



# Wetland Health Evaluation Program

2010 Final Report ♦ Dakota County, Minnesota





# 2010 Wetland Health Evaluation Program Report Dakota County, MN



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**January 2011**

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## **Acknowledgements**

The following organizations participated in and provided funding for the 2010 Wetland Health Evaluation Program

### **Local Government:**

Dakota County  
City of Apple Valley  
City of Burnsville  
City of Eagan  
City of Farmington  
City of Hastings  
City of Lakeville  
City of Mendota Heights  
City of Rosemount  
City of South St. Paul  
Vermillion River Watershed

### **Special Recognition:**

Mark Gernes, Joel Chirhart, Michael Bourdaghs, John Genet; MPCA Technical Experts  
Paula Liepold, Dakota County WHEP Coordinator  
Mary Karius, Hennepin County WHEP Coordinator  
Mary Kay Lynch, Co-Citizen Monitoring Coordinator  
Carolyn Dindorf, Katie Farber, Connie Fortin, Kseniya Voznyuk; Fortin Consulting

### **Cover design by:**

Paula Liepold

Special thanks to all of the WHEP volunteers who donated their time and were out in the wetlands or behind the microscopes.

*For more information on the Dakota County Wetland Health Evaluation Program or for a copy of this report, please contact the Dakota County Water Resources Department or visit [www.mnwhep.org](http://www.mnwhep.org).*

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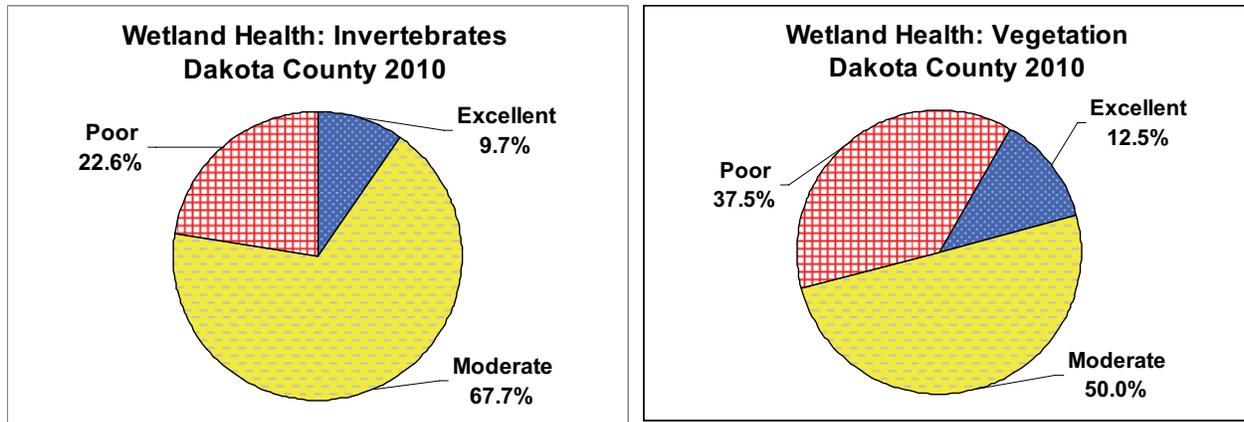
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# Executive Summary

## Dakota County Wetland Health Evaluation Program 2010

Dakota County began sponsoring the Wetland Health Evaluation Program (WHEP) in 1997. Since then, 146 wetlands have been monitored by many volunteers across the County. In 2010, ten cities participated in WHEP, monitoring 32 different wetlands. Several wetlands were monitored for the first time in 2010. Trained volunteers collected data on the macroinvertebrates (insects and other small animals without backbones) that live in the wetlands as well as the vegetation (plants) in the wetlands. The plants and invertebrates identified by the volunteers were then used to calculate an Index of Biotic Integrity (IBI). This IBI can be used to provide an estimate of the health of each wetland.

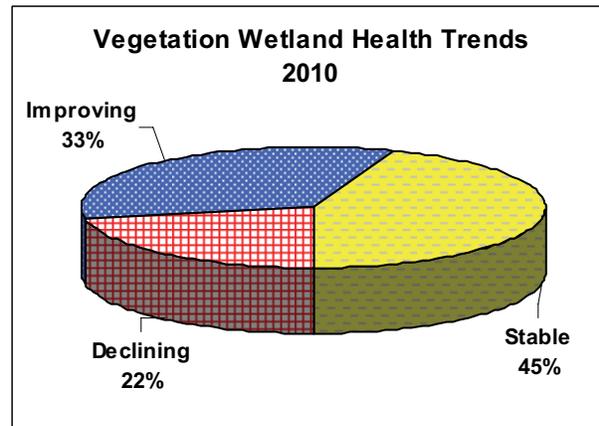
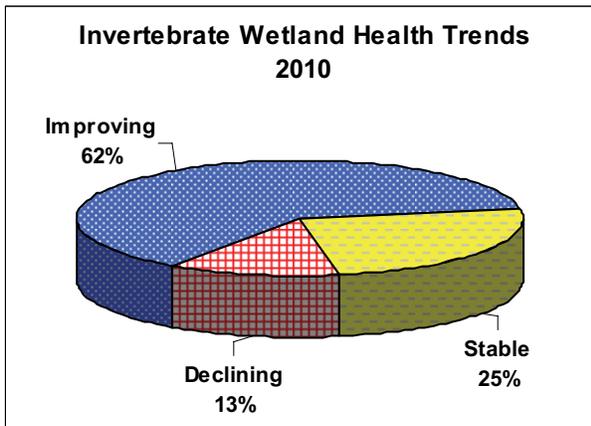


The results of the monitoring for 2010 showed a variety of wetland conditions. The Index of Biotic Integrity was used to determine wetland health ranging from poor to excellent. The majority of wetlands were in the moderate category for both macroinvertebrates and vegetation. Approximately ten percent rated excellent for invertebrates while almost thirteen percent rated excellent for vegetation. Fewer invertebrate scores rated excellent in 2010 than in 2009. Also, there were no vegetation scores that rated excellent in 2009.

The City of Burnsville had both the highest and lowest vegetation scores in 2010: Crystal Lake West (B-1) rated the highest vegetation score (35) and Crosstown West (B-9) rated the lowest vegetation score (9). Sunset Pond (AV-19) in Apple Valley, LeVander Pond (SSP-3) in South St. Paul, and Mare Pond South (R-22) in Rosemount all tied with the highest invertebrate scores (24). The City of Lakeville's 394W (L-10) wetland had the lowest invertebrate score (6).

A trend analysis was conducted for all of the wetlands monitored in 2010 that had enough data to analyze trends. For invertebrates, 62% of wetlands appear to be improving while 13% are declining. For vegetation, 33% of the wetlands showed improved wetland health while 22% are declining. See graphs on next page.

Several analyses were done to try to identify some of the causes of wetland health conditions found. IBI scores were compared to impervious area of the watershed, wetland alterations and presence of invasive species (a new analysis for 2010). No significant relationship was found between impervious area and IBI scores for both invertebrates and vegetation. There were some statistically significant findings for IBI scores versus wetland alteration. Vegetation scores for natural wetlands were significantly different than those for altered by stormwater input and created wetlands. No statistically significant relationship was found between IBI scores and invasive species cover.



**2010 Dakota County Wetland Health Trends\***

\*excludes wetlands that did not have adequate data for trend analysis

In 2010, ninety-eight Dakota County WHEP volunteers donated 1,700 hours in training, sample collection and sample identification in completion of this valuable monitoring. It gives citizens an opportunity to study the wetlands in their communities and see the impacts of human disturbance on our wetlands, and it provides valuable data to the cities and County. The data collected by the WHEP volunteers can be used for many purposes such as, to help track changes in wetlands over time and relate to changes in the watershed, help identify high quality wetlands that may need protection, track changes in wetland health with restoration projects, evaluate the success of wetland creation or impacts of new stormwater input, and to help find invasive species that threaten the wetlands. WHEP is a great example of a successful cooperative program between citizens, cities, counties and state government.

# 1.0 Background

## 1.1 The Wetland Health Evaluation Program (WHEP)

The Wetland Health Evaluation Program (WHEP) is a volunteer monitoring program for wetlands. Developed in 1997, WHEP uses sampling methods and evaluation metrics developed by the Minnesota Pollution Control Agency (MPCA) to evaluate wetland health (Appendices A and B). The metrics are based on species diversity and richness for both vegetation and macroinvertebrate. Citizen teams, led by a trained team leader with education and/or work experience in natural resources, conduct the sampling.

WHEP got its start at the MPCA in the 1990s, when Mark Gernes and Judy Helgen were separately developing biological indexes to measure wetland health using grants from the US Environmental Protection Agency (US EPA) at the MPCA. Mark's biological index was based on wetland plants, Judy's on invertebrates. Developing chemical standards for measuring pollution in wetlands seemed impossible then, so they pushed for the biological approach, as did US EPA.

Wetlands are generally not viewed as having the same status as streams and lakes. The Wetland Conservation Act helps maintain the number and acreage of wetlands in Minnesota, but often the quality of the wetlands is not protected. MPCA staff recognized that they could teach citizens how to evaluate wetlands and they could convince their local governments to protect the water quality as reflected by the diversity of organisms and plants that thrive in healthy wetlands.



Judy Helgen, Program co-founder



Mark Gernes, Program co-founder

In 1996, the MPCA partnered with Minnesota Audubon, forming a large contract with them (with EPA funds) to help start WHEP. Audubon handled the logistics for the various training sessions and organization of the original teams of volunteers linked to six communities in Scott County. Mark and Judy provided the training and developed the guides for sampling protocols and identifications based on MPCA's more technical biological indexes.

Wetland sampling efforts began in 1997 in Dakota County. During 1998-2000, the program was managed by the Dakota Environmental Education Program. During these years, the project was funded by various sources, including the US EPA grant, Minnesota Legislature (LCCMR grant), and participating cities. Gradually, the number of cities participating in WHEP increased under the leadership of Charlotte Shover and Dan Huff, and now Paula Liepold at Dakota County, and others in Hennepin County. Up to eleven cities/citizen teams have participated in the project in Dakota County. MPCA continues to provide the training, but the organization of teams and other logistics are handled by the counties and communities.

Hennepin County joined the project in 2001, and began co-managing with Dakota County in 2002. Dakota County, the Vermillion River Watershed, and the participating cities provide funding for Dakota County WHEP. Today, the program is strong and thriving in both Dakota and Hennepin Counties, setting an example for the nation in volunteer wetland monitoring.

## **1.2 Why Monitor Wetlands?**

Why are we sampling the plants and critters that live in wetlands? Many aquatic invertebrates (animals without a backbone that live in water) spend much or most of their life living in wetlands. Because these animals are exposed to the conditions within the wetland for a period of time, they serve as indicators of the health of the wetland. Some are more sensitive to pollution and habitat conditions than are others. Aquatic plants also respond to wetland conditions. Different plants are found in different water quality and bottom conditions. If we evaluate what is living in a wetland, we can assess its general condition. When the same wetlands are monitored over time, the data can also be used to track changes in wetland health.

The information collected by the WHEP volunteers can be used by decision makers to help identify the highest quality wetland resources and identify those that have been negatively impacted. More information is available to help with decisions regarding development, transportation corridors, and other areas that may affect our water resources. For example, wetlands ranked as excellent may receive more protection. Cities can use this information to evaluate the overall success of creation or restoration projects or to evaluate the impact of new stormwater inputs.

Citizen volunteers are an essential component to WHEP's success. Each season, volunteers are relied upon to provide important data on the health of wetlands in their communities. The data collected is used by the cities, counties, and the State of Minnesota to better plan and protect these environments.

According to Iowater, Iowa's volunteer monitoring program, there are 17 states in the United States with a functioning volunteer wetland monitoring program. Most of these programs are less than ten years old. Minnesotans can be proud to be one of the leaders in understanding and protecting these often overlooked and undervalued water resources.

Although ten million acres of wetlands remain, Minnesota has lost approximately 50 percent of its wetlands since it became a state. Throughout the country, wetlands are being lost due to agriculture, development, and road expansion. Wetlands play a vital role in ecosystems by filtering runoff for ground water, absorbing rain and snowmelt before flooding, providing habitat for mammals, birds, amphibians, reptiles, and many other organisms, and creating beautiful views for our own recreation. Since the adoption of the Minnesota Wetland Conservation Act, Minnesota has worked to maintain no-net-loss of wetlands.

Everyone involved in Minnesota WHEP past, present, and future can be pleased with their contribution, and rewarded with increasingly healthier wetland ecosystems to enjoy for years to come.

## **1.3 Wetland Types**

Wetlands make up about 6.5 percent (24,501 acres) of the total area in Dakota County. Using the Circular 39 classification system, eight different wetland types are recognized in Minnesota. A description of each type and estimates of acreage are listed below. Two additional wetland categories are included in the total, riverine (between banks) and industrial/municipal (dike-related impoundments). WHEP focuses on the open water wetlands, types 3, 4 and 5.

### **Type 1 – Seasonally Flooded Basin or Flat: 5,995 acres**

Seasonally Flooded Basins or Flats are fully saturated or periodically covered with water, usually with well-drained soils during much of the growing season. The vegetation varies from bottomland hardwoods to herbaceous plants depending on the season and length of flooding.

**Type 2 – Wet Meadow:** 551 acres

Wet Meadow wetlands usually do not have standing water, but have saturated soils within a few inches of the surface during the growing season. Grasses, sedges, rushes, and various broad-leaved plants dominate Wet Meadows. Common sites include low prairies, sedge meadows, and calcareous fens.

**Type 3 – Shallow Marsh:** 12,491 acres

Shallow Marsh wetlands often have saturated soils and six inches or more standing water during the growing season. Grasses, bulrush, spike rush, cattail, arrowhead, pickerelweed, and smartweed often grow in these wetlands.

**Type 4 – Deep Marsh:** 778 acres

Deep Marsh wetlands often have inundated soils and six inches to three feet or more standing water during the growing season. Cattail, reed, bulrush, spike rush, and wild rice grow in these wetlands. Pondweed, naiad, coontail, watermilfoil, waterweed, duckweed, water lily, and spatterdock can often be found in the open water areas.

**Type 5 – Shallow Open Water:** 1,213 acres

Shallow Open Water wetlands have standing water less than 10 feet deep. These wetland types include shallow ponds and reservoirs. Emergent plants are often found in these areas.

**Type 6 – Shrub Swamp:** 1,188 acres

Shrub Swamp wetlands are often covered with up to six inches of water, and the soils are usually completely saturated. The water table is usually at or near the surface of these areas. Alder, willow, buttonbush, dogwood, and swamp privet inhabit these areas.

**Type 7 – Wood Swamp:** 1,859 acres

Wood Swamp wetlands often have one foot of standing water, and the soils are completely saturated during the growing season. The water table is usually at or near the surface of these areas. Hardwood and coniferous swamps contain tamarack, northern white cedar, black spruce, balsam fir, balsam poplar, red maple, and black ash.

**Type 8 – Bogs:** 0 acres

Bogs are often supplied by the water table being at or near the surface of these areas. The acidic peat soils are usually saturated. Heath shrubs, sphagnum mosses, sedges, leatherleaf, Labrador tea, cranberry, and cottongrass dominate bogs.

**Riverine:** 52 acres

Wetlands associated with rivers and found between the river banks.

**Municipal/Industrial:** 374 acres

Municipal/Industrial wetlands include diked areas.

**Total wetland area in Dakota County:** 24,501 acres

Many federal and state agencies are involved in wetland regulation, protection, and restoration. In Minnesota, the state wetland regulations are overseen by the Board of Water and Soil Resources and Department of Natural Resources. To learn more about regulations and programs that affect or protect wetlands, visit [www.bwsr.state.mn.us](http://www.bwsr.state.mn.us) and click on wetlands. Many cities, watershed organizations and counties have adopted local administration of the state Wetland Conservation Act.

## 1.4 Dakota County Wetland Monitoring

There are many hands involved in the success of the Dakota County Wetland Health Evaluation Program (WHEP). It is invaluable to have a dedicated and enthusiastic group of people working together to continue the success and growth of the program each year.



Paula Liepold

Paula Liepold is the Dakota County WHEP Coordinator. She enjoys coordinating the program "because I know the volunteers and participants have a passion for understanding the health of area wetlands. They are committed to learning about wetland health and confident in sharing the results with decision-makers. I am proud of the tradition and history of Dakota County's Wetland Health Evaluation Program. The program attracts participation from over 100 volunteers and team leaders, many of whom have supported WHEP for several years and have involved one or more family members as volunteers. WHEP volunteers, trained by Minnesota Pollution Control Agency (MPCA) biologists, use professionally-developed sampling protocols and quality assurance measures, and bring commitment, enthusiasm, and scientific integrity to the program. Through training, monitoring wetlands, and identifying plants and macroinvertebrate species, volunteers are converted into citizen biologists. When volunteers assess the health of wetlands on behalf of their city, they not only provide extra workforce, but also serve as

advocates for protecting wetlands." She adds, "Wetlands are more important than many people think. But ask any WHEP volunteer, and they will tell you how important wetlands are for providing a habitat for animals and plants, controlling floods, and improving water quality by filtering sediments and nutrients. They also know that wetlands are often prime bird watching, photography, and hiking destinations. WHEP volunteers have learned why we monitor wetlands for macroinvertebrates and plants, and what the data tells us about the condition, or health, of the wetland. They are collecting reliable data that city water resource professionals look forward to each year."



Mary Kay Lynch

Mary Kay Lynch is the WHEP Field Monitoring Coordinator. She has a master's degree in biology and taught biology for 22 years, 20 of which were in Dakota County. She was a team leader in the pilot program as it was developed by Judy Helgen of the MPCA. She served as the Burnsville team leader for five years when the program began in Dakota County. She says, "Whenever I have thoughts of retiring from WHEP, it seems there is a news piece in the paper or on TV discussing the importance of wetlands. I can't tolerate the thought of not doing something to try to recognize and protect them. There is much to do! The dedication of the volunteers is an inspiration and their efforts and enthusiasm represent hope for our wetlands."

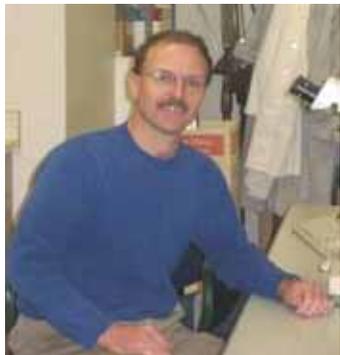
## 2.0 Methods

### 2.1 Training

Training for citizen monitors is arranged by Dakota and Hennepin Counties and taught by technical experts from the MPCA. Both classroom and field sessions are held. Training is provided on vegetation plot selection/sampling and invertebrate sampling (dip netting and setting/retrieving bottle traps). Volunteers learn to identify the vegetation and macroinvertebrates during laboratory identification sessions which cover sampling protocol, key characteristics for invertebrate and plant identification, as well as hands-on identification of live and preserved specimens. For a more detailed explanation of the methods used in WHEP, visit [www.mnwhep.org](http://www.mnwhep.org).



### Vegetation and Invertebrate Experts

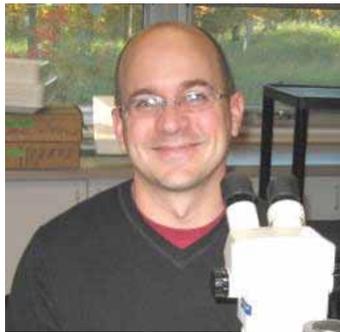


Mark Gernes



Michael Bourdaghs

Part of the success of WHEP is due to the great assistance provided by the knowledgeable team of experts from the MPCA. Mark Gernes and Michael Bourdaghs provide WHEP vegetation training and technical assistance. Joel Chirhart and John Genet provide WHEP macroinvertebrate training and technical assistance.



Joel Chirhart



John Genet

Mark Gernes commented, "The Wetland Health Evaluation Program opens new educational horizons for people interested in wetlands. WHEP serves as an outstanding framework for citizen science (volunteer monitoring). It provides high quality wetland biological data to aid local cities in better protecting and managing the quality of targeted wetlands in their city."

The MPCA staff support WHEP and have been very helpful in making WHEP a success.

### 2.2 Data Collection

In order to use the data to interpret the health or condition of the wetlands, a scoring process called the Index of Biological Integrity (IBI) is used. Separate IBIs are calculated for plants and macroinvertebrates. Several measures, referred to as metrics, are used to calculate an IBI. The IBI scores are categorized into poor, moderate or excellent. Biological integrity is commonly defined as "the ability to support and maintain a balanced, integrated, and adaptive community of organisms having a species composition, diversity and functional organization comparable to those of natural habitats within a region" (Karr, J. R. and D. R. Dudley. 1981. Ecological perspectives on water quality goals. Environmental Management 5: 55-68). Biological integrity is equated with pristine conditions, or those conditions with no or minimal disturbance (U.S.EPA [www.epa.gov/bioindicators/html/about.html](http://www.epa.gov/bioindicators/html/about.html)). Each

city participating in WHEP has identified “reference” wetlands, those that are believed to be minimally disturbed and represent the most pristine conditions within the city.

### ***Vegetation Index of Biological Integrity (IBI)***

Vegetation is analyzed using a 100 square meter releve plot. All species within the sampling plot are identified to the genus level, and documented on the field data sheet. Vegetation is divided into categories based on their ecological function or relationship. The categories include nonvascular, woody, grass-like and forbs. The forbs are further subdivided into various submergent and emergent categories. The number and coverage of genera identified are then evaluated using the metrics developed by MPCA.



The methodology and evaluation for the vegetation IBI has remained relatively consistent throughout the project. However, the persistent litter metric calculation was revised in 2004 to reflect average cover values as compared to maximum cover values. In 2005, minor changes to the data sheets were implemented to reduce the number of transcription errors. The scoring criteria were adjusted slightly to better represent vegetation diversity. Previous changes in methodology have been documented in earlier summary reports.

### ***Macroinvertebrate IBI***

Macroinvertebrates (small aquatic animals with no backbone) are analyzed by collecting samples using six bottle traps and two dip netting efforts combined to represent one sample. The invertebrates are then identified to the genera or “kind” level. Generally, the invertebrates evaluated are macroinvertebrates and include leeches, bugs and beetles, dragonflies and damselflies, caddisflies, mayflies, fingernail clams, snails, crustaceans and phantom midges. The number of genera or kinds identified is then evaluated using the metrics developed by MPCA.



**Dragonfly** Graphic: MPCA

Several changes have been made to the data collection and metrics for the invertebrate IBI over the duration of the project. There were no modifications to the methods after 2004. Previous changes in methodology have been documented in earlier summary reports.

Blank data sheets and equipment lists can be found at [www.mnwhep.org](http://www.mnwhep.org).

## **2.3 Spot Checks and Quality Control**

Each city is responsible for evaluating one wetland in another city as a means of providing a spot check. The citizen spot check provides a second sample for the selected wetland. The purpose of the spot check is to determine if two different samples provide similar results for the vegetation and invertebrate IBI. Large wetlands and wetlands with complex plant communities may have different site scores, depending on where the samples are collected. The Citizen Monitoring Coordinator (Mary Kay Lynch) provides advice regarding proper sampling methods and proper site selection. Fortin Consulting provided Quality Control (QC) review of the completed data sheets in 2010. This review identifies and corrects errors in scoring, transfer of data, and data analysis.



Connie Fortin, Carolyn Dindorf,  
Katie Farber, Kseniya Voznyuk,  
Caitlin Fortin, Roman Rowan

Fortin Consulting (FCI), the technical expert, provides quality assurance and report preparation. FCI has been working with Dakota County on the WHEP program since 2007. FCI conducts QC checks on the wetlands sampled by reviewing the vegetation sample plot that was selected and evaluated by the citizen team. FCI also checks the invertebrate identification of the citizen team for the invertebrate IBI; therefore, the invertebrate QC is not a

second invertebrate sample of the same wetland site, but a review of the sample collected and evaluated by the citizen team.

Over the duration of the project, the work of each citizen team has been reviewed on a rotational basis. The technical expert reviews 10 percent of the vegetation plots and one invertebrate collection from each team. In 2010, Fortin Consulting cross-checked the vegetation plots of three wetlands, one in Hastings, Lakeville, and Rosemount: H-6, L-7, and R-21. The purpose of the checks is to determine if the data being collected by the citizen team is accurate and complete, to verify and correct the samples, and to help the teams better interpret their data and strengthen their vegetation and invertebrate identification. The tables and graphs in Section 4.0 include the corrected data from both the scoring checks and the technical quality control checks; it is the City team’s data with any corrections found during the data transfer and mathematical checks, and the field vegetation and invertebrate identification checks conducted by Fortin Consulting. Data for the cross-check’s conducted by another City team is presented in Section 3.2.

## 2.4 Wetland Scores and Quality Ratings

Each metric, or measure, is evaluated based on the specimens identified and given a score of one, three or five points. The scores for each metric are then combined to get a total score for the IBI. Table 2-1 illustrates the scoring range for each IBI, the corresponding quality rating, and the scores in percent form.

**Table 2.1 Interpretation of site IBI scores.**

INVERTEBRATE IBI SCORE INTERPRETATION			VEGETATION IBI SCORE INTERPRETATION		
Point Scores	Quality Rating	Percent Score	Point Scores	Quality Rating	Percent Score
6 – 14	Poor	<50%	7 – 15	Poor	<46%
15 – 22	Moderate	50 – 76 %	16 – 25	Moderate	46 – 74%
23 – 30	Excellent	>76%	26 – 35	Excellent	>74%

The ratings (poor, moderate, and excellent) are useful to give the wetland a qualitative description, which can make it easier to describe the overall quality of the wetland. A wetland described as having poor quality would have low species richness (number of species) and diversity and a large number of the species would likely be pollution tolerant. A wetland of excellent quality would have high diversity and species richness and would include species that are sensitive to pollution or human disturbance. It should be noted that the invertebrate and vegetation IBIs have slightly different ratings based on the scoring range. This is due, in part, to the number of metrics evaluated in each IBI: six for the invertebrate IBI and seven for the vegetation IBI.

Converting IBI scores to percentages allows for the ability to compare the site scores over several years. Thus, the trend in the vegetation or invertebrate IBI can be evaluated. Additionally, the percent scores allow comparison of the IBI results for a given year. This may be helpful to determine if the scores are consistent, and to determine if additional data collection or more intensive evaluation is necessary to characterize the wetland.

IBI point scores can be used to directly compare sites for a given year; however, they cannot be used to compare sites from year to year because:

- The 1998 invertebrate IBI was scored using seven metrics as compared to the six that have been used in 1999 until present.
- The ranges used to determine the quality rating have been modified since 1998 and numerous scoring sheet and metric modifications have been occurring as well.
- The total possible score is not the same for the two IBIs (vegetation IBI has seven metrics with a possible 35 point score while the invertebrate IBI has six metrics with a possible 30 point score).

## **2.5 Using the Data**

Biological data can be difficult to interpret and use. Converting the data collected to metrics and indexes is helpful in interpreting and presenting the data. The methods used in WHEP allow one to identify wetland health conditions. However, they do not determine the cause of poor wetland health. Once a condition of poor wetland health is identified and confirmed, additional testing and analysis of the wetland may be necessary to further define the problem. For example, monitoring of dissolved oxygen may be appropriate. To identify the cause of poor wetland health, analysis of surrounding land use, stormwater inputs and other potential stressors is the next step.

For those wetlands identified as having excellent wetland health, local governmental organizations may choose to adopt requirements to provide protection to these wetlands in order to maintain wetland health. Where poor wetland health or declining trends are indicated, steps may need to be taken to help reverse the trend. Best management practices (BMPs), actions taken to reduce pollutant loading or stressors to the wetland, may need to be implemented within the wetland or in the surrounding watershed.

When BMPs are implemented, biological monitoring can be used to help track the impacts of the BMPs on the wetland. Continued monitoring can identify a change in trend or improvement in a wetland.

## 3.0 General Results and Recommendations

### 3.1 2010 Sampling Season Results

During the 2010 sampling season, eight citizen teams monitored 32 wetlands in ten cities in Dakota County (Apple Valley, Burnsville, Eagan, Farmington, Hastings, Lakeville, Mendota Heights, Rosemount, South St. Paul, and West St. Paul). Eight of these wetlands were sampled twice through citizen spot checks. Three wetland vegetation samples and eight invertebrate samples were checked for accuracy through the Fortin Consulting quality control check.

**Figure 3.1.1 Dakota County Wetland Ratings**

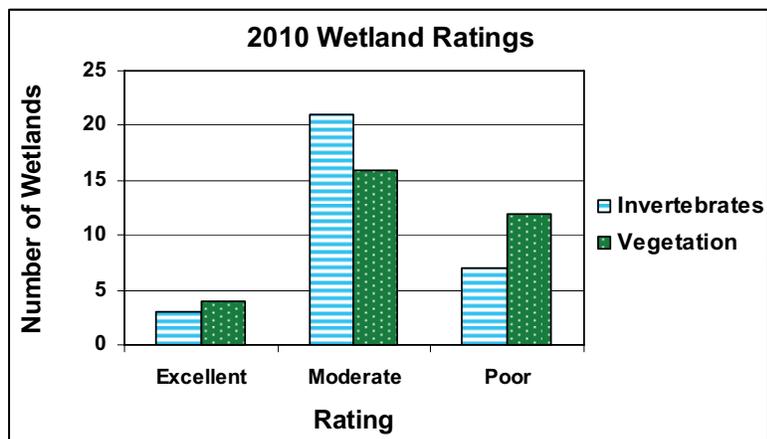


Figure 3.1.1 and Table 3.1.1 show the vegetation and invertebrate ratings for all of the wetlands assessed during the 2010 sampling season. Based on vegetation scores, four of the wetlands rated excellent, 16 of the wetlands were rated moderate, and 12 rated poor. Vegetation scores ranged from nine to 35 out of a maximum of 35 points. The wetlands rated excellent included: Crystal Lake West (B-1), Kraemer (B-3), Lily Pond (E-29), and Copperfield (MH-2).

The invertebrate analysis resulted in three wetlands rating excellent, 21 rating moderate and seven poor. One of the wetlands (F-1) could not be sampled due to dry conditions. Invertebrate scores ranged from 6 to 24 out of a maximum of 30 points. The wetlands rated excellent included, Sunset Pond Park (AV-18), Levander Pond (SSP-3), and Mare Pond South (R-22). Several of the sites showed different ratings for vegetation versus invertebrates. In general, vegetation scores were lower than invertebrate scores. There are different factors that may be influencing the plant and invertebrate communities in each wetland. Possible factors affecting wetland quality are described in the next section.

**Table 3.1.1 Wetland Ratings by City Based on IBI Scores**

Values are listed as number of wetlands rated in each category for Invertebrates/Vegetation

City	Poor	Moderate	Excellent
Apple Valley (AV)	0/1	3/3	1/0
Burnsville (B)	1/1	3/1	0/2
Eagan (E)	1/1	3/2	0/1
Farmington (F)	2/3	0/0	0/0
Hastings (H)	2/2	2/2	0/0
Lakeville (L)	1/2	3/2	0/0
Mendota Heights (MH)	0/0	2/1	0/1
Rosemount (R)	0/0	3/4	1/0
South Saint Paul (MH)	0/2	1/0	1/0
West Saint Paul (MH)	0/0	1/1	0/0
<b>Totals</b>	<b>7/12</b>	<b>21/16</b>	<b>3/4</b>

Figures 3.1.2 and 3.1.3 show the distribution of wetland health ratings for each of the sites monitored in 2010.

Figure 3.1.2

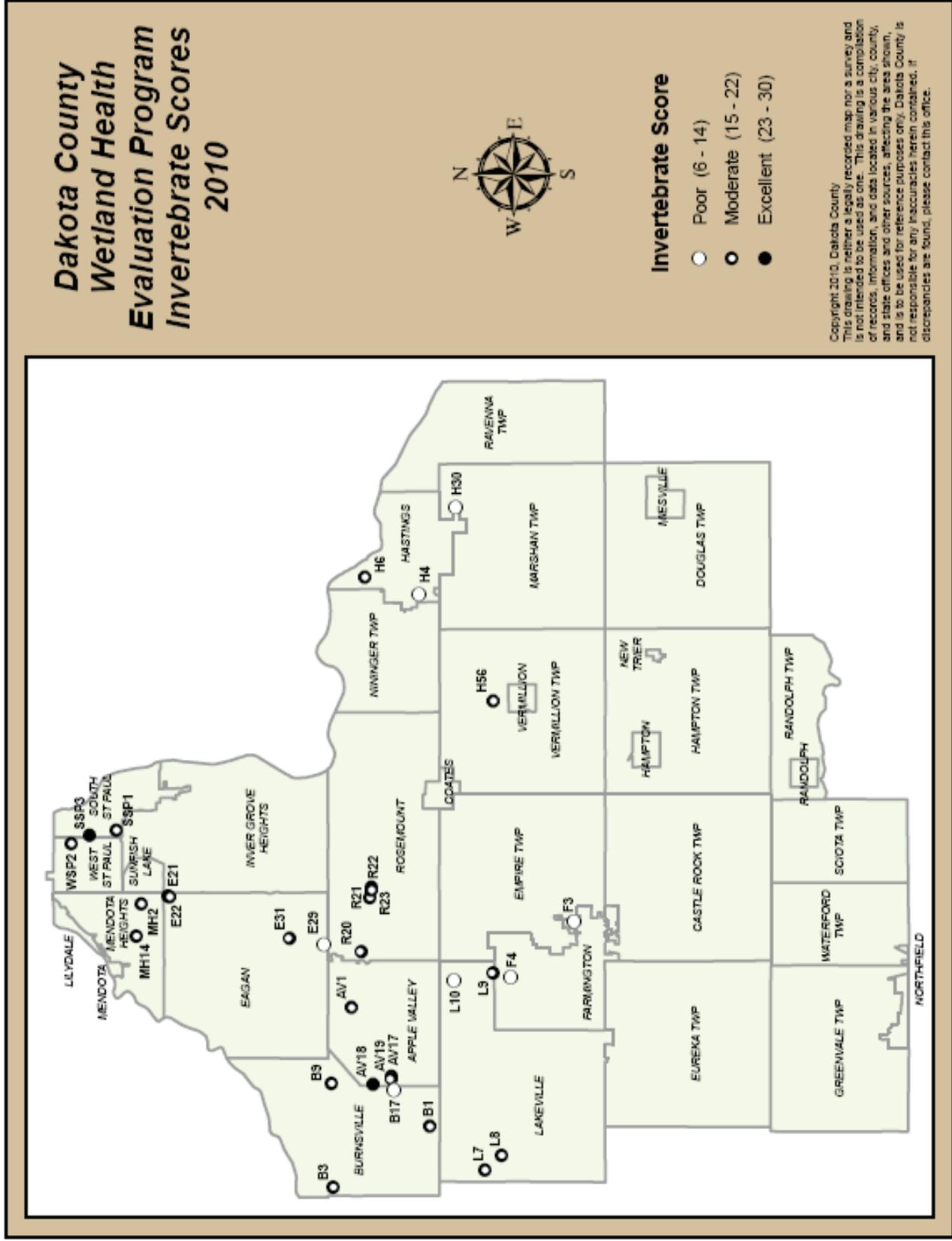
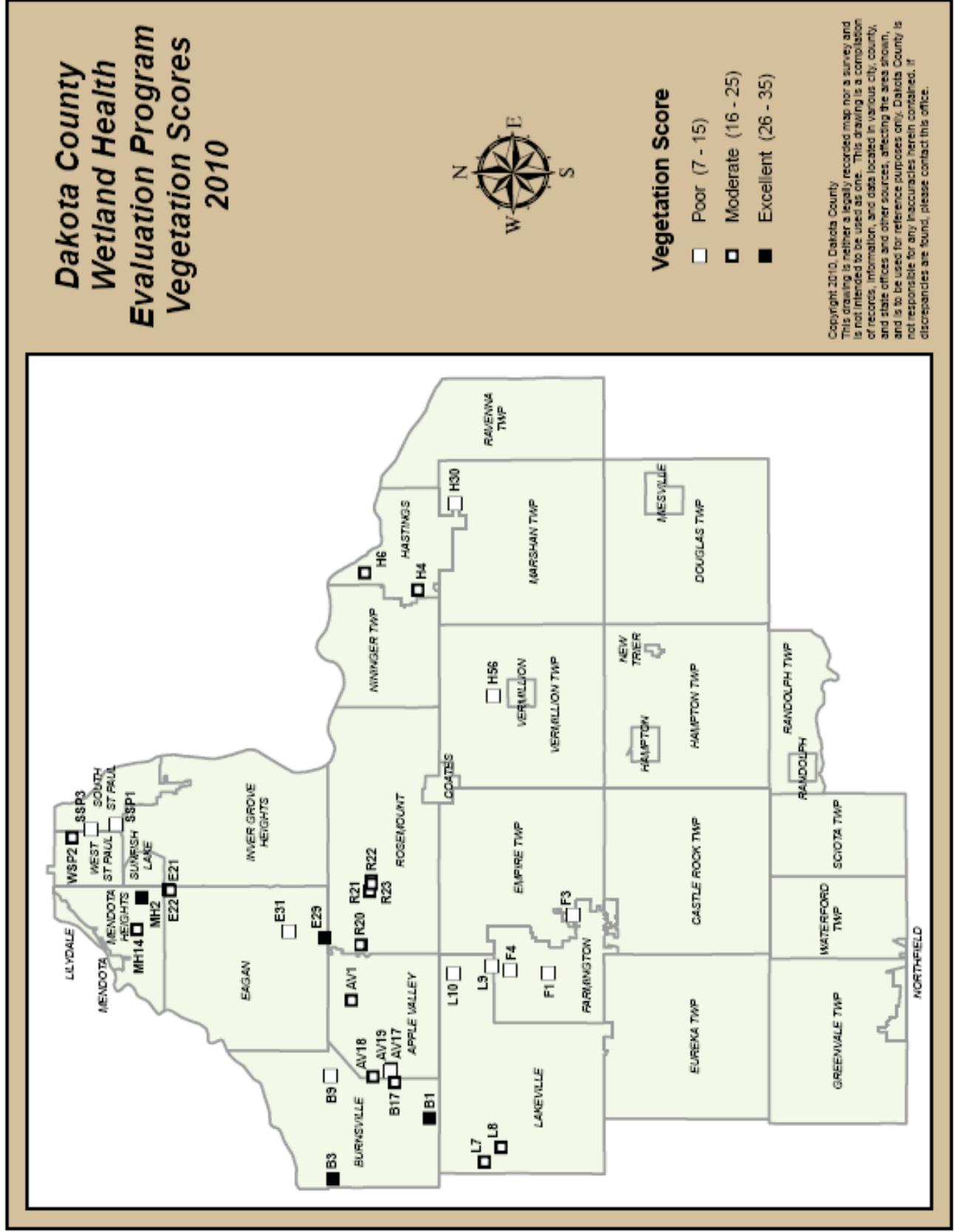


Figure 3.1.3



### 3.1.1 Natural versus Altered Wetlands

In an attempt to help identify why there are differences in wetland quality, different factors that impact the wetlands were evaluated. Wetlands were classified as natural, altered by stormwater input, or created based on information provided in the site identification form or from city staff. The most recent data since 2008 was used. Average IBI scores for each of the three categories were calculated. In the past, WHEP team leaders have commented that the created wetlands seem to exhibit poorer insect diversity. The most recent data (2008-2010) indicates natural wetlands scored higher for both invertebrates and vegetation (Table 3.1.2). An analysis of variance (ANOVA) was completed to determine if the differences were statistically significant. For invertebrates, there was no significant difference between the scores of all three categories, or between each of the three different categories of wetlands. Average scores for the natural wetlands showed the best invertebrate health, but there was no statistically significant difference between natural and other wetlands.

For vegetation, the natural wetlands scored the highest on average. For purposes of this analysis, the low score of 11 for Cam Ram (B-2) from 2008 was removed as a possible outlier. It does not fit with the other data and seems artificially low. Natural wetlands scores were significantly different than both the created and stormwater wetland scores. However, the created and stormwater wetland scores were not significantly different from each other. There also was a statistically significant difference between the scores for all three categories together.

The analysis of variance findings for invertebrate and vegetation were the same as found last year. It is not surprising that natural wetlands would support the richest and most diverse invertebrate and plant communities. We do not restore insect communities in our restored wetlands and it seems like they are having a difficult time re-colonizing the new wetlands. Stormwater altered wetlands tend to have a greater short-term bounce (increase or decrease in water level) and more frequent fluctuations than natural wetlands. They are also inundated with pollutants found in stormwater. Created wetlands likely receive stormwater and thus would have some of the same impacts as stormwater wetlands. These factors are also likely to affect the type and diversity of plants found in the wetlands. At this time, there is no statistical data indicating a decreased invertebrate community in natural versus disturbed wetlands.

**Table 3.1.2 Most Recent IBI Scores (2008-2010) of Created, Stormwater and Natural Wetlands**

Wetland	Invertebrates			Vegetation		
	Created Wetlands	Stormwater wetlands	Natural Wetlands	Created Wetlands	Stormwater wetlands	Natural Wetlands
AV-1		18			23	
AV-8		16			23	
AV-12		16			11	
AV-13		22			13	
AV-14		12			9	
AV-15		10			13	
AV-16		Na			17	
AV-17			18			19
AV-18		24			17	
AV-19			22			15
B-1			22			35
B-1 Alt.			15			23
B-2			na			11
B-3		22			27	
B-6		22			17	
B-9		18			9	
B-11		16			13	

Wetland	Invertebrates			Vegetation		
	Created Wetlands	Stormwater wetlands	Natural Wetlands	Created Wetlands	Stormwater wetlands	Natural Wetlands
E-10		20			19	
E-21		20			19	
E-22		20			17	
E-25		16			19	
E-26		14			15	
E-27		18			21	
E-28		16			21	
E-29			12			27
E-31		20			13	
F-1		Na			13	
F-3		10			11	
F-4	8			11		
H-4	14			19		
H-6		22			23	
H-30	14			13		
H-56		22			11	
L-4	14			15		
L-7		22			25	
L-8			20			19
L-9	22			15		
L-10			6			13
MH-2		22			27	
MH-13		20			21	
MH-14		22			25	
R-1		20			19	
R-2		28			17	
R-4		16			15	
R-14			22			25
R-18			26			19
R-20		18			19	
R-21	20			21		
R-22		24			25	
R-23	20			21		
SSP-1		16			13	
SSP-3		24			13	
WSP-2		16			17	
<b>Average</b>	<b>16</b>	<b>19</b>	<b>23</b>	<b>16</b>	<b>17</b>	<b>21</b>

*Note: For an interpretation of scores, please see page 7.*

### 3.1.2 Affect of Invasive Species on Wetland Health

Many of the WHEP wetlands have been found to contain invasive species. Purple Loosestrife (*Lythrum salicaria*) and Reed Canary Grass (*Phalaris arundinacea*) are two common wetland invaders. Invasive species are a problem in that they tend to take over a wetland, shading out the diversity of wetland vegetation that belongs in the wetlands. Reductions in plant species diversity can result in lower diversity in the invertebrate community. Purple Loosestrife was found in 22% of the wetlands, and Reed Canary Grass in 88% of the wetlands monitored in 2010. Purple Loosestrife will grow in deeper water than Reed Canary grass, which can grow in both upland and wetland conditions. To determine if there is a relationship between invasive species cover and IBI, linear regressions were performed on the data. No statistically significant relationship was found between the cover of invasive species and IBI. If invasive species spread significantly at some sites in the future, the IBI for those sites may be negatively affected.

### 3.1.3 Impervious Area in the Watershed

Data on percent impervious area (hard cover such as streets, parking lots and rooftops) in the watershed was compiled for each wetland based on the site identification forms submitted by each city. Wetlands with higher impervious areas in the watershed, such as roads, parking lot, rooftops and driveways, likely receive more runoff and pollutants. Impervious areas ranged from zero to 55% (Table 3.1.3). Studies have shown that stream degradation occurs at low levels of imperviousness (about 10%)<sup>1</sup>. A similar relationship may exist for wetlands too. Linear regressions completed in previous reports have not shown any relationship between imperviousness and IBI scores. The majority of the sites have impervious areas that exceed the 10% threshold. However, there are a few that are below 10%. IBI means for those sites with 10% impervious area in the watershed were compared to those with greater than 10% impervious area. There was no statistical difference between the scores. Watershed impervious area is likely a factor affecting wetland vegetation and invertebrate life, but there are other factors that are impacting these communities.

<sup>1</sup>Schueler, T. 2000. The Importance of Imperviousness, Article 1 in The Practice of Watershed Protection. Center for Watershed Protection. Ellicott City, MD.

**Table 3.1.3 Wetland and Watershed Data for 2008-2010**

Site ID	Site Name	Wetland size (Acres)	Watershed Size (Acres)	% Imperv	Invert. Score	Veg. Score
AV-1	Hidden Valley	2	21	35	18	23
AV-8	Chaparral Pond	1.5	110	30	16	15
AV-12	EVR-P12 Public Water	5.7	571	25	16	11
AV-13	EVR-P14	3.6	26	25	22	13
AV-14	EVR-P43, Apple Valley East Park	0.8	2738	35	12	9
AV-15	Carrollwood	1.2	398	30	10	13
AV-16	Nordic Park	1	17	25		17
AV-17	AL-P9.1 Alimagnet Lift Station Chain of Ponds	0.25	7	20	18	19
AV-18	Sunset Park Pond	1	252	30	24	17
AV-19	AL-P9.3 Alimagnet Lift Station Chain of Ponds	0.25	28.5	25	22	15
B-1	Crystal Lake West	0.9	4	0	22	35
B-1 Alt	Crystal Lake West Alternate	6	550	0	15	23
B-2	Cam Ram	0.41		0		11
B-3	Kraemer	30	415	30	22	27
B-6	Alimagnet East/Dog Park	2.5	34	15	22	17
B-9	Crosstown West	7.2	388	50	18	9
B-11	Valley View	1	80	10	16	13
B-13	Sunset Lake	30	436	50	22	21
B-17	Terrace Oaks Buckthorn Pond	2.7	24	5	12	25
E-10	AP-3 Cedar Pond	3.1	212	22	20	19
E-21	FP-11.5	0.26	1.6	0	20	19
E-22	FP-11.6	0.58	2.7	0	20	17
E-25	FP 4.5	1	35	55	16	19
E-26	DP-6.2, Northwoods Business Park	3.2	25	44	14	15
E-27	LP-26.54, Thomas Woods Site	0.2	5.3	29	18	21
E-28	HDP-1, Kennerick Addition Site	0.8	39	18	16	21
E-29	LP-15, Lily Pond in Lebanon Hills Pk	6.5	21.8	5.5	12	27
E-31	Walnut Hill Pond	0.65	20	2.5	20	13
F-1	Pine Knoll	35	107.5	10.4	NA	13
F-3	Krail Pond	10	41.8	6.6	10	11
F-4	Lake Julia	10	233	21.2	8	11
H-4	Stonegate Treated	1	9.5	35	14	19
H-6	Lake Rebecca	19	56	1	22	23
H-30	Sand Coulee	1	107	25	14	13
H-56	180th Street Marsh	20	340	1	22	11
L-4	Water Treatment Wetland Bank	22.85	99.8	20	14	15
L-7	DNR 387	10	2087	21	22	21
L-8	DNR 393	9.6	4987	17	20	23
L-9	NC 54	13.8	183	12	22	17
L-10	DNR#349W	40	213	NA	6	13

Site ID	Site Name	Wetland size (Acres)	Watershed Size (Acres)	% Imperv	Invert. Score	Veg. Score
MH-2	Copperfield/Friendly Hills	6	700	35	22	27
MH-13	MH Par 3	0.5	36	3	20	21
MH-14	Wagon Wheel	0.9	18.1	10	22	25
R-1	Kelly Marsh - Derryglen Ct in 2004	1	12.5		20	19
R-2	White Lake	333	998	10	28	17
R-4	Schwartz Pond	10.9	144.5	20	16	15
R-14	WMP #379	4.8	80.9	20	22	25
R-18	WMP #279	4.5	33.7	30	26	19
R-20	Unnamed	1	897	30	18	23
R-21	CR-38 Mitigation Site 1	1.7	1530	30	20	17
R-22	Mare Pond, South	8	81	10	24	19
R-23	CR-38 Mitigation Site 2	0.3	81	30	20	21
SSP-1	Anderson Pond	2.4	168	15	16	13
SSP-3	LeVander	3.4	37.9	20	24	13
WSP-2	Thompson Lake 48W	9	73920	50	16	17

### 3.2 Is Volunteer Data Usable?

WHEP was designed with several layers of quality assurance and quality control to be able to identify and correct potential errors. This was put into place to make sure the data collected is scientifically justifiable and will be used. The WHEP protocol includes standard trainings; citizen monitoring leaders and team leaders that check on the team's collection methods, data entry, and metric calculations; spot checks by other teams; and quality control checks by a professional consultant. With all of these checks in place, data users can be assured that the data and information presented is acceptable.

#### 3.2.1 2010 Cross-checks

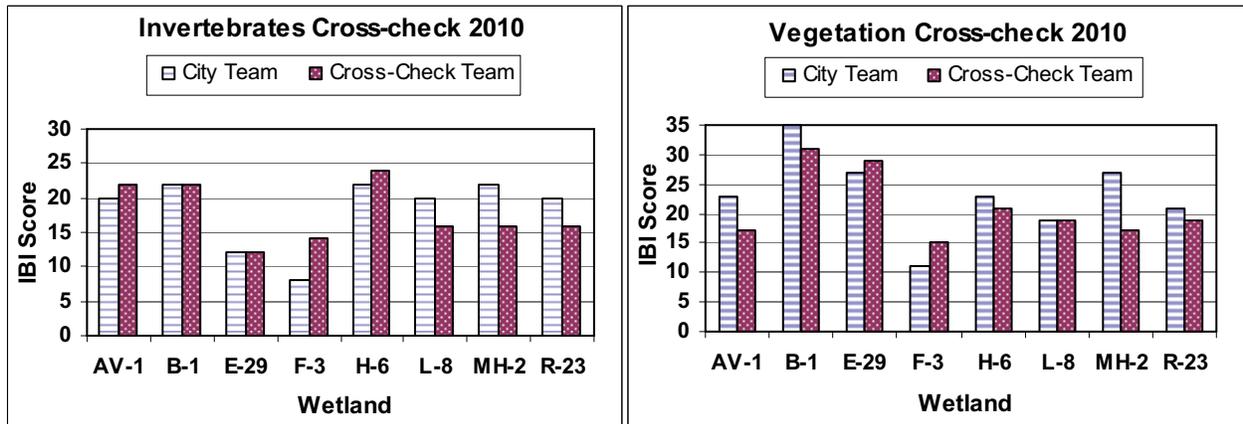
Each city team was responsible for evaluating one wetland in another city (Table 3.2.1). This citizen cross-check provides a second sample for the selected wetland. The purpose of this check is to determine if two different samples provide similar results for the vegetation and invertebrate IBI. Large wetlands and wetlands with complex plant communities may have different site scores, depending on where the samples are collected. The two samples are considered consistent if the IBI point scores differ by six points or less. The majority of the samples are consistent (Table 3.2.1 and Figure 3.2.1). The L-8 site found identical scores for vegetation. The AV-1 and MH-2 sites were not consistent for vegetation. There was a 6 point and 10 point difference in scores, respectively. The varied scores may indicate a difference in sampling technique, a change in conditions between sample dates, differences in identification accuracy, or some other cause. The data sheets for MH-2 show that there was a difference in the number of species identified at the wetland. The City Team identified *Carex*, *Utricularia*, *Potamogeton*, *Spirodela*, *Wolfia*, and *Impatiens*, which the Cross-check Team did not. The presence of *Utricularia* is significant in that its presence results in a score 4 points higher. The City team reported that it has never found it in the past in any of the Mendota Heights, South St. Paul or West St. Paul wetlands. It may have not have been found by the spot check team because of its rarity.

FCI surveyed one of Hastings wetlands (H-6) in 2010. The scores between Hastings and FCI were identical (23). The vegetation data for AV-1 varied, but overall the City Team identified more species of vegetation than the cross-check team. Sites F-3 and MH-2 were not consistent for invertebrates. Data collected by the original city team is used for the individual wetland analysis in Section 4.0 of this report.

**Table 3.2.1 Citizen spot checks (those considered inconsistent are shown in bold)**

City Team	Spot Check Team	Wetland Evaluated	Invertebrate Score Comparison		Vegetation Score Comparison	
			City	Spot Check	City	Spot Check
Apple Valley	Farmington	AV-1	20	22	<b>23</b>	<b>17</b>
Burnsville	Lakeville	<b>B-1</b>	22	22	35	31
Eagan	Rosemount	<b>E-29</b>	12	12	27	29
Farmington	Apple Valley	<b>F-3</b>	<b>8</b>	<b>14</b>	11	15
Hastings	Mendota Heights	<b>H-6</b>	22	24	23	21
Lakeville	Burnsville	<b>L-8</b>	20	16	19	19
Mendota Heights	Hastings	<b>MH-2</b>	<b>22</b>	<b>16</b>	<b>27</b>	<b>17</b>
Rosemount	Eagan	<b>R-23</b>	20	16	21	19

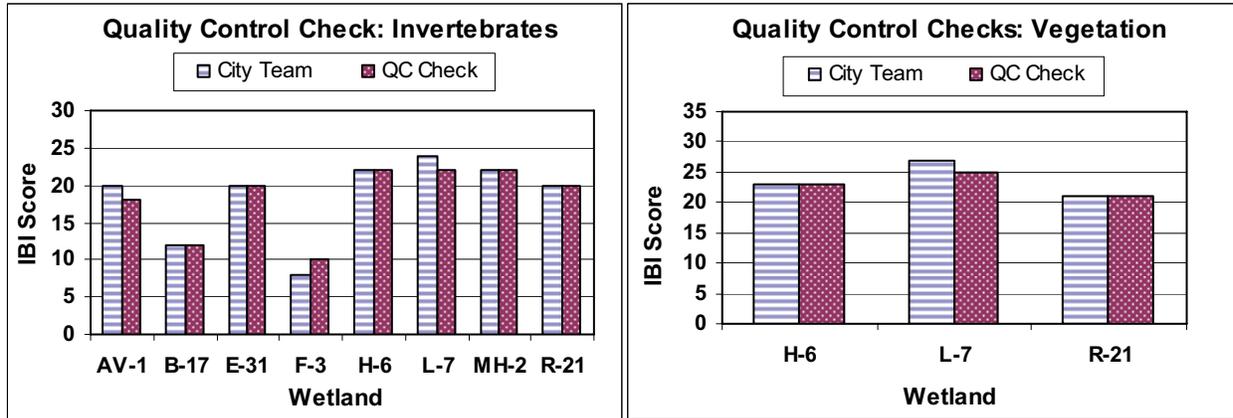
**Figure 3.2.1 Invertebrate and Vegetation Cross-Check Comparisons of IBI Scores**



### 3.2.2 2010 Quality Control Checks

Quality control checks were conducted at three sites for vegetation and eight sites for invertebrates in 2010 (Figure 3.3.2) by Fortin Consulting (FCI), an environmental consulting firm hired to assist with WHEP. The vegetation check was conducted by re-sampling the area marked off by the citizen team using the WHEP procedures and comparing results. For the invertebrates, FCI reviewed the insect samples collected and identified by the teams and completed the lab and metric sheets. The quality control review was done independently of the citizen team. The following sites were checked as a measure of quality control by FCI.

**Figure 3.2.2 Quality Control Checks (IBI Score Comparison)**



The team scores were found to be consistent with the quality control checks. All sites were within the 6 point margin expected. The teams did very well in both their invertebrate identification and vegetation surveys. This shows that with a high quality program that provides good training and oversight, citizen volunteers can collect good usable data.

WHEP also provides review of the data sheets for scoring and data transfer errors. This review is conducted by Fortin Consulting. Table 3.2.2 shows the data sheet review results. Most of the errors found were in data transfer which compounded to errors in metric calculations. Either the data collected was incorrectly transferred to their proper metrics or metric scores were not successfully transferred from one set of calculations to the next. Several errors were the result of misunderstanding the directions associated with computing the Persistent Litter Metric. There were 20 data transfer errors and 25 metric errors most commonly associated with data transfers errors. Six sites resulted in score changes of one to four points. Many of these errors could be prevented by double-checking the transfer and math work on the data sheets. The quality control checks are working well. Errors are identified and corrections are made as needed.

**Table 3.2.2 Data Sheet Review**

Team Name	Site	Invertebrate IBI Scores			Vegetation IBI Scores		
		Team	Review	Errors	Team	Review	Errors
Apple Valley	AV-1	20	20		23	23	4
	AV-17	16	18	6	19	19	1
	AV-18	24	24		17	17	1
	AV-19	22	22		15	15	1
	F-3 cc*	14	14		15	15	1
Burnsville	B-1	22	22		35	35	2
	B-3	22	22		25	27	5
	B-9	16	18	2	9	9	2
	B-17	12	12		25	25	1
	L-8 cc*	16	16		19	19	
Eagan	E-21	20	20	2	19	19	
	E-22	20	20		17	17	
	E-29	12	12		27	27	
	E-30	20	20		15	13	4
	R-23 cc*	16	16		19	19	

**Table 3.2.2 continued**

Team Name	Site	Invertebrate IBI Scores			Vegetation IBI Scores		
		Team	Review	Errors	Team	Review	Errors
Farmington	F-1	No data	No data		13	13	
	F-3	12	8	3	12	11	4
	F-4	8	8	2	11	11	
	AV-1 cc*	22	22	2	17	17	
Hastings	H-4	14	14		19	19	
	H-6	22	22		23	23	
	H-30	14	14		13	13	
	H-56	22	22		11	11	
	MH-2 cc*	16	16		17	17	
Lakeville	L-7	24	24		27	27	
	L-8	20	20		19	19	
	L-9	22	22		15	15	2
	L-10	6	6		13	13	
	B-1 cc*	22	22		31	31	
Rosemount	R-20	18	18		19	19	
	R-21	20	20		21	21	
	R-22	24	24		25	25	
	R-23	20	20		21	21	
	E-29 cc*	12	12		29	29	
Mendota Heights	MH-2	22	22		27	27	
	MH-14	22	22		25	25	
	SSP-1	16	16		13	13	
	SSP-3	24	24		13	13	
	WSP-2	16	16		17	17	
	H-6 cc*	24	24		21	21	

\*cc- indicates cross-check of another team's wetland

### **3.3 WHEP Historical Data**

Since WHEP began in 1997, 146 wetlands have been sampled, but not all are sampled every year. Figures 3.3.1 and 3.3.2 provide an overall picture of wetland health in Dakota County based on the most recent sample collected for each wetland. Appendices A and B list the data for each site since the start of the program. Section 4.0 includes the sites sampled in 2010 with an analysis of historical data, identifying sampling history and trends based on a trend analysis for those with adequate data. There is a spread in the distribution of poor, moderate and excellent ratings, with much fewer excellent ratings compared to moderate and poor. Only a few wetlands have rated excellent for vegetation.

Figure 3.3.1

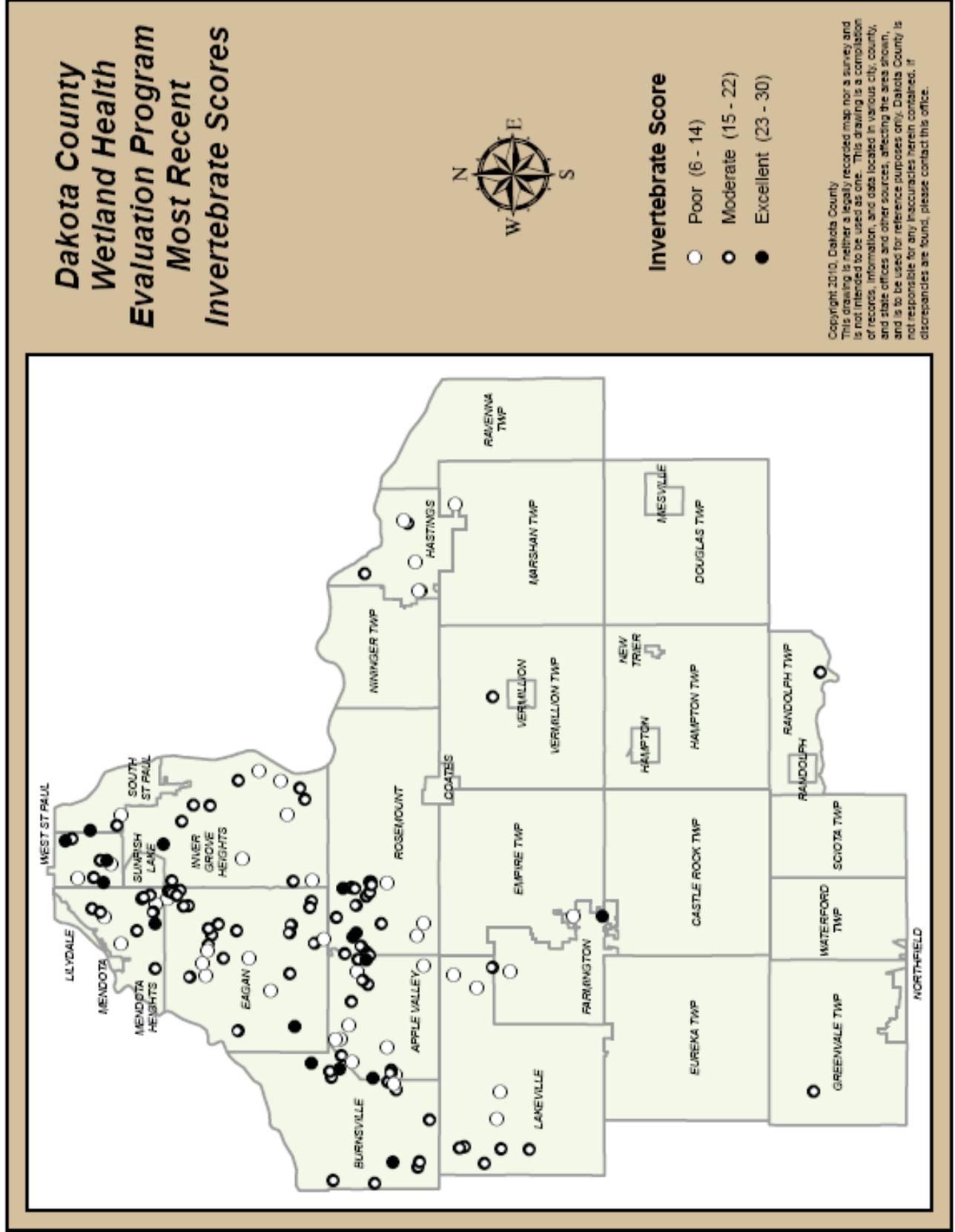
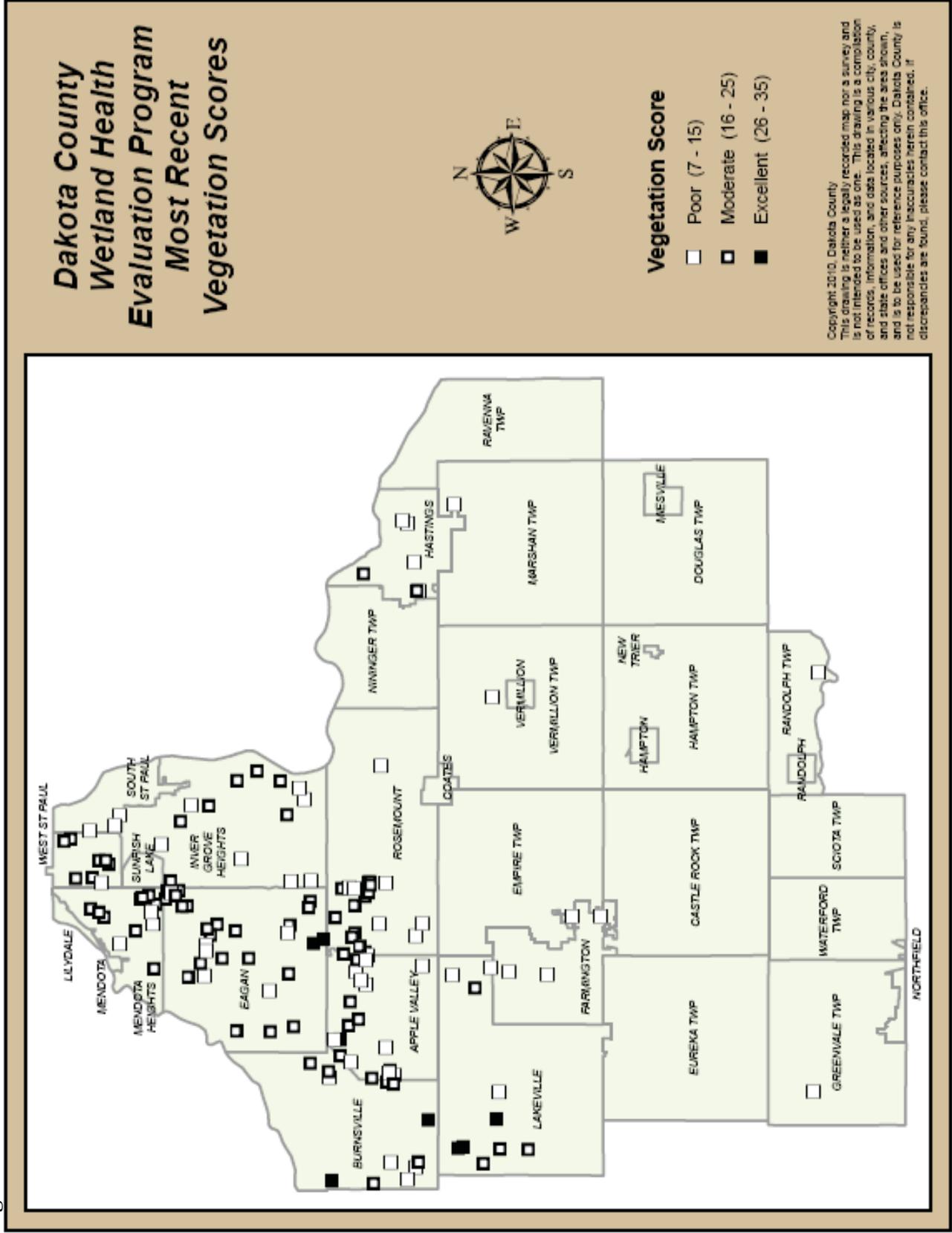


Figure 3.3.2



## 4.0 Wetland Evaluations

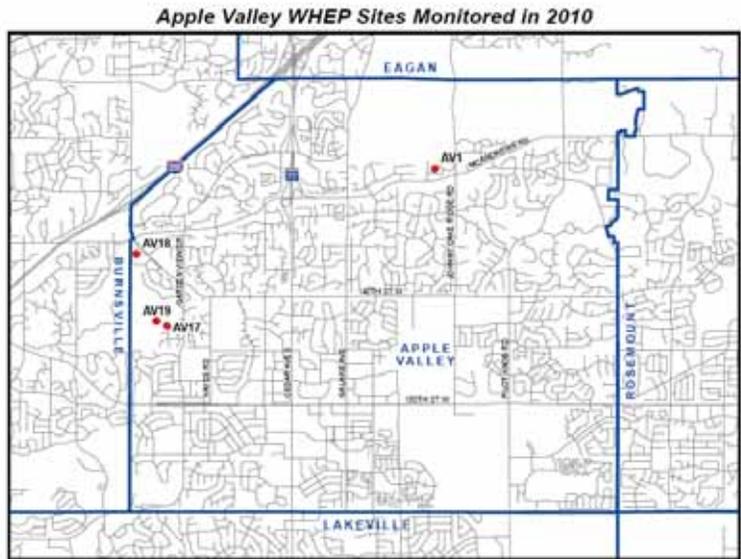
### 4.1 Apple Valley Wetlands

Four wetlands were monitored within the City of Apple Valley in 2010. This is the thirteenth year the City has participated in WHEP, and 19 wetlands have been monitored in that time period.

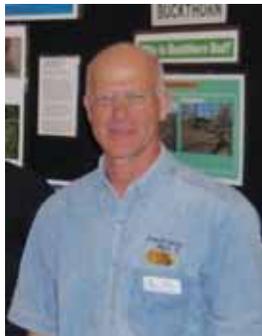
**Team Leader:** Jeff Korpik

**Team Members:** Andrea Brownlow, Colin Brownlow, Kate Fridley, Helen Goeden, Thomas Halter, Christine Miller, Nancy Pope, Rachel Ricard, Brian Taintor, and Cindy Taintor.

Many of the Apple Valley team members have been participating in the WHEP program since the induction of WHEP. Jeff Korpik, the team leader, has also been part of the WHEP program for many seasons, and this is his third year as a team leader. Jeff said that it was another good season. "As always, we had a great group of volunteers. Several new, hard workers, who I hope return, and many seasoned veterans contributed helpful experience," he said.



Jeff Korpik



Jeff Kehrer

Jeff Kehrer is the Natural Resources Coordinator at the City of Apple Valley and has been the city contact for WHEP since 2002. He plays a supporting role in the Apple Valley WHEP program to assure program implementation. In previous years he was more directly involved, but that role has since been passed on to Jane Byron. He feels, "WHEP is important to Apple Valley for collection of valuable and reliable wetland data. Without volunteers, WHEP would not exist in its current form, volunteers are the backbone of the program. Apple Valley has been

fortunate to have many volunteers participate on the Apple Valley WHEP team; many of whom have returned year after year assuring consistent and high quality data collection, and sharing of experiences with new WHEP volunteers. WHEP has played a significant role in raising wetland awareness and importance in Apple Valley, especially during the plan review process for land development."

Jeff told us, in 2007, that Apple Valley has been monitoring a wetland that had a pre-treatment basin constructed upstream to treat parking lot and site runoff prior to discharge into the wetland. WHEP data provided support that the pre-treatment basin was effective. He said, "WHEP provides sound baseline data about wetland quality in Apple Valley, which we can also compare to neighboring WHEP wetlands. Ongoing wetland sampling data is important for monitoring wetland health and necessary for making sound decisions on project proposals."



Jane Byron

provide some of the administrative assistance needed from the City of Apple Valley. She says, "The City finds the information gathered by WHEP volunteers invaluable. In recent years, the data gathered has allowed us to supplement information from other studies on some of our most impacted wetlands to give a much more detailed picture of the quality of selected wetlands. The baseline picture painted by the information gathered will help us gauge the success of future projects to improve water quality. We cannot thank our volunteers enough for the important service they provide."

## Apple Valley General Wetland Health

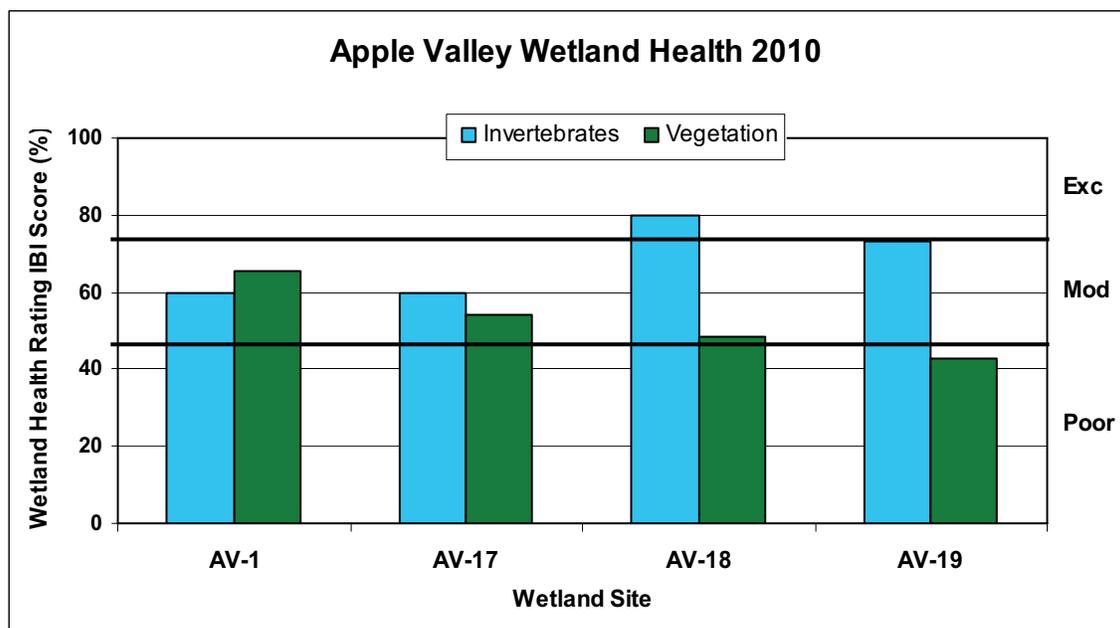


Rachel Ricard, Colin Brownlow,  
Jeff Korpik

Figure 4.1 presents an overall view of wetland health for all of the 2010 monitoring sites in Apple Valley based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.1 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Scores that differ by less than 10 percent are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. Three sites (AV-17, AV-18, AV-19) were monitored for the first time this year. The Apple Valley wetlands exhibited poor to excellent wetland health based on both invertebrate and vegetation data. AV-18 and AV-19 showed considerably different invertebrate and vegetation scores. The vegetation scores were substantially lower than the invertebrate scores. AV-1 and AV-17 had consistent invertebrate and vegetation scores. AV-18 had the highest invertebrate score in Apple Valley in 2010. AV-1 had the highest vegetation score.

AV-1 and AV-17 had consistent invertebrate and vegetation scores. AV-18 had the highest invertebrate score in Apple Valley in 2010. AV-1 had the highest vegetation score.

**Figure 4.1 Apple Valley site scores (percent) for the 2010 sampling season**



### 4.1.1 Hidden Valley (AV-1)

Hidden Valley (AV-1), also known as EVR-P53, is a 2.0 acre, type 4 wetland within the Vermillion River Watershed. It drains locally to EVR-53 toward the East Vermillion River and into the Vermillion River. The wetland watershed is 21 acres with 15 acres of direct drainage, and is 35 percent impervious. It has two inlets along the southern border, one equalizer pipe along the eastern border, and one outlet along the western border.



The wetland is located within a privately-owned residential development and is surrounded by homes and dense lines of deciduous trees such as oak, box elder, and ash. A steep slope extends down to the wetland. Dense stands of cattails, reed canary grass, and willows line much of the wetland edge. Historic aerial photos taken from the county website show an increase in open water/ponding depth. This wetland is included in the City's stormwater management plan as a "Manage 2 Wetland" with a goal to monitor the wetland over time. This is the twelfth year that this site has been surveyed since 1998.

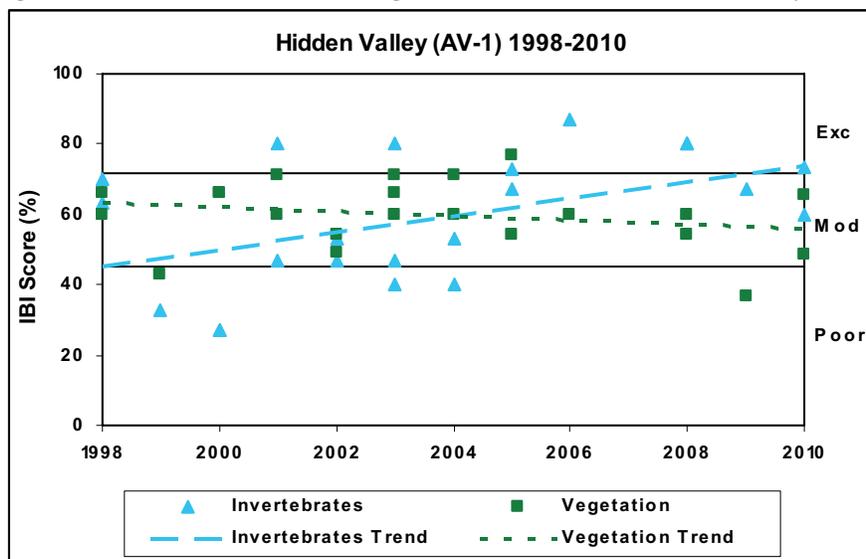
### Wetland Health

**Site Observations:** The wetland vegetation plot was one meter deep in early July 2010. The substrate was mucky and the water warm. Patches of cattail, submerged vegetation and duckweed were present. The wetland had a lot of open water. In contrast, the wetland's water level was unusually low in 2009.

**Table 4.1.1 Hidden Valley (AV-1) Wetland Health based on Index of Biotic Integrity (IBI)**

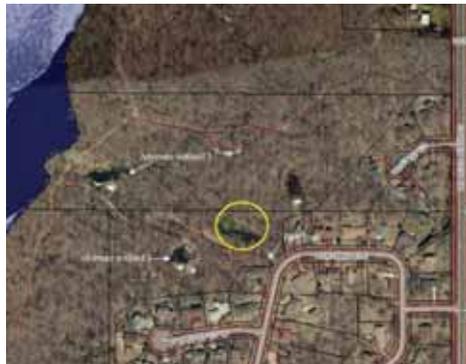
2010 Data (AV-1)	<b>Invertebrates</b> 	<b>Vegetation</b> 
<b>Wetland Health Rating (IBI score)</b>	Moderate (18)	Moderate (23)
<b>Cross-check Rating (IBI score)</b>	Moderate (22)	Moderate (17)
<b>Trend 1998-2010</b>	Improving	Stable to possible decline

**Figure 4.1.1 Invertebrate and vegetation trends for Hidden Valley (AV-1)**



**Site Summary:** Hidden Valley was found to have moderate health in 2010. The scoring was consistent. The invertebrate data has fluctuated between poor to excellent over the years, but overall appears to be improving. The extreme fluctuations may be due to factors such as changes in water level. The vegetation has remained in the moderate category for most of the samples. Based on the twelve years of monitoring, the data indicates stable to improving wetland health.

#### 4.1.2 AL-P9.1, Alimagnet Lift Station Chain of Ponds (AV-17)



Alimagnet Lift Station Chain of Ponds (AV-17), also known as AL-P9.1, is a 0.25 acre, type 3 wetland located within the Alimagnet Lake subwatershed of the Vermillion River Watershed. The wetland watershed has approximately seven acres of direct drainage and is 20 percent impervious. There is one inlet near the southeast corner of the wetland, and one outlet near the southwest corner. It was excavated in the mid 1970's. It is designated as a Manage 2 wetland, but is not part of the City's stormwater or wetland management plans. Periodic monitoring will continue.

The wetland is located within Alimagnet Park, Most of the surrounding area is undeveloped. Private residences exist around the southern and eastern borders. The wetland is protected by vegetative buffers, but buckthorn is spreading throughout the surrounding forest. Two other wetlands are present further along the park trail.

#### Wetland Health

**Site Observations:** The wetland contains a high density of vegetation. Open water is covered with duckweed. There is a gentle slope into the wetland, and the substrate is mucky. The water was approximately two feet deep in survey areas in 2010.

**Table 4.1.2 AL-P9.1, Alimagnet Lift Station Chain of Lakes (AV-17) Wetland Health based on IBI**

2010 Data (AV-17)	<b>Invertebrates</b> 	<b>Vegetation</b> 
<b>Wetland Health Rating (IBI score)</b>	Moderate (18)	Moderate (19)
<b>Trend 2010</b>	Not enough data	Not enough data

**Site summary:** This is the first year that AV-17 has been monitored. Both the invertebrate and vegetation scores indicate moderate wetland health.

#### 4.1.3 Sunset Park Pond (AV-18)

Sunset Park Pond (AV-18), also known as AL-P8, is a one acre type 4 wetland located within the Alimagnet Lake subwatershed of the Vermillion River Watershed. It has a 252 acre watershed with 43 acres of direct drainage. It is 30% impervious. There are four inlets along the northeast side of the wetland and one outlet near its western corner.

AV-18 is located almost entirely on private property with Apple Valley's Sunset Park boundary adjacent to the south shore of the pond. This pond was an historic wetland (likely type 2) that was



excavated for flood storage sometime in the 1980's. It is surrounded by private residences and parkland. There is a vegetative buffer along the park-side of the pond. This wetland is part of the City's stormwater management plan. It is designated as a Manage 2 Wetland.

AV-18 was selected to be surveyed after 1200 cubic yards of sediment was removed in 2007, and it will be evaluated periodically. Updated inlet structures were also installed, and in 2009, disturbed buffer areas were re-established. Additionally, since 2005 the City has added barley straw pellets to the pond as a carbon amendment. The hope is that the barley straw will be a food source for naturally occurring bacteria and that excess phosphorus in the pond will be taken up by the bacteria rather than stimulating algal growth. This pond was one of the key ponds listed for rehabilitation in the Alimagnet Lake Management Plan. Lake Alimagnet is impaired for nutrients (phosphorus) and the Cities of Apple Valley and Burnsville and lakeshore residents have put a significant effort into improving water quality in the lake.

## Wetland Health

**Site Observations:** The wetland substrate was mucky, and the water was almost too deep for sampling. Cattails were not represented in the vegetation survey due to high water levels. Alimagnet Lake is to the west of the wetland. Ash, willow, and oak trees are present around the wetland. Mystery Snails were observed.

**Table 4.1.4 Sunset Park Pond (AV-18) Wetland Health based on Index of Biotic Integrity**

	Invertebrates	Vegetation
<b>2010 Data (AV-18)</b>		
<b>Wetland Health Rating (IBI score)</b>	Excellent (24)	Moderate (17)
<b>Trend 2010</b>	Not enough data	Not enough data

**Site summary:** This is the first year that Sunset Park Pond has been monitored. The invertebrate score indicates excellent wetland health while the vegetation score indicates moderate wetland health. The high water level may have skewed the data. Additional monitoring is recommended to better assess the health of this wetland.

### 4.1.4 AL-P9.3, Alimagnet Lift Station Chain of Ponds (AV-19)

AL-P9.3, Alimagnet Lift Station Chain of Ponds (AV-19) is a 0.25 acre, type 3 wetland located within the Alimagnet Lake subwatershed of the Vermillion River Watershed. The wetland watershed drains approximately 28.5 acres and is 25 percent impervious. There is one inlet near the southeast corner of the wetland, and one outlet near the southwest corner. It is designated as a Manage 2 wetland, but is not part of the City's stormwater or wetland management plans. Periodic monitoring will continue.



## Wetland Health

**Site Observations:** AV-19 is a long and narrow wetland. A walking path is to the south of the wetland, and Alimagnet Lake is just to the west. This wetland is located downhill, near the Alimagnet lift station. The substrate is very mucky and the water level in the vegetation plot area was two feet deep in July 2010. Ducks and monarch butterflies were observed in the wetland.

**Table 4.1.3 AL-P9.3, Alimagnet Lift Station Chain of Lakes (AV-19) Wetland Health based on IBI**

	<b>Invertebrates</b>	<b>Vegetation</b>
<b>2010 Data (AV-19)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (22)	Poor (15)
<b>Trend 2010</b>	Not enough data	Not enough data

**Site summary:** This was the first year that AV-19 was monitored. The invertebrate score indicates moderate wetland health while the vegetation score indicates poor wetland health. Additional monitoring is recommended to better assess the health of this wetland.

## 4.2 Burnsville Wetlands

Four wetlands were monitored within the City of Burnsville in 2010. Burnsville has monitored 14 wetlands through WHEP since 1997.

**Team Leader:** Amy Bruner

**Team Members:** Martin Anderson, Caleb Ashling, Matthew Hardegger, Richard Hardegger, Greg Johnson, Bernie McMaster, Jenna Rempfert, Kaitlin Rempfert, Aaron Steeg, Tracy Stewart, Brady Walter, Thomas Ward, and Jeff Zilka.



Amy Bruner

Amy Bruner has been involved in the WHEP program for eight years, and this is her fourth year as team leader. She is off to seek new adventures this year following the monitoring season. Amy and her family are moving to Iowa. Amy said, "I have enjoyed my experience with WHEP, working with you and my volunteers. It was fun to do real research and to make an impact on the environment. Take care and I wish you continued success with the WHEP program."

Caleb Ashling is the City contact for WHEP. This is his first year as the City contact and also as a natural resources technician for the City of Burnsville. His role is to determine which wetlands to sample, get the word out to citizens about the opportunity to volunteer and to review the data that they collect.



Caleb Ashling

The City of Burnsville is using the WHEP program to monitor their wetlands in several ways. Each year, two wetlands are selected to be sampled for long term monitoring purposes. This provides great baseline data on wetland health trends over time. The other two wetlands are either "new" sites to the WHEP program or sites that have not been visited for several years. This allows the City to periodically check

previously sampled wetlands, and to evaluate "new" sites to help understand the wetland health of more wetlands in the City.

Caleb said, "Being new to the WHEP program, I was excited to see the number of enthusiastic volunteers that were ready to throw on waders and head out into the wetlands. The team valiantly braved mosquitoes and knee deep mud to sample area wetlands and they seemed to have a great time while doing it. The WHEP program provides the City with valuable information about wetland health trends, as well as how our various water quality improvement projects and education programs are, or are not, working to their full potential. It also provides the City with important information on whether invasive plant species are present in our wetlands. The City doesn't have enough staff to keep a close eye on as many wetlands as we would like, but with the help of WHEP volunteers, we can track invasive plant species infestations and catch new infestations before they become a problem. All of this information helps us create much more effective and informed management plans and in the long run, will result in healthier wetlands in the City of Burnsville. As an added bonus, the volunteers that participate in the program receive an excellent education in how wetlands work and why they are important and hopefully they will become great advocates for protecting our wetlands in the future. I've really enjoyed working with the WHEP program so far and I'd really like to thank all of the volunteers for their time and hard work."

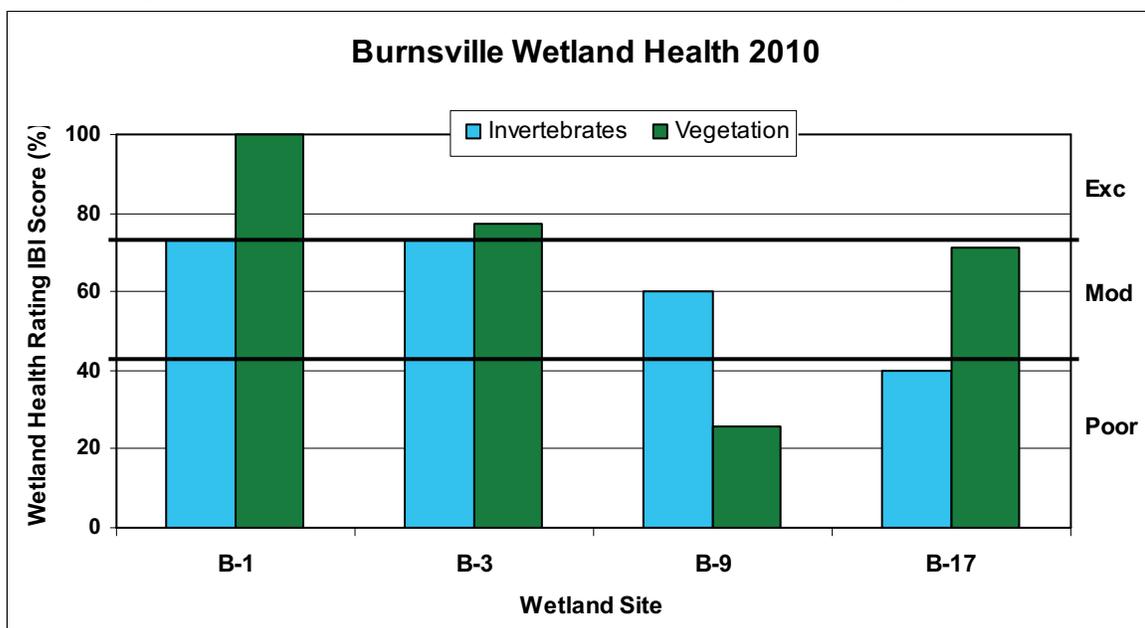


A. Bruner, B. Shand, A. Steeg

## Burnsville General Wetland Health

Figure 4.2 presents an overall view of wetland health for all of the 2010 monitoring sites in Burnsville based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.2 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Scores that differ by less than 10 percent are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. For 2010, the Burnsville wetlands showed poor to excellent wetland health. B-1, B-9 and B-17 showed considerably different invertebrate and vegetation scores. B-3 had consistent invertebrate and vegetation scores. B-1 achieved the highest possible vegetation score in 2010. B-17 was monitored for the first time this year.

**Figure 4.2 Burnsville site scores (percent) for the 2010 sampling season**



## 4.2.1 Crystal Lake West (B-1)

Crystal Lake West (B-1) is a 0.9 acre, type 3 wetland located in the Crystal Lake West Watershed. The watershed is four acres, none of which is impervious. The wetland is part of the wetland management plan with a designation of "aesthetic/recreation/education & science." The wetland has invasive species problems and some recreational vehicle disturbances (mostly in the winter). The wetland is very close to a bay of Crystal Lake and is within a large, naturally vegetated, City-owned park.



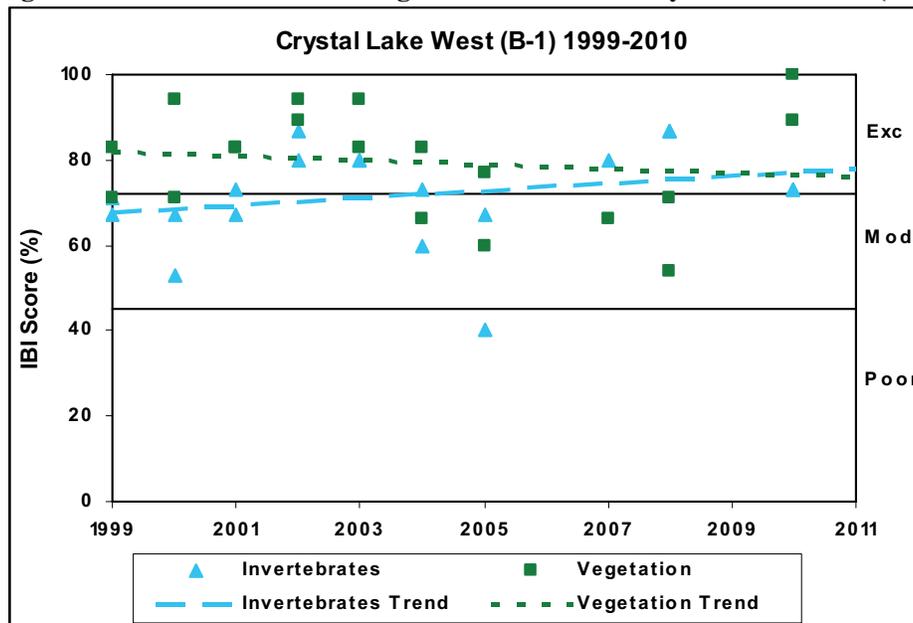
### Wetland Health

**Site Observations:** The wetland was extremely mucky and deep. Lily pads were present in the open waters as well as reed canary grass and several types of *Sagittaria* and *Potamogeton*. Kingfisher, robin, redwing blackbird, cardinal, tadpoles, and crayfish were observed.

**Table 4.2.1 Crystal Lake West (B-1) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (B-1)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (22)	Excellent (35)
<b>Cross-check Rating (IBI score)</b>	Moderate (22)	Excellent (31)
<b>Trend 1999-2010</b>	Stable to Improving slightly	Stable

**Figure 4.2.1 Invertebrate and vegetation trends for Crystal Lake West (B-1)**



**Site summary:** This is the tenth year that B-1 has been surveyed since 1999. The invertebrate and vegetation scores indicate that the wetland has moderate to excellent health, respectively. The scores between the City Team and the Cross-check Team were very consistent. The trend line indicates a decrease in vegetation health, but the vegetation score has increased significantly from the last survey.

The lower scores from 2005-2009 may be associated with lower water levels which will impact wetland vegetation.

### 4.2.2 Kraemer Preserve (B-3)

B-3, also known as Kraemer Preserve, is a restored public water wetland in the City of Burnsville. It is a 30 acre, type 3 wetland located within the Kraemer Nature Preserve subwatershed of the Blackdog Watershed. The wetland drainage area is 415 acres, and is approximately 30 percent impervious. Land use in the watershed is mainly residential and industrial. The wetland was originally a type 1 or 2 wetland which was mined for peat within the last 30 years. Two 18” stormwater pipes were added in 1995 and the area was converted into a wetland mitigation site in 1997.



The upland buffer has been restored to prairie and some stormwater ponds are in place to protect the wetland. It is a protected wetland and is a migratory bird habitat. Invasive species are cause for concern. The wetland management goal is to protect the wetland, maintain flood protection, sediment control, and nutrient removal.

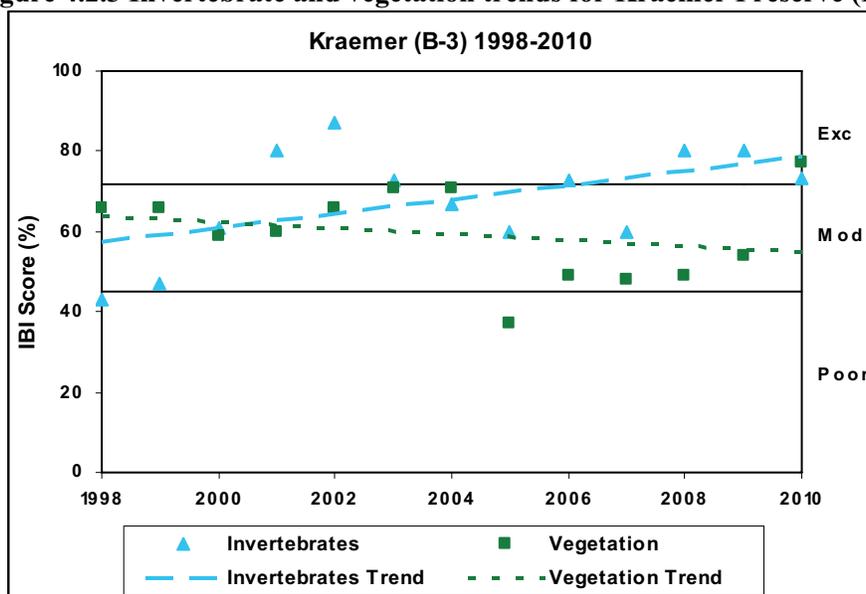
### Wetland Health

**Site Observations:** The water was 3.5 feet deep in July of 2010. Many snails were observed.

**Table 4.2.3 Kraemer Preserve (B-3) Wetland Health based on Index of Biotic Integrity**

2010 Data (B-3)	<b>Invertebrates</b> 	<b>Vegetation</b> 
<b>Wetland Health Rating (IBI score)</b>	Moderate (22)	Excellent (27)
<b>Trend 1998-2010</b>	Improving	Stable

**Figure 4.2.3 Invertebrate and vegetation trends for Kraemer Preserve (B-3)**



**Site summary:** This is the thirteenth year of sampling for Kraemer Preserve (B-3). The vegetation and invertebrate scores indicate moderate to excellent wetland health, respectively. This wetland has maintained overall moderate conditions over most of the 13 years of sampling. Though the vegetation trend line indicates declining health, the vegetation score jumped significantly in 2010 to an excellent rating. Vegetation scores in the previous few years may have been affected by lower water levels which will impact wetland vegetation.

### 4.2.3 Crosstown West (B-9)

Crosstown West (B-9) is a 7.2 acre, type 4 wetland located within the Central Subwatershed which is part of the Black Dog Watershed. Its watershed is 388 acres and 50 percent impervious. This wetland has three inlets: one in the southwest corner, south-central shore, and southeast corner. There is one outlet located on the west-central shoreline. The wetland is addressed within the City's stormwater and wetland management plans. It is designated in the "Improvement Class" and is being managed to improve the function and value of the wetland. Many wetland plants were planted along the northwest shoreline in 2006, but a full scale shoreline restoration did not occur. There are invasive species and large amounts of untreated stormwater input. Sediment is periodically removed as needed.

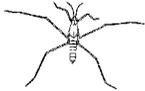


Crosstown West is a shallow marsh within Crosstown West Park with trails that border many sections of the wetland. A boardwalk transects the wetland. It is jointly owned by the City of Burnsville and by a private apartment complex at the northeast corner of the wetland.

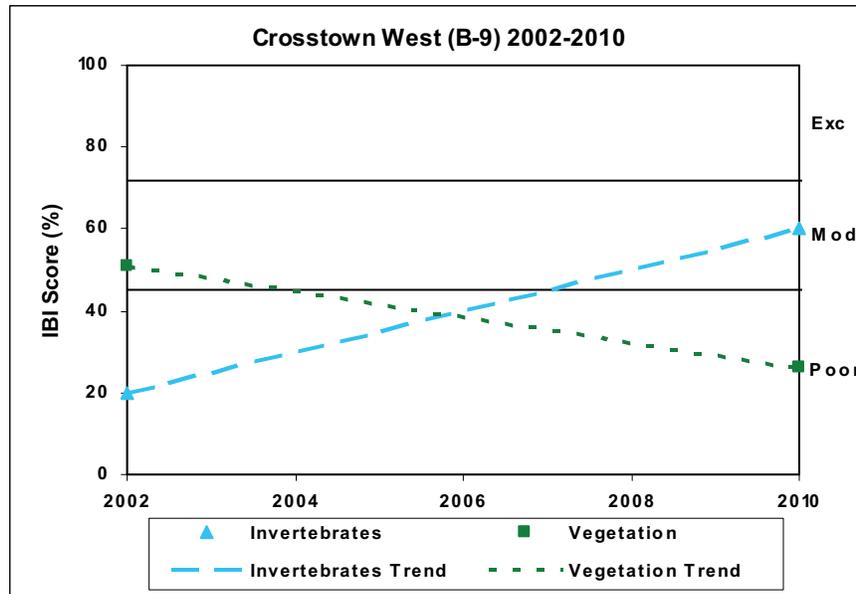
### Wetland Health

**Site Observations:** The wetland water level in the vegetation plot was as deep as two feet. The substrate was slightly mucky, and cattail stands densely border the wetland.

**Table 4.2.4 Crosstown West (B-9) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (B-9)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (18)	Poor (9)
<b>Trend 2002-2010</b>	Not enough data	Not enough data

**Figure 4.2.4 Invertebrate and vegetation trends for Crosstown West (B-9)**



**Site summary:** This is the second time the wetland has been surveyed since 2002. It has exhibited poor to moderate health on both occasions; however, in 2002 the vegetation score indicated moderate wetland health while the invertebrate score indicated poor wetland health. These health indicators were opposite in 2010. Additional monitoring is recommended to better assess the health of this wetland.

#### 4.2.4 Alimagnet Powerline ROW (B-17)

Alimagnet Powerline ROW (B-17) is a 2.7 acre, type 4 wetland located within the Alimagnet Lake Watershed. The wetland watershed is approximately 24 acres and 5 percent impervious. There are no inlets or outlets. The wetland is part of the City's stormwater management plan, and is designated as a “protected” wetland with a goal to maintain and improve the existing habitat.

The wetland is large, round, and located in a depression within Alimagnet Park Preserve. A power line runs along the east side of the pond. Recent large-scale invasive tree removal in the surrounding area may result in erosion to the site. Other invasive species may be a problem in the area.



#### Wetland Health

**Site Observations:** Several *Carex* species were present around the perimeter of the wetland. Cattails were not observed near the survey site. A small infestation of purple loosestrife was discovered by the WHEP team and removed by city staff after the survey was completed.

**Table 4.2.4 Alimagnet Powerline ROW (B-17) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (B-17)</b>		
<b>Wetland Health Rating (IBI score)</b>	Poor (12)	Moderate (25)
<b>Trend 2010</b>	Not enough data	Not enough data

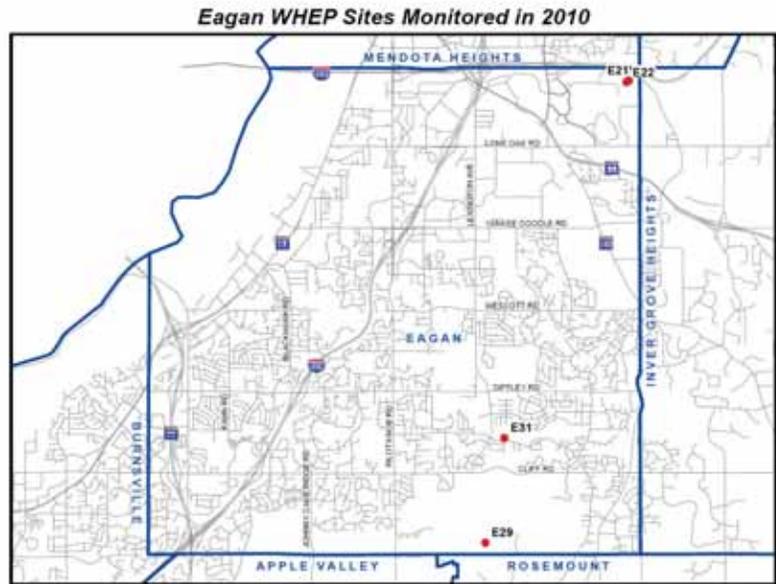
**Site summary:** This is the first time that B-17 has been surveyed. It exhibited poor to moderate wetland health. A significant population of reed canary grass was observed at the site. An invasive species like Reed Canary Grass often reduces the vegetative diversity of a wetland, which would affect the vegetation score. Additional monitoring is recommended.

### 4.3 Eagan Wetlands

The Eagan team monitored four wetlands in 2010. Since WHEP began in 1997, Eagan has monitored 29 wetlands.

**Team Leader:** Jane Tunseth

**Team Members:** Gregory Burgess, Heidi Eaves, Maggie Karschnia, Jessie Koehle, Bill Larson, Rachel Larson, Marianne McKeon, Ryan Messen, Matt Munro, Anna Munson, Wolf Ruhmann, Daniel Schmitter, Janis Sines, and Sondra Tanji.



Jane Tunseth

The success and growth of the WHEP program is obvious in Eagan. Jane Tunseth, team leader for Eagan, is a teacher at the School of Environmental Studies at the Minnesota Zoo. This is her 14<sup>th</sup> summer working on WHEP. Jane said, "My work with WHEP has helped me in teaching my students, several of whom have been WHEP volunteers. I have enjoyed seeing many citizens of Eagan open their eyes to the wonders of wetlands. We can only value what we know, and I believe WHEP has helped many people in our community know more and therefore value wetlands more."

Jessie Koehle is the Water Resources Assistant for the City of Eagan. She expressed, "WHEP is important to the City of Eagan because it is a great opportunity for the general public to be literally up to their elbows in local wetlands, helping people to appreciate the value, beauty, diversity, and human impacts on water bodies. Volunteers not only learn about and care for their local water bodies, but because of their WHEP experiences they become great wetland health ambassadors to the rest of the community. WHEP provides the City with valuable and reliable information about invertebrate and plant species that often would not be available otherwise. Personally, I thoroughly enjoy my role as City representative on our Eagan WHEP team. Not only do I value the time spent learning more about Eagan's water bodies, but I also deeply appreciate our team's dedication and camaraderie. The Eagan WHEP team is a truly special group of people, and I look forward to enjoying many more WHEP field seasons to come. Thank you everyone for all your hard work!"



Jessie Koehle

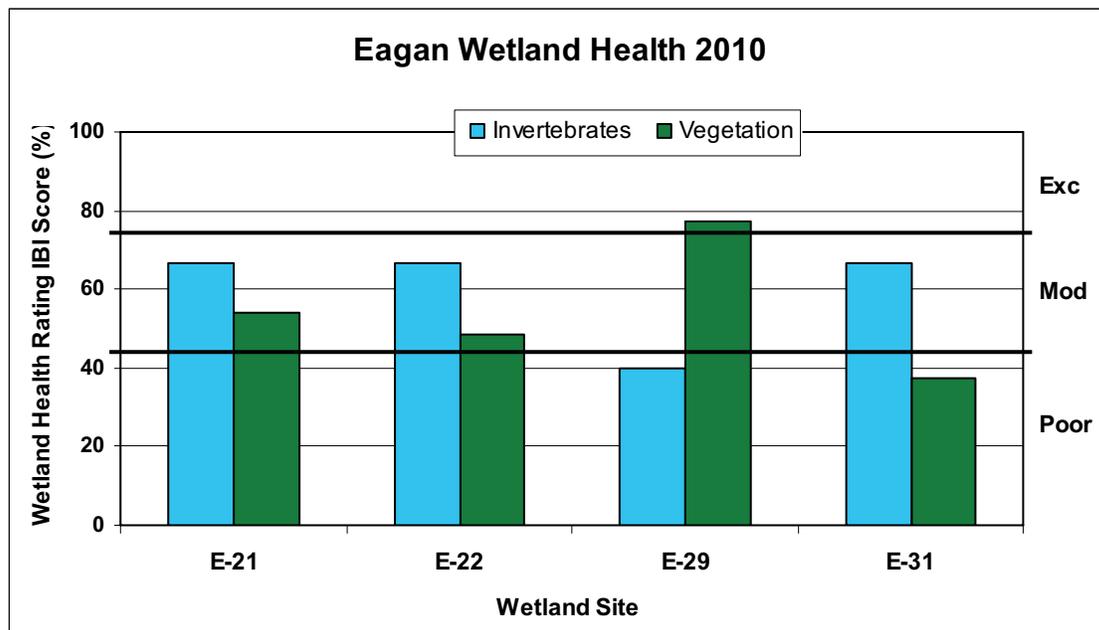


Wolf Ruhmann, Jane Tunseth, Matt Munro, A. Forslund, Marianne McKeon, Daniel Schmitter, Jessie Koehle, Anna Munson

## Eagan General Wetland Health

Figure 4.3 presents an overall view of wetland health for all of the 2010 monitoring sites in Eagan based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.3 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Scores that differ by less than 10 percent are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. Four wetlands were monitored in the City of Eagan in 2010. The Eagan wetlands exhibited poor to excellent wetland health based on both invertebrate and vegetation data. E-29 showed significantly inconsistent health ratings between vegetation and invertebrate scores. E-29 and E-31 were monitored for the first time in 2010.

**Figure 4.3 Eagan site scores (percent form) for the 2010 sampling season**



### 4.3.1 FP-11.5 (E-21)

FP-11.5 (E-21) is a 0.4 acre, type 4 wetland within the Gun Club Lake Watershed. It has 1.9 acres of direct drainage, and is approximately 20 percent impervious. There is one inlet on the west side. This inlet drains from constructed replacement wetlands. There are no structural outlets. It is part of the City's stormwater management plan. E-21 is designated "Protect," and the City's highest management goal for this wetland is to protect high ecological values and contiguous open spaces. The wetland is privately owned by People of Praise Trinity School. The area was an undeveloped natural wetland until development occurred in 2007. E-21 is now adjacent to the Trinity School which has roads and parking lots. Stormwater runoff is routed through a treatment pond and two constructed replacement wetlands before entering this wetland. Moderately functioning raingardens were installed around the school. More development is likely in the future along Ames Crossing Road.



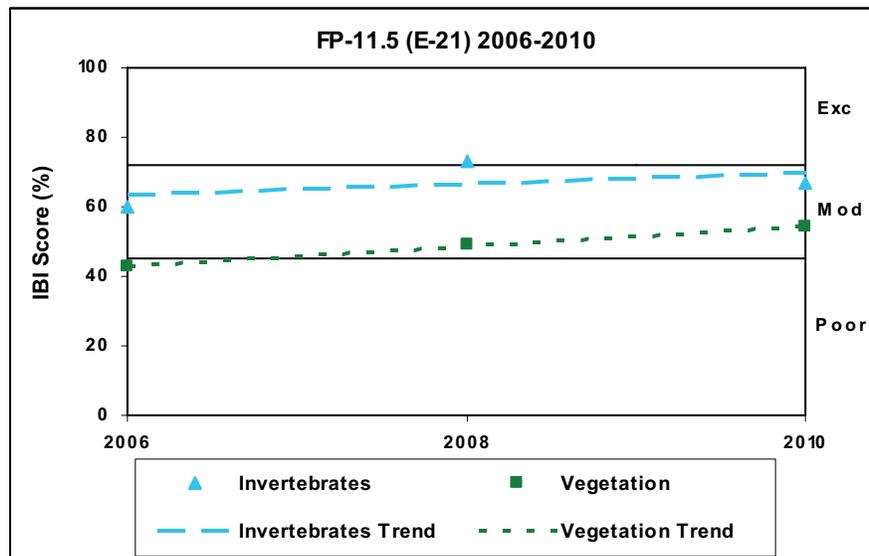
## Wetland Health

**Site Observations:** The slope to the wetland is fairly steep and the bottom substrate was very soft with lots of bubbles emerging with each step. The volunteers sunk to their knees in the muck. The water level was three feet deep. The team noted that there was a lot of bounce in the water levels. Filamentous algae was present.

**Table 4.3.1 FP-11.5 (E-21) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (E-21)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (20)	Moderate (19)
<b>Trend 2006-2010</b>	Stable	Possible slight improvement

**Table 4.3.1 FP-11.5 (E-21) Wetland Health based on Index of Biotic Integrity**



**Site summary:** This is the third year that this wetland has been surveyed since 2006. The vegetation and invertebrate scores indicate moderate wetland health. Vegetation health has been poor to moderate. It is difficult to maintain diverse wetland vegetation in a wetland with a lot of bounce due to stormwater input. Additional data is needed to verify if there is a trend toward improving wetland health.

### 4.3.2 FP-11.6 (E-22)

FP-11.6 (E-22) is a 1.3 acre, type 4 wetland within the Gun Club Lake Watershed. It has 2.9 acres of direct drainage. There is one inlet on the north end of the wetland and one inlet on the west side. Both inlets drain from constructed replacement wetlands. There are no structural outlets. It is part of the City's stormwater management plan. E-22 is designated "Protect," and the City's highest management goal for this wetland is to protect high ecological values and contiguous open spaces.



The wetland is privately owned by People of Praise Trinity School.

The area was an undeveloped natural pond until development occurred in 2007. E-22 is now adjacent to the Trinity School which has roads and parking lots. A treatment pond and two constructed replacement

wetlands receive water from surfaces before entering this natural wetland. Moderately functioning raingardens were installed around the school. More development is likely in the future along Ames Crossing Road.

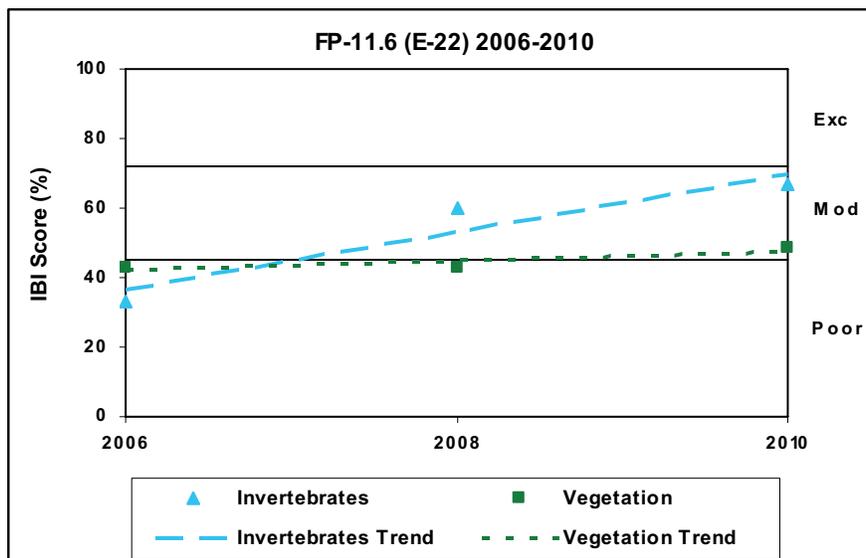
## Wetland Health

**Site Observations:** The wetland bottom was soft but not too mucky, with some rocks. The water was approximately two feet deep in the vegetation plot. There was an abundance of submerged vegetation.

**Table 4.3.2 LP-11.6 (E-22) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (E-22)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (20)	Moderate (17)
<b>Trend 2006-2010</b>	Improving	Stable

**Table 4.3.2 FP-11.6 (E-22) Wetland Health based on Index of Biotic Integrity**



**Site summary:** This is the third year that E-22 has been monitored since 2006. The vegetation and invertebrate scores indicate moderate wetland health. The wetland health appears to be improving.

### 4.3.3 LP-15, Lily Pond in Lebanon Hills Park (E-29)

Lily Pond in Lebanon Hills Park (E-29), also known as LP-15, is a 6.5 acre, type 5 wetland located within the Gun Club Lake Watershed. This wetland has 21.8 acres of direct drainage and is 5.5 percent impervious. It does not have any direct inlets; however, a dirt road nearby drains into a depression which overflows into the wetland.

LP-15 is located within the Dakota County's Lebanon Hills Regional Park. There is very little development in the area and the wetland is buffered by woods and other wetlands. There is one outlet on the northeast side of the wetland. It is part of the City's stormwater management plan, but is unclassified.



## Wetland Health

**Site Observations:** The monitoring team observed many tadpoles in bottletraps. The pond was very shallow and dominated by duckweed (*Lemna* sp.) and emergent vegetation. Reed canary grass was observed along the shore.

**Table 4.3.3 LP-15 (E-29) Wetland Health based on Index of Biotic Integrity**

2010 Data (E-29)	<b>Invertebrates</b> 	<b>Vegetation</b> 
<b>Wetland Health Rating (IBI score)</b>	Poor (12)	Excellent (27)
<b>Cross-check Rating (IBI score)</b>	Poor (12)	Excellent (29)
<b>Trend 2010</b>	Not enough data	Not enough data

**Site summary:** This is the first year that E-29 has been monitored. The vegetation and invertebrate scores are inconsistent. The vegetation scores indicate excellent wetland health while the invertebrate scores indicate poor wetland health. The scores between the City team and the cross-check team were consistent, though, which helps confirm the data results. It is not surprising that this wetland exhibits high IBIs for vegetation since it's not receiving a lot of stormwater runoff and is in an undeveloped area surrounded by upland vegetation. The invertebrate health is somewhat surprising. The diversity of the wetland vegetation is threatened by the presence of reed canary grass. The spread of this species should be tracked to make sure it does not take over and affect the excellent vegetation health.

### 4.3.4 LP-69.1, Walnut Hill Pond (E-31)



Walnut Hill Pond (E-31), also known as LP-69.1, is a 0.65 acre, type 5 wetland located within the "L" watershed which eventually drains to Thomas Lake in Eagan. Its watershed is 20 acres of which 2.5 percent is impervious. The wetland does not contain any inlets, but has one outlet on the south side. The wetland collects runoff from the park. Walnut Hill Pond is part of the City's stormwater management plan, but it is unclassified.

Walnut Hill Pond is all within Walnut Hill Park. Trails surround the wetland, and native plants are present from seeding efforts in the past. Steep hills along the residential properties contribute to runoff, but a 20-30 foot wide buffer comprised of no-mow grass surrounds the wetland.

## Wetland Health

**Site Observations:** The slope into the wetland is moderate, and the substrate was soft but not mucky. Algae was present in the monitoring area. Herons and crayfish burrows were observed.

**Table 4.3.4 Walnut Hill Pond, LP-69.1 (E-31) Wetland Health based on Index of Biotic Integrity**

	<b>Invertebrates</b>	<b>Vegetation</b>
<b>2010 Data (E-31)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (20)	Poor (13)
<b>Trend 2010</b>	Not enough data	Not enough data

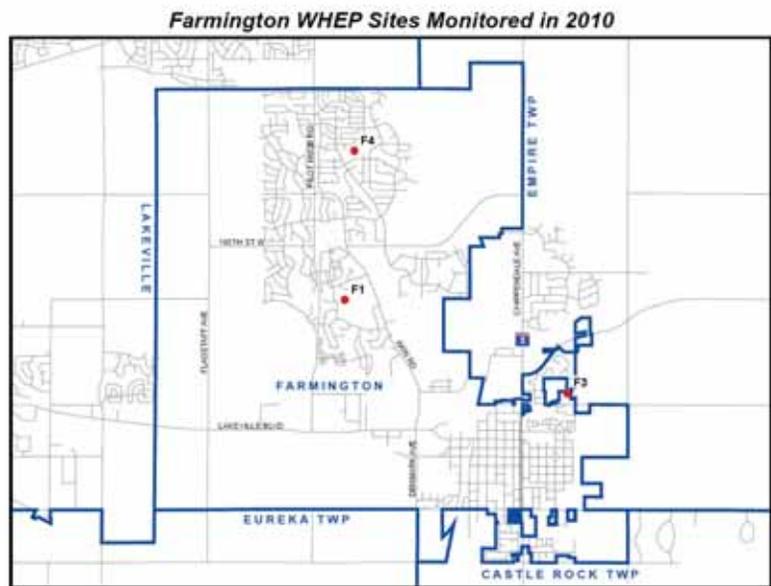
**Site summary:** This is the first year that E-31 has been monitored. The vegetation and invertebrate scores indicate poor to moderate wetland health. Continued monitoring will help provide a better assessment of wetland health and trends.

### 4.4 Farmington Wetlands

The Farmington team sampled three wetlands in 2010. The City has been monitoring wetlands through the WHEP program since 1997, and has many years of data for each of their five wetland sites.

**Team Leader:**  
Katie Koch-Laveen

**Team Members:** Chris Caduff, John Mulligan, Julie Mulligan, Marcia Richter, Ed Scholten, Richard Schuldt, Richard Tucker, and Pam Tucker.



Katie Koch-Laveen

Katie Koch-Laveen got involved with WHEP after a long involvement in 4-H. She enjoys interacting with others and has learned to be an effective team leader. She asserts, "We enjoy each other very much as a team. Each of us has our area of expertise. We still agonize over the identification of grasses, though."

Katie remembers an interesting day in the wetland. "It started to rain when we arrived on site, but we were hopeful and just stood under our umbrellas. Soon the hail started. As we were returning to our car, a work-from-home neighbor noticed us, wet and foolish looking. She invited us inside out of the hail storm. We were very grateful as we observed the severe weather from the safety of her dining room window."



Jennifer Dullum

Jennifer Dullum administers the WHEP program for the City of Farmington. Her role is to publicize the program in local publications, determine which wetlands should continue to be monitored, provide site maps and any directional needs, and review the collected data. She says, "The WHEP program is important to the City in comparing past data to see changes occurring within the wetland system as development increases in Farmington. The City has been monitoring the health of wetlands since 1998. WHEP volunteers are extremely dedicated and all their hard work is appreciated and

a value to the City. Because of the volunteers, wetland health is monitored at a much higher level than it would be without their assistance."

## Farmington General Wetland Health



Richard Schuldt, Marcia Richter,  
Ed Scholten, Chris Cadoff

Figure 4.4 presents an overall view of wetland health for all of the 2010 monitoring sites in Farmington based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.4 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Scores that differ by less than 10 percent are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. Site F-1 (Pine Knoll) was dry again in 2010; so it was surveyed for vegetation but not for invertebrates. All three wetlands were found to be in poor wetland health. Farmington has designated F1, F-3 and F-4 as reference wetlands. None of these wetlands appears to show ideal reference conditions, i.e. minimally impacted. Monitoring results

for F-1 and F-3 in the earlier years of WHEP showed better conditions than in recent years. The data indicate these wetlands are likely impacted. All of Farmington is within the Vermillion River Watershed.

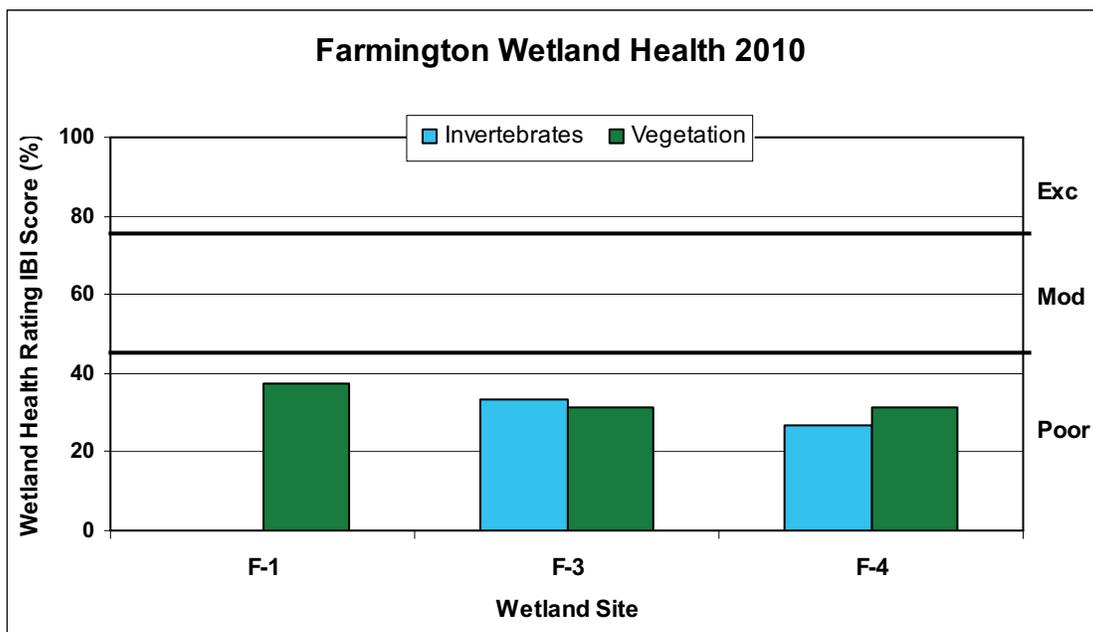


Figure 4.4 Farmington site scores (percent) for the 2010 sampling season

### 4.4.1 Pine Knoll Pond (F-1)

Pine Knoll Pond (F-1) is a 35 acre wetland with a drainage area of 107.5 acres which is 16 percent impervious. There is development surrounding much of the wetland, and wetland buffers are in place. It is designated as "Protect" in the City's wetland management plan. The wetland management goal is to document the wetland health as development occurs. The monitoring site location was moved in 2004 due to construction activities. This new location has stayed



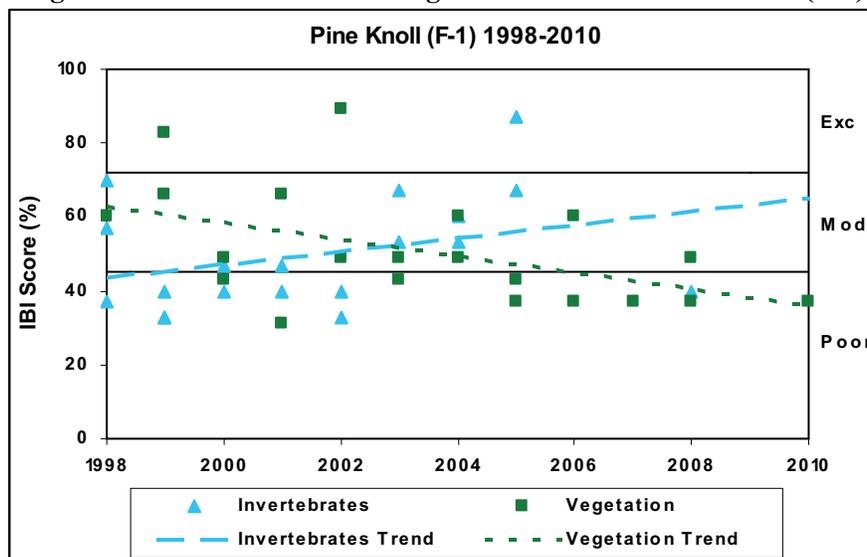
consistent since 2004. The site chosen is within an existing residential area, to the northeast of the previous sampling site. The team noted that this site is more connected to the larger wetland basin.

**Site Observations:** This wetland has been dry for several years, the vegetation is no longer exclusively wetland vegetation. Even after heavy rain raised water levels in other wetlands, this wetland remains dry. Only three vegetation species were observed. One of them was the invasive species, reed canary grass.

**Table 4.4.1 Pine Knoll Pond (F-1) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (F-1)</b>		
<b>Wetland Health Rating (IBI score)</b>	Not sampled due to dry conditions	Poor (13)
<b>Trend 1998-2010</b>	Not sampled since 2005	Declining

**Figure 4.4.1 Invertebrate and vegetation trends for Pine Knoll (F-1)**



**Site summary:** This was the twelfth year that Pine Knoll Pond has been sampled since 1998. It was not sampled in 2009 due to dry conditions. It was dry in 2010 as well; however the vegetation was surveyed. It is difficult to assess the wetland based on invertebrates since they have not been sampled since 2005 due to dry conditions. The long term IBI trends are not consistent. The invertebrate data indicates improving wetland health through 2005, while the vegetation data indicates declining wetland health. However, there is a lot of variability in the data and no recent invertebrate data. The low vegetation scores are not surprising since the wetland has been dry for several years. Most of the obligate wetland vegetation can't survive in these conditions. Vegetation that can survive both in wetter and dryer conditions (facultative) replaces the obligate wetland vegetation. It appears that development around the wetland has adversely affected the wetland by altering its water supply and this has affected its overall health.



#### 4.4.2 Kral Pond (F-3)

F-3, also known as Kral Pond, is a 10 acre wetland with a drainage area of 41.8 acres which is 6.6 percent impervious. It is a type 4 wetland located within the Vermillion River Watershed. There are inlets in the southwest and northeast corners and one outlet on the north end of the

wetland. It is obvious, based on its shape, that this wetland has been altered in the past, likely to accommodate farming practices. Kral Pond is designated as “Manage 2” in the City wetland management plan. There is development to the north, south, and west, and agriculture to the east. Wetland buffers are in place. The wetland management goal is to document how housing and agriculture impact the manmade wetlands.

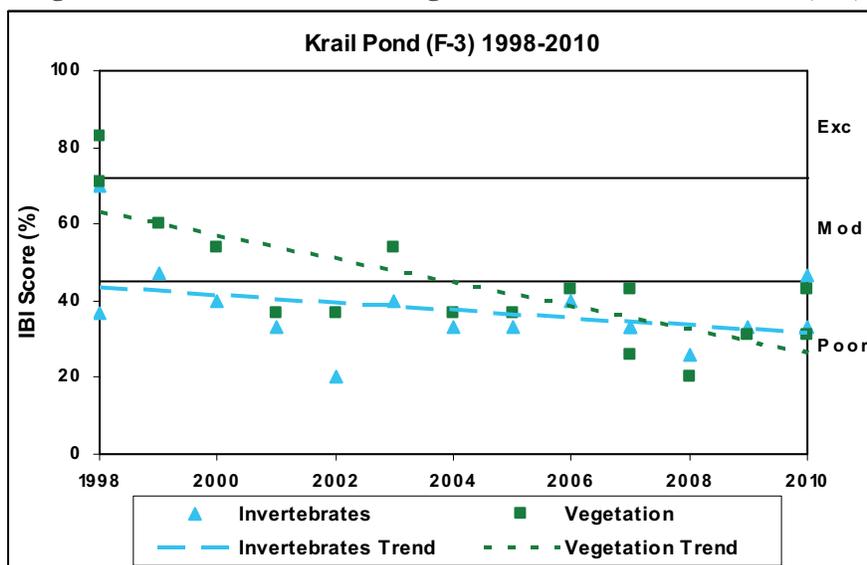
## Wetland Health

**Site Observations:** This is a large wetland with extensive stands of cattail. The slope to the wetland is steep, but gently into water. The water was much higher during the vegetation survey at the end of June than during the invertebrate survey in early June.

**Table 4.4.2 Kral Pond (F-3) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (F-3)</b>		
<b>Wetland Health Rating (IBI score)</b>	Poor (10)	Poor (11)
<b>Cross-check Rating (IBI score)</b>	Poor (14)	Poor (15)
<b>Trend 1997-2010</b>	Declining	Declining

**Figure 4.4.2 Invertebrate and vegetation trends for Kral Pond (F-3)**



**Site summary:** Kral Pond has been monitored for thirteen consecutive years. Recent monitoring indicates poor wetland health. The long term trend shows a continuing and significant decline in wetland health based on both indexes, although the 2009 and 2010 data show an increase in scores. The two indices have been consistent with each other for most years. It appears that the wetland is being impacted from changes in the watershed, including the development that has occurred.

### 4.4.3 Lake Julia (F-4)

F-4, also known as Lake Julia, is a 10 acre open water wetland within the Vermillion River Watershed. The wetland drainage area is 233 acres which is 43 percent impervious. It is designated as “Manage 1” in the City wetland management plan. This is a man-made lake constructed to hold stormwater runoff and relieve down stream flows to the Vermillion River. There is development to the north and west, and Lake Julia Park to the south and east. The immediate area is mowed turf up to a natural grass buffer along the lake edge. The wetland management goal is to document wetland health as development occurs, and to monitor long term effects of development on manmade lakes.



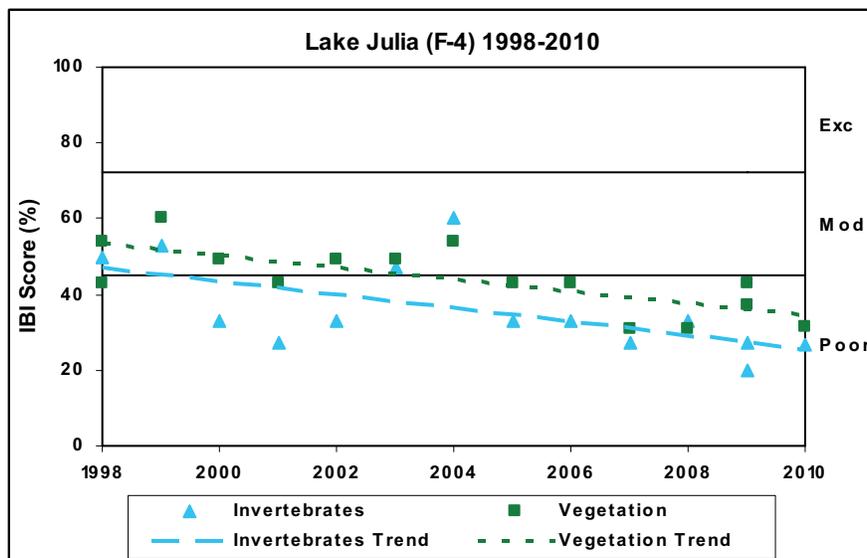
### Wetland Health

**Site Observations:** Lake Julia is within a community park. The lawn is mowed, and a variety of vegetation is present onshore such as woody plants and forbs. The water level of the vegetation sampling area was zero to two feet deep. The substrate was sandy and firm. Dead fish were observed.

**Table 4.4.3 Lake Julia (F-4) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (F-4)</b>		
<b>Wetland Health Rating (IBI score)</b>	Poor (8)	Poor (11)
<b>Trend 1998-2010</b>	Declining	Declining

**Table 4.4.3 Invertebrate and vegetation trends for Lake Julia (F-4)**



**Site Summary:** Lake Julia has thirteen consecutive years of data. The invertebrate and vegetation data indicate declining wetland health, from moderate down to poor. Low water levels in the wetland the past few years may have influenced the IBI scores. The trend analysis for both vegetation and invertebrates continues to indicate a gradual decline in wetland health. The invertebrate scores have been more

variable, but continue to decline since a high in 2004. The low scores are not surprising for a constructed wetland designed to receive stormwater flows. Fluctuating water levels can severely limit the type and amount of vegetation present as well as the related invertebrate community.

## 4.5 Hastings Wetlands

Four wetlands were monitored in Hastings in 2010. Eight wetlands have been sampled in the City of Hastings through the WHEP program since 1999.

**Team Leader:** Joe Beattie

**Team Members:** Alicia Beattie, Summer Hendrickson, Chester Kong, Jen Oknich, Kelly Pechous, Connie Slaten, Dwight Smith, Kevin Smith, and Philip Vieth.



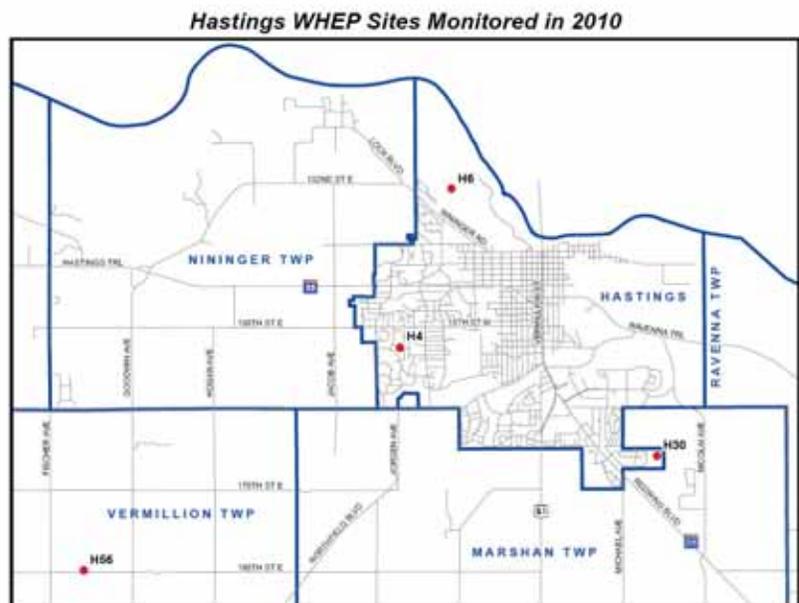
Joe Beattie

Joe Beattie became a WHEP team leader to enrich his knowledge of wetlands. He says, "The WHEP program forms an integral part of my summer months. I enjoy the opportunity to collect data, work with a diversity of passionate people, and, of course getting into the wetlands." Joe was selected by the Dakota County Soil and Water Conservation District for the Outstanding Conservation Award for 2009.

Team Hastings' wetland sites are unique. They include stormwater detention ponds, a farmland pond, and a wetland adjacent to a backwater lake. Team Hastings has just as diverse of a group of volunteers ranging from high school students to professional biologists. Joe admits, "We have a great group of volunteers that are passionate about their work with wetlands."

Joe had the privilege to study biology abroad in Costa Rica this summer. Though he would miss some of the WHEP field season, he couldn't pass up the opportunity. Luckily he could rely on his teammates to continue the work. His daughter, Alicia Beattie, and Kelly Pechous took the reins for the couple of weeks that Joe was exploring.

John Caven administers WHEP for the City of Hastings. This is his first year as the City contact for WHEP. His role includes selecting the wetlands to be monitored as well as being a communication link for the City. He says "the program is a tremendous asset to the community as the program provides tangible trend lines of the general health of area ponds. Over time, we'll be able to see the progress already made and help determine in the future how much further we'll need to go in the area of storm water management. The hard work of many dedicated volunteers is the backbone to providing the vital data required to make this valuable program a success."

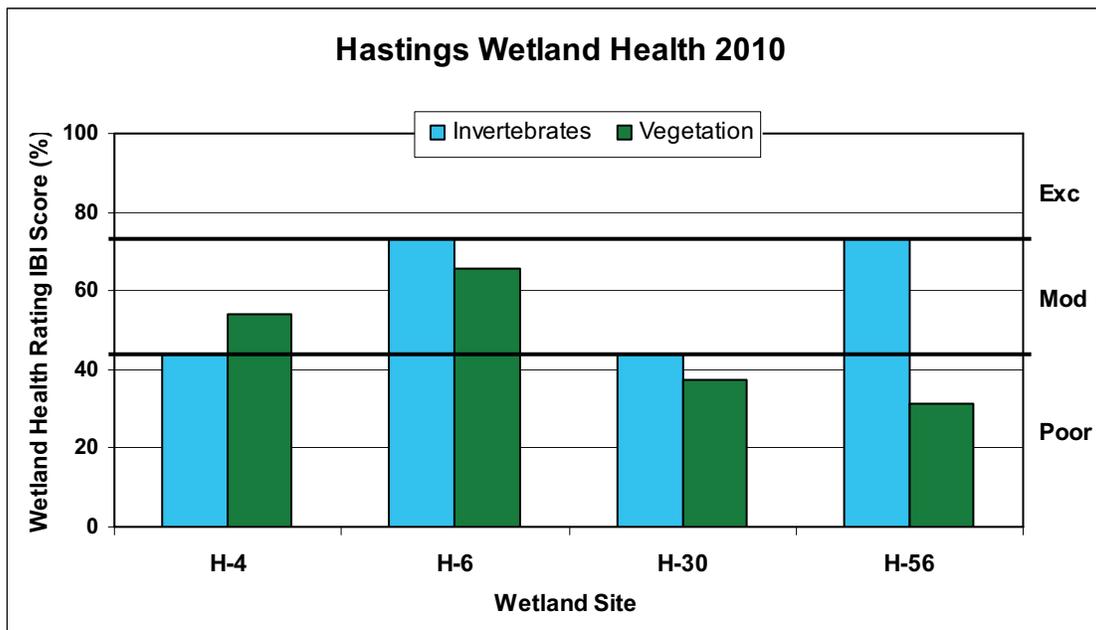


Front to back, left to right: Alicia Beattie, Kelly Pechous, Jean Beattie, Connie Slaten, Dustin Lidtke, Summer Hendrickson, Kevin Smith; and Joe Beattie (standing)

## Hastings General Wetland Health

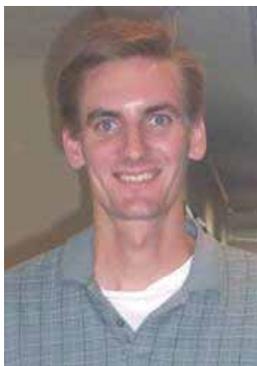
Figure 4.5 presents an overall view of wetland health for all of the 2010 monitoring sites in Hastings based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.5 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Scores that differ by less than 10 percent are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. All of the wetlands showed poor to moderate wetland health in 2010. Vegetation and invertebrates scores were inconsistent for H-56, with the invertebrates moderate to borderline excellent, while the vegetation was rated poor. The vegetation and invertebrate scores for H-4, H-6, and H-30 were quite consistent.

Figure 4.5 Hastings site scores (percent) for the 2010 sampling season



### 4.5.1 Stonegate Treated Wetland (H-4)

H-4, also known as Stonegate Treated, is the second cell of a two-celled stormwater management system created to treat runoff from surrounding residential development. It is a one acre, type 4 wetland located within the Vermillion River watershed. The wetland drainage area is 9 to 10 acres, and is 30 to 40 percent impervious. The wetland has one inlet in the southeast corner and one outlet on the north end. The watershed is primarily residential with private property on three sides and a public trail along the south side of the wetland. The residents maintain a vegetated buffer along the south shore and at least one lot on the north side. Native plant restoration was conducted in 2003-2004 through the Neighborhood Wilds program. Several homeowners still mow 100 percent of the shoreline by their property. The wetland management goal is for storm water management, to enhance the water quality before the waters reach the Vermillion River.



John Caven



The watershed is primarily residential with private property on three sides and a public trail along the south side of the wetland. The residents maintain a vegetated buffer along the south shore and at least one lot on the north side. Native plant restoration was conducted in 2003-2004 through the Neighborhood Wilds program. Several homeowners still mow 100 percent of the shoreline by their property. The wetland management goal is for storm water management, to enhance the water quality before the waters reach the Vermillion River.

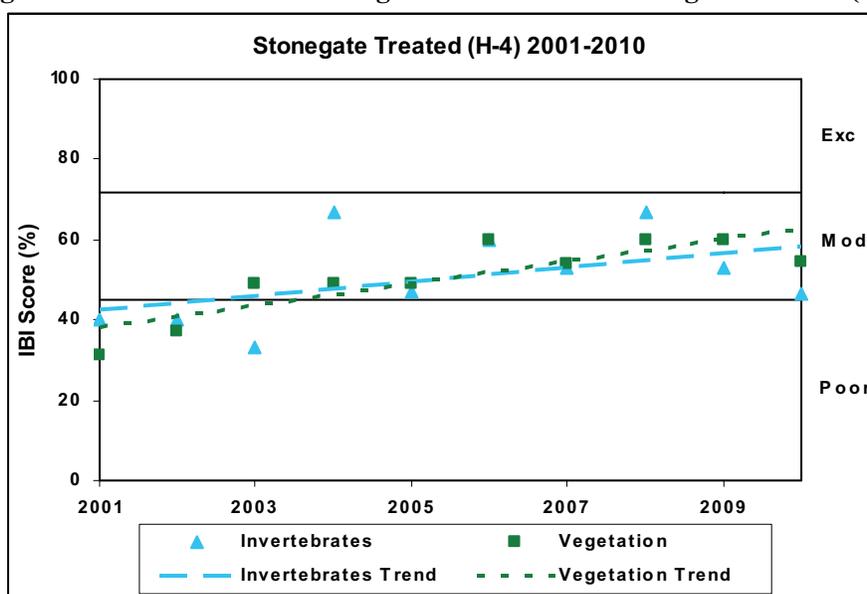
## Wetland Health

**Site Observations:** This is a restoration area with sedges, willows, dogwood, and cattails. The wetland bottom is sandy beneath muck. Some surrounding houses have native vegetation thriving while other properties are mowed to the wetland edge.

**Table 4.5.1 Stonegate Treated (H-4) Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (H-4)</b>		
<b>Wetland Health Rating (IBI score)</b>	Poor (14)	Moderate (19)
<b>Trend 2001-2010</b>	Improving	Improving

**Figure 4.5.1 Invertebrate and vegetation trends for Stonegate Treated (H-4)**



**Site summary:** The invertebrate IBI score indicates poor (borderline moderate) wetland health in 2010, while the vegetation score indicates moderate wetland health. A trend analysis on the ten years of data indicates that wetland health is gradually improving. Although the scores for 2009 and 2010 have dropped each year, the overall trend is still positive. Scores moved from the poor range in 2001 through 2003 up to the moderate range. Both indexes have tracked each other well. Restoring native vegetation around the pond may have helped improve wetland health. Continued monitoring will be necessary to see if the downward trend of the past two years continues.

### 4.5.2 Lake Rebecca Wetland (H-6)

H-6, also known as Rebecca EM 1&2, is a public water wetland in the City of Hastings. It is a 19 acre, type 4 wetland located in the Mississippi River Watershed. The wetland drainage area is 56 acres, and is 1 percent impervious. The wetland has two stormwater inlets and one controlled outlet. The Mississippi River Flats Natural Resource Management and Restoration Plan was adopted in December 2002.



The wetland is an emergent marsh and shoreline/floodplain forest. Diversion of stormwater into the lake from development and invasive species, including purple loosestrife, are of growing concern. The wetland is being monitored to better maintain a shoreline buffer along most of the lake, and to manage for wildlife habitat and recreation.

## Wetland Health

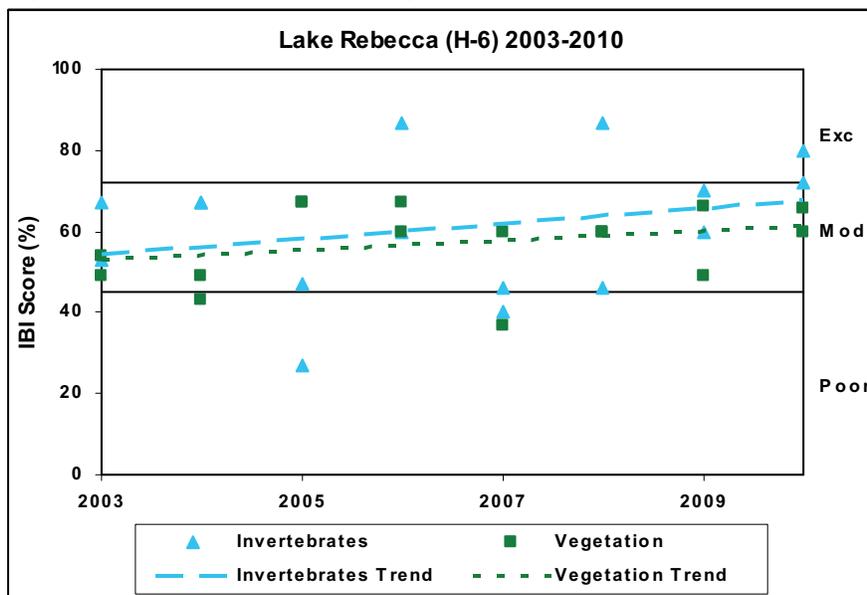
**Site Observations:** Lake Rebecca wetland (H-6) is adjacent to Spring Lake and the Mississippi River. A tall levy with walking/biking trail is located on the north side of the wetland. It is a large open water wetland surrounded by trees. There are several snags in the water which provide good habitat for invertebrates. The substrate is solid near shore, but becomes muckier in deeper waters. The open water was covered with duckweed and wolfia in 2010. In 2009, the Hastings team noticed purple loosestrife and smartweed spreading.



**Table 4.5.2 Lake Rebecca (H-6) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (H-6)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (22)	Moderate (23)
<b>Cross-check Rating (IBI score)</b>	Excellent (24)	Moderate (21)
<b>Trend 2003-2009</b>	Stable	Stable

**Figure 4.5.2 Invertebrate and vegetation trends for Lake Rebecca (H-6)**



**Site summary:** This is the eighth year of monitoring for Lake Rebecca. Although there is a lot of variation in the data, overall, the wetland has maintained moderate health with both invertebrates and vegetation. The cross check was consistent with the original scores, however the invertebrate score

calculated by the cross-check team showed excellent wetland health while the score of the Hastings team was only 2 points lower, but fell within the moderate range.

### 4.5.3 Sand Coulee Pond (H-30)

H-30, also known as Sand Coulee Pond is a 0.92 acre stormwater detention pond located in the Vermillion River watershed. The wetland drainage area is 100 to 114 acres. The watershed area is 20 to 30 percent impervious. The wetland has one inlet and one outlet. The pond is within a valuable and significant dry sand prairie remnant. There is increased development within the watershed. Invasive species such as spotted knapweed and changing water levels threaten plant restoration plans and/or efforts. Some shoreline restoration efforts are underway at this site. The wetland management goal is for this wetland to function as a sediment pond, and then enhance water quality and wildlife habitat.



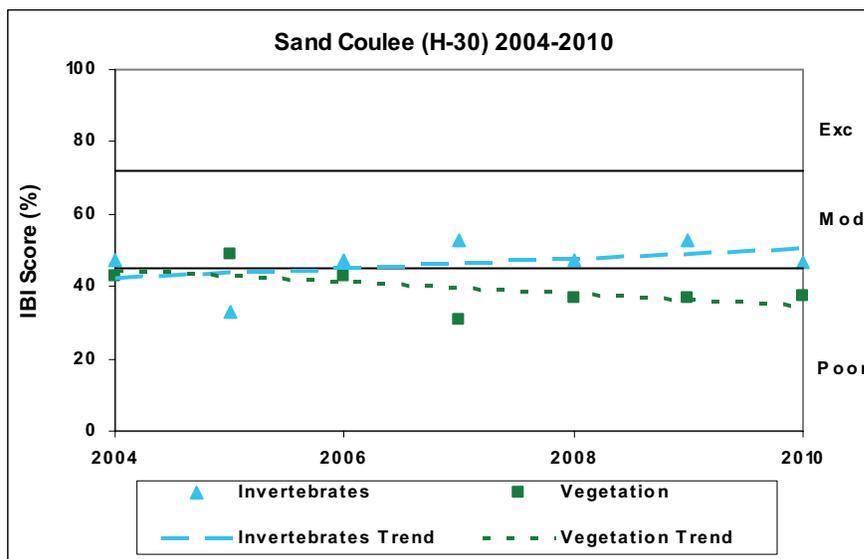
#### Wetland Health

**Site Observations:** Plantain, arrowhead, and bulrush had been planted around the wetland perimeter. Potential threats to the wetland include spotted knapweed, litter, and stormwater runoff.

**Table 4.5.3 Sand Coulee Pond (H-30) Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (H-30)</b>		
<b>Wetland Health Rating (IBI score)</b>	Poor (14)	Poor (13)
<b>Trend 2004-2010</b>	Stable	Stable

**Figure 4.5.3 Invertebrate and vegetation trends for Sand Coulee Pond (H-30)**



**Site summary:** Sand Coulee wetland has been monitored seven consecutive years. Both the vegetation and invertebrate indexes have remained on the boundary between poor and moderate health. Overall, the wetland conditions have remained stable. However, there appears to be slight opposite trends for the invertebrates (improving) and vegetation (declining). Because part of the wetland vegetation has been restored to native species, selecting a location for the releve plot that reflects the diversity of the wetland as accurately as possible is critical to accessing the health of the wetland.

#### 4.5.4 180<sup>th</sup> Street Marsh (H-56)

H-56, also known as 180<sup>th</sup> Street Marsh, is a 20 acre type 5 wetland located in the Vermillion River Watershed. The wetland drainage area is 340 acres, and is less than one percent impervious. The wetland has one inlet on the west side. It also has one outlet that runs south to the Vermillion River from a culvert under 180<sup>th</sup> Street. The wetland is a part of several natural ponds in the immediate area. Agricultural use on the surrounding land is expected to continue. There is a concern that when the ponds are dry, the landowners may put the land into production. The ponds partially cover several parcels of land, each owned by a different party. Management practices are dependent on individual property owners. The wetland management goal is for agriculture to continue on the surrounding land, and wildlife habitat management to be practiced in the wetland areas.



#### Wetland Health

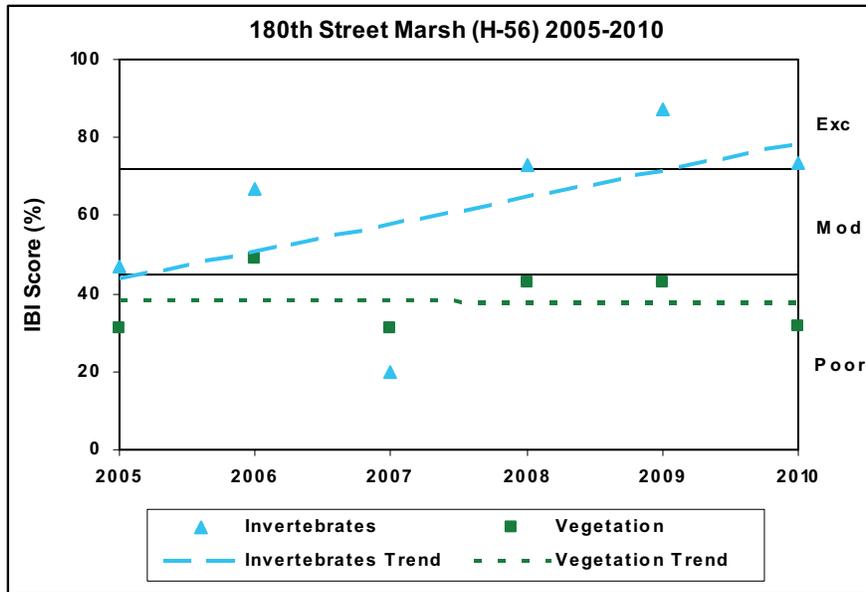
**Site Observations:** River bulrush, arrowhead, and giant burreed grow along the shore. In 2007, the team noted the presence of several invasive species in the upland area, including honeysuckle, spotted knapweed and buckthorn. In 2008, reed canary grass was observed. For 2010, the Hastings team switched to a 5 x 20 meter releve because they felt it captured a more accurate impression of the wetland. The City team noted the health assessment in 2010 does not match their impressions because while the diversity of vegetation is low, it was dominated by native species.



**Table 4.5.4 180<sup>th</sup> Street Marsh (H-56) Wetland Health based on Index of Biotic Integrity**

	Invertebrates	Vegetation
<b>2010 Data (H-56)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (22)	Poor (11)
<b>Trend 2005-2010</b>	Improving	Stable

**Figure 4.5.4 Invertebrate and vegetation trends for 180<sup>th</sup> Street Marsh (H-56)**



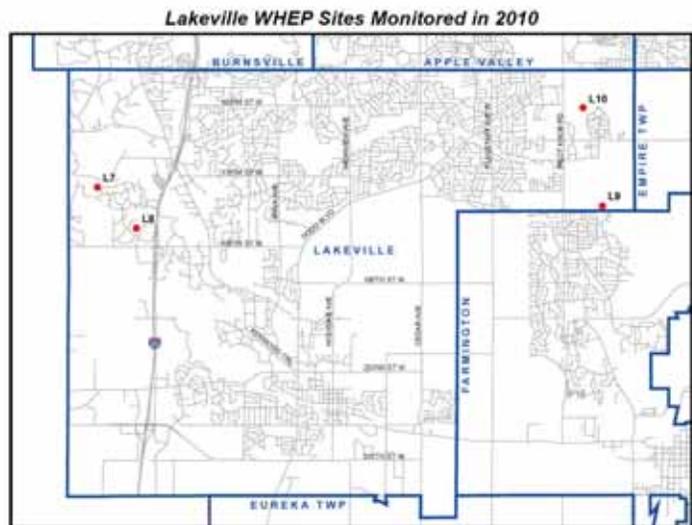
**Site summary:** This site has been monitored six consecutive years. The data are variable between the invertebrates and vegetation, ranging from excellent to poor wetland health. The vegetation and invertebrate scores are significantly inconsistent year after year. There is a positive trend in the invertebrate index, with scores in the excellent range the last 3 monitoring years. The vegetation index which has remained stable but indicates poor conditions, reflects the lower diversity found in the wetland index and may be impacted by invasive species.

## 4.6 Lakeville Wetlands

Four wetlands were monitored in 2010 within the City of Lakeville. Ten wetlands have been monitored since WHEP began.

**Team Leader:** Steve Weston

**Team Members:** Patrick Kilbride, Carol Kilbride, Megan Kilbride, Erin Kilbride, James Kilbride, William Barnes, Rachel Barnes, Rebecca Harnack, David Smith, Katrina Von Hohenberg, and William Von Hohenberg.



Steve Weston

Steve Weston describes himself as a naturalist. "I am best known for my bird observations, but people who join me on field trips realize that I am really interested in all components of the environment."

Steve said in 2010, "We had an excellent team with a number of youth, mostly high school age, and at least one younger. I find working with the kids most rewarding as I get to share an experience and opportunity that few kids have to learn first-hand the rewards they could find in a biological occupation."

"This year we had a call from a Star Tribune reporter and a visit from their photographer, resulting in a positive article. The highlight of the article, I

thought was the dangerous-looking water scorpion that was photographed in one of our traps. To me the highlight of that day was finding a Marsh Wren nest. This little oven-shaped grass basket with five or six small eggs is rarely found as it is usually deep in the cattails in standing water."



Ann Messerschmidt

Ann Messerschmidt is the WHEP contact at the City of Lakeville. Her role is to determine which wetlands should be monitored by WHEP volunteers as well as review the collected data. She uses the data to compare to past years data and see what changes are occurring with the wetlands. She says, "Over time, we hope to be able to see trends in the data." Ann believes, "the WHEP program is a great opportunity for residents interested in the natural environment to learn about wetland plants and invertebrates. This is a valuable asset to the volunteers. Because of the work by the volunteers, the community as a whole can now find in-depth information about the connections of the environment to its inhabitants and how that reflects the overall health of the system. This helps residents of our community learn how their actions can directly affect water quality."

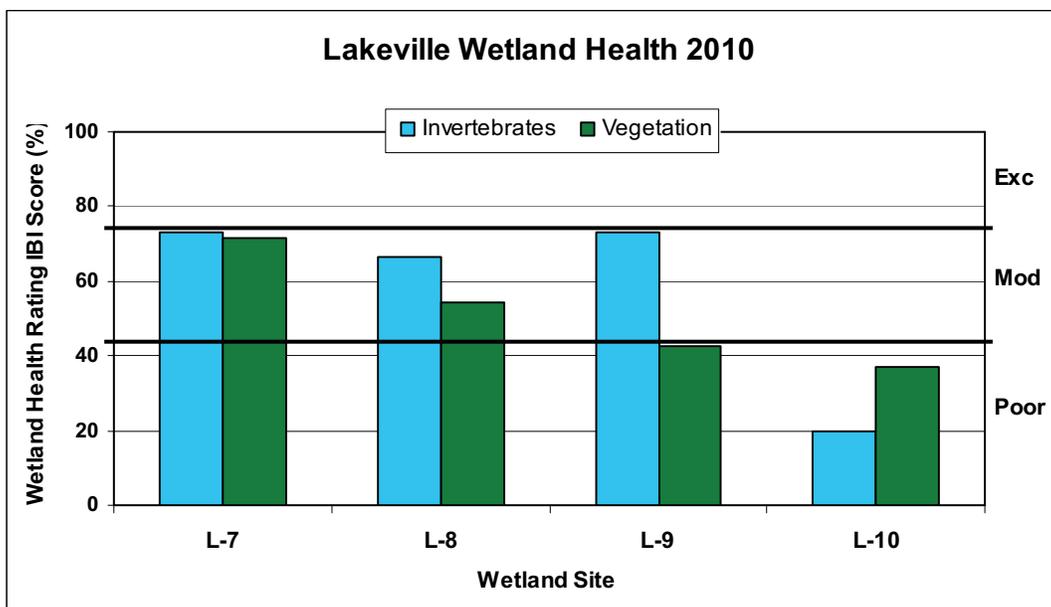
### Lakeville General Wetland Health

Figure 4.6 presents an overall view of wetland health for all the 2010 monitoring sites in Lakeville based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.6 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Scores that differ by less than 10 percent are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. The reference wetland, L-7, had very consistent vegetation and invertebrate scores in 2009 and 2010. The vegetation and invertebrate data for the four wetlands sampled ranged from poor to moderate, with most in the moderate wetland health category. L-10 was sampled for the first time in 2010 and showed poor wetland health in this initial assessment.



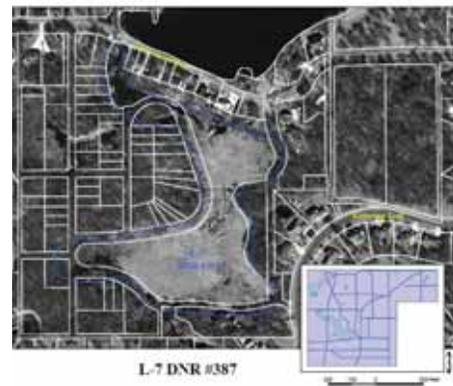
Kelly Rabe, Rachel Barnes, William Barnes, Steve Weston, David Smith, Carol Kilbride, James Kilbride

Figure 4.6 Lakeville site scores (percent) for the 2010 sampling season



### 4.6.1 DNR Wetland #387 (L-7)

L-7, also known as DNR #387, is a 10 acre, type 4 wetland located in the Orchard Lake subwatershed within the Black Dog Watershed. The Orchard Lake subwatershed is 506.6 acres with 105.5 acres of direct drainage. It is 29 percent impervious, and both publicly and privately owned. It has one inlet in the southeast corner of the wetland and two outlets along the north side. The wetland is part of the City's Stormwater Management Plan. The wetland has a designation of preserve. The wetland management goal is to actively protect and preserve the functions and values of the wetland. A woodland buffer surrounds most of the west side of the wetland, with woodland buffers between the few properties along the north and southeast wetland boundary. In an effort to improve water quality to Orchard Lake, an aeration system was installed in L-7 in 2010. There are four diffuser heads installed near the north outlet into Orchard Lake. The goal is to precipitate phosphorous out of the water column and drop it out into the sediments in L-7 so that less phosphorous will enter into Orchard Lake. The aeration system is scheduled to run from May 1 to September 30 annually.



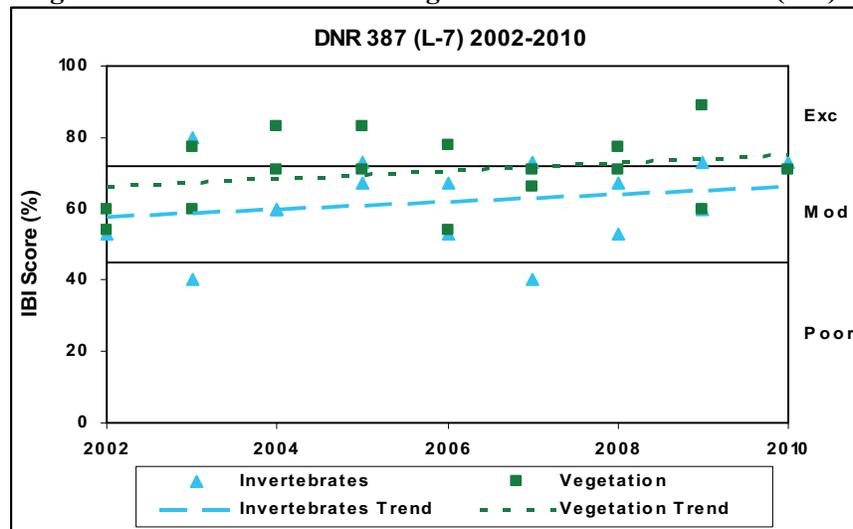
### Wetland Health

**Site Observations:** The Lakeville team observed green heron, house wren, warbling vireo, Baltimore oriole, eastern phoebe, cowbird, pewee, and robin. Reed canary grass was a dominant species and purple loosestrife is common, though the site used to be infested with purple loosestrife until biological controls were introduced. Now the purple loosestrife is better controlled with some cyclical variation in control effectiveness. The wetland is very mucky, and dead cattail debris restricts visibility of vegetation. There was quite a difference in water temperature; open water is much cooler.

**Table 4.6.2 DNR 387 (L-7) Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (L-7)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (22)	Moderate (25)
<b>Trend 2002-2010</b>	Improving slightly	Improving slightly

**Figure 4.6.2 Invertebrate and vegetation trend for DNR 387 (L-7)**



**Site summary:** This is the ninth consecutive year that DNR 387 has been monitored. Dry conditions may have altered the invertebrate scores for this site in the past. The 2010 scores indicate moderate conditions for this reference wetland. A trend analysis indicates possible slight improvement in the vegetation and invertebrate community health over time although there has been a lot of variability in the data. This wetland has a lot of vegetation diversity, but will need ongoing maintenance to keep the purple loosestrife population under control.

#### 4.6.2 DNR #393 (L-8)



L-8, also known as DNR #393, is a 9.6 acre, type 5 wetland located in the Vermillion River Watershed. The wetland drainage area is 74.7 acres, and 17 percent impervious. It is a publicly owned wetland with no inlets or outlets. The wetland has a designation of "Preserve." The wetland management plan is to actively protect and preserve the function and values of the wetland as much as possible.

The wetland is within a residential neighborhood where development began in 2003 and ended in 2008. A conservation easement of varying widths exists along all sides of this wetland. The buffer includes trees and shrubs.

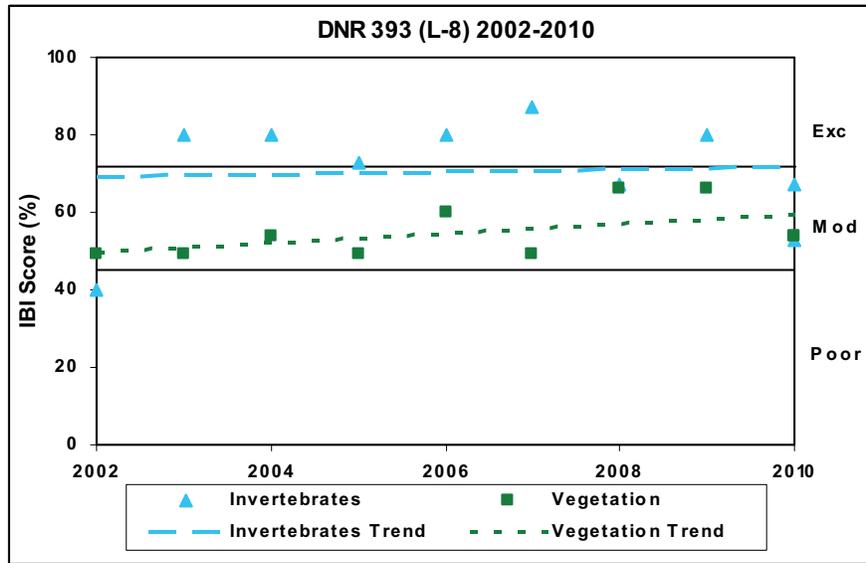
#### Wetland Health

**Site Observations:** Very little submerged vegetation was observed in 2010. High water extended into stands of reed canary grass. *Sagittaria* was found in the past, but not this year. The substrate is firm and sandy. Wildlife observed included, redwing blackbird, barn swallow, chimney swift, warbling vireo, cedar waxwing, osprey, yellow warbler, Baltimore oriole, cooper's hawk, rough winged swallow, and goldfinch.

**Table 4.6.3 DNR Wetland 393 (L-8) Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (L-8)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (20)	Moderate (19)
<b>Cross-check Rating (IBI score)</b>	Moderate (16)	Moderate (19)
<b>Trend 2002-2010</b>	Improving slightly	Improving slightly

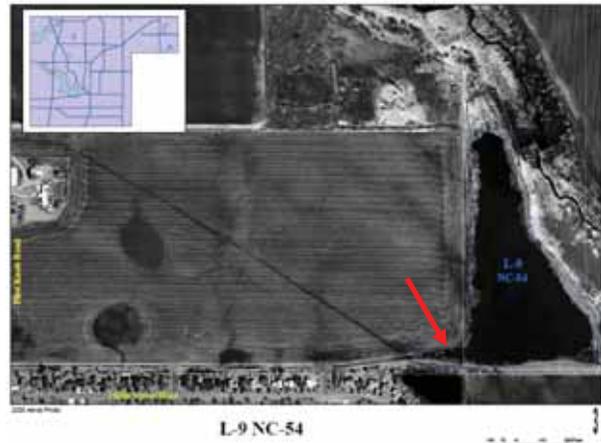
**Figure 4.6.3 Invertebrate and vegetation trends for DNR 393 (L-8)**



**Site summary:** DNR wetland 393 (L-8) has nine consecutive years of monitoring data. The trend analysis indicates a slight improvement in wetland health based on both invertebrates and vegetation, although the indexes for 2010 were both down. The buffer surrounding this wetland and lack of inlets is likely helping preserve and improve this wetland. The City team and the cross-check team had consistent data.

### 4.6.3 NC-54 Mitigation Wetland (L-9)

L-9, also known as NC-54 P.K. Wetland Mitigation, is a 13.84 acre, type 4 wetland located in the City of Lakeville. The wetland drainage area is 183 acres with 12 percent impervious surface. It is located in the Vermillion River Watershed and is on land owned by Dakota County. There is one inlet and no outlet. The wetland has a designation of "manage 1" with a goal to maintain the existing wetland functions and values.



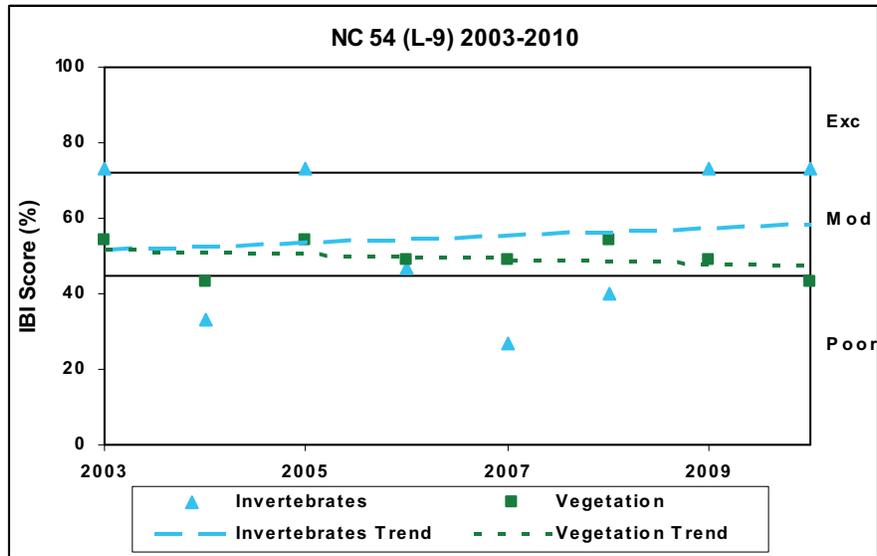
#### Wetland Health

**Site Observations:** The wetland shore is lined with willow, with extensive cattail stands in the shallow water. The wetland bottom consists of muck over sand. Submergent vegetation grows beyond the cattails. Wildlife observed: catbird, mallard, killdeer, redwing blackbird, robin, willow flycatcher, warbling vireo, goldfinch. Reed canary grass was observed in the wetland levee.

**Table 4.6.4 NC54 Mitigation (L-9) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (L-9)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (22)	Poor (15)
<b>Trend 2003-2010</b>	Variable	Stable

**Figure 4.6.4 Invertebrate and vegetation trends for NC-54 (L-9)**



**Site summary:** Eight consecutive years of data exists for NC-54 (L-9). The vegetation score for 2010 is just on the border of poor/moderate wetland health, while the invertebrate score indicates moderate health. The invertebrate score has remained quite high compared to previous years, but has been variable. Vegetation scores show a slight downward trend.

#### 4.6.4 DNR #349W (L-10)

#349W (L-10) is a 40 acre, type 5 wetland located in the Vermillion River watershed. This wetland is a DNR protected wetland. The subwatershed, NC9-1, is 213 acres. Potentially, 7,190.6 acres (44% impervious) could drain into L-10. The wetland is public property. There is one inlet on the northwest side of the wetland and one outlet on the south end of the wetland. It is included in the City's stormwater management plan. It is designated Manage 1 wetland. The City's wetland goal is to improve the existing wetland functions and values.



The water quality of the basin is currently very poor, but the data collected will provide baseline information to determine if future activities are improving water quality. The City is working with Blue Water Science to implement activities aimed at improving water quality with funding assistance from the Vermillion River Joint Powers Organization. Ongoing activities to improve water quality of this basin will continue in 2011.

L-10 is surrounded by a 40 acre park and trail system, but receives large amounts of stormwater runoff, mainly from Apple Valley. Land use impacts include nearby residential development and gravel mining on the north end of the lake (which will eventually be residential land use in the future). Cormorants, herons and egrets use this wetland frequently. There has been confirmation in the past of koi present in the wetland. The northeast portion of the basin is the deepest (~17 feet). The north/south portion of the waterbody is very shallow (~4 feet). A 1.5 acre prairie is being restored on the hill in the northwest corner of the waterbody. Approximately 13 acres of mature oaks are present in the park.

## Wetland Health

**Site Observations:** The water level was high enough to flood the reed canary grass. The substrate is sandy and the slope into the wetland is moderate. Wildlife observed: oriole, robin, goldfinch, catbird, house wren, song sparrow, great crested flycatcher, and tree swallow.

**Table 4.6.4 DNR #349W (L-10) Wetland Health based on Index of Biotic Integrity**

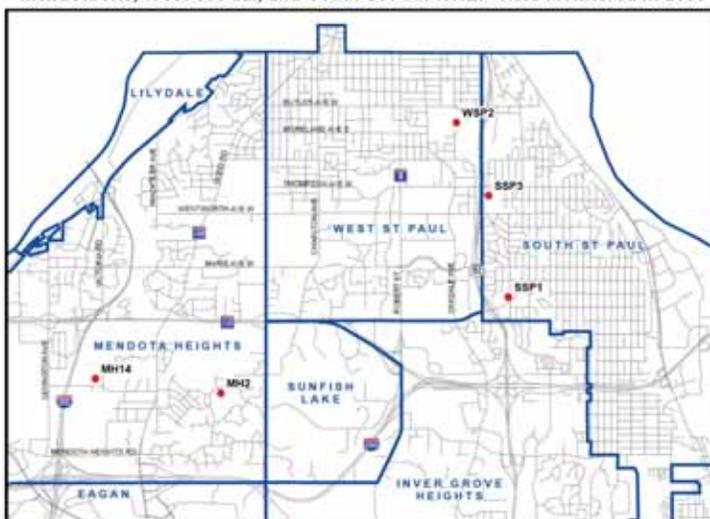
	Invertebrates	Vegetation
<b>2010 Data (L-10)</b>		
<b>Wetland Health Rating (IBI score)</b>	Poor (6)	Poor (13)
<b>Trend 2010</b>	Not enough data	Not enough data

**Site summary:** This is the first year that L-10 has been monitored. Both vegetation and invertebrate scores indicate poor wetland health. Ongoing monitoring will help identify trends in wetland health as water quality improvement projects are implemented in the watershed.

## 4.7 Mendota Heights, South St. Paul, and West St. Paul Wetlands

Two wetlands were monitored in Mendota Heights, two in South St. Paul, and one in West St. Paul in 2010 by the Mendota Heights team. The West St. Paul site is located in a Dakota County Park. Twelve wetlands have been monitored in Mendota Heights, three in South St. Paul, and eight in West St. Paul since the start of the WHEP program.

*Mendota Hts, West St Paul, and South St Paul WHEP Sites Monitored in 2010*



**Team Leader:**  
Darcy Tatham

**Team Members:**  
Caryn Benish, Nicolas Benish, Terri Buttleman, Jess Buttleman, Ross Buttleman, James Chastek, Naomi Chavez, Twyla Hill, Alison Hruby, Kathleen Lane, Michelle Larson, Jim Neuharth, Rachel Olmanson, Povi Rosa-Chavez, Kevin Senander, Mary Stade, Tamara Swanson, and Annaliese Tatham.



Darcy Tatham

Mendota Height's team leader, Darcy Tatham, has been part of the program for ten years. She believes, "when you have the opportunity to get up close to wetlands and discover how unique they all are, even in the same area, and how they can be beautiful in their own way, that is when you start to understand the value and importance they play in our lives. It is exposing people to this in their own neighborhoods and continually learning about our inter-dependence with nature that has brought me back year after year."

Darcy said, "As ever, I can't thank my team members enough for showing up time and time again. The work truly couldn't be done without them!"

John Mazzitello began has been the city WHEP contact since 2008. He was hired as the Mendota Heights Public Works Director/City Engineer. He says, "The City of Mendota Heights is committed to the preservation, maintenance, and improvement of our wetland habitat areas. I am very excited to be a part of a community that has preservation of its natural amenities as such a high priority."



John Mazzitello

Ryan Ruzak is a civil engineer for the City of Mendota Heights. He helped coordinate wetlands for monitoring during the 2010 season. Ryan's WHEP volunteer experience provided him with valuable knowledge helping him analyze the data.



John Sachi

John Sachi is the City Engineer for South St. Paul, and the City contact for WHEP. 2010 is the second year the City has been involved in WHEP since 2003, and John is responsible for convincing the City Council to be part of the program again. He recruited volunteers and identified the ponds to be sampled. John recognizes that, "the City should benefit from this program by helping to establish baseline information for future wetland/pond improvement projects. The City has only a few wetlands, and maintaining and sustaining them to be viable is vital to the City. The volunteers were a great help as our dwindling staff has extra demands put on it and the City could not likely have been part of the program without the volunteer effort. While the City has not seen changes because of the program yet, we are confident it will help direct us in our water quality efforts in the future."

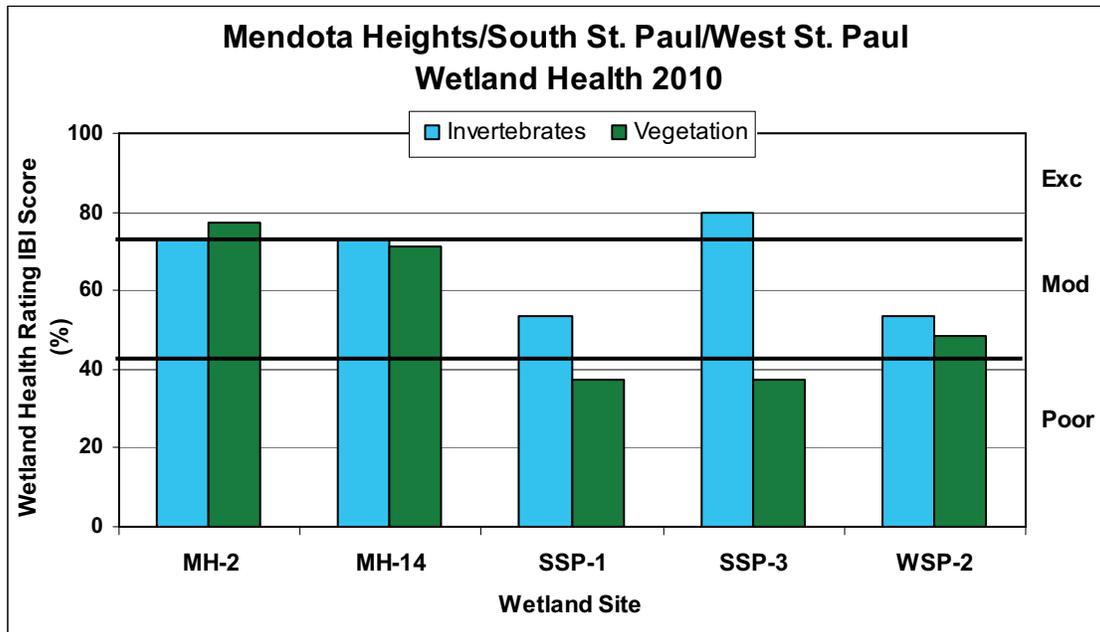
## Mendota Heights, South St. Paul, and West St. Paul General Wetland Health

Figure 4.7 presents an overall view of wetland health for all of the 2010 monitoring sites in Mendota Heights, South St. Paul, and West St. Paul based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.7 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Scores that differ by less than 10 percent are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. Two sites were monitored in Mendota Heights, two in South St. Paul, and one in West St. Paul. The wetland ratings ranged from poor to excellent wetland health. MH-2 and SSP-3 show excellent ratings for the vegetation and invertebrate scores, respectively. MH-14 scored nearly excellent for both invertebrates and vegetation. The scores for SSP-3 are inconsistent with invertebrates rated excellent while vegetation was rated poor.



Nicolas Benish, Rachel Olmanson,  
Mary Stade, Darcy Tatham

**Figure 4.7 Mendota Heights, South St. Paul, & West St. Paul site scores (percent) for the 2010 sampling season**



#### 4.7.1 Copperfield (MH-2)

Copperfield (MH-2) is a 9.4-acre, type 4 wetland within the IV-18 watershed. The watershed is 865.3 acres and is 0.4 percent impervious. The basin is surrounded by grasslands and trees within a residential neighborhood in Mendota Heights. Many of these ponds receive surface runoff from residential and road development. The wetland has several inlets on the south side and one outlet on the northwest side at Huber Drive. The two wetlands are connected when water levels are high. The wetland is part of the City’s stormwater management plan and is managed for aesthetics, natural park area and buffer strips. Copperfield is designated as a reference site.



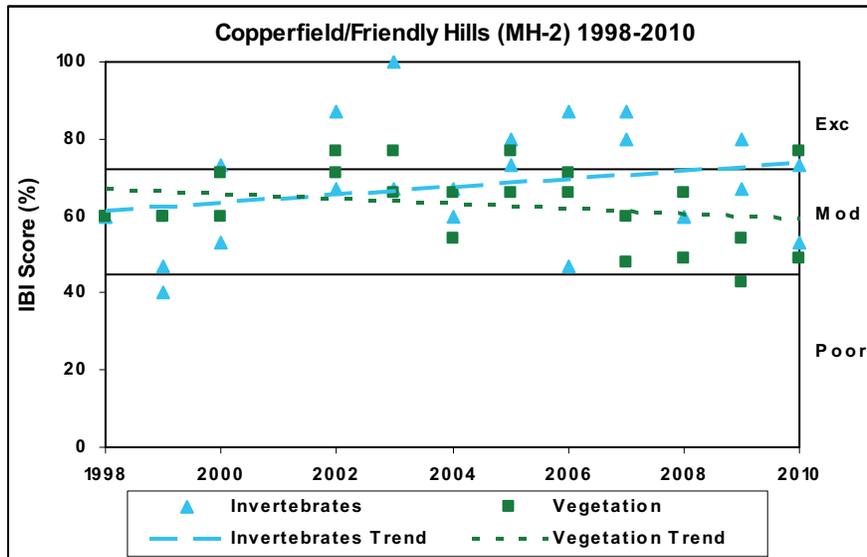
#### Wetland Health

**Site Observations:** More water was present in 2010 than in previous years. A large diversity of vegetation was noted in 2010. For the past few years, the vegetation monitoring area has been on the opposite side of the pond than originally established. The plot is representative of the wetland. The area is secluded. The team was excited to find *Utricularia* for the first time in this wetland.

**Table 4.7.1 Copperfield (MH-2) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (MH-2)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (22)	Excellent (27)
<b>Cross-check Rating (IBI score)</b>	Moderate (16)	Moderate (17)
<b>Trend 1998-2010</b>	Improving but variable	Declining slightly

**Figure 4.7.1 Invertebrate and vegetation trends for Copperfield (MH-2)**



**Site Summary:** The Mendota Heights team found an excellent vegetation rating and moderate invertebrate rating in 2010. The long-term trend based on twelve years of data shows improving invertebrate health and declining vegetation health, although there is a lot of variability in the invertebrate data. The scoring between the City team and the cross-check team were significantly inconsistent for both the vegetation and invertebrate data. The invertebrate samples were taken about one month apart. The City team identified several more forbs and grass-like species that increased the IBI scores significantly, especially *Utricularia* which was found at cover rating of only 0-1%. *Utricularia* presence adds 5 points to the score. MH-2 is designated as a reference wetland for the City.

#### 4.7.2 Wagon Wheel (MH-14)

Wagon Wheel (MH-14) is a 0.9 acre wetland in the IV-P33 watershed. The watershed is 18.1 acres with 10 percent impervious surface. The wetland is privately owned, and has no inlet. The outlet is a swale on the northeast side. It is part of the City's Stormwater Management Plan, and is designated as a "PUB/EMF" wetland or open water pond with some emergent vegetation (Cowardin System, Cowardin et.al 1979, <http://www.npwrc.usgs.gov/resource/wetlands/classwet/index.htm>). The City's wetland management goal is to increase its water quality. Wagon Wheel Trail is scheduled for reconstruction in 2011. Area homeowners are concerned about how this may impact the wetland.



#### Wetland Health

**Site Observations:** MH-14 is a private pond bordered by two residences and Mendakota Country Club/Golfcourse to the north. Filamentous algae was observed in wetland. There is a ring of cattails (*Typha*) and bulrush (*Scirpus*) around the wetland, with pockets of open water and *Scirpus*. The *Typha/Scirpus* reaches at least 15-20 feet from the shore. The bottom was described as mucky. Reed canary grass was found at a low cover class. The team noted concern from homeowners about a noticeable drop in water level since Rogers Lake was dredged. They are no longer able to canoe in the wetland since emergent vegetation has filled in the area.

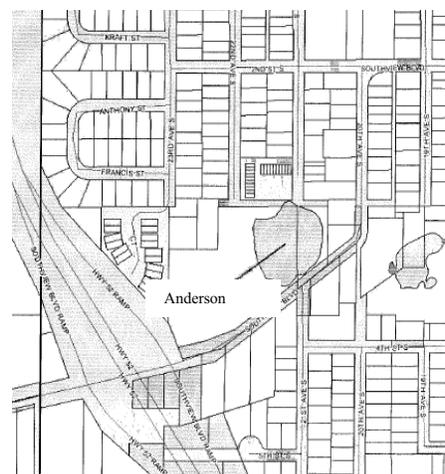
**Table 4.7.2 Wagon Wheel (MH-14) Wetland Health based on Index of Biotic Integrity**

	Invertebrates	Vegetation
<b>2010 Data (MH-14)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (22)	Moderate (25)
<b>Trend 2010</b>	Not enough data	Not enough data

**Site summary:** This is the first year that MH-14 has been monitored. Both the vegetation and invertebrate scores indicate moderate wetland health, although the vegetation score is very close to excellent.

### 4.7.3 Anderson Pond (SSP-1)

Anderson Pond (SSP-1) is a 2.4-acre, type 4 wetland within the Lower Mississippi River watershed. The drainage area is 168 acres, and is approximately 15 percent impervious. It has an inlet on the northwest corner, an inlet on the west side, and an outlet on the south side of the wetland. It is part of the City's stormwater management plan. The City does not have a wetland management plan.



Virtually all of the area that contributes to this wetland is fully developed. In 2008, the City performed an extensive dredging of Anderson Pond. The cattails are already returning on the east and west sides of the pond. A separate cell was created near the northwest inlet in order to facilitate future dredgings and other maintenance activities. In 2009, Southview Pond was constructed as a pre-treatment measure for the runoff from Highway 52 and West St. Paul, prior to conveyance into Anderson Pond. Highway 52 is a major contributor to Anderson Pond as is the City of West St. Paul (over 90% of the pond's watershed is in West St. Paul).

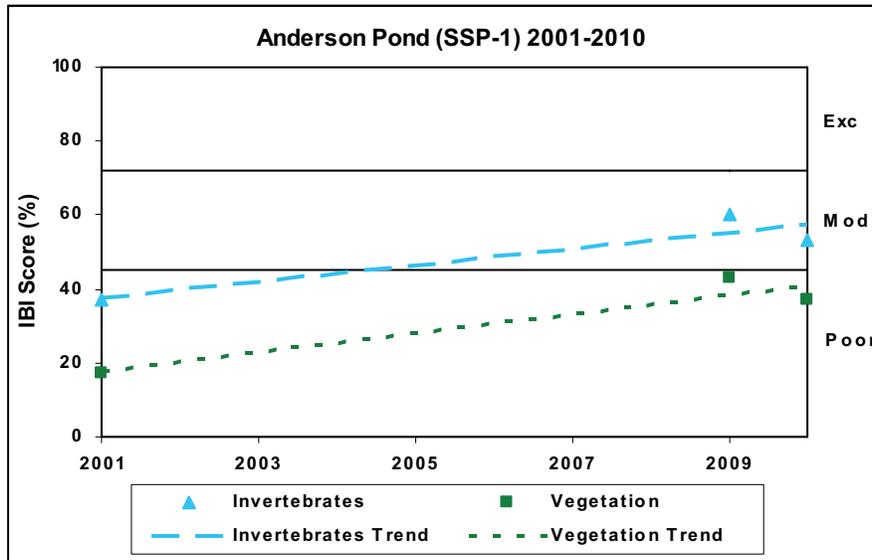
#### Wetland Health

**Site Observations:** Not much submergent vegetation was present in 2010. Wildlife observed: heron, geese, ducks, and red winged blackbirds. The plant survey was conducted by the north side of the wetland, while the invertebrate survey was done by the south side. When the site was first monitored in 2001, monitoring occurred on the north end. The pond was dredged and cattails cut in about 2008.

**Table 4.7.3 Anderson Pond (SSP-1) Wetland Health based on Index of Biotic Integrity**

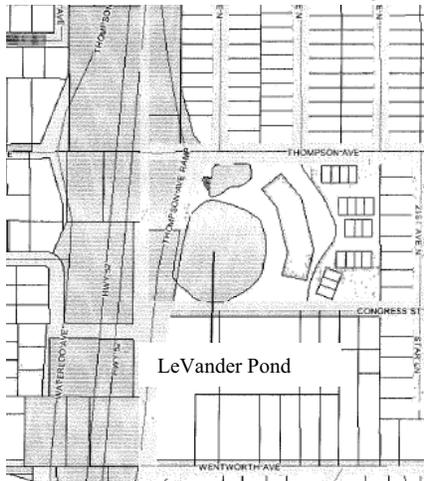
	Invertebrates	Vegetation
<b>2010 Data (SSP-1)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (16)	Poor (13)
<b>Trend 2001-2010</b>	Improving slightly	Improving slightly

**Figure 4.7.3 Invertebrate and vegetation trends for Anderson Pond (SSP-1)**



**Site Summary:** This is the third year that SSP-1 has been monitored since 2001. Based on the past observations of a lot of litter and disturbance, it is not surprising to find a poor vegetation score. However, the scores are substantially higher than in 2001, with the invertebrates moving into the moderate range. This may be due to the dredging work that was done in the wetland. The wetland receives a substantial amount of stormwater from a developed watershed and is therefore not likely to be of high quality. There appears to be a positive trend in both the invertebrate and plant health, however, additional data is needed to confirm this trend.

#### 4.7.4 LeVander Pond (SSP-3)



LeVander Pond, also known as SSP-3, is a 3.4 acre, type 4 wetland within the Lower Mississippi River Watershed. Its watershed is 37.9 acres which is approximately 20 percent impervious. It is part of a City of South St. Paul easement. There is one inlet on the west side, and one outlet on the north side of the wetland. It is part of the City's stormwater management plan. The City does not currently have a wetland management plan.

Virtually all of the area that contributes to this wetland is fully developed. A new development was completed on the east side of LeVander Pond in the last few years. A trail was constructed down to the pond. Mn/DOT recently completed an upgrade of Wentworth/Thompson ramp terminal with Highway 52 and added a pretreatment basin south of LeVander. TH52 is a major contributor to LeVander Pond as is the City of West St. Paul.

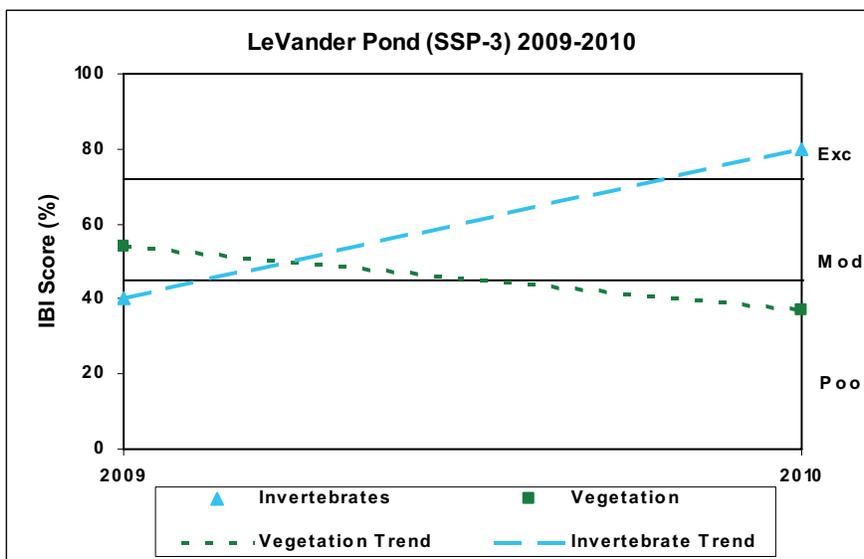
#### Wetland Health

**Site Observations:** The substrate is firm. Trees and underbrush dominate the shoreline. The pond is 100% covered with duckweed. The team observed deer and ducks in and around the wetland.

**Table 4.7.4 LeVander Pond (SSP-3) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (SSP-3)</b>		
<b>Wetland Health Rating (IBI score)</b>	Excellent (24)	Poor (13)
<b>Trend 2010</b>	Not enough data	Not enough data

**Figure 4.7.4 Invertebrate and vegetation trends for LeVander Pond (SSP-3)**



**Site summary:** This is the second consecutive year of monitoring LeVander Pond (SSP-3). The initial data indicates opposite trends for vegetation and invertebrate scores. The vegetation and invertebrates scores were significantly inconsistent in 2010. The vegetation earned a poor rating while the invertebrates earned an excellent rating. There is not enough data to conduct a trend analysis. The scores have varied from poor up to excellent. Additional monitoring is recommended to determine the health of this wetland and identify trends.

### 4.7.5 Thompson Lake (WSP-2)

Thompson Lake (WSP-2) is an eight to ten acre “Kettle” lake about eight feet deep surrounded by glacial moraine hills and silty soils. The subwatershed is approximately 175 acres and is 51-64 percent impervious. It is part of the Simon's Ravine watershed in West St. Paul which is part of the Lower Minnesota River Watershed. It is located within a Dakota County Park. An inlet enters the lake on the north end and an outlet is located on the south end. The City of West St. Paul, Dakota County, and the neighboring school are working together to create a cohesive stormwater management plan, including a plan to correct past stormwater management deficiencies. The school began a year-long lake monitoring project thru a science grant and the County is planning a two-year water quality monitoring project starting January 2011. This is the eighth year of evaluation for this wetland.



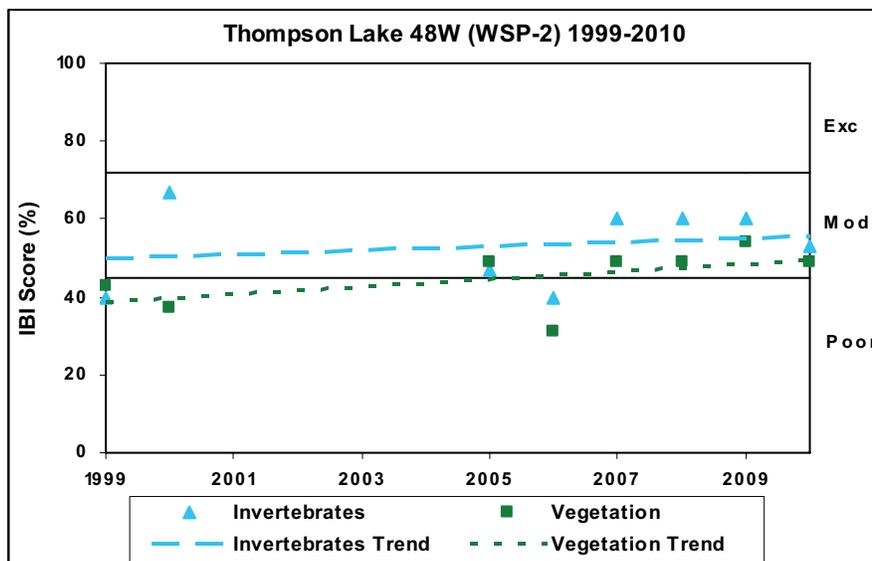
## Wetland Health

**Site Observations:** Woody vegetation has been removed from the shoreline including buckthorn and oak trees. A nearby section of cattails was in poor health. Reed canary grass is present at a fairly high cover. The substrate is sandy with logs and rocks in the water. There is a significant sediment problem, with a large delta formed on the north end. Thompson Lake is on the impaired waters list and found to be contaminated with various chemicals from urban stormwater including road salt, asphalt sealants, and petroleum products. The County is hoping to find some funding to clean up the lake. Many site changes have been implemented in the last few years. The parking lot was moved further from the lake and size reduced; allowing for a larger buffer zone. Wildlife observed: ducks and red winged blackbird.

**Table 4.7.5 Thompson Lake (WSP-2) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (WSP-2)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (16)	Moderate (17)
<b>Trend 1999-2010</b>	Stable	Stable

**Figure 4.7.5 Invertebrate and vegetation trends for Thompson Lake (WSP-2)**



**Site summary:** WSP-2 has been sampled eight times since 1999, but there was a four year period between samples in 2000 to 2005. The data indicate that the wetland conditions have remained fairly stable with ratings in the poor to low moderate wetland health categories. The 2010 data indicate moderate wetland health for both vegetation and invertebrates. There appears to be a slight improvement in scores which may be attributed to some improvements in the surrounding watershed.

## 4.8 Rosemount Wetlands

Four wetlands were monitored in the City of Rosemount in 2010. Twenty-one wetlands have been monitored in Rosemount since the start of WHEP.

**Team Leaders:** Terry Pearson and Dan Stinnett

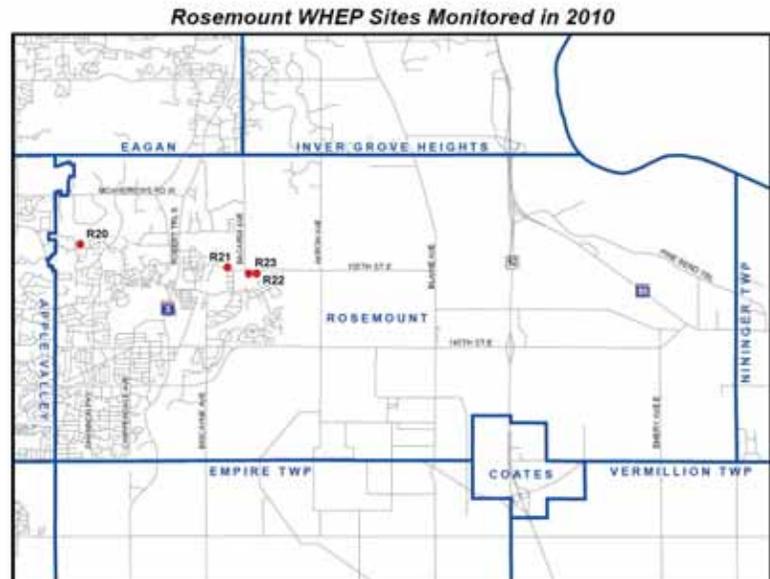
**Team Members:** Brian Berggren, Barbara Berggren, Janell Miersch, Jane Porterfield, Emily Rekstad, and Denise Wilkens.

Congratulations to the Rosemount WHEP Volunteer team who was recognized during a volunteer appreciation event at the Rosemount City Hall in 2010. The Rosemount team is the smallest team in the Dakota County WHEP, and actually only two of the volunteers live in Rosemount. Their high recognition, team size, and home towns only emphasize the team's dedication.

Terry Pearson is a returning team leader for the City of Rosemount. He has been involved in WHEP for many years. Terry recognizes that more frequent flooding demonstrates the need for wetlands. He insists that, "We keep learning the same lesson. It's usually best when we can keep the rain where it lands," by utilizing rain barrels, rain gardens, wetlands, etc. He thinks that WHEP is important because it gets a person into waders to collect wetland data. He admits, "One of my favorite tasks in the field is drawing the maps or sketches. I'm planning on using a GPS next year to better record our monitoring areas."

This is Dan Stinnett's second year at sharing team leader responsibilities for the Rosemount team. He is impressed with the quality of Rosemount team members. "Whether it is peering for hours through a dissecting scope or wading through deep wetland muck, this is a highly motivated and dedicated bunch of citizen scientists," he commented. Dan feels the team 'clicks' because they are there to fulfill a mission but also to have fun along the way.

Dan's enthusiasm is reflected in one of his favorite memories of the 2010 season, "Well, it took place at an Eagan cross-check wetland site named Lily Pond. The site is quite scenic, lake-like, surrounded by hardwoods and located within the Lebanon Hills Regional Park. It was July and the Rosemount team was wrapping up the season's vegetation collection on a Sunday afternoon. I had suggested that team members consider wearing their swim suits to the site as it looked to be a fine swimming hole and a way to cool down following the afternoon data collection. Well, there were only two team members who thought the idea worthwhile - Terry Pearson and myself. As Terry and I waded into the lily pads collecting vegetation it soon became apparent that something was causing our legs to sting. Upon our return to shore we discovered



Dan Stinnett and Terry Pearson



Barbara Berggren, Brian Berggren, Dan Stinnett, Jane Porterfield, Emily Rekstad, Terry Pearson, Tom Wilkens, Denise Wilkins

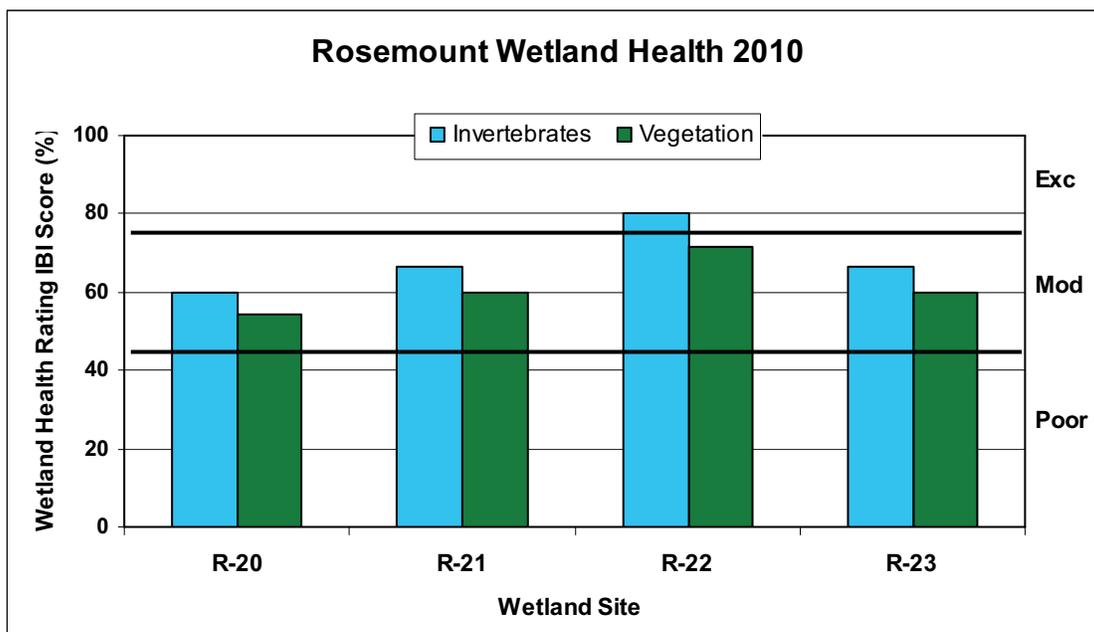
that a number of leeches were literally 'having us for lunch!' We had hoped to receive at least some recognition of sympathy from our beloved mentor Jane Porterfield. Jane, by the way, was safely tucked inside her chest waders and seemed distantly interested in our antics. It didn't take long for me to realize that Jane had figured this whole idea of swimming in a wetland had been hatched by someone who didn't grow up in this neck of the woods and, being the battle tested teacher that she is, figured this little incident would teach us boys a good lesson. She was right, we did learn our lesson, and over the next couple of weeks we were reminded of that lesson as the wounds healed. Fortunately, Terry and I have regained our pride since this incident and wish now that we had taken pictures of our blood streaked legs as a model of courage and commitment to wetland protection. You could even say that we 'took one for the team!'"

Christine Watson, of the City of Rosemount, and Jed Chesnut, WSB & Associates, select the wetlands to be monitored, recruit volunteers, coordinate and support the Rosemount team. The WHEP volunteers have provided the City with high quality quantitative data for several wetlands, which can be very difficult to obtain. Their efforts are greatly appreciated. As part of the WHEP program, the City better manages its wetland resources and has additional data to complement the city's Wetland Management Plan. The cumulative data will allow the city to better manage, restore, and maintain its wetland biodiversity in the future.

## Rosemount General Wetland Health

Figure 4.8 presents an overall view of wetland health for all the 2010 monitoring sites in Rosemount based on the scores for invertebrates and vegetation presented as a percent. Figure 4.8 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Scores that differ by less than 10 percent are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. The 2010 wetland health scores were consistent for vegetation and invertebrates and indicated moderate wetland health ratings for all of the wetlands, with the exception of R-22 which showed an excellent invertebrate score. No wetlands were rated poor.

**Figure 4.8 Rosemount site scores (percent) for 2010**



The City of Rosemount has a wetland management plan which includes four different categories of protection. Vegetated buffers are required around wetlands in new developments, with the buffer size determined by the wetland protection designation.

<u>Wetland designation</u>	<u>Required buffer</u>
Preserve Wetlands	75 feet
Manage I Wetlands	50 feet
Manage II Wetlands	30 feet
Utilize Wetlands	15 feet in non-agricultural areas only

#### 4.8.1 Unnamed Wetland (R-20)



Unnamed Wetland (R-20), also known as WMP #332, is a 1.0 acre, type 3/4 wetland within the Birger Pond Watershed. It has a drainage area of 897 acres with 30 percent impervious surface. There is one inlet on the east side from a stormwater pond, and one outlet on the south side which flows under Evermoor Parkway. The wetland is designated as preserve, and is managed as a maintained wetland without any loss of function or value. It receives runoff from adjacent roads and development, and potentially receives direct nutrient loading from surrounding manicured lawns. It was requested that this

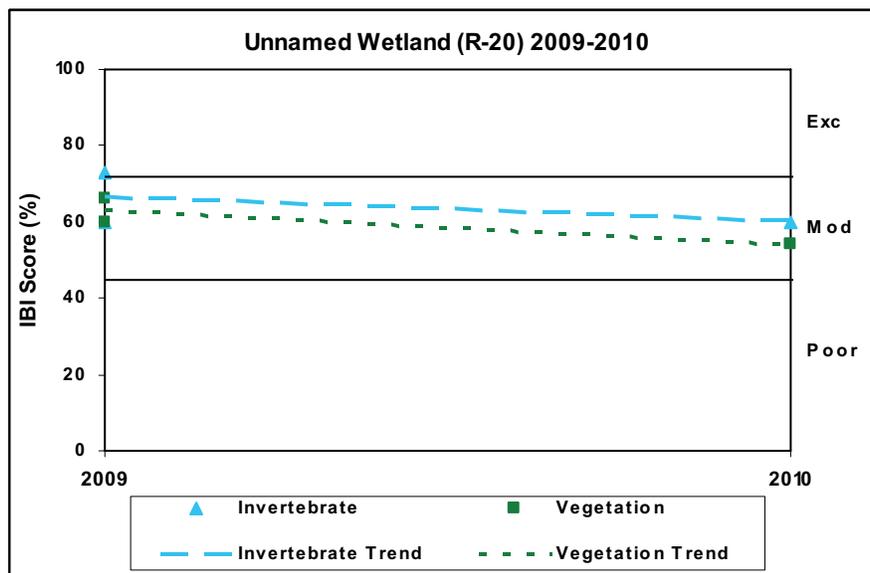
site be monitored in 2009. It should be monitored in the future to assess the impact of surrounding development.

**Site Observations:** The wetland had a lot of open water with water lilies, and a narrow ring of cattails around the shore.

**Table 4.8.2 Unnamed Wetland (R-20) Wetland Health based on Index of Biotic Integrity**

	<b>Invertebrates</b> 	<b>Vegetation</b> 
<b>2010 Data (R-20)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (18)	Moderate (19)
<b>Trend 2009-2010</b>	Not enough data	Not enough data

**Figure 4.8.2 Invertebrate and vegetation trends for Unnamed Wetland (R-20)**



**Site summary:** This is the second year that the wetland has been monitored. The IBI scores for both invertebrates and vegetation indicate moderate wetland health. There is not enough data to conduct a trend analysis; however, data from the last two years indicate a possible decrease in wetland health. It is a depressional, shallow marsh with open water and is present in aerial photos dating back to the 1930's.

#### 4.8.2 CR-38 Mitigation Site 1 (R-21)

CR-38 Mitigation Site 1 (R-21) is a 1.7 acre, type 3 wetland in the Keegan Lake watershed. The watershed is 1,530 acres and 30 percent impervious. The wetland has no inlets or outlets. It is designated as Manage II, and is managed to maintain the wetland without any loss of its functions or values. The wetland may be affected by runoff from the adjacent road, and there is potential for impact from future development in the area and nutrient loading from the adjacent agriculture. The City requires that any new development have a 30 foot buffer. The wetland is located in a basin surrounded by agriculture and a road to the south.

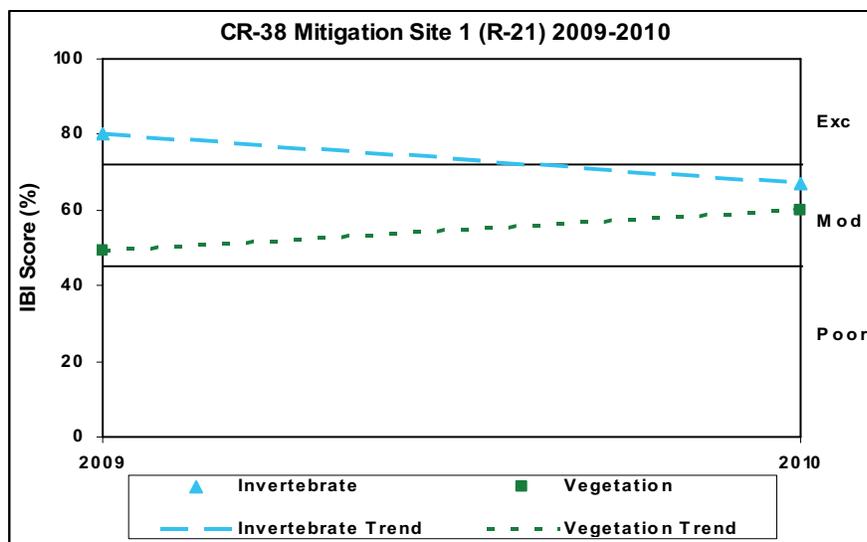


**Site Observations:** The water was higher than normal, nearly one meter deep in the sampling area. It has a firm substrate, and is densely filled with cattail. Wildlife observed: garden snake, muskrat trails, gray tree frog, and red-winged blackbird. The prairie planting surrounding the wetland is doing well. Reed canary grass is present and some purple loosestrife. The upland area includes an easement dominated by weedy species. Beyond the easement is a soybean field.

**Table 4.8.3 CR-38 Mitigation Site 1 (R-21) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (R-21)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (20)	Moderate (21)
<b>Trend 2009-2010</b>	Not enough data	Not enough data

**Figure 4.8.3 Invertebrate and vegetation trends for CR-38 Mitigation Site 1 (R-21)**



**Site summary:** This is the second year that this site has been monitored. The IBI scores for both invertebrates and vegetation indicate moderate wetland health. The wetland health trends for vegetation and invertebrate appear to be opposite; although more data is necessary to identify trends.

### 4.8.3 Mare Pond South (R-22)

Mare Pond South (R-22), also known as WMP 400 and DNR 012W, is an eight acre, type 3/4 wetland in the Keegan Lake Watershed. The watershed is 1,530 acres of which 30 percent is impervious surface. The subwatershed is 81 acres. There is one inlet on the south side and one inlet on the east side. There are no outlets. This wetland is included in the City of Rosemount's Stormwater Management Plan. It is designated as a "Preserve" wetland with a management goal to maintain the wetland without any loss of its functions or values. There is potential for receiving stormwater from a new development to the south. The wetland is located within a basin with a mitigation area and prairie restoration area to the west. There is a wooded area uphill and to the south, and an adjacent road to the north. The City requires a 75 foot buffer around the wetland.



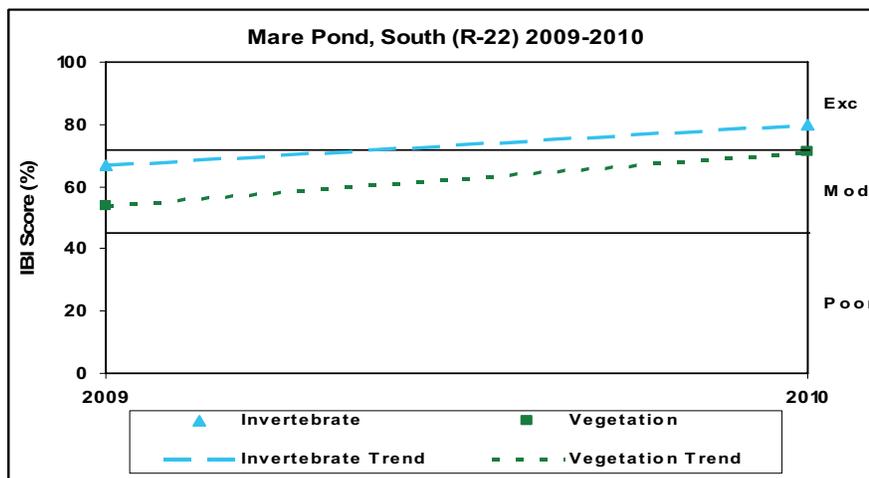
### Wetland Health

**Site Observations:** The wetland is drier with a more solid bottom than in 2009; however, the bottom was mucky. More plantain is present as well. A fringe of reed canary grass surrounds the wetland.

**Table 4.8.3 Mare Pond South (R-22) Wetland Health based on Index of Biotic Integrity**

	Invertebrates 	Vegetation 
<b>2010 Data (R-22)</b>		
<b>Wetland Health Rating (IBI score)</b>	Excellent (24)	Moderate (25)
<b>Trend 2009-2010</b>	Not enough data	Not enough data

**Figure 4.8.3 Invertebrate and vegetation trends for Mare Pond South (R-22)**



**Site summary:** This is the second year that R-22 has been monitored. The wetland scored very high for both vegetation (moderate/borderline excellent) and invertebrate (excellent) in 2010. Low water levels in

2009 likely influenced the IBI scores. Additional monitoring will be needed to establish adequate baseline data for this site.

#### 4.8.4 CR 38 Mitigation Site 2 (R-23)

CR-38 Mitigation Site 2 (R-23) is a 0.3 acre, type 3 wetland in the Keegan Lake Watershed. The watershed is 1,530 acres of which 30 percent is impervious surface. The subwatershed is 81 acres. There are no inlets or outlets, and this wetland is not included in the City of Rosemount's Stormwater Management Plan. This wetland was created after the wetland management plan was in affect. This is a small, depressional shallow marsh wetland.



#### Wetland Health

**Site Observations:** The wetland is a depression surrounded by what appears to be fairly recent prairie type planting. There is a larger wetland to the east of this wetland. It is located on parkland and is surrounded by newer residential development. This is a mitigation site. The wetland had a fringe of cattails around it with some arrowhead in the middle.

**Table 4.8.4 CR-38 Mitigation Site 2 (R-23) Wetland Health based on Index of Biotic Integrity**

	Invertebrates	Vegetation
<b>2010 Data (R-23)</b>		
<b>Wetland Health Rating (IBI score)</b>	Moderate (20)	Moderate (21)
<b>Cross-check Rating (IBI score)</b>	Moderate (16)	Moderate (19)
<b>Trend 2010</b>	Not enough data	Not enough data

**Site summary:** This is the first year that R-23 has been monitored. The wetland scores indicate moderate health for both the City team and cross check team in 2010.

**Appendix A (1997-2003 IBI)  
Dakota County Wetland Sites  
Invertebrate Sampling History**

<b>KEY:</b>	<b>Poor</b>	<b>Moderate</b>	<b>Excellent</b>	<b>Multiple IBI Scores listed in following order: (as of 2007)</b>
<b>Range:</b>	<b>6 - 14</b>	<b>15 - 22</b>	<b>23 - 30</b>	<b>Team Score/Cross-check/QC Score</b>
<b>Percent:</b>	<b>&lt; 50%</b>	<b>50 - 76%</b>	<b>&gt; 76%</b>	<b>QC Score is listed in bold font</b>

Site ID	Site Name	1997	1998*	1999	2000	2001	2002	2003
AV-1	Hidden Valley		19/21	10	8/8	24/14	14/16	14/12/24
AV-2	Kelley Property		17/19	16/16	10/8	16	16	
AV-3	Palomino		25/21	12				
AV-4	Elderberry Court		9/7	8	12	6		
AV-5	Cedar Knolls				16	16	18	12
AV-6	Belmont Pond						18	18
AV-7	Podojil							8
AV-8	Chaparral Pond							
AV-9	Watrud Pond							
AV-10	Alimagnet Park							
AV-11	Farquar Lift Station							
AV-12	EVR-P12 Public Water							
AV-13	EVR-P14 (Long Lake North)							
AV-14	EVR-P43 (East Park)							
AV-15	Carrollwood							
AV-16	Nordic Park							
AV-17	AL-P9.1, Alimagnet Lift Station Chain of Ponds							
AV-18	Sunset Park Pond							
AV-19	AL-P9.3, Alimagnet Lift Station Chain of Ponds							
B-0	Terrace Oaks	17/15/19	13/21/23					
B-1	Crystal Lake West			20/22	16/20	20/22	24/26	24/24
B-1 Alt.	Crystal Lake West Alternate							
B-2	Cam Ram		17/13/17	18				
B-3	Kraemer		15/13/19	14	18	24	26	22
B-4	Alimagnet		19/21/13	20				
B-5	Judicial Park North				16			
B-6	Alimagnet East/Dog Park				16/12		22	
B-7	Terrace Oaks North					20		
B-8	Red Oak					26		
B-9	Crosstown West						6	
B-10	Rosemount Aerospace Pond							26
B-11	Valley View							14
B-12	Terrace Oaks (by BV Parkway)							
B-13	Sunset Lake							
B-17	Alimagnet Powerline ROW							
E-1	Thompson Lake Park		21/17/19					
E-2	Rahn Park		25/21					
E-3	BP- 25 Diffley Pond		15/23		16/16		14	
E-4	Town Center		21/13					
E-6	DP-13 Northwoods			18				

Site ID	Site Name	1997	1998*	1999	2000	2001	2002	2003
E-7	DP-11 Opus			28				
E-8	AP 52.1 Trapp Farm			18				
E-9	LP-5- Wilderness Run			20/22				
E-10	AP-3 Cedar Pond				10	6	10	12
E-11	CP-4 Lockheed				24	18/16		10
E-12	FP 7.5 Lone Oak Drive				18/14			
E-13	FP 7.6 Lone Oak Drive					22		
E14	LP-27 Highway 3					16		
E-15	JP-11.2 Wescott						10	
E-16	EP - 3 Faithful Sheperd						26/14	18
E-17	EP 3.2 Aldrin Rd							14/14/24
E-18	DP 14 Moonshine Park							10
E-19	FP-4.1							
E-20	Shanahan Lake							
E-21	FP-11.5							
E-22	FP-11.6							
E-23	FP-4.2							
E-24	JP-42							
E-25	FP-4.5							
E-26	DP-6.2, Northwoods Business Park							
E-27	LP-26.54, Thomas Woods							
E-28	HDP-1, Kennerick Addition Site							
E-29	LP-15, Lily Pond in Lebanon Hills Park							
E-30	JP-42, Carriage Hill Pond							
E-31	Walnut Hill Pond							
LH-1	Lilypad Knoll, Lebanon Hills				22			
F-1	Pine Knoll		11/21/17	10/10/12	14/12	14/12	10/12	20/16
F-2	Muskkrat		25/17					
F-3	Kral Pond		21/11	14	12	10	6	12
F-4	Lake Julia		15	16	10	8	10	14
F-5	Pilot Knob			20	20/26	16	12	
H-1	Louis Lane			10/10	6/16	8		
H-2	Bullfrog Pond			14	10			
H-3	Stonegate Untreated					8	14	
H-4	Stonegate Treated					12	12	10
H-5	Lower Vets						18/18	
H-6	Lake Rebecca							20/16
H-30	Sand Coulee							
H-56	180th Street Marsh							
T-1	Lake Byllesby				10	16		
T-2	Northfield				18			
IGH-1	KP-9		23/27/23	16/16/26		18/14	24/18	
IGH-2	CP-13			16				
IGH-3	BP-21		23/17	18				
IGH-4	EP-18		23/15	20				
IGH-5	CP-6		19/19					

Site ID	Site Name	1997	1998*	1999	2000	2001	2002	2003
IGH-6	MP-67				10			
IGH-7	LP-2				18			
IGH-8	HP-1				12			
IGH-9	QP-1				22	18		
IGH-10	NP-15					26	20	
IGH-11	NP-12					20		
IGH-12	NP-13						12	
IGH-13	NP-10						12	
IGH-14	DC 2 or Ordway							12
L-1	Ritter Farm Park		19/23/29	20/20/22				
L-2	Orchard		19/23					
L-3	Raven Lake		19/13	20	14	18	14/16	
L-4	Water Treatment Wetland Bank		11/23	14	12	10	16	26
L-5	Country View Marsh			14	10	6		
L-6	Kingsley Lake				20	18/26		
L-7	DNR 387						16	24/12
L-8	DNR 393						12	24
L-9	NC 54							22
L-10	349W							
MH-1	Valley Park		29/27/23	12				
MH-2	Copperfield/Friendly Hills		21/21	12/14	16/22		26/20	30/20
MH-3	Visitation		19/23	24				
MH-4	Industrial Park		27/19	16	18	18		
MH-5	Pagel Pond				12	22		
MH-6	City Hall				10	14		
MH-7	Copperfield II					22/24/22		
MH-9	Hagstrom-King						22	24
MH-10	Wentworth Park							
MH-11	Lockwood Pond							
MH-13	MH Par 3							
MH-14	Wagon Wheel							
R-1	Kelly Marsh - Derryglen Ct in 2004		15/21					
R-2	White Lake		15/17					
R-3	O'Leary					16	10	
R-4	Schwartz Pond		21/13/25	18	14			
R-5	Wilde Lake					24/28	18	
R-6	Keegan					16	10/18	
R-7	Marcotte Pond					12		
R-8	Wachter Lake						6	
R-10	Deepwoods Court							20
R-11	Bicardi Avenue							12
R-12	Avalon							22/16
R-13	130th Way							20
R-14	WMP #379							
R-15	Birger Pond							
R-16	Unnamed							
R-17	Unnamed							

Site ID	Site Name	1997	1998*	1999	2000	2001	2002	2003
R-18	WMP #279							
R-20	Unnamed							
R-21	CR-38 Mitigation Site 1							
R-22	Mare Pond, South							
R-23	CR-38 Mitigation Site 2							
SSP-1	Anderson Pond					6		
SSP-2	Seidl's Lake						10/10	10
SSP-3	LeVander							
WSP-1	Mud Lake			12/10/20	10/10			
WSP-2	Thompson Lake 48W			12	20			
WSP-3	Duck Pond			18	12			
WSP-4	Weshke Pond				12	20		
WSP-5	Lilly Lake					16	24	
WSP-6	Marthaler Park					26	24	20
WSP-7	Vivian Pond					24/24		
WSP-8	DNC Prairie Pond							24

**Appendix A (2004-2010 IBI)  
Dakota County Wetland Sites  
Invertebrate Sampling History**

<b>KEY:</b>	<b>Poor</b>	<b>Moderate1</b>	<b>Excellent</b>	<b>Multiple IBI Scores listed in following order: (as of 2007)</b>
<b>Range:</b>	<b>6 - 14</b>	<b>15 - 22</b>	<b>23 - 30</b>	<b>Team Score/Cross-check/QC Score</b>
<b>Percent:</b>	<b>&lt; 50%</b>	<b>50 - 76%</b>	<b>&gt; 76%</b>	<b>QC Score is listed in bold font</b>

Site ID	Site Name	2004	2005	2006	2007	2008	2009	2010
AV-1	Hidden Valley	16/12	22/20	26		20/24/24	20/24/20	20/22/18
AV-2	Kelley Property							
AV-3	Palomino							
AV-4	Elderberry Court							
AV-5	Cedar Knolls							
AV-6	Belmont Pond	14	18	12				
AV-7	Podojil	6						
AV-8	Chaparral Pond	12	14	18			16	
AV-9	Watrud Pond		26	22/14	18/16			
AV-10	Alimagnet Park				12			
AV-11	Farquar Lift Station				24			
AV-12	EVR-P12 Public Water				12	16		
AV-13	EVR-P14 (Long Lake North)					22		
AV-14	EVR-P43 (East Park)					12		
AV-15	Carrollwood						10	
AV-16	Nordic Park						na	
AV-17	AL-P9.1, Alimagnet Lift Station Chain of Ponds							18
AV-18	Sunset Park Pond							24
AV-19	AL-P9.3, Alimagnet Lift Station Chain of Ponds							22
B-0	Terrace Oaks		26					
B-1	Crystal Lake West	18/22	20/12		24	26/26/26		22/22
B-1 Alt.	Crystal Lake West Alternate						15/na	
B-2	Cam Ram			16		na		
B-3	Kraemer	20	18	22	18	24	24	22
B-4	Alimagnet							
B-5	Judicial Park North							
B-6	Alimagnet East/Dog Park		20		22	22		
B-7	Terrace Oaks North							
B-8	Red Oak							
B-9	Crosstown West							18
B-10	Rosemount Aerospace Pond	18		24				
B-11	Valley View	20	16	24/14			16	
B-12	Terrace Oaks (by BV Parkway)				??			
B-13	Sunset Lake						24/22	
B-17	Alimagnet Powerline ROW							12/12
E-1	Thompson Lake Park							
E-2	Rahn Park							
E-3	BP- 25 Diffley Pond							
E-4	Town Center							
E-6	DP-13 Northwoods							

Site ID	Site Name	2004	2005	2006	2007	2008	2009	2010
E-7	DP-11 Opus				26/26/18			
E-8	AP 52.1 Trapp Farm							
E-9	LP-5- Wilderness Run	14/16			16			
E-10	AP-3 Cedar Pond	6	8/10	12/16	12	22/22/20		
E-11	CP-4 Lockheed							
E-12	FP 7.5 Lone Oak Drive							
E-13	FP 7.6 Lone Oak Drive							
E14	LP-27 Highway 3	18						
E-15	JP-11.2 Wescott							
E-16	EP - 3 Faithful Sheperd							
E-17	EP 3.2 Aldrin Rd	16						
E-18	DP 14 Moonshine Park							
E-19	FP-4.1		14					
E-20	Shanahan Lake		18					
E-21	FP-11.5			18		22		20
E-22	FP-11.6			10		18		20
E-23	FP-4.2			16				
E-24	JP-42				16			
E-25	FP-4.5					16		
E-26	DP-6.2, Northwoods Business Park						14	
E-27	LP-26.54, Thomas Woods Site						18/24/18	
E-28	HDP-1, Kennerick Addition Site						16	
E-29	LP-15, Lily Pond in Lebanon Hills Park							12/12
E-30	JP-42, Carriage Hill Pond							
E-31	Walnut Hill Pond							20/20
LH-1	Lilypad Knoll, Lebanon Hills							
F-1	Pine Knoll	18/16	20/26			12/ na	na	na
F-2	Muskrat							
F-3	Kral Pond	10	10	12	10/10	8	10	8/14/10
F-4	Lake Julia	18	10	10	8	10	6/8	8
F-5	Pilot Knob					na		
H-1	Louis Lane							
H-2	Bullfrog Pond							
H-3	Stonegate Untreated							
H-4	Stonegate Treated	20	14	18	16	20	16	14
H-5	Lower Vets							
H-6	Lake Rebecca	20/20	14/8	18/26	12/14/14	16/26/14	22/20/21/18	22/24/22
H-30	Sand Coulee	14	10	14	16	14	16	14
H-56	180th Street Marsh		14	20	6	22	26	22
T-1	Lake Byllesby							
T-2	Northfield							
IGH-1	KP-9							
IGH-2	CP-13							
IGH-3	BP-21							
IGH-4	EP-18							
IGH-5	CP-6							

Site ID	Site Name	2004	2005	2006	2007	2008	2009	2010
IGH-6	MP-67							
IGH-7	LP-2							
IGH-8	HP-1							
IGH-9	QP-1							
IGH-10	NP-15							
IGH-11	NP-12							
IGH-12	NP-13							
IGH-13	NP-10							
IGH-14	DC 2 or Ordway							
L-1	Ritter Farm Park							
L-2	Orchard							
L-3	Raven Lake							
L-4	Water Treatment Wetland Bank	22	24			14	14	
L-5	Country View Marsh							
L-6	Kingsley Lake							
L-7	DNR 387	18/18	20/22	20/16	22/12	22/16/20	18/22	24/22
L-8	DNR 393	24	22	24	26	20	24	20/16
L-9	NC 54	10	22	14	8	12	22/22	22
L-10	349W							6
MH-1	Valley Park							
MH-2	Copperfield/Friendly Hills	20/18	24/22	26/14	24/26	22/18/18	24/20/24	22/16/22
MH-3	Visitation							
MH-4	Industrial Park							
MH-5	Pagel Pond							
MH-6	City Hall							
MH-7	Copperfield II							
MH-9	Hagstrom-King	18						
MH-10	Wentworth Park			18				
MH-11	Lockwood Pond		18		14			
MH-13	MH Par 3					12	20	
MH-14	Wagon Wheel							22
R-1	Kelly Marsh - Derryglen Ct in 2004	20/14	24/24		24/16/20	22/24/20		
R-2	White Lake			22			28	
R-3	O'Leary			6				
R-4	Schwartz Pond					16		
R-5	Wilde Lake							
R-6	Keegan			22/24				
R-7	Marcotte Pond			26				
R-8	Wachter Lake							
R-10	Deepwoods Court	16			16			
R-11	Bicardi Avenue	16						
R-12	Avalon	12	12					
R-13	130th Way							
R-14	WMP #379		20			22		
R-15	Birger Pond		20		20			
R-16	Unnamed				na			
R-17	Unnamed				18			
R-18	WMP #279					26		

Site ID	Site Name	2004	2005	2006	2007	2008	2009	2010
R-20	Unnamed						20/22/18	18
R-21	CR-38 Mitigation Site 1						24	20/20
R-22	Mare Pond, South						20	24
R-23	CR-38 Mitigation Site 2							20/16
SSP-1	Anderson Pond						18	16
SSP-2	Seidl's Lake							
SSP-3	LeVander						12	24
WSP-1	Mud Lake							
WSP-2	Thompson Lake 48W		14	12	18	18	18	16
WSP-3	Duck Pond							
WSP-4	Weshke Pond							
WSP-5	Lilly Lake							
WSP-6	Marthaler Park							
WSP-7	Vivian Pond							
WSP-8	DNC Prairie Pond							

**Appendix B (1997-2003 IBI)  
Dakota County Wetland Sites  
Vegetation Sampling History**

<b>KEY:</b>	<b>Poor</b>	<b>Moderate</b>	<b>Excellent</b>	<b>Multiple IBI Scores listed in following order: (as of 2007)</b>
<b>Range:</b>	<b>7 - 15</b>	<b>16 - 25</b>	<b>26 - 35</b>	<b>Team Score/Cross-check/QC Score</b>
<b>Percent:</b>	<b>&lt; 46%</b>	<b>46- 71%</b>	<b>&gt; 71%</b>	<b>QC Score is listed in bold font</b>

Site ID	Site Name	1997	1998*	1999	2000	2001	2002	2003
AV-1	Hidden Valley		21/23	15	23/23	21/25	19/17	23/25/21
AV-2	Kelley Property		17/27	23/27	23/17	25	23	
AV-3	Palomino		29/25	na				
AV-4	Elderberry Court		17/17	13	17	15		
AV-5	Cedar Knolls				17	19	15	21
AV-6	Belmont Pond						21	17
AV-7	Podojil							13
AV-8	Chaparral Pond							
AV-9	Watrud Pond							
AV-10	Alimagnet							
AV-11	Farquar Lift Station							
AV-12	EVR-P12 Public Water							
AV-13	EVR-P14 Long Lake North							
AV-14	EVR-P43 East Park							
AV-15	Carrollwood							
AV-16	Nordic Park							
AV-17	AL-P9.1, Alimagnet Lift Station Chain of Ponds							
AV-18	Sunset Park Pond							
AV-19	AL-P9.3, Alimagnet Lift Station Chain of Ponds							
B-0	Terrace Oaks							
B-1	Crystal Lake West			29/25	33/25	29/29	31/33	29/33
B-1 Alt	Crystal Lake West - Alternate							
B-2	Cam Ram	na	21/13	21				
B-3	Kraemer		23/21	23	21	21	23	25
B-4	Alimagnet							
B-5	Judicial Park North				23			
B-6	Alimagnet East/Dog Park				21/21		13	
B-7	Terrace Oaks North					17		
B-8	Red Oak					17		
B-9	Crosstown West						13	
B-10	Rosemount Aerospace Pond							15
B-11	Valley View							27
B-12	Terrace Oaks (by BV Parkway)							
B-13	Sunset Lake	x						
B-17	Alimagnet Powerline ROW							
E-1	Thompson Lake Park	na	17/21/23					
E-2	Rahn Park		17/15/15					
E-3	BP- 25 Diffley Pond		15/25/23		17/25		13	
E-4	Town Center		21/15					
E-6	DP-13 Northwoods			15				
E-7	DP-11 Opus			19				

Site ID	Site Name	1997	1998*	1999	2000	2001	2002	2003
E-8	AP 52.1 Trapp Farm			21				
E-9	LP-5- Wilderness Run			29/27				
E-10	AP-3 Cedar Pond				11		21	23
E-11	CP-4 Lockheed				19	21/15		15
E-12	FP 7.5 Lone Oak Drive				21/19			
E-13	FP 7.6 Lone Oak Drive					21		
E14	LP-27 Highway 3					23		
E-15	JP-11.2 Wescott						23	
E-16	EP - 3 Faithful Sheperd						17/15	21
E-17	EP 3.2 Aldrin Rd							21/21/17
E-18	DP 14 Moonshine Park							23
E-19	FP-4.1							
E-20	Shanahan Lake							
E-21	FP-11.5							
E-22	FP-11.6							
E-23	FP-4.2							
E-24	JP-42							
E-25	FP-4.5							
E-26	DP-6.2, Northwoods Business Park							
E-27	LP-26.54, Thomas Woods Site							
E-28	HDP-1, Kennerick Addition Site							
E-29	LP-15, Lily Pond in Lebanon Hills Park							
E-30	JP-42, Carriage Hill Pond							
E-31	LP-69.1, Walnut Hill Pond							
LH-1	Lilypad Knoll, Lebanon Hills				31		31	
F-1	Pine Knoll		21/21	23/29	17/15	11/23	17/31	17/15
F-2	Muskrat		15/15					
F-3	Kral Pond	na	25/29	21	19	13	13	19
F-4	Lake Julia		19/15	21	17	15	17	17
F-5	Pilot Knob			21	19/21	13	17	15
H-1	Louis Lane			15/15	11/11	11		
H-2	Bullfrog Pond			17	9			
H-3	Stonegate Untreated					9	15	
H-4	Stonegate Treated					11	13	17
H-5	Lower Vets						11/23	
H-6	Lake Rebecca							19/17
H-30	Sand Coulee							
H-56	180th Street Marsh							
T-1	Lake Byllesby				13	13		
T-2	Northfield				15			
IGH-1	KP-9		25/29/27	29/23/23		23/33	15/19	
IGH-2	CP-13			23				
IGH-3	BP-21		17/15	19				
IGH-4	EP-18		15/19	21				
IGH-5	CP-6		13/11					
IGH-6	MP-67				25			

Site ID	Site Name	1997	1998*	1999	2000	2001	2002	2003
IGH-7	LP-2				15			
IGH-8	HP-1				15/15			
IGH-9	QP-1				29	25		
IGH-10	NP-15					15	15	
IGH-11	NP-12					13		
IGH-12	NP-13						15	
IGH-13	NP-10						23/25	
IGH-14	DC 2 or Ordway							23
L-1	Ritter Farm Park		23/21/17	23/23/21				
L-2	Orchard		29/21					
L-3	Raven Lake		23/21	29	17	25	27/15	
L-4	Water Treatment Wetland Bank		23/25	29	23	21	21	17
L-5	Country View Marsh			17	15	23		
L-6	Kingsley Lake				27	31		
L-7	DNR 387						19/21	27/21
L-8	DNR 393						17	17
L-9	NC 54							19
L-10	349W							
MH-1	Valley Park		19/17/23					
MH-2	Copperfield/Friendly Hills		21/21	21/21	21/25		27/25	27/23
MH-3	Visitation		15/17	13				
MH-4	Industrial Park		17/15	17	17	17		
MH-5	Pagel Pond			15	17	15		
MH-6	City Hall				11	15		
MH-7	Copperfield II					23/25/25		
MH-9	Hagstrom-King						23	21
MH-10	Wentworth Park							
MH-11	Lockwood Pond							
MH-13	MH Par 3							
MH-14	Wagon Wheel							
R-1	Kelly Marsh - Derryglen Ct in 2004		17/19/17					
R-2	White Lake		13/23					
R-3	O'Leary		17/11			19	15	
R-4	Schwartz Pond			13	11			
R-5	Wilde Lake					15/15	19	
R-6	Keegan						15/7	
R-7	Marcotte Pond					19		
R-8	Wachter Lake						11	
R-10	Deepwoods Court							17
R-11	Bicardi Avenue							27
R-12	Avalon							15/11
R-13	130th Way							15
R-14	WMP #379							
R-15	Birger Pond							
R-16	Unnamed							
R-17	Unnamed							
R-18	WMP #279							

Site ID	Site Name	1997	1998*	1999	2000	2001	2002	2003
R-20	Unnamed							
R-21	CR-38 Mitigation Site 1							
R-22	Mare Pond, South							
R-23	CR-38 Mitigation Site 2							
SSP-1	Anderson Pond					11		
SSP-2	Seidl's Lake						13/13	11
SSP-3	LeVander							
WSP-1	Mud Lake			15/13/13	17/13			
WSP-2	Thompson Lake 48W			15	13			
WSP-3	Duck Pond			17	21			
WSP-4	Weshke Pond (aka Pond 1)				21	23		
WSP-5	Lilly Lake					17	17	
WSP-6	Marthaler Park					21	21	23
WSP-7	Vivian Pond					19/19		
WSP-8	DNC Prairie Pond							15

**Appendix B (2004-2010 IBI)  
Dakota County Wetland Sites  
Vegetation Sampling History**

<b>KEY:</b>	<b>Poor</b>	<b>Moderate</b>	<b>Excellent</b>	<b>Multiple IBI Scores listed in following order: (as of 2007)</b>
<b>Range:</b>	<b>7 - 15</b>	<b>16 - 25</b>	<b>26 - 35</b>	<b>Team Score/Cross-check/QC Score</b>
<b>Percent:</b>	<b>&lt; 46%</b>	<b>46- 71%</b>	<b>&gt; 71%</b>	<b>QC Score is listed in bold font</b>

Site ID	Site Name	2004	2005	2006	2007	2008	2009	2010
AV-1	Hidden Valley	25/21	27/19	21		19/21/21	13/17	23/17
AV-2	Kelley Property							
AV-3	Palomino							
AV-4	Elderberry Court							
AV-5	Cedar Knolls							
AV-6	Belmont Pond	25	23	15				
AV-7	Podojil	13						
AV-8	Chaparral Pond	19	21	19			15/23	
AV-9	Watrud Pond		25	19/21	17/15			
AV-10	Alimagnet				11			
AV-11	Farquar Lift Station				9			
AV-12	EVR-P12 Public Water				21	11		
AV-13	EVR-P14 Long Lake North					13		
AV-14	EVR-P43 East Park					9		
AV-15	Carrollwood						13	
AV-16	Nordic Park						17	
AV-17	AL-P9.1, Alimagnet Lift Station Chain of Ponds							19
AV-18	Sunset Park Pond							17
AV-19	AL-P9.3, Alimagnet Lift Station Chain of Ponds							15
B-0	Terrace Oaks		na					
B-1	Crystal Lake West	29/23	27/21		23	25/19/23		35/31
B-1 Alternate	Crystal Lake West - Alternate						21/21/23	
B-2	Cam Ram			17		11		
B-3	Kraemer	25	13	17	17	17	19	27
B-4	Alimagnet							
B-5	Judicial Park North							
B-6	Alimagnet East/Dog Park		13		21	17		
B-7	Terrace Oaks North							
B-8	Red Oak							
B-9	Crosstown West							9
B-10	Rosemount Aerospace Pond	13		13				
B-11	Valley View	25	21	17/19			13	
B-12	Terrace Oaks (by BV Parkway)				??			
B-13	Sunset Lake						21	
B-17	Alimagnet Powerline ROW							25
E-1	Thompson Lake Park							
E-2	Rahn Park							

Site ID	Site Name	2004	2005	2006	2007	2008	2009	2010
E-3	BP- 25 Diffley Pond							
E-4	Town Center							
E-6	DP-13 Northwoods							
E-7	DP-11 Opus				19/11/17			
E-8	AP 52.1 Trapp Farm							
E-9	LP-5- Wilderness Run	27/19			17			
E-10	AP-3 Cedar Pond	17	23/15	13	13	19/17		
E-11	CP-4 Lockheed							
E-12	FP 7.5 Lone Oak Drive							
E-13	FP 7.6 Lone Oak Drive							
E14	LP-27 Highway 3	23						
E-15	JP-11.2 Wescott							
E-16	EP - 3 Faithful Sheperd							
E-17	EP 3.2 Aldrin Rd	19						
E-18	DP 14 Moonshine Park							
E-19	FP-4.1		21					
E-20	Shanahan Lake		25					
E-21	FP-11.5			15		17		19
E-22	FP-11.6			15		15		17
E-23	FP-4.2			11				
E-24	JP-42				21			
E-25	FP-4.5					19		
E-26	DP-6.2, Northwoods Business Park						15/15	
E-27	LP-26.54, Thomas Woods Site						21/23	
E-28	HDP-1, Kennerick Addition Site						21	
E-29	LP-15, Lily Pond in Lebanon Hills Park							27/29
E-30	JP-42, Carriage Hill Pond							
E-31	LP-69.1, Walnut Hill Pond							13
LH-1	Lilypad Knoll, Lebanon Hills							
F-1	Pine Knoll	17/21	13/15	13/21	13	13/17	na	13
F-2	Muskrat							
F-3	Kral Pond	13	13	15	9/15	7	11	11/15
F-4	Lake Julia	19	15	15	11	11	13/15	11
F-5	Pilot Knob	19	15	15	13	na		
H-1	Louis Lane							
H-2	Bullfrog Pond							
H-3	Stonegate Untreated							
H-4	Stonegate Treated	17	17	21	19	21	21	19
H-5	Lower Vets							
H-6	Lake Rebecca	15/17	21/23	23/21	21/13/21	21/21	23/17	23/21/23
H-30	Sand Coulee	15	17	15	11	13	13	13
H-56	180th Street Marsh		11	17	11	15	15	11
T-1	Lake Byllesby							

Site ID	Site Name	2004	2005	2006	2007	2008	2009	2010
T-2	Northfield							
IGH-1	KP-9							
IGH-2	CP-13							
IGH-3	BP-21							
IGH-4	EP-18							
IGH-5	CP-6							
IGH-6	MP-67							
IGH-7	LP-2							
IGH-8	HP-1							
IGH-9	QP-1							
IGH-10	NP-15							
IGH-11	NP-12							
IGH-12	NP-13							
IGH-13	NP-10							
IGH-14	DC 2 or Ordway							
L-1	Ritter Farm Park							
L-2	Orchard							
L-3	Raven Lake							
L-4	Water Treatment Wetland Bank	19	21	17	17	13	15	
L-5	Country View Marsh							
L-6	Kingsley Lake							
L-7	DNR 387	25/29	29/25	27/19	25/23	25/27	21/31	27/25
L-8	DNR 393	19	17	21	17	23	23	19/19
L-9	NC 54	15	19	17	17	19	17	15
L-10	349W							13
MH-1	Valley Park							
MH-2	Copperfield/Friendly Hills	23/19	27/23	23/25	21/17	23/17/19	19/15	27/17
MH-3	Visitation							
MH-4	Industrial Park							
MH-5	Pagel Pond							
MH-6	City Hall							
MH-7	Copperfield II							
MH-9	Hagstrom-King	25						
MH-10	Wentworth Park			17				
MH-11	Lockwood Pond		19		19			
MH-13	MH Par 3					21	21	
MH-14	Wagon Wheel							25
R-1	Kelly Marsh - Derryglen Ct in 2004	21/21	15/15		17/13/19	19/17		
R-2	White Lake			15			17	
R-3	O'Leary			11				
R-4	Schwartz Pond					15		
R-5	Wilde Lake							
R-6	Keegan			17/19				

Site ID	Site Name	2004	2005	2006	2007	2008	2009	2010
R-7	Marcotte Pond			17				
R-8	Wachter Lake							
R-10	Deepwoods Court	19			19			
R-11	Bicardi Avenue	15						
R-12	Avalon	17	11					
R-13	130th Way							
R-14	WMP #379		23			25		
R-15	Birger Pond		17		13			
R-16	Unnamed				13			
R-17	Unnamed				17			
R-18	WMP #279					19		
R-20	Unnamed						23/21	19
R-21	CR-38 Mitigation Site 1						17	21/21
R-22	Mare Pond, South						19	25
R-23	CR-38 Mitigation Site 2							21/19
SSP-1	Anderson Pond						15	13
SSP-2	Seidl's Lake							
SSP-3	LeVander						19	13
WSP-1	Mud Lake							
WSP-2	Thompson Lake 48W		17	11	17	17	19	17
WSP-3	Duck Pond							
WSP-4	Weshke Pond (aka Pond 1)							
WSP-5	Lilly Lake							
WSP-6	Marthaler Park							
WSP-7	Vivian Pond							
WSP-8	DNC Prairie Pond							