

**Wetland Activities in Wisconsin: Status Report for 2007  
Gains, Losses and Acre-Neutral Activities**

**July 2008**



**Wisconsin Department of Natural Resources**

Funding for the development of the tracking system used to create this report was supported in part by Wetland Program Development Grant CD97593901 from the US Environmental Protection Agency. Points of view in this report do not necessarily reflect the views or policies of the US Environmental Protection Agency.

### **Contact for Further Information**

Thomas W. Bernthal  
Bureau of Watershed Management  
Wisconsin Department of Natural Resources  
101 S. Webster Street  
Madison, WI 53707  
608-266-3033

[Thomas.Bernthal@wisconsin.gov](mailto:Thomas.Bernthal@wisconsin.gov)

**TABLE OF CONTENTS**

**EXECUTIVE SUMMARY ..... 1**  
**INTRODUCTION ..... 2**  
**WHAT IS TRACKED?..... 3**  
    **FOUR REPORTING CATEGORIES – GAINS, ACRE-NEUTRAL ENHANCEMENTS, LOSSES, ACRE-NEUTRAL DISTURBANCES ..... 3**  
**WHAT IS NOT TRACKED? ..... 7**  
    LOSSES AND NEGATIVE IMPACTS NOT TRACKED ..... 7  
    GAINS AND POSITIVE IMPACTS NOT TRACKED ..... 7  
**STATEWIDE RESULTS..... 8**  
**CUMULATIVE RESULTS FOR 2006 AND 2007 ..... 16**  
**MONITORING WETLAND HEALTH..... 18**

APPENDIX A: TERMS, ACTIVITY CATEGORIES AND EXPECTED IMPACTS ..... A-1  
APPENDIX B: DATA TABLES..... B-1

**FIGURES**

FIGURE 1. WETLAND PROJECTS AND IMPACTS ..... 5  
FIGURE 2. 2006 TO 2007 COMPARISON OF WETLAND ACTIVITIES..... 13  
FIGURE 3. ACTIVITIES AFFECTING WETLANDS DURING 2007, BY WDNR REGION ..... 14  
FIGURE 4. MAPPED WETLAND ACRES BY WDNR REGION ..... 15  
FIGURE 5. PERCENT WETLANDS IN EACH WDNR REGION ..... 15  
FIGURE 6. ACTIVITIES AFFECTING WETLANDS DURING 2006 & 2007, BY WDNR REGION..... 17

**MAPS**

MAP 1. 2007 LOCATIONS OF RESTORED WETLANDS AND TOTAL ACREAGE GAINED PER COUNTY ..... 8  
MAP 2. 2007 LOCATIONS OF ENHANCED WETLANDS AND TOTAL NEUTRAL ACREAGE PER COUNTY ..... 9  
MAP 3. 2007 LOCATIONS OF DISTURBED WETLANDS AND TOTAL NEUTRAL ACREAGE PER COUNTY ..... 10  
MAP 4. 2007 LOCATIONS OF FILLED WETLANDS AND TOTAL ACREAGE LOST PER COUNTY ..... 11  
MAP 5. DNR REGIONS ..... 15  
MAP 6. PERCENT OF WETLANDS THAT ARE DOMINATED BY REED CANARY GRASS, PER BASIN..... 19

**TABLES**

TABLE 1: ACTIVITIES AFFECTING WETLANDS CONDUCTED IN 2007, BY WDNR REGION ..... B-1  
TABLE 2: ACTIVITIES AFFECTING WETLANDS CONDUCTED IN 2006 & 2007, BY WDNR REGION..... B-2

## Executive Summary

This is the second annual report that summarizes and shows locations of activities that affect wetlands across Wisconsin. This report provides maps and tables that break down the data by activity type and by WDNR Region. We report not only on direct gains and losses of wetland acres, but also on “acre-neutral” activities that affect existing wetlands. The 2006 & 2007 cumulative total of 6,855 acres of restoration and enhancement amounts to 0.146% of the estimated 4.7 million acres of wetlands lost in Wisconsin since settlement. For calendar year 2007, the activities we could track and map show that statewide:

### Positive Benefits totaled 3,615 acres.

<u>Gains</u> , re-establishment of formerly drained wetlands. Just over half of the gain was accomplished by a partnership of federal, state and local conservation organizations conducting restoration projects.	2,788 acres
<u>Acre-Neutral: Positive</u> , enhancement of existing wetlands.	827 acres

### Negative Impacts totaled 537 acres.

<u>Losses</u> , permitted fill. Permits for fill are granted only for unavoidable impacts that are minimized to the extent practicable. Of these, transportation projects accounted for 210 acres of direct loss.	312 acres
<u>Acre Neutral: Negative</u> , temporarily disturbing existing wetlands. These are mostly linear utility projects over large distances. Acreage will fluctuate yearly. Permits require disturbance to be minimized to the extent practicable.	225 acres

We have collected data from a variety of existing sources including a new restoration tracking database for voluntary restorations. The amount of acres we report here is based on what we have been able to document and map. There are negative impacts to wetlands that we were not able to track by acre, such as illegal wetland filling and draining, degradation from polluted runoff, and habitat fragmentation. We know that legal drainage and conversion of wetlands to tillable farmland is also occurring as many farmers are willing to forego crop subsidies in order to grow commodity crops whose prices are currently dramatically increasing (in 2008). However, records for wetland conversion are not adequate to track the number of acres involved or map their location. Likewise, it is beyond the scope of the project to track by acre all positive management and maintenance activities such as prescribed burning and control of invasive species. Some voluntary restorations done by local groups not yet reporting to us may also be missing. Specific limitations of the data are discussed for each reporting system.

Project tracking data tell only part of the story on wetland status. Monitoring data are also needed to assess the health of existing wetlands and measure the success of restoration projects. The U.S. Environmental Protection Agency (USEPA) is planning to survey the health of the nation’s wetlands to be carried out in 2011. We hope to conduct an “intensification” of the national survey that will be able to focus in on Wisconsin wetlands, most likely within a particular watershed or river basin.

One important indicator of poor wetland health is dominance by invasive species. Using satellite imagery we have mapped the location of wetlands throughout the state that are dominated by reed canary grass (*Phalaris arundinacea*). Our study found that this species dominates 509,989 acres, about 10% of Wisconsin’s wetlands. The GIS layer is now viewable on the DNR internet mapping application, Surface Water Data Viewer. While the health of these wetlands is reduced, they likely still perform important functions for flood storage and sediment trapping that contribute to downstream water quality and aquatic habitat.

## **Introduction**

This report is directed to decision-makers and citizens concerned with the status of wetlands in Wisconsin. Wisconsin has lost 47% of the estimated original 10 million acres present at statehood. It is estimated that roughly 5.4 million acres remain. Until relatively recently, wetlands were regarded as wastelands to be drained for farmland or filled for other uses as quickly as possible. Since the 1970's, wetlands have increasingly been recognized as valuable lands for the ecosystem services they provide. Flood control managers and emergency planners utilize the storage of flood water that occurs in floodplain wetlands to reduce flooding. Water quality and fisheries managers recognize the critical role wetlands play in maintaining healthy lakes, streams and watersheds. Hunters, trappers, anglers, and nature enthusiasts appreciate the fish and wildlife habitat that wetlands provide.

The Clean Water Act, first enacted in 1972, set in place legal protections for wetlands that prevent people from filling them if a practical alternative exists for their project. The federal government, instead of encouraging the draining of wetlands, now has many incentive programs encouraging people to restore, enhance and protect them.

Debate over wetland policy and management takes place at all levels of government, from the U.S. Supreme Court to the local town board. As scientists work to better understand wetland ecosystems, policy-makers and managers struggle to preserve these resources while allowing needed development. At the national level the policy of "no net loss of functions and acres" of wetlands has been revised to seek a net gain of wetland functions and acres.

In 2001, the newly formed WDNR Wetland Team and the Natural Resources Board articulated "Reversing the Loss" as the strategy for Wisconsin wetlands. The strategy took a step beyond the generally stated federal policy of "no net loss" to aim for achieving gains in both wetland quantity and quality. Because we have already lost roughly five million acres of wetlands, protecting remaining wetlands and restoring former wetlands are two major goals of the Wetland Team. Success will lead to reduced flooding, cleaner water, more habitat for wildlife, and good hunting, fishing and outdoor recreation. All of these benefits will save money in the long run and keep Wisconsin a great place to live and visit. These annual tracking reports are a first step in measuring our success in this endeavor.

## **Compiling the report**

With this report, the Department seeks to provide the best available data from a variety of sources on wetland activities that took place on the Wisconsin landscape in 2007. The intent is to paint as accurate a picture as possible of the **amount** of wetland gains and losses each year. There is a significant amount of activity that affects wetland quality, for better or worse, but does not result in an outright loss or gain of wetland quantity. We describe these activities as "acre-neutral." These range from projects that are generally positive in their impacts, such as enhancements and rehabilitation of degraded wetland, to projects that can be expected to have a negative effect, such as disturbance from constructing utility lines through wetlands. Some negative impacts can be minimized through careful construction practices and proper restoration following construction.

The information in the report is drawn from a new restoration tracking database (RTD) designed and developed with support from a USEPA Wetland Program Development Grant. A critical aspect of our data collection efforts is the establishment of a quality control system for counting and mapping project locations to ensure that projects are not double or triple counted. This year we are including Conservation Reserve Program (CRP) acres involving restoration of cropped land to wetland. Readers of the report should be aware that projects often take more than one

year to plan and complete, and a permit may be issued in one year for a project that is constructed the next year. For this reason, data from multiple years will be required to show the cumulative trend in annual data. If ongoing funding can be secured, we will be able to continue these reports on an annual basis.

#### Note on Federal Agency Projects

This report is for the calendar year 2007, from January through December. However, the data we collect from two federal agencies, the US Fish and Wildlife Service (USFWS) and Natural Resources Conservation Service (NRCS), are on a federal fiscal calendar year, which runs from October 1, 2006 through September 30, 2007. Therefore, data on some projects completed after September 30, 2007, by these two agencies, may not be included in this report for calendar year 2007. Some October – December projects will still be tracked through WDNR field staff reports, because WDNR often partners with USFWS or NRCS on projects.

#### Additions to 2006 Report

After the release of last year's report, there were more records added to the permits database. Additionally, the projects completed from October 1, 2006 to December 31, 2006 by NRCS and FWS were not added to the RTD until the end of the 2007 federal fiscal year. And lastly, because a fifth data source was added this year, the CRP data for 2006 has also been added to last year's summary information. Also, it should be noted, that Figure 4 is a cumulative graph, including the new total for 2006 plus the 2007 numbers.

In this report, there were 626 acres added to our 2006 data, from recently reported NRCS and FWS projects. The late entries into the permits database were not significantly large in acreage, and due to a change in the design of the database, we expect that in the future there will be fewer late entries, if any at all.

**Any 2007 data that is entered after the release of this report will be included in an amendment to next year's report. We plan to report annual statistics as well as cumulative statistics with each consecutive year.**

#### Note on Waterway Permits Projects

Due to the design of the waterway permits database, we can only report on projects whose permits were approved during 2007. There may be projects permitted in 2007 that did not begin construction until 2008. While tracking the date of construction would be preferable, staff resources are not sufficient to track the construction completion date for all projects.

#### Note on Compensatory Mitigation Projects

The numbers reported from this database are taken from as-built reports. These are not the final delineated acreages. They are the estimated acreages post-construction. Because final delineations are typically done at the end of five to ten year monitoring periods, the as-built reports provided more timely data, although less accurate than the delineation reports.

### **What is Tracked?**

#### **Four Reporting Categories – Gains, Acre-Neutral Enhancements, Losses, Acre-Neutral Disturbances**

Last year's report compiled data from four different sources: WDNR's Restoration Tracking Database (RTD) which includes data imported from the NRCS internal database and the USFWS HabITS – Habitat Information Tracking System, WDNR's compensatory mitigation database,

WDNR's waterway and wetland permit database, and the Wisconsin Department of Transportation (WisDOT). This year's report includes a fifth source: USDA-Farm Service Agency's Conservation Reserve Program (CRP). Three CRP practices were included: CP9 – Shallow Water Areas for Wildlife, CP23 – Wetland Restoration, and CP23(A) – Wetland Restoration outside the Floodplain.

CP9 is also called Shallow Water Areas for Wildlife. Its purpose is to develop or restore shallow water areas to an average depth of 6 to 18 inches for wildlife. Construction practices include low head dams, dikes, or shallow scrapes. They are meant to provide permanent water for wildlife. CP9 acres were counted as acre-neutral restorations. CP23 is also called Wetland Restoration. It is considered restoration of degraded or former wetland, where the site is returned to the natural condition to the extent possible. Its purpose is to restore the functions and values of wetland ecosystems that were in agricultural use. CP23 and CP23A only have one difference: CP23 focuses on land lying within the 100-year floodplain, where CP23A focuses on land outside the 100-year floodplain. CP23 and CP23A acres were counted as acre gains.

The CRP data was taken from the Farm Services Agency (FSA) website. They post yearly reports summarizing the acreages in the different CRP practices for active contracts beginning that year. The acreages are summarized by county which makes it impossible to map their locations by point. This issue has been resolved by mapping the acreages in a new way, which is described on page 8.

Figure 1 shows the way we have defined wetland activities, which activity we can currently track, which data source we used to track each activity, and what type of impact is generally expected from the activity. This information is detailed in Appendix A: Terms, Activity Categories and Expected Impacts.

# Wetland Projects and Impacts

## Acre Gains

- Restoration:
  - Re-establishment (+) (A,B,C,D,E,F,G)
- Creation (+/-) (A,C,D,E,F)

## Acre Losses

- Permitted Fill (-) (B,C)
- Illegal Fill (-) (B) (enforcement action)
- Illegal Fill (-) (not reported)
- Exempt Activities (-) (e.g., drainage, fill)

## Acre-Neutral

### Non-Conservation Activities

- Permitted Disturbance (-) (B) (e.g., utility construction)
- Stormwater and Wastewater Discharges (-)

### Conservation Activities

- Enhancement (+)(A,B,D,E,F)
- Restoration: Rehabilitation (+) (A,B,C,D,E,F,G)
- Vegetation management (+) (E) (e.g., prescribed burning, control invasives, planting)
- Wildlife structures (+) (E) (e.g., hibernacula, nest boxes)
- Type Conversions (+/-)

## Key

- Not Tracked
- Tracked

- (+) Positive Impact Expected
- (-) Negative Impact Expected
- (+/-) Impact Could Be Positive Or Negative

- (A) WDNR Compensatory Mitigation database
- (B) WDNR Wetland Permit database
- (C) WisDOT Project File Manager
- (D) WDNR Wildlife Projects
- (E) FWS HabITS database
- (F) NRCS WRP database
- (G) FSA CRP data

Figure 1

### **What is Not Tracked?**

We are not able to track all the activities that affect the quantity and quality of Wisconsin's wetlands. Below we summarize the type of data that we are not yet able to track for this report.

#### Losses and Negative Impacts Not Tracked

##### **Illegal Fill.**

Illegal fill activities occur without the Department's knowledge. There is concern that illegal fill is increasing, particularly in the Northern Region. In an examination of wetland enforcement actions for 2006, 85% of the violations that occurred in that year were the result of illegal wetland fills.

##### **Legal Drainage.**

Drainage projects are done to convert wetland to tillable farmland. While drainage for agriculture was a very large source of historical wetland loss, the practice is no longer promoted by the federal government and negative incentives are in place to discourage it, by loss of commodity supports. Drainage projects are not directly regulated and therefore are not reported to any state agency, unless participating farmers wish to retain federal commodity supports. NRCS administers a program for farmers that wish to convert wetland to productive farmland without losing their commodity support benefits. The program allows them to compensate by restoring other wetlands.

In the last two years we know drainage and conversion of wetlands to tillable farmland is increasing as more farmers are willing to forego crop subsidies in order to grow commodity crops that have been increasing in value. However, records are not adequate to track the number of acres involved or map their location.

##### **Stormwater and Wastewater Discharges**

We know there are some discharges of stormwater and wastewater to wetlands. The emphasis in the stormwater program is to avoid direct impacts to wetlands by building treatment practices in non-wetlands, and providing protective areas around wetlands as well as other surface waters. The water discharged to wetlands may still have a negative impact some wetlands. There is currently no mechanism to track the locations of these discharges to wetlands.

#### Gains and Positive Impacts Not Tracked

##### **Protection through Acquisition or Easement**

We have not attempted to track wetland acres that are given greater protection through acquisition or easement. These projects may result in significant conservation benefits but do not result in a physical change to wetlands. A restoration or enhancement conducted on acquired or eased land will be tracked as such.

##### **Vegetation Management**

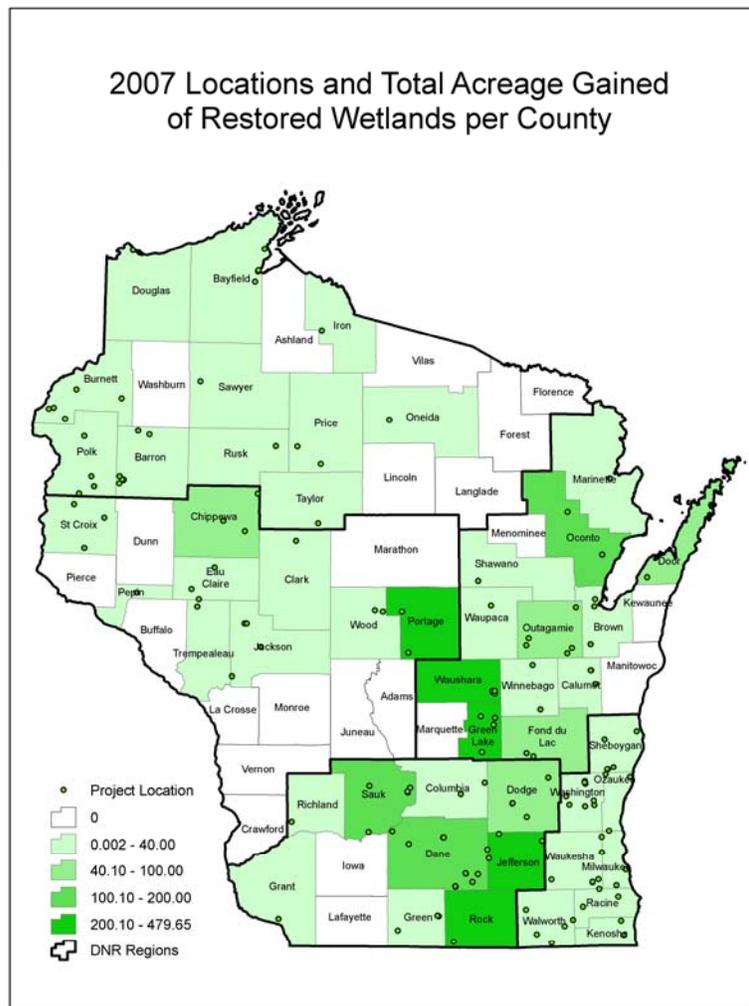
Wetlands are managed to favor diverse native vegetation by removing or controlling invasive species. Management methods can be planting native species, applying herbicide to non-native invasive plants, and conducting prescribed burns. In contrast to restoration and enhancement these activities often must be repeated periodically at the same site on a long term cycle. This makes it very problematic to track without double-counting.

**Statewide Results**

The following four maps show the different activity outcomes: acre-gains, acre-neutral enhancements, acre-neutral disturbances and acre-losses, by county and by individual project location. Note, however, that acre-gains through the Conservation Reserve Program are only shown by county, not by project location. Since project location is not reported by the Farm Services Agency (FSA) a thematic map showing the totals per county for all the databases combined is the only way to display the acre gains data on a map. For the sake of comparability, we have used this format for all four maps.

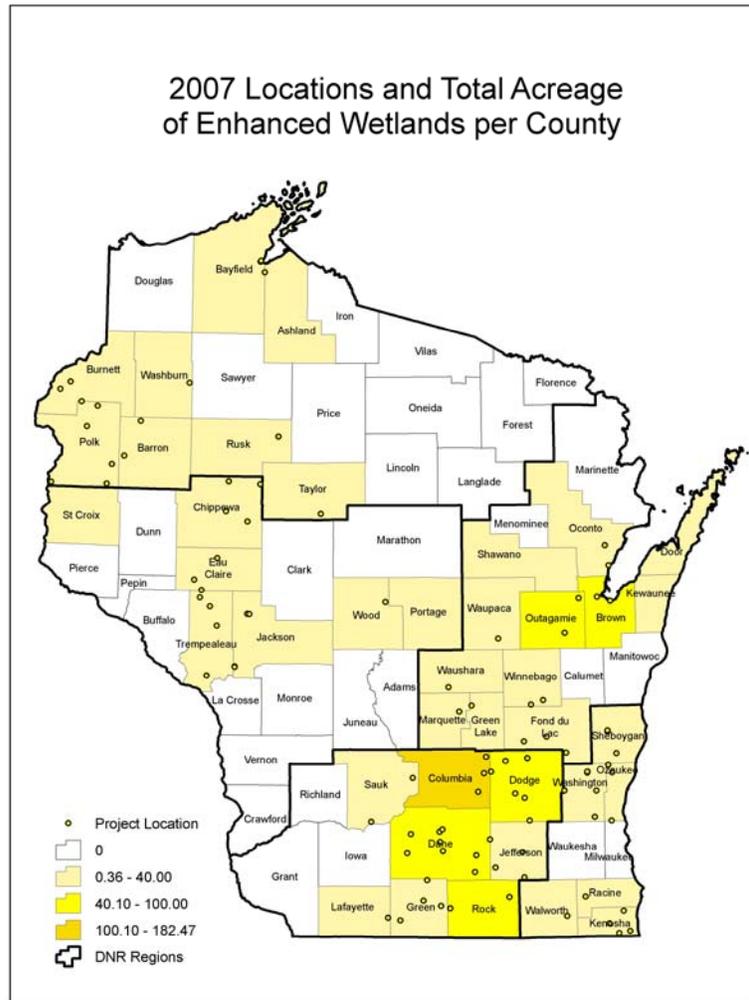
Map 1, showing Acre-Gains, includes acre amounts from all five sources: Compensatory Mitigation, Wetland & Waterway Permits, Restoration and Tracking Database, WisDOT, and FSA-CRP. By referring to Map 1, one can see that Rock County, in the highest class of acre gains among the counties, has only one point location. That point is for a project that restored 305 acres of wetland.

Other counties with large gains were due to Wetland Reserve Program (WRP) restorations. Waushara had a 433 acre WRP restoration and Green Lake had a 258 acre WRP restoration, accounting for their high gains. Portage County had a 273 acre WRP restoration, but was also in the highest loss category.



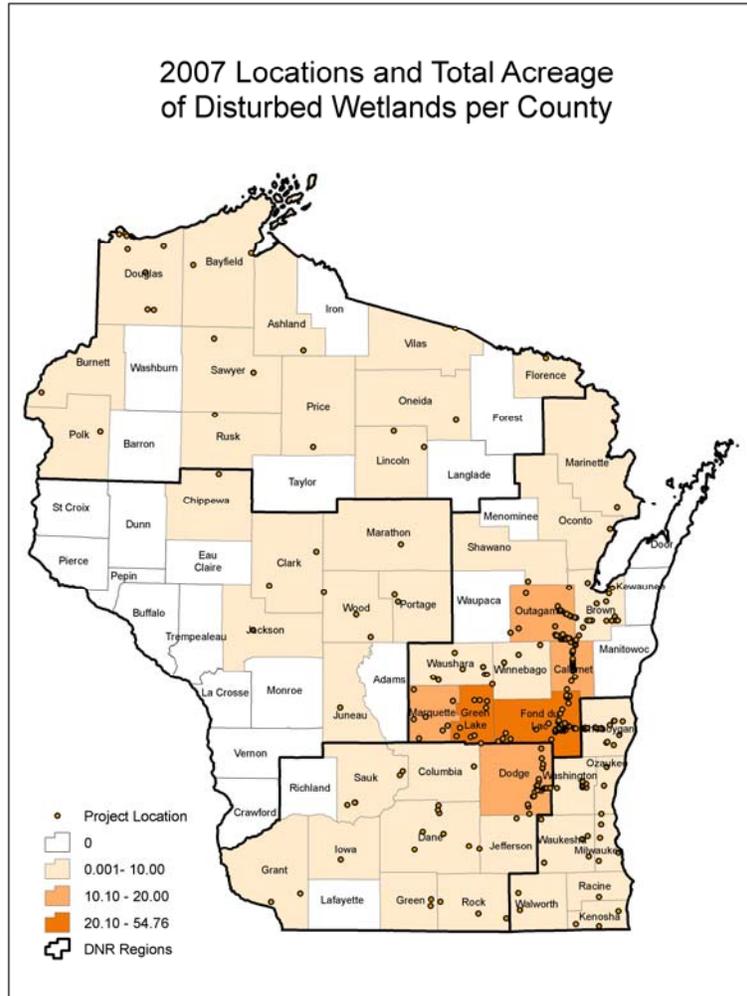
Map 1

Map 2, showing Acre-Neutral Enhancements, includes acre amounts from all five sources: Compensatory Mitigation, Wetland & Waterway Permits, Restoration and Tracking Database, WisDOT, and FSA-CRP. Note that there are some counties shown in yellow that do not contain points. Those counties only have CP 9 data, and no other restorations. Kewaunee and Shawano are two examples. Columbia County has the highest amount of acre-neutral enhancements, mainly due to a single large permit to enhance 175 acres.



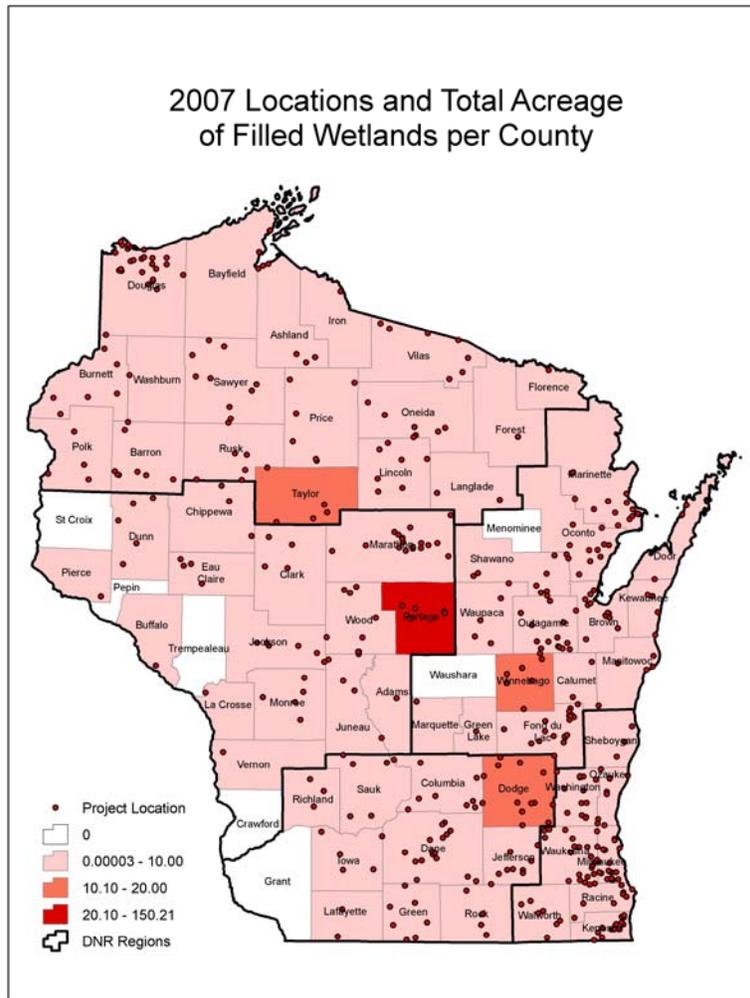
Map 2

Map 3, showing Acre-Neutral Disturbances, presents data from the Wetland and Waterway Permits database. The obvious linear feature, running south from Green Bay to Ixonia in Jefferson County, is the new natural gas line put in by Guardian Pipeline. We Energies and Wisconsin Public Service Corporation are building several smaller diameter lateral lines, the longest stretching to Sheboygan County, to serve customers in eastern Wisconsin. Because of the smaller amount of acreage involved, the disturbed wetland data was sorted into narrower ranges for each class, compared to those used in Maps 1 and 2.



Map 3

Map 4, showing Acre-Losses, presents data from the original four sources. Sixty-eight of Wisconsin's 72 counties lost less than 10 acres of wetland to permitted fill. Comparing Map 4 to the map from last year's report showing Trackable Acre Losses for 2006, a pattern starts to emerge. In both years, there are clusters of points in the Superior area, the Milwaukee area, and the Green Bay area. Interestingly, there are few or no points in those same areas on Maps 1 and 2, showing acre-neutral enhancements and acre gains. Portage County losses were primarily due to 149 acres of wetland filled for a highway project.



Map 4

The results for calendar year 2007 are detailed in Appendix B, Table 1. Our results show that statewide:

**Positive Benefits totaled 3,615 acres.**

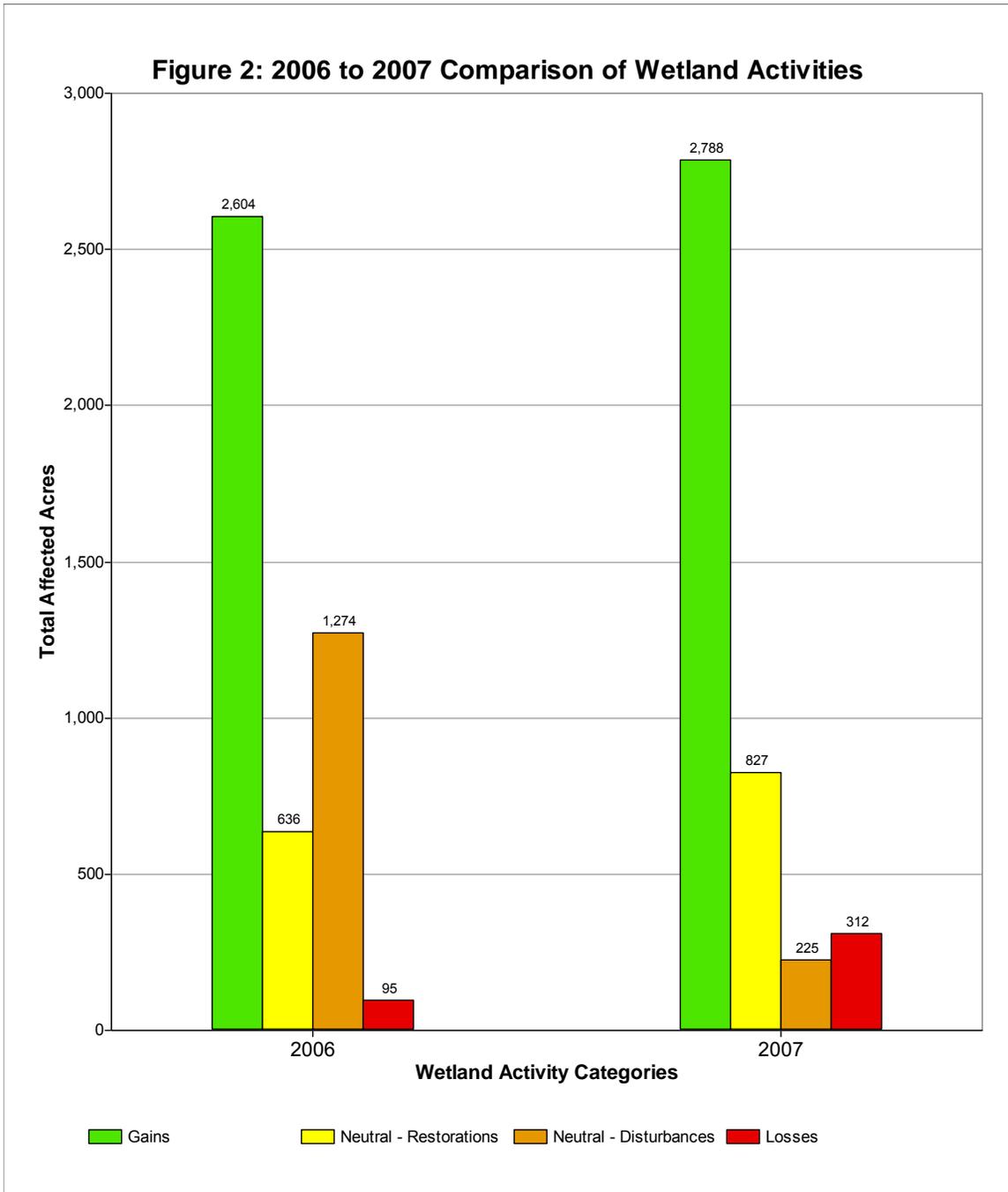
- Gains. 2,788 acres were gained through re-establishment of formerly drained wetlands. This compares to 2,604 acres gained in 2006. Just over half of the gain in 2007, at 1,458 acres, was accomplished by a partnership of federal, state and local conservation organizations conducting restoration projects. Another 590 acres of gains were recorded in the permits database, and 496 acres were achieved through WisDOT to compensate for losses due to transportation projects.
- Acre-Neutral: Positive. 827 acres of existing wetlands were enhanced or rehabilitated. This compares to 636 acres of enhancement of existing wetland in 2006. The increase is largely due to better tracking of acre-neutral restoration in permit database in 2007. A total of 470 acres were reported from 97 projects requiring a permit.

**Negative Impacts totaled 537 acres.**

- Losses. 312 acres were lost through permitted fill. Permits for fill are granted only for unavoidable impacts that are minimized to the maximum extent practicable. Of these, transportation projects accounted for 210 acres of direct loss. In 2006, only 95 acres were lost through permitted fill.
- Acre-Neutral: Negative. 225 acres were permitted for construction work in existing wetlands. These are mostly linear utility projects over large distances. This is a significant drop from 1,274 acres of permitted disturbance in 2006. This category is expected to fluctuate widely depending on the occurrence of permit applications for large utility projects in any given year.

The total positive benefit of 3,615 acres for 2007 is slightly higher than the 3,240 acres in 2006, based on the final totals. Compared to the background of historic wetland loss, the 2007 total amounts to a positive impact that is 0.077% of the estimated 4.7 million acres of wetland lost in Wisconsin since settlement. In 2006 the acres of positive benefits amounted to 0.069% of historic loss.

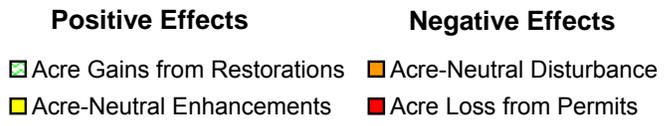
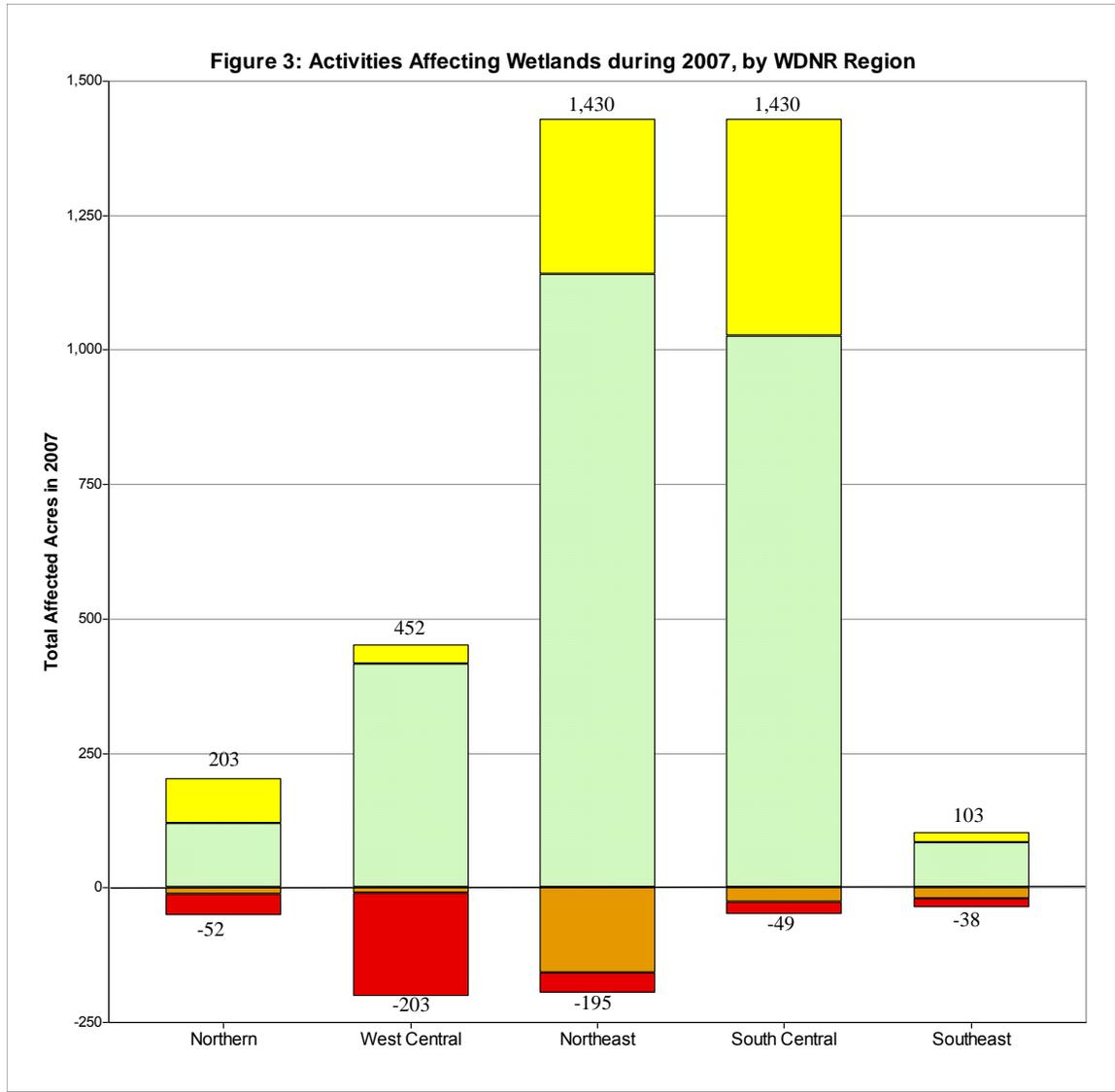
Figure 2 presents a comparison of the statewide data for activities conducted in 2006 with activities in 2007. Note that acre-gains from restorations and acre-neutral enhancements were virtually the same, while acre-neutral disturbances were greatly reduced in 2007, but permitted losses were tripled.



**Regional Results For 2007**

The activity categories can be combined into positive and negative impacts. Below, we present and discuss a summary of the results combining restoration gains and acre-neutral enhancements as “positive benefits,” and combining permitted losses and acre-neutral disturbances as “negative impacts.”

Figure 3 shows the regional breakdown for activities conducted in 2007. The extent of existing mapped wetlands and the percent wetlands in each region are shown in Figure 4 and 5 on the next page. Regional results are discussed below within the context of the existing wetland resource base for each region.



The Southeast Region is the most urbanized region with the least amount of existing wetlands. The consequences of historic wetland loss are concentrated in this region. While the amount of filled and disturbed acreage is less than other regions, so is the amount of restoration. A significant protection project, Greenseams, is being carried out by the Milwaukee Metropolitan Sewerage District. Sixteen hundred acres of hydric soils have been purchased in the last five years. As some of these acres are restored, they will be added to the database.

South Central Region contains counties in the non-glaciated Driftless Area of Wisconsin which is naturally low in wetland acreage. The eastern half of the region has much more wetland but this area has lost a large portion of its wetlands to agricultural drainage. The South Central Region had the highest new enrollment in CRP fields, at 247 acres, partially accounting for the large proportion of acre gains. There was also a big restoration project in Rock County that accounted for 305 acres gained.

The Northeast Region is wetland-rich. It had two very large WRP sites, restoring 433 acres to wet meadow and emergent wetland at one site and 258 acres at another. Another quite large project sponsored by the Oneida Tribe was 140 acres, half considered acre gain and the other half, acre-neutral.

West Central Region contains a large amount of existing wetlands in the Central Sands area, while the western part of the region, in the Driftless Area has a relatively low amount of existing wetlands. This region experienced the most loss in 2007. The majority of the loss, at 149 acres, can be attributed to the US Highway 10 WisDOT project between Marshfield and Stevens Point in Portage County. This region also had quite a large WRP site at 273 acres gained.



Map 5

The Northern Region is the most wetland-rich and lake-rich of the WDNR regions. Restoration and enhancement projects are concentrated in Barron, Polk and Burnett counties. Both positive and negative project acreages are small in comparison to 2006 activities and in comparison to the size of the existing wetland resource base.

Figure 4

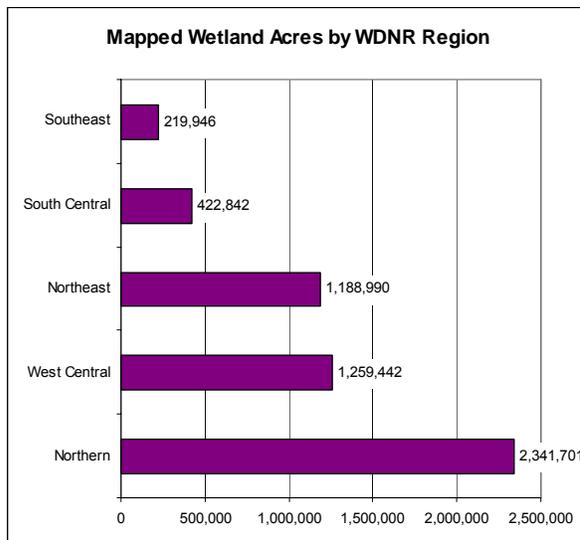
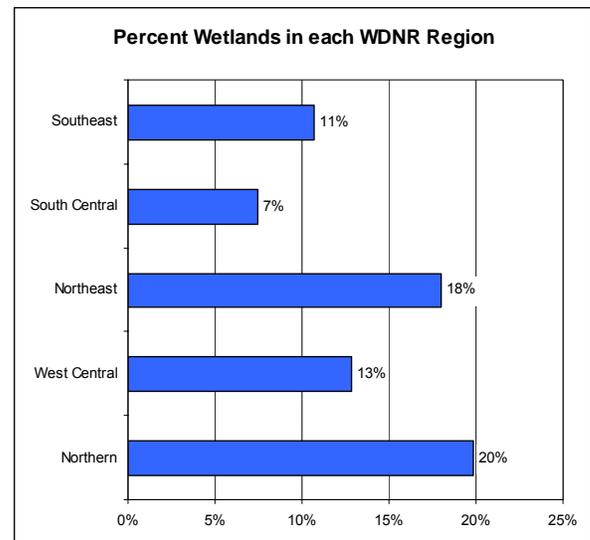


Figure 5

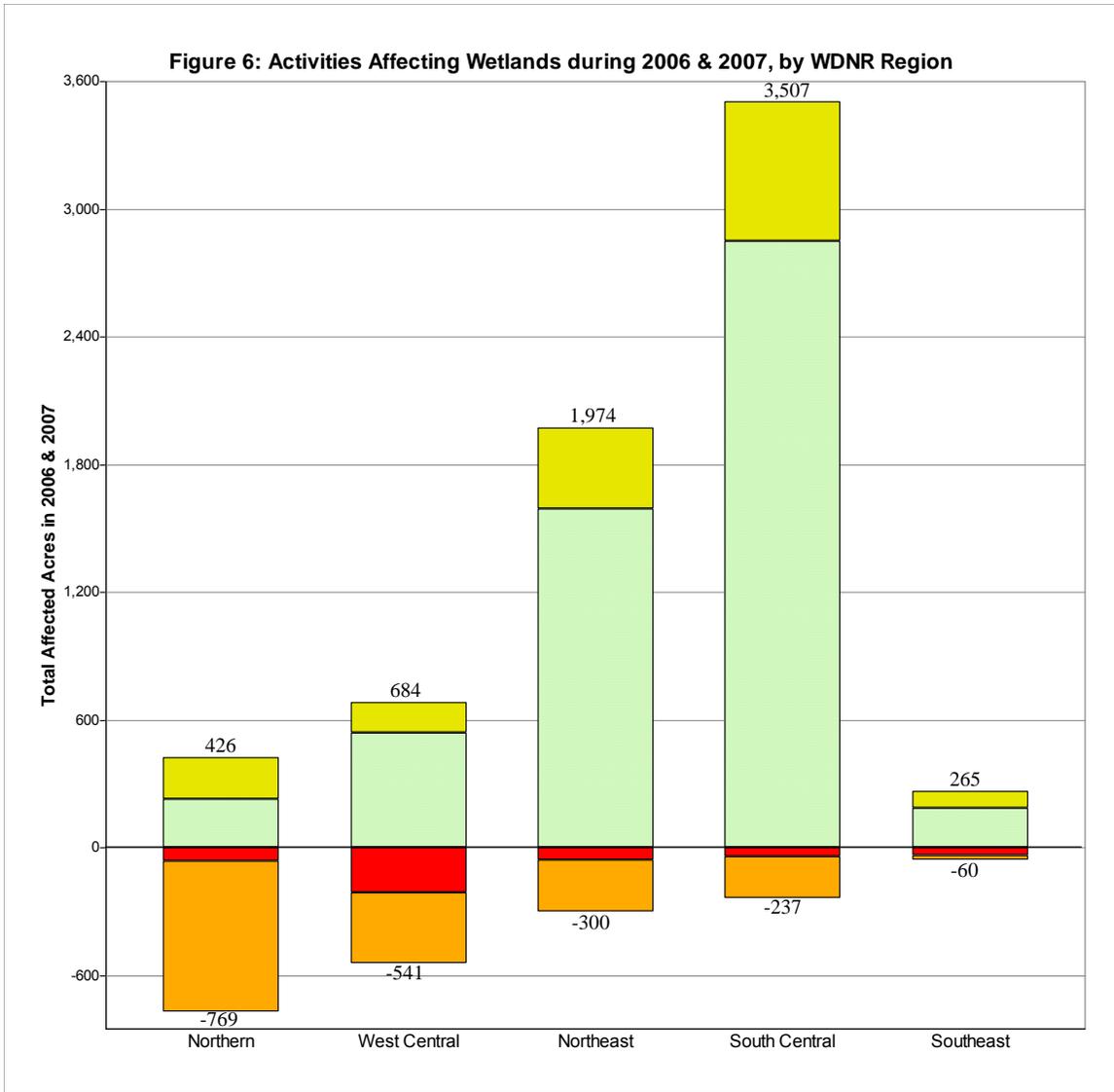


**Cumulative Results for 2006 and 2007**

Figure 6 presents the cumulative results for calendar years 2006 and 2007. Although there will likely be some additional acreage reports for restoration and enhancement in 2007, we are reporting the data available at present. A complete breakdown by activity and region of the combined 2006 and 2007 data is presented as Table 2 in Appendix B at the end of this report.

Northern Region had a negative balance over the two year period and Northeast Region had a slight positive balance. West Central Region had over six times more acreage of positive than negative activities and South Central Region had almost fifteen times more positive than negative acreage. Southeast Region had over four times more positive than negative acreage, but it also had the fewest restored and enhanced acres.

Viewed in context with historical loss and existing wetland extent some general observations can be made. Statewide restoration and enhancement projects during the last two years amounted to a positive impact that is 0.146% of historic wetland loss. The amount of wetland restoration and enhancement taking place in South Central Region seems appropriate given its low percentage of existing wetlands. An increase in restoration activity in Southeast Region would be desirable, given its low acreage of wetlands, and high development pressure. All regions appear to be effectively minimizing permitted fill, though West Central had a relatively high amount of wetland fill compared to all other regions over the last two years.



**Positive Effects**                      **Negative Effects**

■ Acre Gains from Restorations    ■ Acre-Neutral Disturbance  
■ Acre-Neutral Enhancements      ■ Acre Loss from Permits

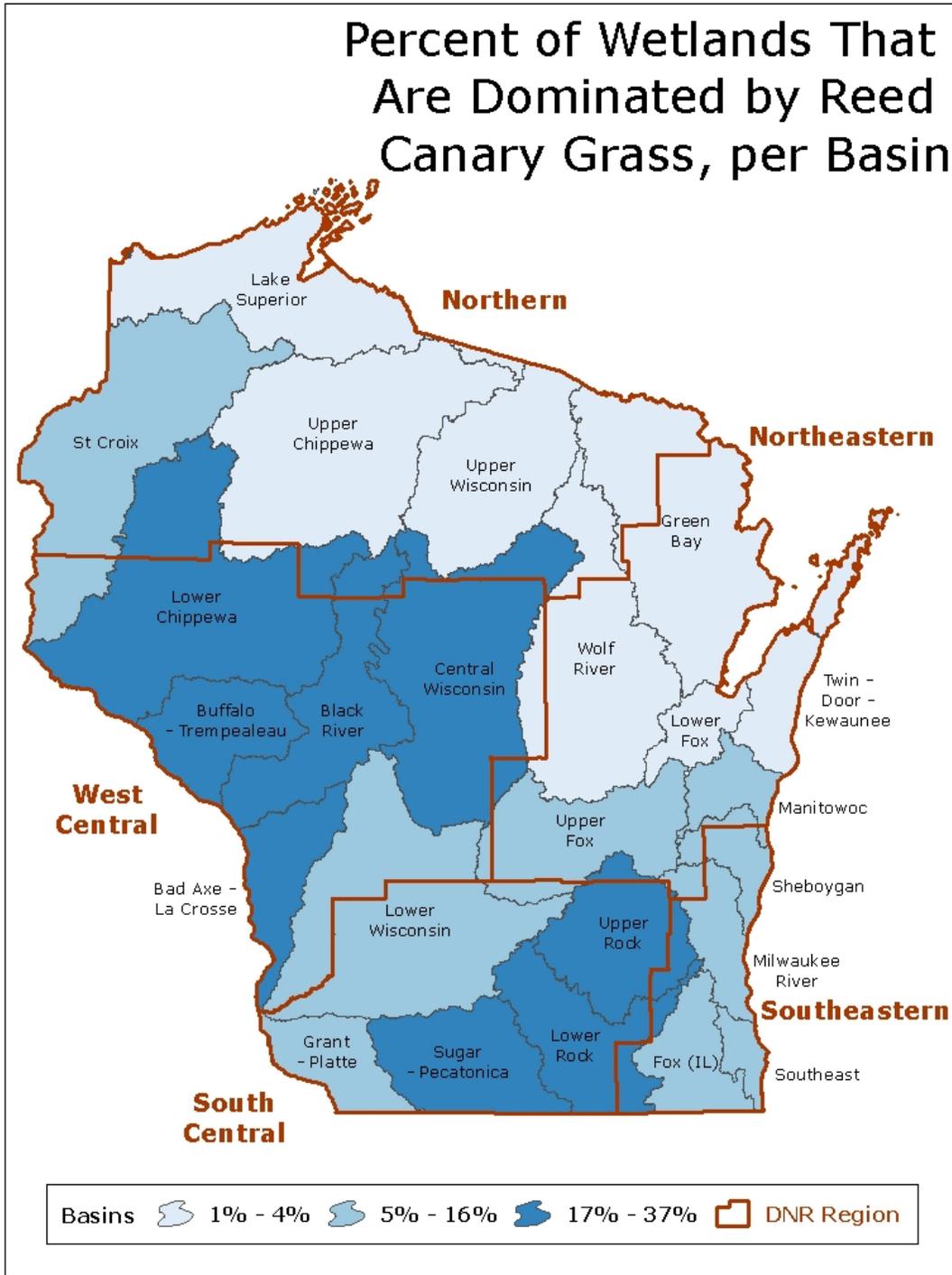
### **Monitoring Wetland Health**

Project tracking data tell only part of the story on wetland status. Monitoring data are also needed to assess the health of existing wetlands and measure the success of restoration projects. It is clear that to report a more complete picture on the status of wetlands we will need to develop more measures of wetland quality. We have worked with EPA to develop methods to assess wetland health, known as “condition assessment,” and continue to work on additional methods. The EPA is planning a condition assessment survey of the nation’s wetlands to be carried out in 2011. The Department is part of the work group designing the national survey. We hope to conduct an “intensification” of the national survey that will be able to focus in on Wisconsin wetlands, most likely within a particular watershed or river basin.

In addition to direct gains or losses of wetland acres, there are many activities that negatively affect the health of Wisconsin’s wetlands. Though they can protect downstream waters, wetlands are degraded when they receive polluted runoff. In agricultural watersheds, sediments and nutrients from eroded cropland and manure-spreading wind up in downstream wetlands. In urbanized areas, the amount of stormwater flowing over pavement and other impervious surfaces increases while the amount of water that can soak into the ground is greatly reduced. The increased flow brings too much water too quickly, stressing plants and dumping sediment and nutrients into wetlands. The result is often an increase in the spread of invasive species. In meadow and marsh wetlands the most problematic species are reed canary grass (*Phalaris arundinacea*), giant reed grass (*Phragmites australis*) and purple loosestrife (*Lythrum salicaria*). In meadows and wooded wetlands, invasions of buckthorn trees (*Rhamnus cathartica*) and honeysuckle shrubs (*Lonicera sp*) are problematic.

One important indicator of poor wetland health is dominance by invasive species. Using satellite imagery we have mapped the location of wetlands throughout the state that are dominated by reed canary grass (*Phalaris arundinacea*). This invasive species drives out native wetland plant species, drastically reducing floristic diversity and degrading the health of the wetland plant community. In 2006 we completed a project to map wetlands dominated by reed canary grass (Hatch and Bernthal in preparation). We found that reed canary grass dominates 509,989 acres, about 10% of Wisconsin’s wetlands. This is a major negative effect on wetland health that needs to be considered when discussing the status of Wisconsin wetlands. The GIS layer is now viewable on the Surface Water Data Viewer. Instructions for viewing are at <http://dnr.wi.gov/wetlands/reports.html>. The layer is also downloadable from the DNR ftp site at [ftp://dnrftp01.wi.gov/geodata/landcover/reed\\_canary\\_grass.zip](ftp://dnrftp01.wi.gov/geodata/landcover/reed_canary_grass.zip)

The southern two-thirds of the state is much more heavily impacted by reed canary grass, than northern Wisconsin. Map 6 demonstrates the extent of the problem by showing the WDNR Regions and major water basins that have the largest percentages of their wetlands dominated by this invasive species. The wetlands of the West Central Region and the South Central Region are the most heavily impacted by reed canary grass. While the health of these wetlands plant communities is reduced, they likely still perform important functions for flood storage and sediment trapping that contribute to downstream water quality and aquatic habitat.



Map 6

## Appendix A: Terms, Activity Categories and Expected Impacts

The terms used in the report include broad terms like “restoration” and “conservation” that in common usage cover many different activities. To produce uniform, consistent annual reports, terms must be more narrowly defined, yet not so technical as to be confusing to managers and decision-makers. Figure 1 outlines how wetland activities will be characterized as “gain”, “loss” or “acre-neutral” and the working assumptions about the impacts we expect from a given activity. The definitions we adopt here are based on those first developed by a federal interagency committee to use in reporting wetland conservation activities (Clean Water Action Plan, 2000). Later, these were slightly modified by the US Army Corps of Engineers in Regulatory Guidance Letter No.02-2, December 24, 2002. We use this 2002 guidance letter for the definition of restoration, enhancement and establishment (creation) and the Clean Water Action Plan for the definition of the two subcategories for restoration: reestablishment and rehabilitation. We adopt them here because these terms enable consistent tracking of wetland conservation activities.

**Restoration:** Re-establishment or rehabilitation of a wetland with the goal of returning natural or historic functions and characteristics to a former or degraded wetland.

Restoration may result in a gain in wetland function and/or acres.

- **Re-establishment** - the manipulation of the physical, chemical or biological characteristics of a site with the goal of returning natural/historic functions to former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres.
- **Rehabilitation** - the manipulation of the physical, chemical or biological characteristics of a site with the goal of repairing natural/historic functions of a degraded wetland. Rehabilitation results in a gain in function but does not result in a gain of wetland acres.

**Enhancement** –activities conducted within existing wetlands that heighten, intensify, or improve one or more wetland functions. Enhancement is often undertaken for a specific purpose such as to improve water quality, floodwater retention, or wildlife habitat. Enhancement results in a change in wetland function(s), but does not result in a gain in wetland acres.

**Establishment (Creation)** – the manipulation of the physical, chemical, or biological characteristics present to develop a wetland on an upland or deepwater site, where a wetland did not previously exist. Establishment results in a gain in wetland acres.

### Assumptions About Wetland Activities and Their Expected Impacts

Figure 1 shows the assumptions we have made in order to sort project data into the general categories of acre gains, losses and acre-neutral projects. We have used straightforward definitions to assign projects into gains and losses of wetland acres. “Acre-Neutral” is a category that we had to create to handle the many projects that take place in existing wetlands and do not result in a loss or gain of acres. This is a catchall category that includes a wide variety of projects, with impacts that can be expected to be positive or negative, or it may not be possible to determine whether the impact will be positive or negative. In order to make the status report

more meaningful within the “acre-neutral” category, we list below our general expectations for whether the impact of types of activities will be positive, negative, or cannot be determined. These are only categorical expectations based on past experience. The impacts of any given project may differ upon investigation, but for tracking and reporting purposes these are the general expectations.

### Expected Impact of Acre Gain type activities

**(+) Re-establishment** of wetland conditions on former wetland results in an acre gain and is expected to be a positive wetland impact.

**(+/-) Creation** of wetland on land that was not wetland in the past (based on lack of hydric soil) results in a gain of acres, if successful; but because the track record of creation projects is poor, we expect that we cannot categorize the impact as always positive. We list the expected impact as “+/-“ meaning the impact could be positive or negative.

### Expected Impact of Acre Losses

**(-) Permitted Fill.** Though federal and state laws require avoidance and minimization of wetland impacts, permitted losses of wetland will have a negative wetland impact.

**(-) Illegal Fill** is expected to be a negative wetland impact. Some illegal fills are reported and enforcement action is taken. These are recorded in the wetland permit database. When resolution of the violation includes restoration, that is also documented. Illegal fills that are not reported cannot be accounted for in our reports. A tracking report will always under-report on the total amount of losses due to wetland fill.

**(-) Drainage** projects are also a cause of wetland loss. Where agricultural commodity supports are not involved, we do not have a mechanism to track the amount of wetland drained. NRCS administers a program for farmers that wish to compensate for converting existing wetlands to non-wetland agricultural land. This data may be available in the future.

### Expected Impact of Acre-Neutral Activities

#### Activities Where Wetland Conservation is Not the Primary Goal

**(-) Permitted Disturbance.** Permits are issued for some temporary disturbances, such as pipeline or transmission line installation, which do not result in loss of wetland acres but likely result in negative impacts. Generally, there is at least a temporary impact and the possibility of a longer term negative impact due to altering soils and hydrology. Long-term impacts of forest fragmentation and loss of forested wetland can be expected where the project requires clearing and maintaining an open corridor through forested wetland. Though these impacts are minimized to the extent practicable, some negative impact can be expected.

**(-) Stormwater Discharge** to wetlands. Stormwater treatment facilities are generally not permitted in wetlands, and treatment of stormwater is required before discharging to

wetlands. Nonetheless, it is well known that stormwater has detrimental effects on wetlands and other waters, so in Figure 1 we list the expected impact to be negative. While the WDNR reviews stormwater plans for compliance with wetland water quality standards, the stormwater database does not record the locations of permitted discharges to wetlands.

## Wetland Conservation Activities

(+) **Enhancement** projects alter wetlands to increase one or more specific wetland functions. However decreases in other functions may occur. For example a wetland could be impounded to increase the amount of open water to benefit waterfowl and anuran species, but this may reduce habitat for other wildlife, such as grassland species, or reduce floristic diversity. While enhancement projects are done for conservation purposes, trade-offs are often involved, making it important to evaluate individual projects outcomes. Further monitoring is needed to report on specific outcomes. For the purposes of this report, enhancements are considered to generally have an overall positive impact on the wetland.

(+) **Rehabilitation** projects can be distinguished from enhancement by their goals and design. Rehabilitation projects are directed toward reversing alterations that have caused degradation of existing wetlands. For example a reed canary grass dominated wetland degraded by partial drainage and sediment delivery from adjacent crop land could be rehabilitated by filling the drainage ditch and removing the sediment to uncover the original hydric soil and release the native seedbank. These projects can be expected to have a positive impact on the wetland.

(+) **Vegetation management** activities are carried out to favor more diverse, native vegetation, by removing or controlling invasive species. This could include prescribed burning or herbicide application. When successful, these activities have a positive impact on the wetland plant community. In contrast to restoration and enhancement, these activities usually are repeated on a long term cycle. Because they are repeated on the same acres periodically, it would be very problematic to track them in our system without double counting.

(+) **Wildlife structures** are artificial structures that provide specific lost habitat elements needed by wildlife. This could include nest boxes or snake boards. The federal HabITS database includes them, but NRCS does not. These are expected to have positive impacts, but they cannot be translated into our acreage-based tracking system so we do not include them.

(+/-) **Type Conversions** are not an activity type, but are an outcome that could be identified by comparing pre-restoration to post-restoration vegetation and hydrology. This requires more effort than we judged we could invest on an ongoing basis in a tracking system, and seems more appropriate as a basic element of future monitoring. The impacts can be positive or negative depending on the pre- and post- wetland type, and consensus on specific cases is elusive. For this reason we list the impacts as +/-.

## Appendix B: Data Tables

Table 1: Activities Affecting Wetlands Conducted in 2007, by WDNR Region

		Northern	West Central	Northeast	South Central	Southeast	Statewide
Acre Loss from Permits Total = 312.11	Permits Database Loss	22.04	37.53	12.52	16.54	13.33	101.96
	DOT Loss	18.81	156.16	23.81	6.65	4.72	210.15
Acre-Neutral Disturbance Total = 225.18	Permits Database Neutral - Disturbance	11.34	9.04	159.02	25.97	19.81	225.18
Acre-Neutral Enhancements Total = 827.27	Permits Database Neutral - Enhancement	69.20	15.90	55.44	317.00	12.82	470.36
	Mitigation Database Neutral Enhancement	0.00	0.00	0.19	0.00	0.00	0.19
	RTD Neutral Enhancement	14.75	4.08	147.41	7.78	2.70	176.72
	CRP Neutral CP9	0.00	14.90	84.6	77.40	3.10	180.00
Acre Gains from Restorations Total = 2788.2	Permits Database Gain	76.70	16.00	9.76	432.15	55.63	590.24
	DOT Gain	0.00	1.14	234.00	252.88	8.36	496.38
	Mitigation Database Gain	0.00	0.00	0.95	0.00	0.00	0.95
	RTD Gain	42.20	326.90	897.07	172.00	20.16	1458.33
	CRP Gain CP23(A)	0.00	72.8	0.00	169.5	0.00	242.3
Total Project Acres	255.04	654.45	1624.77	1477.87	140.63	4152.77	
Existing Mapped Wetland Acres	2,341,701	1,259,442	1,188,990	422,842	219,946	5,432,921	

Table 2: Activities Affecting Wetlands Conducted in 2006 & 2007, by WDNR Region

		Northern	West Central	Northeast	South Central	Southeast	Statewide
Acre Loss from Permits Total = 407.71	Permits Database Loss	33.83	46.74	24.10	25.91	26.98	157.56
	DOT Loss	30.22	161.98	33.10	14.15	10.70	250.15
Acre-Neutral Disturbance Total = 1498.85	Permits Database Neutral - Disturbance	704.83	332.55	242.69	196.79	21.99	1498.85
Acre-Neutral Enhancements Total = 1463.16	Permits Database Neutral - Enhancements	72.12	99.97	61.47	332.08	15.20	580.84
	Mitigation Database Neutral	0.00	1.30	0.19	0.61	0.00	2.10
	RTD Neutral	125.22	16.51	207.51	191.78	18.70	559.72
	CRP Neutral CP9	3.00	27.80	113.70	130.20	45.80	320.50
Acre Gains from Restorations Total = 5392	Permits Database Gain	77.80	23.00	9.76	432.15	56.13	598.84
	DOT Gain	0.00	23.54	360.00	253.24	8.70	645.48
	Mitigation Database Gain	0.00	0.00	0.95	0.00	0.00	0.95
	RTD Gain	147.96	412.89	1220.29	1933.12	62.97	3777.23
	CRP Gain CP23(A)	0.00	78.60	0.00	233.50	57.40	369.50
Total Project Acres		1194.98	1224.88	2273.76	3743.53	324.57	8761.73
Existing Mapped Wetland Acres		2,341,701	1,259,442	1,188,990	422,842	219,946	5,432,921





Wisconsin Department of Natural Resources  
P.O. Box 7921, Madison, WI 53707 • (608) 267-7694  
DNR PUB WT-882-2008



*The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of Interior, Washington, D.C. 20240.*

*This publication is available in alternative format (large print, Braille, audio tape. etc.) upon request. Please call (608) 267-7694 for more information.*