy wetlands in good condition; exercising prudence, moderation, and wisdom to protect and manage wetlands; aiming for self-sustaining wetlands; and focusing on the long-term functions performed by wetlands.

This plan focuses on the net effect of wetland protection and management on wetlands in the state in total, rather than area-by-area. This approach underscores the need for a restoration strategy.

CONNECTION TO KEY ISSUES

This Goal Statement was designed in response to the set of key strategic issues identified for the Minnesota Wetlands Conservation Plan (see Chapter 2):

- ★ Regional differences → accounting for observable complexity
- ★ Functional assessment → determining what wetlands do and how they do it
- ★ Wetland restoration → regaining what has been lost
- ★ Economic considerations → seeing people as part of the system
- ★ Regulatory simplification → making the process serve people
- ★ Customized education → learning

The Goal Statement describes what can be achieved by addressing these key issues through the management strategies that follow this chapter. The Minnesota Wetlands Conservation Plan helps guide stewardship of wetlands by using a geographic system approach to the issues.

The quality and diversity of Minnesota's wetland resources can be maintained and restored more effectively by applying knowledge about regional differences and functional assessment to management decisions. Increases in the overall quantity of wetlands must be targeted to areas where restoration is most needed, so working with regional differences and functional assessment are also essential for that purpose.

People are a part of the systems in which they live - ecological systems, economic systems, and communities. To work on wetland problems, it is not enough to simply examine the science, the landscape, and the water regimes; consideration of the needs of individuals and communities must be part of the process. Regulatory processes, which are one of the most intrusive forms of government intervention in people's lives, must serve the parties involved as efficiently and fairly as possible. Continuous learning enhances everyone's ability to make informed decisions.

This Goal Statement sets forth a demanding objective of continuous improvement, always trying to do better for both the natural resource and for ourselves. The Goal Statement does not set a target date for a precise objective, which might imply that the job would then be done. Sustainability is an aspiration and a way of "doing business" over time in a complex set of dynamic circumstances, rather than an objective that can be achieved and set aside. This theme is reflected in management actions for the strategies that follow; target dates became a moot point because nearly all of the listed actions were rated as highly important for immediate or ongoing implementation.

4. REGIONAL MANAGEMENT STRATEGY

A Bridge Between Local & State Management

THIS CHAPTER PROVIDES MANAGEMENT STRATEGIES FOR REGIONAL DIFFERENCES ACROSS THE STATE. It goes beyond the simple 3-region differentiation in the Wetland Conservation Act (based solely on the degree of historic wetland losses) by applying more information on similarities and differences relevant to wetlands. Common understanding of regional differences is essential for building differentiation in state wetlands policy. This chapter is not independent of other chapters and should be read and used in the context of the entire plan.

One of the challenges for creating a state wetlands conservation plan is the breadth of shared responsibility for wetlands across jurisdictions. Much responsibility for wetlands management rests with local forms of government under the State's Wetland Conservation Act and through local wetlands ordinances. A state wetlands plan had to be useful at different levels of scale and encourage coordination and cooperation among government units.

Finding ways to deal with regional differences was another challenge. From the start of the project, it was argued that the State's "one-size-fits-all" wetlands policy did not always fit well with circumstances and failed to recognize differences between large areas of the state. Working more by region or watershed could help customize policy decisions to needs and circumstances. **LOCAL WATER PLANS, WETLANDS PLANS, AND LAND USE PLANS REMAIN THE BEST WAY TO ACCOUNT FOR SPECIFIC LOCAL NEEDS AND CONDITIONS;** this plan does not supersede local authorities, but should help build a better bridge between state and local wetlands management.

VOICES ON REGIONAL DIFFERENCES from Project Report #1:

Dealing With Wetlands In Minnesota

There is strong interest throughout the state in understanding regional differences and how they might be incorporated in wetlands goals and policies. Hope was expressed that more could be achieved for wetlands and other public policy goals by doing this.

Ecological and economic needs in different regions are often perceived to be different. The types and quantities of wetlands and the kinds of land use planning issues vary across the state. Not all types of wetlands have the same functions and values.

Wetland managers need to know where to target efforts and where they can make trade-offs. This may be crucial information for community planning and development and for efficient application of financial resources.

It can be challenging to answer the question of why to preserve a particular basin or complex on a particular site . . . when individual permit applicants have a localized viewpoint that typically fails to realize regional implications.

Describing Regional Differences

The first step in recognizing and understanding regional differences was to describe the state's wetland resources as simply as possible while highlighting significant regional differences. The Work Team developed a set of fourteen (14) "Wetland Ecological Units" (WEUs) across the state using existing data and their best professional judgment to evaluate the status of wetlands around the state, the pressures on those resources, and the management tools available.

METHOD

It was important to balance two criteria in creating a model for understanding regional differences:

- 1) Maintaining as much complexity in the approach as possible to avoid over-simplification, and
- 2) Arriving at a result that managers and citizens, along with technical staff, can understand and use.

Data sources

- Maps from the **Ecological Classification System (ECS)**. Data layers at the subsection level include: climate, glacial deposits and land-forming processes, regional elevation, bedrock formations, vegetation, and (in some areas) hydrogeomorphology.
[Sources: Minnesota DNR, University of Minnesota, & USDA Forest Service]
- An analysis of the **National Wetland Inventory** to associate wetland types with each of the 24 ECS subsections in Minnesota. Results show patterns of predominant wetland types and distribution.
[Source: Minnesota Land Management Information Center]
- **Soil Associations** of Minnesota map.
[Source: University of Minnesota, October 1983]
- **Watersheds**, patterns of **surface water features**, and **water quality** patterns.
- **Percentage of wetlands remaining**. The data provides an estimate of wetland losses by county since statehood; it is the only estimate of wetland losses available for use at this time on a statewide scale.
[Source: "Growing Energy Crops on Minnesota's Wetlands: The Land Use Perspective," Anderson and Craig, University of Minnesota, 1984]
- General **land use** similarities that can affect regional ecological systems (e.g., urban growth, agriculture, forestry, growth in summer homes).

WHAT IS AN ECOLOGICAL CLASSIFICATION SYSTEM (ECS)?

The ECS is part of a nationwide mapping initiative developed to improve our ability to manage natural resources on a sustainable basis. It is a method to identify, describe, and map units of land with different capabilities to support natural resources. This is done by integrating climatic, geologic, hydrologic, topographic, soil, and vegetation data.

An ECS can: provide a common means for communication among resource managers; improve predictions about how vegetation will change over time in response to various influences; and improve our understanding of interrelationships between plant communities, wildlife habitat, timber production, water quality, and other natural resources.

In Minnesota, the classification and mapping is divided into six levels of detail:

Province: Largest units representing major climate zones in North America. Minnesota is intersected by 3 provinces.

Section: Divisions within provinces defined by the origin of glacial deposits, regional elevation, distribution of plants, and regional climate. Minnesota has 10 sections.

Subsection: Multi-county size areas within sections defined by glacial land-forming processes, bedrock formations, local climate, topographic relief, and the distribution of plants. In some areas, hydrology is also a factor at the section level. Minnesota has 24 subsections.

Analysis

The second step for regional strategy development was a review of bio-physical conditions, land use pressures, and management factors for wetlands management.

BIO-PHYSICAL CONSIDERATIONS included the quantity and distribution of wetlands by type; the overall quality and diversity of wetlands; and overall ecological integrity (self-sustaining character) of wetlands in different regions. National Wetland Inventory data was cross-referenced with the boundaries of the WEUs (sorted by wetland type) in order to characterize differences in wetland patterns.

PRESSURES ON WETLAND RESOURCES were discussed in terms of different needs and expectations for wetlands, often expressed in relation to land uses, economic and social benefits, and population trends. For example:

- ✓ **Needs for functions and values from wetlands** (e.g., groundwater recharge, recreation, wildlife habitat, flood water retention, etc.).
- ✓ **Needs for commercial uses of wetlands** (e.g., forestry, wild rice, pasturing, sod farming, etc.).
- ✓ **Needs for draining or filling of wetlands, or for alteration of the water regime, water quality, or wetland type** (e.g., cropland, residential development).

WETLAND MANAGEMENT CAPACITY was assessed for the strengths and suitability of different levels of management for distinguishing development and activities that are sustainable from those that are not.

Local and state government units each have management strengths that can be applied effectively in regional wetlands management strategies. Some of the factors discussed were:

- ✓ **Staff and budgets**
- ✓ **Policy constraints** (current laws and policies)
- ✓ **Technology** (e.g., GIS access, training)
- ✓ **Level of commitment**

RESULT: WETLAND ECOLOGICAL UNITS

People across the state know that there are real landscape and watershed differences in Minnesota and they want that included in state wetlands policy. This basic outline of ecological information will give more information to decision makers, along with the hydrology (watershed) information that remains fundamentally important. Although the analysis was not as rigorous as many scientists might prefer and not as locally-detailed as some local officials and landowners would like, it is a very good start on customizing wetland policy to build on in the future.

The regional management strategy provides a rational policy basis for state and federal agencies to move away from a "one-size-fits-all" approach. It includes people and their uses of land as part of the ecosystem, not separate.

THESE WEUs ARE "INFORMATION ZONES" ONLY; WEUs ARE NOT SUITABLE FOR USE AS ADMINISTRATIVE OR REGULATORY REGIONS. They are simplified illustrations of complex, dynamic systems. Further, WEU lines are really "gray" transitional areas, because shifts from one ecological zone to another usually do not have sharply defined borders.

For local wetland management, **THE BEST WAY TO APPLY THIS GUIDANCE MATERIAL IS ON A WATERSHED BASIS THROUGH LOCAL WATER PLANS, WETLANDS PLANS, AND LAND USE PLANNING AND ZONING** (if applicable). State and federal agencies should implement this guidance through their administrative systems and resource programs. The Work Team considered using political subdivision boundaries (such as counties), but settled on the WEU plus watersheds approach for the plan instead.

PURPOSE OF WEUs

Wetland Ecological Units (WEUs)
provide a way to:

- ★ **DESCRIBE REGIONAL DIFFERENCES**
(but not local differences)
- ★ **SUPPORT WATERSHED-BASED**
ADMINISTRATION (not replace it)
- ★ **GET AWAY FROM "ONE-SIZE-FITS-ALL"**
WETLANDS MANAGEMENT

It was a very challenging task to pull together information about complex bio-physical systems and social and economic factors, all of which deserve more time and study than was possible. Some may argue that the conclusions lack sufficient hard data to draw legitimate findings for wetland policy and management. In complex planning situations with high uncertainty about many kinds of information, there will be few clear "answers" and reasonable people will disagree in their interpretations and conclusions from existing data. The best that citizens and government officials can do is to use the information they have to make better decisions and to seek better information for the future. The plan must be reviewed and improved in the future, but this first version is a very strong beginning.

Descriptions and management information for 14 Wetland Ecological Units are included in this chapter. **Figures 7 and 8** show the WEUs and the state's watersheds. Additional maps showing WEU boundaries in relation to various administrative boundaries are provided in the Appendix.

WHO SHOULD USE THIS INFORMATION

Necessary or Potential Leader(s)

*Local government units; LGUs
DNR, BWSR, PCA, DOT
Tribal governments
Public land managers
Joint Powers Boards for rivers and watersheds*

Necessary or Potential Partners

*USCOE, USFWS, USDA-NRCS, USFS
Univ. of Minn. Extension Service (esp. BMPs)
Minnesota Geological Survey
Metropolitan Mosquito Control District
Watershed districts & WMOs
Cities & townships
Landowners
Private groups
Academic and other research organizations*

NOTE: "LGUs" refers to Local Government Units under the WCA and "local government units" refers to any or all of the following: counties, cities, townships, watershed districts or WMOs, and SWCDs.

Refer to Chapter 5 for information on transferring mitigation from one watershed or region to another.

FIGURE 7 ~ MAJOR WATERSHED UNITS OF MINNESOTA

Source: Minnesota Department of Natural Resources (Division of Waters)

[Note: There are 81 watersheds in the map (3 numbers in the sequence from 1 to 84 are not currently used)]

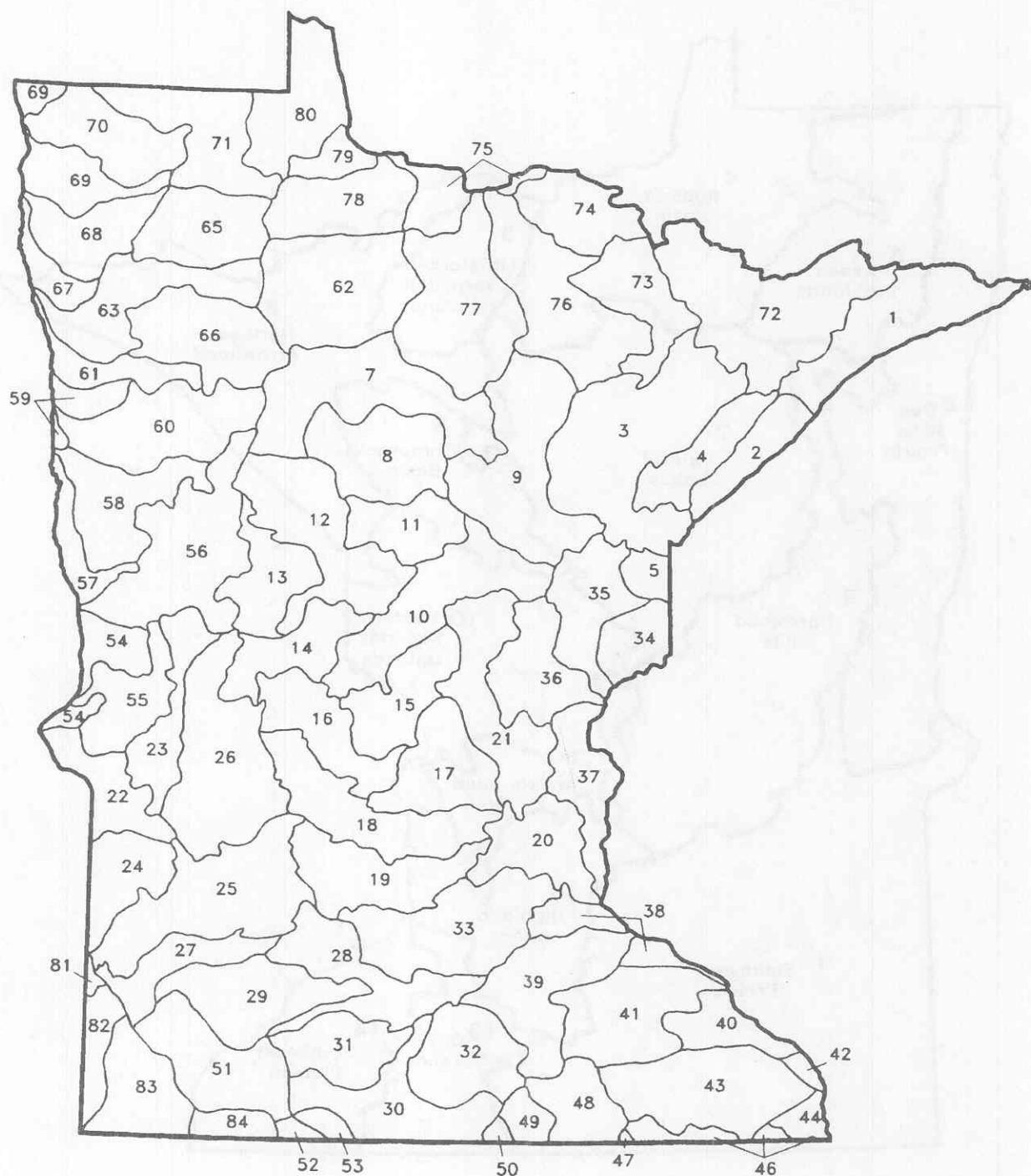
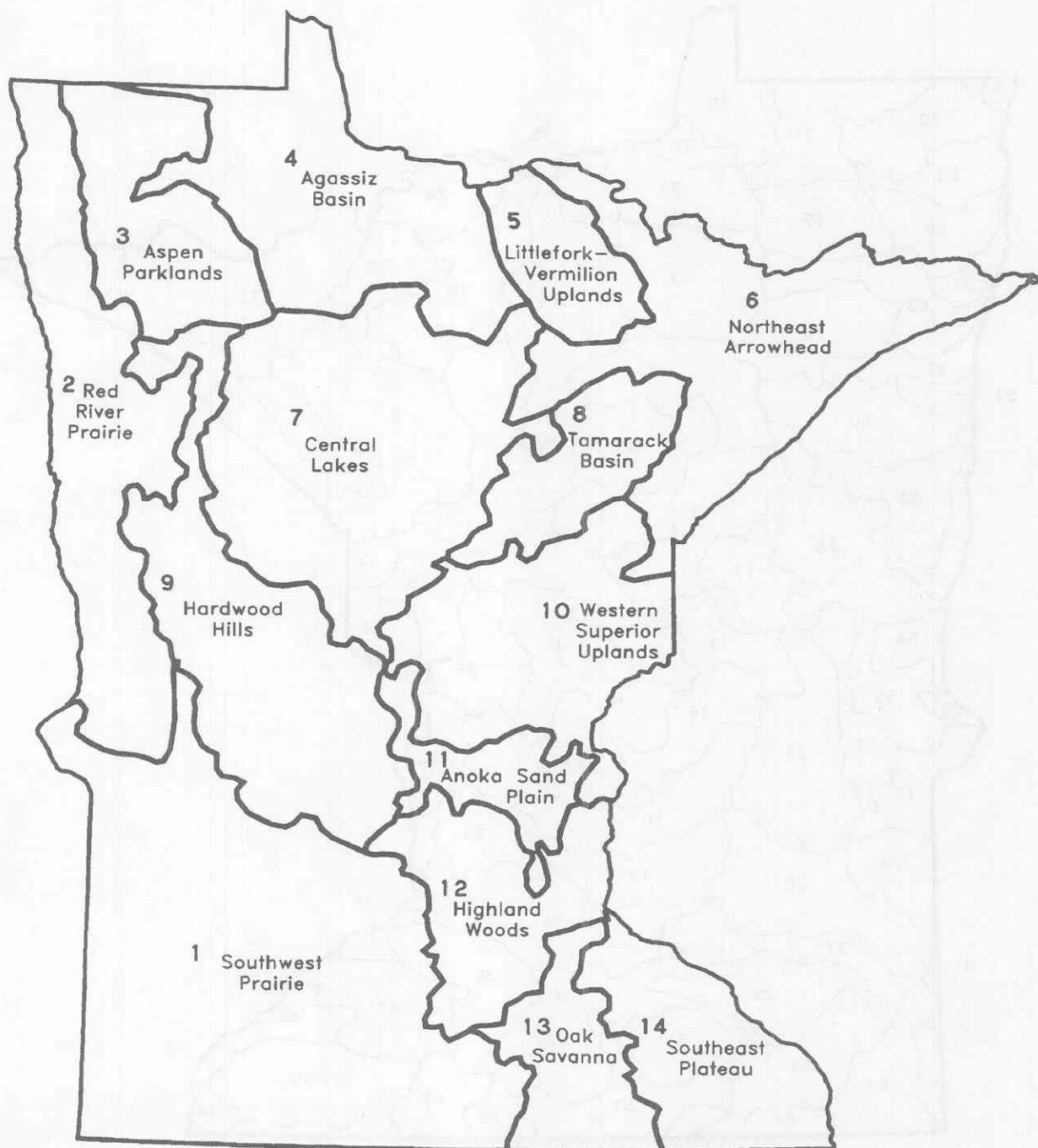


FIGURE 8 ~ WETLAND ECOLOGICAL UNITS (WEUS)

Source: Minnesota Department of Natural Resources (Division of Waters), 1996

Data: Ecological Classification System and National Wetland Inventory



Restoration & Maintenance Priorities

RESTORATION STRATEGY

A restoration strategy has been sought by the state agencies sponsoring development of the MWCP. **The most likely means for achieving meaningful gains in the state's wetland base are public and private funds and programs targeted where the greatest benefits from wetland restoration are likely.** Important incentives and objectives to pursue and support include:

- A new or improved, better-funded RIM Reserve Program (Reinvest In Minnesota).
- High priority given by state and federal agencies to providing technical assistance and training for local government units.
- Recognition of inequities for rural landowners to preserve wetlands at their own expense.
- Wetland restorations that are accomplished through cooperation and partnership among agricultural interests, the business community, citizens, and government (local and other).
- Offsets to local tax base for preserved wetlands.
- Strategies for restoring complexes of wetlands to create cumulative function and value benefits.

Eight WEUs were identified for a wetland restoration strategy because of the following regional conditions that could be alleviated through restoration of wetlands:

- ✦ Degraded groundwater and surface water quality
- ✦ Hydrologic instability (e.g., flooding, stream flow maintenance)
- ✦ Degraded or lost fish and wildlife habitat

Management variations among these units will be found in the WEU summaries that follow this section. See also the "Restoration Program" section in Chapter 5, Statewide Management Strategy.

Wetland restoration should be the primary wetland management strategy in the following WEUs:

- # 1 Southwest Prairie
- # 2 Red River Prairie
- # 3 Aspen Parklands
- # 9 Hardwood Hills
- # 11 Anoka Sand Plain
- # 12 Highland Woods
- # 13 Oak Savanna
- # 14 Southeast Plateau

RESTORATION GOALS

- ★ NET GAIN IN WETLAND ACREAGE
- ★ NET GAIN IN WETLAND FUNCTION AND VALUE
- ★ IMPROVE DIVERSITY OF WETLAND TYPES

MAINTENANCE STRATEGY

Several areas of the state have an extensive wetland resource base and a "net gain" restoration strategy would be inappropriate. The focus in these regions is on the existing high quality wetlands, the quality of wetland functions, and the diversity of wetland types suitable for the needs of their location. Management variations among these units will be found in the WEU summaries that follow this section.

Maintaining the high quality of existing wetland resources should be the primary wetland management strategy in the following WEUs:

- # 4 Agassiz Basin
- # 5 Littlefork-Vermilion Uplands
- # 6 Northeast Arrowhead
- # 7 Central Lakes
- # 8 Tamarack Basin
- # 10 Western Superior Uplands

MAINTENANCE GOALS

- ★ MAINTAIN HIGH QUALITY WETLANDS
- ★ MAINTAIN OR IMPROVE WETLAND FUNCTION
- ★ MAINTAIN DIVERSITY OF WETLAND TYPES

Regional Descriptions

The 14 WEUs are briefly described on the following pages. General landscape features, regional watersheds, major land use activities, and the current distribution of wetland types are summarized for each WEU. Wetland management guidance is also provided, including the overall wetland management focus for state policy (see page 31) and a list of recommended actions. The actions may be undertaken by local government units, landowners, and/or agency staff, as applicable. Note that the guidance for identifying "high priority areas" is a recommendation about areas that may merit particular attention when LGUs identify their high priority areas.

The distribution of wetland types in the 14 WEUs is summarized in **Table 2**. It is important to keep in mind that these percentages are totals for each WEU; the distribution of each wetland type will also vary within a WEU. For example: 2.6% of wetlands in the Hardwood Hills WEU are Type 8 wetlands, but it is unlikely that those wetlands are evenly distributed throughout the WEU. Internal variations must be taken into account at any level of landscape scale.

TABLE 2 - PERCENTAGE OF WETLAND TYPES, BY WEU

Source: Minnesota Department of Natural Resources (Division of Waters), December 1996
Data used: Ecological Classification System and National Wetland Inventory

Wetland Ecological Unit (WEU)	T1 (%)	T2 (%)	T3 (%)	T4 (%)	T5 (%)	T6 (%)	T7 (%)	T8 (%)	Riverine (%)	Indus./ Munic. (%)	Total Wetland (acres)
1 SOUTHWEST PRAIRIE	16.8	2.9	58.0	2.3	8.6	2.1	5.9	0.0	3.1	0.4	428,925
2 RED RIVER PRAIRIE	14.2	18.2	46.3	1.8	2.3	5.8	6.1	0.6	3.9	0.9	186,260
3 ASPEN PARKLANDS	2.2	46.5	10.4	2.0	0.7	23.1	9.9	2.4	0.7	2.2	545,221
4 AGASSIZ BASIN	0.5	8.6	1.2	0.3	0.7	22.6	15.6	50.2	0.3	0.1	2,794,394
5 LITTLEFORK-VERMILION UPLANDS	0.9	1.5	4.1	0.7	1.6	13.6	9.0	67.8	0.8	0.0	531,733
6 NORTHEAST ARROWHEAD	0.1	1.6	4.6	1.3	2.5	17.4	6.2	63.4	0.8	2.0	1,232,980
7 CENTRAL LAKES	1.1	5.6	19.2	1.7	2.8	31.4	6.6	30.7	0.8	0.3	1,477,998
8 TAMARACK BASIN	0.3	7.3	1.3	0.2	0.6	28.9	5.0	55.4	0.6	0.5	858,128
9 HARDWOOD HILLS	3.9	3.3	58.0	2.3	6.0	15.8	7.7	2.6	0.4	0.1	712,797
10 WESTERN SUPERIOR UPLANDS	1.1	19.7	12.8	0.5	1.0	28.5	13.2	22.5	0.7	0.1	1,112,381
11 ANOKA SAND PLAIN	3.7	9.6	45.2	1.7	3.8	19.1	10.5	3.0	3.4	0.1	251,519
12 HIGHLAND WOODS	16.2	3.3	57.4	1.8	6.2	5.5	7.7	0.3	1.6	0.1	326,605
13 OAK SAVANNA	27.0	9.3	48.5	0.9	4.3	4.0	3.1	0.2	2.5	0.3	40,354
14 SOUTHEAST PLATEAU	29.2	8.1	18.1	2.2	10.6	4.1	22.6	0.1	4.8	0.2	86,888
STATEWIDE WETLAND DISTRIBUTION	2.7	9.5	16.0	1.1	2.3	21.5	10.0	35.6	0.9	0.5	10,586,183

These estimates of wetland area are expressed as a **PERCENTAGE OF THE TOTAL WETLANDS FOR EACH WETLAND ECOLOGICAL UNIT (WEU)**. The percentages were derived from National Wetland Inventory (NWI) habitat classification polygon data (Cowardin *et al.* 1979) and converted to Circular 39 types (Shaw and Fredine 1956). Deepwater habitats in Cowardin *et al.* (1979) were assumed to be the habitats of L1 (excluding water regime K), PUBG, and PUBH. Types 1 (T1) through 8 (T8) are the conventional Circular 39 types. Because of differences between Circular 39 and the Cowardin system, "Riverine" wetlands and "Industrial/Municipal" facilities are listed separately. "Total Wetland" (in acres) is the sum of all wetland types T1 through T8 *plus* "Riverine" *plus* "Industrial/Municipal".

1 SOUTHWEST PRAIRIE

GENERAL LANDSCAPE

The Minnesota River Prairie is gently rolling ground moraine and glacial till draining to the Minnesota River with mostly well to moderately well drained loamy soils. Coteau areas in the southwest corner are high glacial landforms draining to the Missouri River; loamy well-drained soils with thick dark surface horizons are dominant. Creeks, shallow lakes, riparian wetlands, calcareous fens, wildlife habitat, river bluffs, and remnants of oak savanna and native prairie are some of the important natural resources here. The landscape on the whole is dominated by agriculture.

WATERSHEDS

The southwest corner of this unit drains into the Missouri watershed, but the majority drains into the Mississippi watershed by way of the Minnesota River. The Minnesota River valley contains 150 lakes larger than 160 acres, many of which are shallow and perched; the Coteau areas have few lakes. The drainage network is extensively developed. Water quality and quantity are major concerns. Most wetlands have been eliminated, which provides abundant opportunities for wetland restoration. The water quality of the Minnesota River valley is severely degraded and the system also has problems with overbank stream flooding.

LAND USE

Current: Intensive agriculture is the dominant land use; row crop production will remain intensive and the livestock industry is growing (mostly in large confinement operations). Many medium-size cities have new light industry, manufacturing, and agricultural processing businesses, which are expanding water supply needs and water quality concerns. Those communities have growing populations and housing needs, as well. Recreation uses will continue to grow, especially along rivers and trail corridors.

Historic Condition: Vegetation was tallgrass prairie, with many islands of wet prairie. Forests of silver maple, elm, cottonwood, and willow grew on floodplains along the Minnesota River. In the Coteaus, wet prairie was restricted to narrow stream margins.

WETLANDS

Total land area: 10,402,837 acres
Upland (% of total area): 95 %
Estimated remaining presettlement wetlands: < 1-4 %
Wetland as percentage of total wetland:

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Riverine	Industrial/Municipal
16.8 %	2.9 %	58.0 %	2.3 %	8.6 %	2.1 %	5.9 %	0.0 %	3.1 %	0.4 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: WETLAND RESTORATION

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, ground water recharge areas, wetland complexes, and for locally-identified needs. State and local government and private groups should work together to identify migratory waterfowl habitat and water quality areas for major river systems. Location within a watershed should be a strong factor. Identify calcareous fens for special protection.
- **Land use planning & zoning:** Through local government units, prohibit draining of wetlands in crucial areas along rivers and streams (to prevent flooding and to improve water quality); apply performance-based land use controls (e.g., sediment control basins and other BMPs); improve compliance of individual household sewage treatment where there are inadequacies.
- **Monitoring:** Upgrade local government information systems for monitoring and evaluation of programs and projects. Monitor water quality in lakes and streams and for private household water systems.
- **BMPs:** Use Best Management Practices for agriculture and shorelands.
- **Mitigation:** Give stewardship credits for buffer strips or associated upland in wetland restorations, (especially important in undulating topography). Target program funding and improve incentives to maintain or restore wetlands, particularly Types 1-5. Encourage restoration of wetland complexes (which may provide more benefits than isolated wetlands, for the same acreage).
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

2 RED RIVER PRAIRIE

GENERAL LANDSCAPE

The majority of this unit is a glacial lake plain with silty, sandy, and clayey lacustrine deposits. The level and gently sloping topography has wetlands, meandering waterways, and beach ridges from prehistoric Lake Agassiz. Poorly, somewhat poorly, and moderately drained lacustrine clays, silts, and sands make up the majority of soils. Virtually all of the poorly drained soils have been ditched and drained for very productive agricultural use. Saline soils are present in localized areas. Dry, sandy, gravelly soils are characteristic in the beach ridges. Wildlife habitat, beach ridges, native prairie remnants, calcareous fens, and potable water are some of the important natural resources here.

WATERSHEDS

This unit drains to Hudson Bay via the Red River of the North. The drainage network is extensively developed. Rivers and streams meander extensively through this region. The few lakes are shallow and perched. Sheet flooding is common each spring and causes major problems for agricultural producers and cities.

LAND USE

Current: The dominant land use is intensive agriculture, including wheat, sugar beets, and specialized products. There is some recreational use, primarily hunting, fishing, and watercraft.

Historic Condition: Tallgrass prairie and wet prairie were the dominant vegetation communities. Narrow, forested floodplains were common along larger streams and rivers.

WETLANDS

Total land area: 4,443,598 acres
Upland (% of total area): 95 %
Estimated remaining presettlement wetlands: < 1-19 %
Wetland as percentage of total wetland:

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Riverine	Industrial/Municipal
14.2 %	18.2 %	46.3 %	1.8 %	2.3 %	5.8 %	6.1 %	0.6 %	3.9 %	0.9 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: WETLAND RESTORATION

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities. Coordinate with Aspen Parklands and Hardwood Hills WEUs (beach ridges).
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, ground water recharge areas, wetland complexes, and for locally-identified needs. State and local government and private groups should work together to identify migratory waterfowl habitat and water quality areas for major river systems. Location within a watershed should be a strong factor. Identify calcareous fens for special protection.
- **Land use planning & zoning:** Through local government units, implement land use policies and practices to protect wetland and water quality.
- **Wild rice waters:** Protect wild rice waters and avoid impacting small wetlands upstream from a wild rice waterbody. Cultural values and waterfowl migration are other values associated with wild rice waters. "Bounce" in water level is the greatest problem to overcome. The PCA should designate wild rice use for particular waterbodies under the Clean Water Act.
- **BMPs:** Use Best Management Practices for agriculture and shorelands.
- **Flood water retention:** Model some subwatershed pilot projects to test ways in which wetland restoration or engineered flood control wetlands could contribute to flood water retention and wildlife habitat.
- **Water supply:** Locate areas of ground water recharge.
- **Mitigation:** Target program funding and incentives to maintain or restore wetlands and discourage further filling or draining of wetlands in the region.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

3 ASPEN PARKLANDS

GENERAL LANDSCAPE

This unit is a low, level plain between extensive forested peatlands to the east and tallgrass prairie to the west, all part of the same glacial lake plain. Low dunes, beach ridges, and wet swales mark the western edge. To the east, low ridges of water and reworked till are surrounded by herbaceous wetlands. Soils of the lacustrine plain range from loams and silts to sands and gravels. Calcareous fens and saline seeps occur at the base of sand dunes and beach ridges. Wildlife, forests, calcareous fens, and winter recreation are some of the natural resource concerns here.

WATERSHEDS

This unit drains to Hudson Bay via the Red River of the North. The Two River and Red Lake River are two of the larger rivers in the region. Rivers and streams meander extensively, but lakes are rare. The region does have a well-developed drainage network. Flooding can be a problem due to the level topography; peak flow rates far exceed the capacity of the system.

LAND USE

Current: Agriculture is the dominant land use in much of the region. More forestry activities could develop in the future. Industrial and residential development is likely to be confined to existing cities and roadways.

Historic Condition: Vegetation consisted of a combination of aspen savannas, tallgrass, wet prairie and dry gravel prairie. Floodplain forests of silver maple, elm cottonwood and ash occurred along the rivers and streams.

WETLANDS

Total land area:	2,594,698 acres
Upland (% of total area):	79 %
Estimated remaining presettlement wetlands:	8-44 %
Wetland as percentage of total wetland:	

<u>Type 1</u>	<u>Type 2</u>	<u>Type 3</u>	<u>Type 4</u>	<u>Type 5</u>	<u>Type 6</u>	<u>Type 7</u>	<u>Type 8</u>	<u>Riverine</u>	<u>Industrial/Municipal</u>
2.2 %	46.5 %	10.4 %	2.0 %	0.7 %	23.1 %	9.9 %	2.4 %	0.7 %	2.2 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: WETLAND RESTORATION

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities. Coordinate with Red River Prairie WEU for restorations in beach ridges.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, ground water recharge areas, wetland complexes, and for locally-identified needs. State and local government and private groups should work together to identify migratory waterfowl habitat and water quality areas for major river systems. Identify calcareous fens for special protection.
- **BMPs:** Use Best Management Practices for agriculture and shorelands.
- **Flood water retention:** Model some subwatershed pilot projects to test ways in which wetland restoration or engineered flood control wetlands could contribute to flood water retention and wildlife habitat. Continue seeking more water-tolerant, high value crops suitable to this region.
- **Old ditch systems:** Pursue voluntary ditch abandonment (according to Minn. Stat. Chap. 103E) for systems that are ineffective or no longer in use.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

4 AGASSIZ BASIN

GENERAL LANDSCAPE

The Agassiz Basin is characterized by a flat, poorly drained lake plain. Extensive peatlands are dominated by bog forest species (black spruce and tamarack); these include the "patterned peatlands" that are unique to Minnesota. Upland sites are commonly vegetated by aspen, birch, and jack pine. Soils are predominantly organic, with increased amounts of poorly drained mineral soils near the edges. Peat depths can exceed 15 feet. Glacial drift is thinnest at the northern and eastern edges of the lake plain, where bedrock is locally exposed. Wildlife, forestry, uplands, and peatlands are some of the natural resource concerns here.

WATERSHEDS

This unit drains to Hudson Bay via the Red River of the North. The Big Fork and Rainy Rivers are the largest rivers running through this area. Lower Red Lake, Upper Red Lake, and Lake of the Woods are remnants of glacial Lake Agassiz. Extensive ditching of the peatlands in the earlier part of this century was largely unsuccessful; much of the peatlands are now protected as state Scientific and Natural Areas.

LAND USE

Current: Forestry, recreation, and some agriculture are the dominant land uses. A high percentage of wetlands are in public ownership.

Historic Condition: Vegetation was dominated by lowland conifers (black spruce, tamarack, white cedar).

WETLANDS

Total land area: 4,356,036 acres
Upland (% of total area): 24 %
Estimated remaining presettlement wetlands: 89-98 %
Wetland as percentage of total wetland:

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Riverine	Industrial/Municipal
0.5 %	8.6 %	1.2 %	0.3 %	0.7 %	22.6 %	15.6 %	50.2 %	0.3 %	0.1 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: MAINTAIN HIGH QUALITY WETLAND RESOURCES

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, high quality wetlands and wetland complexes, peatlands, and for locally-identified needs.
- **Land use planning & zoning:** Concentrate new development along existing settlement corridors (existing roads and highways). Special attention should be given to avoiding impacts on large peatlands and high quality wetlands.
- **BMPs:** Use Best Management Practices for agriculture and shorelands.
- **Peatlands, shoreland, high quality wetlands:** Adhere to strict sequencing for impacts to shorelands, high quality wetlands, and the fringes of large peatlands, with special attention to cumulative impacts.
- **Mitigation:** Allow stewardship credits for restoration or improvements on upland habitat.
- **Old ditch systems:** Pursue voluntary ditch abandonment (according to Minn. Stat. Chap. 103E) for systems that are ineffective or no longer in use and would provide good wetland restoration opportunities.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

5 LITTLEFORK-VERMILION UPLANDS

GENERAL LANDSCAPE

This is a level to gently rolling lake plain; it is a transition zone between peatlands to the west and a bedrock-dominant landscape to the east. Most soils are moderately well to poorly drained mineral soils.

WATERSHEDS

This unit drains to Hudson Bay via the Red River of the North. It is framed by the Littlefork River on the west side and the Vermilion River on the east side. The drainage network is limited, but an extensive stream network meanders throughout, especially in the western part. Lakes are concentrated in the southeastern part of the unit.

LAND USE

Current: The local economy is based on forestry and timber management. Quaking aspen is the most common tree species and it is harvested for pulp. Recreation, housing, and other shoreland development is occurring near lakes and rivers and is expected to increase in the future. A high percentage of land is publicly-owned.

Historic Condition: Much of this unit was in aspen and birch with a climax condition dominated by white pine, white spruce and balsam fir. The eastern portion was dominated by white pine, red pine, and jack pine. Lowlands were characterized by bog plant communities.

WETLANDS

Total land area:	1,405,020 acres
Upland (% of total area):	60 %
Estimated remaining presettlement wetlands:	97 %
Wetland as percentage of total wetland:	

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Riverine	Industrial/Municipal
0.9 %	1.5 %	4.1 %	0.7 %	1.6 %	13.6 %	9.0 %	67.8 %	0.8 %	0.0 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: MAINTAIN HIGH QUALITY WETLAND RESOURCES

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities. High degree of state and Federal land ownership necessitates close coordination during development of local water plans and wetland plans.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, wetland complexes, and for locally-identified needs.
- **Land use planning & zoning:** Concentrate new development along existing settlement corridors (existing roads and highways). Special attention should be given to avoiding impacts on large peatlands and high quality wetlands.
- **Wild rice waters:** Protect wild rice waters and avoid impacting small wetlands upstream from a wild rice waterbody. Cultural values and waterfowl migration are other values associated with wild rice waters. "Bounce" in water level is the greatest problem to overcome. The PCA should designate wild rice use for particular waterbodies under the Clean Water Act.
- **BMPs:** Use Best Management Practices for forestry and shorelands.
- **Old ditch systems:** Pursue voluntary ditch abandonment (according to Minn. Stat. Chap. 103E) for systems that are ineffective or no longer in use.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

6 NORTHEAST ARROWHEAD

GENERAL LANDSCAPE

Lakes, streams, and forests are the outstanding and popular aspects of this unit, which includes 4 landscape areas:

Border Lakes: Lakes and rocky ridges characterize this landscape of glacially-eroded bedrock, poor soils, and forests. [Much of this area is designated as the Boundary Waters Canoe Area Wilderness.]

Nashwauk Uplands: Landforms include end moraines, outwash plains, and lake plains. Most of the state's iron mining takes place here. Forest communities dominate.

Laurentian Highlands: Topography is rolling with drumlins and very poorly drained organic soils in between. Forest communities dominate.

North Shore: Rolling to steep topography along Lake Superior. Bedrock outcroppings are common and soils are commonly shallow and rocky. Lake Superior moderates the climate throughout the year.

Water quality, wildlife, trout streams, wild rice waters, unique bogs, headwaters and riparian wetlands, forests, mining, and recreation are many of the natural resource concerns here.

WATERSHEDS

The northern half of this unit drains to Hudson Bay; southern and eastern areas flow to Lake Superior. The Border Lakes portion contains over 300 lakes larger than 160 acres; lakes make up a significant portion of the landscape in the other areas as well. There are many large rivers.

LAND USE

Current: Major land use activities include forestry, mining, recreation, and tourism. Except for urban areas, the main difference from the rest of Minnesota is the low degree of direct human alteration of the landscape. Some communities and more remote areas will continue to add seasonal housing and commercial growth. Timber harvest may intensify. A high percentage of land is publicly-owned. Land management activities such as forestry and shoreland development may produce excessive runoff into wetlands, resulting in lower basic water quality and increased conversion rates of inorganic mercury to methylmercury (a more bio-available form of mercury) in the aquatic ecosystem; this is a special concern in this region because the water bodies are sensitive to methylmercury, which causes increased contamination of the aquatic food chain (especially game fish).

Historic Condition: This area was dominated by a rather diverse hardwood conifer forest including white pine, red pine, balsam fir, white spruce, aspen, and birch.

WETLANDS

Total land area:	5,349,384 acres
Upland (% of total area):	69 %
Estimated remaining presettlement wetlands:	93-100 %
Wetland as percentage of total wetland:	

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Riverine	Industrial/Municipal
0.1 %	1.6 %	4.6 %	1.3 %	2.5 %	17.4 %	6.2 %	63.4 %	0.8 %	2.0 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: MAINTAIN HIGH QUALITY WETLAND RESOURCES

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities. High degree of state and Federal land ownership necessitates close coordination during development of local water plans and wetland plans.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, wildlife habitat, wetland complexes, and for locally-identified needs.
- **Land use planning & zoning:** Concentrate new development along existing settlement corridors. Special attention should be given to avoiding impacts on shoreland, large peatlands, and high quality wetlands. Improve wastewater treatment and management in shoreland areas.
- **Wild rice waters:** Protect wild rice waters and avoid impacting small wetlands upstream from a wild rice waterbody. Cultural values and waterfowl migration are other values associated with wild rice waters. "Bounce" in water level is the greatest problem to overcome. The PCA should designate wild rice use for particular waterbodies under the Clean Water Act.
- **BMPs:** Use Best Management Practices for forestry and shorelands.
- **Trout streams and lakes:** Protect and restore wetlands in the watersheds of trout streams and trout lakes to maintain the necessary temperature and water quality.
- **Mitigation:** Allow stewardship credits for restoration or improvements on upland habitat.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

7 CENTRAL LAKES

GENERAL LANDSCAPE

Lakes, streams, and forests are the outstanding and popular aspects of this unit, which includes 3 landscape areas:

St. Louis Moraines: A north-south band on the eastern side of this unit, rolling to steep slopes characterize this area. End moraines are the dominant landform. Topography ranges from gently rolling to steep. Area is heavily forested.

Chippewa Plains: Comprising the northern part of this unit, level to gently rolling lake plains and till plains characterize this area. Three large, well-used lakes are found here: Leech Lake, Lake Winnibigoshish, and Cass Lake. Much of the area is forested, but agriculture is important in the western part.

Pine Moraines and Outwash Plains: Comprising the southern part of this unit, it has a mix of end moraines, outwash plains, till plains, and drumlin fields. On outwash plains, excessively drained sands are prevalent, but they are interspersed with numerous wetlands. Vegetation varies from pine species to bog conifer species.

Water quality, forestry, wildlife, wild rice waters, shoreland, and recreation are many of the natural resource concerns here.

WATERSHEDS

Most of this unit in the Mississippi watershed, but the northwestern rim drains to Hudson Bay. There are hundreds of lakes within this unit. The headwaters of the Mississippi River, Lake Itasca, is in this region. Other rivers flowing through this area are the Pine, Crow Wing, Prairie, Willow, Hill and Moose Rivers.

LAND USE

Current: Land use varies from predominantly forestry-related to primarily residential (especially in lake areas) to primarily agriculture. There is an increase in agricultural irrigation (particularly potatoes) taking place in sandy soil areas. Recreation, tourism, and summer homes are common where there are concentrations of lakes.

Historic Condition: Pine and hardwood forests were patterned across this part of the state, along with forested lowlands and sedge-meadow wetlands.

WETLANDS

Total land area:	6,653,798 acres
Upland (% of total area):	68 %
Estimated remaining presettlement wetlands:	53-95 %
Wetland as percentage of total wetland:	

<u>Type 1</u>	<u>Type 2</u>	<u>Type 3</u>	<u>Type 4</u>	<u>Type 5</u>	<u>Type 6</u>	<u>Type 7</u>	<u>Type 8</u>	<u>Riverine</u>	<u>Industrial/Municipal</u>
1.1 %	5.6 %	19.2 %	1.7 %	2.8 %	31.4 %	6.6 %	30.7 %	0.8 %	0.3 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: MAINTAIN HIGH QUALITY WETLAND RESOURCES

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, water quality, wetland complexes, and for locally-identified needs. Identify calcareous fens for special protection.
- **Land use planning & zoning:** Through local government units, prohibit draining of wetlands in shoreland and riparian areas; apply performance-based land use controls (e.g., sediment control basins and other BMPs); develop comprehensive land use plans for areas experiencing residential growth.
- **BMPs:** Use Best Management Practices for shorelands and forestry.
- **Wild rice waters:** Protect wild rice waters and avoid impacting small wetlands upstream from a wild rice waterbody. Cultural values and waterfowl migration are other values associated with wild rice waters. "Bounce" in water level is the greatest problem to overcome. The PCA should designate wild rice use for particular waterbodies under the Clean Water Act.
- **Mitigation:** Allow all types of stewardship credits for replacement above and beyond a 1:1 ratio. Provide higher credit for shoreland and riparian wetland restoration.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

8 TAMARACK BASIN

GENERAL LANDSCAPE

The largest landform in the Tamarack Basin is a lake plain and around the edges of an old glacial lake is a till plain, resulting in a level-to-gently rolling topography. Lowland hardwoods and conifers are the most common forest communities. There are extensive peatlands here, as well. Forestry, wildlife, water quality, and uplands are some of the natural resource concerns here.

WATERSHEDS

The northeastern part of the Tamarack Basin drains to Lake Superior and the southwestern part drains to the Mississippi River. Rivers and streams meander extensively across this unit due to a mainly level landscape. There are few lakes in the lake plain; the largest is Big Sandy Lake, which is a reservoir created by a dam on the Savannah River.

LAND USE

Current: Forestry, recreation, and some agriculture are the main land uses. Tourism is important in the Big Sandy Lake area. A high percentage of wetlands are in public ownership.

Historic Condition: Vegetation was dominated by lowland conifers (black spruce, tamarack, white cedar) and sedge meadows were also extensive.

WETLANDS

Total land area:	1,787,888 acres
Upland (% of total area):	50 %
Estimated remaining presettlement wetlands:	93 %
Wetland as percentage of total wetland:	

<u>Type 1</u>	<u>Type 2</u>	<u>Type 3</u>	<u>Type 4</u>	<u>Type 5</u>	<u>Type 6</u>	<u>Type 7</u>	<u>Type 8</u>	<u>Riverine</u>	<u>Industrial/Municipal</u>
0.3 %	7.3 %	1.3 %	0.2 %	0.6 %	28.9 %	5.0 %	55.4 %	0.6 %	0.5 %

WETLAND MANAGEMENT

➤ **PRIMARY MANAGEMENT FOCUS: MAINTAIN HIGH QUALITY WETLAND RESOURCES**

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, high quality wetlands and wetland complexes, peatlands, and for locally-identified needs.
- **Land use planning & zoning:** Concentrate new development along existing settlement corridors (existing roads and highways). Special attention should be given to avoiding impacts on large peatlands and high quality wetlands.
- **BMPs:** Use Best Management Practices for forestry and shorelands.
- **Peatlands, shoreland, high quality wetlands:** Adhere to strict sequencing for impacts to shorelands, high quality wetlands, and the fringes of large peatlands, with special attention to cumulative impacts.
- **Mitigation:** Allow stewardship credits for restoration or improvements on upland habitat.
- **Old ditch systems:** Pursue voluntary ditch abandonment (according to Minn. Stat. Chap. 103E) for systems that are ineffective or no longer in use and would provide good wetland restoration opportunities.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

9 HARDWOOD HILLS

GENERAL LANDSCAPE

This unit is in the transition zone from prairie to woods. Steep slopes, hills, and lakes formed in glacial end moraines, outwash plains characterize this unit. Soils range from loamy sands and sandy loams on outwash plains to loams and clay loams on moraines. Water quality, steep slopes, shoreland and riparian wetlands, fisheries, and wildlife are some of the natural resources concerns here.

WATERSHEDS

The continental divide splits this unit, so the northern half of this unit drains to Hudson Bay and the southern half drains to the Mississippi. The Alexandria moraine forms a high ridge which is the headwaters of many rivers and streams. Major rivers include the Chippewa, Long Prairie, Sauk, and Crow Wing Rivers. There are over 400 lakes larger than 160 acres.

LAND USE

Current: Agriculture is the major land use, but many poorly-drained "pothole" wetlands remain for either recreational or wildlife use, some upland forests adjacent to lakes or steep landscapes also remain. Tourism is important in lakes areas.

Historic Condition: Irregular topography and presence of numerous lakes and wetlands provided a partial barrier to fires, resulting in woodland or forest to the northeast. Tallgrass prairie existed in more level terrain in the southwest.

WETLANDS

Total land area: 4,841,332 acres
Upland (% of total area): 78 %
Estimated remaining presettlement wetlands: 44-94 % (greater losses to the southwest)
Wetland as percentage of total wetland:

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Riverine	Industrial/Municipal
3.9 %	3.3 %	58.0 %	2.3 %	6.0 %	15.8 %	7.7 %	2.6 %	0.4 %	0.1 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: WETLAND RESTORATION

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities. Coordinate with Red River Prairie WEU for restorations in beach ridges.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, wetland complexes, lakesheds, and for locally-identified needs. State and local government and private groups should work together to identify migratory waterfowl habitat and water quality areas for major river systems. Identify calcareous fens for special protection.
- **Lakes & streams:** Create wetland preservation areas adjacent to wetlands that maintain or improve the water quality of lakes and streams. Wetlands within and adjacent to recreational lakes and that provide fish spawning habitat should be a high priority for protection and restoration. Restoration of wetlands for use in aquaculture should be encouraged.
- **Wild rice waters:** Protect wild rice waters and avoid impacting small wetlands upstream from a wild rice waterbody. Cultural values and waterfowl migration are other values associated with wild rice waters. "Bounce" in water level is the greatest problem to overcome. The PCA should designate wild rice use for particular waterbodies under the Clean Water Act.
- **Water storage:** Wetlands that provide water retention functions in developing areas should be a high priority for protection and restoration. Construct dedicated water retention basins where necessary to protect the integrity of existing wetlands.
- **Mitigation:** Wetland impacts should be replaced within the same watershed or lakeshed if possible. Replacements from other WEUs should be targeted for the southwestern portion of this WEU (adjust replacement ratios). Allow stewardship credits or use other incentives for preserving and restoring wetland complexes and adjacent upland habitat for nesting waterfowl and other wildlife species.
- **BMPs:** Use Best Management Practices for agriculture and shorelands. Promote wetland restoration and creation for filtering agricultural runoff. Locate and manage feedlots to avoid impacts to wetlands. Maintain upland vegetated buffers of at least 50 feet around open water wetlands.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

10 WESTERN SUPERIOR UPLANDS

GENERAL LANDSCAPE

Gently rolling till plains and drumlin fields are the dominant landforms. The large Mille Lacs Lake is very well-known for year-round fishing. Depressions between drumlins contain peatlands and shallow organic material. Typically there is dense glacial till underlying most soils in this unit, which impedes water movement throughout the soil profile. The soils are described as acid, stony, reddish sandy loams, silt loams and loamy sands. The northeast corner by Lake Superior is a forested glacial lake plain with deep valleys cut by the Nemadji River and its tributaries. Wetlands, trout streams, rivers and lakes, ground water, wildlife, fishing, wild rice waters, and forestry are some of the natural resource concerns here.

WATERSHEDS

The majority of this unit is in the Mississippi watershed. The St. Croix River forms part of the eastern boundary and the Kettle and Rum Rivers are protected "Wild and Scenic Rivers". The drainage network is young and underdeveloped, with extensive areas of wetlands present. There are 100 lakes greater than 160 acres in size, most found in end moraines.

LAND USE

Current: Agriculture is mostly practiced in the western and southern portions of this unit. Forestry and recreation are the most important land uses in the central and eastern part. There are large areas in eastern Pine County that are still heavily forested and relatively undisturbed. Recreation, peat mining, sod production, and wild rice harvesting are other common activities. Urbanization, rural residential development, and lakeshore development is expanding rapidly.

Historic Condition: Original vegetation consisted of a mosaic of forest types. Along the southern boundary, maple-basswood forests were prevalent. The rest of the subsection was a vast mix of conifer, hardwood and mixed conifer-hardwood forests. Peatlands areas were inhabited by sedge-fen, black spruce-sphagnum, or white cedar-black.

WETLANDS

Total land area:	3,867,414 acres
Upland (% of total area):	66 %
Estimated remaining presettlement wetlands:	62-92 %
Wetland as percentage of total wetland:	

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Riverine	Industrial/Municipal
1.1 %	19.7 %	12.8 %	0.5 %	1.0 %	28.5 %	13.2 %	22.5 %	0.7 %	0.1 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: MAINTAIN HIGH QUALITY WETLAND RESOURCES

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities. Address ground water protection in the local water plan.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, ground water recharge areas, wildlife habitat, wetland complexes, and for locally-identified needs.
- **Land use planning & zoning:** Through local government units, prohibit draining of wetlands in shoreland and riparian areas; apply performance-based land use controls (e.g., sediment control basins and other BMPs); improve compliance of individual household sewage treatment where there are inadequacies. Develop comprehensive land use and growth management plans.
- **Wild rice waters:** Protect wild rice waters and avoid impacting small wetlands upstream from a wild rice waterbody. Cultural values and waterfowl migration are other values associated with wild rice waters. "Bounce" in water level is the greatest problem to overcome. The PCA should designate wild rice use for particular waterbodies under the Clean Water Act.
- **BMPs:** Use Best Management Practices for forestry, agriculture, and shorelands.
- **Mitigation:** Require a minimum replacement ratio of 1:1. Allow habitat, water quality, and water storage stewardship credits beyond the 1:1 ratio, especially along sensitive, unique, or rare wetlands.
- **Trout streams:** Protect and restore wetlands in the watersheds of trout streams to maintain and improve the water quality of the streams.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

11 ANOKA SAND PLAIN

GENERAL LANDSCAPE

This unit consists of a flat, sandy lake plain along the Mississippi River. Recent mapping suggests that much of the sand plain, once thought to be fluvial, is probably lacustrine in origin. The soils are primarily fine sands with organic and loamy hydric soils in depressions. Glacial till is deposited in scattered moraines. The regional water table is very shallow, usually less than 15 feet below the surface with much of it exposed in the form of wetlands, lakes, and stream. The sand plain is thought to recharge the Jordan Aquifer (used for drinking water by much of the Twin Cities Metropolitan Area). Sand plain aquifers (ground water), high water tables, shoreland and riparian wetlands, remnant oak stands, and habitat are some of the natural resource concerns here.

WATERSHEDS

This unit drains to the Mississippi River. Although most rivers and streams are tributaries of the Mississippi, some flow east to the St. Croix River, which also discharges into the Mississippi. Many rivers, streams, and lakes are located in the old glacial tunnel valleys. Extensive ditching has occurred in large wetland networks, lowering the regional ground water table.

LAND USE

Current: This is a developing urban corridor from Minneapolis to St. Cloud. Sod and vegetable crops are extensively grown on drained wetlands. Irrigated sands are used for potato production; high nitrate levels in ground water are common in areas of irrigated crops in sand soils. Wetland impacts continue in the form of wetland fill for residential and commercial development, roadways, and other infrastructure, as well as drainage for agriculture by ditch maintenance and upgrades.

Historic Condition: The predominant vegetation was oak savanna on droughty uplands and expansive networks of varied wetland types.

WETLANDS

Total land area:	1,254,545 acres
Upland (% of total area):	77 %
Estimated remaining presettlement wetlands:	33-80 %
Wetland as percentage of total wetland:	

<u>Type 1</u>	<u>Type 2</u>	<u>Type 3</u>	<u>Type 4</u>	<u>Type 5</u>	<u>Type 6</u>	<u>Type 7</u>	<u>Type 8</u>	<u>Riverine</u>	<u>Industrial/Municipal</u>
3.7 %	9.6 %	45.2 %	1.7 %	3.8 %	19.1 %	10.5 %	3.0 %	3.4 %	0.1 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: WETLAND RESTORATION

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities. Develop local plans with consideration of resources on a minor subwatershed level.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, ground water recharge areas, wetland complexes, and for locally-identified needs. State and local government and private groups should work together to identify water quality areas for major river systems.
- **Land use planning & zoning:** Through local government units, amend zoning ordinances to allow "cluster" or "conservation" developments (State should provide a model ordinance) and consider adopting buffer ordinances for existing wetlands. Require strictest adherence to sequencing requirements for impacts to shoreland wetlands and high quality wetlands.
- **Mitigation:** Require a minimum replacement ratio of 1:1. Allow stewardship credits for habitat, water quality, and water storage beyond the 1:1 ratio.
- **Habitat:** Develop long-range comprehensive plans to restore and maintain high quality wetlands in sufficient quantity and distribution to sustain wildlife populations or habitat corridors.
- **Old ditch systems:** Pursue voluntary ditch abandonment (according to Minn. Stat. Chap. 103E) for systems that are ineffective or no longer in use.
- **Ground water:** Identify regional ground water recharge areas for protection.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

12 HIGHLAND WOODS

GENERAL LANDSCAPE

This unit includes 2 landscape areas:

Big Woods: This portion comprises the western side of the metro area and extends northwest to St. Cloud and southwest to Mankato. Topography is gently to moderately rolling. Soils are loamy, with textures ranging from loam to clay loam.

St. Croix Moraines & Outwash Plains: This portion covers the eastern side of the metro area along the St. Croix River. Topography ranges from rolling to steep, short slopes. Soils are primarily Alfisols (formed under forested vegetation).

Remaining wooded areas, lakes and streams, the Minnesota River valley, calcareous fens and other less common wetland types, steep slopes, trout streams, and special uplands are some of the natural resource concerns in this unit.

WATERSHEDS

This unit drains to the Mississippi River. The Mississippi and Minnesota Rivers cut through the heart of this unit and the St. Croix River forms the eastern boundary. In the Big Woods portion there are over 100 lakes of 160 acres or more in size, many of which are groundwater-controlled with no inlets or outlets. Many lakes are found on moraines in the St. Croix side to the east and there is a well-developed floodplain associated with the Mississippi River.

LAND USE

Current: Urban land uses predominate within the metro development corridor and will continue to expand. A considerable amount of land along the Minnesota River outside the metro area is in agriculture.

Historic Condition: Oak woodland and maple-basswood forest were the most common vegetation types in the Big Woods. The St. Croix had a mosaic of oak and aspen savanna, tallgrass prairie, and maple-basswood forest.

WETLAND

Total land area: 2,584,241 acres

Upland (% of total area): 83 %

Estimated remaining presettlement wetlands: 2-43 %

Wetland type as percentage of total wetland:

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Riverine	Industrial/Municipal
16.2 %	3.3 %	57.4 %	1.8 %	6.2 %	5.5 %	7.7 %	0.3 %	1.6 %	0.1 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: WETLAND RESTORATION

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities. Develop local plans with consideration of resources on a minor subwatershed level.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, for water quality and quantity, ground water recharge, and for locally-identified needs. State and local government and private groups should work together to identify water quality areas for major river systems.
- **Land use planning & zoning:** Through local government units, require natural vegetation buffers around replacement wetlands and consider adopting buffer ordinances for existing wetlands. Amend zoning ordinances to allow "cluster" or "conservation" developments (State should provide a model ordinance). Require strict adherence to sequencing requirements for all wetland impacts.
- **Habitat:** Develop long range comprehensive plans to restore and maintain high quality wetlands in sufficient quantity and distribution to sustain wildlife populations or habitat corridors.
- **Mitigation:** Allow all types of stewardship credits for replacement above and beyond a 1:1 ratio. Provide higher credit for shoreland and riparian wetland restoration.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

13 OAK SAVANNA

GENERAL LANDSCAPE

Much of this unit is a gently rolling plain of loess-mantled ridges over sandstone and carbonate bedrock and till, with moraine ridges at the southwestern edge. Soils are a mosaic of forest and grassland generated types correlated with either upland prairie on relatively flat ridgetops or wetland prairies in broad depressions. Hillside forests, ground water, wetland complexes and riparian wetlands, calcareous fens, water quality, and wildlife are some of the natural resources concerns here.

WATERSHEDS

This unit drains to the Mississippi River. Most of this unit has a fairly well developed drainage network. The few lakes here are found in the western moraines.

LAND USE

Current: Agriculture is the dominant land use and will continue to be so. However, urban development is accelerating along the northern and eastern sides of the unit.

Historic Condition: Bur oak savanna was the primary vegetative community, but areas of tallgrass prairie and maple-basswood forest were common.

WETLANDS

Total land area: 1,692,073 acres
Upland (% of total area): 97 %
Estimated remaining presettlement wetlands: 1-14 %
Wetland type as percentage of total wetland:

<u>Type 1</u>	<u>Type 2</u>	<u>Type 3</u>	<u>Type 4</u>	<u>Type 5</u>	<u>Type 6</u>	<u>Type 7</u>	<u>Type 8</u>	<u>Riverine</u>	<u>Industrial/Municipal</u>
27.0 %	9.3 %	48.5 %	0.9 %	4.3 %	4.0 %	3.1 %	0.2 %	2.5 %	0.3 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: WETLAND RESTORATION

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities. Wetland impacts should be replaced at a minimum 2:1 ratio; higher ratios could be imposed based on local conditions. Assess the effects of existing wetland regulatory exemptions on overall surface water resources and consider adjustments in local water plans.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas, for water quality and habitat, and for locally-identified needs. State and local government and private groups should work together to identify water quality areas for major river systems. Identify calcareous fens for special protection.
- **Water quality:** Consider wetland restoration and protection as a (partial) solution to poor ground water and surface water quality and flooding. Local water planning should include analysis of where to target restorations for maximum benefit.
- **BMPs:** Use Best Management Practices for agriculture.
- **Habitat:** Restore wildlife travel corridors to connect significant wetland areas or complexes and protect them with easements or other management. Promote existing programs and develop new incentives for landowners to preserve and restore wetlands and adjacent upland habitat. Identify and protect wetlands that contribute significantly to local or regional biodiversity.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

14 SOUTHEAST PLATEAU

GENERAL LANDSCAPE

This unit consists of 2 landscapes areas:

Rochester Plateau: A plateau covered by loess (windblown silt) along the eastern side and glacial till in the central and western parts. Topography varies from level to gently rolling.

Blufflands: A plateau covered by loess (windblown silt) and then extensively eroded along rivers and streams. It is characterized by highly dissected bedrock controlled landscapes associated with major rivers in southeastern Minnesota. Bluffs and stream valleys (500 to 600 feet deep) are common. River bottom forests grow along major streams and rivers.

an old plateau covered by loess. Bluffs and deep stream valleys are common along the eastern border with the Mississippi River. River bottom forests grew along major streams and rivers. Loess thickness varies from 1 to 30 feet. Flood plains, springs, trout streams, fens, riparian wetlands, and steep slopes are some of the natural resource concerns here.

Most wetlands occur near the vicinity where water confining rocks outcrop or underlay the regional landscape. The landscape setting is likely to appear as hillside seeps or waterlogged swale drainageways or backwater areas in flood plains.

WATERSHEDS

This unit drains to the Mississippi River; however, the natural dynamics of that river have been altered by the lock and dam system. There is significant interaction between surface water and ground water in this region and sinkholes are common. There are few lakes and the drainage network is well defined and dendritic. Major rivers include the Root, Whitewater, Zumbro and Cannon, and there are numerous trout streams in the eastern part.

LAND USE

Current: Much of this unit is heavily farmed. About 1/3 to 1/2 of the unit in is hardwood forest. Highway corridors and urban development are expanding.

Historic Condition: In the Rochester portion, tallgrass prairie and bur oak savanna were the major vegetative communities. In the Blufflands portion, prairie was restricted primarily to the broader ridge tops; red oak-white oak-hickory-basswood grew on moister slopes, and red oak-basswood-black walnut grew in protected valleys.

WETLANDS

Total land area: 2,494,456 acres

Upland (% of total area): 95 %

Estimated remaining presettlement wetlands: < 1 %

Wetland as percentage of total wetland:

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Riverine	Industrial/Municipal
29.2 %	8.1 %	18.1 %	2.2 %	10.6 %	4.1 %	22.6 %	0.1 %	4.8 %	0.2 %

WETLAND MANAGEMENT

► PRIMARY MANAGEMENT FOCUS: WETLAND RESTORATION

- **Wetland planning:** Integrate wetlands planning into local water plans and cite specific needs, objectives, & opportunities.
- **High priority areas:** Identify high priority areas for wetland protection and restoration in shoreland and riparian areas; ground water quality and quantity; bluff-area wetlands and spring-fed wetlands at the base of bluffs; and for locally-identified needs. State and local government and private groups should work together to identify migratory waterfowl habitat and water quality areas for major river systems. Identify calcareous fens for special protection.
- **Mississippi River:** Avoid impacts to wetlands within and adjacent to the Mississippi River (an internationally important migratory wildlife corridor). Identify and implement measures to ensure the long-term sustainability of Mississippi River wetlands.
- **Trout streams:** Target and carry out wetland restorations in the watersheds of trout streams to help avoid adverse temperature changes in those streams.
- **Water storage:** Wetlands that provide water retention functions in developing areas should be a high priority for protection and restoration. Construct dedicated water retention basins where necessary to protect the integrity of existing wetlands.
- **Incentives:** Promote existing programs and develop new programs and incentives for landowners to preserve and restore wetlands, especially forested floodplain wetlands.
- **Public lands:** For wetlands in public ownership, conduct vegetation and water level management where necessary to discourage extensive monocultures of invasive, non-native species.

5. STATEWIDE MANAGEMENT STRATEGY

Addressing Statewide Concerns

THIS CHAPTER PROVIDES STATEWIDE MANAGEMENT STRATEGIES FOR CERTAIN SITUATIONAL DIFFERENCES, RATHER THAN REGIONAL (LOCATIONAL) DIFFERENCES. The chapter includes sections on: general management settings; mitigation siting and transfer; a restoration program; and wetland banking. The sections furnish information and guidance to assist with decision-making at statewide, regional, watershed and local levels of scale. This chapter is not independent of other chapters and should be read and used in the context of the entire plan.

*Management Settings*⁸

As discussed previously in the plan, wetlands are defined by the presence of appropriate soils, vegetation, and hydrology. Predominantly similar soils, vegetation, and hydrology on a regional basis are described in the Wetland Ecological Units (WEUs). The WEUs provide insights into needs for retaining or regaining the integrity of wetlands around the state according to regional characteristics.

However, within and between these WEUs, wetland managers can encounter situations which may call for adjustments to recommendations for an overall WEU. In such situations, there may be regulatory and technical conditions that affect the degree to which residents can achieve their personal goals of land use without compromising the long-term sustainability of the wetland resource, or there may be physical situations where the soil and hydrologic conditions may no longer sustain those wetlands.

After determining the presence or absence of the wetland soils, vegetation, and hydrology for the site and the WEU, the task of making wetland management decisions (for plans and for projects) begins with defining the management situation, or "setting". Management settings are characterized by physical, social, and managerial factors that influence the sustainability of a particular wetland resource. The range of possible physical, social, and management factors create choices and consequences that will affect the short and long term outcomes of a situation. The intent of the management setting approach is to evaluate and communicate those factors that expand or constrain the range of alternatives available to citizens and managers.

The first three management settings described in this chapter cover the spectrum of human settlement and landscape modification varying from **urban settings** to **rural settings** to **natural environment settings**. In addition, three types of **unique settings** are also provided; due to their special conditions and sensitivity; unique settings can be found nested within any of the first three settings. The general characteristics of each setting, a wetland management focus, and wetland management actions are provided in outlines for each setting on the following pages.

VOICES ON STATEWIDE MANAGEMENT from Project Report #1:

Dealing With Wetlands In Minnesota

The lack of flexibility forces all wetland impacts to be treated the same and does not allow for perhaps the best decision in some circumstances. Insights into these questions could help with targeting efforts towards more valuable wetlands, when there is a choice to be made for staff time, limited funds, and competing objectives.

There is a common belief that a lot of hassle and expense goes into wetlands of lesser value because of the blanket protection for all wetlands, no matter what.

A proactive, workable strategy for wetland restoration is needed, instead of just taking whatever is done on an ad hoc basis.

We should be planning for long-term sustainability, not just for short term benefits. How can wetland resources of statewide and national significance be properly protected and managed while respecting local needs and attitudes?

⁸ Tim Kelly, Coon Creek Watershed District Administrator, contributed the introductory text for "Management Settings."

NOTE: "LGUs" refers to Local Government Units under the WCA and "local government units" refers to any or all of the following: counties, cities, townships, watershed districts or WMOs, and SWCDs.

URBAN SETTINGS

CHARACTERISTICS

Physical: Area is characterized by a substantially or wholly modified natural environment, although the background may have natural elements.

- ◇ Evidence of use by humans is evident.
- ◇ Land modification is extensive and intended to enhance or ensure specific uses.
- ◇ Vegetative cover may be exotic and manicured.
- ◇ Soil protection is usually accomplished with hard surfacing and terracing.
- ◇ Size is not a factor.
- ◇ Landscape dominated by "built environment" with a large amount of impervious surface (high percentage of area modified; high degree of alteration to the landscape).
- ◇ Roads and streets are highly evident and are paved.
- ◇ Many different types of land uses.
- ◇ Buffering between wetlands and adjacent upland uses is low.

Social:

- ◇ Demand and use for land is high.
- ◇ Demands for services tend to be high volume and are quite specific.
- ◇ Population density tends to be high.

Managerial:

- ◇ The evidence of management through ordinances, rules and structures is evident. Structural and non-structural controls are designed to handle high volume and intensive use.
- ◇ Structural and non-structural controls and regimentation are obvious and numerous.
- ◇ Facilities are provided to protect or enhance specific goods and services and facilities are highly intensified.
- ◇ Staff presence is evident and tends to be specialized.
- ◇ Budgets for maintenance and capital improvements are readily apparent.
- ◇ Water management tends to focus on storm water by using curb, gutter, and sewer systems augmented by ponds.
- ◇ Water management philosophy tends to emphasize conveyance, rate control, flood prevention, and water quality.

MANAGEMENT FOCUS

The high population densities and engineered environment create management challenges for wetlands in urban settings. The management goals in this setting are:

- ◆ To protect the remaining integrity and sustainability of wetlands;
- ◆ To restore degraded wetlands to a higher level of function; and
- ◆ To be flexible in determining the adequacy of regulatory sequencing for specific site conditions and other local factors such as land uses and growth management plans.

MANAGEMENT NEEDS

- a) A coordinated and collaborative local planning and land use process which clearly identifies and demands, impacts and quality of wetland resources.
- b) A public financing approach which accounts for the quality of wetlands in the locality and the amount and quality of water which must be managed
- c) The ability to access technical expertise and pursue creative alternatives in addressing and balancing development and resource issues.
- d) Incentives for investing in the restoration or enhancement of degraded or poor quality wetlands

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URBAN SETTINGS CONTINUED -

➤ TASKS: PLANNING & LAND USE

- **Local government units** should make wetlands planning an important component of local water plans and land use plans.
- **Local government units** should identify high priority sites for potential restoration and can establish wetland reserves as open space. They should consider in their land use plans the potential ecological damage and financial impacts of wetland losses for local citizens.
- **Local government units** should follow storm water management guidelines developed by the PCA and should set buffers, setbacks, and vegetation requirements for wetlands.
- **Local government units** should require the use of published Best Management Practices (BMPs) for construction sites, agriculture, forestry, and water quality
- **Local government units and landowners** should prevent invasive or exotic species from becoming introduced or established.

Necessary or Potential Leader(s)

Local government units

Necessary or Potential Partners

Landowners
Metropolitan Mosquito Control District
PCA

➤ TASKS: REVENUE & COSTS

- **Local government units** should use the "contributing waters" user fee (Minnesota Statutes Section 103D.725 Subd. 2 (2)) for storm water management and public drainage systems as an incentive-based alternative to tax levies and special assessments, especially where intensive development is supplanting agricultural land uses.

Necessary or Potential Leader(s)

Local government units
State Legislature

Necessary or Potential Partners

BWSR

➤ TASKS: REGULATORY & TECHNICAL

- **State agencies** will provide technical assistance to local government units on biodiversity and habitat corridor development.
- **State agencies** can provide sequencing flexibility and guidance based on such site-specific criteria as wetland size and position in landscape, quality, hydrology, critical habitat, sustainability, and locally-developed land use plans.
- **State and local government units** can provide incentives, technical assistance, and credits for wetland conservation (e.g., buffers, open space and park dedication, wetland preservation, removal of stressors on wetlands, habitat restoration, tax relief).

Necessary or Potential Leader(s)

BWSR, DNR, PCA
Local government units

Necessary or Potential Partners

RURAL SETTINGS

CHARACTERISTICS

Physical:

- ◇ Area is characterized by a predominantly natural environment with some evidence of human impact.
- ◇ Vegetative cover is predominantly crops.
- ◇ Soil protection is accomplished through agricultural or forest best management practices.
- ◇ Area is of moderate to large size.
- ◇ Moderate variety in land use, landscape is dominated by agriculture and related uses and services.
- ◇ Evidence of human impact on the landscape is obvious.
- ◇ Most impacts easily harmonize with the natural environment.
- ◇ Roads are evident and vary in degree of improvement.
- ◇ Modification of the land and utilization practices are evident, but harmonize the natural environment.
- ◇ Buffering between wetlands and adjacent upland uses is moderate.

Social:

- ◇ Population density is moderate to low.
- ◇ Demand for and uses of the resource's goods and services is low to moderate with specific areas dedicated to specific uses.

Managerial:

- ◇ Structural and non-structural controls maintain order and minimize conflicts between land.
- ◇ Land modification and structural alteration occurs in select areas designated for intense use.
- ◇ Such areas often serve multiple-uses, although multiple-use is typically accomplished through separation or zoning.
- ◇ Resource uses are spatially separated to minimize conflicts.
- ◇ Water management tends to be through open conveyance systems such as ditches, tiles, and streams.
- ◇ The management philosophy tends to emphasize disposal, flood prevention, and water quality.

MANAGEMENT FOCUS

The lower population density and agricultural use of the landscape allow wetland management to be oriented to preservation and restoration. The management goal in this setting is:

- ◆ The preservation and restoration of wetland functions and self-sustaining wetland complexes where needed.

Restoration strategy is determined by the regional management strategies in Chapter 4.

MANAGEMENT NEEDS

- a) Local analysis of high quality wetland resources which should be preserved.
- b) Identification of local wetland restoration opportunities within a watershed to maximize wildlife and other needed wetland functions.
- c) Credits for landowners who restore or mitigate currently farmed or prior converted wetlands.
- d) Funding for public acquisition and compensation for wetlands.
- e) Broad and specific training and education opportunities to integrate water resource and wetland concerns related.

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RURAL SETTINGS CONTINUED -

➤ TASKS: PLANNING & LAND USE

- **The State Legislature** should require counties to prepare local water plans on a watershed basis. **Counties** can cooperate with each other to prepare local water plans on a watershed basis.
- **Counties** should identify high priority areas in their local water plans or wetland plans for preservation and restoration of wetlands. In addition, counties or SWCDs can maintain lists of landowners interested in non-regulatory preservation and restoration programs or wetland banking.
- **Landowners** can choose to restore farmed wetlands and prior converted cropland in their own county or watershed using incentive programs (private and public) or wetland banking.
- **Local government units and landowners** should prevent invasive or exotic species from becoming introduced or established.

Necessary or Potential Leader(s)

State Legislature
Local government units, landowners

Necessary or Potential Partners

BWSR, DNR
Other state and federal agencies

➤ TASKS: REVENUE AND COSTS

- **The State Legislature** should provide funding for voluntary incentive payments to landowners who allow walk-in access for public recreation on their wetlands.
- **State and federal agencies** will provide technical assistance and cost-sharing to landowners for wetland restoration projects.
- **The DNR and USFWS** should continue to purchase wetlands and associated uplands that provide valuable wildlife habitat or contribute significantly to local, regional, or statewide biodiversity.
- **Counties** should designate preserved and restored wetlands in high priority areas as Wetland Preservation Areas, as provided in Minnesota Rule 8420.0440, which provides a tax exemption for the landowner. Subsequent adjustments to the assessed value of non-wetland properties according to the watershed benefits received from the wetlands would be similar to the way benefits are attributed to ditch systems.
- **Counties, watershed districts, and drainage authorities** should consider imposing a contributing waters user fee as described in Minnesota Statutes Section 103D.725 Subd. 2 (2) on the installation of new drainage. This would provide funds for mitigating the costs of downstream impacts caused by the additional drainage. [Note: the term "new drainage" in this item does not refer to maintaining or improving previously converted lands.]

Necessary or Potential Leader(s)

Local government units
State Legislature

Necessary or Potential Partners

DNR, BWSR, PCA
USFWS, USDA-NRCS, USCOE

➤ TASKS: EDUCATION

- **Local government planners, development staff, and engineering staff** should seek training in wetland attributes and benefits in order to tie those factors into local planning and zoning.
- **Local government units and local private groups** can provide wetland education and discussion opportunities for landowners and all citizens.
- **Environmental Learning Centers and K-12 schools** can be instrumental in educating the next generation of citizens and voters about wetland values and benefits.

Necessary or Potential Leader(s)

Local government units
Conservation groups and lake associations
Environmental learning centers & K-12 schools

Necessary or Potential Partners

BWSR, DNR
Tribal governments

NATURAL ENVIRONMENT SETTINGS

CHARACTERISTICS

Physical:

- ◇ Fully functioning, self sustaining wetlands and landscapes.
- ◇ Area is characterized by an unmodified or predominantly unmodified natural environment of moderate to large size.
- ◇ Evidence of human impact is minimal.
- ◇ Roads are largely unimproved and of low density.
- ◇ The diversity and intensity of land uses is low.
- ◇ Impacts on the resource are low.
- ◇ Buffering between wetlands and adjacent upland uses is high.

Social:

- ◇ Very low population densities.
- ◇ Demand for land is low.
- ◇ Demands for and uses of the land tends to be low.

Managerial:

- ◇ Long term landscape management causing little obvious or lasting human disturbance.
- ◇ The area is managed to be essentially free of active, direct and/or structural management efforts.
- ◇ Management philosophy and activities are focused primarily provided on the protection of overall resource values and maintaining future options.
- ◇ Water management is generally passive, relying on natural systems.
- ◇ Resource uses may be spatially separated to minimize conflicts.

MANAGEMENT FOCUS

The low degree of obvious and lasting impacts from human activities and the high public value of these areas calls for taking actions to avoid degradation and maintaining natural environment wetlands according to WEU management recommendations.

MANAGEMENT NEEDS

- a) Closely coordinated identification and management efforts between federal, state and county land management agencies and divisions with an emphasis on avoidance of impacts and perpetuation of landscape processes.
- b) Funds for acquisition of special and high quality habitats.

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NATURAL ENVIRONMENT SETTINGS CONTINUED -

➤ TASKS: LAND MANAGEMENT & REGULATION

- **The DNR** will provide information and technical assistance to local government units and landowners about natural environment settings. Related DNR programs include the Natural Heritage Program, the County Biological Survey, and the Scientific and Natural Areas Program, along with other staff in the Divisions of Fish and Wildlife, Waters, and Forestry.
- **Local government units** should identify high priority areas in their local water plans or wetland plans for preservation and restoration of wetlands. In addition, counties or SWCDs can maintain lists of landowners interested in non-regulatory preservation and restoration programs or wetland banking.
- **Local government units** should ensure that surrounding land uses do not impair or destroy the high quality and self-sustaining features of these wetlands. Development should be directed to existing settled corridors, such as highways.
- **Landowners and public land managers** should simulate natural events as necessary for natural processes to be sustained.
- **Local government units and landowners** should apply Best Management Practices (BMPs) for wetlands and prevent invasive or exotic species from becoming introduced or established.

Necessary or Potential Leader(s)

Local government units
Public land managers (including DNR)

Necessary or Potential Partners

DNR, BWSR, PCA
Tribal governments
Landowners

➤ TASKS: REVENUE AND COSTS

- **The State Legislature** should provide funding for voluntary incentive payments to landowners who allow walk-in access for public recreation on their wetlands.
- **State and federal agencies** will provide technical assistance and cost-sharing to landowners for wetland restoration projects.
- **The DNR and USFWS** should continue to purchase wetlands and associated uplands that provide valuable wildlife habitat or contribute significantly to local, regional, or statewide biodiversity.
- **Counties** should designate preserved and restored wetlands in high priority areas as Wetland Preservation Areas, as provided in Minnesota Rule 8420.0440, which provides a tax exemption for the landowner. Subsequent adjustments to the assessed value of non-wetland properties according to the watershed benefits received from the wetlands would be similar to the way benefits are attributed to ditch systems.

Necessary or Potential Leader(s)

Local government units
State Legislature

Necessary or Potential Partners

DNR, BWSR, PCA
USFWS, USDA-NRCS, USCOE

UNIQUE SETTINGS - SHORELAND & RIVERINE WETLANDS

CHARACTERISTICS

Shoreland wetlands are adjacent to lakes and streams. Riverine wetlands are contained in natural or artificial channels periodically or continuously containing flowing water, and may be perennial or intermittent.

MANAGEMENT FOCUS

The state prides itself on its lakes and water courses, which are affected directly by associated wetlands. The management intent in these settings is to preserve and improve water quality and aquatic habitat, recreation value, and other wetland values by protecting wetlands. Numerous laws and programs exist pertaining to shorelines but need to be enforced and coordinated.

► TASKS: LAND MANAGEMENT & REGULATION

- **Regulatory agencies and local government units** should apply a strict standard of impact avoidance when evaluating permit applications.
- **State agencies** will provide technical assistance to landowners, lake associations, and local government units on the role of wetlands in maintaining and improving the quality of lakes and streams.
- **State and federal agencies and private land trusts** should make shoreland and riverine wetlands a high priority for acquisition or easements.
- **Local government units** should require, and lake associations should support, replacement of wetlands within the same lakeshed.
- **Local government units** should adopt zoning and subdivision ordinances that identify and strictly protect shoreland and riverine areas; prohibit development plans that threaten shoreland and riverine wetlands; increase protection for both soil disturbance and wetland vegetation; and evaluate cumulative impacts over time.
- **Local government units** should give special attention in ordinances and watershed plans to protecting wetlands that serve trout streams to maintain the necessary hydrology, temperature, and water quality for the fishery and wildlife benefits associated with shoreland and riverine wetlands.
- **Counties** should identify high priority areas in their local water plans or wetland plans for preservation and restoration of wetlands. In addition, counties or SWCDs can maintain lists of landowners interested in non-regulatory preservation and restoration programs or wetland banking.
- **Local government units** and lake associations should work with developers and landowners to analyze development plans for the least destructive alternatives early in the planning and construction process.
- **Lake associations** are a valuable link to landowners and can help inform their discretion on decisions concerning water quality other wetland values for their lake. They should consider evolving into lake improvement districts or lake conservation districts if necessary to raise revenue for lake improvement projects.
- **Local government units and landowners** should prevent invasive or exotic species from becoming introduced or established.

Necessary or Potential Leader(s)

Local government units
Landowners
Lake associations

Necessary or Potential Partners

DNR, PCA, BWSR
Tribal governments
USCOE, USFWS, USDA-NRCS
The Nature Conservancy
Minnesota Land Trust

UNIQUE SETTINGS - WETLAND RARE FEATURES

CHARACTERISTICS

The Rare Features Unique Setting has rare and endangered plants, animals, and animal aggregations (such as nesting colonies) that are found in or associated with wetlands. Therefore, this category is habitat site-specific, while the Natural Environment Setting is a more general landscape description. Rare Features Unique Settings may be found within Urban, Rural, Natural Environment Setting, or Shoreland & Riverine Wetland Settings. Calcareous fens are also rare features but they are treated separately in this plan because they have been accorded special protection under state law.

MANAGEMENT FOCUS

The management of rare features in many cases relies on the protection and management of wetlands. Preserving and maintaining these valuable resources will require a partnership between state agencies, local governments, interest groups, and landowners.

► TASKS: LAND MANAGEMENT & REGULATION

- **Regulatory agencies and local government units** should apply a strict standard of impact avoidance when evaluating permit applications.
- **The DNR** will provide information and technical assistance to local government units and landowners about rare features. Related DNR programs include the Natural Heritage Program, the County Biological Survey, and the Scientific and Natural Areas Program.
- **The DNR** should examine and recommend guidelines for the design and management of buffers for unique settings / rare features.
- **State and federal agencies and private land trusts** should make wetland rare features a high priority for acquisition or easements.
- **The DNR and other agencies** will work with permit applicants to address wetland rare features on the property in question.
- **Local government units** should identify wetland rare features as high priority areas in their local water plans or wetland plans for preservation and restoration of wetlands. In addition, counties or SWCDs can maintain lists of landowners interested in non-regulatory preservation and restoration programs or wetland banking.
- **Local government units** should use planning and zoning authority to protect wetland rare features (e.g., require setbacks and buffers; deed restrictions). They should include wetland rare features in local water plans, wetland plans, and land use plans.
- **Landowners** should be given incentives and assistance to protect wetland rare features.
- **Local government units and landowners** should prevent invasive or exotic species from becoming introduced or established.

Necessary or Potential Leader(s)

DNR, BWSR
LGUs

Necessary or Potential Partners

Landowners
Tribal governments
USFWS
The Nature Conservancy
Minnesota Land Trust

UNIQUE SETTINGS - CALCAREOUS FENS

CHARACTERISTICS

A calcareous fen is a peat-accumulating wetland dominated by distinct groundwater inflows having specific chemical characteristics. The groundwater recharge area may be significantly removed from the site of the fen itself. The water is characterized as circumneutral to alkaline, with high concentrations of calcium and low dissolved oxygen content. The chemistry provides an environment for specific and often rare hydrophytic plants. [See Minnesota Rules Section 8420.1020.] See **Figure 7**.

MANAGEMENT FOCUS

Calcareous fens are rare and distinctive natural features that are protected under a number of state and federal laws. However, the State cannot by itself adequately protect these valuable resources and, therefore, must rely on the assistance of other agencies and local government units.

► TASKS: LAND MANAGEMENT & REGULATION

- **Regulatory agencies and local government units** should apply a strict standard of impact avoidance when evaluating permit applications.
- **The DNR** will develop quality assessment criteria and acquisition priorities for calcareous fens.
- **The DNR** will develop Best Management Practices guidelines for calcareous fens, including restoration techniques and buffers. Agency staff can assist with delineating the boundaries of calcareous fens.
- **The DNR** will consider the effects of proposed water appropriations on calcareous fens with the intent of maintaining the integrity of calcareous fens.
- **State agencies** will, and local government units can, integrate calcareous fen protection in existing programs and in wetlands plans.
- **Local government units** should use planning and zoning authority to identify and protect calcareous fens and their recharge areas (e.g., require setbacks and buffers; deed restrictions). They should include calcareous fens in local water plans, wetland plans, and land use plans.
- **Local government units and landowners** should prevent invasive or exotic species from becoming introduced or established.
- **The DNR, local government units, or private land trusts** should, when possible, acquire pristine calcareous fens and their recharge areas.
- **The DNR** should seek to acquire mineral rights that will help protect calcareous fens.
- **The State Legislature** should appropriate funds for protection and restoration of calcareous fens and their recharge areas.

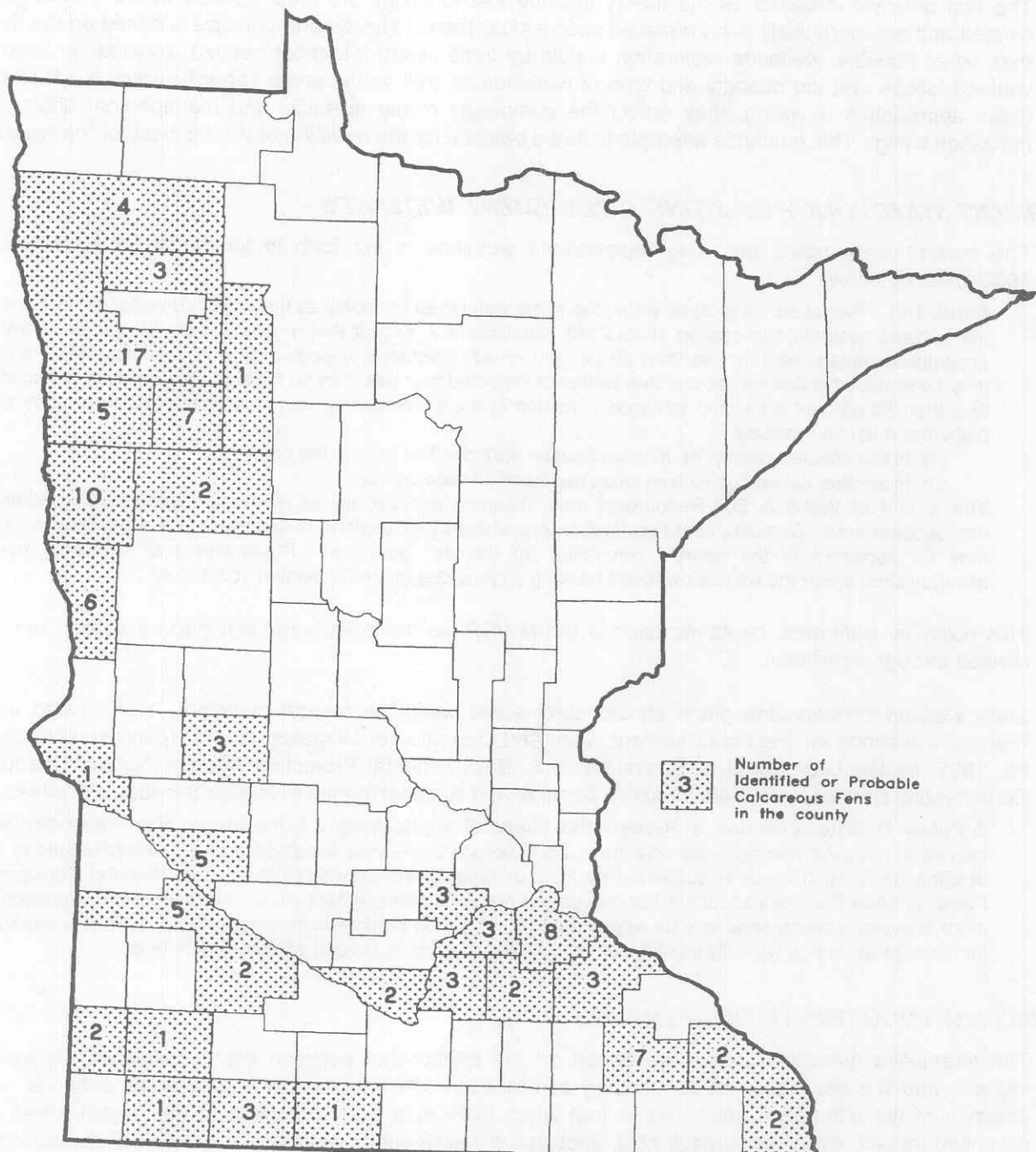
Necessary or Potential Leader(s)

Necessary or Potential Partners

DNR Local government units Landowners State Legislature The Nature Conservancy Minnesota Land Trust Environmental groups	BWSR, PCA, MDA Tribal governments USCOE, USFWS
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FIGURE 9 - COUNTIES WITH IDENTIFIED OR PROBABLE CALCAREOUS FENS

Source: Minnesota Department of Natural Resources (Divisions of Waters and Fish & Wildlife), January 1997



Wetland Replacement Siting Criteria

This section provides guidance for identifying and selecting sites for compensatory mitigation. The objective is to establish a common understanding among regulatory agencies and project applicants of where compensatory mitigation should be located relative to wetland impacts, and the various factors that enter into such decisions. The result should be better coordination between regulatory agencies and increased predictability on permit decisions.

REPLACEMENT SITING PRINCIPLES AND CRITERIA

This guidance reflects two (sometimes competing) principles:

- To keep replacement of lost functions as close as possible to the wetland impact.
- To achieve the greatest overall environmental benefit for the state.

The first principle is based on the theory that the lost functions are most needed where they originally existed and are more likely to be replaced successfully there. The second principle is based on the theory that, when feasible, wetlands restoration should be done where it is most needed, considering historical wetland losses and the quantity and type of wetlands as well as the project-specific impacts. A concept common to both theories is that wetland restoration is generally preferred over wetland creation.

A list of preferences for siting replacement wetlands follows. They address the principles discussed above and are based on an analysis of the status and distribution of wetlands in the state. They also reflect certain provisions already established by the Wetland Conservation Act; however, full implementation of these criteria would require further amendments to the Act.

Preference for siting wetland replacement follows this priority order:

- 1) On-site or in the same minor watershed as the impacted wetland;
- 2) In the same watershed (81 USGS) as the impacted wetland;
- 3) In the same county as the impacted wetland;
- 4) In the same Wetland Ecological Unit (WEU) as the impacted wetland; and
- 5) Statewide, only for wetland impacts in "Greater than 80 Percent Areas" and for public transportation projects.*

* Except that wetlands impacted in a less than 50 percent area must be replaced in a less than 50 percent area, and wetlands impacted in the seven county metropolitan area must be replaced in the affected county, or, if no restoration opportunities exist in the county, in another seven-county metropolitan area county. This exception does not apply to replacement completed using wetland banking credits established by a person who submitted a complete wetland banking application to a local government unit by April 1, 1996.

APPLICATION OF REPLACEMENT SITING CRITERIA

The replacement siting criteria established above represent the preferences for compensatory mitigation. In practice, the ultimate location of replacement wetlands must be based on the availability of reasonable, practicable and environmentally beneficial replacement opportunities along with the consideration of the overall environmental significance of the impact.

The intent of the ultimate location of the mitigation siting process is to locate replacement as close to the impacted area as possible. On-site, in-kind replacement is generally preferred. If on-site replacement is not possible, practicable, or desirable (i.e., will not likely result in a functional wetland system that replaces lost functions of the impacted wetland), off-site replacement that is demonstrated to be environmentally beneficial may be considered. The responsibility for obtaining adequate wetland replacement rests with permit applicants, however, regulatory agencies will work with applicants to identify appropriate sites based on:

- a) The siting criteria established above;
- b) The availability of reasonable, practicable and environmentally beneficial replacement

- opportunities; and
- c) The functional significance of the impact.

For the purposes of this guidance, "reasonable, practicable and environmentally beneficial replacement opportunities" are defined as those that:

- Take advantage of naturally occurring hydrogeomorphological conditions and require minimal landscape alteration; and
- Have a high likelihood of becoming a functional wetland and remaining so in perpetuity; and
- Do not adversely affect other habitat types or ecological communities that are important in maintaining the overall biological diversity of the area; and
- Are available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

When reasonable, practicable and environmentally beneficial replacement opportunities are not available in the first "step" of the siting priorities listed above, then the search expands to the next step, and so on.

To facilitate this process, regulatory agencies, other entities involved in wetland restoration, and local governments will collaborate to identify potential replacement opportunities within their jurisdictional areas. A compendium of known, pending and proposed banking sites will be provided, along with a list of additional potential sites. Applicants will be encouraged to propose replacement that best matches the project impacts.

MANAGEMENT ACTIONS

NOTE: "LGUs" refers to Local Government Units under the WCA and "local government units" refers to any or all of the following: counties, cities, townships, watershed districts or WMOs, and SWCDs.

➤ TASKS: FACILITATING THE SEARCH FOR REPLACEMENT SITES

- Local COE, BWSR, DNR, and LGU staff, in collaboration with other agencies involved in wetland regulation will develop and annually update lists of potential wetland replacement sites within their geographic areas of jurisdiction, with a goal of developing a joint list that represents all the known potential restoration sites in a county for a given year.
- DNR will provide maps of minor watersheds to all LGUs and Soil and Water Conservation Districts.

Necessary or Potential Leader(s)

BWSR
DNR
COE
LGUs

Necessary or Potential Partners

MnDOT
Tribal governments
USFWS
USDA

Restoration Program

FOCUS & OBJECTIVES

Significant gains in the State's wetland resource base will not be achieved through the compensatory mitigation required by regulatory programs, because the goal of those programs is only to offset wetland losses. However, there are a variety of non-regulatory programs aimed at restoring wetlands (see *Appendix*). The results of these statewide restoration programs can be enhanced by targeting areas for restoration programs and improving coordination among non-regulatory programs.

PURPOSE OF RESTORATION PROGRAM

To achieve a net gain of wetland functions and values in targeted areas of the state, and to maintain or improve the ecological and hydrological integrity of watersheds.

Wetland restoration and preservation can be accomplished through existing state and Federal incentive programs if they are adequately funded, because the programs themselves work well. Interest in conservation easement programs is so high that appropriations consistently fall far short of demand. Agricultural participants in plan development insist that there are more than enough willing landowners to meet any restoration goals if adequate compensation is provided.

The management strategy includes:

- Increasing the functions and values (benefits) provided by wetlands.
- Focusing on willing landowners for restoration opportunities.
- Targeting public funds to restorations that provide the best ecological and hydrological return on investment.
- Using wetland restoration to help renew the Minnesota River Basin; the upper subwatersheds of other degraded drainage basins; the prairie pothole region; and the Agassiz beach ridge.

MANAGEMENT ACTIONS

NOTE: "LGUs" refers to Local Government Units under the WCA and "local government units" refers to any or all of the following: counties, cities, townships, watershed districts or WMOs, and SWCDs.

➤ TASKS: RESTORATION PRIORITIES & OPPORTUNITIES

- **DNR and BWSR** should identify and use statewide restoration priorities on a regional or larger scale. This includes the following WEUs targeted for restoration: Southwest Prairie, Red River Prairie, Aspen Parklands, Hardwood Hills, Anoka Sand Plain, Highland Woods, Oak Savanna, and Southeast Plateau. Additional target areas may be identified; factors to consider may include watershed of regional or statewide significance, large-scale habitats of concern; and analysis of drained wetland inventories.
- **LGUs and local water planners and wetland planners** should determine restoration priorities at the watershed and/or site level of scale. **LGUs** can assist permit applicants by maintaining a list of landowners who are interested in having wetlands restored on their property.
- **State agencies** should conduct a statewide inventory of drained wetlands in cooperation with local government units, to identify opportunities for wetland restorations. **BWSR and DNR** should oversee the compilation of a database for drained wetlands that is accessible statewide.
- **State and federal agencies, local government units, landowners, and private organizations** should coordinate their work on wetland restorations to achieve maximum benefits for the targeted areas.

Necessary or Potential Leader(s)

BWSR, DNR, MnDOT
LGUs, local water planners and wetland planners
Tribal governments
USFWS, USDA

Necessary or Potential Partners

Planning & zoning offices
Wetland professionals

RESTORATION PRIORITIES & OPPORTUNITIES CONTINUED -

➤ TASKS: FUNDING FOR WETLAND RESTORATION & PRESERVATION

- **The State Legislature** should consider increasing Legislative appropriations for non-regulatory incentive programs.
- **BWSR and DNR** should seek funding through the LCMR, EPA, or other grant sources, to develop a statewide drained wetland inventory and database.
- **State agencies, the USDA, and Minnesota's representatives in the U.S. Congress** should actively support renewal of the Conservation Reserve Program (CRP) under the Food Security Act and other federally-funded programs that support wetland conservation..
- **BWSR and DNR** should explore using RIM or other non-regulatory programs to maintain wetlands on former CRP lands.
- **State and federal agencies** should allocate a portion of flood disaster funds for wetland restoration.

Necessary or Potential Leader(s)

State Legislature (for state program funding)
U.S. Congress (for CRP item)
MDA and USDA

Necessary or Potential Partners

Interest groups
Local government associations
State and Federal agencies

➤ TASKS: PARTNERSHIPS FOR WETLAND RESTORATION

- **Wetlands planning participants** should seek support for the MWCP and this restoration strategy from wetland delineators, wetland consultants, corporations, and interest groups, and engage them in identifying restoration opportunities and assisting with financial support.

Necessary or Potential Leader(s)

State and Federal agencies
LGUs, local water planners and wetland planners
Tribal governments

Necessary or Potential Partners

Wetland professionals
Corporations
Other interest groups

THE QUESTION OF WETLAND TARGET ACREAGE

Most studies that have attempted to determine ideal target amounts for wetland restoration are either inconclusive or difficult to translate into Minnesota's landscape and hydrology. A recently published study conducted in nine agricultural watersheds in Wisconsin found that 10% was the minimum ratio of wetland to total land area necessary to sustain hydrologic integrity.⁹ Similar studies involving hydrologic modeling are underway in the Redwood River basin in Minnesota, which will not be completed until late 1997 or 1998 (contact Peter Cooper, USDA-NRCS in St. Paul). Because of the uncertainty in applying the Wisconsin study to Minnesota agricultural areas and until the Redwood River study is completed, it is difficult to specify a restoration target with scientific confidence. A 10% wetland/watershed ratio may be an appropriate interim guideline for Minnesota agricultural watersheds, but **VERSION 1.0 OF THE MWCP DOES NOT SET FORTH SPECIFIC TARGET AMOUNTS FOR WETLAND RESTORATION.**

Instead, this plan emphasizes wetland restorations that meet a public need for various wetland functions in a watershed or larger drainage basin and for improved ecological and hydrological integrity of wetlands as part of the larger water regime that serves all Minnesotans.

Counties, cities, and watershed districts can set local goals, do advance identification of priority areas for restorations, and maintain lists of willing landowners for potential wetland restorations by third parties (in the private sector or other governmental entities like road authorities). All such information is essential for maintaining local decision-making authority and for achieving the goal of this plan.

⁹ Hey, D. L. and J. A. Wickenkamp, "Some Hydrologic Effects of Wetlands in Nine Watersheds of Southeastern Wisconsin," *Great Lakes Wetlands*, 7 (2) : 4-9 (1996).

PROPERTY TAXES & WETLAND RESTORATION

Wetlands provide both private and public benefits, but a possible tax burden associated with wetland restoration may occur for private landowners or a tax revenue reduction may occur for local government units [however, these are not issues everywhere in the state, since many factors in local government revenue can vary the outcome]. Some functions are site-specific; some benefit a watershed; and some functions have statewide or even international significance. Therefore, no one should get a "free ride" for those benefits; sharing tax impacts among the landowner, local taxpayers, and statewide taxpayers would seem appropriate and reasonable.

Exemptions from property taxes

Exemptions are provided for some wetlands under Minnesota Statutes Section 272.02, Subd. 1(10):

- ➔ **Wetlands inventoried as Protected Wetlands and shown on Protected Waters Inventory maps.**
- ➔ **A wetland which is mostly under water, produces little if any income, and has no use except for wildlife or water conservation purposes,** provided it is preserved in its natural condition and drainage would be legal, feasible, and economically practical for the production of livestock, dairy animals, poultry, fruit, vegetables, forage, and grains (except wild rice).
- ➔ **Land in a "wetland preservation area."** Under Minnesota Rule 8420.0400, "Wetland Preservation Areas," Subpart 1, wetlands located in both high priority regions and high priority areas are eligible for enrollment as wetland preservation areas. A wetland so enrolled is exempt from property tax.

Counties accept wetland preservation areas at their own discretion. If they do so, the state Department of Revenue can replace the revenue lost through the tax exemption under Minnesota Statutes Section 272.295 "Wetlands Exemption; Replacement of Revenue." The total amount of lost revenue is computed each year by applying the current local tax rates of the taxing jurisdictions in which the wetland preservation areas are located to the net tax capacity of the wetlands. Payment to the county for lost revenue must not be less than the revenue that would have been received in taxes if the wetlands had a net tax capacity of 50 cents per acre.

State-owned or administered lands

The State makes in lieu payments for exempt property to local governments under four programs:¹⁰

- General in lieu payments for natural resource lands.
- Consolidated conservation (ConCon) area payments.
- Public hunting lands payments.
- 70/30 lease sharing payments (mainly on natural resource lands).

Each program uses different a formula to calculate and distribute payments to local governments. Counties receive the majority of all natural resource payments.

The State Legislature set general in lieu payment rates on a per acre basis for each program when the law was enacted in 1979. A local government can substitute an ad valorem tax for the program rates if they apply an ad valorem approach to all taxable lands in their jurisdiction; this can work to the advantage of counties with mostly high land values, but may not provide relief for counties with a high percentage of low-value lands. The only exception to the ad valorem rule is public hunting lands (which can be taxed ad valorem without changing other rates to ad valorem).

Conclusion

Tax relief in the form of an exemption has been made available by the State Legislature for owners of wetlands in high priority regions and areas. However, sometimes local officials find it difficult to approve landowner requests for this tax relief, in spite of the non-fiscal benefits that wetlands would or already do provide for local lands and watersheds. The Payment In Lieu of Taxes program has been debated for years and the disagreements between local and state governments did not originate with wetlands policy. These are complex fiscal policy issues that go beyond the scope of this plan and are better addressed through other forums. Further progress on this issue could enhance wetland restoration efforts.

¹⁰ *Natural Resources In Lieu Payments*, House Research Information Brief, Minnesota House of Representatives, September 1994.

State Wetland Bank

OVERVIEW OF BANKING SYSTEM

Wetland banking is an alternative method of wetland replacement. It is a non-regulatory, market-driven option for mitigation whereby replacement wetlands are restored or created in anticipation of losses to be mitigated. The steps in the process for "deposits" of wetland credits are as follows:

- a) The technical panel reviews a proposal for a deposit to the bank prior to construction and approves or denies the application (can also advise on changes needed for approval).
 - * Anyone can get a copy for review.
 - * BWSR has a vote through the technical panel.
 - * Other agencies only give opinions but are often involved by consensus of the parties.
- b) If approved, the proposer does the restoration or creation. No deposit is made until a 12-month waiting period passes or the replacement is a fully functioning wetland, whichever is later.
- c) The technical panel certifies the wetland for a deposit in the form of "credits". Wetland credits are based on the wetland type, acreage, public value, and a "new" credit. Credits, but not any property interest, can be sold by the owner who made the investment. . Current and future landowners of the credited wetland remain responsible for the wetland.

There is only one statewide, ongoing wetland bank in Minnesota with many accounts. This approach makes banking more available as an option and provides a way to set criteria. BWSR is the administrator for the state wetland bank, acting as a recorder but not a broker. The current state wetland banking system has two parts:

Public road authorities. There are two separate types of road authority accounts:

- MnDOT (maintains its own separate account)
- Local government units (received a 1996 special appropriation for a minimum of 2 years)

All others. Anyone may deposit an approved wetland restoration or creation in the bank and receive credits for later sale; each holder of credits has a separate account, much like a conventional monetary bank. Local government units can set up their own accounts so that they can sell local credits to local permit applicants.

Demand to purchase credits exceeded the supply during the first two years of the project, but that should change as people become more familiar with the system and because the 1996 legislative appropriations to local and state road authorities effectively removed them from the open market where they had been the largest purchasers of bank credits. Prices for credits vary around the state in response to several factors, including land values and development pressure.

STUDY UNDERWAY FOR STATE LEGISLATURE

A wetland banking study has been undertaken to fulfill the following task from the 1996 State Legislature:

The commissioner of natural resources, in consultation with the board of water and soil resources and the commissioner of agriculture, shall ensure that the wetland conservation planning process currently underway includes a study of alternative procedures and policies for improving the current wetland banking system in the state. The study and any resulting recommendations must be reported to the appropriate policy committees of the legislature by June 30, 1997, or upon completion of the wetland conservation planning final report, whichever is later.

A subcommittee of the wetland planning Work Team formed to plan and carry out the study. The work plan includes analysis of data collected by BWSR as administrator of the state wetland bank; field reviews of wetland banking sites in 4 sample counties; and a review of policies and procedures for wetland banking in other states, as well as a recent national wetland banking study by the U.S. Army Corps of Engineers.

The most vital questions driving the study are:

- ☆ **What is really happening now?** What kinds of wetland impacts and restorations are occurring through the state wetland banking system? Where are the wetland impacts and their replacement wetlands located? Is wetland quality gained or lost through the transactions? What are the effects of transferring replacement to other regions of the state? What are the effects of clumping impacts for single replacement?

- ☆ **What factors should be applied for decisions about mitigation type, size, and location?**
Public road projects, functional assessment, incentives, and targets are subtopics.
- ☆ **What improvements or refinements to the process would make the system work better for everyone?** (Including agencies, local government units, private sector participants, landowners.)

The study was still in progress at the time this plan was published. The study results and any recommendations will be reported to the State Legislature by June 30, 1997.

Enforcement

CURRENT SYSTEM

Enforcing authorities

DNR JURISDICTION: Under Minnesota Statutes Chapter 103G, Department of Natural Resources conservation officers and other peace officers are the enforcing authorities for wetlands regulated under the State's public waters law and the Wetland Conservation Act. The Commissioner of Natural Resources, DNR Conservation Officers, and other peace officers enforcing the WCA may issue cease and desist orders and restoration and replacement orders. Restoration orders issued under the public waters law are subject to the rules and procedures of the Administrative Procedures Act (Minnesota Statutes Chapter 14) and are subject to judicial review.

LOCAL JURISDICTION: Some local government units have adopted wetlands ordinances prior to and since passage of the Wetland Conservation Act. Also, under recent amendments to the WCA, a Local Government Unit (LGU) can adopt a BWSR-approved local wetland management plan. LGUs may assume enforcement responsibilities but DNR Conservation Officers retain full enforcement authority for WCA jurisdictional matters. Components of local ordinances more restrictive than the WCA must be enforced through local ordinances.

FEDERAL JURISDICTION: Three federal agencies may exercise enforcement authority for federal regulations. The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency can use any of the following options: cease & desist order from the District Engineer; voluntary restoration; after-the-fact permit; fines; and the assistance of U.S. Attorney to enforce restoration. The USDA Farm Service Agency can withhold program benefits when a participant in a federal farm program is in noncompliance with the wetland requirements of the program.

Site-specific cease & desist orders

The term "site-specific" is not currently defined in statute or rule and different interpretations exist; for example, some people believe it was intended to mean the "site of a project" and others believe it was intended to mean the "site of the wetland basin." Clarification of this term will allow for a project in violation of the WCA to be issued a cease and desist order until the project is brought into compliance.

RECOMMENDATION

► TASKS: IMPROVE ENFORCEMENT PROCESS

- Consider amending Rule 8420 to give enforcement officers additional discretion to issue a cease and desist order covering all or part of a project related to a wetland violation.
- Require that local wetland plans identify the DNR as an enforcement agency for the local wetland plan.
- Coordinate local, state, and federal law enforcement for wetlands violations.

Necessary or Potential Leader(s)

BWSR, DNR, LGUs

Necessary or Potential Partners

COE, USEPA, USDA-FSA

6. REGULATORY SIMPLIFICATION STRATEGY

Simplifying the Permitting Process

THIS CHAPTER PRESENTS A "ONE-STOP-SHOP" MODEL FOR REGULATORY WETLANDS PERMITTING AND A STRATEGY FOR SHIFTING THE PRESENT SYSTEM IN THAT DIRECTION. The main objectives in the Regulatory Simplification Strategy are:

- ✓ To simplify the permitting system using a staged course of action.
- ✓ To design the strategy in such a way that it can be pursued in any present and future organizational structures of responsible government units.

ONE-STOP-SHOP & COORDINATION

The concept of a "one-stop-shop" has been an appealing idea for some time, but what it really means has not been explicitly defined. The usual reasons given for "one-stop-shopping" are: it should be cheaper and simpler for applicants and regulators than existing arrangements; it would promote greater consistency and simplicity in existing regulatory programs; and it must recognize local, regional, and statewide concerns about wetland impacts.

A "one-stop-shop" would cover the application, the fee system, public notice, wetland delineation, permit review timing and activities, and the final decision (including any conditions). In the long view, linking all regulation of waters including wetlands might be better systems management. Other water regulations cover storm water management, drainage, water appropriations, and ground water quality.

Another long-term idea is to streamline administration of federal, state, and local water resource permitting into politically neutral management units, which could further reduce administrative and training costs and enhance customer service.

VOICES ON REGULATORY SIMPLIFICATION from Project Report #1:

Dealing With Wetlands In Minnesota

The sheer number of agencies and local government units can be confusing, frustrating, alienating, and overwhelming for landowners and staff. Confusion and lack of understanding are common, almost universal complaints, and the consequences are not necessarily a savings of wetland benefits.

There is a perception that there is little coordination or common understanding among the agencies, resulting in long delays and conflicts in permitting. Implementation varies among local government units.

"Turf" protection . . . will be a considerable challenge to developing a plan.

[Staff in] different scientific disciplines and agencies are hesitant to trust and believe that their goals and interests will be pursued diligently [by others]. Everyone is watching everyone and no one is managing, resulting in misallocation of time, material, and know-how.

The efforts of many local government units to exercise responsible local control are not adequately recognized, so they are treated to the same lengthy processes. Minimum standards and criteria or a general policy framework were suggested . . . as reasonable guidance.

APPROPRIATE ADMINISTRATIVE UNIT

While information presented in this plan for decision makers is organized in different ways (ecological units, political jurisdictions, etc.), participants in plan development agreed that **WETLANDS PLANS, POLICIES, AND PROGRAMS SHOULD BE ADMINISTERED ON A WATERSHED BASIS** and that should be the framework for improving regulatory coordination and simplification.

This approach is not a new layer of government. It should be read as a more efficient and responsive way to coordinate permitting responsibilities among regulators and, as a result, streamline the process.

A "One-Stop-Shop" Model

SCOPE OF THE MODEL

In thinking about how a "one-stop-shop" would work, the scope of the model was framed using these three questions:

- ◆ What water bodies should the one-stop shop include?
- ◆ What activities (identified by program) should it include?
- ◆ What jurisdictional boundaries should be used?

In the following text, the following terms are used and defined as follows:

Existing:	Currently in active use or practice
Short-term:	1997-1998
Mid-term:	1999-2000
Long-term:	Beyond 2000

What water bodies does the one-stop shop include?

SHORT-TERM: The one-stop-shop should cover surface waters including wetlands (namely protected waters, WCA wetlands, drainage system, and storm water). The U.S. Army Corps of Engineers, the USDA, the DNR, and local government units currently administer programs for surface waters permits.

LONG-TERM: Regulators could investigate whether to add ground water regulations in the one-stop-shop. Ground water is under state jurisdiction only.

What activities does the one-stop-shop include?

The one-stop-shop should include as many of the following programs as possible: WCA wetlands; DNR protected waters; surface water appropriations; drainage and ditch authority; utility crossings; PCA water quality standards; local ordinances applicable to surface waters (including those enacted prior to the WCA) and public drainage systems; Section 404 of the Federal Clean Water Act and Section 10 of the Rivers & Harbors Act of 1899; and USDA Farm Program participants who propose wetland manipulations.

SHORT-TERM: State and federal agencies must analyze current programs to see where overlaps can be eliminated administratively; or, in the alternative, identify the most restrictive policies, have that statute or rule become the standard, and eliminate the rest. There should be lobbying efforts to simplify laws and update pre-WCA local ordinances as necessary to move closer to a one-stop-shop.

MID-TERM: Local government units should coordinate or even integrate their water, wetlands, and land use (zoning) plans, ordinances, and activities.

LONG-TERM: Local government and state and federal water regulations should be made more consistent, including use of common (or standardized) permitting language and compliance requirements. This would allow further coordination of permitting programs and activities, perhaps evolving into a single, comprehensive permit from the community of regulatory interests.

HOW A ONE-STOP-SHOP WOULD WORK

The central features of a one-stop-shop are a single application; a coordinator for water permits; a coordinated regulating team of local and agency staff; common site visits, public notices, hearing, and fees; and a single permit. It would be difficult to make all of these changes quickly, but many steps can be taken to move in the direction of a one-stop-shop approach. As with any significant change, experiments, learning, and refinements will occur along the way.

Water Permit Coordinators would be designated at the local level and could be a staff person with an SWCD, LGU, or local zoning authority. The suggested scale for "coordination zones" are the 31 watershed groups shown in **Figure 10**. In areas of high population density, several coordinators in a zone might be necessary. Local government units could also work out coordination systems among themselves at their own discretion; in some places it might match coordination for local water planning.

POTENTIAL MID- TO LONG-TERM SCENARIO:

The applicant works with the permit coordinator to fill out a single application for the water-related elements of the project. The regulatory authorities have fully informed the coordinator of the water bodies and activities over which they have jurisdiction. The coordinator passes the application to the local, regional, state, and federal authorities with jurisdiction.

The regulators then coordinate their activities, such as site visits (including wetland delineation review), discussions with the applicant, public notices and hearings, and fees. The regulators do not make duplicative requests for additional information or select conflicting conditions for a permit; they do consider alternatives and work out interagency disagreements. A permit denial can still result if the requirements of one or more regulators simply cannot be met. The coordinator returns to the applicant a single coordinated response (either permit approved; permit approved with conditions or required project changes; or permit denied) within the required deadlines.

Applicants could work directly with agencies (including LGUs), which might be more efficient for the applicant on permit applications for very large, complex projects, but not in such a way that circumvents the WCA permitting process. However, the Water Permit Coordinator will still need to be aware of the project to make sure that all necessary notifications have been made and that all regulators strive to coordinate their efforts and decisions according to this model.

The degree of responsibility for the Water Permit Coordinator (and associated expertise) could fall anywhere along a range from a basic liaison with limited responsibilities to a skilled and experienced professional with extensive responsibilities. A basic liaison could, with time and experience, grow into more of an advanced lead role. On the other hand, LGUs and other local decision makers could designate a skilled and experienced professional as water permit coordinator from the beginning. The choice depends on the preferences and staff opportunities available in the coordination area.

Over time, agency staff taking part in a more collaborative process should, in many cases, become more comfortable and familiar with each others' responses and conditions for various kinds of applications, and some alternatives for working out their differences. Trust must be learned and earned among the staff of different agencies, technical disciplines, and local government units. This component is fundamental for creating efficiencies.

STRENGTHS & FOLLOW-UP QUESTIONS

The model has the following strengths:

- ◆ The primary point-of-contact for the applicants is nearby.
- ◆ The applicant does not have to know who regulates what, just that somebody does.
- ◆ Over time, the authorities participating in coordinated permitting teams should learn that less than all of them need participate in all aspects of a permit review, and that they can design common standards for many activities.
- ◆ Closer working relationships would produce better consensus on permitting decisions.
- ◆ This model of day-to-day working relationships is universal in that it can be adapted to any current or future organization of government units or agencies.

Some details that remain to be determined include:

- ◇ Details of the Water Permit Coordinator's specific duties.
- ◇ Funding source for Coordinators.
- ◇ Selection of Coordinators and determination of who can best fit the need.
- ◇ Procedures for public hearings, appeals, fee schedules, and timelines differ among the various ordinances, statutes, and regulations for water-related permits, so legislative and rule-making actions may be necessary to truly coordinate these aspects of water permitting.
- ◇ Mechanism and conditions for any delegation of authority to a Permit Coordinator.

Simplification Activities Currently Underway

The following chart summarizes recent and ongoing activities to help simplify the wetland regulatory system. The Interagency Wetlands Group (IWG) is an informal group of staff from state and federal agencies, with participation by local governments and other interest groups, which meets monthly.

MINNESOTA ROUTINE ASSESSMENT METHOD (MNRAM)	The methodology was designed for use by wetland professionals (state and local government or private sector) and is <u>ready for use in 1997</u> . Who is responsible: <i>Interagency Wetlands Group (IWG)</i>										
1996 WCA PROCESS FOR ANNUAL NOTICE ON ROAD PROJECTS	WCA rules were revised in 1996 for public transportation project, to allow the substitution of annual projections of wetland impacts from transportation projects instead of individual project replacement plans. Who is responsible: <i>BWSR and public transportation authorities</i>										
JOINT PROJECT APPLICATION FORM	Under development in 1997. This is an upgrade to the joint project notification form in been use since 1992; the same form is accepted by all regulating and reviewing agencies as official notification of a prospective wetland impact over which one or more regulators might have jurisdiction. Who is responsible: <i>IWG</i>										
OLD GENERAL PERMIT 17	<u>Pilot program in 1995-96</u> to test local capability to administer wetland regulations on behalf of the USCOE. Evaluation of results began in Oct. 1996. Who is responsible: <i>U.S. Army Corps of Engineers and BWSR, with the IWG</i>										
GENERAL PERMIT 1 and NEW GENERAL PERMIT 17 [STATE PROGRAMMATIC GENERAL PERMIT (SPGP)]	Corps of Engineers General Permit 1, with the DNR, was reissued and expanded in 1996. Expanding General Permit 17 to additional WCA LGUs is currently under consideration; there may be different thresholds for public road projects and the USCOE would reserve the right to intervene on any permit as it deems necessary. Who is responsible: <i>U.S. Army Corps of Engineers, BWSR, IWG</i>										
RE-ISSUANCE OF NATIONWIDE PERMITS	The Corps' Nationwide Permits were reissued in February 1997. Development of Regional and/or Section 401 conditions is ongoing. Who is responsible: <i>U.S. Army Corps of Engineers, working with the IWG</i>										
1994 MEMORANDUM OF UNDERSTANDING (MOU) FOR REGULATORY SIMPLIFICATION	Concurrence that the state wetland bank is an acceptable option for compensatory mitigation; that a Statewide General Permit from the Corps of Engineers should be developed; and that various specified opportunities for cooperation, training, and communications (including state wetland planning efforts) should be undertaken. Signed August 24, 1994, by: <table border="0"> <tr> <td>Minnesota Board of Water & Soil Resources</td> <td>U.S. Army Corps of Engineers</td> </tr> <tr> <td>Minnesota Department of Natural Resources</td> <td>U.S. Environmental Protection Agency</td> </tr> <tr> <td>Minnesota Pollution Control Agency</td> <td>U.S. Fish & Wildlife Service</td> </tr> <tr> <td>Minnesota Department of Agriculture</td> <td>USDA Soil Conservation Service</td> </tr> <tr> <td>Minnesota Department of Transportation</td> <td></td> </tr> </table> Who is responsible: <i>: IWG and agency leaders</i>	Minnesota Board of Water & Soil Resources	U.S. Army Corps of Engineers	Minnesota Department of Natural Resources	U.S. Environmental Protection Agency	Minnesota Pollution Control Agency	U.S. Fish & Wildlife Service	Minnesota Department of Agriculture	USDA Soil Conservation Service	Minnesota Department of Transportation	
Minnesota Board of Water & Soil Resources	U.S. Army Corps of Engineers										
Minnesota Department of Natural Resources	U.S. Environmental Protection Agency										
Minnesota Pollution Control Agency	U.S. Fish & Wildlife Service										
Minnesota Department of Agriculture	USDA Soil Conservation Service										
Minnesota Department of Transportation											
WCA RULEMAKING	Emergency rules were developed after the 1996 legislative WCA amendments. Formal rulemaking will be conducted in late 1997. Who is responsible: <i>BWSR</i>										
WCA GUIDANCE	The Board of Water & Soil Resources provides written guidance to Local Government Units on topics related to WCA rules and administration. Who is responsible: <i>BWSR and the IWG</i>										
WETLAND NEWS SERVICE	Ongoing effort by agency staff to distribute information about wetlands. Many articles are published in the "Marsh Memos" newsletter published by the BRW consulting firm, which is widely distributed to local governments and private sector organizations. Who is responsible: <i>IWG</i>										

Further Actions For Regulatory Simplification

The following actions should be taken to move the regulatory permitting closer to a "one-stop-shop" and to make use of general permits. General permits are a distinct simplification tool, but they can also contribute to a one-stop-shopping approach for many routine and small scale wetland permits.

NOTE: "LGUs" refers to Local Government Units under the WCA and "local government units" refers to any or all of the following: counties, cities, townships, watershed districts or WMOs, and SWCDs.

➤ TASKS: ONE-STOP SHOPPING

- *Execute a Memorandum of Agreement among state and federal agencies that authorizes development of a joint application form or system for water permits and agrees on a coordinated schedule or approach for permit review.*
- *Determine and implement steps to coordinate site visits (including wetland delineations), public notice and hearings, fees, and deadlines for permit review.*
- *Make local, state, and federal regulations more consistent, including use of common language in compliance requirements (e.g., permit conditions, terms of replacement plans), to allow further coordination of programs and activities and eventual development of a single water permit.*

Necessary or Potential Leader(s)

BWSR, DNR, PCA, MnDOT
USCOE

Necessary or Potential Partners

LGUs
USFWS, USDA, EPA

➤ TASKS: WATER PERMIT COORDINATORS

- **Local government units** (including WCA LGUs) can initiate water permit coordination and designate a mutually agreeable Coordinator among themselves. They should execute a Joint Powers Agreement or whatever form of agreement is necessary to act on this.
- **The Interagency Wetlands Group** should develop a description of the duties for a Water Permit Coordinator and identify any necessary funding sources.
- **The Interagency Wetlands Group** should supply information about water permit coordination and promote the approach to local government units. Interested areas could serve as pilot programs.
- **State and federal agencies** should investigate ways to coordinate or match procedures for public hearing and appeals.

Necessary or Potential Leader(s)

Local government units and LGUs
BWSR

Necessary or Potential Partners

DNR, PCA, MnDOT
USCOE, USFWS, USDA

➤ TASKS: GENERAL PERMITS

- *Establish programmatic general permits for the State of Minnesota and for LGUs to remove duplication of effort wherever feasible. The Interagency Wetlands Group should support, monitor, and evaluate pilot projects.*
- *Ensure that all government water resource personnel understand the entire wetland regulatory process, so that they have the knowledge to work the process effectively, to increase the capacity of LGUs to take on responsibilities from other jurisdictions, and to enhance local control.*

Necessary or Potential Leader(s)

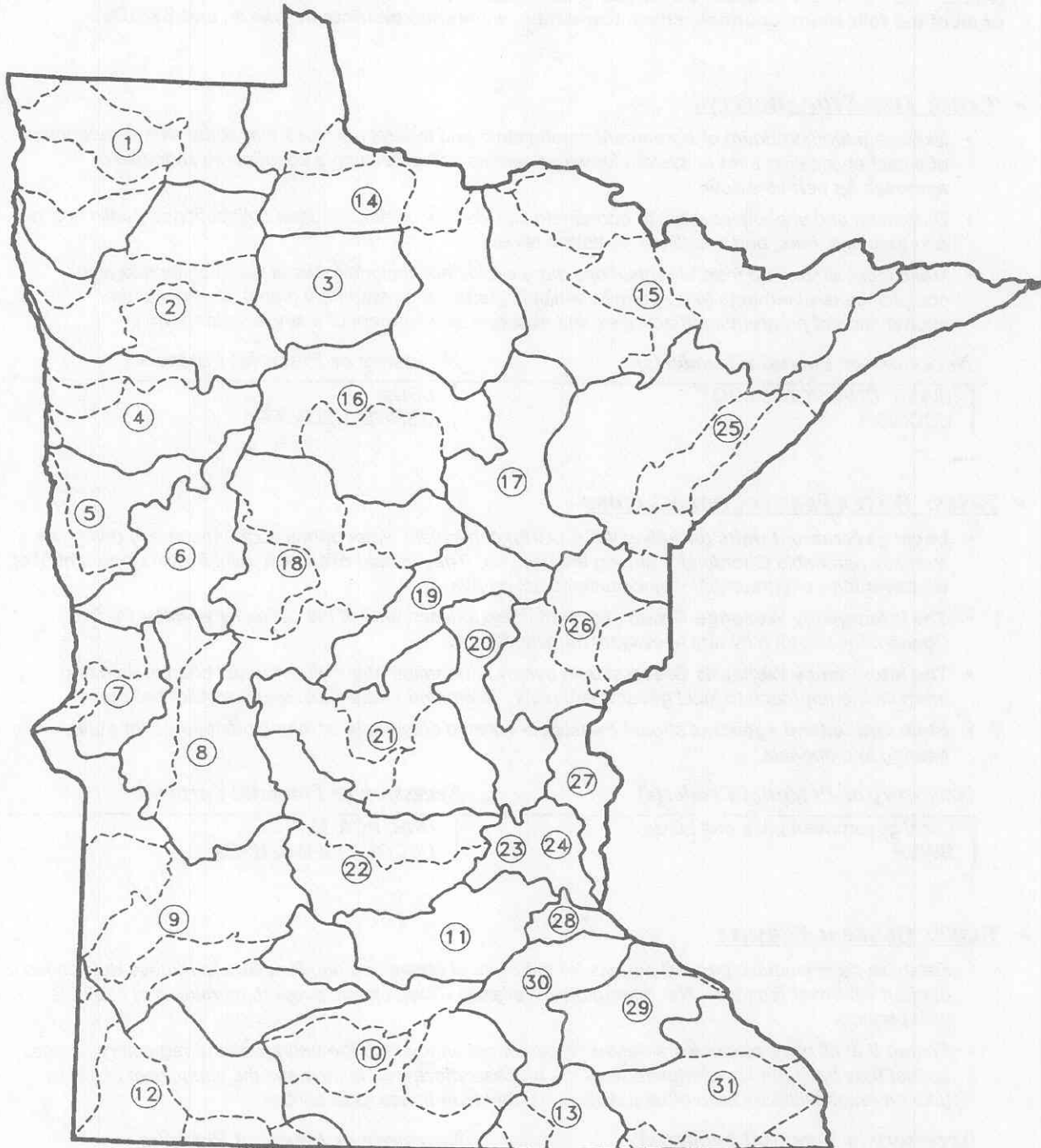
BWSR, DNR, PCA, MnDOT
USCOE

Necessary or Potential Partners

USFWS, USDA, EPA
LGUs
Tribal governments

FIGURE 10 ~ OPTIONAL MODEL FOR WATER PERMIT COORDINATION ZONES

Sources: Minnesota Department of Natural Resources (Division of Waters) and Gerry Wind, Work Team participant
[Note: Placement of the coordination zone numbers does not designate specific locations for coordinators.]



7. EDUCATION & OUTREACH

Education and outreach were identified by project participants as essential elements for a state wetlands plan. It is important to provide information that is complete and acknowledges different perspectives. Education and outreach must be targeted to the needs of different audiences: local government staff and officials, landowners, agency staff, students and professionals, as well as the general public. Preparing and delivering information is a responsibility best accomplished cooperatively through partnerships among local government units, state and federal agencies, and educators. Each partner can contribute important and sometimes specialized skills and knowledge to the efforts of decision makers to understand and analyze the choices and consequences they face.

Actions for Different Audiences and Places

NOTE: "LGUs" refers to Local Government Units under the WCA and "local government units" refers to any or all of the following: counties, cities, townships, watershed districts or WMOs, and SWCDs.

NOTE: Items listed for education & outreach may not be an exhaustive summary of all available materials. Lists of leaders and partners may also be incomplete, depending on the location.

AUDIENCE: LOCAL GOVERNMENT

The local government staff and officials involved in land use decisions may include (with variations in some government units): planning, zoning, development engineering staff; administrators; boards of adjustment; planning commissions; parks and natural resource commissions; land departments; town boards; city councils; county boards; watershed boards, and SWCD boards; one way or another, they all play a role in local land management. It is important that these persons become familiar with their role in wetland conservation.

EDUCATION AND DELIVERY OF INFORMATION TO LAND MANAGERS IS BEST DONE AT THE LOCAL LEVEL. Local staff or officials should take the lead in determining the kinds of information most needed in their jurisdiction. Local government associations may also find ways to assist their members as clearinghouses for locally-oriented wetlands information.

The field staff of state and federal agencies are sources for technical information and advice. For example, the BWSR's Board Conservationists are experienced in discussing wetland issues and information with local policy makers and the DNR has locally-based staff who are specialists in a variety of natural resource disciplines. The BWSR has provided basic training to LGU wetland coordinators in past years, but there is turnover among those coordinators and many others are likely ready for more advanced training.

➤ **TASKS: LAND USE & WETLANDS PROGRAMS**

- Give classes, presentations, or discussion forums on wetlands and development, roads, ditches, utilities, and/or other topics, based on needs of local officials. This could be done through state-sponsored classes; a single or serial agenda item at local meetings; annual or other meetings of local government associations; and other opportunities.
- Conduct field tours for elected and appointed officials hosted by a local government unit(s) to view and discuss local wetlands topics. Invite education partners to listen to local concerns, provide handouts (if appropriate), and help answer questions.

Necessary or Potential Leader(s)

LGU wetland coordinators
Local water planners
SWCDs
Planning & zoning offices
Other local government units or subunits

Necessary or Potential Partners

BWSR, DNR, MDA, MnDOT
Univ. of Minn. Extension Service
Metropolitan Mosquito Control District
Tribal governments
USDA-NRCS, USCOE
AMC, LMC, MAT, MASWCD, MAWD

LOCAL GOVERNMENT CONTINUED -

► TASKS: BASIC GUIDANCE MATERIALS

- Create uniform, readily available guidance for elected and appointed officials on wetland values in specific areas of the state, and on options for landowners and communities. Coordinate with an updated Minnesota Restoration Guide. Provide graphics or other simple tools that LGUs can use when meeting with citizens.
- Create a model local wetlands management plan as guidance to assist local government units, using the best features of the first local wetland plans being drafted in 1996-97.

Necessary or Potential Leader(s)

BWSR
DNR
Other state agencies

Necessary or Potential Partners

LGUs; planning & zoning offices
Metropolitan Mosquito Control District
Tribal governments

► TASKS: STAFF TRAINING & ASSISTANCE

- For LGU wetland coordinators and local officials: Provide introductory and advanced training on: Ecology, hydrology, wetland soils, botany; wetland classification and delineation; functions & values, MNRAM functional assessment method; technical panel & permitting procedures; regulatory & nonregulatory programs and management tools. Include field tours.
- Provide technical assistance to LGUs, tax assessors, policy-makers.
- Establish Internet access for local government staff to view the National Wetland Inventory, Ecological Classification System, soils data, ditch system data, etc.

Necessary or Potential Leader(s)

BWSR, DNR, PCA, MDA, MnDOT

Necessary or Potential Partners

USDA-NRCS, USCOE
Univ. of Minn. Extension Service

AUDIENCE: DEVELOPMENT PROFESSIONALS

Professionals should seek to improve their skills and knowledge and keep up-to-date on wetland conservation programs that may affect their work.

► TASKS: CONTINUING EDUCATION

- Maintain continuing education courses for realtors, builders, and other development professionals.
- Wetland professionals can seek certification as wetland scientists and delineators.
- Consider developing a formal certification program for wetland professionals working in Minnesota.

Necessary or Potential Leader(s)

Builders Association of Minnesota
Minnesota Realtors Association
Wetland Delineators Association
Other professional groups

Necessary or Potential Partners

BWSR, DNR, USCOE
Tribal governments
Wetland professionals (consultants; govt. staff)
Universities and colleges

AUDIENCE: AGENCY STAFF

The message for agency staff is that learning must be a two-way street. They must listen and learn from local staff, officials, and citizens, as much as they seek to inform. The purpose is to provide better customer service to applicants and local government units.

► TASKS: IMPROVED CUSTOMER SERVICE IN EDUCATION

- Emphasize to state agency staff that education and outreach about wetlands and waters is a major job duty. Remove internal barriers to this activity. Make expectations clear to management and staff.
- Emphasize a local focus for staff and enable them to coordinate effectively with each other and with local government staff on wetland and water permitting activities and nonregulatory projects.

Necessary or Potential Leader(s)

Managers & supervisors in all state agencies

Necessary or Potential Partners

Agency staff

AUDIENCE: LANDOWNERS

There is no single reference guide on wetlands and waters in this state for landowners. Information should be consolidated, updated, and supplemented to create a handout that is available upon request from local government and state agency offices. The objectives are to make comprehensive information readily available and to make the whole system easier for applicants to understand and navigate.

► TASKS: BASIC GUIDANCE MATERIALS

- Create a readable, non-technical landowner guide with topics like: wetland functions & values and "what's in it for them"; "thinking beyond the drain" in situations like shoreland, lakes, & rivers; the ecology & watersheds of Minnesota; what a landowner can do with wetlands; compensation; nonregulatory programs and technical assistance; and how to get help from government or from non-government organizations; list of contacts. Give specific local/regional examples. Expand the guide to address all water bodies (not just wetlands) since some are similar.
- Update information pamphlets on WCA regulations and public waters regulations as necessary.

Necessary or Potential Leader(s)

To produce materials:
BWSR, DNR, PCA, MDA
(in cooperation with partners)

Necessary or Potential Partners

To review drafts and to deliver information:
LGUs; planning & zoning offices
Metropolitan Mosquito Control District
Tribal governments

AUDIENCE: GENERAL PUBLIC

These tasks are locally-specific general communications activities.

► TASKS: OUTREACH

- Find effective ways to do outreach on these topics: wetland functions & values; drainage & storm water processes; best management practices for runoff; environmental and economic benefits & costs (short-term vs. long-term); cumulative impacts of land use decisions; environmental protection and economic growth.
- Produce a series of short articles for local newspapers about wetlands policy, regulation, wetland banking, nonregulatory programs, local needs & wetlands, etc. Well-written articles could be shared among LGUs and adapted for local publication.
- Conduct public field tours hosted by a local government unit(s) to view and discuss local wetlands and land use topics. Discuss wetland criteria, local wetland types, local watersheds and landscapes, stewardship. Invite education partners to listen to local concerns, provide handouts (if appropriate), and help answer questions.
- Make public information about local wetlands conservation activities; tie statistics to recommended actions for use by local officials.
- LGUs should consider allocating 5% of local wetland management funds to local education and outreach.
- Seek citizen dialogue on land use planning & zoning and sustainable development.
- Encourage and assist local groups with their education efforts (for example, lake associations) by providing speakers, lists of information sources, handouts, audiovisual materials, and volunteer opportunities.
- Establish Internet access for the public to view the National Wetland Inventory, Ecological Classification System, soils data, ditch system data, etc.

Necessary or Potential Leader(s)

LGU wetland coordinators
Local water planners
Planning & zoning offices
Regional development and resource organizations
BWSR, DNR, PCA, MDA (publications, Internet)
Non-governmental groups (e.g., Ducks Unlimited, Audubon Society; lake associations)

Necessary or Potential Partners

SWCDs, Univ. of Minn. Extension Service
Watershed Districts & Management Organizations
BWSR, DNR, PCA, MDA
Non-governmental groups (e.g., Audubon Society; sports groups, lake associations)
USDA-NRCS, USCOE, USFWS
Tribal governments

AUDIENCE: K-12 STUDENTS

Existing education opportunities should be continued and enhanced.

➤ **TASKS: EARLY EDUCATION**

- Use good computer (such as CD-ROM) and video materials when available for K-12 wetlands programs. An example is "SEEK", the state's interactive environmental education clearinghouse on the Internet [<http://www.seek.state.mn.us>].
- Use participative programs like "Wow! The Wonders of Wetlands" and "Project WET" to give K-12 students a personal experience with wetlands.
- Produce K-12 level educational handouts about wetlands for teachers.
- Encourage high school students to take at least one course in biology or another basic science.
- Promote wetland-related activities for high school science fair projects.

Necessary or Potential Leader(s)

K-12 teachers
School district curriculum coordinators
State agencies (materials & promotion)

Necessary or Potential Partners

Local wetland coordinators & water planners
Univ. of Minn. Extension Service
Metropolitan Mosquito Control District
State agencies, Tribal governments

AUDIENCE: LEGISLATORS & STAFF

State lawmakers need complete and up-to-date information in order to make sound policy decisions.

➤ **TASKS: BRIEFING MATERIALS**

- Provide timely and complete information on wetlands policy issues to legislators and their staff.

Necessary or Potential Leader(s)

Coalition of diverse interests (similar to the
Wetlands Network that produced the MWCP)

Necessary or Potential Partners

(see left)

8. RESEARCH PRIORITIES

This is a list of research priorities related to wetlands conservation and management. Ideas were compiled from wetlands planning focus groups and feedback during 1994-1996 and consolidated into this summary list. Therefore, the list reflects needs identified throughout the state from local and state-level participants. The list should not be considered all-inclusive, but it provides a reliable reference for perceived needs at the time this plan was developed.

Both public and private sector researchers (agencies, academic institutions, non-governmental organizations, etc.) should refer to this list when planning research projects. Nearly all of these research items are state-level responsibilities in terms of scale. The items are sorted by general topics, but they do not reflect any prioritization (which should be evaluated when projects are chosen).

SUSTAINABILITY

- a) Develop indicators for wetland sustainability in different landscapes and hydrologic systems.
- b) Conduct further research in the complexities of wetland ecology. Some examples:
 - Conduct systems analysis of wetlands as an integral part of landscape-level ecosystems and water resources, rather than simply assessing individual wetland basins.
 - Share current information and continue study of the role of wetlands in the transport and transformation of naturally occurring and other sources of mercury, which can be a matter of concern under aggravating circumstances. There does not appear to be agreement or common understanding among scientists or agency staff about this issue.¹¹

FUNCTIONAL ASSESSMENT

- a) Develop improved wetland functional assessment methods.
- b) Identify "reference" wetlands for use in wetland functional assessments.
- c) Determine which wetlands or wetland complexes recharge which aquifers (state, regional, or watershed scales).
- d) Develop methods or criteria for determining the role of a particular wetland in ground water recharge.
- e) Determine the conditions under which wetlands act as sources or sinks for nutrients or other contaminants.
- f) Examine the role of wetlands in attenuating flooding in different landscape settings and in different regions.
- g) Determine the amount, distribution, and types of wetlands necessary to maintain desired functions (flood water abatement, water quality, biodiversity, etc.).
- h) Determine the optimal width and characteristics of buffer strips adjacent to streams, ditches, and tile inlets under different land use conditions.
- i) Determine the impacts of different kinds of tile inlet systems on drainage water quality.
- j) Determine the impacts of riparian and wetland grazing systems on wetland quality.

RESTORATION, CREATION, & COMPENSATORY REPLACEMENT

- a) Evaluate restored and created wetlands to develop improved standards and techniques for future projects.
- b) Develop biological criteria (indicators) for evaluating the success of restored and created wetlands.
- c) Determine the feasibility and ecological/hydrological benefits of eliminating non-functional ditches in peatlands.
- d) Evaluate replacement wetlands on mine tailings sites.
- e) Determine the extent to which continued loss of wetlands can be attributed to different regulatory exemptions.

¹¹ For further information: Larry Schwarzkopf, Fond du Lac Natural Resources Program (Cloquet), and Willis Mattison, MPCA (Detroit Lakes).

BENEFITS & COSTS

- a) Determine the social and economic benefits and costs of maintaining or restoring wetlands for downstream water quality maintenance or improvements.
- b) Determine the social and economic benefits and costs of maintaining or restoring wetlands for downstream flood water abatement and stream flow maintenance.
- c) Evaluate how the property tax system influences local government and landowner decisions about natural resource management.
- d) Identify all benefits and costs associated with wetland conversion, compared to alternative land uses.
- e) Evaluate the economics of wetland mitigation.

INVENTORY

- a) Inventory wetlands on a watershed basis for local water planning and wetland planning purposes.
- b) Produce and distribute digitized natural resource maps pertaining to wetlands (such as soil surveys, hydrologic maps, wetland inventories, etc.).
- c) Develop improved inventory methods for wetlands.
- d) Develop remote sensing techniques for underground tile lines.
- e) Conduct inventories of microfauna for various wetland types and conditions in different Wetland Ecological Units (WEUs).

9. MONITORING & EVALUATION

Purpose of Monitoring and Evaluation

Monitoring of implementation for the Minnesota Wetlands Conservation Plan (MWCP) is necessary to assess whether and how well the goal of the plan is being achieved. As such, monitoring and evaluation activities are different from enforcement actions because they are focused on measuring progress toward meeting a goal, rather than compelling regulatory compliance, and because they are future-oriented and , rather than.

Collection and evaluation of monitoring data will require a partnership among all responsible entities.

Indicators of Success

Signposts for successful implementation of this Minnesota Wetlands Conservation Plan, drawn from the Goal Statement, will be (see page 25):

- ✓ **IMPROVED QUALITY, DIVERSITY, AND OVERALL QUANTITY OF WETLANDS** in the state.
- ✓ **INCREASED QUANTITY OF WETLANDS** in areas targeted for wetland restoration.
- ✓ **WATERSHED IMPROVEMENTS** attributable to protection and restoration of wetlands.
- ✓ **HIGHER SATISFACTION** with wetlands conservation and regulatory programs.
- ✓ **POSITIVE RETURN-VS.-COST RATIO** for wetland conservation efforts.

The key strategic issues identified for the Minnesota Wetlands Conservation Plan (see page 26) should be important elements in the methods used for monitoring and evaluation:

- Regional differences → accounting for observable complexity
- Functional assessment → determining what wetlands do and how they do it
- Wetland restoration → regaining what has been lost
- Economic considerations → seeing people as part of the system
- Regulatory simplification → making the process serve people
- Customized education → learning

➤ TASKS: INFORMATION & ANALYSIS

- *Develop and implement methods for measuring and evaluating ecological, social, and economic progress toward the goal of the MWCP. State agencies must create an interdisciplinary team of state, federal, and local governmental entities and non-governmental interests (both technical and non-technical participants) to determine the appropriate indicators and methods.*
- *Collect and evaluate information on the selected indicators; identify deficiencies and determine necessary incentives to improve the quality and sufficiency of the data collected.*
- *Publish periodic reports on progress toward the goal of the MWCP and recommend improvements to the MWCP.*

Necessary or Potential Leader(s)

BWSR, DNR, PCA, MnDOT
USFWS

Necessary or Potential Partners

LGUs
Local water planners and wetland planners
Metropolitan Mosquito Control District
USCOE, USDA-NRCS

10. UNRESOLVED ISSUES

The following list summarizes issues left unresolved at the conclusion of plan development by the Work Team, due to lack of time, resources, or an appropriate forum. The fact that these issues are unresolved does not lessen their importance, but may highlight greater challenges. The list may not be all-inclusive.

SOCIAL & ECONOMIC FACTORS FOR WETLAND CONSERVATION

This topic is a prime candidate for further study and dialogue. Economics is a major component but it only one of several pieces of this puzzle. Five challenging questions on this subject are posed in Chapter 8, "Research," but there may be other study questions as well. A number of participants are interested in pursuing this issue in partnership. One possible approach would be an interdisciplinary, public/private study and discussion forum, funded through an LCMR grant.

LINKING UPLAND PROTECTION WITH WETLAND REPLACEMENTS

Participants often commented on the disparity between wetland protections and the lack of specific protection for upland landscape features, such as oak stands and prairie. They were also aware that, because wetlands are an integral part of the larger landscape and hydrologic system, wetlands are indirectly affected by off-site activities.

CREDITS FOR WETLAND REPLACEMENT

Several participants were interested in exploring alternative replacements credits for wetland impacts. Some examples could be credit for habitat stewardship, water quality stewardship, and water storage stewardship activities, which would replace some or all of the lost wetland values through other means.

HOW THE "ONE-STOP-SHOP" STRATEGY WILL WORK IN PRACTICE

The Regulatory Simplification Strategy does not answer all questions about how a one-stop-shop could or should work. Many details and alternatives will have to be resolved through demonstration, testing, and learning processes. Because of the complexity of the regulatory system and the variations in Minnesota's state and local political administrative arrangements, there probably is not a single, complete, ideal, model that could be successfully applied everywhere.

MITIGATION SITING & TRANSFER GUIDELINES

While the five state agencies sponsoring development of this wetlands plan have agreed on the guidelines in Chapter 5, those guidelines do not have the full support of the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, or the U.S. Fish & Wildlife Service. The state and federal agencies will continue their dialogue on this issue. The agreement among state agencies is an important move forward in coordinating state-level administration, however.

PROPERTY TAXES & WETLAND RESTORATION

Sometimes local officials find it difficult to approve landowner requests for property tax relief, in spite of the non-fiscal benefits that wetlands would or already do provide for local lands and watersheds, because of perceived risks for local revenue and budgets. The Payment In Lieu of Taxes program has been debated for years and the disagreements between local and state governments did not originate with wetlands protection policy. These are complex fiscal policy issues that go beyond the scope of this plan and must be addressed through other forums.

CONFLICT BETWEEN LANDOWNER RIGHTS AND LAND USE REGULATION

This is a very complex and challenging issue that extends far beyond the matter of wetlands regulation. The majority of participants strove to be sensitive to the relevant concerns but also thought that the philosophical and legal questions went far beyond the scope of this project or that rollbacks in state wetlands protections were the objective of the landowner rights advocates.

DOES THE WETLAND CONSERVATION ACT REALLY RESULT IN NO-NET-LOSS OF WETLANDS

With all the exemptions and de minimus provisions in the WCA and its focus on project-by-project evaluation rather than cumulative impacts, questions were raised about whether the no-net-loss policy stated in the WCA could possibly be met.

A MORE EFFECTIVE APPEAL PROCESS UNDER THE WETLAND CONSERVATION ACT

This planning project was not intended to revisit negotiations on the specific provisions of the WCA. The few recommendations for legislative action are focused on the ability of governmental entities to implement the MWCP.

Unresolved issues like these and others are not be listed here can be addressed in other forums and through continued discussions and voluntary networking among the participants in this planning project and other interested parties. This project has laid the groundwork for resolving more wetlands disputes through new and improved working relationships.

Appendix A

GLOSSARY

ACRONYMS

BMP	Best Management Practice
BWSR	Minnesota Board of Water & Soil Resources
COE	U.S. Army Corps of Engineers
CRP	Conservation Reserve Program (Federal)
CWA	Clean Water Act (Federal)
DNR	Minnesota Department of Natural Resources (also MDNR)
ECS	Ecological Classification System
EPA	U.S. Environmental Protection Agency
EQB	Minnesota Environmental Quality Board
FHWA	Federal Highway Administration
FmHA	Farmers Home Administration
FSA	Farm Service Agency, U.S. Department of Agriculture (formerly the Agriculture Stabilization & Conservation Service)
GP	General Permit
IWG	Interagency Wetlands Group
LCMR	Legislative Commission on Minnesota Resources
LGU	Local Government Unit under the WCA (may be a county , city, township, watershed district or water management organization, or soil & water conservation district; also state agencies responsible for state-owned or administered lands).
MDA	Minnesota Department of Agriculture
MEPA	Minnesota Environmental Protection Act
MnDOT	Minnesota Department of Transportation (also DOT)
MWCP	Minnesota Wetlands Conservation Plan
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service, U.S. Department of Agriculture (formerly the Soil Conservation Service)
NWI	National Wetland Inventory
NWPCP	National Wetland Priority Conservation Plan
PCA	Minnesota Pollution Control Agency
PWI	Protected Waters Inventory
RIM	Reinvest In Minnesota Program
SCORP	State Comprehensive Outdoor Recreation Plan
SPGP	State Programmatic General Permit
SWCD	Soil & Water Conservation District
TEP	Technical Evaluation Panel
USCOE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service, U.S. Department of Agriculture
USFWS	U.S. Fish & Wildlife Service, U.S. Department of Interior
WCA	Wetland Conservation Act
WD	Watershed District
WEU	Wetland Ecological Unit
WMO	Watershed Management Organization
WPA	Wetland Preservation Areas under the WCA

TERMS & PHRASES

Banking See "wetland banking"

Benefits Qualitative and quantitative services and improvements to the quality of life for individuals, communities, and to overall conditions provided through the integrity of land and water systems. Many of these benefits cannot or have not been measured in monetary terms, so the term "benefits" includes but is not limited to economic valuation in this plan.

Best Management Practice (BMP) A procedure or action taken to prevent or minimize potential adverse effects of human activity on a wetland or other water resource, e.g., installation of silt fencing at a construction site to contain erosion.

Biogeochemical Dealing with the relation of earth chemicals to plant and animal life in an area.

Circumneutral Having a pH near neutral (7.0), i.e., neither strongly acidic nor basic.

Creation Construction of wetlands in an area that was not wetlands in the past.

Credit See "stewardship credit" and "wetland credit."

Degradation The decline or loss of one or more wetland functions due to human activities.

Delineation The process of identifying boundaries and classifying a wetland according to scientific standards.

Dendritic, dendrification A branching tree-like pattern.

Ditch An open channel constructed to conduct the flow of water.

Drainage authority The county board of commissioners or joint county drainage authority having jurisdiction over a drainage system or project.

Drainage system A system of ditch or tile, or both, to drain property, including laterals, improvements, and improvements of outlets, established and constructed by a drainage authority. It includes the improvement of a natural waterway used in the construction of a drainage system and any part of a flood control plan proposed by the United States or its agencies in the drainage system.

Drumlin An elongate or oval hill of glacial drift.

Ecology 1 Science concerned with the interrelationship of organisms and their environments. 2 The totality or pattern of relations between organisms and their environment.

Ecoregion A geographic unit of the landscape having distinct ecological characteristics.

Ecosystem A system formed by the interaction of a community of organisms with their environment.

Enhancement Creating one or more functions of an existing wetland by human activities.

Ecosystem The complex of a community and its environment functioning as an ecological unit in nature.

Evapotranspiration Loss of water from the soil both by evaporation and as water vapor passed off from plants growing in the soil.

Facultative Refers to plants that can live in a variety of environmental conditions. In the context of wetland vegetation, facultative plants are those that can live in both wetland and upland conditions. There are three subcategories of facultative species: 1) facultative wetland plants usually occur in wetlands but are occasionally found in non-wetlands; 2) facultative plants equally likely to occur in wetlands and non-wetlands; and 3) facultative upland plants usually occur in non-wetlands but are occasionally found in wetlands.

Functional assessment The process of identifying and measuring, through comparison, the functions performed by a wetland.

Functions; functions and values See "wetland function" and "wetland value."

General permit General permits are a means of entrusting some permitting decisions to lower levels of government. Such a permit can run from the Corps of Engineers to the DNR or LGUs, or from the DNR to LGUs. A wetland impact acreage cap is generally used to put a routine limit on the entrusted permitting and the higher government authority reserves its right to intercede on any permit application as it deems appropriate and necessary.

Herbaceous Refers to plants having little or no woody tissue.

High quality wetland Self-sustaining wetland that exhibits the full range of elements (biological and chemical) and processes characteristic of its type.

Hydric Characterized by or requiring an abundance of moisture.

Hydrophytic Describes plants that grow in water or in soil too waterlogged for most plants to survive.

Hydrogeomorphology See "wetland hydrogeomorphology."

Hydrology Science dealing with the properties, distribution, and circulation of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere.

Lacustrine Of, relating to, or growing in lakes.

Lakeshed 1) The areas around a lake, including the watersheds of in-flowing streams, which contribute surface water to the lake. 2) The watershed of a lake.

Loam, loamy Soil consisting of an easily crumbled mixture of varying proportions of clay, silt, and sand.

Macrophyte Plant life large enough to be seen with the naked eye.

Mafic A group of usually dark colored minerals rich in magnesium and iron.

Management The act, manner, or practice of directing, supervising, or controlling. The term is used in this plan in this general sense of making plans and decisions about wetlands conservation at any level of scale, and is not restricted to specific basin management or permitting.

Management setting A distinct set of geographic, physical and/or cultural features that influence or constrain the range of actions available for managing a wetland. (See Chapter 5)

Mesic Characterized by or requiring a moderate amount of moisture.

Mitigation, compensatory mitigation, mitigation wetland As used in this state wetlands plan, mitigation refers to the restoration, creation, enhancement, and in exceptional circumstances, preservation of wetlands expressly for the purposes of compensating for the loss of other wetlands due to human activities. Compensatory mitigation as used in this document is synonymous with the term "**replacement**" and is the last step in the process of "**sequencing**".

Mitigation banking See "**wetland banking**."

Moraine An accumulation of earth and stones carried and finally deposited by a glacier.

Nationwide permits A form of general permit under which certain activities are "pre-approved," in that they can be undertaken without specific or written agency approval.

Obligate Refers to plants that are restricted to a particular set of environmental conditions. For example, obligate wetland species are those that are only found in wetlands.

Palustrine Living or thriving in a marshy environment; being or made up of marsh.

Perched Description of a localized unconfined aquifer where the ground water body is above the general surrounding regional water table and is controlled by structure or stratigraphy; the upper surface of the ground water body is called a "perched water table."

Presettlement wetland A wetland that existed in the state at the time of statehood in 1858.

Regional watershed For the purposes of the MWCP, nine major surface water drainage basins are consolidated into five regional watersheds. They include Hudson Bay Basin (combining Red River of the North Basin and Lake of the Woods Basin), Lake Superior Basin, Minnesota River Basin, Mississippi River (combining Upper Mississippi, St. Croix, and Lower Mississippi Basins), and Missouri River (combining Missouri River Basin and Cedar-Des Moines Rivers Basin). See Minnesota Rules Section 7050.0465 "Waters of the State" regarding major surface water drainage basins.

Replacement, replacement wetland See "**mitigation**."

Restoration The re-establishment of an area that was historically a wetland but currently provides no or minimal wetland functions due to manmade alteration such as filling or drainage.

Riparian Relating to or living or located on the bank of a natural watercourse (as a river) or sometimes of a lake or a tidewater.

Riverine Relating to, formed by, or resembling a river. (See page 19 for definition of "riverine wetlands")

Sequencing A requirement for wetland permit applicants to reasonably avoid and minimize wetland impacts and to provide compensatory mitigation, or replacement for the unavoidable loss of wetlands.

Self-sustaining Maintaining or able to maintain itself.

Shoreland For the purposes of this state wetlands plan, shoreland generally means the area extending landward 1,000 feet from a water body (lake or pond) or 300 feet from a watercourse (river or stream). Legal definitions of shoreland for regulatory purposes are found in Minnesota Statutes 103F.205 and Minnesota Rules Section 8420.0110.

Stewardship credit Mitigation credit for activities determined to be consistent with resource stewardship. *Note: this may not be a currently accepted form of wetland replacement credit.*

Subwatershed A local watershed within one of the 81 major watersheds in Minnesota.

Swale A low-lying or depressed and often wet stretch of land.

Technical evaluation panel, technical panel (TEP) A established by the Minnesota Wetland Conservation Act to address technical issues related to wetland functions, values, location, type, and size, and to make recommendations on wetland replacement plans, exemption and no-loss determinations, sequencing determinations, local comprehensive wetland plans, and wetland banking plans. A panel is comprised of a technical professional with expertise in water resource management appointed by the local government unit (LGU), a technical professional representing the county soil and water conservation district, and a technical professional representing the Minnesota Board of Water & Soil Resources.

Till, glacial till Unstratified glacial drift consisting of clay, sand, gravel, and boulders intermingled.

Water basin An enclosed natural depression with definable banks, capable of containing water, that may be partly filled with water of the state and is discernible on aerial photographs.

Watershed A region or area drained by a river or stream. For the purposes of the MWCP, the term "watershed" refers to one of the 81 major watershed units as shown in Map 4.

Wetland An ecosystem that depends on constant or recurrent, shallow inundation or saturation at or near the surface of the substrate [soil]. The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation at or near the surface and the presence of physical, chemical, and biological features reflective of such inundation or saturation (*National Research Council, 1995*). For regulatory purposes in Minnesota, wetlands are identified by all three of the following criteria:

- 1) Having a predominance of hydric soils;
- 2) Being inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and
- 3) Under normal conditions, actually supporting a prevalence of hydrophytic vegetation.

These features will be present except where specific physiochemical, biotic, or human-influence factors have removed them or prevented their development.

Wetland banking Compensatory mitigation carried out in advance of the actual loss of wetlands, and the associated system of recording and facilitating the exchange of "**wetland credits**."

Wetland benefit See "**wetland value**"

Wetland complex A group of adjacent wetlands, usually having a mosaic of wetland types and functions. The benefits received from a wetland complex come from the cumulative functions and values and reduce the need to depend on one basin to provide all needed functions and values. ["Wetland complex" is not a scientific term.]

Wetland credit A quantifiable unit of restored or created wetland and associated land resources used to offset wetland losses, often referred to in the context of wetland banking. In Minnesota, the unit of measure is acres, categorized by wetland type.

Wetland function A physical, chemical, or biological process or attribute of a wetland. Theoretically, all wetland functions can be measured or quantified objectively. Example: surface water storage is a hydrologic function of some wetlands measured in cubic feet of water stored. (See also "**wetland value**")

Wetland hydrogeomorphology The combined hydrologic and landscape setting of a wetland. An understanding of these physical characteristics of a wetland is useful in determining how a wetland is formed and how it functions.

Wetland hydrology The presence of recurrent, sustained inundation or saturation at or near the surface of the substrate sufficient to produce physical, chemical, and biological features reflective of anaerobic conditions. The source and dynamics of wetland hydrology can vary. Some examples include overbank flooding from streams, upwelling of groundwater, or surface runoff from precipitation.

Wetland value The extent to which a physical, chemical, or biological process or attribute of a wetland is beneficial or valuable to individuals or society. Since wetland values are culturally derived, they may be difficult to quantify and may change over time. Example: the extent to which a wetland stores surface water and thereby reduces downstream flooding is a wetland value, possibly measured in dollars of damage reduction. (See also "**wetland function**")

Appendix B

DESCRIPTIONS OF WETLAND TYPES IN MINNESOTA Sorted by Circular 39 Classification System

Source: Minnesota Department of Natural Resources (Division of Waters), January 1997.

Circular 39 wetland types are from Shaw and Fredine 1956, reprinted 1971; NWI habitat types are from Cowardin et al. 1979.

The topic "NWI symbols" refers to wetland habitat symbols on National Wetland Inventory maps.

- TYPE 1** Seasonally flooded basin or flat
Soil: Usually well-drained during much of the growing season.
Hydrology: Covered with water or waterlogged during variable seasonal periods.
Vegetation: Varies greatly according to season and duration of flooding, from bottomland hardwoods to herbaceous plants.
Common sites: Upland depressions, bottomland hardwoods (floodplain forests).
NWI symbols: **PEMA; PFOA; PUS**
- TYPE 2** Wet meadow
Soil: Saturated or nearly saturated during most of the growing season.
Hydrology: Usually without standing water during most of the growing season, but waterlogged within at least a few inches of the surface.
Vegetation: Includes grasses, sedges, rushes, various broad-leaved plants.
Common sites: Meadows may fill shallow basins, sloughs, or farmland sags, or these meadows may border shallow marshes on the landward side; includes low prairies, sedge meadows, and calcareous fens.
NWI symbols: **PEMB**
- TYPE 3** Shallow marsh
Soil: Usually waterlogged early during growing season.
Hydrology: Often covered with 6 inches or more of water.
Vegetation: Includes grasses, bulrushes, spikerushes, and various other marsh plants such as cattails, arrowheads, pickerelweed, and smartweeds.
Common sites: May nearly fill shallow lake basins or sloughs, or may border deep marshes on landward side; common as seep areas near irrigated lands.
NWI symbols: **PEMC and F; PSSH; PUBA and C**
- TYPE 4** Deep marsh
Soil: (inundated)
Hydrology: Usually covered with 6 inches to 3 feet or more of water during growing season.
Vegetation: Includes cattails, reeds, bulrushes, spikerushes, and wild rice; open areas may have pondweeds, nalads, coontail, watermilfoils, waterweeds, duckweeds, waterlilies, or spatterdocks.
Common sites: May completely fill shallow lake basins, potholes, limestone sinks and sloughs, or may border open water in such depressions.
NWI symbols: **L2ABF; L2EMF and G; L2US; PABF and G; PEMG and H; PUBB and F**
- TYPE 5** Shallow open water
Soil: (inundated)
Hydrology: Usually less than 10 feet deep; includes shallow ponds and reservoirs.
Vegetation: Fringed by emergent vegetation similar to open areas of Type 4 wetlands.
Common sites: Shallow lake basins; may border large open water basins.
NWI symbols: **L1; L2ABG and H; L2EMA, B, and H; L2RS; L2UB; PABH; PUBG and H** [L1, PUBG, and PUBH are often considered deep water habitats]
- TYPE 6** Shrub swamp
Soil: Usually waterlogged during growing season.
Hydrology: Often covered with as much as 6 inches of water; water table at or near the surface.
Vegetation: Includes alder, willows, buttonbrush, dogwoods, and swamp-privet.
Common sites: Along sluggish streams, drainage depressions, and occasionally on flood plains.
NWI symbols: **PSSA, C, F, and G; PSS1, 5, and 6B**

TYPE 7	<u>Wooded swamp</u>	
	Soil:	Waterlogged within a few inches of surface during growing season.
	Hydrology:	Often covered with as much as 1 foot of water; water table at or near the surface.
	Vegetation:	Includes hardwood and coniferous swamps with tamarack, arborvitae, black spruce, balsam, red maple, and black ash; deciduous sites frequently support beds of duckweeds and smartweeds.
	Common sites:	Mostly in shallow ancient lake basins, on old riverine oxbows, on flat uplands, and along sluggish streams.
	NWI symbols:	PFO1, 5, and 6B; PFOC and F
TYPE 8	<u>Bog</u>	
	Soil:	Usually waterlogged.
	Hydrology:	Water table at or near the surface.
	Vegetation:	Woody, herbaceous, or both, supporting a spongy covering of mosses; typical plants are heath shrubs, sphagnum moss, sedges, leatherleaf, Labrador tea, cranberries, sedges, and cottongrass; scattered, often stunted, black spruce and tamarack may occur.
	Common sites:	Mostly in shallow glacial lake basins, glacial lake filled depressions, on flat uplands, and along sluggish streams.
	NWI symbols:	PFO2, 4, and 7B; PSS2, 3, 4, and 7B

NOTE: the following Cowardin wetland types were not included in the Circular 39 classification system, but they are used in the Minnesota Wetlands Conservation Plan:

Riverine	<p>Riverine wetlands are contained in natural or artificial channels periodically or continuously containing flowing water. Riverine wetlands may be perennial or intermittent.</p> <p><i>Note that palustrine wetlands (of a Type noted above) may occur in the channel, but they are not part of the riverine system and are termed shoreland wetlands rather than riverine wetlands. Riverine wetlands are system-level of wetlands in the Cowardin classification system and the National Wetland Inventory.</i></p> <p>NWI symbols: R</p>
Industrial/Municipal	<p>Artificially flooded impoundments identified on National Wetland Inventory (NWI) maps with water regime "K." The amount and duration of flooding is controlled with pumps or siphons in combination with dikes or dams. Examples would include portions of water/wastewater facilities and mine tailing impoundments.</p> <p>NWI symbols: K</p>

Appendix C

SOURCES OF DATA & INFORMATION (as of Spring 1997)

GENERAL CONTACTS

The best contact to try first regarding a regulatory or non-regulatory question about wetlands is the local Soil and Water Conservation District (SWCD) office or Natural Resources Conservation Service (USDA-NRCS) office. Most SWCDs are county-based. They can refer to other appropriate contacts, if necessary.

State-level contacts

Minnesota Board of Water & Soil Resources
One West Water Street, Suite 200
St. Paul, MN 55107
(612) 296-3767

Natural Resources Conservation Service
375 Jackson Street, Suite 600
St. Paul, MN 55101
(612) 290-3675

Minnesota Department of Natural Resources
Division of Waters
500 Lafayette Road
St. Paul, MN 55155-4032
Division of Waters (612) 296-4800
Division of Fish & Wildlife (612) 296-2835

U.S. Army Corps of Engineers
St. Paul District Attn: CO-R
190 Fifth Street East
St. Paul, MN 55101
(612) 290-5375

CONTACTS FOR WETLAND BANKING AND WETLAND GUIDANCE MATERIALS

State agency contacts

Minnesota Board of Water & Soil Resources
One West Water Street, Suite 200
St. Paul, MN 55107
(612) 296-3767

Minnesota Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155
Division of Fish & Wildlife (612) 296-2835
Division of Waters (612) 296-4800

HOW TO OBTAIN OR VIEW MAPS

National Wetland Inventory, digital version:

Call 1-800-USA-MAPS or access through the Internet at <http://www.nwi.fws.gov>.

National Wetland Inventory, paper copy:

Call the Minnesota Bookstore at 1-800-657-3757 or 612-297-3000.

Or contact the local Soil and Water Conservation District (SWCD) office.

National Resources Inventory:

Access through the Internet at <http://www.mn.USDA-NRCS.usda.gov>.

CURRENTLY AVAILABLE INFORMATION ON DRAINED WETLANDS

Contact the local Soil and Water Conservation District (SWCD) office or Natural Resources Conservation Service (USDA-NRCS) office to inquire about FSA maps identifying prior converted croplands, farmed wetlands, and converted wetlands.

Contact DNR Wildlife or Waters staff in the area for information about old waterfowl breeding and hunting areas.

SOURCES FOR BEST MANAGEMENT PRACTICES (BMPs) OR SIMILAR GUIDANCE

For agriculture: Contact the county office of the University of Minnesota Extension Service.

For forestry: Contact the county forestry office or the area or St. Paul offices of the DNR Division of Forestry.

For shoreland: Contact the area, regional, or St. Paul offices of the DNR Division of Waters.

For construction and storm water: Contact a local zoning official or the Pollution Control Agency at 296-3890 (metro) or 1-800-657-3864 (toll-free) to obtain copies of (1) *Protecting Water Quality in Urban Areas: Best Management Practices for Minnesota*, and (2) *Guidance For Evaluating Urban Storm Water and Snowmelt Runoff Impacts to Wetlands*.

WETLAND PROFESSIONAL CERTIFICATION

The State of Minnesota does not have a certification program for wetland professionals. The U.S. Army Corps of Engineers has proposed a nationwide Wetland Delineator Certification Program, which will test an applicant's competence in wetland delineation methods on a written test and in a field test; this proposal is on hold pending publication of regulations.

A private sector certification program for wetland professionals is the Professional Wetland Scientist (P.W.S.) certification as granted by the Society of Wetland Scientists, a national organization. P.W.S. certification involves completing prescribed post-secondary courses (including specific wetland science courses) and having at least five years of documented direct wetland science experience.

HOW TO FIND A WETLAND PROFESSIONAL

If you are aware of a need for a wetland delineation or permitting activity, you can contact the following organization for a list of practicing wetland professionals:

Wetland Delineators Association
PO Box 47915
Plymouth, MN 55447

The Wetland Delineators Association was formed in August 1995 by a group of wetland scientists from private industry and public agencies throughout Minnesota. The purposes of the organization are: to develop and promote the scientific foundation of wetland delineation; to promote and establish education and training opportunities for wetland delineators; and to provide a forum for exchange of wetland delineation issues. A member of the Wetland Delineators Association, Wayne Jacobson of SEH, Inc., contributed material to the "Current Conditions" chapter of the MWCP.

The local Soil and Water Conservation District or Natural Resources Conservation Service may also be able to assist with delineation questions, depending on staff availability.

WETLAND DEFINITION AND DELINEATION

Cowardin et al., *Classification of Wetlands and Deepwater Habitats of the United States*, U.S. Department of the Interior (Washington, D.C., 1979).

Eggers, S. D. and D. M. Reed, *Wetland Plants and Plant Communities of Minnesota and Wisconsin*, U.S. Army Corps of Engineers, St. Paul District (St. Paul, Minnesota, 1987).

National Research Council, *Wetlands: Characteristics and Boundaries*, National Academy Press (Washington, D.C., 1995).

Richardson, C. J., *Ecological Functions and Human Values in Wetlands*, *Wetlands* (Volume 14, No. 1:1-9).

Shaw, S. P. and C. G. Fredine, *Wetlands of the United States*, (U.S. Fish & Wildlife Service Circular 39, 1956).

State of Minnesota, *Minnesota Routine Assessment Method For Evaluating Wetland Functions (MNRAM) Version 1.0*, (Minnesota Board of Water & Soil Resources, 1995).

State of Wisconsin, *Basic Guide to Wisconsin's Wetlands and Their Boundaries*, Wisconsin Coastal Management Program (Madison, Wisconsin, 1995).

U.S. Army Corps of Engineers, *Corps of Engineers Wetland Delineation Manual*, Technical Report Y-87-1, Waterways Experiment Station (Vicksburg, Mississippi, 1996).

U.S. Army Corps of Engineers, *Guidelines for Submitting Wetland Delineations to the St. Paul District Corps of Engineers and Local Government Units in the State of Minnesota*, (1996).

U.S. Department of Agriculture, *Hydric Soils of the United States*, Soil Conservation Service in cooperation with the National Technical Committee for Hydric Soils (Washington, D.C., 1991).

U.S. Department of Agriculture, *Field Indicators of Hydric Soils in the United States Version 3.2*, Natural Resources Conservation Service in cooperation with the National Technical Committee for Hydric Soils (Washington, D.C., 1996).

U.S. Department of the Interior, *National List of Plant Species That Occur in Wetlands: North Central (Region 3)*, Biological Report 88 (26.3), Fish & Wildlife Service in cooperation with the National and Regional Interagency Review Panels (Washington, D.C., 1988).

Wetland Training Institute, Inc., "Questions & Answers on 1987 Corps of Engineers Manual" in *Federal Wetland Regulation Reference Manual 1991 Update*, WTI 92-1 (Poolesville, MD, 1992) pp. 9164-9168.

Appendix D

REGULATORY & NON-REGULATORY WETLANDS PROGRAMS

From Project Report #1, *Dealing With Wetlands In Minnesota: Questions and Concerns From Around the State About Issues For a State Wetlands Conservation Plan*, published by the Minnesota Department of Natural Resources, April 1995, pp. 6-8.

Responsibilities for wetlands in Minnesota are broadly shared among state and Federal agencies, various forms of local government, and private citizens and organizations. These responsibilities include both regulatory and non-regulatory activities. The agencies and local government units involved in the system are operating under different mandates and have varied, sometimes multiple objectives. Please note that, while state and Federal transportation agencies do not have regulatory or non-regulatory responsibilities, they do have significant compliance responsibilities related to their construction and maintenance responsibilities.

The two tables on the following pages outline how each of these entities plays different, interrelated roles in wetlands protection, management, and restoration, and provide a partial illustration of why so many organizations are part of the system for dealing with wetlands in Minnesota. Further information about programs and responsibilities listed in the charts can be obtained from the responsible agencies.

KEY TO AGENCY ABBREVIATIONS IN CHARTS

WCA:	Minnesota Wetland Conservation Act
LGU:	"Local Government Unit" under the WCA (may be a county, city, township, water management organization, or soil and water conservation district; also, state agencies responsible for state-owned lands)
SWCD:	Soil and Water Conservation District
WD:	Watershed District
WMO:	Watershed Management Organization
BWSR:	Minnesota Board of Water and Soil Resources
DNR:	Minnesota Department of Natural Resources
PCA:	Minnesota Pollution Control Agency
MnDOT:	Minnesota Department of Transportation
MDA:	Minnesota Department of Agriculture
EQB:	Minnesota Environmental Quality Board
MMCD:	Minnesota Mosquito Control District
USEPA:	U.S. Environmental Protection Agency
USCOE:	U.S. Army Corps of Engineers
USDA:	U.S. Department of Agriculture
USDA-NRCS:	Natural Resources Conservation Service (formerly the Soil Conservation Service)
USDA-FSA:	Consolidated Farm Service Agency (formerly the Agricultural Stabilization & Conservation Service)
USFWS:	U.S. Fish and Wildlife Service, U.S. Department of Interior
FHWA:	Federal Highway Administration
FmHA:	Farmers Home Administration

Summary of Regulatory Responsibilities as of 1996

Counties, SWCDs Cities, Townships WDs / WMOs	<p><u>LGUs</u>: Draining & filling a wetland prohibited without replacement; Consider applications for replacement plan approval.</p> <p><u>Counties</u>: Local water planning in greater Minnesota.</p> <p><u>Metro watersheds</u>: Surface water comprehensive plans.</p> <p><u>Metro cities & townships</u>: Local water plans consistent with watershed plans.</p> <p><u>All counties & cities</u>: Shoreland & floodplain ordinances with DNR approval.</p> <p>Any local govt. may administer other locally-instituted wetlands, drainage, & stormwater plans and ordinances.</p>
BWSR	<ul style="list-style-type: none"> • Provide administrative & technical guidance to LGUs. • Consider appeals of local decisions under WCA. • Oversee metropolitan surface water planning & local water planning in greater Minn. counties.
DNR	<ul style="list-style-type: none"> • Permitting for draining, filling, channelizing, etc. in protected waters wetlands (type 3, 4, 5 of a min. size in the public waters inventory). • Enforcement for "protected waters" & WCA wetlands. • Permitting for water appropriation. • Aquatic plant management, rules.
PCA	<ul style="list-style-type: none"> • Sec. 401 of CWA: Certify compliance with state water quality standards for a discharge into state waters. • Issuance of NPDES & SDS permits for stormwater & other discharges.
All state agencies	<ul style="list-style-type: none"> • Responsible Govt. Units must conduct environmental reviews under MEPA. EQB prepared rules & provides assistance. • Executive Order 91-3 re: no-net-loss of wetlands.
USCOE	<ul style="list-style-type: none"> • Sec. 404 of CWA: discharge of dredge or fill into wetlands. • Rivers & Harbors Act: activities affecting course, location, & condition of navigable waters. • Enforcement.
USFWS	<ul style="list-style-type: none"> • Endangered & threatened species & their habitat not to be jeopardized by Federally-supported activities.
USDA-NRCS USDA-FSA	<ul style="list-style-type: none"> • Farm Bill's "Swampbuster": prohibits drainage of wetlands on Federally-subsidized farmland; this is meant to control production of commodities rather than to regulate wetlands directly.
FHWA	<ul style="list-style-type: none"> • Compliance responsibility only.
All Federal agencies	<ul style="list-style-type: none"> • 11990: must consider mitigation & public involvement before proposing new construction in <u>wetlands</u>. • 11988: Must take actions to reduce risk of flood loss; minimize impact of floods on human health, safety, & welfare; and restore & preserve the natural & beneficial values served by <u>floodplains</u>.

Summary of Non-Regulatory Program Responsibilities as of 1996

Counties, SWCDs Cities, Townships WDs / WMOs	<ul style="list-style-type: none"> Varies. SWCDs provide technical assistance to landowners for wetland enhancement, restoration. Some watershed districts and water planning programs provide similar assistance
MDA	<ul style="list-style-type: none"> Technical, advocacy, & policy support for agricultural interests.
BWSR	<ul style="list-style-type: none"> Wetland Mitigation Bank Permanent Wetland Preserves Program Reinvest in Minnesota (RIM) Cost-Share Programs Public Drainage Inventory (pilot program) Public Road Wetland Replacement Program Wetland Preservation Areas Local Wetland Protection & Management Plan & Related Grant Program Local Water Planning - plan approval & grant program Technical & administrative assistance to local government units
DNR	<ul style="list-style-type: none"> RIM Critical Habitat Matching Grant Private Lands Wetland Restoration Program Various wildlife habitat enhancement and land acquisition programs Northern Pike Spawning Area Program Flood Damage Reduction Program Forestry Stewardship Program Environmental Indicators Project Technical assistance to landowners for wetland and wildlife mgmt. and wetland restoration Training & Education Programs on wildlife & habitat development
PCA	<ul style="list-style-type: none"> Clean Water Partnership Clean Lakes Program (with USEPA.) Wetlands Biological Assessment Project
USCOE	<ul style="list-style-type: none"> Project Modification for Improvement of the Environment Program Wetlands Research Program Wetland Technical Assistance Program (assistance for state & local governments)
USFWS	<ul style="list-style-type: none"> Partners for Wildlife Program Wetland Restoration North American Waterfowl Management Plan Small Wetlands Acquisition National Wildlife Refuge System Acquisition/Easement Program Monitoring Wetland Losses & Quality Program Office of Training & Education provides wetlands training courses to interested persons Information & Education Programs provide information on wetlands
USDA-NRCS USDA-FSA	<ul style="list-style-type: none"> Conservation Reserve Program (CRP) Water Bank Program Wetland Reserve Program PL-566 Watershed Program Plant Materials Program Technical assistance to individuals, groups, and local governments
FmHA	<ul style="list-style-type: none"> Conservation Easement Debt Restructuring
National Park Service	<ul style="list-style-type: none"> Land and Water Conservation Fund for states.
Private organizations	<ul style="list-style-type: none"> Partners for Wetlands Program (Izaak Walton League) Purchase and/or easement (MN Deer Hunters Assoc.; MN Waterfowl Assoc.; The Nature Conservancy; Pheasants Forever) Construction and/or funding (Ducks Unlimited; MN Waterfowl Assoc.; sportsmen's clubs; Pioneer Heritage Conservation Trust in Douglas, Grant, & Otter Tail Counties; WCentral MN Initiative Fund)

Appendix E

PARTICIPANTS IN PLAN DEVELOPMENT

WetNet Work Team

The following primary & alternate Work Team members attended at least one meeting during 1996:

Local Government & Private Sector Participants: (list includes both primary and alternate members)

Pat Alberg Resort owner; Little Sand Lake Association member [Park Rapids]
Don Albrecht Cash crop farmer in McLeod County; Penn Township Clerk in McLeod Co. [Brownton]
John Anderson Consultant / geographer, Wetlands Data [Minneapolis]
Char Brooker Izaak Walton League - MN Division [St. Paul]
Al Christopherson Minnesota Farm Bureau Federation; farmer [Willmar]
Bill Clapp Attorney; member of Wetland Conservation Coalition [St. Paul]
Al Cottingham Wetlands Coordinator, City of Brainerd
Don Dinndorf Conservationist & sportsman [St. Cloud]
Dan Edgerton Consulting Engineer, Bonestroo & Associates, Inc. [Roseville]
Jimmie Gates Public Works Deputy Director, City of Bloomington
Milford Gentz Chair, Heron Lake Area Restoration Association; sportsman; farmer [Lakefield]
Monica Gross Board of Managers, Minnehaha Creek Watershed District [Minneapolis]
Curt Gutoske City Planner, City of Inver Grove Heights
Michelle Hanson Hubbard Co. Wetland Administrator [Park Rapids]
Ken Hiemenz MN Conservation Federation member; St. Joseph City Council [St. Joseph]
Wayne Jacobson Wetlands biologist, SEH, Inc. [Vadnais Heights]
Tim Kelly Administrator, Coon Creek Watershed District [Blaine]
Jay Leitch Natural resource & agriculture economist, North Dakota State University [Moorhead]
Chris Lord District Manager, Anoka County SWCD [Ham Lake]
Mark McNamara Resource Conservationist, Wright County SWCD [Buffalo]
Michele McPherson Planning Assistant, City of Fridley
Cheryl Miller Wetlands Coordinator, Audubon Society [St. Paul]
Shane Missaghi Water Resources Engineer, City of Plymouth
Robert Mostad Administrator, Sauk River Watershed District [Sauk Centre]
Don Ogaard Administrator, Red River Watershed Management Board [Ada]
Rick Reimer Program Coordinator/Technician, Kandiyohi County SWCD [Willmar]
Ron Ringquist Sioux Engineering; Minnesota Viewers Association [Ruthton]
John Smyth Consulting Engineer, Bonestroo & Associates, Inc. [Roseville]
Jim Stanton Shamrock Development; Builders Association of Minnesota [Coon Rapids]
Dan Svedarsky Biologist (wildlife, plant ecology), University of Minnesota [Crookston]
Scott Thureen Engineer, City of Bloomington
Brian Watson Wetland Specialist, Dakota County SWCD [Farmington]
Jack Wimmer Stearns County Planning and Environmental Services [St. Cloud]
Gerry Wind Stearns County Wetlands Specialist [St. Cloud]

State and Federal Agencies; Indian Bands & Communities: (list includes both primary and alternate members)

Erv Berglund Wetlands Hydrologist, DNR Division of Waters [St. Paul]
Reginald Defoe Wetlands Specialist, Fond du Lac Reservation [Cloquet]
Tim Fell Regulatory Project Manager, U.S. Army Corps of Engineers [St. Paul]
Bruce Gerbig Protected Waters & Wetlands Supv., DNR [St. Paul]
Dirk Haire Policy Director, MN Dept. of Agriculture [St. Paul]
David Hills Regional Hydrologist, Dept. of Natural Resources [Brainerd]
Steve Hirsch Fisheries Section, DNR [St. Paul]
John Holck Program Manager, MPCA Nonpoint Source Section [St. Paul]
Amy Janke Policy Analyst, MN Dept. of Agriculture [St. Paul]
John Jaschke Wetland Hydrologist, WCA Program Mgr., MN Board of Water & Soil Resources [St. Paul]
Tom Landwehr Wildlife Section, DNR [St. Paul]
Greg Larson Supv., Land & Water Sec., MN Board of Water & Soil Resources [St. Paul]
Chuck Meyer Wetlands Specialist, Red Lake Band of Chippewa [Red Lake]
Doug Norris Wetlands Coordinator, Ecological Services, DNR [St. Paul]
Barbara Ohman Wetland Specialist, MN Board of Water & Soil Resources [St. Paul]
Frank Pafko Environmental Services, MN Dept. of Transportation [St. Paul]
Robert Strand Regional Fisheries Supervisor, DNR [Bemidji]
Sarma Straumanis Environmental Services, MN Dept. of Transportation [St. Paul]
Larry Zdon Nonpoint Source Section, MPCA [St. Paul]

WETNET CONSULTING POOL

This list includes Work Team members/alternates who did not attend meetings and several Consulting Pool members who did choose to attend Work Team meetings:

Local Government

Counties

Ken AlbrechtNicollet County Commissioner
Robert FergusonJackson County Commissioner
Richard FlorhaugBeltrami County Commissioner
Arne StoenPope County Commissioner
Art WagnerCrow Wing County Commissioner
Dick LarsonMille Lacs County Engineer
Tom MartinsonLake County Land Commissioner
Tim PenfieldClearwater County Land Dept. Water Resource Conservationist
Tom TriSt. Louis County Environmental Project Manager

Cities

Steve KernikEnvironmental Planner, City of Woodbury
Robert HaarmanAdministrator-Clerk, City of Sauk Rapids

Townships

[TOWNSHIP PARTICIPANT WAS AN ALTERNATE MEMBER OF THE WORK TEAM]

Watershed Districts

[ALL WD PARTICIPANTS WERE PRIMARY OR ALTERNATE MEMBERS OF THE WORK TEAM]

Soil & Water Conservation Districts

Tom TorattiKoochiching County SWCD
Doug EasthouseLake of the Woods County SWCD
William FrittsOlmsted County SWCD Supervisor
Harold LuthiStevens County SWCD Supervisor
Mark DoneuxWashington County SWCD

Indian Communities

Millard MyersEnvironmental Biologist, 1854 Authority [Duluth]

Other

Marcel JouseauWater Management Technical Services Manager, Metropolitan Council [St. Paul]
Leon HeathExecutive Director, NW Regional Development Commission [Warren]
Kristin JuliarDeputy Director, Region 9 Development Commission [Mankato]
Diann CraneMetropolitan Mosquito Control District [St. Paul]
Julie GoehringThe International Coalition [Moorhead]

Private Sector Interests

Bruce BarkerMinnesota Forest Industries & Minnesota Timber Producers [Duluth]
George BoodyLand Stewardship Project [White Bear Lake]
Jeff BrobergMember of Outdoor Heritage Alliance and Minnesota Trout Association [Rochester]
Donna CampbellMember of Lake Lizzie Lake Association [Moorhead]
Bob CobornCoborn Land Company [St. Cloud]
Tom CochraneExecutive Director, Minnesota Agri-Growth Council
Kurt DeterRinke-Noonen Law Firm [St. Cloud]
Don FinbergMinnesota Viewers Association [Clinton]
Dave FredericksonPresident, Minnesota Farmers Union
William FreyAudubon Society member [North Oaks]
Keith HansonMinnesota Power [Duluth]
James JohnstonSienna Corporation; member of Builders Association of the Twin Cities
James D. JonesMember of Izaak Walton League - Rochester Chapter
Ken KailingConsulting Ecologist [Hokah]
Frank KottschadeCommercial developer with North American Realty [Rochester]
Thomas MaltererMinnesota Peat Association [Duluth]
Michael McGintyExecutive Director of Minnesota Waterfowl Association
Steven MendenEnvironmental Scientist, Woodward-Clyde Consultants [Minneapolis]
Steve MolineExecutive Director of Minnesota Lakes Association
Jo Ann MusumeciConservation Committee member, North Star Chapter of Sierra Club [Minneapolis]
George PochSoil Scientist, McGhie & Betts Envir. Services Inc. [Rochester]
Chris RadatzDirector of Governmental Affairs, Minnesota Farm Bureau Federation

Rochelle Rubin..... Director of Legal Affairs, Minnesota Realtors Association
 John Schneider..... President of Minnesota Sportfishing Congress
 Dean Schumacher Nursery owner; member of Heron Lake Area Restoration Association [*Heron Lake*]
 Rod Skoe Minnesota Cultivated Wild Rice Council [*Clearbrook*]
 Remi Stone Builders Association of Minnesota
 Jerry Teeson Shamrock Development, Inc. and Riverdale Realty; member of MN Realtors Association
 Blair Tremere Legislative Committee, Minnesota Chapter of American Planning Association
 Mary Jo Truchon Member of League of Women Voters [*Blaine*]
 Dave Zavoral..... Member of Minnesota Landowner Rights Association [*Grygla*]
 Dave Zentner Member of Izaak Walton League - W. J. McCabe Chapter [*Duluth*]

Educators & Scientists

Calvin Alexander..... Hydrogeologist (surface & groundwater) University of Minnesota [*St. Paul*]
 Sandra Archibald Natural resource economist.....University of Minnesota [*Minneapolis*]
 Robert Bixby GeographerSt. Cloud State University [*St. Cloud*]
 Kenneth Brooks Hydrogeologist (forest & peatland)University of Minnesota [*St. Paul*]
 James Cooper Wildlife biologist.....University of Minnesota [*St. Paul*]
 Susan Galatowitsch Wetland & landscape ecologyUniversity of Minnesota [*St. Paul*]
 Gary Lemme Soils scientist.....West Central Experiment Station [*Morris*]
 Neal Mundahl..... Aquatic biologist / limnologistWinona State University [*Winona*]
 Charlotte Shover..... Environmental Education CoordinatorDakota County SWCD [*Farmington*]
 Steve Taff Land economistUniversity of Minnesota [*St. Paul*]

State and Federal agencies

Lou Flynn Stormwater Wetlands Unit, Nonpoint Source Section, MPCA
 Randy Ferrin Chief of Resource Mgmt., St. Croix National Scenic Riverway, National Park Service
 Jonette Kreideweis Minnesota Dept. of Transportation (*Minnesota Transportation Plan*)
 Steve Light..... Office of Planning, Minnesota DNR (*EBM Initiatives*)
 Marilyn Lundberg Minnesota Planning (*Sustainable Development Initiative; Minn. Water Plan; EQB*)
 Cheryl Martin..... Highway Engineer, Federal Highway Administration
 Mark Oja State Biologist, Natural Resources Conservation Service
 Paul Pajak..... Office of Planning, Minnesota DNR (*Environmental Indicators Initiative*)
 Lynn Lewis..... Fish & Wildlife Biologist, U.S. Fish & Wildlife Service (*head of Twin Cities Field Office*)

State Agency Leaders

Kent Lokkesmoe Director, Div. of Waters, Minnesota Department of Natural Resources
 Ron Harnack..... Executive Director, Minnesota Board of Water & Soil Resources
 Len Eilts Director, Environmental Services, Minnesota Department of Transportation
 (initially Lawrence Foote, now retired)
 Rod Massey Director, Water Quality Division, Minnesota Pollution Control Agency
 (initially Patricia Burke, now working for Minnesota Department of Natural Resources)
 Amy Janke Policy Analyst, Minnesota Department of Agriculture
 (initially William Oemichen, Deputy Commissioner, now working for State of Wisconsin)

Appendix F

OVERVIEW OF PLAN DEVELOPMENT

MEETING	DATE	LOCATION	PROGRESS MADE
1	Nov 29-30, '95	Alexandria	<ul style="list-style-type: none"> Kick-off; initial "putting things on the table"; found starting points.
2	Jan 3, 1996	Grand Rapids	<ul style="list-style-type: none"> Began exploring how to deal with regional differences (ECS introduced and thought to be a possible tool). Reviewed Charter. Continued getting to know and understand each other.
3	Jan 25, 1996	Rochester	<ul style="list-style-type: none"> Team clarified its own understanding of its task (mission). Identified 6 key issues from Phase 1 for plan to address. More discussion on regional differences. Subcommittee to work on a recommendation for dealing with regional differences problem. <p><i>{Meeting was cut short by a snowstorm}</i></p>
4	Feb 14, 1996	Maplewood	<ul style="list-style-type: none"> Tried using a "straw dog" framework for regional differences (on the right track, but perhaps not this model). Agreed on 3 guiding themes for plan goals. Subcommittee to do more work on framework for regional differences.
5	Mar 6, 1996	Bemidji	<ul style="list-style-type: none"> Objective at this meeting was to continue exploring frameworks for decision-making using regional differences. Worked with a straw description of wetlands sorted by ECS sections (physical, social, political aspects) and compared it with frameworks discussed at March 6 meeting. Work Team did not recommend which framework would work best; each method has strengths and weaknesses. Next tasks are to finalize a framework for dealing with regional differences; continue to build a more complete understanding of ecological, social, and economic factors; develop overall goals; and craft management strategies.
6	Apr 17-18, '96	Worthington	<ul style="list-style-type: none"> Accepted subcommittee's recommendation for a 3-part approach with Bio-Physical + Social + Institutional elements (ECS being a valuable tool for bio-physical factors). Preliminary listing of information needs. Discussed goals. Subcommittee formed to refine one or more goal statements for the next meeting. Subcommittee formed to identify and gather data needed.
7	Jun 26-27, '96	St. Cloud	<ul style="list-style-type: none"> Contingent approval of goal statement. Discussed a preliminary framework for regional differences. Began generating ideas for regional and statewide strategies.
8	Aug 21, '96	St. Cloud	<ul style="list-style-type: none"> Heard reports from Institutional Committee, Strategies Committee, and Mitigation Banking Committee Gave feedback to committees; they will continue developing the proposals in more detail.
9	Oct 9-10, '96	Brainerd	<ul style="list-style-type: none"> Discussed rough first draft of wetlands plan. Generated detailed action steps for restoration, research, education & outreach, monitoring & evaluation; sent work back to committees.
10	Jan 29-30, '97	Willmar	<ul style="list-style-type: none"> Discussed second draft of wetlands plan. Made final decisions on recommendations for the wetlands plan.

Appendix G

Complete Text of:
EXECUTIVE ORDER 91-3
DIRECTING STATE DEPARTMENTS AND AGENCIES
TO FOLLOW A "NO-NET LOSS" POLICY IN REGARD TO WETLANDS

I, Arne H. Carlson, GOVERNOR OF THE STATE OF MINNESOTA, by virtue of the authority vested in me by the Constitution and the applicable statutes, do hereby issue this Executive Order:

WHEREAS, wetlands provide economic as well as ecological benefits to the state by protecting and preserving water supplies; by providing for natural storage and retention of flood waters; by serving as transition zones between dry land and lakes and rivers, thereby retarding soil erosion; by functioning as nature's biological filters, assimilating nutrients; by providing essential habitats for fish and wildlife; by providing for groundwater recharge; by providing low flow augmentation for rivers and streams; by providing aesthetic and recreational opportunities; by providing aesthetic and recreational opportunities; by providing outdoor educational resources; and by adding to Minnesota's ecological diversity; and

WHEREAS, over eighty percent of the state's original prairie pothole wetlands has been drained and over sixty percent of the state's total original wetland base has been drained, filled or otherwise diminished, and

WHEREAS, the loss of wetlands in the state, both urban and rural, is continuing in excess of 5,000 acres per year; and

WHEREAS, the continued loss of wetlands harms the economic and environmental welfare of the state; and

WHEREAS, it is in the public interest to protect the functions and values of wetlands; and

WHEREAS, the state, through public agencies and units of government, must provide leadership in the stewardship of wetlands for all projects on the lands and waters entrusted to the state by the public;

NOW, THEREFORE, I hereby order that:

- A. All responsible departments and agencies of the State of Minnesota shall protect, enhance, and restore Minnesota's wetlands to the fullest extent of their authority;
- B. All responsible departments and agencies of the State of Minnesota shall operate to the fullest extent of their authority under the strict concept of "NO-NET LOSS" of wetlands of the state in regard to projects under their jurisdiction;
- C. All responsible departments and agencies of the State of Minnesota shall survey and categorize all wetlands on land being acquired by or donated to the state and on public lands threatened by development activities. Acquisition decisions and subsequent management plans shall mitigate ecological impacts as a result of development activities;
- D. All responsible departments and agencies of the State of Minnesota shall be guided by the following prioritized criteria in the implementation of this "NO-NET LOSS" executive order:
 - 1) AVOID the impact altogether by not taking a certain action or actions;
 - 2) Minimize the impact by limiting the degree or magnitude of the action by using appropriate technologies or by taking affirmative steps to avoid or reduce the impact.
 - 3) Mitigate all functional values of the wetlands that have been diminished. Mitigation must, in order of importance, be accomplished by: first, restoration of drained or diminished wetlands; second, enhancement of existing wetlands; and last, creation of new wetlands;
- E. The head of each department or agency shall, by appropriate means, ensure that all staff are advised of this order and shall by January 1 of each year report to the Commissioner of Natural Resources on efforts to comply with this order; and
- F. The Commissioner of Natural Resources shall, by March 1 of each year, report to the Governor and the chairs of the Senate and House environment committees a composite report on implementation of the order and the status of Minnesota's wetlands.

In addition, I hereby encourage all local units of government to adopt "NO-NET LOSS" wetlands resolutions guiding public actions within their jurisdiction.

Pursuant to Minnesota Statutes 1990, Section 4.035, this Order shall be effective fifteen (15) days after publication in the State Register and filing with the Secretary of State and shall remain in effect until rescinded by proper authority or it expires in accordance with Minnesota Statutes 1990, section 4.035, Subdivision 3.

IN TESTIMONY WHEREOF I have set my hand this 17th day of January, 1991.

ARNE J. CARLSON, Governor

FIGURE 11 ~ WEU OVERLAY WITH WATERSHEDS

Source: Minnesota Department of Natural Resources (Division of Waters)

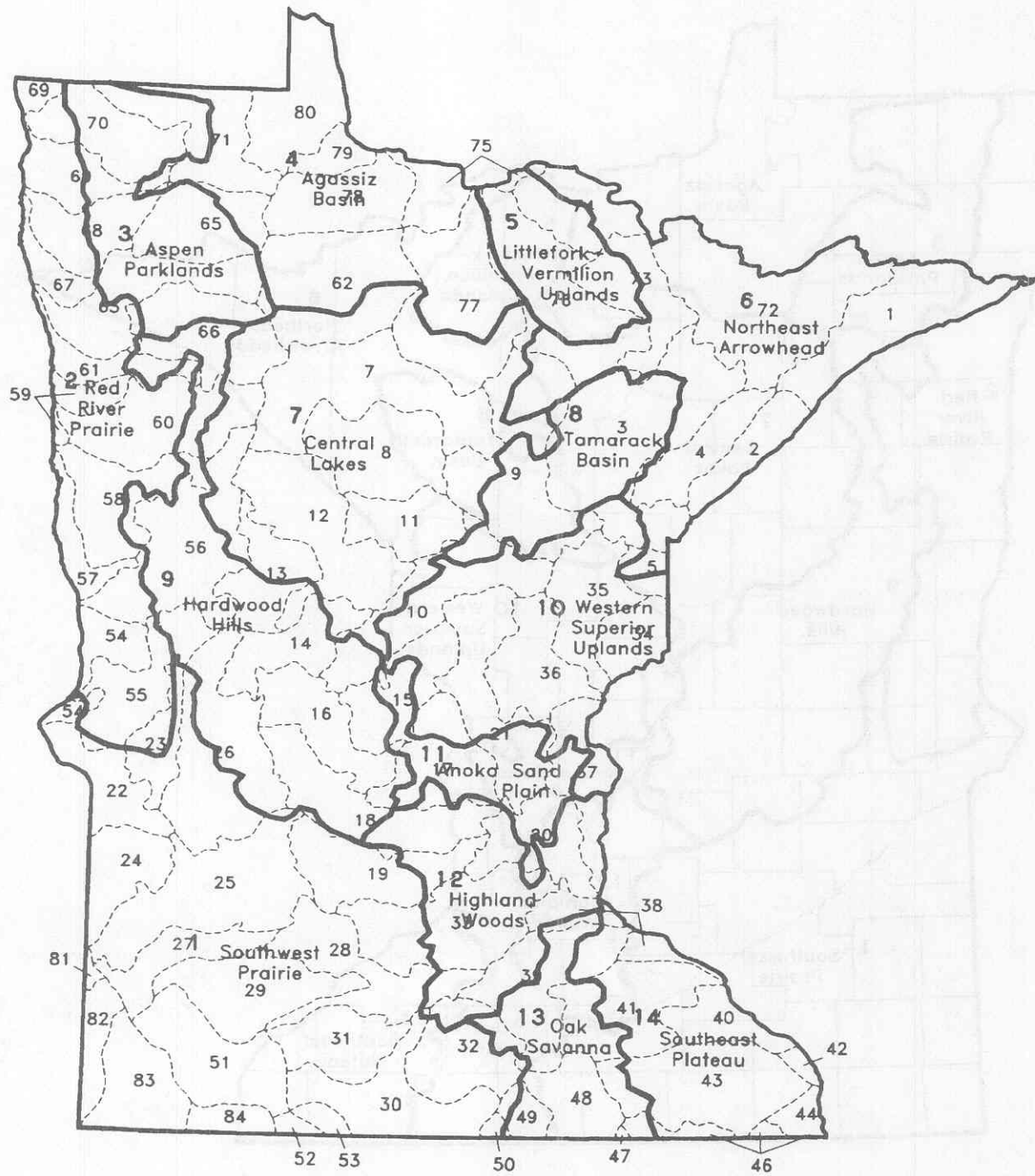


FIGURE 12 ~ WEU OVERLAY WITH ADMINISTRATIVE BOUNDARIES OF COUNTIES

Source: Minnesota Department of Natural Resources (Division of Waters)

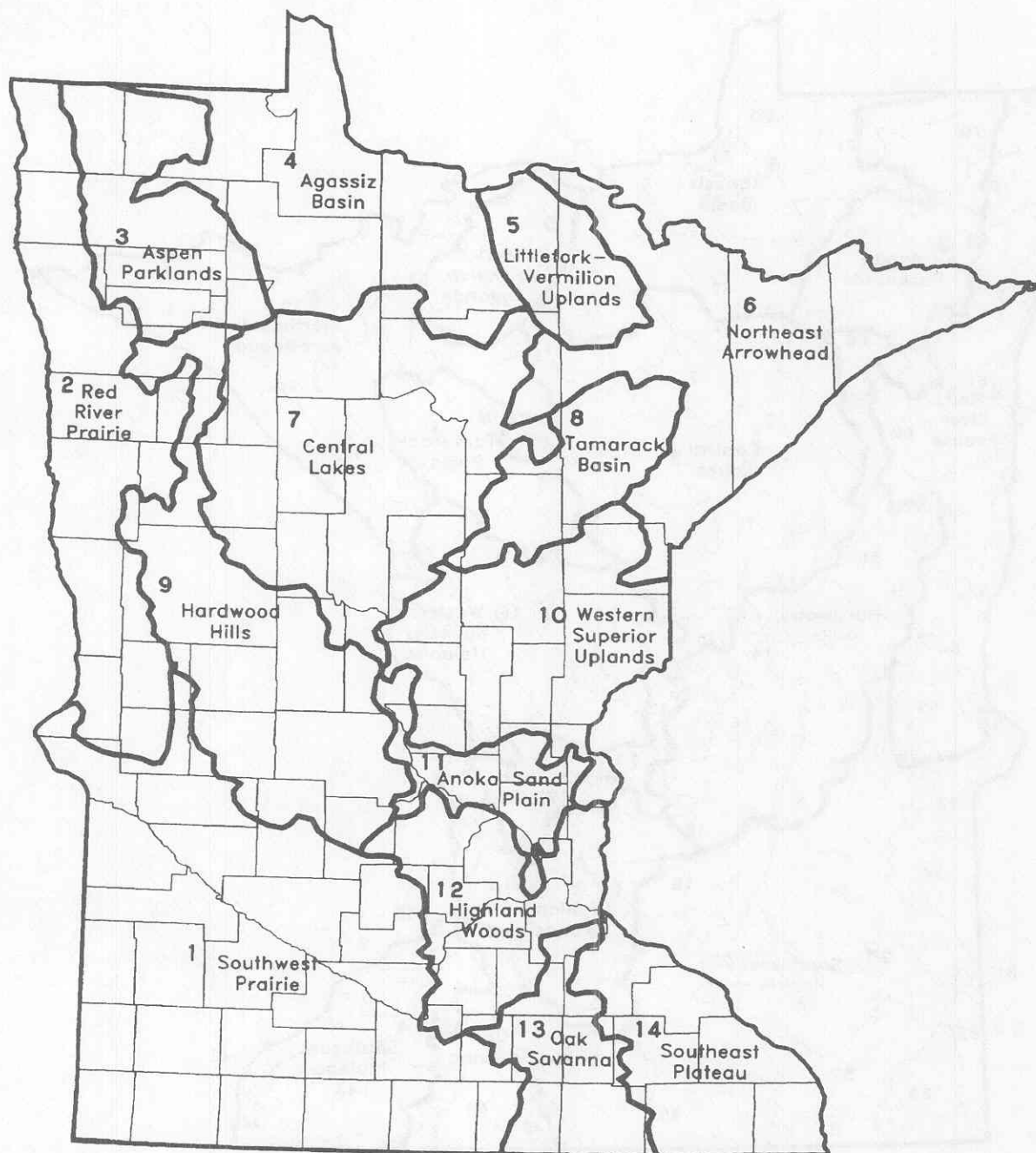


FIGURE 13 - WEU OVERLAY WITH ADMINISTRATIVE BOUNDARIES
OF MINNESOTA DEPARTMENT OF NATURAL RESOURCES

Source: Minnesota Department of Natural Resources (Division of Waters)

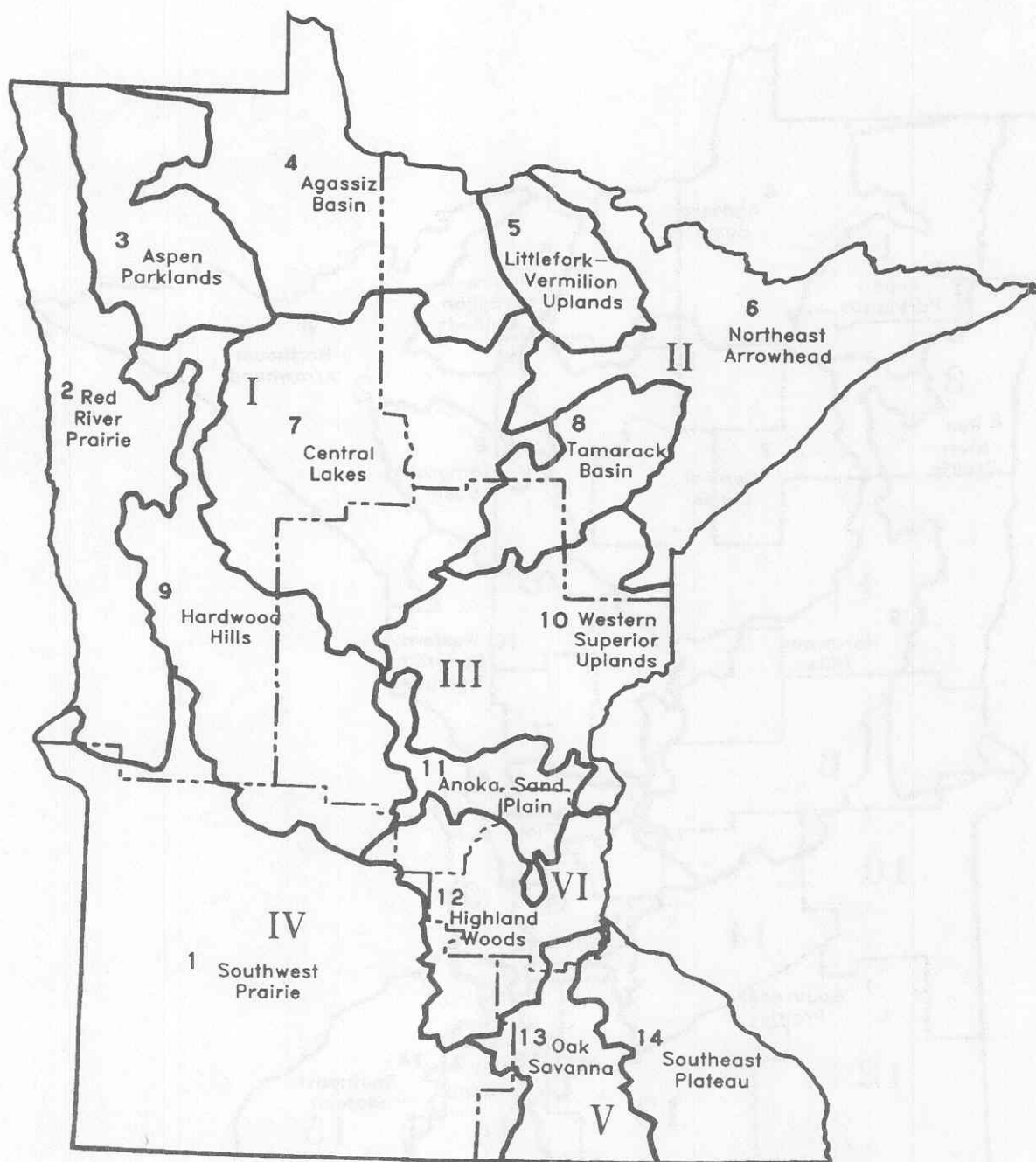


FIGURE 14 ~ WEU OVERLAY WITH ADMINISTRATIVE BOUNDARIES
OF MINNESOTA BOARD OF WATER & SOIL RESOURCES

Sources: Minnesota Department of Natural Resources (Division of Waters)
and Minnesota Board of Water & Soil Resources

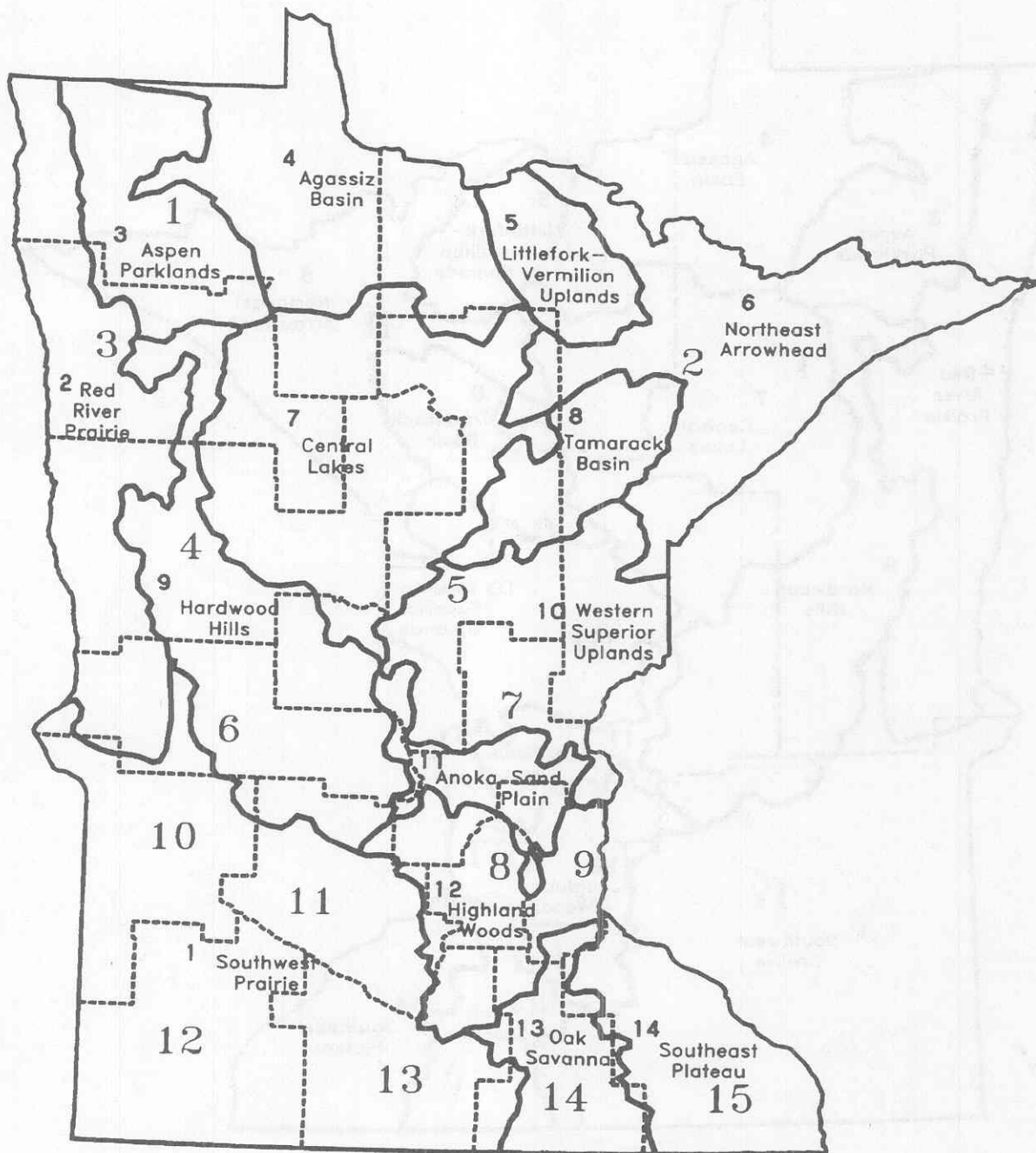


FIGURE 15 - WEU OVERLAY WITH ADMINISTRATIVE BOUNDARIES
OF MINNESOTA POLLUTION CONTROL AGENCY

Sources: Minnesota Department of Natural Resources (Division of Waters)
and Minnesota Pollution Control Agency



**FIGURE 16 - WEU OVERLAY WITH ADMINISTRATIVE BOUNDARIES
OF MINNESOTA DEPARTMENT OF TRANSPORTATION**

Sources: Minnesota Department of Natural Resources (Division of Waters)
and Minnesota Department of Transportation



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