

# **Minnesota Wetland Mitigation Banking Study**

March 1998

addendum to: Minnesota Wetlands Conservation Plan, Version 1.0, 1997

and

in fulfillment of Minnesota Laws 1996, Chapter 462, Section 40

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## Executive Summary

This report fulfills a legislative mandate to study ". . . alternative procedures and policies for improving the current wetland banking system in the state." This study was conducted by a subcommittee of participants from the Minnesota Wetlands Conservation Planning effort. The subcommittee included representatives from federal, state, and local government agencies and representatives from private sector interest groups. This report is an addendum to the Minnesota Wetlands Conservation Plan, version 1.01, June 1997.

The wetland banking study involved three separate initiatives: a field study of a sample of existing wetland bank sites, an analysis of wetland replacement and banking plans from 1995, and literature reviews to obtain general information on wetland banking and information on banking programs in other states. For the field study, a wetland functional assessment was conducted on 15 wetland bank sites from around the state. This information was used to gain a general understanding of the characteristics and quality of existing wetland bank sites. The analysis of 1995 wetland replacement and banking plans provided a complete picture of wetland replacement for an entire year and allowed comparisons between wetland replacement via banking versus project-specific replacement. The literature survey provided ideas for alternative procedures and possible improvements based national guidance and experiences in other states.

Five issue areas were identified, three concerned with improving the ecological value of wetland bank sites and two concerned with administration of the state wetland bank. These issue areas can be summarized as follows:

- (1) How to improve the quality of wetland bank sites;
- (2) How to improve wetland banking as an environmental tool through siting or targeting decisions;
- (3) How to enhance the current state-level administration structure to adequately handle growing activities and demands;
- (4) How current mitigation policies are being implemented by local, state, and federal government agencies;
- (5) How financial aspects, including the cost of wetland banking credits, will affect the quantity and quality of banked wetlands.

## Findings/Recommendations

Following are some of the key findings of the study, followed by the recommendations of the wetland banking subcommittee. The first three points relate to "on-the-ground" observations, or the actual results of the wetland banking program to date. The remaining findings mostly pertain to administrative issues that are largely responsible for shaping the "on-the-ground" results.

***1. The quality of wetland bank sites varied, and was generally related to construction method.*** The highest quality sites were restorations of previously drained wetlands, surrounded by permanent upland vegetation. The poorest sites observed were wetlands that had been created through excavation. With the

exception of the poorest quality created sites, the banked wetlands analyzed appeared to be reflective of the range of conditions observed in natural wetlands within the study areas.

Recommendations:

- C Wetland replacement standards for all regulatory programs should be rigorously enforced to ensure that all replacement wetlands (banked and project-specific replacements) meet expected levels of quality.**
- C Additional quality goals, including guidelines for vegetative coverage and diversity, should be developed.**
- C Encourage the establishment of a wider range of wetland types, relative to the types of wetlands lost, for both banking and project-specific replacement.**
- C Encourage restoration of previously drained wetlands rather than wetland creation and to particularly discourage creation projects that adversely affect high quality or scarce natural upland features for wetland replacement purposes. This may require some additional flexibility in the WCA rules regarding the location of replacement wetlands.**
- C Develop additional incentives for restoration of partially drained wetlands, based on an analysis of functions gained and lost.**
- C Establish incentives to encourage the highest quality banking sites, for example, award additional public value credits to established bank sites that meet certain high quality criteria, based on TEP review and approval. The Interagency Wetlands Group, with public input, should develop the qualifying criteria.**

**2. Wetland bank sites and project-specific mitigation tend to differ in terms of type of project and distance from impact site.** The Committee found that wetland banks, in general, tend to be restorations of previously disturbed wetlands while project-specific mitigation projects are typically created wetlands. Project-specific replacement tends to be closer to the site of the wetland impact than bank sites.

Recommendations:

- C Encourage the continued restoration of wetlands to serve as wetland banks, and in general, encourage the use of local wetland banks for replacement of small impacts. However, the decision on which replacement procedure is best for any particular project should be based on a project-specific analysis, taking into account the functions and values lost, the likelihood of achieving successful replacement, land availability, and other factors.**
- C Encourage greater use of restoration for project-specific mitigation**
- C Investigate the relative effectiveness of small, on-site wetland creations versus larger, off-site restorations as compensatory mitigation; document the factors and techniques**

**associated with successful replacement in order to develop improved standards and guidelines.**

3. ***The location of wetland bank sites is seldom based on ecological/hydrological needs.*** Presently, the location of wetland bank sites is almost entirely dictated by the presence of landowners who are willing to undertake wetland creation or restoration projects. Wetland banking sites could address watershed needs much more effectively if the location of the sites was based on an analysis of identified problems as well as the presence of willing landowners. The second generation of local water planning provides an opportunity to properly analyze watershed needs and target areas for wetland restoration or creation.

Recommendations:

- C Federal, state and local governments should collaborate on the identification of high priority sites for wetland restoration or creation that most effectively address watershed needs (water quality, flooding, habitat, recreation, etc.). Such sites should be identified in local surface water management plans. Encourage the establishment of bank sites in these high priority areas.**
  
- C State and federal agencies should encourage completion of ongoing gap analysis<sup>1</sup> studies and conduct additional gap analysis studies at the appropriate scales (watershed, ecoregion) to identify critical discontinuities in wildlife habitat and should provide such information to local governments for inclusion in local water plans.**
  
- C Agencies that have continuing, large scale wetland banking programs, such as the Minnesota Dept. of Transportation (MnDOT) and the Minnesota Board of Water and Soil Resources (BWSR) wetland banks associated with public transportation projects, should make a concerted effort to locate those banks in identified high priority areas. These agencies should also develop wetland bank sites that reflect the range of wetland types being lost, taking into account cumulative impacts, cost, and overall feasibility.**

4. ***Current wetland bank accounting/administration services are insufficient.*** Significant increases in the workload associated with wetland bank accounting and administration have occurred as use of the bank has increased and the responsibility for replacing impacts from public road projects was shifted to BWSR in 1996.

Recommendation:

- C Establish a full time bank administrator position.** The bank administrator would handle the project reviews, legal documentation, trend analysis, reporting, and accounting needs associated with maintaining the state's wetland banking system. Included in the duties of this position is the administration of the public road wetland replacement program.

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<sup>1</sup> Gap analysis is an emerging, geographic information system-based approach to identifying discontinuities, or gaps in habitat that are critical for the maintenance of wildlife populations.

5. ***Current monitoring and certification are inadequate.*** Compliance with WCA requirements to conduct post-project monitoring of wetland replacement sites, under both project-specific mitigation and wetland banking was found to be inadequate. The fact that no post-project certification is required for project-specific replacement was found to be a problem. There are potential problems with WCA rules on banking as far as ensuring that wetland impacts do not occur until project applicants have obtained banking credits and the wetland bank is properly debited.

Recommendations:

- **Assigning responsibility for monitoring:**

**T Put monitoring authority in the hands of a governmental agency and remove the responsibility from the individual land owners,**

*or:*

**T Keep land owners responsible for monitoring, but provide technical assistance.**

- C Establish a regional interagency audit team to conduct broad-based follow-up on all regulated activities pertaining to wetlands, including impacts to wetlands and wetland replacement**
- C Revise procedures on wetland banking to ensure that wetland impacts do not occur before certified wetland credits are obtained by the applicant and the wetland bank is properly debited.**

6. ***There exists a lack of comprehensive, easily-accessible data.*** A number of government agencies maintain databases pertaining to some aspect of wetland activities in Minnesota, but there is currently no single source containing all the state's wetland information.

Recommendation:

- **Establish and maintain a central, joint database of wetland activities in the state.** The database should contain current information available from federal, state, and local governments and should be easily accessible.

7. ***Wetland replacement plans are sometimes incomplete.*** It was found that some Local Government Units (LGUs) have been accepting and approving incomplete wetland replacement plan applications.

Recommendations:

- **LGUs should return incomplete wetland replacement plans to the applicant for completion and resubmittal.**
- **Reviewing parties should identify deficiencies in wetland replacement plans to LGUs and to the BWSR. The BWSR, as part of their WCA oversight responsibilities, should work with LGUs to ensure that wetland replacement plans are complete.**

- **An interagency team should continue to evaluate and improve/simplify the replacement plan forms.**

**8. *Public vs. Private Components and Cash Banking.*** In Minnesota there are currently two separate banking systems in operation: the entrepreneurial system which is used by private (and a few public) developers and the public system established in 1996 for public road projects. This combination, although workable, leads to potential confusion among users and creates conflicts due to market influences of each system on the other. Based on the experiences of the public road replacement program and of some local government units, "cash banking" is a concept worth exploring to add simplicity and consistency to the wetland replacement/mitigation process. However, some of the drawbacks to cash banking may require that its use be limited to clearly defined situations.

Recommendations:

- C An interagency team, including the Banking Study Committee, should continue to evaluate and improve/simplify the wetland banking process and evaluate the options that may be available using "cash banking" concepts.**

**9. *A strong and continuing training program for LGUs is needed.*** The decentralized nature of WCA administration (more than 400 LGUs statewide) and the associated turnover in staff, advances in wetland science, and occasional changes to state and federal wetland regulations and policies contribute to the need for continuing training if wetland banking is to be effective and consistently administered statewide. A variety of training opportunities are already available, particularly the annual administrative training for LGUs conducted by the BWSR.

Recommendations:

- **LGUs should continue to be provided with advanced training and education on components of wetland banking and mitigation in the state.**

It's recognized that some of the recommendations in this report will require additional funding. Some possible funding mechanisms were identified, including additional state funding and "user fees" assessed to those impacting wetlands. It is recommended that the state legislature and the responsible state agencies, in conjunction with concerned stakeholders consider these and other options and address this need within one year.

# Wetland Banking Report

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# Wetland Banking Report

## **I. Purpose**

In 1996, as part of several revisions to the Minnesota Wetlands Conservation Act (WCA) the Minnesota State Legislature requested a study of the state's current wetland banking system:

"The commissioner of natural resources, in consultation with the board of water and soil resources and the commissioner of agriculture, shall ensure that the wetlands conservation planning process currently under way 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 wetlands conservation planning final report, whichever is later." (Laws 1996, chapter 462, section 40)

The Minnesota State Wetlands Conservation Planning effort began in 1993, involving federal, state and local government agencies and a diverse group of representatives from private sector interest groups. The wetlands banking study was initiated in 1996 as a subset of the overall wetlands planning effort (see Appendix A for a list of participants). Version 1.0 of the Minnesota Wetlands Conservation Plan was completed and published in June 1997, with the exception of the wetlands banking study, which was still ongoing. This report, though published separately, is an addendum to the Minnesota Wetlands Conservation Plan and fulfills the legislative requirements cited above.

## **II. Introduction to Wetland Banking**

National and state policies aimed at achieving "no-net-loss" of wetlands require a mitigation sequence of avoidance-minimization-replacement of wetland acres and functions impacted by a development project. Regulations for wetland replacement, also known as "compensatory mitigation," have generally required that wetland impacts be replaced on a project-by-project basis and that the replacement wetlands be on-site rather than off-site and in-kind rather than out-of-kind. These two criteria are meant to ensure that wetland functions - such as flood storage, water filtration, or distinctive habitat communities - associated with the wetlands being impacted do not disappear from the impact site. "On-site, in-kind" has been a simple and important principle guiding most mitigation decisions.

Project-specific mitigation, whether or not it is in-kind and on-site, does have shortcomings. Studies of compensatory mitigation practices throughout the United States reveal that project-specific mitigation often fails because (1) the permittee does not construct the mitigation project at all or the project is not constructed according to specifications; (2) technical difficulties prevent a functional wetland from developing; (3) landscape changes reduce wetland functions and values; and (4) monitoring and management after initial construction does not occur or is insufficient.

An alternative to project-specific mitigation - wetland banking - has been developed for both ecological and administrative reasons. Wetland banks consolidate mitigation from multiple development projects into one or more larger wetland restorations or creations. This consolidation allows economies of scale in planning, implementation, and maintenance and helps reduce certain risks (described above) associated with project-specific mitigation. Conversely, banks tend to transfer wetland functions far from an impact site, clump many small and diverse impacts into fewer, large projects, and may weaken the "avoid first" imperative of no-net-loss policies.

### **Types of Wetland Mitigation Banks and Systems**

The different types of wetland mitigation banking systems may be broadly divided into five classes: single-user banks, public banks, private entrepreneurial banks, fee-based systems, and systems that combine aspects of different wetland banking methods (see also Appendix B).

#### Single-User Banks

Single-user banks are mitigation banks whose credits are used exclusively by a single public or private entity. A typical example of such a bank would be a state Department of Transportation (DOT) which will need to mitigate a large number of impacts (often small, fragmented sites) over a relatively long period of time. With the necessary financial and technical resources at its disposal, a mitigation bank created expressly for DOT use in mitigating the impacts resulting from its many public projects is often a viable alternative. A 1994 study by the Institute for Water Resources found that of the mitigation banks in operation in Summer 1992, more than ninety percent were of the single-user variety. Additionally, of the operating banks identified in the study, it was determined that about seventy percent of the banks were created by government or quasi-government entities.<sup>2</sup>

#### Public Banks

In some cases, banks created by government, quasi-government or not-for-profit organizations may provide credits for sale to the public. While the credits from the public commercial bank are generally produced solely for sale to the public, it is reasonable to assume that excess credits left in a public bank after the project's needs have been met may be, upon regulatory approval, available for sale. Sales of credits in these circumstances are often used to offset the costs of establishing and maintaining the bank.

#### Private Commercial/Entrepreneurial Banks

While not as prevalent as the preceding systems, a private market for mitigation credits is developing. In this scenario, a private entity generates credits, which a

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<sup>2</sup> Brumbaugh, Robert W.; "Wetlands Mitigation Banking: Entering a New Era?" Wetlands Research Program Bulletin 5, 3/4; 1995; pg. 1-8.

third party purchases to meet its own unrelated mitigation requirements. This exchange is akin to a commercial paper transaction. Party A (the generator of the credits) informs Party B (the regulatory agency) that the credits should be released to Party C (the third party with mitigation requirements).<sup>3</sup>

In lieu fee-based Systems (a.k.a. “Cash Banking”)

In fee-based mitigation programs, a fee is charged for permit approval in lieu of the permit applicant actually undertaking the compensatory mitigation project. These fees, usually based upon estimated costs of mitigation, are often held in trust by a not-for-profit or government sponsor for use in future creation, enhancement, restoration or preservation projects.

Other Wetland Mitigation Systems

Though many banking systems fall into the categories discussed above, due to the flexibility often allowed in the establishment of mitigation banks, some mitigation systems have attributes of several of the aforementioned bank types. The current Minnesota Wetland Banking System illustrates how a wetland banking system may utilize aspects of the four basic bank types.

### **III. Wetland Banking in Minnesota**

Minnesota’s first statewide banking initiative consisted of a partnership between the Minnesota Department of Transportation (MnDOT), the Minnesota Department of Natural Resources (DNR) and the U.S. Fish and Wildlife Service (USFWS). This pioneering effort was one of the first of its kind in the nation and has been used as a model by other states. The inter-agency agreement called “Wetland Habitat Mitigation Banking” (WHMB), was in effect for nine years, until the advent of the WCA. WHMB used a wildlife habitat-based evaluation procedure to quantify both impacts and mitigation efforts. The WHMB system lowered the threshold of accountability to capture impacts that had traditionally not been replaced (i.e., impacts authorized under Corps of Engineers nationwide permits). Under this system a number of major wetland restoration and creation sites were developed statewide. The success of this effort was demonstrated by the fact that at the end of its existence, acres mitigated outnumbered acres impacted by three to one.

Under the Minnesota Wetland Conservation Act, a state wetland mitigation bank was established via rule-making in 1994, which facilitates both public and private mitigation

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<sup>3</sup> Gardner, R.C.; “Banking on Entrepreneurs: Wetlands, Mitigation Banking, and Takings”; 81 Iowa Law Review 527 (1996). The analogy does not fit precisely, of course. In the case of a draft, Party B is a bank. See U.C.C. § 3-104 (1994) (defining and explaining negotiable instruments). In the case of a wetland mitigation bank, Party A is usually considered the “banking project sponsor”.

banking. While project-specific replacement is still the most widely-used option for wetland mitigation in the state, the Minnesota state wetland bank provides an alternative procedure for meeting the compensatory mitigation needs of wetlands developers or others impacting wetlands.

The Minnesota Board of Water and Soil Resources (BWSR) administers the state wetlands bank. Restored or created wetlands can be deposited in the bank as wetland credits, provided the credits are designated for banking prior to the actual restoration or creation and the credits are approved by an official technical evaluation panel. The account holder is the owner of the banked wetland and the credits. Wetland credits are based on the wetland type, acreage, the extent of any pre-existing wetlands at the site, and other "public value" features that contribute to the quality of the wetland. The credits may be used by account holders as mitigation for their own projects, or the credits may be sold to others needing mitigation. The buyer and seller are free to negotiate the terms of the transaction (i.e., cost of credits), although the wetland replacement ratios will be determined by the applicable regulations and authorities.

The BWSR maintains a record of deposits and withdrawals and oversees banking operation statewide. The BWSR provides review of proposed banking projects as part of the Technical Evaluation Panel, certifies deposits in the bank, including a legal review of property restrictions, records withdrawals, monitors projects, and provides status reports and legal guidance and forms to interested buyers, project sponsors, and local government units. Additional details on the mechanics of the state wetland banking system are provided in Appendix C.

In addition to facilitating wetland banking by private individuals or entities, the Minnesota Wetland Banking System also incorporates public banking aspects for public highway projects. The 1996 amendments to the WCA placed the responsibility for replacement of wetland impacts caused by local government road improvement projects with the BWSR. Although the road replacement wetland program is currently carried out separately from the state wetland bank, the features are similar and the level of BWSR administration and oversight is even greater. The BWSR is currently in the process of developing wetland bank sites in critical rural and urban watersheds for the road replacement program. MnDOT maintains their own banking account under the state wetlands bank for state highway project impacts.

In 1994, all of the state and federal agencies having wetland regulatory responsibilities signed an interagency memorandum of understanding (MOU) on wetland regulatory simplification (Appendix D). In a section of the MOU pertaining to wetland banking, the signatory agencies concurred that it is in the public interest to allow use of the state wetland bank, as established by Minnesota Wetland Conservation Act rules (Chapter 8420), and that the respective agencies will consider the use of wetland bank credits for compensatory mitigation in "applicable and appropriate" situations.

To date, 66 projects representing 1,235 acres of restored and created wetlands have been deposited in the state wetlands bank, with a current "balance" of 934 acres. Another 38 restoration and creation projects that are currently underway or that have been proposed are projected to provide more than 2,000 additional acres of credit. The number of projects in the bank has steadily risen since the wetland banking program was established in 1994 and will continue to increase as sites are developed in counties and watersheds lacking available credits and as new projects are developed to offset continued wetland impacts. The Banking Status Report in Appendix C documents the current status of the bank and illustrates the geographic distribution and types of wetlands currently on deposit.

### **Selected Rules From the Wetland Conservation Act (WCA)**

(The complete WCA rules regarding wetland banking in the state can be found in Appendix E).

- Wetland replacement accomplished via mitigation banking is subject to the same requirements concerning the amount and location of replacement as for project-specific mitigation. For all impacts except those from public transportation projects (see next bullet), replacement wetlands must be located within the same watershed or county as the impacted wetlands, except that impacts in greater than 80 percent areas may be replaced in less than 50 percent areas. When environmentally preferable, replacement wetlands should be located as close to the impacted wetland as possible, preferably in the same watershed.
- Prior to 1996, wetlands impacted by public transportation projects could be replaced statewide. In 1996, the legislature modified this rule so that wetlands impacted by public transportation projects may be replaced statewide, 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 by public highways must be replaced in the affected county, or, if no restoration opportunities exist in the county, in another seven-county metropolitan area county.
- Any restored wetland is eligible for deposit into the wetland bank. Any created wetland is eligible for deposit in the wetland bank in greater than 80 percent areas. In less than 80 percent areas, created wetlands are eligible for deposit in the bank only if they are created by excavation in nonwetlands, by dikes or dams along public or private drainage ditches, or by dikes or dams associated with the restoration of previously drained or filled wetlands. Credits resulting from created wetlands or from the restoration of completely drained or filled wetlands are termed "New Wetland Credits" (NWC). "Public Value Credits" (PVC), obtained through the restoration of partially drained wetlands, establishing upland buffers around restored or created wetlands, or constructing water quality retention basins associated with restored or created wetlands, may also be banked.

- The minimum wetland acreage eligible to establish an account in the wetland bank is 0.1 acres. While there is no maximum wetland acreage eligible for deposit into the state wetland bank, as an incentive to encourage the deposit of small wetlands, the LGU shall assign wetland banking credit to wetland acreage as follows:

Wetland Acreage	Wetland Banking Credit
0 to 10 acres	100 percent of total acreage
over 10 acres	90 percent of total acreage

The LGU may modify the credit given, up to a maximum of 100 percent of the total acreage, if agreed to by the Technical Evaluation Panel (TEP).

- Wetlands that are drained or filled under an exemption of the WCA and subsequently restored are not eligible for deposit into the state wetland bank. Modification or conversion of nondegraded naturally occurring wetlands from one type to another are not eligible for enrollment in the state wetlands bank. Further, the replacement wetland proposed for banking must not have been previously restored or created for other regulatory mitigation/replacement purposes, and not restored with financial assistance from a public conservation program.
- No sooner than six months after a proposed banking wetland is restored, and no sooner than one year after a proposed banking wetland is created, and construction has been approved, the depositor must contact the LGU to request final determination of wetland bank acceptability and approved quantities of wetland banking credits for deposit. The Technical Evaluation Panel (TEP) shall, based on a site visit, ensure that sufficient time has been allowed for the wetland to become established and determine the size and type of wetland as well as topographic setting characteristics. If applicable, the resulting NWC and PVC shall be deposited into a wetland bank. The TEP will provide the information to the LGU, for final certification of wetland banking credits. If the TEP has reason to believe that the wetland characteristics may change substantially, the TEP must postpone its recommendations to the LGU until the wetland has stabilized.
- To be deposited into the state wetland bank, the wetland must be certified as eligible for deposit by the LGU in which it is located. After July 1, 1993, wetlands restored or created without prior LGU approval are not eligible for deposit into the wetland bank. The method of certification by the LGU is optional, but wetland banking credits may not be deposited into the bank within that LGU's jurisdiction without certification. If a LGU elects to certify wetlands for the wetland bank, the LGU is also responsible for insuring that the monitoring provisions for banking are fulfilled. A LGU may decline to certify all wetlands within its jurisdiction or, based on a comprehensive local water plan, a LGU may elect to certify wetlands for deposit into the wetland bank only in selected areas, for example, high priority regions and areas. If the LGU elects to reject or limit banking, it must do so by local rule or ordinance.

#### **IV. Minnesota Wetland Banking Study**

To complete the banking study mandated by the Minnesota State Legislature, a study committee was formed, consisting of the lead state agencies (as specified in the legislation), as well as a subset of the participants in the Minnesota Wetlands Conservation Planning effort (Appendix A). The study committee met from July 1996 through July 1997. Tasks undertaken by this committee included:

- C formulation of a scope of work, or a set of issues meriting detailed consideration;
- C design of study methods to address issues;
- C assignment of responsibilities for components of study, including field visits, data analysis, literature review, and report writing;
- C evaluation of study findings and development of recommendations.

Five issue areas were identified, three concerned with improving the ecological value of wetland banks and two concerned with administration of the state wetland bank. These issue areas can be summarized as follows:

- (1) How to improve the quality of wetland bank sites;
- (2) How to improve wetland banking as an environmental tool through siting or targeting decisions;
- (3) How to enhance the current state-level administration structure to adequately handle growing activities and demands;
- (4) How current mitigation policies are being implemented by local, state, and federal government agencies;
- (5) How financial aspects, including the cost of wetland banking credits, will affect the quantity and quality of banked wetlands.

#### **V. Methods**

The Wetland Banking Committee recognized the need for data collection and compilation before conclusions could be made on the status of the current wetland banking system. Three separate efforts were initiated:

##### **A. Field Study of Wetland Banking Sites**

A field study of 15 wetland bank sites in Minnesota was conducted by an interagency team in September 1996. This team, consisting of representatives of the

BWSR, DNR, MnDOT, USFWS, U.S. Army Corps of Engineers (USACOE), and Local Government Unit (LGU) and Soil and Water Conservation District (SWCD) staff, conducted a functional assessment at each of the sites using the Minnesota Routine Assessment Method. In addition, the following information was collected for each wetland bank visited:

- wetland size
- wetland type
- method of development (creation or restoration)
- date of wetland creation/restoration

Selection of wetland bank sites was based on travel efficiency (allowing the most sites to be visited in the least amount of time) while attempting to achieve a representative sample from various parts of the state and different wetland types. This information was collected to provide empirical data on the characteristics and functional quality of a variety of wetland bank sites in the state. Additional details on the design and the results of the field study can be found in Appendix F.

**B. Analysis of Wetland Replacement and Banking Plans**

The second part of the data collection involved reviewing and compiling data from all wetland replacement plans submitted for the year 1995. This year was chosen as the best available representation of wetland replacement activities in the state under the current WCA rules. The wetland replacement plans were accessed through the files at the DNR. The following information was collected from each replacement plan when available:

- Name of applicant
- acres of wetlands impacted/replacement acres used
- type of wetland impact/replacement
- location of wetland impact/replacement (county, watershed, wetland ecological unit)
- method of replacement (creation, restoration, bank)
- class of project impacting wetland (e.g., residential, commercial, public transportation, etc.)
- Date of impact/completion of replacement acres
- Distance from impacted wetland to replacement wetland
- Replacement rule governing location (i.e., public transportation, 80-50, county/watershed)
- Status of monitoring reports

Further information was obtained from the BWSR files and telephone contact with several LGUs. A database containing the available information was established and used to analyze the data. The results of this analysis can be found in Appendix G.

***C. Literature Reviews***

The third phase of the data collection was a literature review of wetland banking systems in place in other states, as well as a review of the *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks* (Federal Register 60(228):58605-58614, 1995). The Committee reviewed a variety of banking systems used outside of the state and discussed whether these systems might be applicable for use in Minnesota.

The Federal Guidance document was reviewed for information on the following mitigation banking topics:

- monitoring
- wetland size and type
- service area for bank
- restoration vs. creation vs. enhancement vs. preservation
- cash banking
- pre-sale of credits
- cost-effectiveness
- incentives for higher quality restorations

These reviews can be found in Appendices B and H.

**VI. Findings**

The Committee, through the analyses of the field study, wetland replacement plan data, and literature reviews, identified a number of weaknesses in the current banking system. The first three points relate to “on-the-ground” observations, or the actual results of the wetland banking program to date. The remaining findings mostly pertain to accounting, administration, and monitoring issues that influence the effectiveness of the banking program.

***A. The quality of wetland bank sites varied, and was generally related to construction method***

WCA rules (8420.0550) contain standards for replacement wetlands that apply to both project-specific wetland replacements as well as restored or created wetlands that are to be banked. These standards are designed to “. . . ensure adequate replacement of wetland functions and values.” To gauge the quality of previously deposited banked wetlands, the committee conducted a functional analysis of a sample of wetland banks. This study is presented in Appendix F. The following is from the “conclusions” section of the study report:

"Based on the functional assessments and subjective impressions, the overall quality of the wetland banking sites varied widely. The highest quality sites tended to be restorations surrounded by permanent upland vegetation. Two of the highest quality sites were on lands in public ownership. The two poorest sites observed were wetlands that had been created through excavation. The primary problems with these sites were side slopes that were too steep and water levels too deep to reliably support aquatic vegetation<sup>4</sup>. With the exception of the poorest quality created sites, the wetlands analyzed appeared to be reflective of the range of conditions observed in natural wetlands within the study areas."

Associated with the issue of bank quality is question of types of wetlands being banked, and the extent to which they reflect the types of wetlands being lost. The WCA requires that the functions and values of a wetland that is drained or filled be replaced with a wetland of equal function and value. To a certain extent, wetland type dictates functions and values. The analysis of 1995 wetland replacement plans showed that wetland types 2, 3, and 4 were over-represented in wetland replacement projects (both banked wetlands and project-specific replacement) compared to the level of impacts of those types, while types 6, 7 and 8 were under represented. It should be noted that the data in this regard was skewed by one very large project that affected a large amount of type 6, 7 and 8 wetlands. The analysis was further clouded by the fact that types 2 and 6 wetlands often intergrade and can be difficult to classify as one or the other type. Nonetheless, the analysis shows that wetland types 6, 7 and 8 are seldom (never for type 8<sup>5</sup>) the goal of wetland replacement projects. Also, it is the experience of wetland banking committee members that lowland hardwood wetlands are rarely proposed as replacement.<sup>6</sup> Finally, it is widely acknowledged that the WCA rules on wetland replacement create an incentive to establish type 3 and 4 wetlands.

**B. Wetland bank sites and project-specific mitigation tend to differ in terms of type of project and distance from impact site.**

The Committee found that wetland banks, in general, tend to be restorations of previously disturbed wetlands while project-specific mitigation projects are typically created wetlands. In 1995, a total of 35 projects used mitigation banks to satisfy their wetland replacement requirements. Four of the 35 projects obtained their credits from banks

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<sup>4</sup> One of the poorest quality, excavated wetland bank sites was subsequently withdrawn from the bank and was never debited for any wetland impacts.

<sup>5</sup> Type 8 wetlands, or bogs cannot be created and opportunities for complete restorations are few or non-existent. Minnesota has thousands of acres of partially drained bogs, some of which are potentially restorable; however, current WCA rules limit their use for wetland replacement.

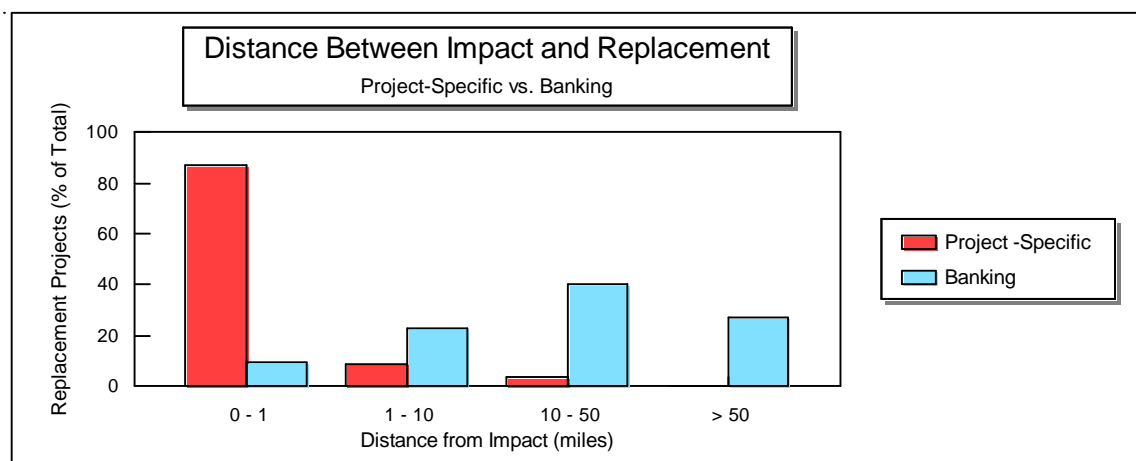
<sup>6</sup> This was not evident in the analysis of wetland replacement plans because the data did not distinguish between herbaceous Type 1 wetlands and lowland hardwood, Type 1L wetlands.

which were known to be creations, while 27 of the projects debited banks which were known to be restorations. Of the 64 currently approved wetland bank sites, \_\_\_ are restorations, while the remainder are wetland creations. Conversely, 163 project-specific mitigation projects in 1995 were creations, and 27 were restorations. Information was not available on the method of establishment of the remaining bank and project-specific sites.

The wetland banking committee was also interested in the relative distances between wetland impacts and their replacements. Distance-from-impact can be important because many wetland functions, such as water filtration and habitat, are not readily transferable.

Data from 1995 showed that the majority (87 percent) of project-specific mitigation projects occurred either on-site or within one mile of the impact. This contrasts sharply with mitigation through wetland banking, in which only 10 percent of replacements were within one mile of the impact. A significant proportion (27 percent) of the replacements via wetland banking was located more than 50 miles from the impact. This information is displayed in Figure 1 below, and Figures 4 and 5 of Appendix G.

The wetland banking committee was also interested in determining the time differential



**Figure 1.** Comparison of the distance between wetland impact site and replacement site for project-specific replacement and replacement via wetland banking.

between the date of a wetland impact and the date of creation of the wetland bank site which was debited as mitigation for the impact. The data show that for 1995, 7.4 acres had been established approximately five years before the impact occurred; 1.9 acres were established about three years prior to the impact; 2 acres were established approximately two years before the impact; 1.7 acres were established about 1.5 years prior to the impact, and 6.27 acres were established 1 year prior to wetland impact. The data also show that 44.03 acres were established concurrent with the impact. Additionally, 7.18 acres of bank were established 0.5 years after the impact. There were 62.33 acres debited from banks in 1995 which had insufficient data available to determine the time differential. Technically, the banking credits that were established concurrent with or after the wetland

impacts should not have been designated as banked acres, since by definition, wetland banking involves establishing credits prior to the impact.

For project-specific mitigation, the files did not contain information on when the replacement wetlands were constructed. The WCA rules require prior or concurrent replacement, or a financial guarantee that replacement will occur, for those projects using project-specific mitigation; however, the rule does not require an official post-construction sign-off or review of the mitigation wetland to ensure that the mitigation has actually occurred.

***C. The location of wetland bank sites is seldom based on ecological/hydrological needs***

Presently, the location of wetland bank sites is almost entirely dictated by the presence of landowners who are willing to undertake wetland creation or restoration projects. In some instances the landowners sell the rights to conduct such projects to other entities, such as transportation agencies. To date, this system has resulted in a fairly equitable distribution of banking sites statewide (see maps in Appendix C) and in many cases, the restored or created wetlands address certain watershed needs. However, it's possible that wetland banking sites could address watershed needs much more effectively if the location of the sites was based on an analysis of identified problems as well as the presence of willing landowners. In addition, the collective nature and pro-active planning associated with wetland banking may provide a better opportunity to accomplish this compared to project-specific mitigation. The WCA contains a provision that requires local governments, through their surface water management plans, to identify high priority areas for wetland preservation, enhancement, restoration and establishment. WCA rules contain criteria for identifying such areas. These high priority areas are just beginning to be identified during the current round of water plan revisions and have not yet been used to target wetland bank sites.

Most banking projects involve the restoration of previously disturbed wetlands. However, there are circumstances where wetland banking projects and, more often, project specific replacement projects have the potential to adversely affect desirable upland habitats such as native prairie or woodlands. These projects are always wetland creation projects, rather than wetland restorations.

***D. Current wetland bank accounting/administration services are insufficient***

Presently, the BWSR is the sole agency responsible for tracking banking activities, including crediting, debiting and legal oversight of property and transaction records. Significant increases in the workload associated with wetland bank accounting and administration have occurred as use of the bank has increased substantially (due to greater

demand and acceptance) and as the responsibility for replacing impacts from public road projects was shifted to BWSR in 1996.

Because of the increased work load, the BWSR has been unable to track trends associated with wetland banking such as distance from impacted wetlands to bank sites used and also wetland types impacted and types of replacement acres used. To effectively evaluate wetland replacement based on the WCA goals, it is necessary to track these cumulative impacts. These data are desirable because they yield the information necessary to effectively target wetland bank sites to best meet ecological needs. As the use of wetland banking continues to increase, more BWSR staff time will be required to update and maintain the records of these transactions, conduct monitoring of projects, and to manage wetland restoration projects needed to replace impacts from local public road projects.

***E. Current monitoring and certification are inadequate***

A lack of monitoring of wetland bank sites was identified as a weakness in the current wetland banking system. This was identified as a problem with project-specific mitigations, as well. Mitigation sites, including newly established banks, are to be monitored annually for five years after completion (unless the technical evaluation panel deems it unnecessary after three years). Under WCA rules, monitoring reports for each site are to be sent to the appropriate LGU to help ensure the success of the mitigation wetland.

It was found during the data collection portion of this study that these annual monitoring reports are not being received by the LGUs on a regular basis. Based on a small sampling of LGUs, it was found that only about 8 percent of the project-specific mitigations occurring in the jurisdiction of these LGUs had annual monitoring reports submitted. For project-specific mitigation, this means that little information is available as to whether the mitigation actually did occur or whether the site is functioning as a wetland.

While wetland bank sites are subject to an initial evaluation by the Technical Evaluation Panel (TEP), the bank holders are also required to submit annual monitoring reports for five years after the banks are established. According to the same LGUs surveyed on project-specific mitigation monitoring, it was found that about 25 percent of the wetland bank holders within their jurisdictions were submitting annual monitoring reports. Again, these results are based on a small sampling of LGUs contacted and the results can only be considered as rough estimates.

Finally, the committee found that there are potential problems with WCA rules on banking as far as ensuring that wetland impacts do not occur until project applicants have officially obtained banking credits and the wetland bank is properly debited.

***F. There exists a lack of comprehensive, easily-accessible data***

A number of government agencies maintain databases pertaining to some aspect of wetland activities in Minnesota, but there is currently no single source containing all the state's wetland information. During the data analysis phase of the study, it was necessary to access the BWSR files, the DNR files, and contact several LGUs in order to obtain the required data.

The BWSR compiles an annual report which summarizes WCA activities in the state. The LGUs annually submit to the BWSR reports which contain such information as the number of replacement plans submitted, number of exemptions issued, and total wetland acres impacted and replacement acres used. The BWSR also records and tracks all the wetland banking activities in the state. In addition, the wetland restorations occurring under the Reinvest in Minnesota (RIM) Program are also recorded by the BWSR.

Another database available is the DNR's Environmental Review Database which tracks land use changes over time. These changes are projections based on environmental review documents such as environmental assessment worksheets, environmental impact statements, and various permits, including wetland replacement plan applications. The database tracks changes in wetland acreage as well as other land use alterations.

In addition, the USACE maintains a database for tracking all of the activities that they regulate. This database, called the Regulatory Assessment and Management System contains information for each project on the type of authorization, the acres and type of wetland affected, and mitigation efforts, including acres of impact avoided and acres of compensatory mitigation.

While information on wetland activities in the state is available, it currently must be extracted from a number of different sources which all have different standards and conventions for cataloging data. Therefore, it has been difficult to detect any significant trends in cumulative wetland losses and to determine whether the long-term goals of the WCA and other wetland regulatory and restoration programs are being achieved.

***G. Wetland replacement plans are sometimes incomplete***

It was found that some LGUs have been accepting and approving incomplete wetland replacement plan applications. The cause may be that the LGUs have not been diligent in evaluating the applications, the reviewing agencies are not thoroughly reviewing them, or a combination of the two. During the data collection portion of the study, it was estimated that about 10 percent of the wetland replacement plans reviewed were unclear or incomplete.

**H. Public vs. Private Components and Cash Banking**

In Minnesota there are currently two separate banking systems in operation: the entrepreneurial system which is used by private (and a few public) developers and the public system established in 1996 for public road projects. This combination, although workable, leads to potential confusion among users and creates conflicts due to market influences of each system on the other.

An entirely entrepreneurial system offers the advantage of minimal government involvement and relies on free-market fiscal forces. An entirely public system would offer consistency and quality benefits that would remove many of the concerns about banking stated in earlier sections. Although a single system (i.e., entirely public or entirely entrepreneurial) would be simpler, changes to the current dual system were not considered by the committee.

In-lieu-fee, fee mitigation, “cash banking” or other similar arrangements, wherein funds are paid to a natural resource management entity for implementation of either specific or general wetland or other aquatic resource development projects, are not generally considered to meet the definition of mitigation banking as they do not typically provide compensatory mitigation in *advance* of project impacts. Moreover, such arrangements do not typically provide a clear timetable for the initiation of mitigation efforts. According to federal guidance<sup>7</sup>, the Corps of Engineers, in consultation with the other agencies, may find there are circumstances where such arrangements are appropriate so long as they meet the requirements that would otherwise apply to an offsite, prospective mitigation effort and provides adequate assurances of success and timely implementation. In such cases, a formal agreement between the sponsor and the agencies is necessary to define the conditions under which its use is considered appropriate.

Benefits of a “cash banking” system

- C Simplicity for credit buyers.
- C Uniform pricing possible.
- C May be more cost-effective.
- C Quality of sites is in public sector control.

Drawbacks of a “cash banking” system

- C Market for entrepreneurial bankers affected by loss of demand and/or government price fixing.
- C Negative balance: wetland losses occur before replacement unless “jumpstarted” by public funding.
- C Government staff needed to develop sites.

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<sup>7</sup>

Federal Register, 60(443); March 6, 1995; pages 12286-12293.

Some of the drawbacks may be tempered if the credit buyers are limited to public project sponsors.

## **VII. Recommendations:**

The wetland banking committee reached agreement on several recommendations for improving wetland banking in Minnesota. Rule revision will be the primary mechanism to effect these recommendations, but other mechanisms could include statutory changes, memorandums of agreement, changes in operational policies, guidance development and educational efforts.

### **A. Wetland Bank Quality**

- C Wetland replacement standards for all regulatory programs should be rigorously enforced to ensure that all replacement wetlands (banked and project-specific replacements) meet expected levels of quality.**
- C Additional quality goals, including guidelines for vegetative coverage and diversity, should be developed.**
- C Encourage the establishment of a wider range of wetland types, relative to the types of wetlands lost, for both banking and project-specific replacement.**
- C Encourage restoration of previously drained wetlands rather than wetland creation and to particularly discourage creation projects that adversely affect high quality or scarce natural upland features for wetland replacement purposes. This may require some additional flexibility in the WCA rules regarding the location of replacement wetlands.**
- C Develop additional incentives for restoration of partially drained wetlands, based on an analysis of functions gained and lost.**
- C Establish incentives to encourage the highest quality banking sites, for example, award additional public value credits to established bank sites that meet certain high quality criteria, based on TEP review and approval. The Interagency Wetlands Group, with public input, should develop the qualifying criteria.**

### **B. Project-specific mitigation vs. banks**

Project-specific replacement and replacement through wetland banking each have advantages and disadvantages. It's impractical to recommend one over the other for all circumstances. Given the findings of this study that most project-specific mitigation tends to be created wetlands while most wetland banks tend to be restorations, and given that previous studies have shown that restorations are usually more successful than wetland creations, there is some rationale for promoting wetland banking. On the other hand, wetland banks were generally observed to be farther away from impact sites than project-specific replacements, and therefore less likely to replace localized wetland benefits. The following recommendations take these considerations into account.

- C Encourage the continued restoration of wetlands to serve as wetland banks, and in general, encourage the use of local wetland banks for replacement of small impacts. However, the decision on which replacement procedure is best for any particular project should be based on a project-specific analysis, taking into account the functions and values lost, the likelihood of achieving successful replacement, land availability, and other factors.**
- C Encourage greater use of restoration for project-specific mitigation**
- C Investigate the relative effectiveness of small, on-site wetland creations versus larger, off-site restorations as compensatory mitigation; document the factors and techniques associated with successful replacement in order to develop improved standards and guidelines.**

***C. Wetland Bank Location***

- C Federal, state and local governments should collaborate on the identification of high priority sites for wetland restoration or creation that most effectively address watershed needs (water quality, flooding, habitat, recreation, etc.). Such sites should be identified in local surface water management plans. Encourage the establishment of bank sites in these high priority areas.**
- C State and federal agencies should encourage completion of ongoing gap analysis<sup>8</sup> studies and conduct additional gap analysis studies at the appropriate scales (watershed, ecoregion) to identify critical discontinuities in wildlife habitat and should provide such information to local governments for inclusion in local water plans.**

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<sup>8</sup> Gap analysis is an emerging, geographic information system-based approach to identifying discontinuities, or gaps in habitat that are critical for the maintenance of wildlife populations.

- C Agencies that have continuing, large scale wetland banking programs, such as the MnDOT and BWSR wetland banks associated with public transportation projects, should make a concerted effort to locate those banks in identified high priority areas. These agencies should also develop wetland bank sites that reflect the range of wetland types being lost, taking into account cumulative impacts, cost, and overall feasibility.**

***D. Bank Accounting/Administration***

- **Establish a full time bank administrator position.**

The bank administrator would handle the project reviews, legal documentation, trend analysis, reporting, and accounting needs associated with maintaining the state's wetland banking system. Included in the duties of this position is the administration of the public road wetland replacement program.

***E. Monitoring and Certification***

The Committee discussed the following options for improving monitoring and certification.

- C Assigning responsibility for monitoring:  
Alternatives:**

**T Put monitoring authority in the hands of a governmental agency and remove the responsibility from individual land owners.**

Options:

1. Establish a position at the BWSR whose primary responsibility would be monitoring of mitigation sites. This position is in addition to the full time bank administrator position recommended under Part D. This position could have a statewide responsibility to conduct and coordinate monitoring of all project-specific mitigation and bank sites according to the WCA rules. Also, this position would be responsible for a share of the wetland administration duties during seasons where in-field monitoring is not feasible to allow more specific bank information to be tracked (e.g., database development and coordination).
2. Give LGUs the responsibility to monitor mitigated wetlands within their jurisdiction.

3. Establish a designated regional audit team to monitor mitigation wetlands. This team should consist of a group of interagency wetland specialists to complement the TEP.
4. Establish a monitoring system using a combination of the above suggestions

*or:*

**T Land owners remain responsible for monitoring, but with technical assistance.**

The land owner would remain responsible for ensuring that their monitoring reports are completed, but the actual monitoring may be conducted by a wetland specialist (i.e., a consultant or government employee). The landowner would be responsible for the associated costs. One possibility is to allow LGUs to collect an “escrow” payment from applicants that is released upon satisfactory completion of monitoring requirements.

**C Establish a regional interagency audit team to conduct broad-based follow-up on all regulated activities pertaining to wetlands, including impacts to wetlands and wetland replacement**

Regardless of whether monitoring remains the responsibility of landowners or is assigned to governmental agencies, the banking committee believes that the overall wetland regulatory system would be improved by routine oversight by an interagency group. This team would periodically review all facets of wetland regulation, identify deficiencies and make recommendations for improvement, and foster improved interagency coordination.

**C Revise procedures on wetland banking to ensure that wetland impacts do not occur before certified wetland credits are obtained by the applicant and the wetland bank is properly debited.**

**F. Database**

- **Establish and maintain a central, joint database of wetland activities in the state.**

The database should contain information available from federal, state, and local governments. Important trends such as types and locations of wetland impacts and

wetland acres used for replacement could be detected and tracked over time. This information could be used to more effectively target bank sites, determine deficiencies in monitoring, aid in general wetland mitigation program management, and determine whether the goals of the WCA and other regulatory and restoration programs are being achieved.

***G. Wetland Replacement Plans***

- **LGUs should return incomplete wetland replacement plans to the applicant for completion and resubmittal.**
- **Reviewing parties should identify deficiencies in wetland replacement plans to LGUs and to the BWSR. The BWSR, as part of their WCA oversight responsibilities, should work with LGUs to ensure that wetland replacement plans are complete.**
- **An interagency team should continue to evaluate and improve/simplify the replacement plan forms.**

***H. Public vs. Private Components and Cash Banking.***

- C** **An interagency team, including the Banking Study Committee, should continue to evaluate and improve/simplify the wetland banking process and evaluate the options that may be available using “cash banking” concepts.**

Based on the experiences of the public road replacement program and of some local government units, “cash banking” is a concept worth exploring to add simplicity and consistency to the wetland replacement/mitigation process. However, some of the drawbacks to cash banking (see page 16) may require that its use be limited to clearly defined situations.

***I. LGU Training***

- **LGUs should continue to be provided with advanced training and education on components of wetland banking and mitigation in the state.**

This training should address issues such as improving the quality of mitigation sites, improving administration of project-specific and wetland bank sites, and more thorough review of replacement plans. The BWSR should continue to

oversee the LGU activities and provide additional guidance and training where needed.

***J. Cost of Additional Services***

- **More funding should be allocated to cover the costs of additional recommended services.**

The Committee considered how to pay for the extra services which were recommended (dedicated monitor, technical panel, database, etc.). The following possibilities were identified:

1. The state government would fund the additional services. This logic is based on the idea that wetlands are valuable to the public, and therefore, the public should share the financial responsibility to protect them. The land owners should not be required to cover the financial burden while the general public can reap the benefits.
2. Those impacting wetlands would be charged a user fee. The idea behind a user fee system is that "the polluter pays." Those impacting wetlands are benefiting from this impact (e.g., developers) and therefore they, not the public, should be responsible for compensation. Further, the user fee may provide a disincentive for wetland impacts.

The Committee did not reach agreement on how to handle the additional costs at this time. The state legislature, in conjunction with the concerned stakeholders, will need to address this issue.

## **VIII. Glossary**

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

50 percent to 80 percent counties - Those counties in Minnesota with less than 80 percent but greater than 50 percent of their presettlement wetlands remaining.

Greater than 80 percent counties - Those counties in Minnesota with greater than 80 percent of their presettlement wetlands remaining.

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

Less than 50 percent counties - Those counties in Minnesota with less than 50 percent of their presettlement wetlands remaining.

Mitigation, compensatory mitigation, mitigation wetland - As used in the state wetland plan, mitigation refers to the restoration, creation, enhancement, and in exceptional circumstances, preservation of wetlands expressly for the purposes of compensation for the loss of other wetlands due to human activities. Synonymous with “**replacement**”.

Minnesota Routine Assessment Method For Evaluating Wetland Values (MNRAM) - An analytical method to evaluate wetland functions and values. 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    | *Fishery habitat                   |
| *Shoreline protection     | *Floral diversity and integrity    |
| *Ground water interaction | *Aesthetics, recreation, education |
| *Water quality protection | *Commercial uses                   |
| *Wildlife habitat         |                                    |

New wetland credit (NWC) - Wetland replacement credit that can be used for any portion of wetland replacement.

Off-site replacement - Wetland replacement that is not adjacent to or contiguous with the impact site.

On-site replacement - Wetland replacement that is adjacent to or contiguous with the impact site.

Project-specific mitigation - The direct creation or restoration of wetlands to replace wetlands being impacted.

Public value credit (PVC) - Wetland replacement credit that can only be used for the portion of wetland replacement required above a 1:1 ratio.

Replacement - See "Mitigation"

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

Technical evaluation panel (TEP) - A panel 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 determination, 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, a technical professional representing the county soil and water conservation district, and a technical professional representing the Minnesota Board of Water and Soil Resources.

Wetland bank site - The TEP-approved restored or created wetland and the associated upland area available for sale of credits.

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 debit - A unit of wetland value withdrawn from an approved bank for compensation of a wetland impact.

Wetland ecological unit - Ecological "information zones" that provide a way to:

- \* describe regional differences
- \* support watershed-based administration
- \* get away from "one-size-fits-all" wetlands management

Fourteen wetland ecological units are identified in the Minnesota Wetlands Conservation Plan, ver. 1.0.

Wetland function - A physical, chemical, or biological process or attribute of a wetland. Theoretically, all wetland functions can be measured or quantified objectively.

#### Wetland Types

Type 1 - Seasonally flooded basin or flat

Type 2 - Wet meadow

Type 3 - Shallow marsh

Type 4 - Deep marsh

Type 5 - Shallow open water

Type 6 - Shrub swamp

Type 7 - Wooded swamp

Type 8 - Bog

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.