



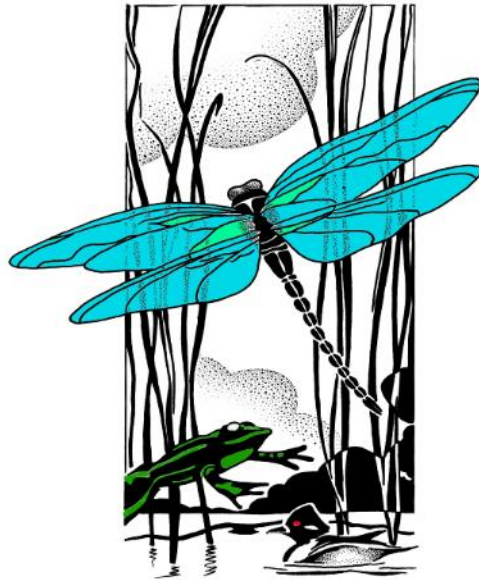
2024

Wetland Health Evaluation Program

Dakota County, Minnesota

2024 Wetland Health Evaluation Program Report

Dakota County, MN



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Report
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Dakota County Parks Department

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

City of West St. Paul

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For more information on the Dakota County Wetland Health Evaluation Program or for a copy of this report, please contact the Dakota County Environmental Resources Department or visit www.mnwhep.org.

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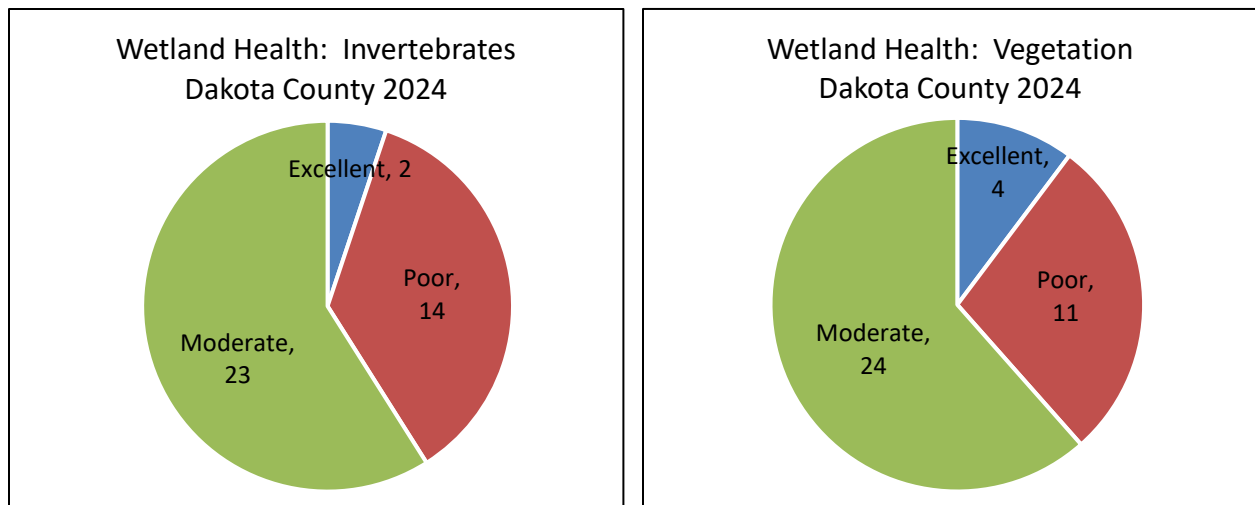
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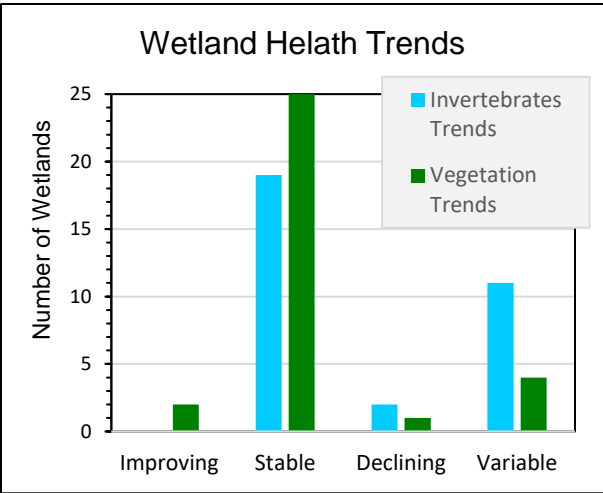
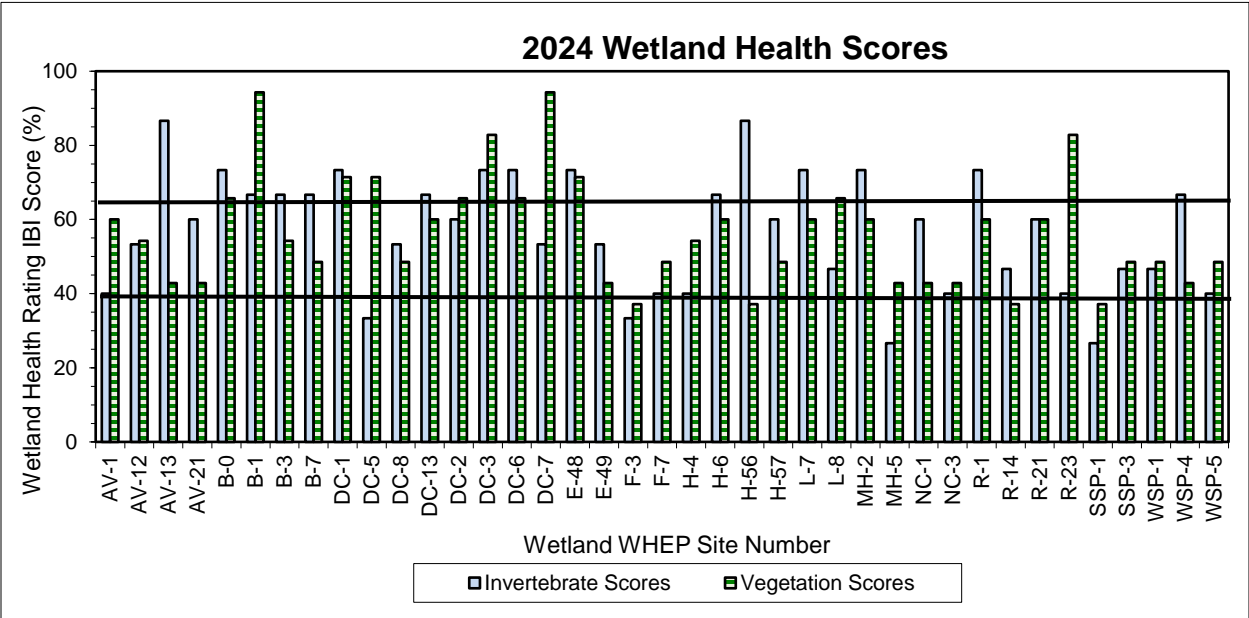
Executive Summary

Dakota County Wetland Health Evaluation Program 2024

Dakota County began sponsoring the Wetland Health Evaluation Program (WHEP) in 1997. Since then, 205 wetlands have been monitored by many volunteers across the County. In 2024, ten cities, one watershed management organization, and Dakota County Parks sponsored WHEP teams, monitoring 39 different wetlands. Three of these wetlands (AV-21, E-48, E-49) were monitored for the first time in 2024. Trained volunteers collected macroinvertebrates (insects and other small animals without backbones) that live in the wetland, and surveyed for vegetation (plants) present in the wetlands. The invertebrates and vegetation are identified and documented. The data is used to calculate an Index of Biotic Integrity (IBI) that is used to estimate the health of each wetland.



The results of the monitoring for 2024 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 scored in the moderate category for invertebrates (59%) and vegetation (62%). Two wetland sites rated excellent for invertebrates: EVR-P14 (AV-13) in Apple Valley and 180th Street Marsh (H-56) in Hastings. Four wetland sites rated excellent for vegetation: Crystal West (B-1) in Burnsville, Tamarack Swamp (DC-3) in Dakota County Parks, East Jenson (DC-4) in Dakota County Parks, Lilypad Pond (DC-7) in Dakota County Parks, and CR-38 Mitigation Site #2 (R-23) in Rosemount. Fourteen (36%) of the wetlands scored poor for invertebrates and eleven (28%) of the wetlands scored poor for vegetation. There was agreement between invertebrate and vegetation wetland health ratings for 20 of the wetlands monitored in 2024.



A trend analysis was conducted for each of the wetlands monitored in 2024 that had enough data to analyze trends. The overall trends are indicated as follows; however, the health of each wetland is unique and observed changes in health score trends are discussed with each wetland later in the report. For invertebrates, no wetlands are showing improvement, 19 wetlands are stable, and two are declining. Vegetation trends show two of the wetlands improving, 25 are stable, and one is declining. Eleven wetlands show variable invertebrate data over the years of their monitoring and four wetlands show variable vegetation data. Seven wetlands did not have enough years of data to

demonstrate a health trend. Nineteen of the wetlands agree in invertebrate and vegetation health trends. Several analyses were done to try to identify some of the causes of wetland health conditions found. No significant relationships were found between IBI scores and wetland alterations.

In 2024, 147 Dakota County WHEP volunteers donated more than 2,000 hours in training, invertebrate sample collections and invertebrate identification, and vegetation surveys to capture and report this valuable biological data. The dedicated volunteers look forward to the science, environmental stewardship, and community gathering that WHEP demonstrates. It gives community members 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, watersheds, counties, and state government.

1.0 Background

The Wetland Health Evaluation Program (WHEP)

The Wetland Health Evaluation Program (WHEP) is a volunteer monitoring program for wetlands. WHEP uses sampling methods and evaluation metrics developed by the Minnesota Pollution Control Agency (MPCA) to evaluate wetland health. The metrics are based on species diversity and richness for both vegetation and macroinvertebrates. 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). 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.

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. Up to thirteen 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 County and communities.



JUDY HELGEN,
PROGRAM CO-FOUNDER



MARK GERNES,
PROGRAM CO-FOUNDER
(DEMONSTRATING HIS "SEDGE
THREE-RANKED" POSE)

Dakota County, participating cities, and North Cannon River Watershed Management Organization provide funding for Dakota County WHEP. Today, the program is strong and thriving in Dakota County, setting an example for the nation in volunteer wetland monitoring.

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 construction 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.

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 groundwater, 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.

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 riverbanks.

Municipal/Industrial: 374 acres

Municipal/Industrial wetlands include diked areas.

Total wetland area in Dakota County: 24,501 acres

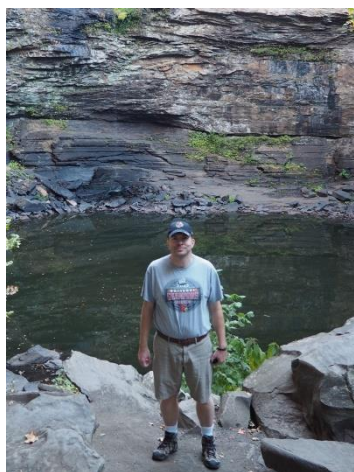
Many federal and state agencies are involved in wetland regulation, protection, and restoration. In Minnesota, the state wetland regulations are overseen by the Board of Water and Soil Resources and Department of Natural Resources. To learn more about regulations and programs that affect or protect wetlands,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

Dakota County Wetland Monitoring



PAULA LIEPOLD AND EMILY GABLE

Paula Liepold and Emily Gable, Dakota County Environmental Resources Department staff, manage WHEP. WHEP is community science – a practice where non-professionals participate in scientific research. Volunteers come from all different backgrounds, but all have an interest in learning about the environment and science. With professional training and guidance from an experienced team leader, volunteers collect and interpret data, make observations, and discuss insights and conclusions. Volunteers form friendships among their team, learn about the natural world, and contribute valuable data about wetlands in Dakota County. Paula and Emily thank the volunteers, team leaders; city, watershed and county leadership; Minnesota Pollution Control Agency biologists and Bolton & Menk consultants for their dedication and commitment to maintaining and growing WHEP.



JEFF KORPIK

Jeff Korpik is the Field Monitoring Coordinator for Dakota County WHEP. He has been involved in WHEP since 2007 as a volunteer, team leader, and field monitoring coordinator. Jeff stated, “Another great year in the wetlands. Thanks to all of the team leaders, volunteers and trainers. All the teams I visited seemed to really enjoy and value the work of WHEP. I do too. It was good to see some water in more of the sites. A few had too much water and the teams needed to adjust. Different from 2023 when some had no water at all. Lastly, a few people need additional thanks this year. First to Mark Gernes, for whom this program might not exist without. Also, to Paula Liepold, who has made WHEP the long-term successful project it is. She has brought joy and enthusiasm to WHEP. I will miss them both.”

2.0 Methods

2.1 Training

Training for citizen monitors is arranged by Dakota County and taught by technical experts from the MPCA and Bolton & Menk, Inc. 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.



TRAINING DAY

Minnesota Pollution Control Agency Experts

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

Mark Gernes commented, "WHEP is an opportunity for citizens to learn about wetland plants and bugs, build lasting friendships all while helping our local communities protect and manage water resources. As a watershed professional I value the contribution citizen scientists are able to make. Each year I look forward to recounts of citizen experiences in their local wetlands."

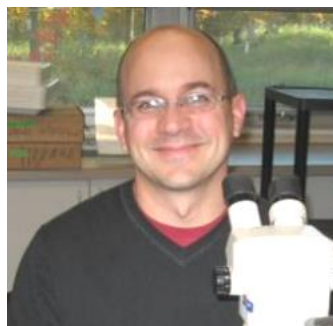
The MPCA staff support WHEP and have been very helpful in making WHEP a success.



MARK GERNES



MICHAEL BOURDAGHS



JOEL CHIRHART



JOHN GENET

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 (MPCA, <https://www.pca.state.mn.us/water/tmdl-glossary>). 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)

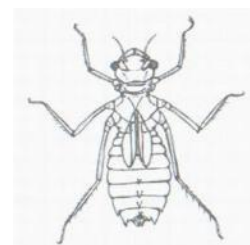
Vegetation is analyzed using a 100 square meter releve plot. All species within the sampling plot are identified to the genus level, and documented on the field data sheet. Vegetation is divided into categories based on their ecological function or relationship. The categories include nonvascular, woody, 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 and again in 2015, 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. Since 2018, Dakota County Parks has altered the vegetation survey protocol (see Dakota County Parks section 4.2). 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 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 program. 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.

2.3 Cross-Checks and Quality Control

There are several safeguards included in WHEP to validate the data, including training, assistance in the wetland, team cross-checks, and third-party cross-checks. In typical years, each WHEP team is responsible for evaluating one wetland of another WHEP team as a means of providing a cross-check, providing a

second sample for the selected wetland to determine if two different samples provide similar results for the vegetation and invertebrate IBI; the Citizen Monitoring Coordinator (Jeff Korpik) assists teams and provides advice regarding proper sampling methods and sampling placement; and a third party technical expert (Bolton & Menk, Inc.) provides Quality Control (QC) review of the completed data sheets, and invertebrate and vegetation identification.

In 2024, Bolton & Menk, Inc., assisted MPCA in training sessions, provided quality assurance of data, and prepared the annual report. Bolton & Menk Water Resources staff has been working with Dakota County on WHEP since 2007.

Over the duration of the program, team cross-checks and third-party cross-checks have been conducted on a rotational basis. The technical expert reviews 10 percent of the vegetation plots and one invertebrate collection from each team. In 2024, Bolton & Menk cross-checked the vegetation plots of four wetlands: Burnsville's Crystal Lake West (B-1), Dakota County Parks' Buck Pond (DCP-2), NCRWMO's Loretto Wetland (NCR-1), and South St. Paul's Anderson Pond (SSP-1). Bolton & Menk also reviewed the invertebrate samples from sites AV-1, B-7, DC-5, E-48, F-7, H-6, L-8, MH-2, R-1, SSP-3, and WSP-4. 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 the technical quality control checks. The official data scores are derived from the WHEP team's data incorporating any corrections made during the technical quality control checks (vegetation cross-check, and datasheet review) conducted by Bolton & Menk.

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 nutrient and/or chloride 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.

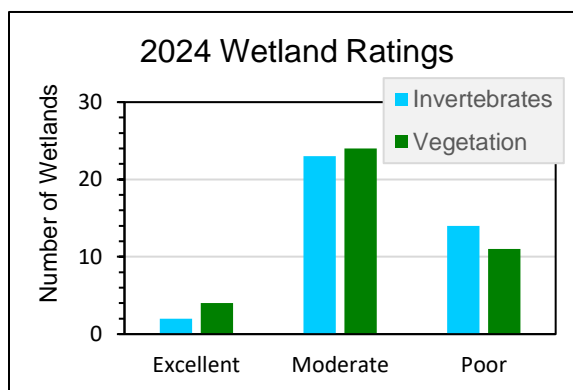
When BMPs are implemented, biological monitoring can be used to help track the impacts of the BMPs on the wetland. Continued monitoring can identify a change in trend or improvement in a wetland.

3.0 General Results and Recommendations

3.1 2024 Sampling Season Results

During the 2024 sampling season, thirteen citizen teams (Apple Valley, Burnsville, Dakota County Parks Team 1, Dakota County Parks Team 2, Eagan, Farmington, Hastings, Lakeville, Mendota Heights, North Cannon River Watershed Management Organization, Rosemount, South St. Paul, and West St. Paul) monitored 39 wetlands in ten cities in Dakota County, one watershed management organization, and Dakota County Parks. Twelve of these wetlands were sampled twice through citizen cross-checks. Four wetland vegetation samples and eleven invertebrate samples were checked for accuracy through the quality control check performed by Bolton & Menk, Inc.

Figure 3.1.1 and Table 3.1.1 show the invertebrate and vegetation ratings for all the wetlands assessed during the 2024 sampling season. Based on invertebrate scores, 2 of the wetlands rated excellent, 23 rated moderate and 14 rated poor. Invertebrate scores ranged from 8 to 26 out of a maximum of 30 points. Based on vegetation scores, 4 wetlands rated excellent, 24 rated moderate, and 11 rated poor. Vegetation scores ranged from 13 to 33 out of a maximum of 35 points.



Several of the sites showed different ratings for vegetation versus invertebrates. Twenty of the wetlands showed agreeing ratings for vegetation versus invertebrates. Differing ratings per wetland may be the result of varying factors influencing the plant and invertebrate communities in each wetland. Possible factors affecting wetland quality are described in the next section. Each metric can achieve a score of 1, 3, or 5. Metric scores per wetland for the current year can be found at www.mnwhep.org.

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	Excellent		Moderate		Poor	
	Invert	Veg	Invert	Veg	Invert	Veg
Apple Valley	1	0	2	2	1	2
Burnsville	0	1	4	3	0	0
Dakota County Parks	0	2	7	6	1	0
Eagan	0	0	2	1	0	1
Farmington	0	0	0	1	2	1
Hastings	1	0	2	3	1	1
Lakeville	0	0	1	2	1	0
Mendota Heights	0	0	1	1	1	1
North Cannon River	0	0	1	0	1	2
Rosemount	0	1	2	2	2	1
South Saint Paul	0	0	0	1	2	1
West Saint Paul	0	0	1	2	2	1
Totals	2	4	23	24	14	11

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

Figure 3.1.2 2024 Invertebrate Scores. Shows the distribution of wetland health ratings for each site monitored in 2024.

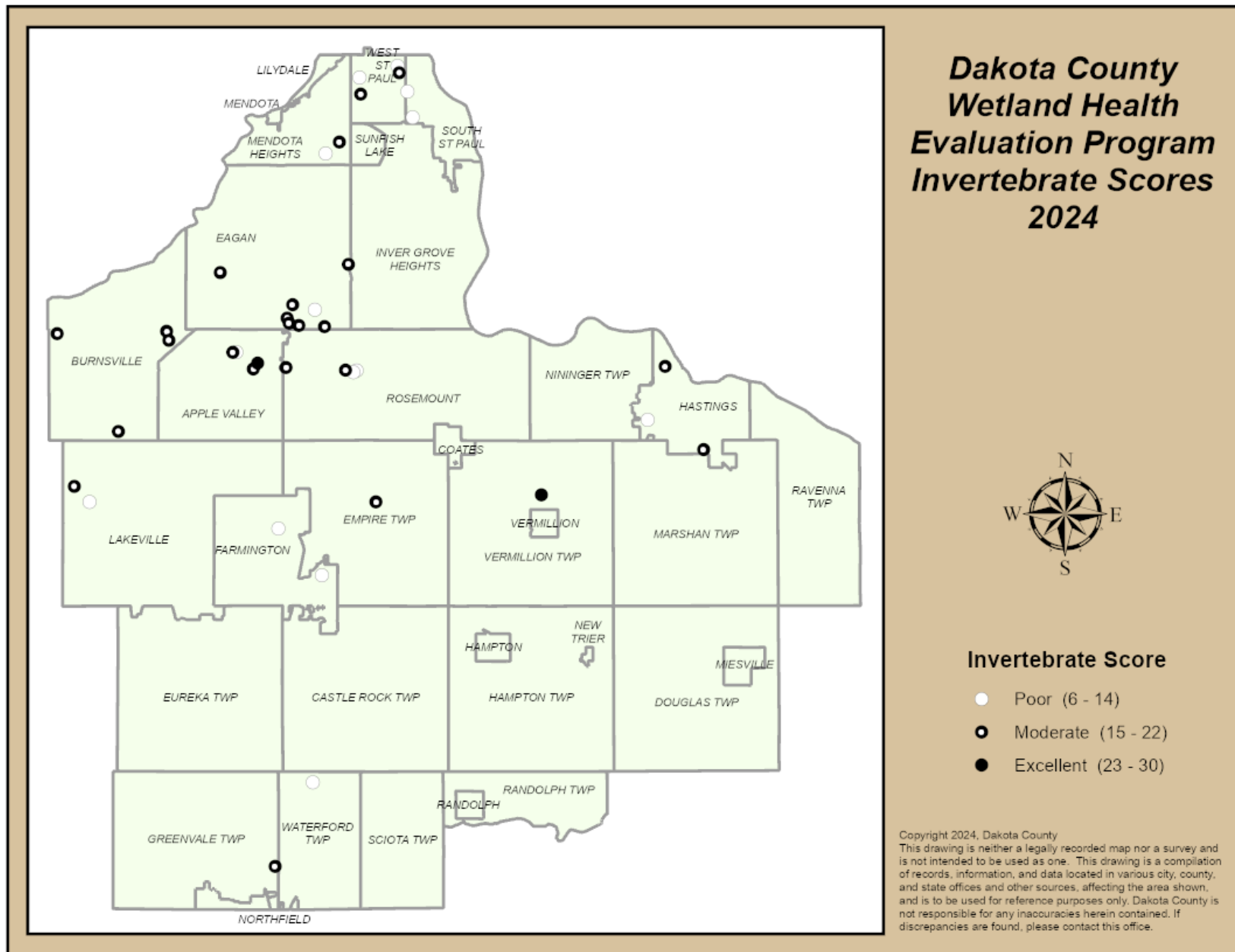
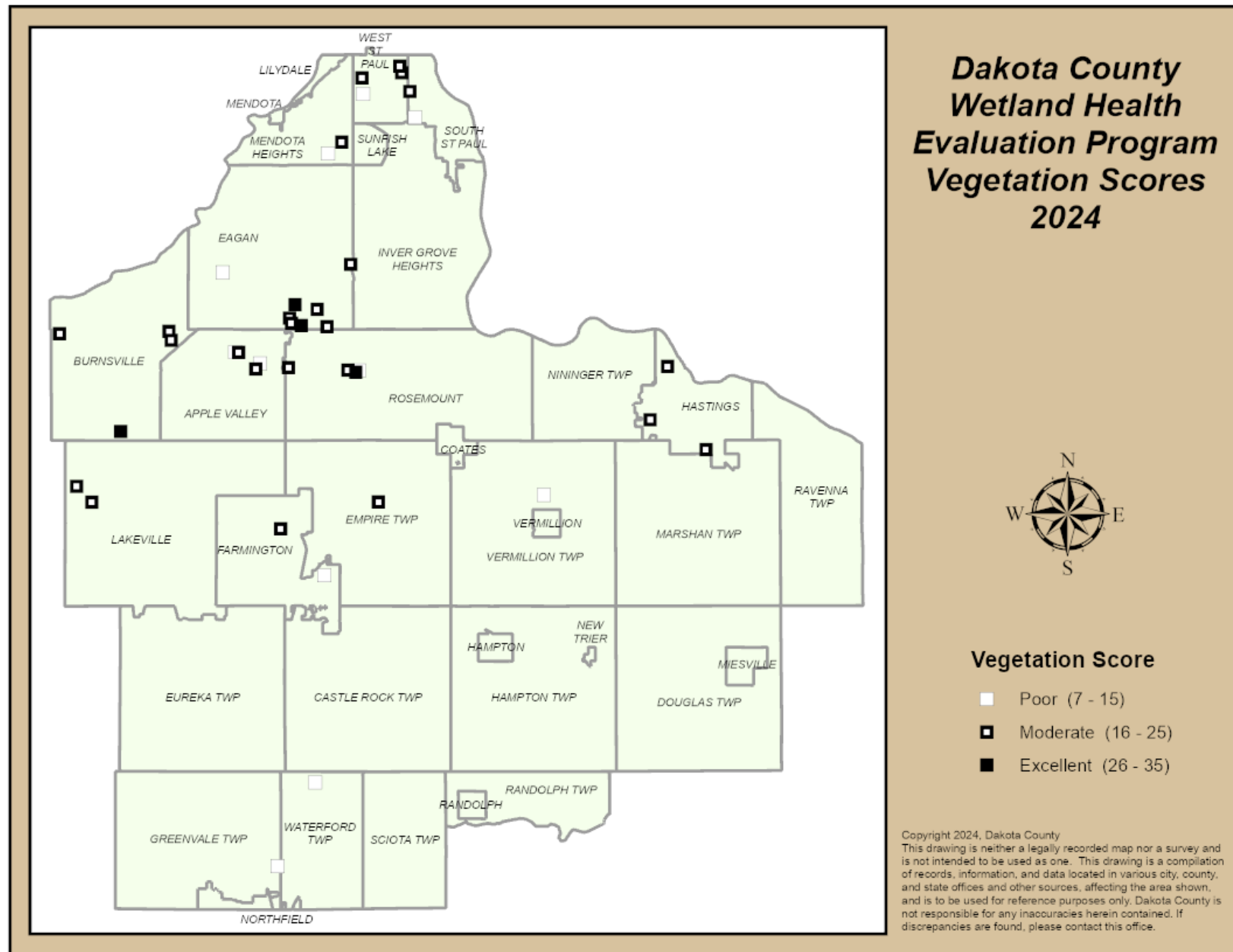


Figure 3.1.3 2024 Vegetation Scores. Shows the distribution of wetland health ratings for each site monitored in 2024.



In an attempt to help identify why there are differences in wetland quality, different factors that impact the wetlands were evaluated.

3.1.1 Aquatic Invasive Species and Wetland Health

Invasive species are non-native organisms that spread to ecosystems beyond their natural historic range, causing harm to economic, environmental, or human health. Aquatic invasive species (AIS) are invasive species more generally found in or near water. Invasive species are often aggressive, spread quickly, and take over areas. They impact native habitat and species diversity. They may be introduced to new areas by wind, water, animals, humans, and other means of transport.

Early detection of invasive species can greatly reduce their success and spread. New infestations or smaller populations of invasive species require less resources to control, and chances of eradication are improved. Once established, invasive species are very difficult and expensive to control, and eradication is unlikely. Detecting and reporting the presence of invasive species early in their introduction to a new area is key. WHEP provides an opportunity for aquatic invasive species to be detected and reported early so that control can be implemented before they take over a wetland.

Aquatic invasive species education and early detection tools have been incorporated into WHEP, preparing WHEP volunteers as early detectors. WHEP volunteers receive AIS training including a presentation highlighting AIS to watch for, identification tips and techniques, and how to record and report AIS to authorities. Hands-on identification practice of native and non-native species is also offered at the invertebrate and vegetation trainings to heighten species recognition, demonstrate comparisons of species, and improve identification skills. WHEP volunteers also receive AIS identification materials, including the [AIS Identification Guide](#) by the University of Minnesota CFANS, and the [Aquatic Invasive Species Early Detectors: A How to Guide](#) by Minnehaha Creek Watershed District. Each team receives AIS early detection field data sheets to record findings during each wetland visit.

Invasive species that have not yet been introduced to Minnesota or exist in limited distribution, but are known to thrive in neighboring states with similar climates and ecosystems are being targeted for early detection. Highlighted species in WHEP training include starry stonewort (*Nitellopsis obtuse*), Hydrilla (*Hydrilla verticillata*), Brazilian elodea (*Egeria densa*), brittle naiad (*Najas minor*), Carolina fanwort (*Cabomba caroliniana*), water chestnut (*Trapa natans*), flowering rush (*Butomus umbellatus*), yellow iris (*Iris pseudacorus*), non-native phragmites (*Phragmites australis*), water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), and other invasive species already found in the wetlands. In Dakota County, flowering rush (limited number) has been found in Lake Byllesby, and yellow iris has been found in Lakeville at Kingsley Lake and Orchard Lake.

WHEP teams are expected to report the presence of invasive species in the wetlands that they monitor. Findings in 2024 were as predicted. Many of the WHEP wetlands have been found to contain invasive species. Reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), and invasive mystery snails (*Cipangopaludina chinensis*) are common wetland invaders that were observed in wetlands monitored in 2024. Reed canary grass was observed in 26 of the wetlands, purple loosestrife was observed in 5 of the wetlands, invasive mystery snails were found in 5 of the wetlands. Non-native phragmites was also observed in one wetland in 2024. It is possible that other invasive species exist in wetlands, but were not observed near monitoring sites at each wetland. In addition, pondweeds and milfoils were found in several wetlands, but not specifically identified as the invasive species. The history of invasive species presence in WHEP monitored wetlands can be found at www.mnwhep.org.

An analysis of variance (ANOVA) was completed to determine if the differences in wetland health scores were affected by the presence of invasive species, and statistically significant. Differences in IBI scores for wetlands with invasive species present vs. not present were not statistically significant.

3.1.2 Natural versus Altered Wetlands

Wetlands were classified as natural, altered by stormwater input, or created based on information provided in the site identification form from city staff. The overall score averages of each site indicate that created, stormwater, and natural wetlands are scoring similarly. An analysis of variance (ANOVA) was completed to determine if the differences were statistically significant. Differences in IBI scores comparing natural, created, and stormwater wetlands were not statistically significant.

The score range between the created, stormwater, and natural wetlands is similar. The most recent invertebrate scores for each wetland show the lowest invertebrate scores for created, stormwater, and natural wetland, respectively, are 11, 8, 8. The highest invertebrate scores, respectively, are 18, 26, 26. The lowest vegetation scores for created, stormwater, and natural wetlands, respectively, are 15, 9, 11. The highest vegetation scores, respectively, are 29, 29, 33.

Wetland health scores vary from year to year. In 2024, the wetland health was not affected by the type of wetland (created, stormwater, or natural). One would expect that natural wetlands would support the richest and most diverse invertebrate and plant communities. 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 and would take time to colonize. These factors are also likely to affect the type and diversity of plants found in the wetlands. These results infer that the created wetlands are functioning similarly to the natural wetlands as far as the biological community. See www.mnwhep.org for associated data.

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 team sponsor. Wetlands with higher impervious areas in the watershed, likely receive more runoff and pollutants. Impervious areas ranged from 0 to 80% (Table 3.1.3). Studies have shown that stream degradation occurs at low levels of imperviousness (about 10%)¹. A similar relationship may exist for wetlands too. Linear regressions have not shown any relationship between imperviousness and IBI scores. Watershed impervious area is likely a factor affecting wetland vegetation and invertebrate life, but there are other factors that are impacting these communities. See www.mnwhep.org for wetland and watershed data.

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

3.1.4 Effect of Wetland Water Levels on Wetland Health

Wetland water levels fluctuate from year to year. They may fluctuate daily in response to rainfall and drought, as well. Water levels may affect site sampling placement. High water levels may push plots farther upland than normally placed. Water levels may also affect the species dominance and diversity. Wetter conditions may encourage more submergent and emergent species of vegetation. Drought may reduce the population of invertebrates. Water levels were measured by volunteer WHEP teams within the vegetation plot sites. The lowest water level measured within the plots was zero feet, the highest water

level was 4.9 feet (1.5 m), and the average water level was 1.8 feet. A linear regression was completed to compare IBI scores to average plot depth. No significant relationship between IBI score and average plot depth was found for either invertebrates or vegetation. Results assume that vegetation and invertebrates sampling occurred in the same general vicinity of the wetland.

3.1.5 Winter Salt Watch

Since 2021, Dakota County WHEP has participated in Winter Salt Watch, a chloride monitoring program managed by Izaak Walton League of America (IWLA), in partnership with Minnesota Pollution Control Agency. The purpose is to measure chloride levels in surface waters and connect the data nationwide. IWLA provided Winter Salt Watch kits for the WHEP teams to measure chloride levels in each of the monitored wetlands.

Chloride is a water pollutant of concern. Salt applied to roads and walkways during Minnesota winters contains chloride. Stormwater readily transports chloride from the hard surfaces to the rivers, lakes, wetlands, and groundwater. Once dissolved in the water, there is no easy way to remove the chloride. Increased chloride levels in surface waters can be harmful to aquatic life and disrupt natural functions of surface waters. The State and Federal Chronic Water Quality Standard for Chloride is 230 mg/L². This is about 1 teaspoon of salt in 5 gallons of water. Chloride levels exceeding this standard are toxic to fish, aquatic invertebrates, and amphibians.

WHEP teams collected chloride measurements in May/June (during invertebrate collection) using Hach Quantab Chloride titration test strips. The test strips are simply placed in a clean container of water from the wetland site for approximately ten minutes. The test strip and associated chart indicate the level of chloride present in the water. The Quantab strips are certified to have an accuracy of ± 10 percent (± 0.2 Quantab Units)³. Unfortunately, the Quantab strips used in 2024 were expired, so data results have been discarded.

In general, chloride concentrations in the wetlands are likely to be higher during the winter and in the spring than what is found in May or June. Chloride will also be higher in the bottom of the wetland rather than at the surface where the samples were collected per the procedures of the test kit. A study on a shallow wetland in Madison, Wisconsin showed that ice thickening over the winter can increase chloride concentrations that are above natural background beyond the toxicity threshold for much of the winter.⁴ Additional monitoring of the wetlands with elevated chloride concentrations would be helpful to determine if and for how long they are exceeding the chloride standard.

²Minnesota Pollution Control Agency. 2018. TCMA Chloride TMDL – Applicable Water Quality Standards and Numeric Water Quality Targets. stormwater.pca.state.mn.us

³Hach. 2020. What is the accuracy of the Quantab Chloride Titration Test Strips? support.hach.com

⁴Hilary A. Dugan, Greta Helmueller, John J. Magnuson, Ice Formation and the risk of chloride toxicity in shallow wetlands and lakes. *Limnology and Oceanography Letters* 2, 2017, 150-158.

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 annual training; citizen monitoring leaders and team leaders that check on the team's collection methods, data entry, and metric calculations; cross-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 2024 Cross-checks

In a typical year, each team is responsible for evaluating one wetland of another team (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 scores differ by six points or less. The majority of the samples are consistent (Table 3.2.1 and Figure 3.2.1). Invertebrate scores for E-48 and L-8 were inconsistent, both differing by 8 points. The vegetation scores for E-48 were also inconsistent, differing by 8 points. 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. Below lists the obvious differences in scoring for those wetlands that were inconsistent. Data collected by the original citizen team is used for the individual wetland analysis in Section 4.0 of this report. Invertebrate scores between citizen team and cross-check team for sites B-7 and WSP-4 were identical. Vegetation scores between citizen team and cross-check team for sites B-7, H-6, and R-1 were identical. Many other site cross-check scores were close in comparison. A general explanation of differences between inconsistent scores are as follows:

Invertebrate cross-check score inconsistencies:

- *E-48*: The Eagan team identified a more diverse invertebrate community than the cross-check team. This affected the Leech, *Corixidae*, and Snail Metrics.
- *L-8*: The Lakeville team identified a more diverse invertebrate community than the cross-check team. This affected the Odonata, ETSD, and Total IBI Metric scores.

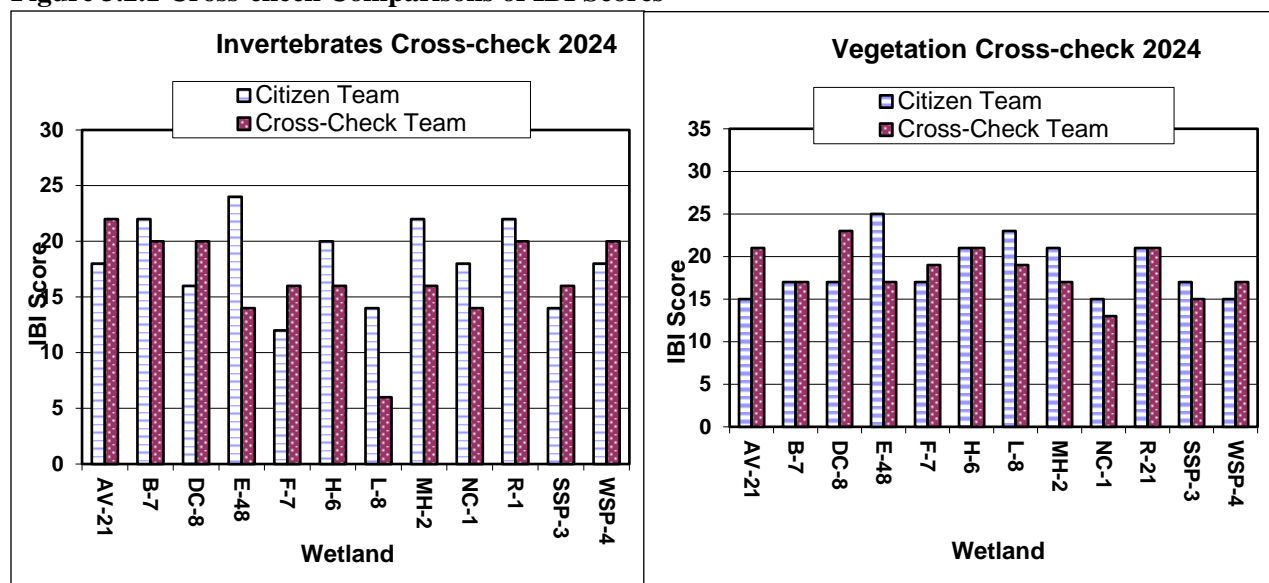
Vegetation cross-check score inconsistencies:

- *E-48*: The Eagan team identified a more diverse vegetation community than the cross-check team. This affected the Vascular, Nonvascular, and *Carex*, Metrics scores.

Table 3.2.1 Citizen cross-checks (those considered inconsistent are shown in bold)

Citizen Team	Cross-Check Team	Wetland Evaluated	Invertebrate Score Comparison		Vegetation Score Comparison	
			Citizen	x-check	Citizen	x-check
Apple Valley	Eagan	AV-21	18	22	15	21
Burnsville	Rosemount	B-7	20	20	17	17
DCP Team #1	DCP Team #2	DC-8	16	20	17	23
Eagan	Apple Valley	E-48	22	14	25	17
Farmington	Lakeville	F-7	12	16	17	19
Hastings	West St. Paul	H-6	20	16	21	21
Lakeville	NCRWMO	L-8	14	6	23	19
Mendota Heights	South St. Paul	MH-2	22	16	21	17
Rosemount	Burnsville	R-1	22	20	21	21
South St. Paul	Mendota Heights	SSP-3	14	16	17	15
West St. Paul	Hastings	WSP-4	20	20	15	17

Figure 3.2.1 Cross-check Comparisons of IBI Scores



3.2.2 2024 Quality Control Checks



BURNSVILLE'S B-1



DAKOTA COUNTY PARKS' DC-2



NCRWMO'S NC-1

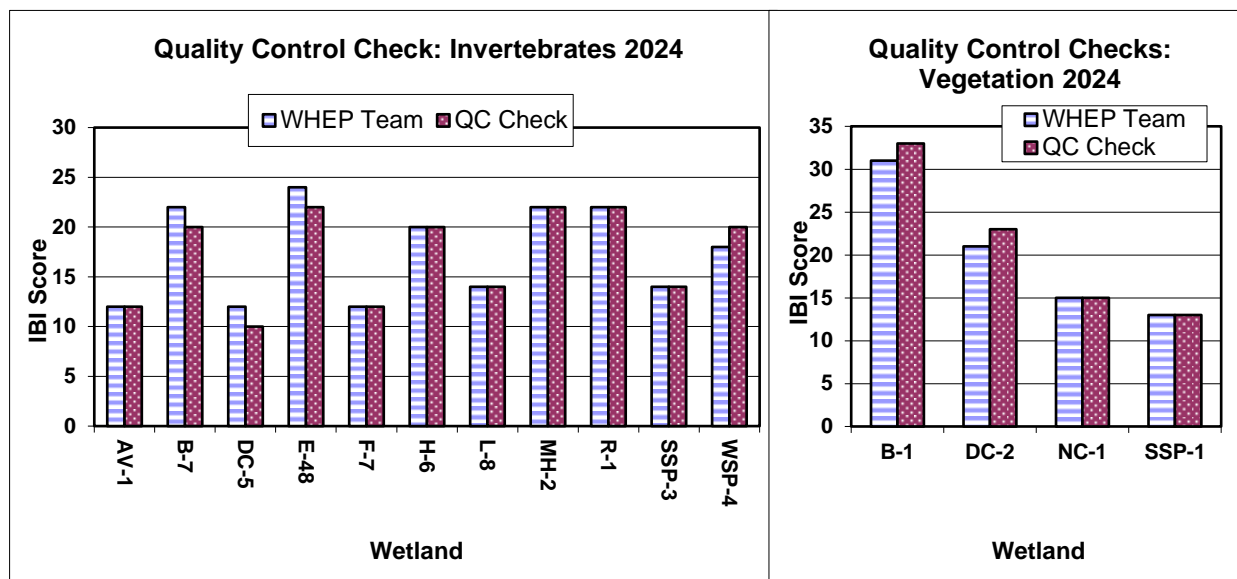


SOUTH ST. PAUL'S SSP-1

Quality control checks were conducted at four sites for vegetation and twelve sites for invertebrates in 2023 (Figure 3.3.2) by Bolton & Menk, Inc. The invertebrate check was conducted by reviewing one identified and preserved invertebrate sample per team. The vegetation check was conducted by re-sampling the area marked off by the citizen team using the WHEP procedures and comparing results. The quality control review was done independently of the citizen team. The following sites were checked as a measure of quality control: AV-1, B-7, DC-5, E-48, F-7, H-6, L-8, MH-2, R-1, SSP-3, and WSP-4 were reviewed for invertebrate identification accuracy; B-1, DC-2, NC-1, and SSP-1 were reviewed for vegetation identification accuracy.

All team invertebrate and vegetation scores were found to be consistent with the quality control checks. Each WHEP team demonstrated competency in both invertebrate identification and vegetation surveys, and illustrated that citizen volunteers participating in a high-quality program that provides good training and oversight can collect usable data.

Figure 3.2.2 Quality Control Checks (IBI Score Comparison)



WHEP also provides review of the data sheets for scoring and data transfer errors. This review is conducted by Bolton & Menk, Inc. In 2023, newly revised invertebrate summary datasheets created confusion in calculating some metrics. The invertebrate datasheets were reviewed and corrected for errors by Bolton & Menk, but only transfer and math errors were not recognized. There was a total of 12 errors found in the vegetation datasheets; 9 transfer errors and 3 math errors. The transfer errors were due to 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. Corrections affected the scores by zero to two 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, corrections are made as needed, and the teams are able to review the changes and strengthen their own skills.

3.3 WHEP Historical Data

Since WHEP began in 1997, 205 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. The historical data can be found for each site since the start of the program at www.mnwhep.org. Section 4.0 includes the sites sampled in 2024 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.

Figure 3.3.1 Most Recent Invertebrate Scores

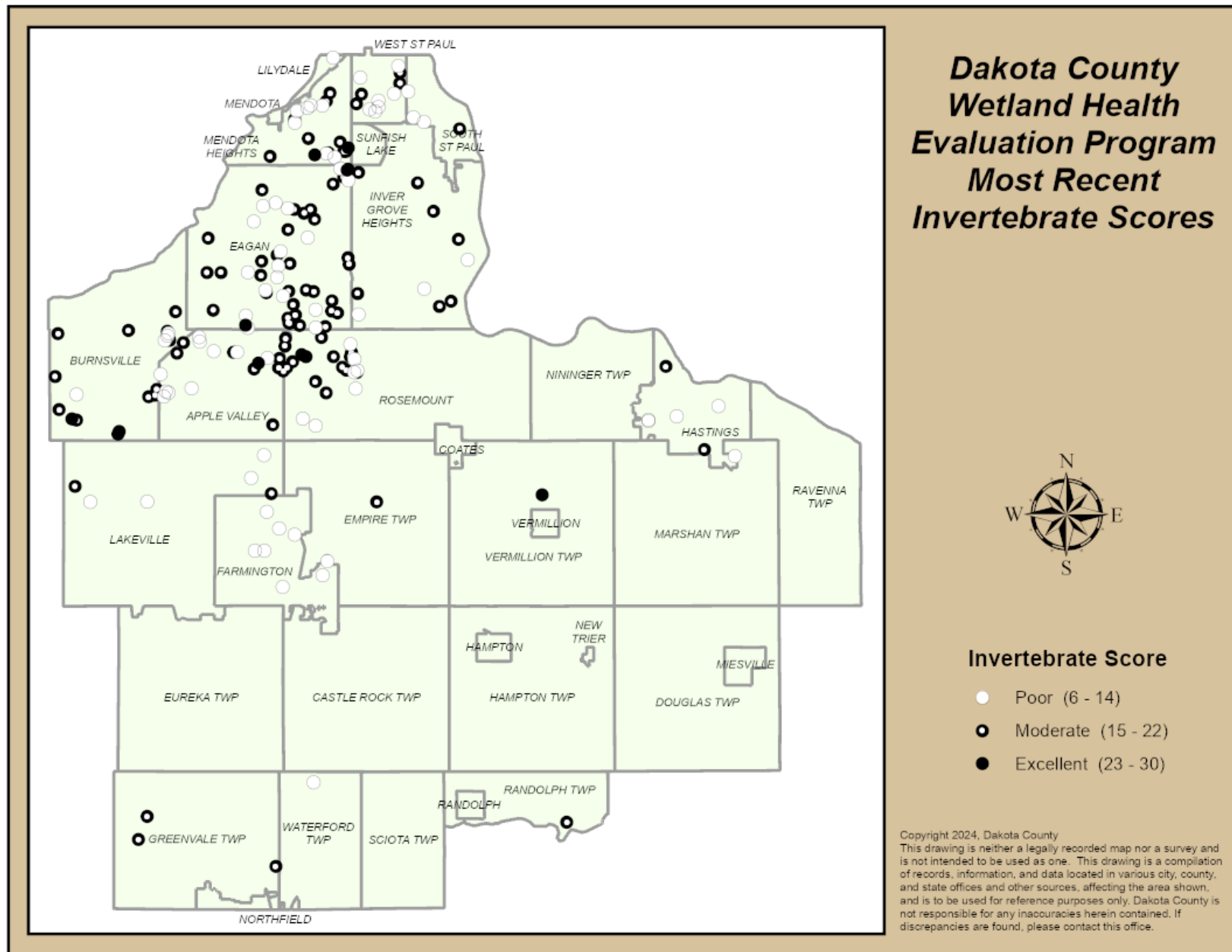
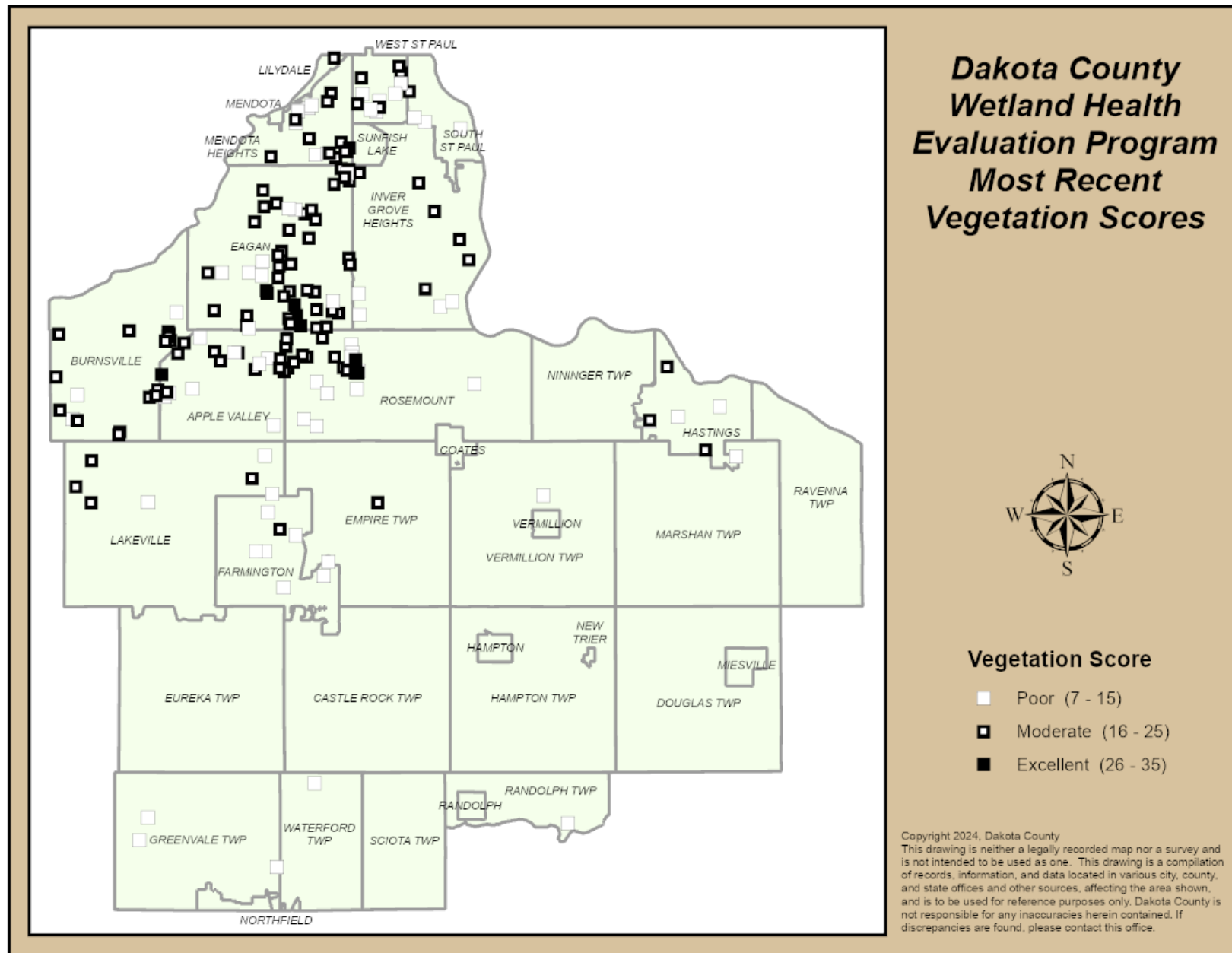


Figure 3.3.2 Most Recent Vegetation Scores



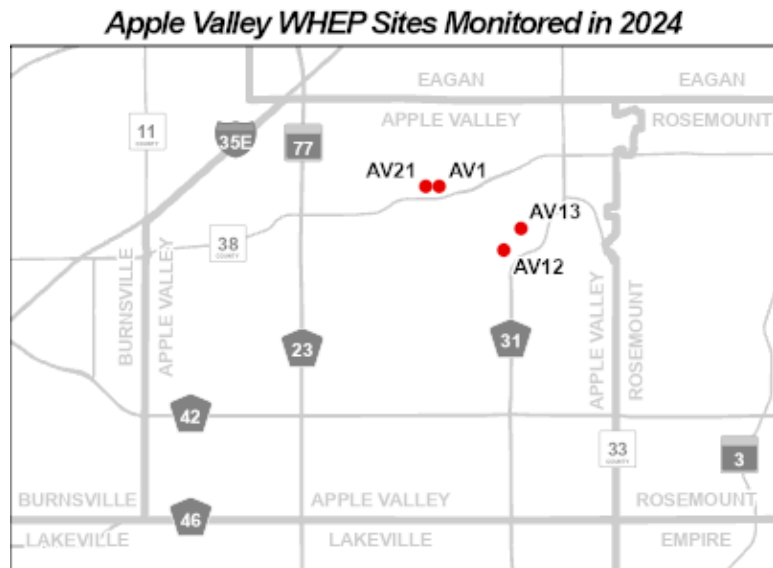
4.0 Wetland Evaluations

4.1 Apple Valley Wetlands

Four wetlands, including one new wetland, were monitored within the City of Apple Valley in 2024. This is the 27th year the City has participated in WHEP! Twenty-one wetlands have been monitored in Apple Valley since the initiation of WHEP in 1997.

Team Leader: Tom and Cindy Taintor

Team Members: Heden Abdulahi, Sam Berger, Brad Blackett, Dexter Ellingson, Reed Ellingson, Stacey Hansen, Kyle Jackson, Karen Levisen, Grace Monaghan, Harper Monaghan, Matt Monaghan, Brianna Riosfski, Mark Riosfski, Gail Smook, Jill Smook, Robert Suchanek, Emma Wuebben, Greta Wuebben, Miles Wuebben, and Kevin Wuebben..



TOM AND CINDY TAINTOR

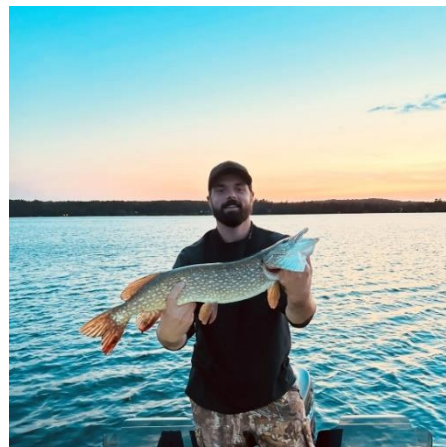
Tom and Cindy Taintor are co-leaders for the Apple Valley WHEP team. They have been involved with WHEP for many years. Cindy commented, “The Apple Valley team had a great season in 2024. Instead of the low water problems we had in 2023, we were challenged by extra-deep ponds. We found an abundance of remarkably tall cattails at one pond which made access challenging. At that same pond, a big snapping turtle was watching us from the road nearby. He didn’t seem bothered by us and we didn’t bother him. We were quite pleased to find more than one variety of caddisfly larva in their cases. We have found empty cases in the past, but these were the first live caddisflies, and there was more than one type.

“It’s always a pleasure to work with the Apple Valley volunteers. We deeply appreciate how well they work together to collect and process the samples while enjoying the wetlands and the interesting things we find. And this year, a couple of our youngest volunteers were excited to have grown enough to be able to fit into our smallest waders.

“We enjoy learning about the wetland plants and critters, and the opportunity to collect reliable information about the health of local wetlands. We appreciate the training and support from Dakota County and the City of Apple Valley, and especially the fantastic Apple Valley team members who make it fun.”

Brian Hartman is the new Water Resources Specialist for the City of Apple Valley. Brian has been working in the stormwater and erosion control industry since 2019. In his previous career, he spent a lot of time

around wetlands while conducting SWPPP inspections for multiple clients around the country. Although this will be Brian’s first year in the WHEP program, he is eager to apply some of his previous experience with wetlands to the program as well as further his knowledge in this discipline. In Brian’s free time he enjoys hunting, fishing, and trapping. Being an avid outdoorsman, Brian is aware of the significance that wetlands play in the ecosystem, which enhances his passion for protecting and cultivating wetlands. Brian has commented, “I am excited to get started with the WHEP Program and meet volunteers within the community who share similar interests and passion for protecting our local wetlands”.

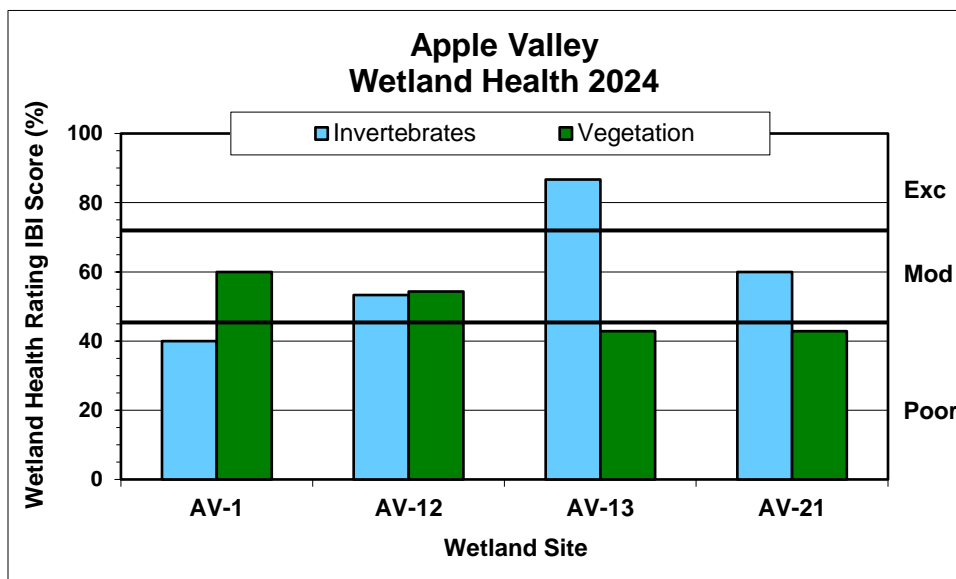


BRIAN HARTMAN

Apple Valley General Wetland Health

Figure 4.1 presents an overall view of wetland health for all the 2024 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. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate, or poor. The Apple Valley wetlands exhibited poor to excellent wetland health based on invertebrate data, and poor to moderate wetland health based on vegetation data. The invertebrates and vegetation scores for AV-1, AV-13, and AV-21 were inconsistent, differing by 20, 44, and 23 percent, respectively.

Figure 4.1 Apple Valley site scores (percent) for the 2024 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 a wetland known as EVR-P53, and then through a series of wetlands and lakes. The wetland watershed is 21 acres with 15 acres of direct drainage, and it is 35 percent impervious. It has two inlets along the southern border, two inlets on the northern end, one equalizer pipe along the eastern border, and one outlet along the western border. Shallow sumps have been placed at the inlets. This wetland is part of the City’s stormwater management plan, and it is designated as a Manage 2 wetland with a goal to observe the effects of the wetland after the drawdown at Long Lake. Wetlands assigned to this category are characterized by high or exceptional restoration potential but are not located in public or open space.



The wetland is located within a privately-owned residential development and is surrounded by homes. A vegetative buffer exists between the wetland and homes/roads. Historic aerial photos show an increase in open water/ponding depth. An adjacent County trail (North Creek Greenway) was constructed in 2016. Infiltration BMPs were included during the trail construction and native seed was used to establish any areas that were disturbed adjacent to the wetland. Erosion was observed on the northeast inlet during pond inspections in 2022.



APPLE VALLEY TEAM

Wetland Health

Site Observations: The wetland is at the bottom of a steep hill. The slope of the wetland is gentle at the water’s edge, but the water deepens quickly. The wetland substrate is mucky with a solid bottom. There is a large vegetative buffer between the homes and the wetland that includes upland vegetation like brome grass (*Bromus* sp.), thistle (*Cirsium* sp.), beebalm (*Monarda* sp.), and vervain (*Verbena* sp.). Cattails (*Typha* sp.), reed canary grass (*Phalaris arundinacea*), bur-reed (*Sparganium* sp.), flatsedge (*Cyperus* sp.), and manna-grass (*Glyceria* sp.) surround the wetland. Coontail (*Ceratophyllum* sp.) and water-nymph (*Najas* sp.) were observed in the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.), water-meal (*Wolffia* sp.), and mosquito fern (*Azolla* sp.), float upon the water surface. Water plantain (*Alisma* sp.) and field-mint (*Menta arvensis*) were also present. Leeches, dragonflies, damselflies, snails, trueflies, crustaceans, and beetles and bugs were collected.

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



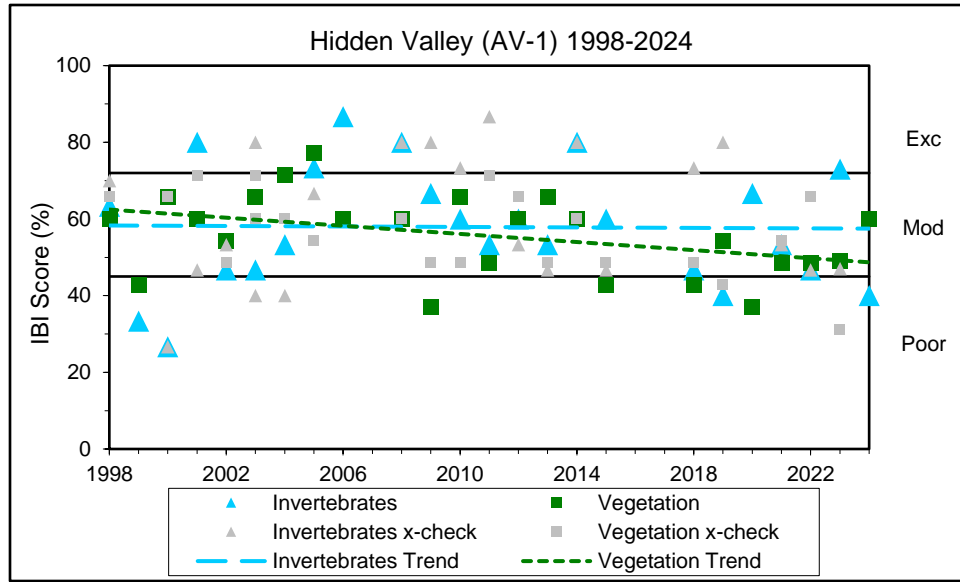
2024 Data (AV-1)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (12)	Moderate (21)
Trend 1998-2024	Variable	Variable

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



Site Summary: Hidden Valley has been surveyed 24 times since 1998. The invertebrate and vegetation health scores were inconsistent in 2024, differing by 20 percent. The invertebrates score indicates poor wetland health, which is a decline from 2023. Fewer types of dragonflies, damselflies, snails, and crustaceans were collected in 2024 than 2023. The vegetation score indicates moderate wetland health. In general, the invertebrate and vegetation scores have been variable over the years fluctuating between excellent and poor. Variability in data may be due to factors such as changes in water level and monitoring location within the wetland.



APPLE VALLEY TEAM IDENTIFYING VEGETATION

4.1.2 Everest Pond (AV-12)

Everest Pond (AV-12), also known as EVR-P12 and Public Water 19-225W, is a 5.7-acre, type 5 wetland within the EVR-P12 subwatershed within the Vermillion River Watershed. The watershed has approximately 527 acres of total drainage of which 61 acres drain directly. There is one inlet in the northwest corner of the wetland, and one inlet along the southwestern shoreline. There is one outlet on the northwest corner of the wetland, and one outlet along the northeastern shoreline. Everest Pond is part of the City's stormwater management plan and is designated as a Manage 1 wetland. Wetlands in this classification have medium floral diversity/integrity, but also have direct stormwater input. The wetland must have high or exceptional restoration potential and be located in public or open space in order to meet the restoration classification.



This wetland is a key drainage area to Long Lake and Farquar Lake, both of which are impaired for phosphorus. Approximately 68 percent of the external phosphorus load entering Long Lake comes from this pond. Several projects have been completed in the pond and the overall drainage as part of addressing the TMDL, including an iron-enhanced sand filter and raingardens upstream. The City is completing an additional project on an upstream pond in 2024. The area surrounding this wetland is primarily residential. More than half of the wetland is surrounded by a wooded buffer, and the rest by manicured lawn. There are algal blooms in the summer, and the presence of goldfish has been noted.

Wetland Health

Site Observations: The wetland slope is gentle and the substrate very mucky. Trees surround the wetland, including willow (*Salix* sp.), cottonwood (*Populus* sp.), and ash (*Fraxinus* sp.). Fallen branches and logs lie underwater. Coontail (*Ceratophyllum* sp.) crowded the water column. Waterweed (*Elodea* sp.) and pondweed (*Potamogeton* sp.) were also found. Duckweed (*Lemna* sp.) and water-meal (*Wolffia* sp.) floated upon the surface of the water. Very little emergent vegetation was present, but included reed canary grass (*Phalaris arundinacea*), cattail (*Typha* sp.), beggar-ticks (*Bidens* sp.), loosestrife (*Lysimachia* sp.), and smartweed (*Polygonum* sp.). Species of leeches, dragonflies, damselflies, caddisflies, snails, trueflies, crustaceans, and beetles and truebugs were collected.

Table 4.1.2 Everest Pond (AV-12) Wetland Health based on IBI



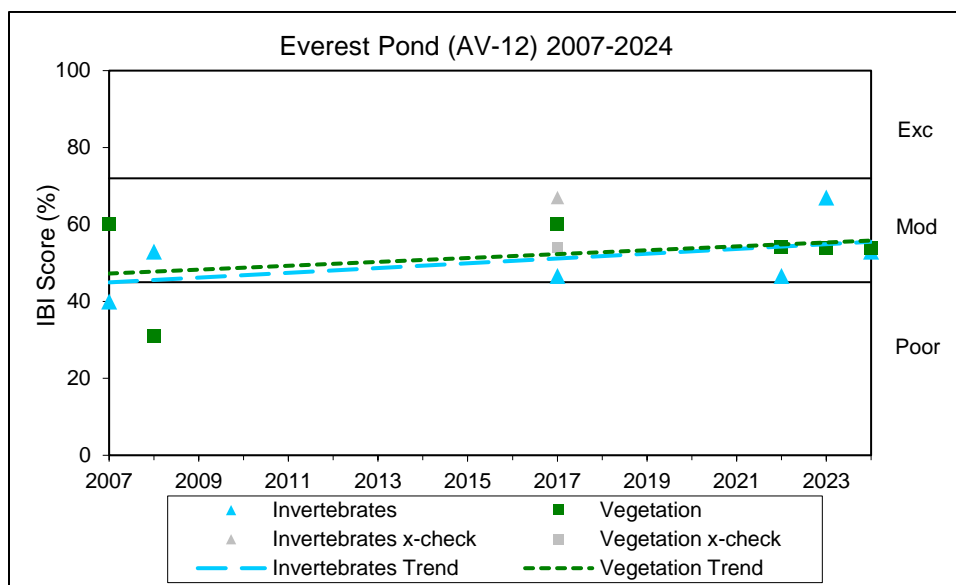
2024 Data (AV-12)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (16)	Moderate (19)
Trend 2007-2024	Stable	Stable

Figure 4.1.2 Invertebrate and vegetation trends for Everest Pond (AV-12)



Site summary: This is the sixth time that AV-12 has been monitored since the initial survey in 2007. The invertebrate and vegetation scores were consistent in 2024, both scores indicating moderate wetland health. Both health trends appear stable. The fluctuating presence of dragonflies and damselflies have affected the invertebrate scores over the last few years. The vegetation scores have been similar since 2022.

4.1.3 EVR-P14 (AV-13)

EVR-P14 (AV-13) is a 3.6-acre, type 5 wetland within the Vermillion River Watershed. The wetland watershed has approximately 26 acres, all of which is direct drainage. The watershed has 35 percent impervious surface. There are two inlets along the eastern border and two inlets along the northern border of the wetland. There is an equalizer pipe along the southern border. This wetland is within the Long Lake and Farquar Lake TMDL drainage areas. Approximately 0.13 percent of the external phosphorus load entering Long Lake comes from this pond. This wetland is part of the City's stormwater management plan and is designated as a Manage 3 wetland. The management goal is to observe the effects of the wetland after the drawdown at Long Lake.



Wetland Health

Site Observations: EVR-P14 is primarily surrounded by residential properties. The wetland slope is steep and the substrate is very mucky. Cattails (*Typha* sp.) and reed canary grass (*Phalaris arundinaca*) surround the wetland. Coontail (*Ceratophyllum* sp.) was the only submergent vegetation observed. Duckweeds (*Lemna* sp. and *Spirodela* sp.) floated upon the water's surface. Willows (*Salix* sp.), maple trees (*Acer* sp.), smartweed (*Polygonum* sp.), beggar-ticks (*Bidens* sp.), and bugle weed (*Lycopus* sp.) were also present. Species of leeches, dragonflies, damselflies, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected. Tadpoles and fish were found in bottle traps. Crayfish, painted turtles, snapping turtles, and red-winged blackbirds were observed.



APPLE VALLEY TEAM SORTING FOR INVERTEBRATES

Table 4.1.3 EVR-P14 (AV-13) Wetland Health based on IBI



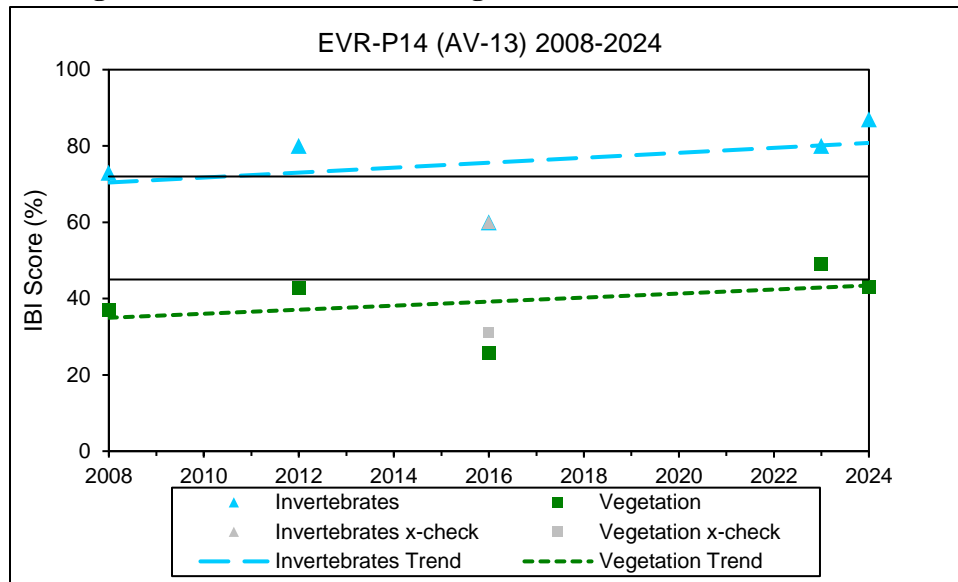
2024 Data (AV-13)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Excellent (26)	Poor (15)
Trend 2008-2024	Stable	Stable

Figure 4.1.3 Invertebrate and vegetation trends for EVR-P14 (AV-13)



Site summary: This is the fifth time that AV-13 has been monitored since the initial survey in 2008. The invertebrate and vegetation scores were inconsistent in 2024, differing by 44 percent. The invertebrate score indicates excellent wetland health while the vegetation score indicates poor wetland health. Invertebrates and vegetation data was similar in 2023 and 2024. Despite low vegetation diversity, there is adequate habitat to provide for a high diversity of invertebrates. The health scores show stable health trends for both invertebrates and vegetation.

4.1.4 EVR-P55 (AV-21)

EVR-P (AV-21) is a type 5 wetland within the Vermillion River Watershed. The wetland watershed has approximately 39.25 acres. The watershed has 36.2 percent impervious surface. There is one inlet at the southwestern edge of the wetland, one inlet on the eastern border of the wetland, and one outlet at the southernmost tip of the wetland. The City is anticipating a future water quality improvement project at this location and wants to determine and review the wetland health ahead of the project.





This is a public water wetland within a residential area. There is a vegetative buffer separating the wetland from nearby homes and roads.

Wetland Health

Site Observations: The wetland slope is steep and the substrate mucky. Ash trees (*Fraxinus* sp.), oak trees (*Quercus* sp.) grow along the shoreline of the wetland. Pondweed (*Potamogeton* sp.) crowded the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.), water-meal (*Wolffia* sp.), and yellow water-lily floated upon the water's surface. Very little emergent vegetation was represented. Species of leeches, dragonflies, snails, trueflies, crustaceans, and bugs and beetles were collected. Fish were found in bottle traps.

Table 4.1.4 EVR-P (AV-21) Wetland Health based on IBI

2024 Data (AV-21)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (18)	Poor (15)
Cross-check Rating (IBI score)	Moderate (22)	Moderate (21)
Trend 2024	NA	NA

Site summary: This is the first year that AV-21 has been monitored for WHEP. The invertebrate and vegetation scores were inconsistent, differing by 23 percent. The invertebrate score indicates moderate wetland health while the vegetation score indicates poor wetland health. The vegetation diversity is low. This site was cross-checked by another team. Invertebrate scores between the two teams were inconsistent, differing by 13 percent. The cross-check team identified a larger diversity of snails which reflected in a higher invertebrate health score. The vegetation scores between the two teams were also inconsistent, differing by 17 percent. The cross-check team identified a larger diversity of nonvascular taxa which reflected in a higher vegetation score. Fish were found in the bottle traps of both teams. More years of data will help determine reliable health trends.

4.2 Burnsville Wetlands

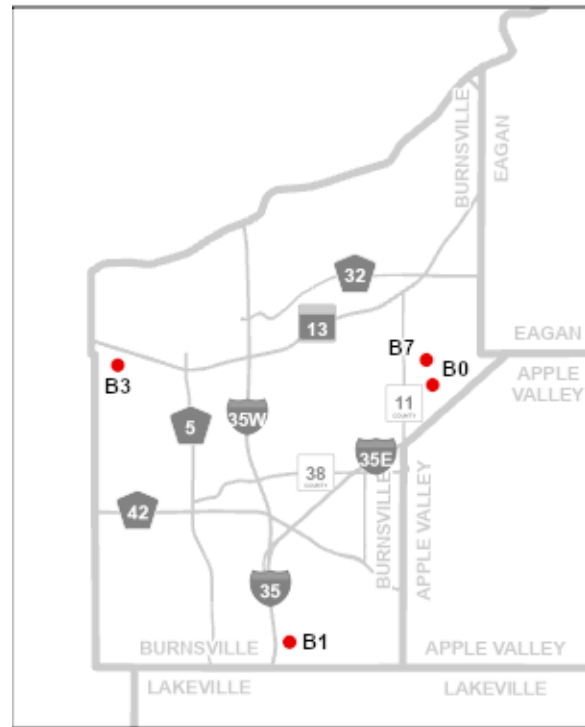
Four wetlands were monitored within the City of Burnsville in 2024. This is the 28th year the City has participated in WHEP! Eighteen wetlands have been monitored in Burnsville since the initiation of WHEP in 1997.

Team Leader: Caitlin Hughes-Parry

Team Members: Don Ackerman, Emily Caouette, Dalton Dehne, Alec Erickson, Sally McNamara, Quinn McNamara, Shannon Pipho, Chelsea Schaibly, Emma Strecker, Jillian Walechka-Olson, Tom Ward, Patricia Weeks, Brian Wolff, and Chris Wolff.

Caitlin has been the Burnsville WHEP Team leader since 2021. She said, “Leading the Burnsville WHEP Team is an incredible privilege thanks to both the city's incredible wetlands and the amazing community of volunteers. The WHEP program is a wonderful way to contribute to the health of the local wetland ecosystems, to learn about the amazing natural spaces around us, and to connect with other people in our communities that share curiosity and compassion for these

Burnsville WHEP Sites Monitored in 2024





CAITLIN HUGHES-PARRY

places. My favorite thing about WHEP is spending summer evenings getting muddy with a handful of really exceptional people. The 2024 season was a great one; we surveyed four Burnsville wetlands and a cross-check site in Rosemount and had a small, but committed group of both veteran and new volunteers.”

John Stelzner is the city contact for the Burnsville WHEP team. His role at the City of Burnsville is to assist in implementation of natural resources projects, water quality monitoring, and leading volunteers. He has been in the



JOHN STELZNER

natural resources field for over 15 years. He affirmed, “The City values the WHEP program for the citizen science engagement and wetland data. The data is used for comparing changes over time in our local waterbodies, in particular if any large changes are occurring in the area like the large scale restoration at Terrace Oaks. We can monitor how the restoration is impacting the local wetlands in Terrace Oaks and hopefully improving them as we progress towards diverse native plant communities, primarily savanna. As a staff of two people, we appreciate the WHEP volunteers as they help boost our “staffing” through their volunteer efforts.”

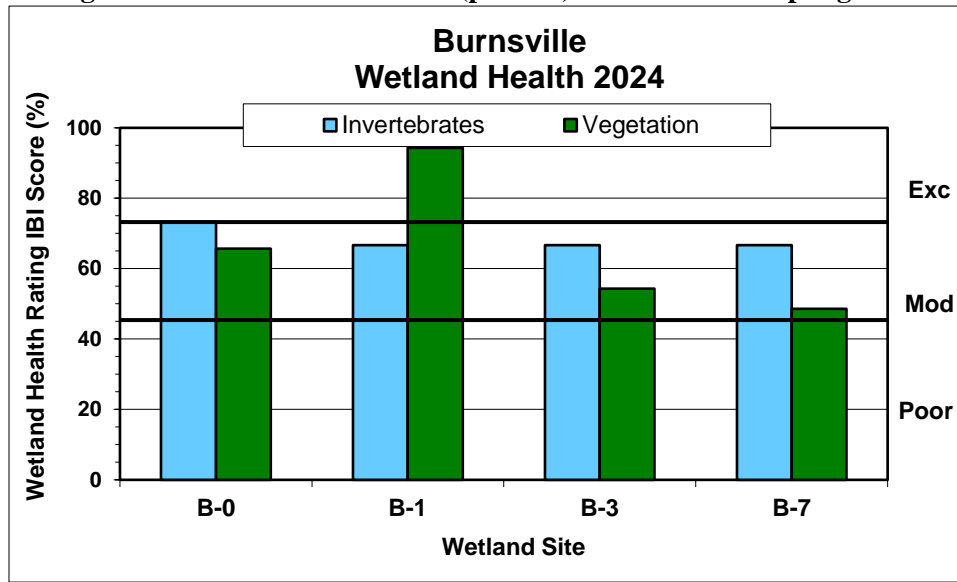
Burnsville General Wetland Health

Figure 4.2 presents an overall view of wetland health for all the 2024 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. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate, or poor. The Burnsville wetlands exhibited moderate wetland health based on invertebrate data, and moderate to excellent wetland health based on vegetation data. The invertebrate and vegetation scores for B-1, B-3, and B-7 were inconsistent, differing by 27, 13, and 18 percent, respectively.



SALLY MCNAMARA, CHRISTINE WOLFF, TOM WARD, CAITLIN HUGHES-PARRY

Figure 4.2 Burnsville site scores (percent) for the 2024 sampling season



4.2.1 Terrace Oaks East Central (B-0)

Terrace Oaks East Central (B-0) is a wetland located in the E26 drainage area within the Black Dog watershed. The E26 drainage area is 16.6 acres with no impervious surface. There are no inlets or outlets in the wetland. The wetland is part of the City's stormwater management plan and is designated as a Protection Class. The management goal is to maintain the wetland and its existing functions, values, and wildlife habitat.

The wetland is located within Terrace Oaks Park which is used predominantly for walking, biking, birdwatching, and recreational sports. The wetland lies in a depression surrounded by an area of rolling hills, and is accessible by a mountain bike trail. In an area of the park adjacent to the wetland, buckthorn and other invasive species and select trees have been removed. Cover crop and grass seed mix was sown to establish ground cover after the woody vegetation removal.



Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is fairly solid. Dense buckthorn stands surround the wetland and duckweed (*Lemna* sp.) covered the surface of the water. Bladderwort (*Utricularia* sp.) was the only submergent species. Three-way sedge (*Dulichium arundinaceum*), cutgrass (*Leersia* sp.), water plantain (*Alisma* sp.), arrowhead (*Sagittaria* sp.), and loosestrife (*Lysimachia* sp.) dominate the shoreline. Sedges (*Carex* sp.), spike-rush (*Eleocharis* sp.), manna-grass (*Glyceria* sp.), reed canary grass (*Phalaris arundinacea*), blue grass (*Poa* sp.), bur-reed (*Sparganium* sp.), bugleweed (*Lycopus* sp.), field mint (*Mentha arvensis*), skullcap (*Scutellaria* sp.), nightshade (*Solanum dulcamara*), oak trees

(*Quercus* sp.), elm trees (*Ulmus* sp.), and cherry trees (*Prunus* sp.) were also present. Species of leeches, dragonflies, damselflies, snails, fingernail clams, trueflies, crustaceans, and beetles and bugs were collected.

Table 4.2.1 Terrace Oaks EC (B-0) Wetland Health based on Index of Biotic Integrity (IBI)



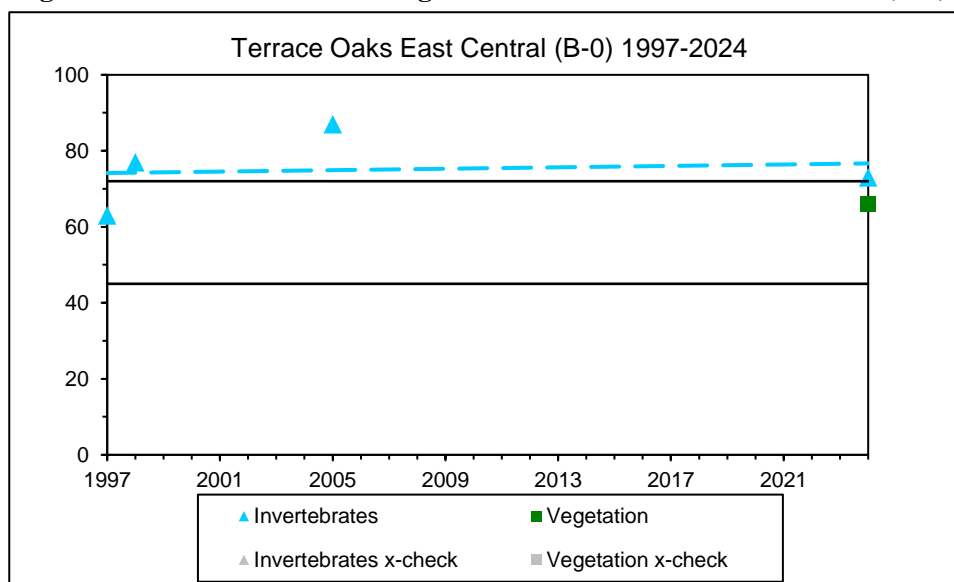
2024 Data (B-0)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (23)
Trend 1997-2024	Not enough data	Not enough data

Figure 4.2.1 Invertebrate and vegetation trends for Terrace Oaks EC (B-0)



Site Summary: Terrace Oaks East Central wetland has been surveyed 4 times since 1997 for WHEP. The invertebrate and vegetation health scores were consistent in 2024, and indicate moderate wetland health. This is the only year of vegetation data. More years of surveys will help determine reliable health trends.

4.2.2 Crystal Lake West (B-1)

Crystal Lake West (B-1) is a one-acre, type 3 wetland located in the CL6 Drainage Area of Crystal Lake subwatershed within the Black Dog watershed. The CL6 drainage area is 444.5 acres, and is five percent impervious. There are no inlets or outlets in the wetland. The wetland is part of the wetland management plan and is designated as an Improvement Class. The goal for the wetland is to improve its quality. The wetland has invasive species problems, including reed canary grass. There is some recreational vehicle disturbances (mostly in the winter). The wetland is very close to a bay on the west side of Crystal Lake, and is within a large, naturally vegetated, City-owned park called Crystal Lake West Park.



Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is very mucky and covered with lily pad root mat. A walking trail leads to the wetland. It is regularly used by walkers and anglers. The open water is covered in white water lily (*Nymphaea* sp.). Bladderwort (*Utricularia* sp.) filled the water column. Coontail (*Ceratophyllum* sp.), duckweeds (*Lemna* sp. and *Spirodela* sp.), arrowhead (*Sagittaria* sp.), sedge (*Carex* sp.), spike-rush (*Eleocharis* sp.), bulrush (*Scirpus* sp.), marsh milkweed (*Asclepias* sp.), beggar-ticks (*Bidens* sp.), bugle weed (*Lycopus* sp.), and purple loosestrife (*Lythrum salicaria*) were also present. Slender Riccia (*Riccia fluitans*) and purple-fringed Riccia (*Ricciocarpus natans*) were also observed. Species of leeches, dragonflies, damselflies, snails, fingernail clams, trueflies, crustaceans, and true bugs were collected.

Table 4.2.2 Crystal Lake West (B-1) Wetland Health based on Index of Biotic Integrity (IBI)



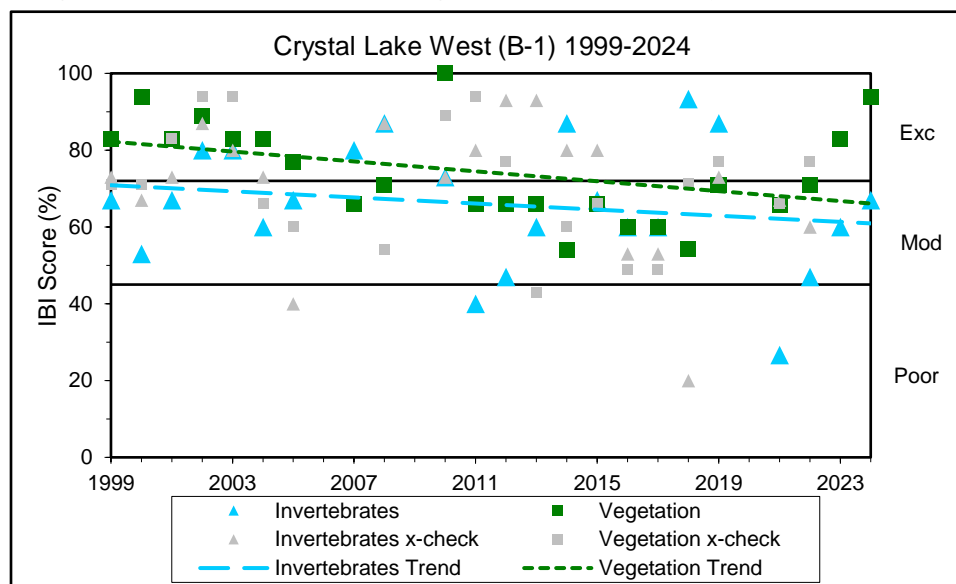
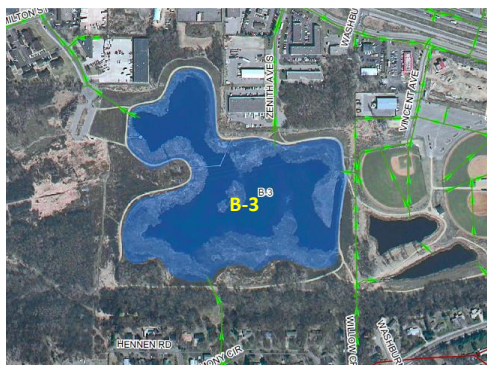
2024 Data (B-1)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (20)	Excellent (33)
Trend 1999-2024	Variable	Variable

Figure 4.2.2 Invertebrate and vegetation trends for Crystal Lake West (B-1)



Site Summary: Crystal Lake West has been surveyed 23 times since 1999. The invertebrate and vegetation health scores were inconsistent in 2024, differing by 27 percent. The invertebrate score indicates moderate wetland health while the vegetation score indicates excellent wetland health. Data for 2023 and 2024 are very similar. Overall, invertebrate and vegetation scores have been variable over the years fluctuating between excellent and poor. The extreme fluctuations may be due to factors such as changes in water level and plot placement. The tadpole and crayfish population may impact the invertebrate scores. The presence of bladderwort and nonvascular vegetation enhances the vegetation score. This wetland was cross-checked by a third party (Bolton & Menk). Similar vegetation was observed within the releve.

4.2.3 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 29.7-acre, type 3 wetland located within the NW21 drainage area of Northwest Subwatershed (1,404 acres) of the Lower Minnesota Watershed (40,960 acres). The NW21 drainage area is 93 acres and approximately 30 percent impervious. It has one inlet on the south side and one inlet on the east side. It also has one outlet in the northwest corner and one outlet on the north side. The wetland is part of the City’s stormwater management plan, and is designated as Protection Class with a wetland management goal to protect the wetland, maintain flood protection, control sediment, and remove nutrients.

The large wetland was installed in 1997 to mitigate for wetland disturbances by Kraemer & Sons, Inc. Land use in the watershed is mainly residential and industrial. The upland buffer has been restored to prairie and some stormwater ponds are in place to protect the wetland. Upland vegetation is managed through burning, spraying, and interseeding. A gravel path encircles the wetland. It is a protected wetland and provides migratory bird habitat. Invasive species are cause for concern.



CAITLIN HUGHES-PARRY, TOM WARD,
AND CHRISTINE WOLFF

Wetland Health

Site Observations: The wetland is completely surrounded by cattail (*Typha* sp.) and has a deep dropoff beyond the cattail mats. The wetland substrate is very muddy. Other than cattails, no emergent grasses or forbs were observed in the 5x20 square meter vegetation releve. Coontail (*Ceratophyllum* sp.), water beggar-ticks (*Megalodonta beckii*), water-milfoil (*Myriophyllum* sp.), water-nymph (*Najas* sp.), and pondweed (*Potamogeton* sp.) fill the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.) scatter upon the surface of the water. Leeches, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and beetles and bugs were collected.

Table 4.2.3 Kraemer Preserve (B-3) Wetland Health based on IBI



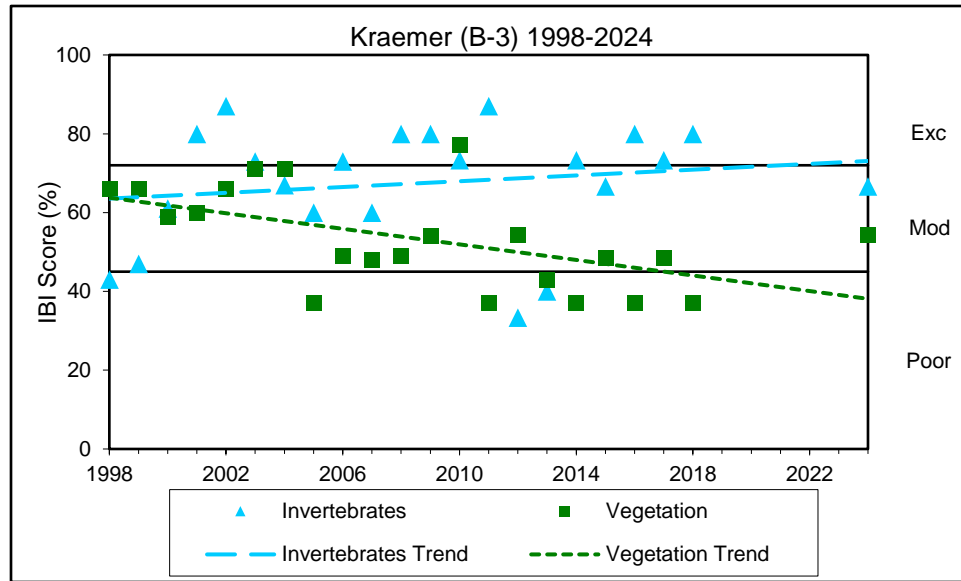
2024 Data (B-3)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (20)	Moderate (19)
Trend 1998-2024	Stable	Stable

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

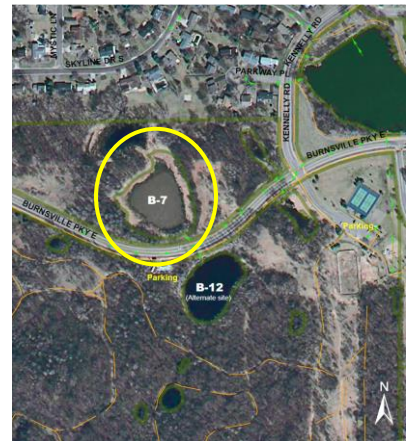


Site summary: Kraemer Preserve wetland has been surveyed 22 times for WHEP since 1998. The invertebrate and vegetation scores are inconsistent, differing by 13 percent; however, both scores indicate moderate wetland health. This wetland shoreline is dominated by cattail and lacks a diverse emergent plant community, but contains a dense and diverse community of submergent vegetation. Both invertebrates and vegetation data history show stable wetland health trends.

4.2.4 Terrace Oaks Burnsville Parkway North (B-7)

Terrace Oaks Burnsville Parkway North (B-7) is a 2.2-acre, type 4 wetland located within the E15 Drainage Area of the East Subwatershed (2,171 acres) of the Black Dog Watershed (3,700 acres). The E15 Drainage area is 15.7 acres and approximately five percent impervious. The wetland is part of the City's stormwater management plan. It has no inlets and one 12-inch outlet in the southeast corner of the wetland. It is a protected wetland and is being managed to maintain the wetland and its existing functions, values, and wildlife habitat.

Terrace Oaks North is located on the north end of Terrace Oaks Park. There is an approximately 150-foot buffer on its northern edge. Burnsville Parkway runs less than 50 feet south of the wetland. Invasive species, winter road salt and sand, and stormwater runoff are disturbances of concern. Nearby streets are swept twice per year.



Wetland Health

Site Observations: The wetland has a gentle slope into the water. The wetland substrate is fairly solid. This wetland has no open water. Reed canary grass (*Phalaris arundinacea*) spreads across the entire wetland. Willow trees (*Salix* sp.), oak trees (*Quercus* sp.), bulrush (*Scirpus* sp.), bluegrass (*Poa* sp.), arrowhead (*Sagittaria* sp.), smartweed (*Polygonum* sp.) were present. There were no submergent plants present in the vegetation releve. Very little duckweed (*Lemna* sp.) and slender riccia (*Riccia fluitans*) floated upon the surface of the water. Species of leeches, dragonflies, damselflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

Table 4.2.4 Terrace Oaks Burnsville Parkway North (B-7) Wetland Health based on IBI



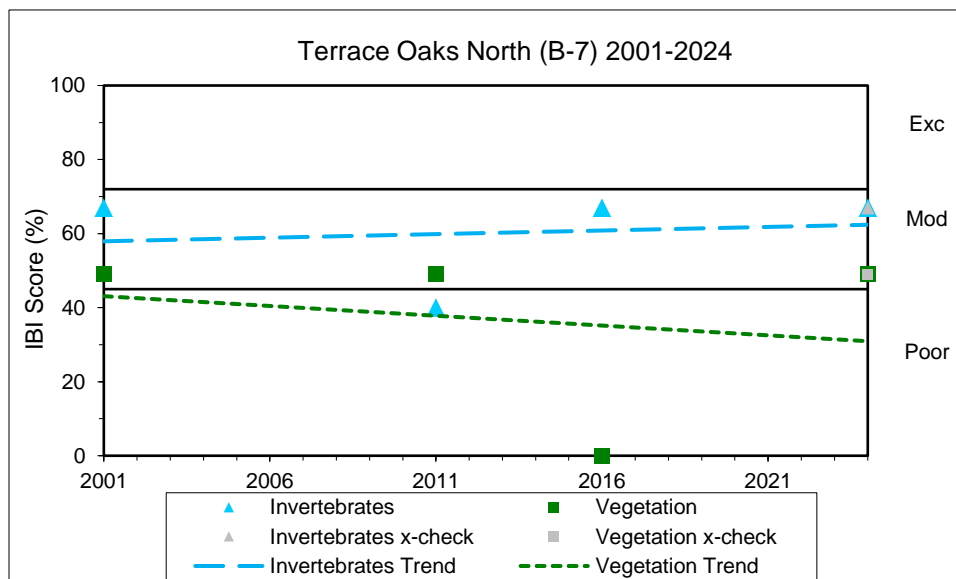
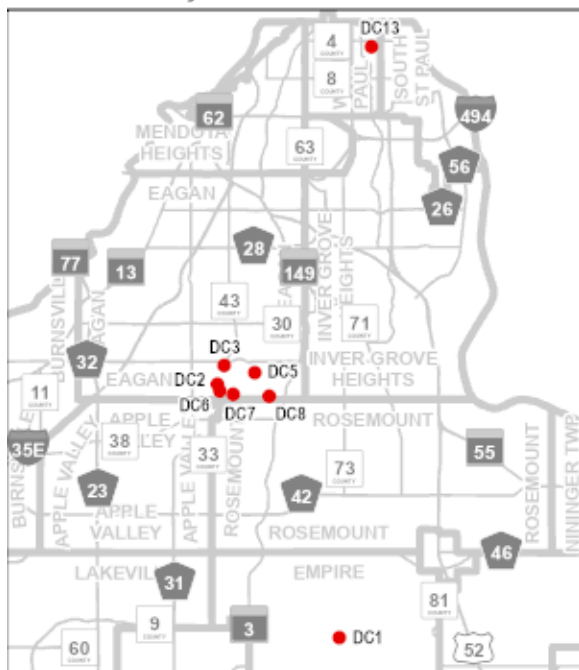
2024 Data (B-7)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (20)	Moderate (17)
Cross-check Rating (IBI score)	Moderate (20)	Moderate (17)
Trend 2001-2024	Stable	Stable

Figure 4.2.4 Invertebrate and vegetation trends for Terrace Oaks BV Pkwy North (B-7)



Site summary: This is the fourth time that B-7 has been surveyed since 2001. The invertebrate and vegetation scores were inconsistent with each other, differing by 18 percent; however, both scores indicate moderate wetland health. The minimal data recorded for invertebrates and vegetation appear consistent. More years of data may determine a more reliable health trend. This wetland was cross-checked by another WHEP team. The vegetation and invertebrate observations were very similar for both teams.



4.3 Dakota County Parks Wetlands

Two teams monitored eight wetlands for Dakota County Parks in 2024. This is the tenth year that Dakota County Parks has monitored wetlands with WHEP. Eleven wetlands have been monitored for the Parks Department since 2015.

Team Leaders:

Marianne McKeon Buck (Team 1)

Jennifer Kanz (Team 2)

Team 1 Members:

Zachary Armstrong, Posie Geyer, Lauren Heaton, Paul Leeder, Miles Marcuson, Alan Nordquist, Tara Perriello, Joseph Schulte, and Wesley Smith.

Team 2 Members: Nastja Nykaza, Margaret Perry, Akil, Jerry, Smith, TJ, and Valerie.



MARRIANNE MCKEON

Marianne McKeon has led the Dakota County Parks Team #1 since 2022, and has been involved in WHEP since 2007. Previously, she was a team leader for the City of Eagan for many years. She previously said, “What I love about WHEP after all these years is the volunteers. I’m so grateful for such dedicated returning volunteers and enthusiastic new ones and it’s so much fun to get to know them while helping them to be good citizen scientists!”

Jennifer Kanz has led the Dakota County Parks Team #2 since 2021. She previously expressed, “Thanks to all of the volunteers this year. We survived the mud and heat, and we saw lots of cool critters!”

Max Samuelson is Dakota County Parks’ WHEP contact. He recognized, “Dakota County Parks’ mission is to enhance and

enrich lives by providing high quality recreation and education opportunities in harmony with natural resource preservation and stewardship. The WHEP program embodies all elements of this mission by providing critical data that helps track the effectiveness of our restoration projects and identify priority areas for future work, while providing an opportunity for the public to participate in the stewardship of their favorite natural areas. Across the County’s park system there are 2,200 acres of restored land being maintained and another 604 acres under active restoration. Monitoring is an important piece of natural resource stewardship and WHEP provides critical information for future management decisions to improve



MAX SAMUELSON

water and habitat quality in the parks. We are beyond grateful for everything WHEP does, and hope everyone had fun while they were out there!”

Vegetation Protocol Modified

In 2019, the Dakota County Parks Department modified the WHEP vegetation protocol in order to better understand species richness, abundance, and distribution. The traditional WHEP protocol is to identify vegetation to the genus level. The modified protocol requires that the vegetation be identified to the species.

Team members set up a 100 m² vegetation plot and surveyed the vegetation within the plot, as outlined in the traditional WHEP protocol. The key difference is specifying the plants to the species level of identification. The shared genus of species could then be easily transferred into the WHEP metrics to calculate a vegetation health score.

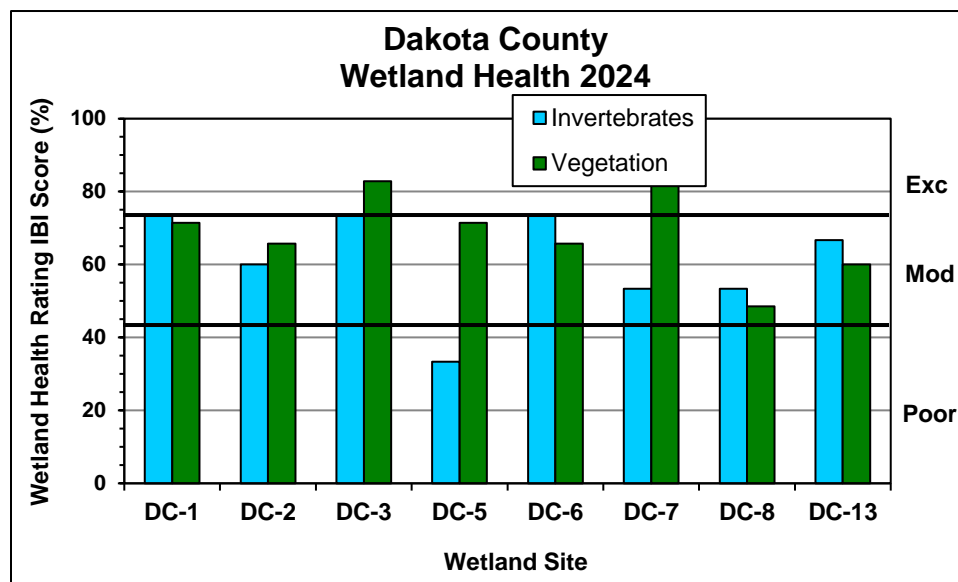
In addition, to surveying the vegetation plot, Dakota County WHEP volunteers may have conducted an optional 20-minute meander survey. This was to be completed after the 100 m² plot sampling. Meander surveys involve walking “randomly” through a wetland site and noting each species found. Meander surveys are useful in difficult terrain or irregularly-shaped sites, and are particularly useful for locating small habitat features that fall outside of the plot site. The meander should be conducted on the edges of the plot sample area. The meander is completed only if there is enough time after completing the plot survey.

These modifications came after a trial of the Rapid Floristic Quality Assessment (rFQA) was completed in the Dakota County Parks wetlands in 2018. Modifications of the WHEP protocol in 2019 were made in hopes that moderately trained and/or experienced naturalists are able to complete the surveys.

Dakota County Parks General Wetland Health

Figure 4.3 presents an overall view of wetland health for all the 2023 monitoring sites in Dakota County Parks 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. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate, or poor. The wetland health invertebrates scores ranged from poor to moderate. The wetland health vegetation scores ranged from moderate to excellent. Wetlands DC-3, DC-4, DC-6, and DC-7 exhibited excellent wetland health based on vegetation data. Invertebrate and vegetation scores were inconsistent for DC-3, DC-4, DC-5, DC-6, DC-7, and DC-13, differing by 37, 27, 13, 24, 27, and 26 percent, respectively.

Figure 4.3 Dakota County Parks site scores (percent form) for the 2024 sampling season



4.3.1 Empire Lake (DC-1)

Empire Lake (DC-1) is a 25.1-acre, type 5 wetland located in the Vermillion River Watershed. The subwatershed is approximately 4,000 acres with 5 percent impervious surface. Empire Lake is the man-made result of impounding an unnamed tributary stream to the Vermillion River. This dike was built in 1965. Some improvements have been made to the dike since the original construction, and it was reconstructed with an outlet in 2019. Management goals are to monitor the lake to track effects of recent restoration and ongoing management of invasive species.



Empire Lake is located within Whitetail Woods Regional Park. The watershed includes agricultural fields, natural areas, and gravel mining. The adjacent woodland was highly disturbed by invasive buckthorn which was removed during restoration activities between 2015-2019. Upstream wetlands to the north and west of this site were not completely restored during previous restoration efforts, such that continuous monitoring will be needed to observe differences during and after those activities. A Natural Resources System Management Plan was completed for the Park in 2020. A water quality survey was completed on this lake in 2009 measuring healthy phosphorus levels, much below the Shallow Lake State Standard. Secchi disk measurements also indicate higher water clarity, a critical component in encouraging and maintaining rooted submergent vegetation.

Wetland Health

Site Observations: The wetland slope is very gentle near the shoreline. The wetland substrate is fairly mucky with many fallen logs. Small representations of many plants are present including coontail (*Ceratophyllum* sp.), water beggar-ticks (*Megalodonia beckii*), water-nymph (*Najas* sp.), pondweed (*Potamogeton* sp.), smartweed (*Polygonum* sp.), duckweeds (*Lemna* sp. and *Spirodela* sp.), water-meal (*Wolffia* sp.), water arum (*Calla palustris*), iris (*Iris* sp.), arrowhead (*Sagittaria* sp.), sedges (*Carex* sp.), spike-rush (*Eleocharis* sp.), rushes (*Juncus* sp.), bulrush (*Scirpus* sp.), cutgrass (*Leersia* sp.), reed canary grass (*Phalaris arundinacea*), dogwood (*Cornus* sp.), willows (*Salix* sp.), cottonwood (*Populus* sp.), and several other emergent forbs. Species of dragonflies, damselflies, caddisflies, snails, fingernail clams, and crustaceans were collected. No leeches, beetles, or truebugs were collected. Mystery snails were present.

Table 4.3.1 Empire Lake (DC-1) Health based on Index of Biotic Integrity



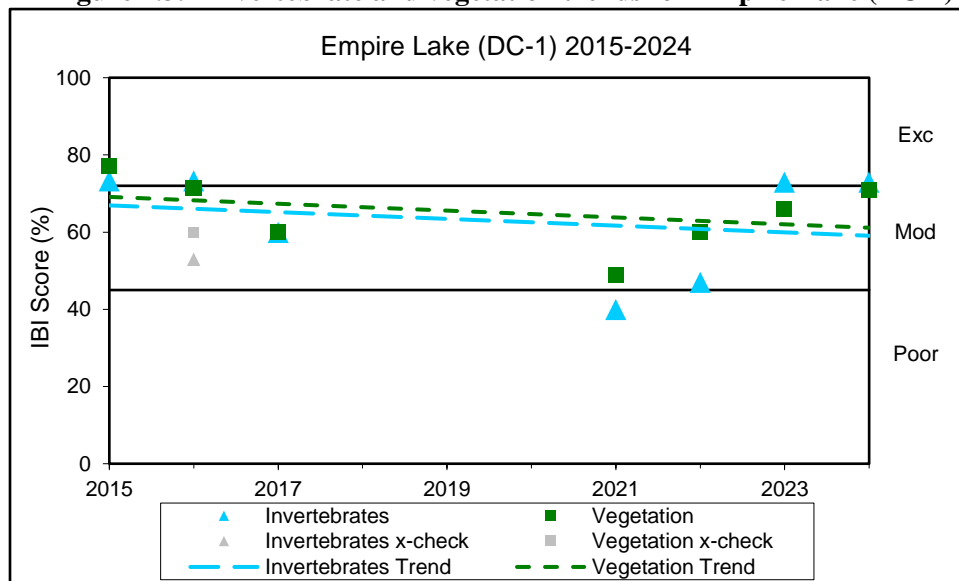
2024 Data (DC-1)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (25)
Trend 2015-2024	Stable	Stable

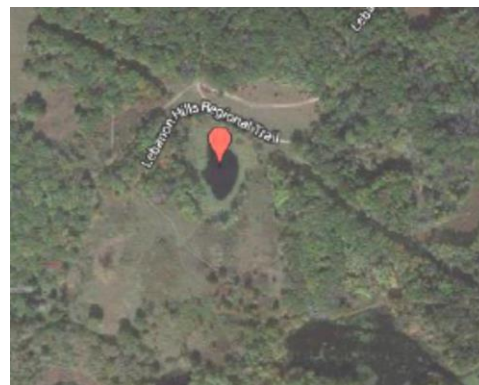
Figure 4.3.1 Invertebrate and vegetation trends for Empire Lake (DC-1)



Site summary: This is the seventh time that Empire Lake has been monitored for WHEP since 2015. The invertebrate and vegetation scores were consistent, and both scores indicate moderate (nearly excellent) wetland health. This wetland has a higher diversity of vegetation; however, the plants are only sparsely represented. Both health trends appear to be stable. Leeches, beetles, and truebugs were not represented in the collection. Fish were found in the bottle trap, which may have impacted the invertebrate collection.

4.3.2 Buck Pond (DC-2)

Buck Pond (DC-2) is a 1.6-acre, type 3 wetland located in the Lower Minnesota River watershed. The pond's watershed is approximately 12 acres with zero impervious surface. It is a small, round depressional pond/wetland located near the center of Lebanon Hills Regional Park. It is an isolated terrene basin, within 700-1200 feet of larger lakes to the east and south. It is classified as "shallow marsh" and a "freshwater emergent wetland". The wetland and surrounding area were recently restored. Previously, the wetland was surrounded by smooth brome-dominated uplands and overgrown savanna/woodland, which have now been restored to native prairie vegetation. Prior to restoration, the wetland was dominated by reed canary grass (*Phalaris arundinacea*), and deposition from the surrounding land had caused build-up in the wetland covering the native seed bank. Historically, the area was likely grazed and/or farmed.



Dakota County began implementing major ecological restoration of this wetland in December 2015 and continued through June 2018. In December of 2015, 1.5 feet of farmland deposits were scraped from the wetland edge, in hopes that it would remove the rhizomatous root system of reed canary grass and expose and reestablish the native wetland seed bank. Prior to the scrape, there was very low plant diversity within the basin and very little native emergent vegetation; however, following the scrape in June 2016, the native seedbank began emerging during the growing season. Data collected before, during, and after the restoration document the effects of the project on the wetland.

Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is mucky. The upland vegetation is full of colorful blooms and textures. Coontail (*Ceratophyllum* sp.) dominated the water column. Water-nymph (*najas* sp.), pondweed (*Potamogeton* sp.), water-celery (*Vallisneria americana*), and smartweed (*Polygonum* sp.) were also present. Duckweeds (*Lemna* sp. and *Spirodela* sp.) floated upon the surface of the water. Cutgrass (*Leersia* sp.), arrowhead (*Sagittaria* sp.), flatsedge (*Cyperus* sp.), spike-rush (*Eleocharis* sp.), vervain (*Verbena* sp.), monkey flower (*Mimulus* sp.), and blazing star (*Liatris* sp.) densely populated the shoreline and shallow water. Cottonwood (*Populus* sp.), sedges (*Carex* sp.), (*Leersia* sp.), reed canary grass (*Phalaris arundinacea*), boneset (*Eupatorium* sp.), bugleweed (*Lycopus* sp.) marsh-cinquefoil (*potentilla palustris*), and several other upland forbs and grasses were also present. Leeches, dragonflies, damselflies, snails, trueflies, and bugs and beetles were collected.

Table 4.3.2 Buck Pond (DC-2) Health based on Index of Biotic Integrity



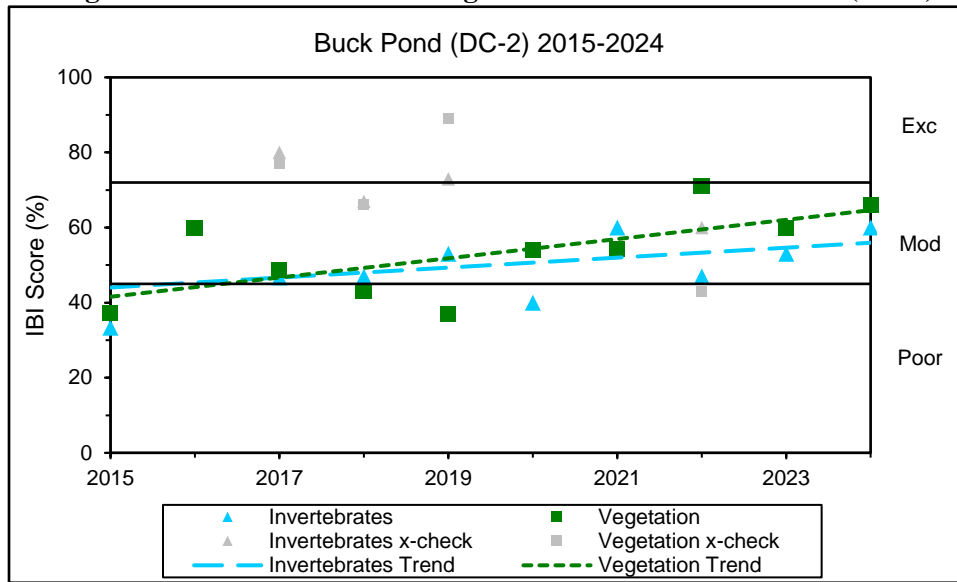
2024 Data (DC-2)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (18)	Moderate (23)
Trend 2015-2024	Stable	Improving

Figure 4.3.2 Invertebrate and vegetation trends for Buck Pond (DC-2)



Site summary: This is the tenth consecutive year that Buck Pond has been monitored by WHEP. The invertebrate and vegetation scores were consistent, and both scores indicate moderate wetland health. The invertebrate trend is stable. The vegetation trend is showing improvement, especially since the completion of the restoration in the area. This site was cross-checked for vegetation by a third party (Bolton & Menk). The third-party consultant identified a higher diversity of vegetation which enhanced the vegetation health score for this site.

4.3.3 Tamarack Swamp (DC-3)

Tamarack Swamp (DC-3) is a 7.7-acre, type 3 wetland located in the Lower Minnesota River watershed. This tamarack occurrence is the southernmost example of tamarack swamp remaining in Minnesota. No large-scale alterations to the historic hydrology of the swamp have been detected, and efforts have been made throughout the history of the park to protect this unique feature from human impact. It receives runoff from surrounding land, and there is a small outlet that runs into Holland Lake that was restored in 2020 and only flows during high water periods. A number of years show the area dry in September.



This remnant tamarack swamp is located in Lebanon Hills Regional Park. Surrounding the swamp are oak woodland and oak forest plant communities. The natural area is comprised of a matrix of glacial moraine hills, plains and kettle hole lakes and ponds. The dominant land cover types pre-settlement would have been primarily oak forest, shallow lakes and wetlands, and prairie/savanna.

Dakota County Natural Resource Department's primary goal is to create conditions in this wetland that favor tamarack regeneration through the removal of shrubs and invasive herbaceous species within the swamp, and to buffer the swamp by removing invasive species from the adjacent plant communities with the swamp watershed. Monitoring will give the County baseline data and on-going data collection in the

following years. The monitoring will help determine the effectiveness of the restoration efforts of Tamarack Swamp. Minnesota County Biological Survey surveyed the park, including the Tamarack Swamp, and found the swamp to be of moderate biological diversity significance. This wetland has also been monitored by MPCA for the past decade.

Wetland Health

Site Observations: The wetland slope is gentle and the substrate is solid. In most years, a high diversity of emergent forbs, grasslike plants, and trees have been present while submergent vegetation is lacking. In 2024, submergent plants, pondweed (*Potamogeton* sp.) and water-crowfoot (*Ranunculus* sp.), were present. Sensitive fern (*Onoclea sensibilis*), water plantain (*Alisma* sp.), smartweed (*Polygonum* sp.), arrowhead (*Sagittaria* sp.), sedges (*Carex* sp.), spike-rush (*Eleocharis* sp.), bulrush (*Scirpus* sp.), and several other upland forbs were present. Leeches, dragonflies, damselflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles, were collected.

Table 4.3.3 Tamarack Swamp (DC-3) Health based on Index of Biotic Integrity



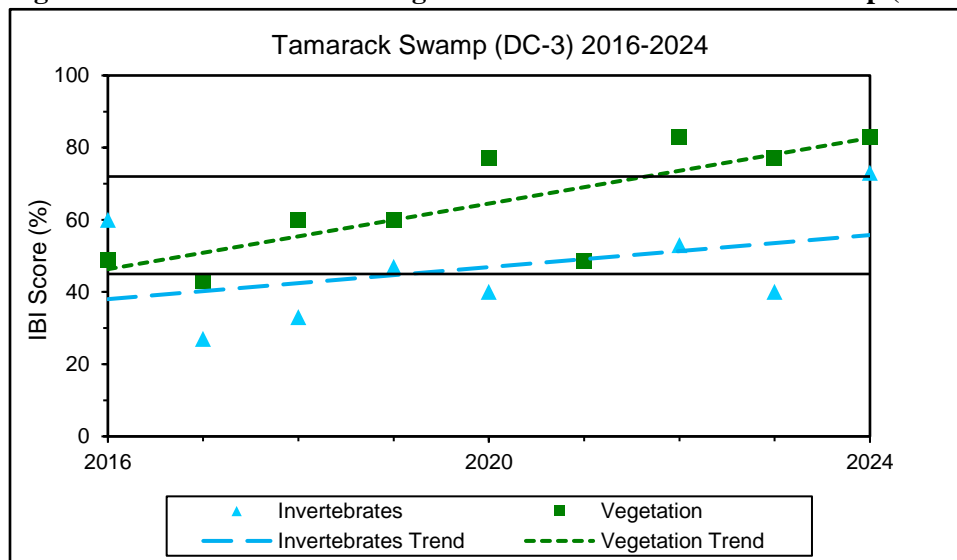
2024 Data (DC-3)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (22)	Excellent (29)
Trend 2016-2024	Stable	Improving

Figure 4.3.3 Invertebrate and vegetation trends for Tamarack Swamp (DC-3)



Site summary: This is the ninth consecutive year that Tamarack Swamp has been monitored by WHEP. The invertebrate and vegetation scores were consistent. The vegetation score indicates excellent wetland health while the invertebrate score indicates moderate (almost excellent) wetland health. A high representation of emergent woody, grasslike, and forb species add to the vegetation diversity. The vegetation data has been consistent in recent years. The presence of submergent vegetation may have provided adequate habitat for the invertebrate community which showed higher diversity in 2024.

4.3.4 Wood Pond (DC-5)

Wood Pond (DC-5) is a 0.8-acre, type 3 wetland located in the Lower Minnesota River watershed. The pond's watershed is approximately 22 acres with no impervious surface. Water flows into Wood Pond from Cattail Pond and seeps from the surrounding area. The water eventually drains into Schultz Lake.



Historically, the area was used for grazing; though now, Wood Pond is near a restored and maintained prairie. Upland areas immediately surrounding the pond are under active restoration through goat browsing to manage woody invasive species (primarily buckthorn). Continuous monitoring will serve to observe changes as activities progress.

Wetland Health

Site Observations: The wetland slope is gentle and the substrate is solid. Reed canary grass (*Phalaris arundinacea*) and bur-reed (*Sparganium* sp.) dominated the vegetation releve. Sedges (*Carex* sp.), spike-rush (*Eleocharis* sp.), bulrush (*Scirpus* sp.), marsh milkweed (*Asclepias* sp.), smartweed (*Polygonum* sp.), and other upland forbs and grasses were present in low proportions. Sparse populations of coontail (*Ceratophyllum* sp.), bladderwort (*Utricularia* sp.), and duckweeds (*Lemna* sp. and *Spirodela* sp.) were observed. Leeches, dragonflies, damselflies, snails, crustaceans, and bugs and beetles were collected.

Table 4.3.4 Wood Pond (DC-5) Health based on Index of Biotic Integrity



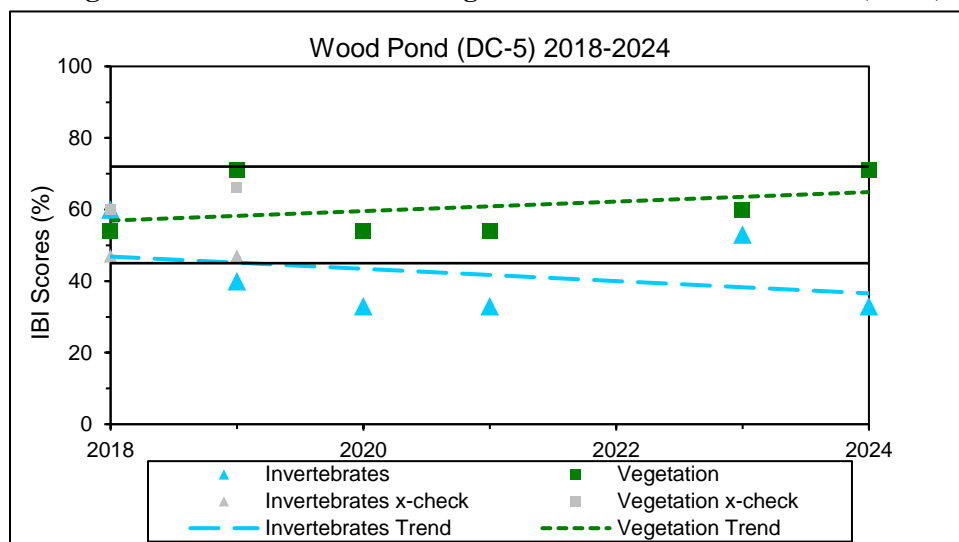
2024 Data (DC-5)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (10)	Moderate (25)
Trend 2018-2024	Stable	Stable

Figure 4.3.4 Invertebrate and vegetation trends for Wood Pond (DC-5)

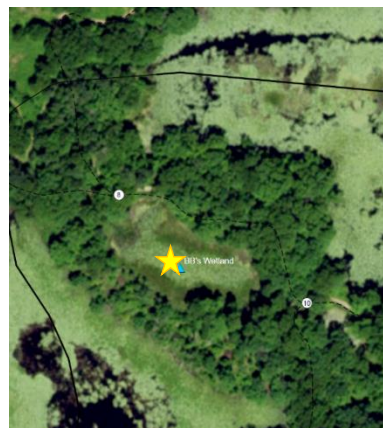


Site summary: This is the sixth year that Wood Pond has been monitored by WHEP since 2018. The invertebrate and vegetation scores were inconsistent with each other, differing by 38 percent. The invertebrate score indicates poor wetland health, while the vegetation score indicates moderate wetland health. Both trends are stable. A high diversity of emergent vegetation is present at this site; though populations are sparsely represented, and very little submergent or floating-leaved plants are present. Multiple years with low water and underrepresented aquatic vegetation may impair the invertebrate population while a diverse emergent vegetation community reflects positively on the wetland health.

4.3.5 BB's Wetland (DC-6)

BB's Wetland (DC-6) is a 1.2-acre, type 5 wetland located in the Lower Minnesota River watershed. There is a natural inlet on the west end of the wetland, as well as a natural overflow/outlet on the west end.

This wetland is within Lebanon Hills Regional Park. There is very little disturbance. Natural oak forest surrounds the wetland. This wetland is significant due to the presence of Blanding's turtles. The County Parks have been tracking a female Blanding's turtle in the vicinity of the wetland. The wetland management goal is to maintain high quality vegetative cover conducive to turtle habitat. The overall strategy is to continue monitoring for the presence of invasive species and determine stability of native plant cover.



Wetland Health

Site Observations: The wetland slope is gentle, and the wetland substrate is solid. A hiking trail runs along the northern portion of the wetland. White water lily (*Nymphaea* sp.), duckweed (*Lemna* sp.), and slender riccia (*Riccia flutans*) float on the water surface. Pondweed (*Potamogeton* sp.) grows in the water column. Sedges (*Carex* sp.), reed canary grass (*Phalaris arundinacea*), bur-reed (*Sparganium* sp.), smartweed (*Polygonum* sp.), and several upland forbs and woody species were present. Leeches, dragonflies, damselflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

Table 4.3.5 BB's Wetland (DC-6) Health based on Index of Biotic Integrity



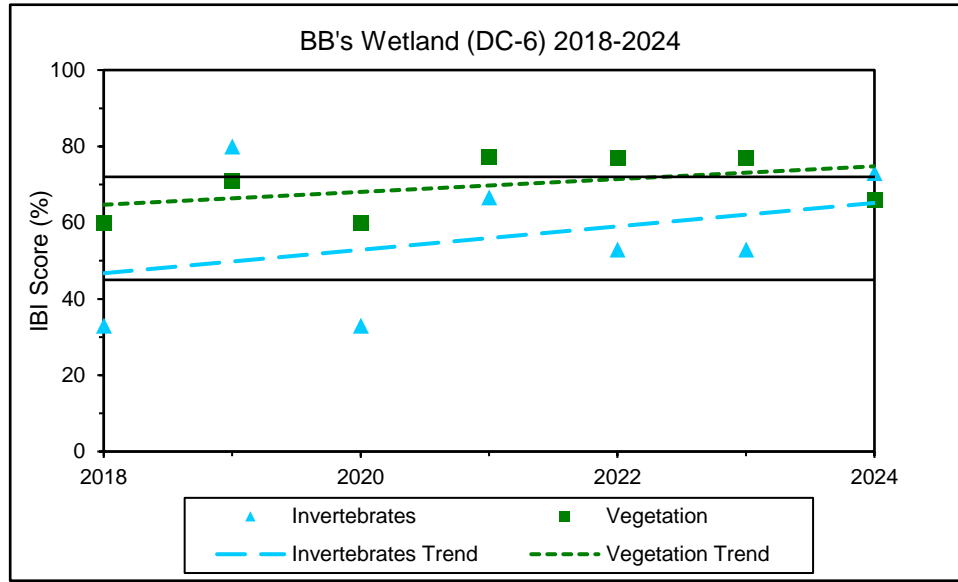
2024 Data (DC-6)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (23)
Trend 2018-2024	Stable	Stable

Figure 4.3.5 Invertebrate and vegetation trends for BB's Wetland (DC-6)



Site summary: This is the seventh consecutive year that BB's Wetland has been monitored by WHEP since 2018. The invertebrate and vegetation scores were consistent with each other, and both scores indicate moderate wetland health. Though the vegetation data has varied from year to year, the annual scores indicate a stable health trend. The invertebrate scores are more variable; however, appear stable in most recent years. Likely, water levels impact wetland populations and monitoring capabilities.

4.3.6 Lilypad Pond (DC-7)

Lilypad Pond (DC-7), formerly known as E-29, is a 2.35-acre wetland located in the Lower Minnesota River watershed. It is delineated as a type 3 (shallow marsh) and type 5 (shallow open water) wetland. Water flows into Lilypad Pond from Dakota Lake on the north side. A natural outflow/outlet exists on the west end of the wetland.



This wetland is within Lebanon Hills Regional Park. There is very little disturbance, with natural oak forest surrounding the wetland. The portion of the wetland defined as shallow marsh includes excellent vegetative diversity. It is considered high quality with a management goal to protect and maintain health. The portion of the wetland defined as shallow open water (i.e. shallow lake) is considered medium quality with a management goal to protect the area from reed canary grass and cattail invasion.

Wetland Health

Site Observations: The wetland slope is gentle, and the wetland substrate is mucky. Yellow water lily (*Nuphar* sp.), white water lily (*Nymphaea* sp.), and duckweed (*Lemna* sp.) float on the water surface.

Pondweed (*Potamogeton* sp.), bladderwort (*Utricularia* sp.), coontail (*Ceratophyllum* sp.), and milfoil (*Myriophyllum* sp.) grow in the water column. Smartweed (*Polygonum* sp.), osmunda (*Osmunda* sp.), sedges (*Carex* sp.), three-way sedge (*Dulichium arundinaceum*), bur-reed (*Sparganium* sp.), spike rush (*Eleocharis* sp.), and other upland forbs, grasses, and woody species were represented in vegetation releve. Leeches, dragonflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

Table 4.3.6 Lilypad Pond (DC-7) Health based on Index of Biotic Integrity



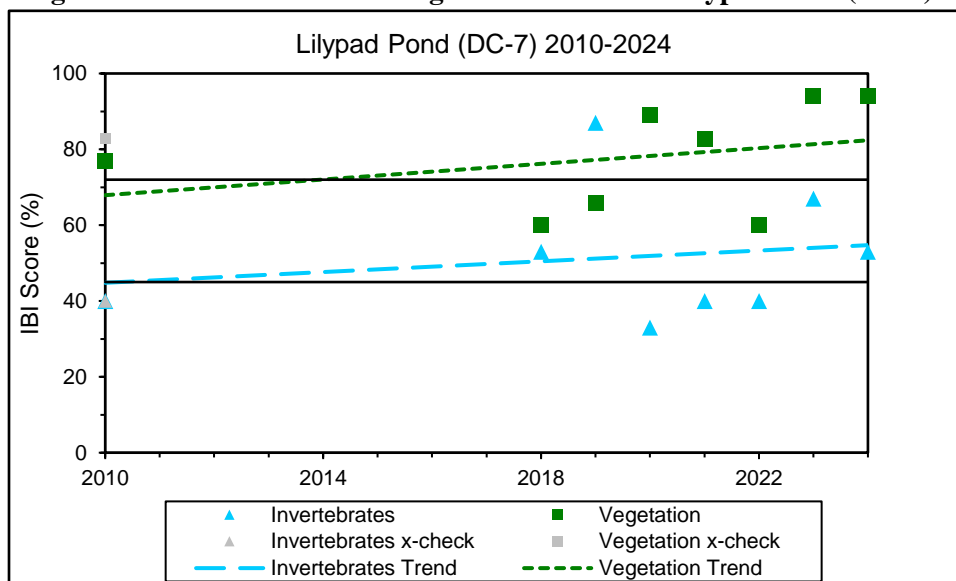
2024 Data (DC-7)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (16)	Excellent (33)
Trend 2010-2024	Variable	Variable

Figure 4.3.6 Invertebrate and vegetation trends for Lilypad Pond (DC-7)



Site summary: This is the eighth year (seventh consecutive) year that Lilypad Pond has been monitored by WHEP. It was first monitored in 2010 by the Eagan Team. The invertebrate and vegetation scores were inconsistent with each other, differing by 41 percent. Invertebrate data indicates moderate wetland health. The vegetation data indicates excellent wetland health. The invertebrate and vegetation communities are very similar in 2023 and 2024. The variable health scores may be due to fluctuating water levels and monitoring locations at the wetland site.

4.3.7 Star Pond East (DC-8)

Star Pond East (DC-8) is a 0.7-acre, type 3, wetland located in the Lower Minnesota River watershed. There is a natural inlet from the south and a natural outlet to the east. The management goal is to maintain this as a high quality wetland and to continue to monitor for changes in vegetation quality and presence of invasive species.



This wetland is part of Lebanon Hills Regional Park. There is very little disturbance in the area. It is surrounded by quaking aspen and restored prairie.

Wetland Health

Site Observations: This wetland is low in vegetative diversity despite its natural appearance within the undeveloped Lebanon Hills Regional Park. Cattail (*Typha* sp.) and bulrush (*Scirpus* sp.) dominate the vegetation releve. Sparse populations of blue grass (*Poa* sp.), marsh milkweed (*Asclepias* sp.), duckweeds (*Lemna* sp. and *Spirodela* sp.), water-meal (*Wolffia* sp.), and purple-fringed riccia (*Ricciocarpus natans*) are present. No submergent vegetation was observed in 2024. Leeches, dragonflies, damselflies, snails, true flies, and bugs and beetles were collected.

Table 4.3.7 Star Pond East (DC-8) Health based on Index of Biotic Integrity



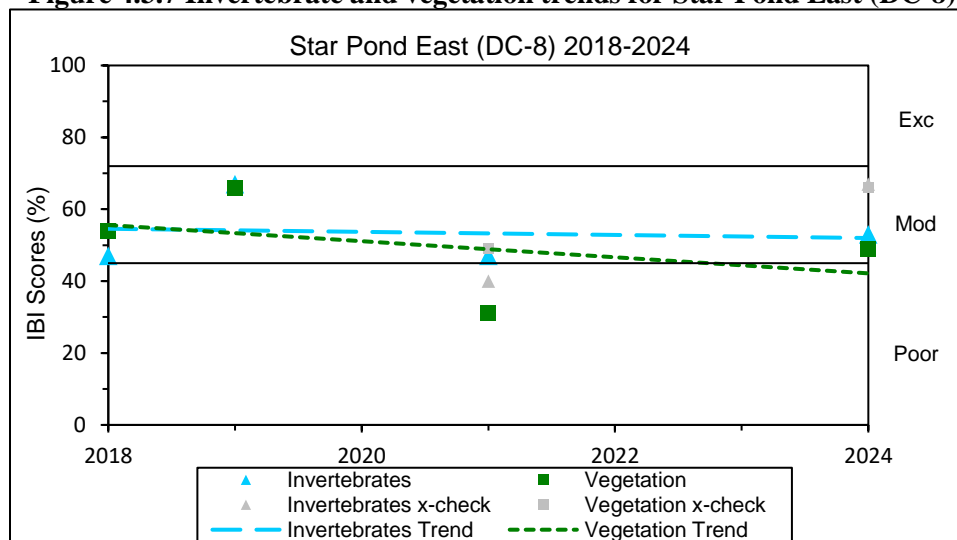
2024 Data (DC-8)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (16)	Moderate (17)
Cross-check Rating (IBI score)	Moderate (20)	Moderate (23)
Trend 2018-2024	Not enough data	Not enough data

Figure 4.3.7 Invertebrate and vegetation trends for Star Pond East (DC-8)



Site summary: This is the fourth time that Star Pond East has been monitored by WHEP. The invertebrate and vegetation scores were consistent with each other, both indicating moderate wetland health. Diversity and abundance of species was low. In previous surveys, more woody and submergent species have been documented. The invertebrate data has been similar for each of the surveys. More years of data may help determine more reliable health trends.

4.3.8 Thompson Lake (DC-13)

Thompson Lake (DC-13), formerly WSP-2, is a 10-acre, type 5, wetland located in West St. Paul in the Lower Minnesota River watershed. The lake is approximately eight feet deep and sits on top of a glacial moraine of Superior Lobe age. The sub-watershed is approximately 175 acres in size and consists of about 51-64% impervious land areas. There is an inlet on the north side from Lily Lake. There is a manmade outlet on the south side of the wetland. The lake has open water with cattails along the shoreline. An aspen woodland is along the east side of the lake. An oak dominated woodland spreads along the west side. There is a lot of buckthorn in the wooded areas. A native plant shoreline restoration was completed along the north and east sides in 2021. The wetland management goal is to monitor the success of this restoration.



This wetland is highly disturbed. Residential development is to the north and south. St. Croix Lutheran Academy and turf fields are to the east. There is a paved trail around the lake and a community center on the property. There is a lot of construction occurring within the park as it develops.

Wetland Health

Site Observations: The wetland bank is steep with gentle slope upon entry. The wetland substrate is fairly firm. This wetland is often used for WHEP field methods training. Many species were represented in the vegetation releve, though all were observed in low population sizes. Duckweeds (*Lemna* sp. and *Spirodela* sp.) floated on the surface of the water. Coontail (*Ceratophyllum* sp.) and water-milfoil (*Myriophyllum* sp.), grew in the water column. Sedges (*Carex* sp.), rush (*Juncus* sp.), bulrush (*Scirpus* sp.), sweet flag (*Acorus* sp.), iris (*Iris* sp.), pickerelweed (*Pontedaria cordata*), swamp milkweed (*Asclepias* sp.), bugle weed (*Lycopus* sp.), and several other emergent grasses, forbs, and woody species were present. Leeches, dragonflies, damselflies, mayflies, caddisflies, snails, true flies, and crustaceans, and bugs and beetles were collected.

Table 4.3.8 Thompson Lake (DC-13) Health based on Index of Biotic Integrity



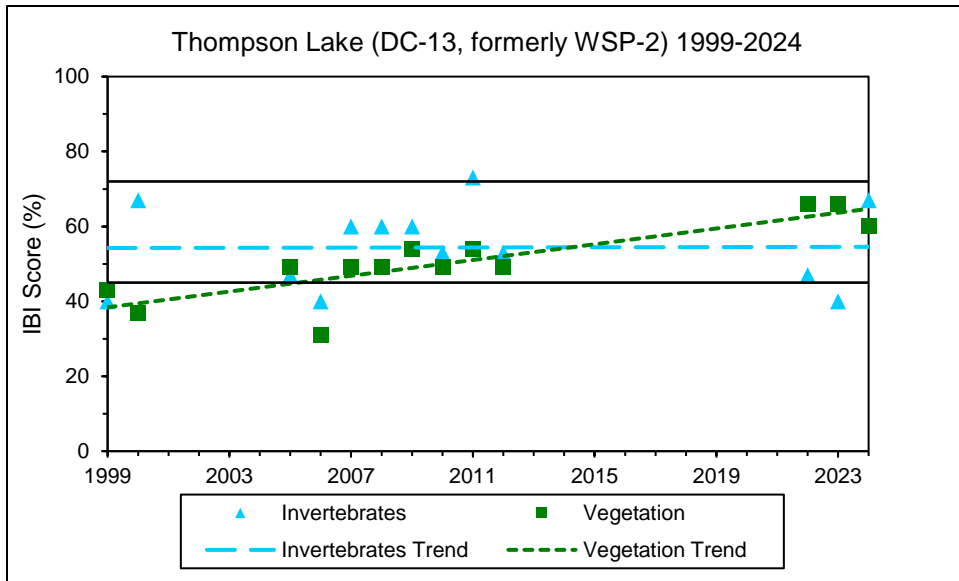
2024 Data (DC-13)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (20)	Moderate (21)
Trend 1999-2024	Stable	Improving

Figure 4.3.8 Invertebrate and vegetation trends for Thompson Lake (DC-13)



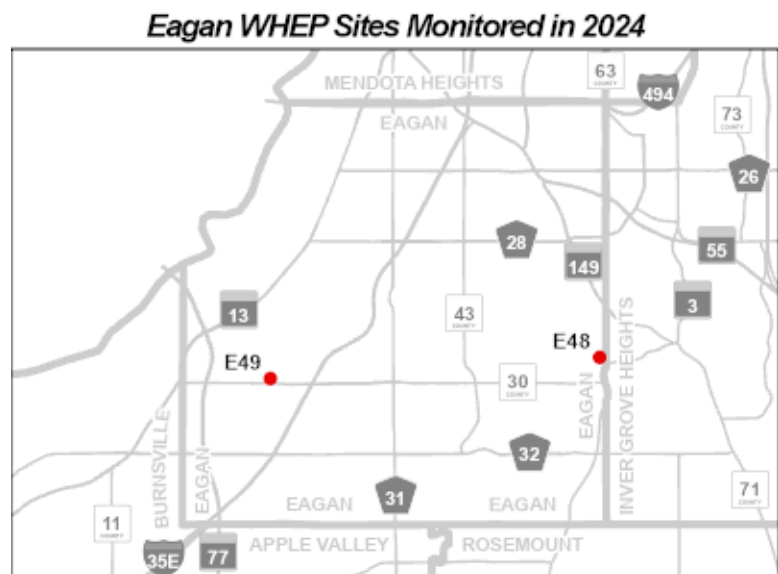
Site summary: This is the thirteenth time that Thompson Lake has been monitored by WHEP, and the third year that it has been monitored by the Dakota County Parks team (formerly monitored by West St. Paul team). The invertebrate and vegetation scores were consistent with each other, and both scores indicate moderate wetland health. Vegetation diversity is high; however, there is low population density. Vegetation data has been similar since 2022. The invertebrate data has been variable, but the invertebrate health trend appears stable. The vegetation health trend appears stable.

4.4 Eagan Wetlands

Two wetlands were monitored within the City of Eagan in 2024. The City has 27 years of data! Forty-eight wetlands, including one new site in 2024, have been monitored in Eagan since the initiation of WHEP in 1997.

Team Leader: Hannah Figura and Chris Figura

Team Members: Bekka Ginzburg, Craig Harnagel, Erin Hauer, Jessie Koehle, Diane Lazarus, Rob McKenna, Mark Niznik, Brian Raney, and Greg Svendsen.



Hannah Figura has been a WHEP team leader for Eagan since 2019. Her father, Chris, lovingly assists as an equipment and administrative assistant. Hannah previously commented, “Each WHEP season brings new experiences and new challenges. Eagan was once again blessed with an excellent team of experienced returning volunteers and eager first timers.”



HANNAH FIGURA



JENNA OLSON AND JESSIE KOEHLE

The Eagan WHEP team has two city staff contacts: Water Resources Manager Jenna Olson, and Water Resources Specialist Jessie Koehle. When Jenna and Jessie aren’t out admiring turtles, they work with other City staff and community to

protect Eagan’s waterbodies, which is no small feat. Within Eagan’s borders there are 34 priority lakes, over 800 wetlands, and almost 400 constructed storm ponds. Jessie specializes in lake water quality sampling, plant management, public education and outreach, pond depth mapping, fisheries, and lake biology. Jenna’s expertise lies in stormwater management, green infrastructure, and environmental law and policy.

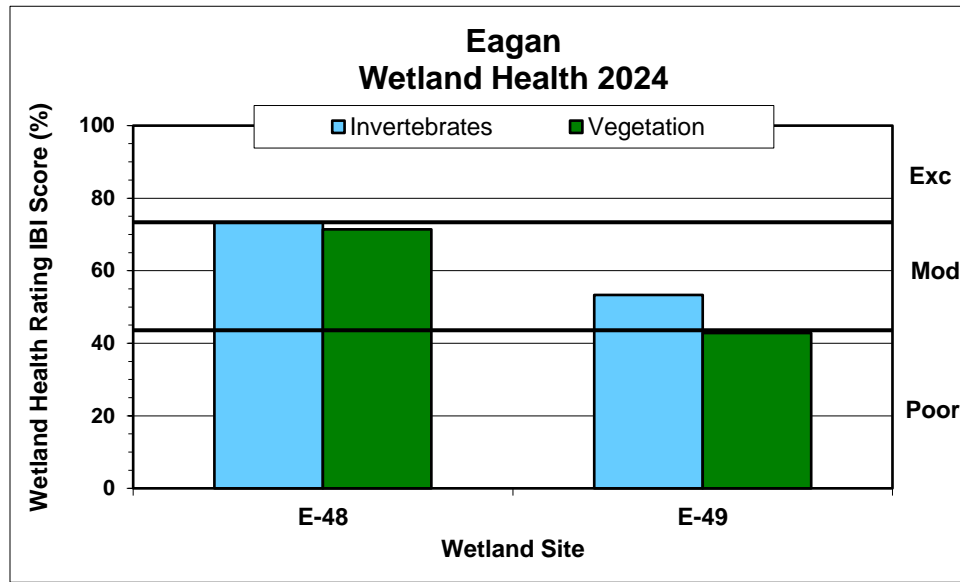
Both women are full time working moms, enthusiastic fans of aquatic environments, and really enjoy their roles at the City of Eagan.

Jessie and Jenna send their sincere thanks and deep appreciation for all the hard work that WHEP volunteers put in every year. Eagan recognizes that WHEP is one of those many important sources of data that help to understand the health and ecology of our surface waters more deeply than would otherwise be possible. Sites are often chosen to be monitored as a pre- and post-assessment of conditions when new infrastructure is built, or areas are remodeled. We don’t have any other regularly monitored source of invertebrate and plant quality other than this. Also, WHEP volunteers themselves are an incredible resource in the community and can serve as ambassadors to help everyone understand how important our lakes and wetlands truly are. Thanks for everything you do!

Eagan General Wetland Health

Figure 4.4 presents an overall view of wetland health for all the 2024 monitoring sites in Eagan 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. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. Two wetlands were monitored in the City of Eagan in 2024. The Eagan wetlands exhibited poor to moderate wetland health based on invertebrate and vegetation data. The invertebrates and vegetation scores were consistent for both wetlands monitored in 2024.

Figure 4.4 Eagan site scores (percent form) for the 2024 sampling season



4.4.1 Captain Dodd Park Pond (E-48)

Captain Dodd Park Pond (E-48), also known as JP-24, is a 2.4-acre, type 4 wetland within the Eagan-Inver Grove Heights Watershed within the City’s “J” stormwater district that eventually drains to Fish Lake. The watershed has 21 acres of direct drainage with approximately 15 percent impervious surface. There are two inlets on the northwest end of the wetland. There is one outlet on the north/middle side of the southern shore of the wetland. The wetland is included in the City’s stormwater management plan, and is designated as “General” indicating City intentions to protect the wetland from stormwater impacts, manage in compliance with all regulations and according to community values and priorities, and enhance the function, value, and ecological diversity, as opportunities arise. The City has a general wetland management plan.





The wetland is within a single-family residential area and receives street runoff. The shoreline is vegetated, and the stormwater pond system goes through several upland wetlands. Upstream Coventry Pond has raingardens in its neighborhood but is still a eutrophic wetland system. In past decades, lead contamination was a concern in the soil adjacent in the park but environmental requirements are considered to be satisfied. Residents around the pond often complain about the smell of decaying wetland vegetation.

Wetland Health

Site Observations: The wetland slope is gentle. The bottom of the wetland is firm. Sparse populations of coontail (*Ceratophyllum* sp.) were present in the water column. Duckweeds (*Lemna* sp. and *Spirodela*

sp.) and water-meal (*Wolffia* sp.) densely covered the surface of the water. Willow trees (*Salix* sp.), reed canary grass (*Phalaris arundinacea*), cattail (*Typha* sp.), and jewelweed (*Impatiens* sp.) were the most prominent emergent plants within the vegetation releve. Maple trees (*Acer* sp.), buckthorn (*Rhamnus cathartica*), sedges (*Carex* sp.), cut grass (*Leersia* sp.), marsh fern (*Thelypteris palustris*), and several other emergent forbs were also present in the releve. Leeches, caddisflies, snails, fingernail clams, trueflies, crustaceans, and beetles were collected.

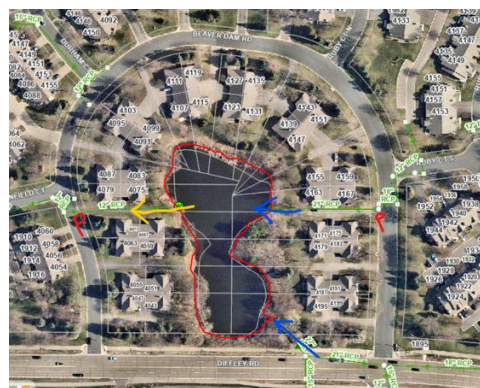
Table 4.4.1 Captain Dodd Park Pond (E-48) Wetland Health based on Index of Biotic Integrity

2024 Data (E-48)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (25)
Cross-check Rating (IBI score)	Poor (14)	Moderate (17)
Trend 2024	Not enough data	Not enough data

Site summary: This is the first time that E-48 has been surveyed by WHEP. The invertebrates and vegetation scores were consistent, both scores indicating moderate wetland health. This wetland was also cross-checked by another WHEP team. The invertebrate scores between teams were inconsistent, differing by 26 percent. The City team identified a larger diversity of leeches, caddisflies, snails, and trueflies. The vegetation scores between teams were also inconsistent, differing by 22 percent. More years of data will help determine a more reliable wetland health trend. The City team identified more nonvascular species, woody species, grasslike species, and forbs than the cross-check team. Plot location differences may have affected score differences.

4.4.2 Beaver Dam Road Pond (E-49)

Beaver Dam Road Pond (E-49), also known as AP-35, is a 1.2-acre, type 5 wetland within the Eagan-Inver Grove Heights Watershed, within the City’s “A” stormwater district that eventually drains to the Minnesota River. The watershed has 20 acres of direct drainage with 50 percent impervious surface. There is one inlet on the north east side of the wetland, one inlet southeast side of the wetland, and one outlet on the west shoreline of the wetland. The wetland is included in the City’s stormwater management plan, and is designated as “General” indicating City intentions to protect the wetland from stormwater impacts, manage in compliance with all regulations and according to community values and priorities, and enhance the function, value, and ecological diversity, as opportunities arise. The City has a general wetland management plan.





Stormwater runoff is received from the surrounding multifamily residential lots, from Diffley Road, and from the church parking lot to the south. The vegetated shoreline is generally poor quality. There has not been a lot of aquatic vegetation observed in the past, and the wetland is generally shallow and mucky.

Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is firm. Low diversity and population density was observed within the vegetation releve. Bulrush (*Scirpus* sp.) was the most prominent plant. Pondweed (*Potamogeton* sp.) was sparsely present. Duckweed (*Lemna* sp.) scattered upon the surface of the water. Marsh marigold (*Caltha palustris*), smartweed (*Polygonum* sp.), and a few other emergent forbs and woody trees were also present. Leeches, damselflies, mayflies, snails, trueflies, crustaceans, and bugs and beetles were collected.

Table 4.4.2 Beaver Dam Road Pond (E-49) Wetland Health based on Index of Biotic Integrity

2024 Data (E-49)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (16)	Poor (15)
Trend 2024	Not enough data	Not enough data

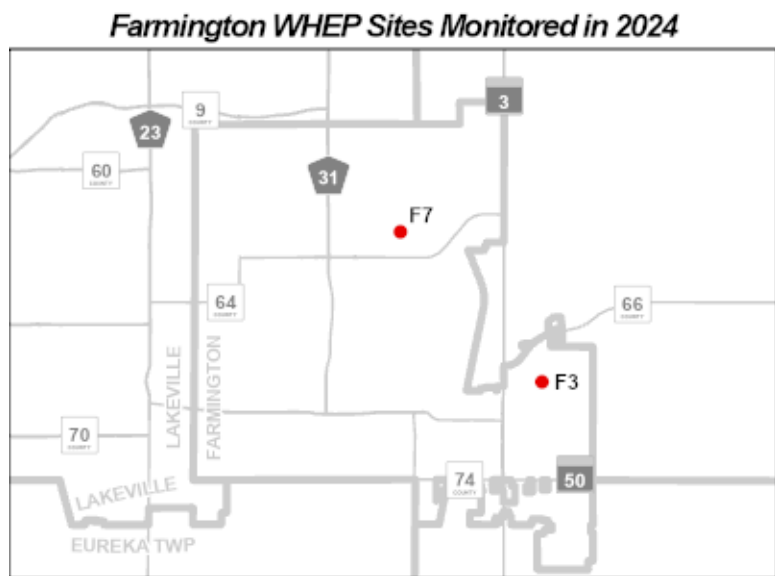
Site summary: This is the first time that E-49 has been surveyed for WHEP. The invertebrate and vegetation scores were consistent; however, the invertebrate score indicated moderate wetland health while the vegetation score indicated poor wetland health. More years of data will help determine more reliable health trends.

4.5 Farmington Wetlands

Two wetlands were monitored within the City of Farmington in 2024. The City has 27 years of data! Nine wetlands have been monitored in Farmington since the initiation of WHEP in 1997.

Team Leader: Rick Schuldt

Team Members: Rollie Greeno, Katie Koch-Laveen, Cadence Schuldt, Calan Schuldt, and Bellah Tange.



Rick Schuldts has been involved with the Farmington WHEP team for 14 years including 8 years as team leader. Following graduation from the University of Minnesota in wildlife biology he spent two years in the US Army and over 30 years of employment with the US Fish and Wildlife Service. This included time spent on Great Lakes tributaries to control sea lampreys. The latter part of his time with the Service was spent as a regional supervisor in the Fort Snelling Regional Office where he retired in 2009. WHEP afforded him the opportunity to get back out in the water to continue learning about creatures and plants of our wetlands. His spare time includes the pursuit of trout in southeast Minnesota cold water streams.

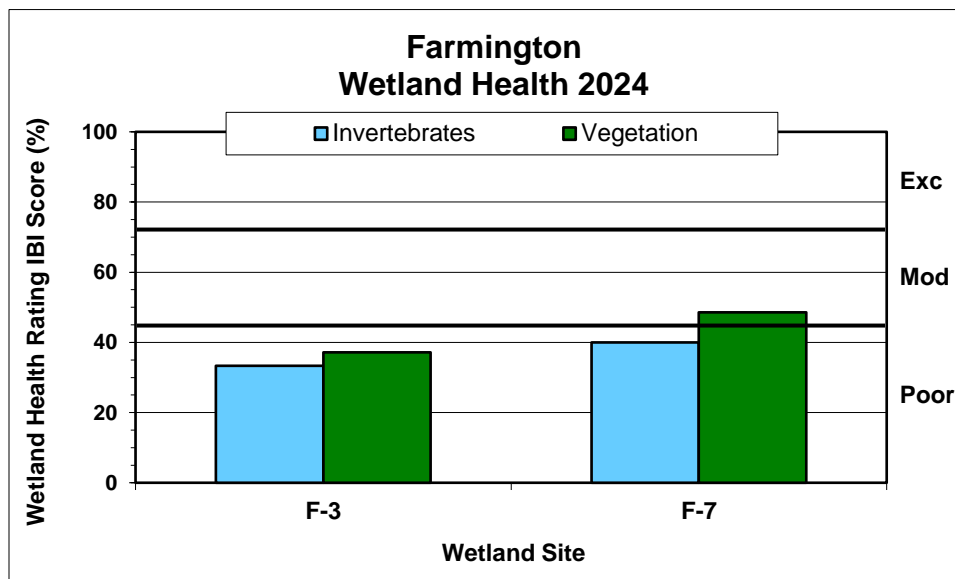


RICK SCHULDT

This year the makeup of the Farmington team underwent major changes. The traditional team member has been an older retiree. Surgeries and other obligations limited their availability. We were delighted to be joined by three high schoolers including two of Rick's grandchildren Calan and Cadence, and her friend Bellah. It was a real joy to teach them of the wonders and value of our wetlands. They also provided much needed assistance throughout the season.

Farmington General Wetland Health

Figure 4.5 presents an overall view of wetland health for all the 2024 monitoring sites in Farmington 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. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. The Farmington wetlands exhibited poor wetland health based on invertebrate data, and poor to moderate wetland health based on vegetation data. The invertebrates and vegetation scores were consistent for both wetlands monitored in 2024.



4.5.1 Kral Pond (F-3)

F-3, also known as Kral Pond, is a 10-acre, type 4 wetland located within the Vermillion River Watershed. The wetland watershed is 41.8 acres and 6.6 percent impervious. There is one inlet in the southwest corner, one inlet in the northeast corner, 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 included in the City’s stormwater management plan. It is also included in the City’s wetland management plan and is designated as a Manage 2 wetland. Manage 2 wetlands have usually been altered by human activities. These wetlands have low to medium floral diversity and wildlife habitat components, and are slightly susceptible to impacts from stormwater. The management goal is to monitor and document how different land uses impact man-made wetlands over time. There is development to the north, south, and west, and agriculture to the east. Native vegetation serves as a buffer around the wetland.



Wetland Health

Site Observations: The wetland slope is steep. The wetland substrate is muck over sand. This is a large wetland (lake) with an extensive ring of cattails (*Typha* sp.). Anglers use this site to launch kayaks, canoes, and small boats, though not heavily accessed. The team noted that in 2024 the water was deeper than it has been in previous years, and the cattail was taller and more dense. Duckweeds (*Lemna* sp. and *Spirodela* sp.), water-meal (*Wolffia* sp.), and algae covered the surface water. Water-crowfoot (*Ranunculus* sp.), coontail (*Ceratophyllum* sp.) and pondweed (*Potamogeton* sp.) crowded the water column. Reed canary grass (*Phalaris arundinacea*) and arrowhead (*Sagittaria* sp.) were also present. Dragonflies, damselflies, mayflies, snails, fingernail clams, and crustaceans were collected.



BELLAH TANGE, CADENCE SCHULTD, CALAN SCHULTD, RICK SCHULTD, AND ROLLIE GREENO

Table 4.5.1 Kral Pond (F-3) Wetland Health based on Index of Biotic Integrity



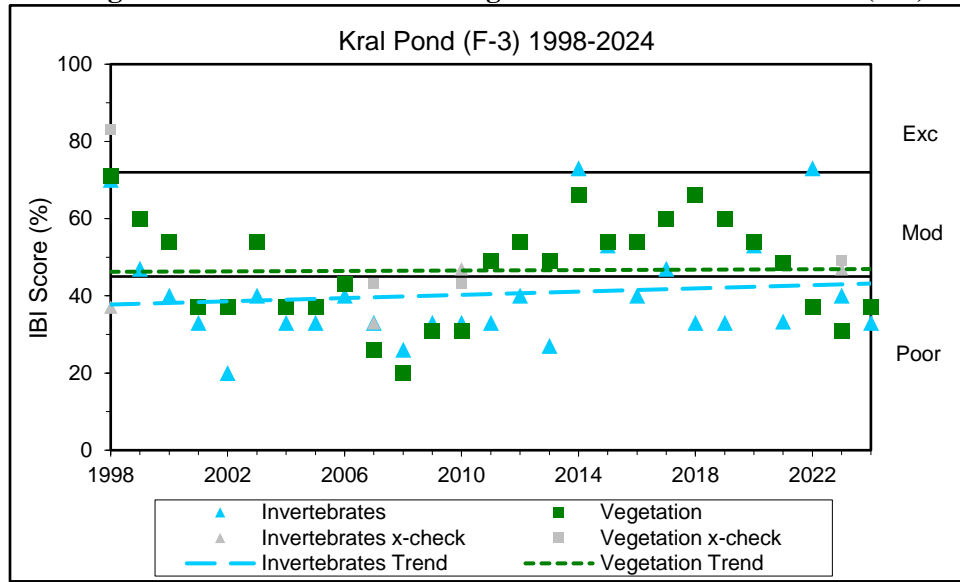
2024 Data (F-3)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (10)	Poor (13)
Trend 1998-2024	Stable	Variable

Figure 4.5.1 Invertebrate and vegetation trends for Kral Pond (F-3)



CADENCE SCHULDT AND BELLAH TANGE
RETRIEVING BOTTLE TRAPS

Site summary: Kral Pond has been monitored for 27 consecutive years! The invertebrate and vegetation scores were consistent in 2024, and both scores indicate poor wetland health. Water levels were deeper than in recent years. The vegetation make-up of this wetland has been fairly similar over the many years of monitoring. The fluctuation in scores seem to be associated with the presence or absence of bladderwort (*Utricularia* sp.) and persistent litter calculations. The invertebrate scores are consistently poor with the exception of data collected in 1998, 2014, and 2022, which had higher diversity of dragonflies, caddisflies, or snails in those years.

4.5.2 Autumn Glen (F-7)

Autumn Glen (F-7) is a 2.9-acre wetland within the Vermillion River Watershed. The wetland watershed is ten acres including four percent impervious surface. There is one inlet in the northwest corner of the wetland along Dunbury Avenue and one outlet in the northeast corner. The water ultimately flows to North Creek. The wetland is included in the City's stormwater management plan; however, it does not have a designated classification. The wetland management goal is to monitor and document the health of a wetland surrounded by forest, agriculture, and residential with possible future development.



Autumn Glen lies within City-owned land. It is located within a trail system, but is not easily spotted from the trail. Tall grasses (including reed canary grass) and tree obstruct views. The wetland is approximately 50 meters from the trail. Forest and agricultural landscapes exist to the east and includes Jim Bell Park and Preserve. Man-made basins exist adjacently north and south of the wetland. There is residential development to the north, south, and west of the land.



SIBLINGS CALAN AND CADENCE SCHULTDT

Wetland Health

Site Observations: The wetland slope is gentle and the substrate is mucky. A bicycle path runs along the south side of the wetland. This shallow pond has been dried up for the past two summers. In 2024, regular rains elevated the water level. Emergent vegetation has invaded the open water areas, including bulrush (*Scirpus* sp.), manna grass (*Glyceria* sp.), bur-reed (*Sparganium* sp.), water-plantain (*Alisma* sp.). A meadow of reed canary grass (*Phalaris arundinacea*) surrounds the wetland. Water-crowfoot (*Ranunculus* sp.) and bladderwort (*Utricularia* sp.) were present within the water column. Duckweed (*Lemna* sp.) sparsely scattered on the surface of the water. Dragonflies, damselflies, mayflies, snails, and bugs and beetles were collected.

Table 4.5.2 Autumn Glen (F-7) Wetland Health based on Index of Biotic Integrity



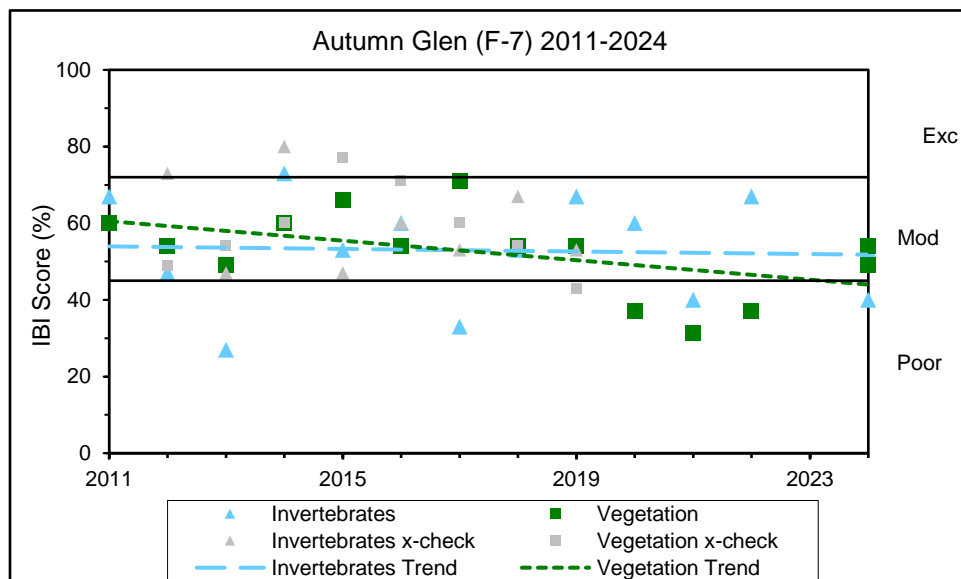
2024 Data (F-7)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (12)	Moderate (17)
Cross-check Rating (IBI score)	Moderate (16)	Moderate (19)
Trend 2011-2024	Stable	Stable

Figure 4.5.2 Invertebrate and vegetation trends for Autumn Glen (F-7)



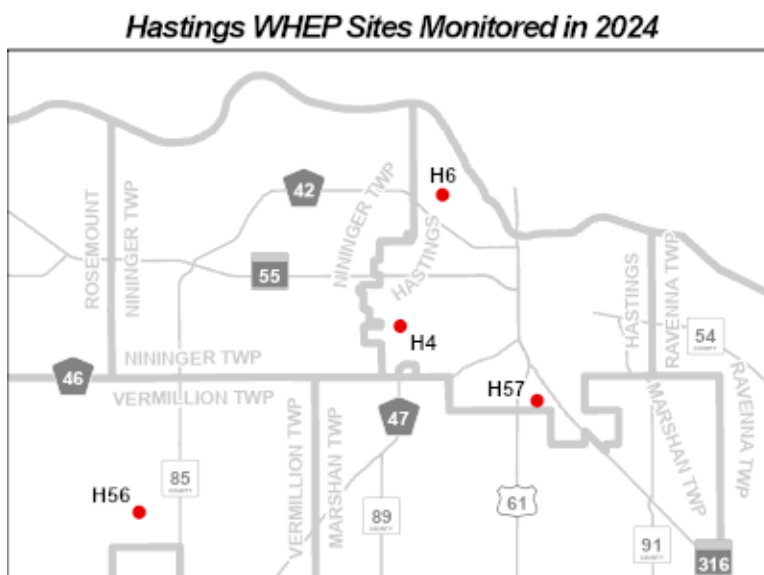
Site Summary: This is the thirteenth year that Autumn Glen has been monitored. The invertebrate and vegetation scores were consistent with each other, even though the invertebrate score indicated poor health while the vegetation score indicated moderate health. Water levels have drastically changed over the past few years. Reed canary grass is heavily encroaching on the wetland, though several other emergent plants thrive within the wet footprint of the wetland. Both invertebrate and vegetation health trends appear stable. This wetland was cross-checked by another WHEP team. The cross-check team collected a higher diversity of snail, trueflies, and crustaceans than the City team. Tadpoles overtook the City team's bottle traps which likely impacted the invertebrate collection. The cross-check team also observed more woody species in the vegetation releve; the City team did not include woody species within the releve. This may have been due to plot placement.

4.6 Hastings Wetlands

Four wetlands were monitored within the City of Hastings in 2024. The City has 26 years of data! Nine wetlands have been sampled in the City of Hastings through the WHEP program since 1999.

Team Leader: Jessie Eckroad

Team Members: Sarah Belisle, Kari Bestick, Jonathan Blank, Tricia Bremer, Jerome Gust, Autumn Kirchoff, Sam Krahling, Judy LaFollette, Mark LaFollette, Rick Logan, Mary Miller, Kim Olson, Dwight Smith, and Molly Tribe.



JESSIE ECKROAD

fortunate to count many of her teammates as friends.

John Caven is the Assistant City Engineer for the City of Hastings. He has been the City contact since 2010. He said, "The health of local water bodies are largely dependent on the surrounding

The 2024 season was Jessie Eckroad's tenth year as the Hastings WHEP team leader. As an environmental scientist, Jessie has been involved with several water quality monitoring and education projects over the last decade. Clean water is a cause that she is very passionate about, and she feels honored to be a part of citizen-science efforts like WHEP. While she views the scientific aspects of WHEP as being very valuable, her favorite part of WHEP is building relationships with her teammates and fellow Hastings residents. She enjoys getting to know people with a variety of personal and professional experiences, and feels



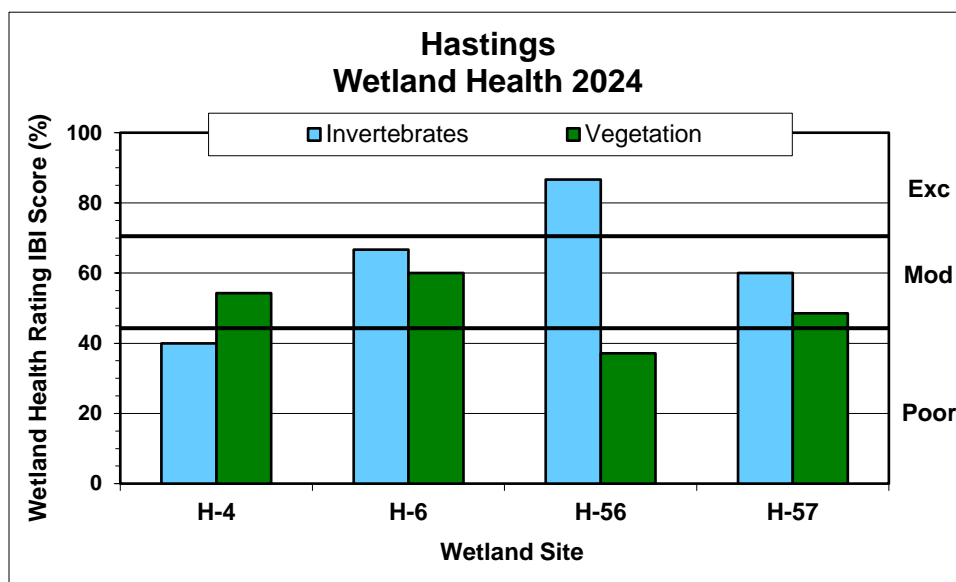
JOHN CAVEN

land management practices. The dedicated volunteers provide reliable and dependable data for City staff and elected officials to make informed decisions. The many hours of hard work are greatly appreciated as they provide wetland health trendlines that make educated decisions possible. Thank you!”

Hastings General Wetland Health

Figure 4.6 presents an overall view of wetland health for all the 2024 monitoring sites in Hastings 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. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. The wetlands showed poor to excellent wetland health based on invertebrate scores, and poor to moderate wetland health based on vegetation scores. Invertebrate and vegetation scores for H-4, H-56, and H-57 were inconsistent with each other, differing by 14, 50 and 11 percent, respectively.

Figure 4.6 Hastings site scores (percent) for the 2024 sampling season



4.6.1 Stonegate Treated Wetland (H-4)

Stonegate Treated Wetland (H-4) is the second cell of a two-celled stormwater management system created to treat runoff from surrounding residential development. It is a 1.2-acre, stormwater retention pond located within the Vermillion River Watershed. The watershed is nine to ten acres, and is 30 to 40 percent impervious. The wetland has one inlet in the southeast corner and one outlet on the north end. It is part of the stormwater management plan. The stormwater detention pond is within a developed neighborhood. The goal for the wetland is to improve water quality of the stormwater runoff before it adversely affects the Vermillion River.



The wetland is primarily residential with private property on three sides and a public trail along the south side. Private landowners within the Wyndham Hills Neighborhood Association manage their own frontages of the pond with rip-rap, mowing, and chemical use. Several property owners demonstrate good management practices by maintaining shoreland buffers to protect water quality and provide wildlife habitat. In 2004, the Wyndham Hills Neighborhood Association partnered with the City of Hastings and the DNR to provide native plantings around the pond. A private trail access divides Stonegate pond from another pond just south of the site. Some concerns compromising the health of the pond include invasive species, mowing too close to the water's edge, and the use of chemicals on adjacent shoreline turf.

Wetland Health

Site Observations: The wetland slope is too steep to set a 10x10 plot. The substrate is mucky but navigable. The most prevalent vegetation is overhanging trees and shrubs including willow (*Salix* sp.), ash (*Fraxinus* sp.), and dogwood (*Cornus* sp.). Coontail (*Ceratophyllum* sp.), pondweed (*Potamogeton* sp.), Duckweed (*Lemna* sp.), sedges (*Carex* sp.), cattail (*Typha* sp.), and sensitive fern (*Onoclea sensibilis*) were sparsely represented. Several woody plants, including dogwood trees (*Cornus* sp.), ash trees (*Fraxinus* sp.), elm trees (*Ulmus* sp.), grape vines (*Vitis riparia*), and raspberry brambles (*Rubus* sp.). Leeches, mayflies, snails, true flies, crustaceans and beetles and bugs were collected.

Table 4.6.1 Stonegate Treated (H-4) Health based on Index of Biotic Integrity



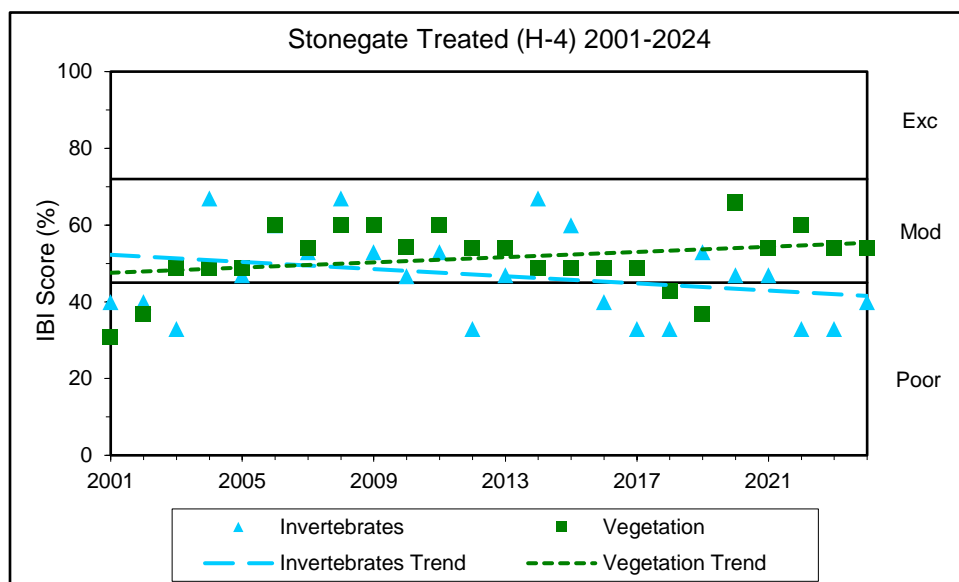
2024 Data (H-4)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (12)	Moderate (19)
Trend 2001-2024	Stable	Stable

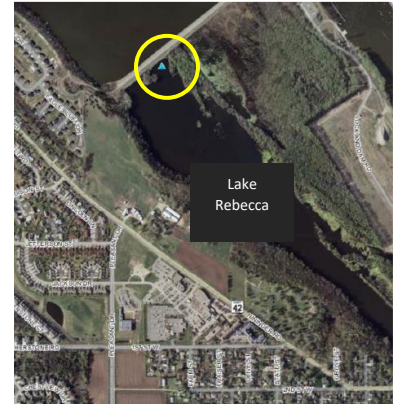
Figure 4.6.1 Invertebrate and vegetation trends for Stonegate Treated (H-4)



Site summary: This is the 24th consecutive year that Stonegate Treated has been surveyed! The invertebrates and vegetation scores were inconsistent in 2024, differing by 14 percent. The invertebrate score indicates poor wetland health while the vegetation score indicates moderate wetland health. In general, the invertebrate scores are often lower than the vegetation scores. The vegetation density is sparse. The lack of submergent and floating vegetation likely impairs the invertebrate community. Data has been similar since 2022. The long-term trends for both vegetation and invertebrates appear stable.

4.6.2 Lake Rebecca Wetland (H-6)

Lake Rebecca (H-6) also known as Rebecca EM 1&2, is a stormwater detention pond in the City of Hastings. It is a 19-acre, open water wetland located in the Vermillion River Watershed. The wetland drainage area is 56 acres and has 1 percent impervious surface. The wetland has two stormwater inlets along the southwest shoreline and one controlled outlet on the southeast end. The wetland is part of the City's stormwater management plan. It is being managed as a wildlife habitat area and for recreational use. A natural shoreline buffer zone exists along much of the lake's perimeter. The Mississippi River Flats Natural Resource Management and Restoration Plan was adopted in December 2002. One of the inflow areas to the lake is fitted with a series of sediment control structures. These are maintained by the City Public Works Department. The City Parks Department operates an aeration system during the winter season to benefit the game fish.



The wetland is an emergent marsh and shoreline/floodplain forest. Spring fed water from the bluffs helps maintain water levels. Jaycee Park provides access for recreation on the lake, including a boat launch. Diversion of stormwater into the lake and an impervious parking lot/boat launch adjacent to the eastern edge of the lake are of concern. Purple loosestrife and zebra mussels compromise the health of the lake.

Wetland Health

Site Observations: The wetland slope from the shoreline is gentle. The wetland substrate is sandy and solid. There are many fallen logs in the water. Access to the monitoring site is via the bikepath on the levee that divides the Mississippi River and Lake Rebecca. The slope from the bike path to the water is very steep and is covered with tall grasses and forbs. Coontail (*Ceratophyllum* sp.), pondweed (*Potamogeton* sp.), water-nymph (*Najas* sp.), and waterweed (*Elodea* sp.), fill the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) cover the open water. Sedges (*Carex* sp.), smartweed (*Polygonum* sp.), bur-reed (*Sparganium* sp.), clearweed (*Pilea* sp.) and reed canary grass (*Phalaris arundinacea*) were sparsely represented. Leeches, damselflies, mayflies, caddisflies, snails, trueflies, crustaceans, and bugs and beetles were collected.

Table 4.6.2 Lake Rebecca (H-6) Wetland Health based on Index of Biotic Integrity



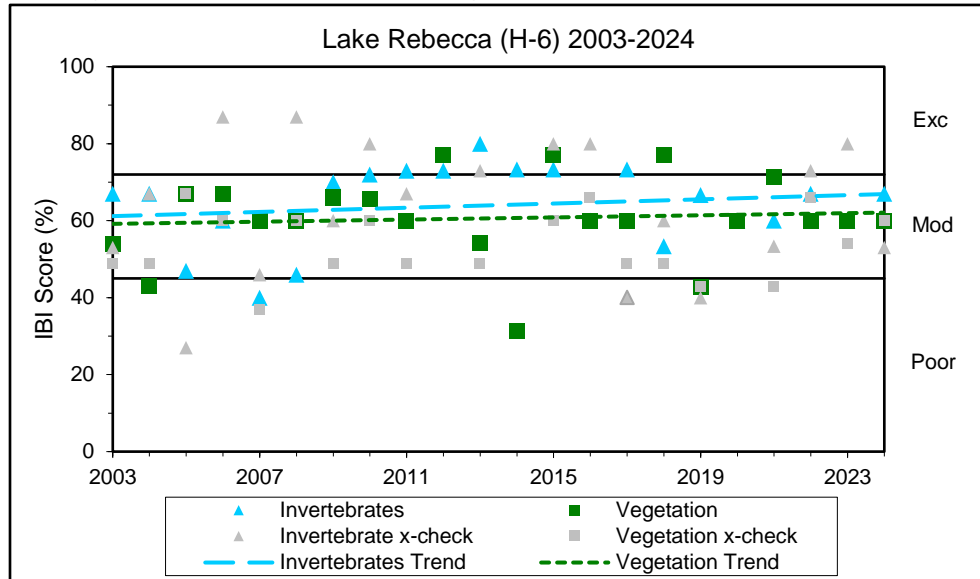
2024 Data (H-6)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (20)	Moderate (21)
Cross-check Rating (IBI score)	Moderate (16)	Moderate (21)
Trend 2003-2024	Stable	Stable

Figure 4.6.2 Invertebrate and vegetation trends for Lake Rebecca (H-6)

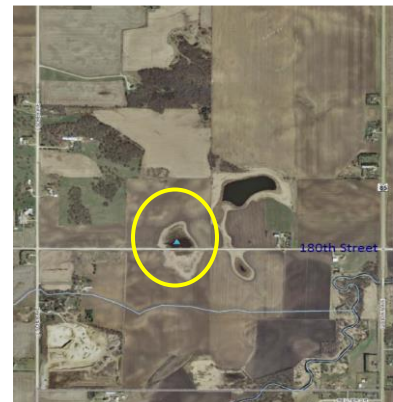


Site summary: This is the 22nd consecutive year of monitoring for Lake Rebecca. Invertebrate and vegetation scores are consistent, and both scores indicate moderate wetland health. With the exception of a few variable years, the invertebrates and vegetation scores show long-term stable health trends. This site was cross-checked by another team in 2024. The invertebrates scores between the two teams were inconsistent, differing by 14 percent. The City team identified a larger diversity of snails which enhanced the snail and total metric scores. The vegetation data is similar between the teams.

4.6.3 180th Street Marsh (H-56)

180th Street Marsh (H-56) is a 20-acre stormwater detention pond 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 culvert located on the south side. This wetland is not part of the City's stormwater management plan; it is in Dakota County and not under the management of the City.

The wetland is a part of several natural ponds in this agricultural area. The ponds partially cover several parcels of land; each parcel owned by a different party. Management practices are dependent on individual



property owners. The landowners have not communicated any plans on management of the wetland. Farming practices to the south restrict above ground outflow to the Vermillion River. Wildlife management is protected through the Farmland and Natural Area Program. The wetland management goal is for agriculture to continue, and wildlife habitat management to be practiced in the wetland areas.

Wetland Health

Site Observations: The wetland slope is gentle, though there is a drop-off at the shoreline. The wetland substrate is moderately mucky. The team commented that the water was drastically deeper than usual and was unable to set a vegetation plot to properly capture diversity of emergent forbs and woody plants. Coontail (*Ceratophyllum* sp.) and pondweed (*Potamogeton* sp.) grew in the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.) sparsely floated on the water. Bulrush (*Scirpus* sp.), reed canary grass (*Phalaris arundinacea*), cattail (*Typha* sp.), arrowhead (*Sagittaria* sp.), bur-reed (*Sparganium* sp.), water plantain (*Alisma* sp.), and smartweed (*Polygonum* sp.) were present. Leeches, dragonflies, damselflies, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

Table 4.6.3 180th Street Marsh (H-56) Wetland Health based on Index of Biotic Integrity



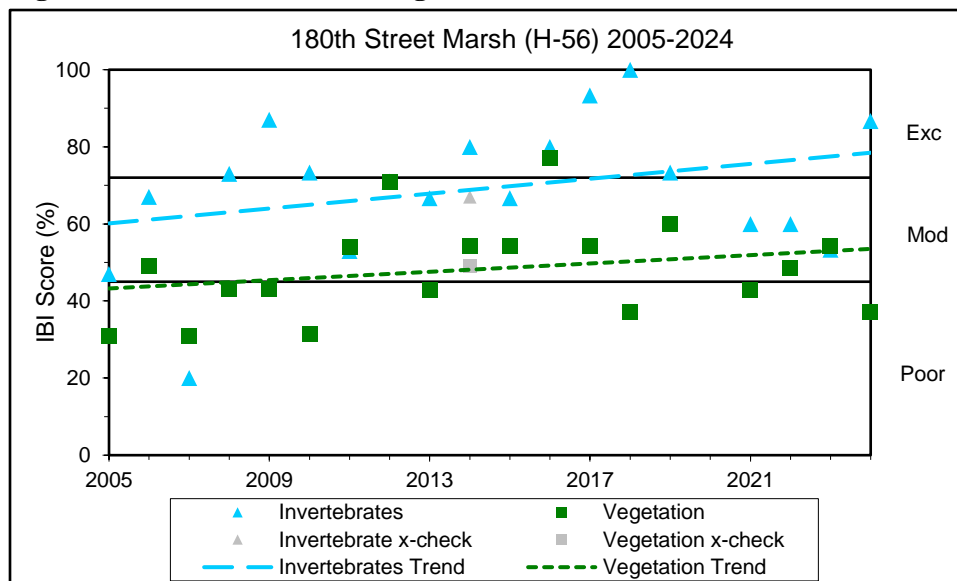
2024 Data (H-56)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Excellent (26)	Poor (13)
Trend 2005-2024	Stable	Stable

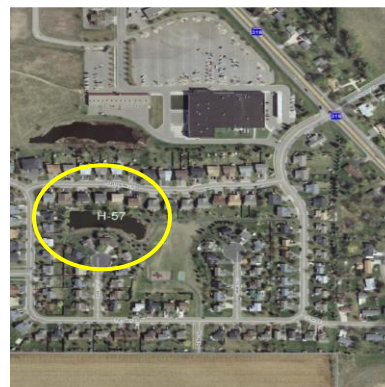
Figure 4.6.3 Invertebrate and vegetation trends for 180th Street Marsh (H-56)



Site summary: This is the 19th year that H-56 has been monitored for WHEP since 2005. The invertebrate and vegetation scores were inconsistent in 2024, differing by 50 percent. The invertebrate score indicates excellent wetland health while the vegetation score indicates poor wetland health. The team said that deep water affected the vegetation releve placement which did not adequately include the existing emergent community. This impacted the vegetation score, but the invertebrate community was not impacted the same. Though there are years of variability in scores, both the invertebrate and vegetation health trends appear to be stable.

4.6.4 Cari Park Pond (H-57)

Cari Park Pond (H-57) is a 20-acre stormwater detention pond located in the Vermillion River Watershed. The wetland drainage area is 29 acres, and 14 percent impervious. The wetland has four inlets of which three are located on the east side of the pond and one on the west side. It also has one outlet on the west side. This wetland is part of the City’s stormwater management plan. It is a man-made sedimentation pond that was constructed in 1989. It serves as a stormwater detention pond within a developed neighborhood. The goal for the wetland is to improve water quality of the stormwater runoff before it adversely affects the Vermillion River. The City has erosion control regulations in place to minimize the impacts of development within the watershed. Private landowners within the Cari Park neighborhood manage their own frontages of the pond with rip-rap, mowing, and chemical use. On the south and east sides of the pond, a City bituminous path connects the neighborhoods through Cari Park. Cari Park offers recreational opportunities on the south side of the pond. A bike trail runs along the south and east sides of the pond.



Wetland Health

Site Observations: The wetland slope is gentle, and the substrate is very mucky. The wetland is surrounded by homes and a nearby park. Trees overhang portions of the wetland shoreline. Maple trees (*Acer* sp.) and willows (*Salix* sp.) were present in the vegetation releve. The team commented that there were much less submergent vegetation present than in past years. Cattails (*Typha* sp.), bulrush (*Scirpus* sp.), and reed canary grass (*Phalaris arundinacea*) dominated the shoreline. Only small populations of sedges (*Carex* sp.), clearweed (*Pilea* sp.), and nightshade (*Solanum* sp.) were present. Coontail (*Ceratophyllum* sp.) sparsley grew in the water column. Duckweed (*Lemna* sp.) and water-meal (*Wolffia* sp.) scattered upon the water surface. Leeches, dragonflies, damselflies, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and waterboatman (*Corixidae* sp.) were collected.

Table 4.6.4 Cari Park Pond (H-57) Wetland Health based on Index of Biotic Integrity



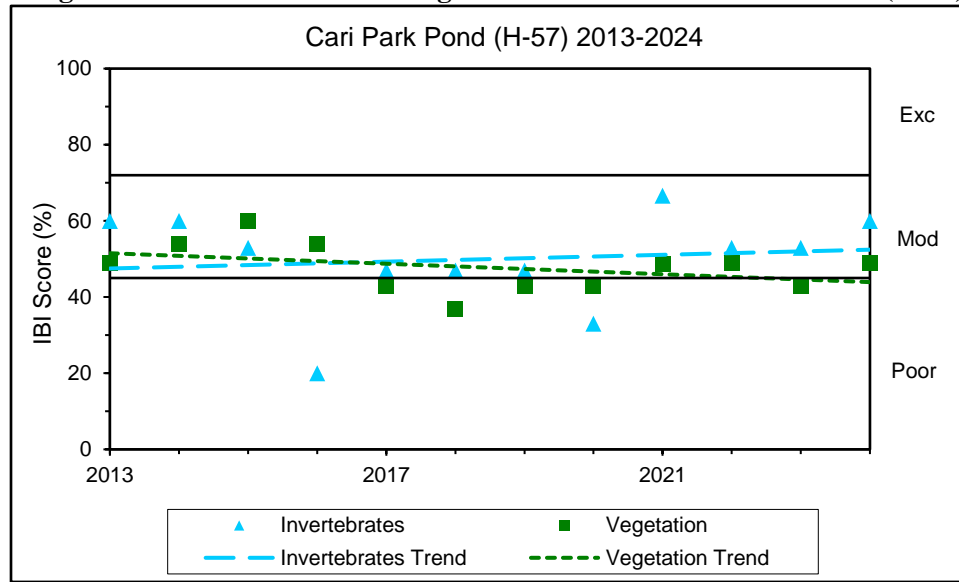
2024 Data (H-57)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (18)	Moderate (17)
Trend 2013-2024	Stable	Stable

Figure 4.6.4 Invertebrate and vegetation trends for Cari Park Pond (H-57)



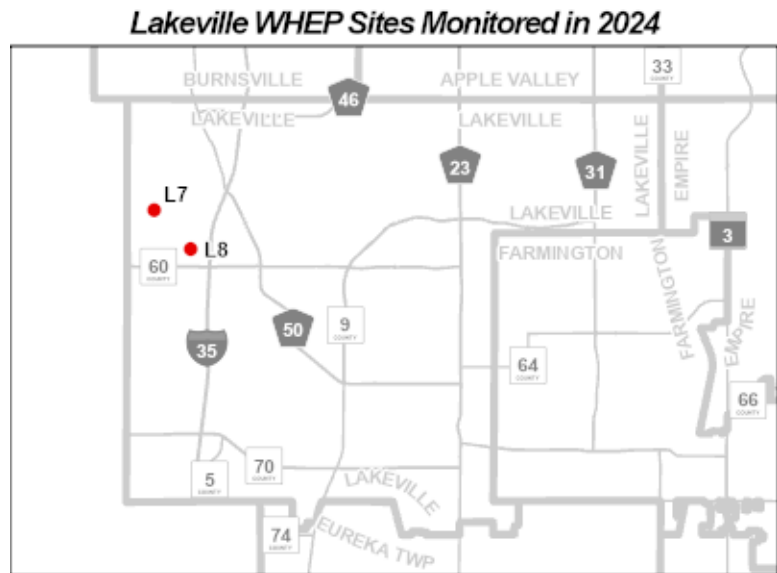
Site summary: This is the 12th consecutive year that Cari Park Pond has been monitored. The vegetation and invertebrate scores were considered inconsistent, differing by 11 percent; however, both health scores indicate moderate wetland health. Data is fairly similar over the years, and the long-term health trends appear stable for both invertebrates and vegetation.

4.7 Lakeville Wetlands

Two wetlands were monitored within the City of Lakeville in 2024. The City has 27 years of data! Ten wetlands have been sampled in the City of Lakeville through the WHEP program since 1998.

Team Leader: Steve Weston

Team Members: Dani Collier, Amanda Drews, Loren Knutson, Alli Nickel, Andrew Nowak, Naseema Omer, Alex Schwartz, Mark Traffa, Lili Yu, Zihan Yu, and Ziran Yu.



Steve Weston has participated in WHEP for over 20 years. He explained, “I have been a team leader of the Lakeville team since 2001 and it continues to be a high point of the year. I enjoy sharing the experience with volunteers, especially the high school students, several of whom have gone on to study biology in



STEVE WESTON

college and find environmental jobs. “This year we found the wetlands had high water levels in a marked contrast to last year’s low water. The water levels contributed to differences in the results.”

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



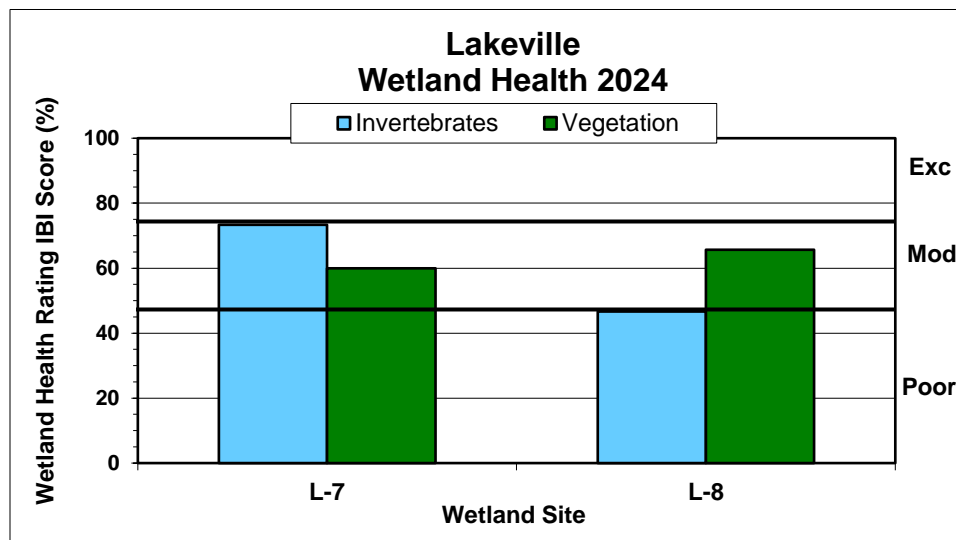
ANN MESSERSCHMIDT

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. Because of the work by the volunteers, the community can 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 directly affect water quality. I like how WHEP connects residents to wetlands, and the long-term data at these sites are something worth tracking.”

Lakeville General Wetland Health

Figure 4.7 presents an overall view of wetland health for all the 2024 monitoring sites in Lakeville 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. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. The wetlands showed poor to moderate wetland health based on invertebrate scores, and moderate wetland health based on vegetation scores. The invertebrates and vegetation scores for sites L-7 and L-8 were inconsistent, differing by 13 and 19 percent, respectively.

Figure 4.7 Lakeville site scores (percent) for the 2024 sampling season



4.7.1 DNR Wetland #387 (L-7)

DNR #387 (L-7) is a ten-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 off of Kettering Trail and two outlets along the north side near Orchard Lake. The wetland is part of the City's stormwater management plan. The wetland designation is to preserve. The 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 of 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 Orchard Lake. The aeration system is scheduled to run from April to October annually.

Wetland Health

Site Observations: The wetland slope is gentle, and the substrate is very mucky. *Carex* hummucks that remain, despite living *Carex* being absent from the wetland for over 25 years, are prevalent in wetland. There were no submergent plants observed in the vegetation releve in 2023 or 2024. Duckweed (*Lemna* sp.) was floating on the surface of the water. Many emergent woody, grass, and forb species were observed, though most in small population sizes. Reed canary grass (*Phalaris arundinacea*), arrowhead (*Sagittaria* sp.), bur-reed (*Sparganium* sp.), and cattail (*Typha* sp.), dominated the vegetation releve. Sedges (*Carex* sp.), bulrush (*Scirpus* sp.), spike rush (*Eleocharis* sp.), smartweed (*Polygonum* sp.), purple loosestrife (*Lythrum salicaria*), and other updland grasses and forbs were also present. Leeches, dragonflies, damselflies, snails, fingernail clams, trueflies, crustaceans and bugs and beetles were collected.



MARK TRAFFAS

Table 4.7.1 DNR 387 (L-7) Health based on Index of Biotic Integrity



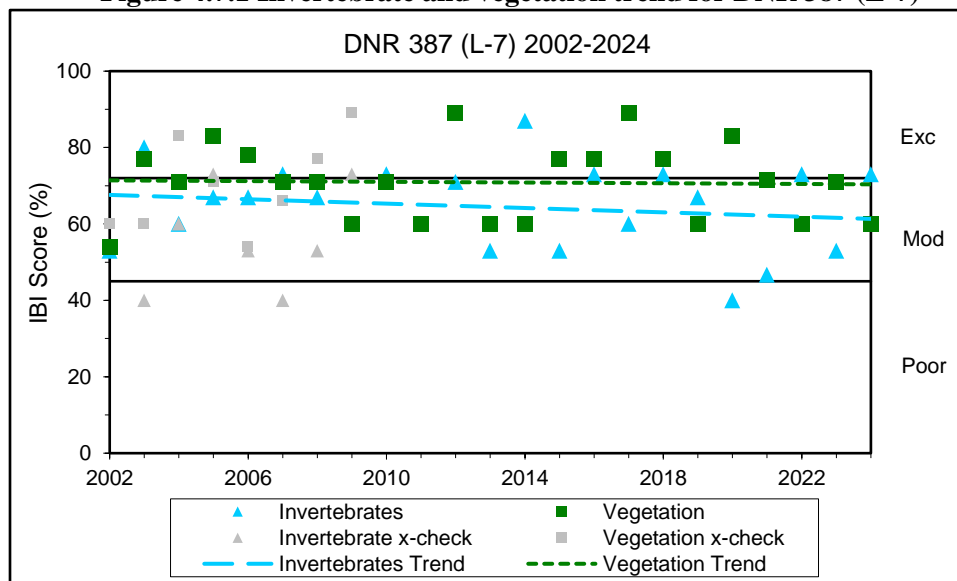
2024 Data (L-7)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (21)
Trend 2002-2024	Stable	Stable

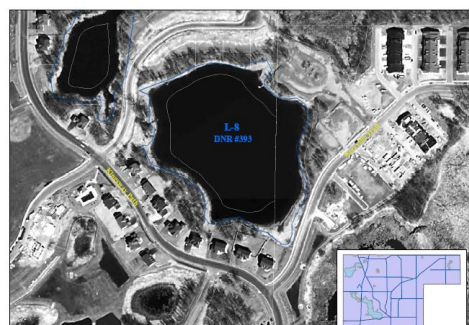
Figure 4.7.1 Invertebrate and vegetation trend for DNR 387 (L-7)



Site summary: This is the 23rd consecutive year that DNR 387 has been monitored for WHEP since 2002. The invertebrate and vegetation scores were inconsistent in 2024, differing by 13 percent; however, both scores indicate moderate wetland health. The invertebrate and vegetation both appear to have long-term stable health trends. The team commented, “this year marked an increase in cattails that crowded out emergent plants, while the higher water levels resulted in a higher water flow and more turbidity which reduced the floating and submergent vegetation including pondweed, bladderwort, and Riccia. All of this resulted in a noticeable reduction in vegetation diversity.”

4.7.2 DNR #393 (L-8)

DNR #393 (L-8) is a 9.6-acre, type 5 wetland located in the Lake Marion subwatershed of the Vermillion River Watershed. The wetland drainage area is 74.7 acres, and 17 percent impervious. It is a publicly owned wetland. It has one non-stormwater inlet on the west side, and one outlet on the south side. There is a structure on the west side of the wetland that is connected to another wetland; however, it does not receive stormwater. The wetland is included in the City’s stormwater management plan and is designated to preserve. The wetland management plan is to actively protect and preserve the function and values of the wetland to the maximum extent feasible. The wetland is within a residential neighborhood where development began in 2003 and ended in 2008. A conservation easement of with a vegetative buffer of varying widths exists along all sides of this wetland.



Wetland Health

Site Observations: The wetland slope is steep near the shoreline, but gentle in the water. The substrate is a firm, sandy bottom overlaid with muck. Coontail (*Ceratophyllum* sp.), water milfoil (*Myriophyllum* sp.), and pondweed (*Potamogeton* sp.) grew in the water column. Water-shield (*Brasenia schreberi*) and

duckweeds (*Lemna* sp. and *Spirodela* sp.) floated the open water. Sedges (*Carex* sp.), spike-rush (*Eleocharis* sp.), rush (*Juncus* sp.), arrowhead (*Sagittaria* sp.), smartweed (*Polygonum* sp.), reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum* sp.), and several other emergent grasses and forbs were observed. Dragonflies, damselflies, snails, fingernail clams, trueflies, and crustaceans were collected.

Table 4.7.2 DNR Wetland 393 (L-8) Health based on Index of Biotic Integrity



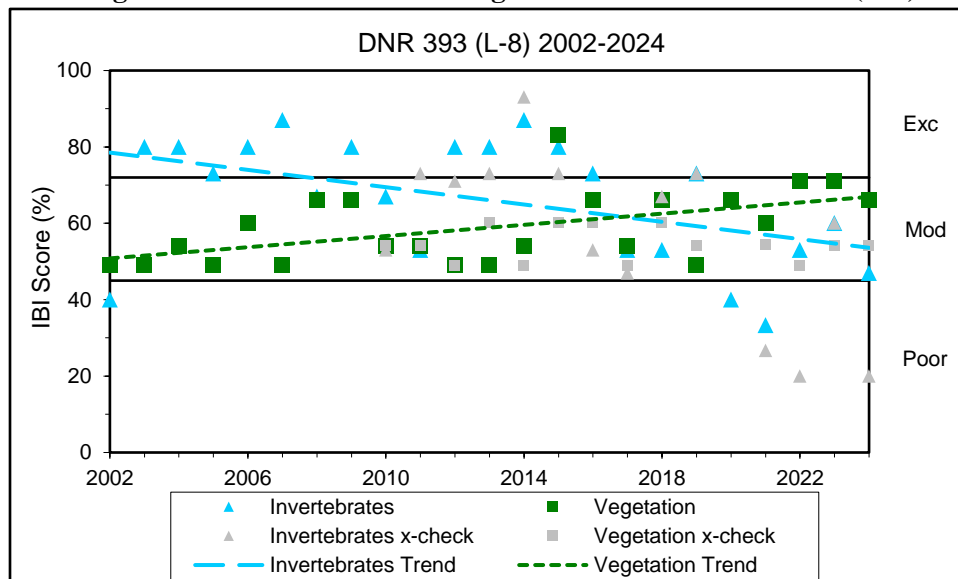
2024 Data (L-8)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (14)	Moderate (23)
Cross-check Rating (IBI score)	Poor (6)	Moderate (19)
Trend 2002-2024	Variable	Stable

Figure 4.7.2 Invertebrate and vegetation trends for DNR 393 (L-8)



Site summary: DNR 393 has been monitored 23 consecutive years. The invertebrate and vegetation scores were considered inconsistent, differing by 19 percent. Excluding a high score in 2015, the vegetation scores regularly indicate moderate wetland health, and the trend is stable. Until more recently, invertebrate health scores have indicated excellent wetland health. In general, the diversity of invertebrates has been declining through the years. In the past, the team has noted that sunfish, large-mouth bass, crayfish, and tadpoles are present in the wetland which may impact the invertebrate population. The team commented, “this year the higher water levels impacted the shoreline vegetation. The waterline was pushed up the shore into the grasses and the submergent and emergent vegetation was further out in deeper water. Emergent vegetation such as arrowhead and smaller spike rush species, common in earlier years, were almost extirpated from the plot. In former years, this site would have included diverse macroinvertebrate profile, despite a consistent low population



AMANDA DREWS, LOREN KNUTSON,
ZIRAN YU, AND ALEX SWARTZ

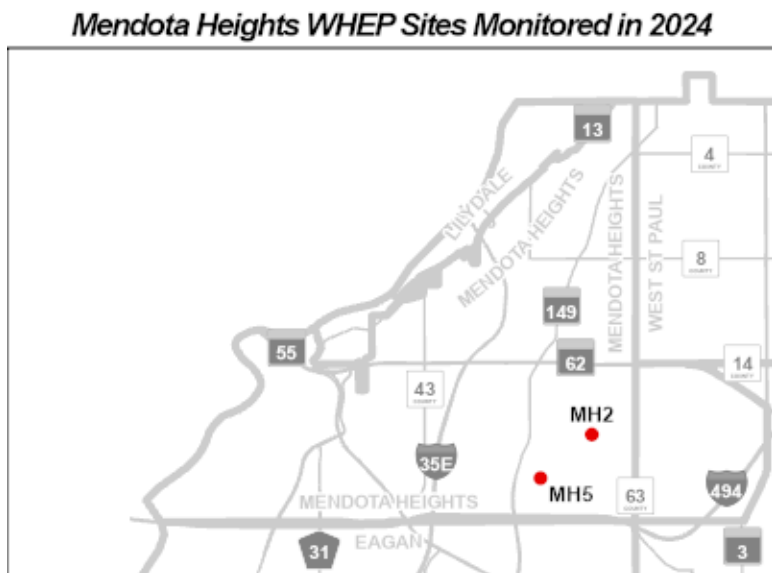
consistent with a healthy piscine predatory presence. But, this year's higher water levels obscured or obliterated the invertebrate habitat. While invertebrates might have been around somewhere, neither of the two teams could find them.” This wetland was cross-checked by another team. Invertebrate scores between the teams were inconsistent, differing by 27 percent. In general, the invertebrate data for both teams was low in diversity, lacking species of leeches, beetles and bugs, mayflies and caddisflies. The cross-check team excluded damselfies and trueflies as well. The vegetation scores between the teams were inconsistent, differing by 12 percent. The vegetation data was fairly similar between teams. Slight differences in cover class and vascular vegetation presence enhanced the vegetation score for the City team. Likely, the differences are due to plot placement at the wetland.

4.8 Mendota Heights Wetlands

Two wetlands were monitored within the City of Mendota Heights, in 2024. The City has 27 years of WHEP data! Nineteen wetlands have been monitored in Mendota Heights since the start of the WHEP program.

Team Leader: Darcy Tatham

Team Members: Gayl Gustafson, Katie Meenan, Joan O'Donnell, Edwin O'Donnell, Angela Richardson, Emma Richardson, Madeline Skog, Michelle Skog, Mary Stade, Krista Spreiter, Carol Strojny, Anneliese Tatham, Noelle Wang, and Cam Wang.



DARCY TATHAM

Darcy Tatham has been involved with WHEP since 2000. Her first year was as a volunteer and after that as a team leader. Darcy stated, “One of the great aspects of this program is the involvement of citizens. A friend of mine many years ago said that he loved the idea of citizens monitoring wetlands because there just aren’t enough people in the profession to do all the monitoring that should be done. I also like to think that citizens need to be involved because of the interconnectedness all of our decisions have on the environment.

“I have had the privilege of working with people from many different career paths and interests. Everyone brings their own perspective, knowledge, and enthusiasm to the team. No one is an expert. Sometimes we need to problem solve while sampling and

sometimes we need to get someone out of the muck or get a bike and hockey nets out of the mud as well. Thank you to my wonderful team!

“WHEP is a great way to promote community involvement and it sure beats sitting at home being on the computer or phone or watching TV.”

As the Natural Resources Coordinator for the City, Krista Spreiter has had the opportunity to work with the Mendota Heights WHEP team through several seasons both in the field and in the lab. Krista remarked, “I have gotten the opportunity to work with Darcy and the Mendota Heights WHEP team for the past five years that I have been at Mendota Heights and it is always a pleasure. I am continually impressed with their dedication and expertise. They put in a lot of time and effort, with some volunteers participating in the program over many years. WHEP provides the city with valuable data that the city can then utilize to monitor our wetlands and find opportunities to protect and improve them, as well as share the data with residents and visitors that enjoy the city’s wetlands. The city is very appreciative of our WHEP team and all that they do for our wetlands!”

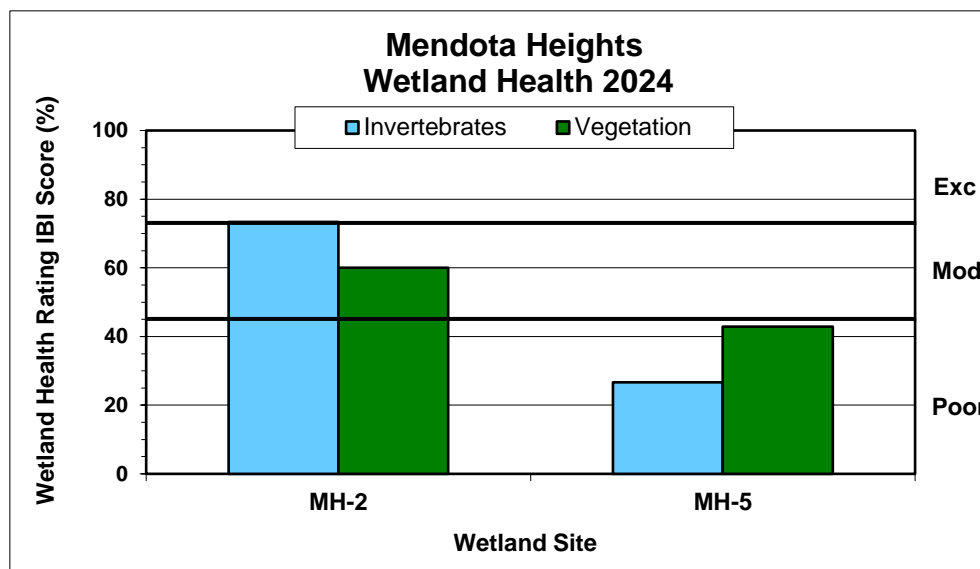


KRISTA SPREITER

Mendota Heights General Wetland Health

Figure 4.8 presents an overall view of wetland health for all the 2024 monitoring sites in Mendota Heights based on the IBI 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. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. Two wetlands were monitored in 2024. Invertebrate and vegetation scores indicate poor to moderate wetland health for MH-2 and MH-5. The invertebrate and vegetation scores were inconsistent with each other for both wetlands, differing by 13 and 16 percent.

Figure 4.8 Mendota Heights' site scores (percent) for the 2024 sampling season



4.8.1 Copperfield Pond (MH-2)

Copperfield Pond (MH-2) is a 5.8-acre, type 5 wetland within the Lower Mississippi River Watershed. Its watershed is 965.4 acres and is 30.1 percent impervious. There is one inlet in the northeast corner of the wetland, one inlet in the southeast corner, and one inlet in the southwest corner. There is one outlet in the northwest corner, near Huber Drive. The wetland is included in the City’s stormwater management plan and is designated as NWI-PUBG. The pond serves as a recreational natural resource with a surrounding paved trail and gravel nature trail. The wetland management goal is to protect and improve water quality, and provide wildlife habitat and flood storage. A majority of the drainage area includes several treatment ponds. Copperfield is connected to an adjacent wetland when water levels are high. Many of these ponds receive surface runoff from residential and road development.



This area is a City-owned open space, and is intended for recreation and educating the public on native plantings and the importance of water management. The pond is located in a wooded area with mature trees. Some invasive species in the area include buckthorn, amur maple, and garlic mustard; however, the park and surrounding buffer is undergoing a native restoration to remove invasive species and re-establish a native vegetative buffer. The surrounding area includes residential neighborhoods in Mendota Heights.

Wetland Health

Site Observations: Copperfield is part of a chain of ponds within an established neighborhood, but it is City-owned. The pathway to the pond is flat and wooded, with a vegetated buffer around the water’s edge. The wetland slope is gentle. The substrate was firm near the shore and only slightly mucky in 2024. The water level was much higher than in recent previous years and there was a very large stand of cattails (*Typha* sp.) that extended more than 20 feet from the shore. There were a lot of white water lilies (*Nymphaea* sp.) at the outer edge of the cattails. Duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) also covered the open water. Pondweed (*Potamogeton* sp.) filled the water column. Coontail (*Ceratophyllum* sp.), waterweed (*Elodea* sp.), and water-nymph (*Najas* sp.) also grew below the waters surface. Spike rush (*Eleocharis* sp.), arrowhead (*Sagittaria* sp.), water plantain (*Alisma* sp.), and cut grass (*Leersia* sp.) were the only other emergent grasses and forbs found in the vegetation releve. Leeches, dragonflies, damselflies, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and beetles and truebugs were collected.

Table 4.8.1 Copperfield (MH-2) Wetland Health based on Index of Biotic Integrity



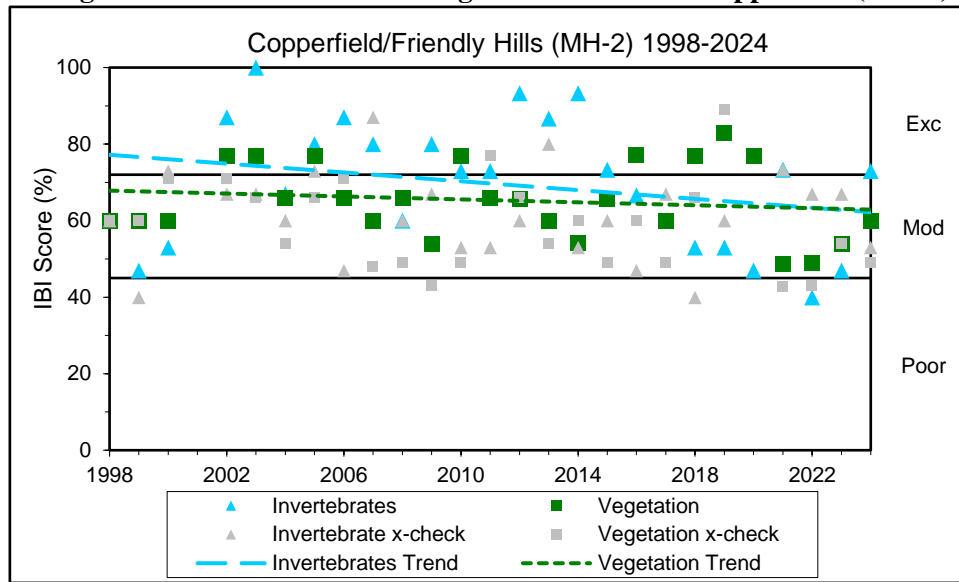
2024 Data (MH-2)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (21)
Cross-check Rating (IBI score)	Moderate (16)	Moderate (17)
Trend 1998-2024	Variable	Stable

Figure 4.8.1 Invertebrate and vegetation trends for Copperfield (MH-2)



Site Summary: This is the 26th year that MH-2 has been monitored for WHEP. There is a lot of variability in the data throughout the years of monitoring. Both health data sets show steady long-term trends. Fluctuation in water levels from year to year may impact data results. The invertebrate and vegetation scores were inconsistent in 2024, differing by 13 percent; however, both scores indicate moderate wetland health. This wetland was cross-checked by another team. The invertebrate and vegetation scores were inconsistent between the teams. The invertebrate scores differed by 20 percent. The City team found a larger diversity leaches and caddisflies. The vegetation scores between the teams differed by 11 percent. The City team found a larger diversity of non-vascular and grasslike vegetation.

4.8.2 Pagel Pond (MH-5)

Pagel Pond (MH-5) is a 6.4-acre, type 5 wetland located within the Interstate Valley Creek subwatershed of the Lower Mississippi Watershed. The subwatershed is 36.8 acres and 29 percent impervious. There are three inlets: one on the south side, one southwest side, and one north side of the pond. There is one outlet on the southeast side of the pond. Pagel Pond is part of the City's stormwater management plan with a goal to protect and improve water quality and to provide wildlife habitat and flood storage.



Pagel Pond is surrounded by residential property and mostly buffered by woodland. Stormwater runoff from residential neighborhoods and invasive species challenge the management of this pond.

Wetland Health

Site Observations: Houses and trees surround much of the pond. The slope is steep from the path down to the water. The substrate is slightly mucky. There were no floating or submerged vegetation in the vegetation releve. Oak trees (*Quercus* sp.), maples (*Acer* sp.), cottonwoods (*Populus* sp.), and a few other woody plants were noted. Cutgrass (*Leersia* sp.) and swamp milkweed (*Asclepias* sp.) were sparsely present. Buckthorn (*Rhamnus cathartica*) and reed canary grass (*Phalaris arundinacea*) were also present.

Table 4.8.2 Pagel Pond (MH-5) Wetland Health based on Index of Biotic Integrity



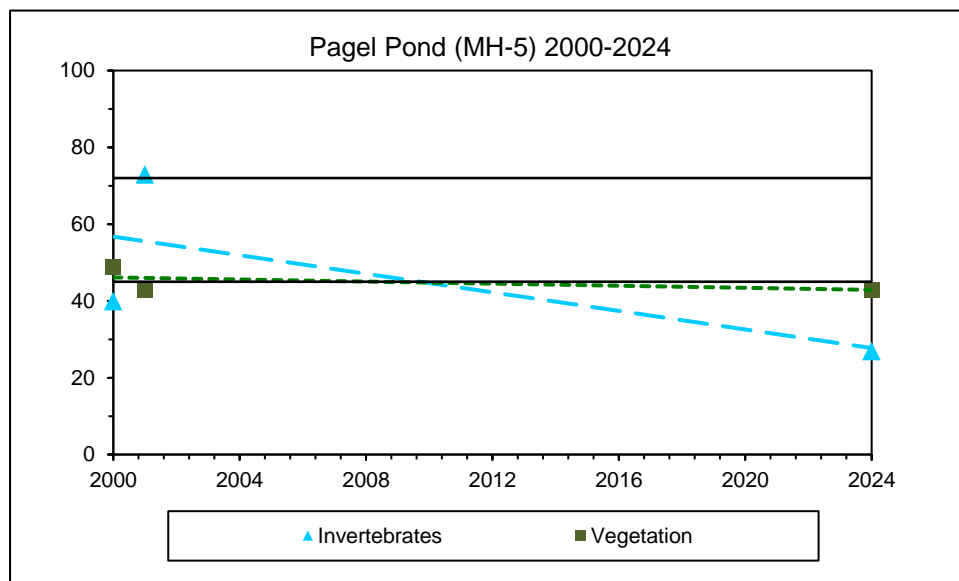
2024 Data (MH-5)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (8)	Poor (15)
Trend 2000-2024	Not enough data	Not enough data

Figure 4.8.2 Invertebrate and vegetation trends for Pagel Pond (MH-5)



Site summary: This is the third time overall that this pond has been monitored for WHEP. It was previously monitored in 2000 and 2001. Both invertebrates and vegetation scores indicate poor wetland health. Very little aquatic vegetation is present in this wetland which likely impacts the invertebrate population. The vegetation scores from all three surveys are similar. The invertebrate scores are variable. More years of data may show more reliable health trends.

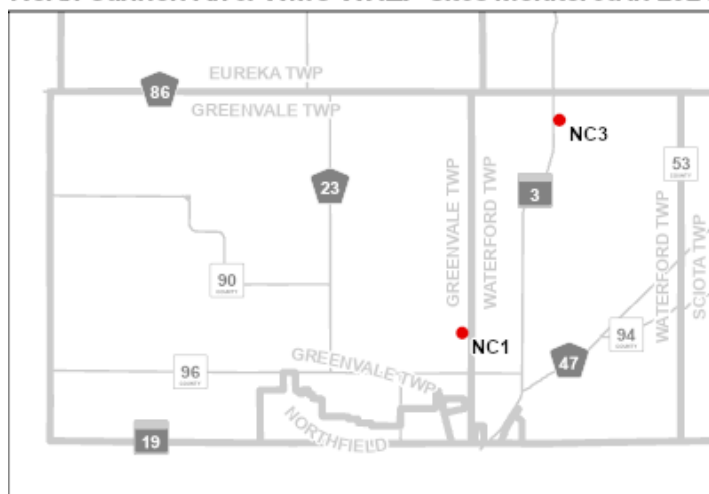
4.9 North Cannon River Watershed Management Organization

Two wetlands were monitored for North Cannon River Watershed Management Organization (NCRWMO) in 2024. This is the eighth year that NCRWMO has monitored wetlands with WHEP. Three wetlands have been monitored for NCRWMO since their inclusion in WHEP.

Team Leader: Shamus Collins

Team Members: Andy Fox and Ellie Fox

North Cannon River WMO WHEP Sites Monitored in 2024



This is Shamus Collins third year as team leader of the North Cannon River WHEP team, and has participated in WHEP since 2022. He previously said, “I have been involved with the North Cannon River Watershed for around 6 years in various roles, but always with the overarching goal of doing my part to maintain and protect the health of the associated ecosystems.”



SHAMUS COLLINS



ASHLEY GALLAGHER

Ashley Gallagher is a Senior Resource Conservationist for Dakota County Soil and Water Conservation District. She explained, “We serve as the Administrator for the North Cannon River Watershed Management Organization (NCRWMO). The NCRWMO is a watershed in the southern part of Dakota County. A Board of managers with representation from eight townships and three cities oversees watershed management and planning in the North Cannon River Watershed area. One goal within the NCRWMO watershed management plan is ‘to inform landowners, children, and local units of government, about the watershed and human impacts on water quality and quantity, and to invite public participation in watershed management processes.’ In 2017, the Board decided to participate in WHEP for the first

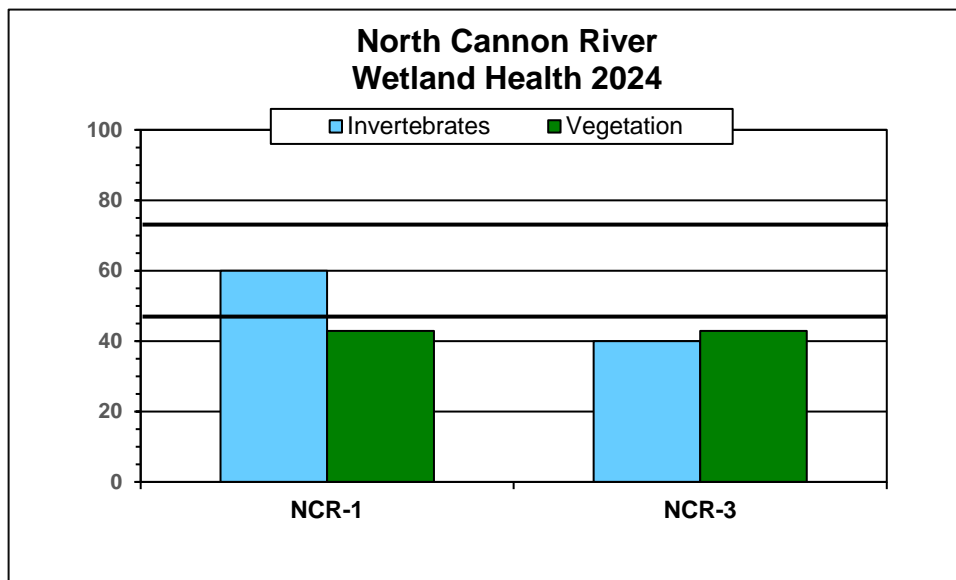
time. They are pleased with the way the program uses volunteers to conduct the monitoring, which helps increase public awareness of the watershed and the issues it faces.

North Cannon River WMO General Wetland Health

Figure 4.9 presents an overall view of wetland health for all the 2024 monitoring sites in Mendota Heights based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.9 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a

wetland health rating is assigned as excellent, moderate or poor. Two wetlands were monitored in 2024. Invertebrate and vegetation scores indicate poor to moderate wetland health for NCR-1 and NCR-3. The invertebrate and vegetation scores for NCR-1 were inconsistent with each other, differing by 17 percent.

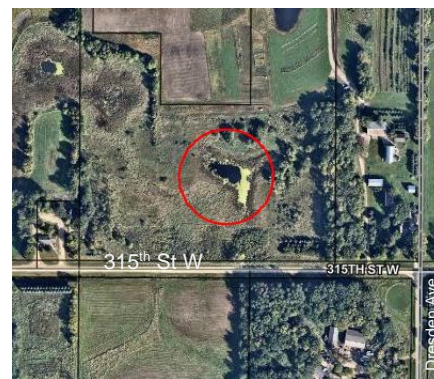
Figure 4.9 NCRWMO's site scores (percent) for the 2024 sampling season



4.9.1 Loretto Wetland (NCR-1)

Loretto Wetland (NCR-1), formerly known as Wasner, is a 0.5-acre, type 4 wetland within the Cannon River Watershed. The wetland watershed is 160 acres with four acres of impervious surface. A wetland restoration was completed in 1996. The wetland management goal is to maintain the wetland and determine the effectiveness of the restoration.

This wetland is located within Greenvale Township in southwest Dakota County. The surrounding area is predominately agricultural. There is potential for future development in the area.



Wetland Health

Site Observations: An organic farm is north of the wetland and a conventional farm is to the west. Open water covered in slender Riccia (*Riccia fluitans*) and duckweed (*Lemna* sp.) is deceptively veiled by a tangle of overgrown woody brush and a seemingly endless swath of dense cattail (*Typha* sp.). There are no submergent plants observed in 2024; however, emergent grasslike plants and forbs including spike rush (*Eleocharis* sp.), bulrush (*Scirpus* sp.), manna-grass (*Glyceria* sp.), smartweed (*Polygonum* sp.), water-plantain (*Alisma* sp.), bur-reed (*Sparganium* sp.), and beggar-ticks (*Bidens* sp.) thrive. Reed canary grass (*Phalaris arundinacea*) is also present. Dragonflies, snails, fingernail clams, crustaceans, and bugs and beetles were collected.

Table 4.9.1 Loretto Wetland (NCR-1) Wetland Health based on Index of Biotic Integrity



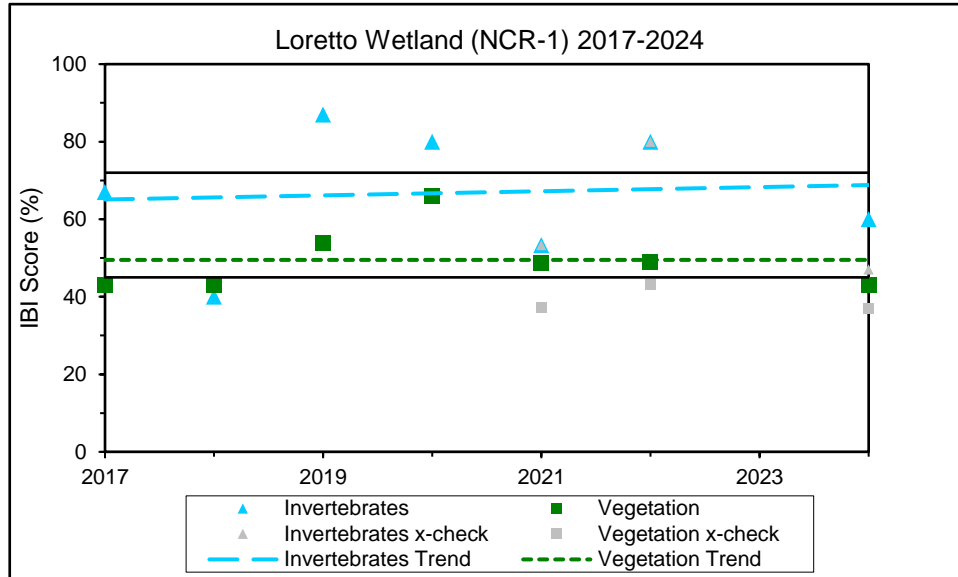
2024 Data (NCR-1)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (18)	Poor (15)
Cross-check Rating (IBI score)	Poor (14)	Poor (13)
Trend 2017-2024	Variable	Stable

Figure 4.9.1 Invertebrate and vegetation trends for Loretto Wetland (NCR-1)



Site summary: This is the eighth year that Loretto Wetland has been monitored by WHEP volunteers since 2017. The wetland was too dry to collect data in 2023. In 2024, the invertebrate and vegetation scores were inconsistent with each other, differing by 17 percent. The invertebrate score indicates moderate wetland health while the vegetation score indicates poor wetland health. Floating and emergent aquatic vegetation was present, but no submergent vegetation was observed. The vegetation scores show stable wetland health. The invertebrate scores are variable and more years of data may help determine a more reliable wetland health. Extreme fluctuations in water levels impact monitoring accessibility and habitat. This site was cross-checked by another WHEP team. The NCRWMO team collected a larger diversity of snails which enhanced the invertebrate score compared to the cross-check team. A difference in scoring persistent litter caused vegetation scoring differences between teams. This site was also cross-checked by a third-party consultant (Bolton & Menk) for vegetation. The data was very similar between groups.

4.9.2 Jordan Wetland (NCR-3)

Jordan Wetland (NCR-3) is a 25-acre, type 3 shallow marsh within the Cannon River Watershed. The wetland watershed is 33 acres with two acres of impervious surface. The wetland management goal is to restore for the State of Minnesota Wetland Bank completed in 2019.

The surrounding area includes agriculture and roads. The site was cropped until 2018 when restoration work began. The drainage ditches were filled and a berm was built to hold back water. Vegetation work and seeding throughout the easement have created various wetland and upland habitats.



Wetland Health

Site Observations: The wetland slope is steep. The substrate is mucky. There are no trees, as it is located in the remnants of a agricultural field. This site was too dry to sample in 2023. There was no floating vegetation in 2024. A sparse population of pondweed (*Potamogeton* sp.) was the only submergent vegetation observed. Water-plantain (*Alisma* sp.), arrowhead (*Sagittaria* sp.), swamp milkweed (*Asclepias* sp.), bulrush (*Scirpus* sp.) cut grass (*Leersia* sp.), and cattail (*Typha* sp.) were represented in the vegetation releve. Dragonflies, snails, fingernail clams, crustaceans, and four bugs and beetles were collected.

Table 4.9.2 Jordan Wetland (NCR-3) Wetland Health based on Index of Biotic Integrity



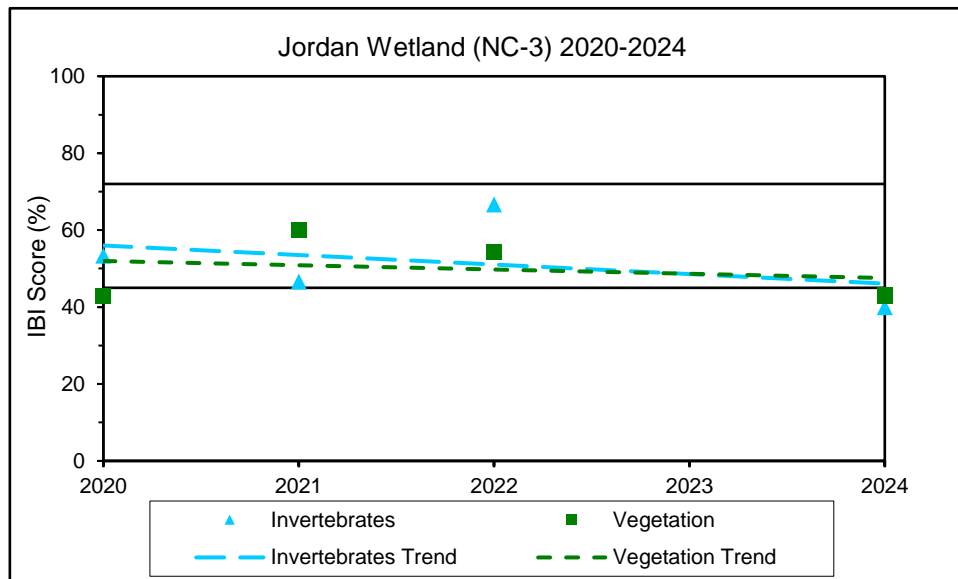
2024 Data (NCR-3)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (12)	Poor (15)
Trend 2020-2024	Not enough data	Not enough data

Figure 4.9.2 Invertebrate and vegetation trends for Jordan Wetland (NCR-3)



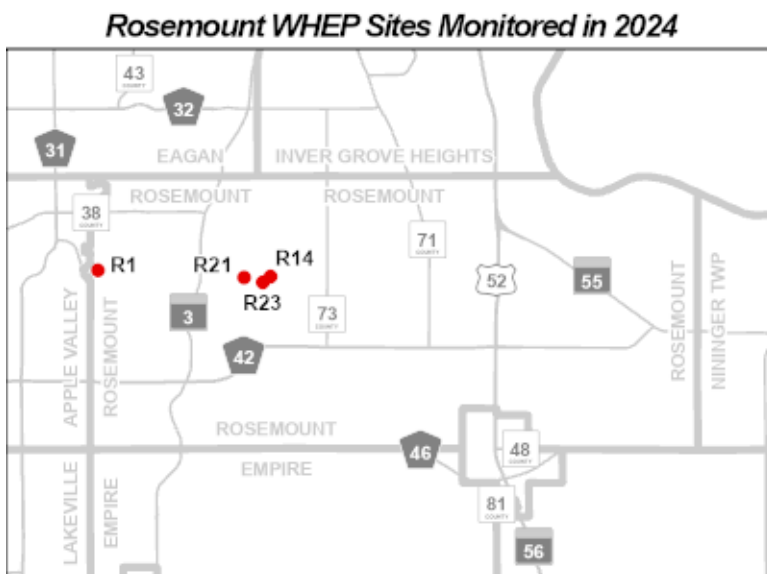
Site summary: This is the fifth year that Jordan wetland has been monitored by WHEP volunteers since 2020. The absence of standing water prevented invertebrate and vegetation surveys in 2023. In 2024 the invertebrate and vegetation data was very consistent, both indicating poor wetland health. Invertebrate and vegetation scores have ranged from poor to moderate over the years of monitoring. Dry conditions have been reported at this site several years since monitoring started. Reed canary grass, water plantain, bur-reed (*Sparganium* sp.), and cattails have been consistently present at this site. With few years of data, both data sets show consistency. More years of data will help determine a more reliable health trend.

4.10 Rosemount Wetlands

Four wetlands were monitored in the City of Rosemount in 2024. The City has 27 years of WHEP data! Twenty-four wetlands have been monitored in Rosemount since the start of WHEP.

Team Leaders: Jane Porterfield and Stephan Hoche

Team Members: Reagan Cardwell, Sean Christianson, Susie Freiburger, Emily Hoche, Reid Huey, Abate Terefe, Greta Willander, and Tom Willander.



JANE PORTERFIELD

Jane Porterfield is the co-team leader for Rosemount. She has been involved in WHEP since its induction in 1997. She previously stated, “WHEP has provided a great opportunity for me to participate in wetland research and share that enthusiasm with fantastic volunteers. I enjoy being in waders in a wetland as the sun is setting. Wetlands and water quality are so important to the health of our world. This was a great year. Not too hot, not too many mosquitoes and wetlands with water! However, Schwarz Pond water level was lower than it had been in the past. Every year we find and learn new things.”

Stephan Hoche, Rosemount WHEP co-team leader commented, “This marks my fourth year with WHEP and my second year as co-leader. My daughter Emily has been contributing for the past three years, and together, we’ve come to deeply appreciate the thriving community developing through gathering in the field, the wetlands, the lab and at the State Fair. This season was particularly rewarding, thanks to our dedicated volunteers—many returning, alongside a few new faces—all of whom are greatly appreciated. Clean water is a universal need, and our wetlands play a crucial role in ensuring it. I’m truly grateful to be part of this community and the vital work we do.”



STEPHAN HOCHÉ

Jane Byron is the Stormwater Specialist and WHEP coordinator at the City of Rosemount. She has been involved in WHEP for many years. She commented, “We love our WHEP volunteers. They come through for us year after year. Because of all their hard work, we see how these wetlands are changing over time. We can see where they are resilient, and where they need more protection. We couldn’t do this without them.”



JANE BYRON

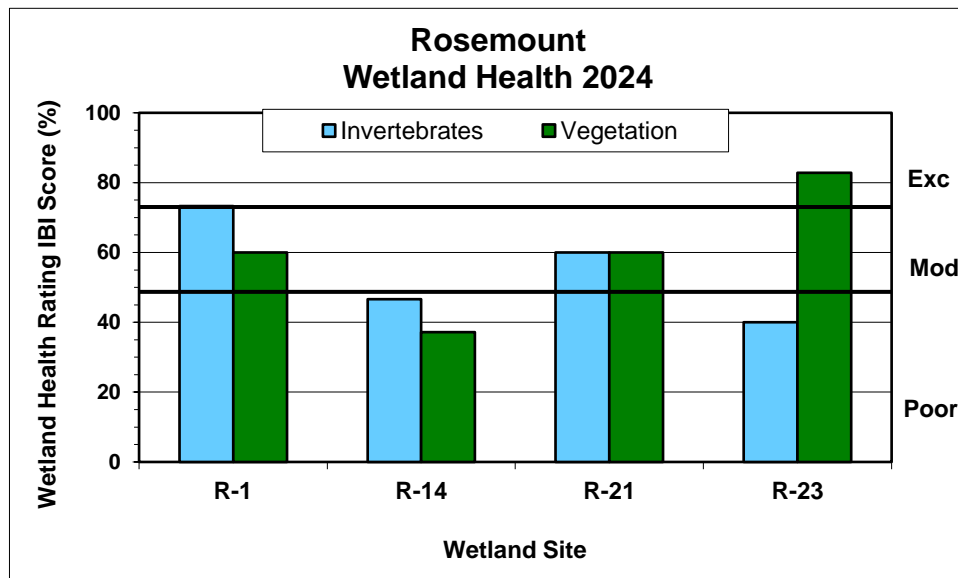
Rosemount General Wetland Health

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

Figure 4.10 presents an overall view of wetland health for all the 2024 monitoring sites in Rosemount based on the scores for invertebrates and vegetation presented as a percent. Figure 4.10 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. The invertebrate scores indicate poor to moderate wetland health. The vegetation scores indicate poor to excellent wetland health. The invertebrate and vegetation scores for R-1 and R-23 were inconsistent, differing by 13 and 43 percent, respectively.

Figure 4.10 Rosemount site scores (percent) for 2024



4.10.1 Kelly Marsh (R-1)

Kelly Marsh (R-1), also known as WMP #362, is a 1.3-acre, type 5 wetland within the Birger Pond subwatershed of the Vermillion River Watershed. The subwatershed is 897 acres with 20 percent impervious surface. There is one inlet on the north side and one outlet on the south side of the wetland. Kelly Marsh is part of the City’s stormwater management plan and is designated to preserve with a management goal to maintain wetland without loss of function and value, and to maximize potential for education purposes by taking advantage of surrounding residential area and park.



The wetland is within a basin surrounded by residences and a city park. The wetland basin is affected by storm water runoff from the nearby development which is encroaching upon the existing 75-foot buffer. In 2021, willow trees were removed in portions of the vegetative buffer to prevent damage to the nearby trail.

Wetland Health

Site Observations: The wetland slope is steep. The wetland substrate is firm and sandy. A sparse population of coontail (*Ceratophyllum* sp.) was the only submergent vegetation observed. White water-lily (*Nymphaea* sp.), duckweeds (*Lemna* sp. and *Spirodela* sp.), and water-meal (*Wolffia* sp.) covered the surface of the water. Spike rush (*Eleocharis* sp.) and reed canary grass (*Phalaris arundinacea*) dominated the emergent zone of the wetland releve. Willow trees (*Salix* sp.), sedges (*Carex* sp.), bulrush (*Scirups* sp.), arrowhead (*Sagittaria* sp.), willow-herb (*Epilobium* sp.), and bugle weed (*Lycopus* sp.) were also present. Leeches, dragonflies, damselflies, mayflies, caddisflies, snails, fingernail clams, crustaceans, trueflies, and bugs and beetles were collected.

Table 4.10.1 Kelly Marsh (R-1) Wetland Health based on Index of Biotic Integrity



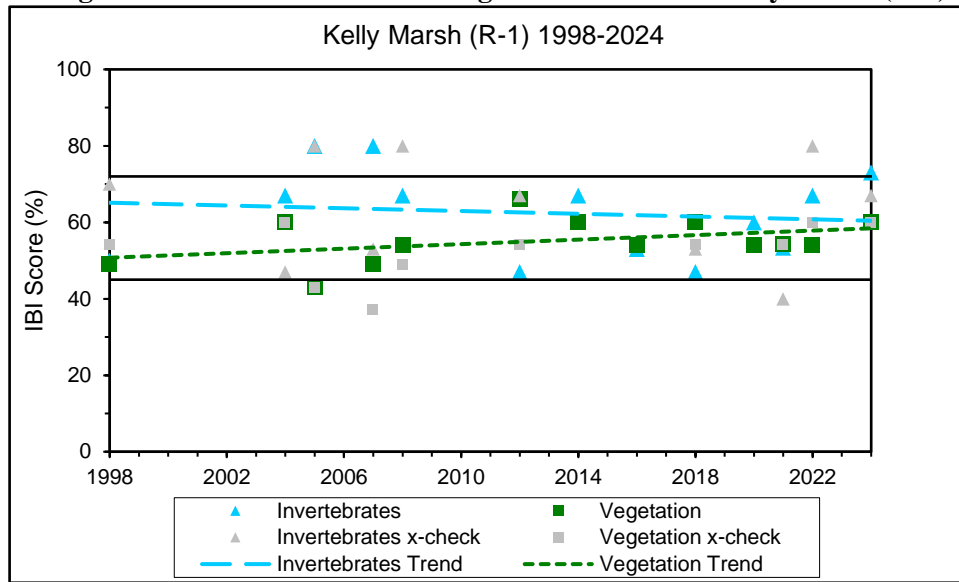
2024 Data (R-1)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (21)
Cross-check Rating (IBI score)	Moderate (20)	Moderate (21)
Trend 1998-2024	Stable	Stable

Figure 4.10 .1 Invertebrate and vegetation trends for Kelly Marsh (R-1)



Site summary: This is the 13th time that Kelly Marsh has been monitored for WHEP since 1998. The invertebrate and vegetation health scores were inconsistent, differing by 13 percent; however, both scores indicate moderate wetland health. The invertebrates scores have been somewhat variable over the years; however, the long-term health trend is stable. The vegetation scores have been fairly stable. This site was cross-checked by another WHEP team. The vegetation scores were consistent with each other. Both teams observed very similar vegetation representation. The invertebrate scores were also consistent, though there was slight variation in the invertebrate collection for each team. Differences in collection locations and the presence of tadpoles may have affected collection results.

4.10.2 Mare Pond North (R-14)

Mare Pond North (R-14), also known as WMP #379, is a 4.8-acre, type 5 wetland within the White Lake watershed. The wetland watershed is 81-acres with 30 percent impervious surface. There is one inlet on the west side of the wetland and one inlet on the north side of the wetland. The north inlet comes in north of the recreational trail and flows overland about 370 feet. There is also one outlet on the south side of the wetland. R-14 is part of the City's stormwater management plan and is designated to preserve with a management goal to maintain the wetland and its existing functions, values, and wildlife habitat.



The wetland is located in a natural area of a park within a residential development. A vegetation buffer surrounds approximately 2/3 of the pond. A small pretreatment pond to the west collects runoff from Bonaire Path, a higher speed road that runs along the southern side of the wetland.

Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is solid. Cattail (*Typha* sp.) surrounds the wetland. Coontail (*Ceratophyllum* sp.) and pondweed (*Potamogeton* sp.) fill the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) densely cover the surface of the water. Small populations of arrowhead (*Sagittaria* sp.), swamp milkweed (*Asclepias* sp.), and smartweed (*Polygonum* sp.) were represented in the vegetation releve. Reed canary grass (*Phalaris arundinacea*) were also observed. Dragonflies, snails, trueflies, crustaceans, and beetles and bugs were collected.



TOM WILLANDER, GRETA WILLANDER, STEPHAN HOCHÉ, EMILY HOCHÉ, REAGAN CARDWELL, ABATE TEREFE

Table 4.10.2 Mare Pond North (R-14) Wetland Health based on Index of Biotic Integrity



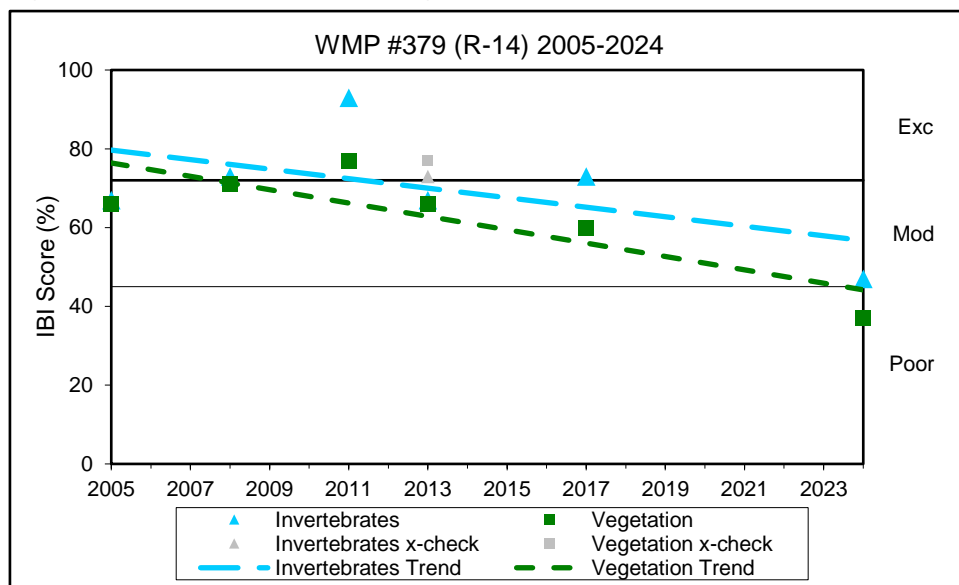
2024 Data (R-14)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (14)	Poor (13)
Trend 2005-2024	Decline	Decline

Figure 4.10.2 Invertebrate and vegetation trends for Mare Pond North (R-14)



Site summary: This is the sixth time that R-14 has been monitored since 2005. The invertebrate and vegetation scores were consistent, and both scores indicate poor wetland health. Wetland health trends appear to be declining for both invertebrates and vegetation. Emergent vegetation is lacking in the vegetation releve in 2024. This may be due to plot placement or other shoreline disturbance. The invertebrates score may have been impacted by the presence of fish, tadpoles, and muskrats.

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

CR-38 Mitigation Site 1 (R-21) is a 1.7-acre, type 3 wetland in the Kegan Lake subwatershed of the Vermillion River watershed. The subwatershed is 1,530 acres and 30 percent impervious. The wetland has one inlet on the east side which receives stormwater overflow from a storm pond. There are no outlets. R-21 is included in the City's stormwater management plan. It is designated as Manage II, and is managed to maintain the wetland quality and monitor wetland mitigation.



R-21 is a depressional shallow marsh wetland. A portion of this wetland was constructed as mitigation for impacts to other wetlands as a result of street reconstruction.

Wetland Health

Site Observations: The wetland slope is steep. The substrate is firm. Cattails (*Typha* sp.) surround the wetland. Pondweed (*Potamogeton* sp.) fills the water column. Bladderwort (*Utricularia* sp.) and coontail (*Ceratophyllum* sp.) are present. Slender Riccia (*Riccia fluitans*), purple-fringed Riccia (*Ricciocarpus natans*), duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) cover the surface of the water. Though emergent vegetation is present around the wetland, there were none represented in the releve. Mayflies, snails, fingernail clams, trueflies, crustaceans, and beetles and bugs were collected.

Table 4.10.3 CR-38 Mitigation Site #1 (R-21) Wetland Health based on Index of Biotic Integrity



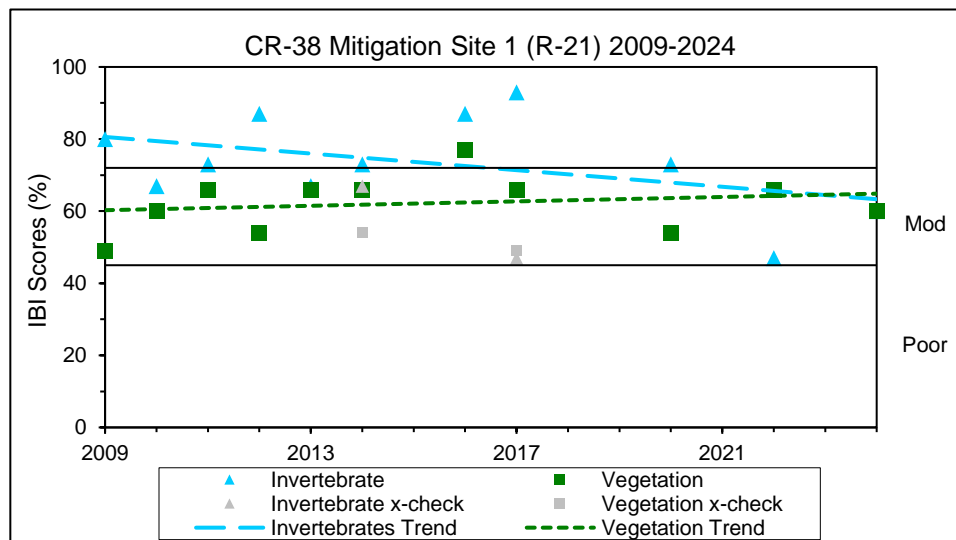
2024 Data (R-21)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (18)	Moderate (21)
Trend 2009-2024	Stable	Stable

Figure 4.10.3 Invertebrate and vegetation trends for CR-38 Mitigation Site #1 (R-21)



Site summary: This is the 11th time that R-21 has been monitored by the WHEP volunteers since 2009. The invertebrate and vegetation scores were very consistent, and both scores indicate moderate wetland health. Despite the moderate health rating, the diversity of invertebrates and vegetation was low. A wide variety of snails and trueflies enhanced the invertebrate score while the presence of non-vascular plants and bladderwort enhanced the vegetations score. The health trend for invertebrates is variable. The health trend for vegetation appears stable.



REID HUEY

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

CR-38 Mitigation Site 2 (R-23) is 0.3-acre, type 3 wetland in the White Lake subwatershed within the Vermillion River watershed. The White Lake subwatershed is 998 acres of which 30 percent is impervious surface. There are no inlets. There is one outlet on the south side of the wetland. This wetland is not part of the City's stormwater management plan. The wetland management goal is to maintain the wetland without any loss of function and value, and to monitor the success of this wetland's creation.



R-23 is a small depressional shallow marsh wetland. The wetland was constructed to mitigate impacts to other wetlands as a result of street reconstruction.

Wetland Health

Site Observations: The wetland slope is gentle and the substrate is solid. The team commented that the water levels were the highest that they had ever seen in July. "The wetland is usually dry or almost dry." Emergent grasses, especially reed canary grass (*Phalaris arundinacea*) spread throughout the entire wetland, also including spike-rush (*Eleocharis* sp.), bulrush (*Scirpus* sp.), rush (*Juncus* sp.), cut grass (*Leersia* sp.), and blue grass (*Poa* sp.). Only fragments of bladderwort (*Utricularia* sp.) and pondweed (*Potamogeton* sp.) were found in the water column, and only a scattering of duckweed (*Lemna* sp.), slender Riccia (*Riccia fluitans*), and purple-fringed Riccia (*Ricciocarpus natans*) floated on the surface of the water. Water plantain (*Alisma* sp.), bugle weed (*Lycopus* sp.), monkey flower (*Mimulus* sp.), and a few other emergent forbs were sparsely represented in the vegetation releve. Animals (maybe muskrats) are grazing the grasses and water plantain. Damselflies, mayflies, snails, fingernail clams, true flies, fairy shrimp, and beetles and bugs were collected. In addition, sand hill cranes were observed and trumpeter swans are nesting in the pond directly east of this wetland.



SEAN CHRISTIANSON, REAGAN CARDWELL, AND
SUSIE FREIBURGER

Table 4.10.4 CR-38 Mitigation Site #2 (R-23) Wetland Health based on Index of Biotic Integrity



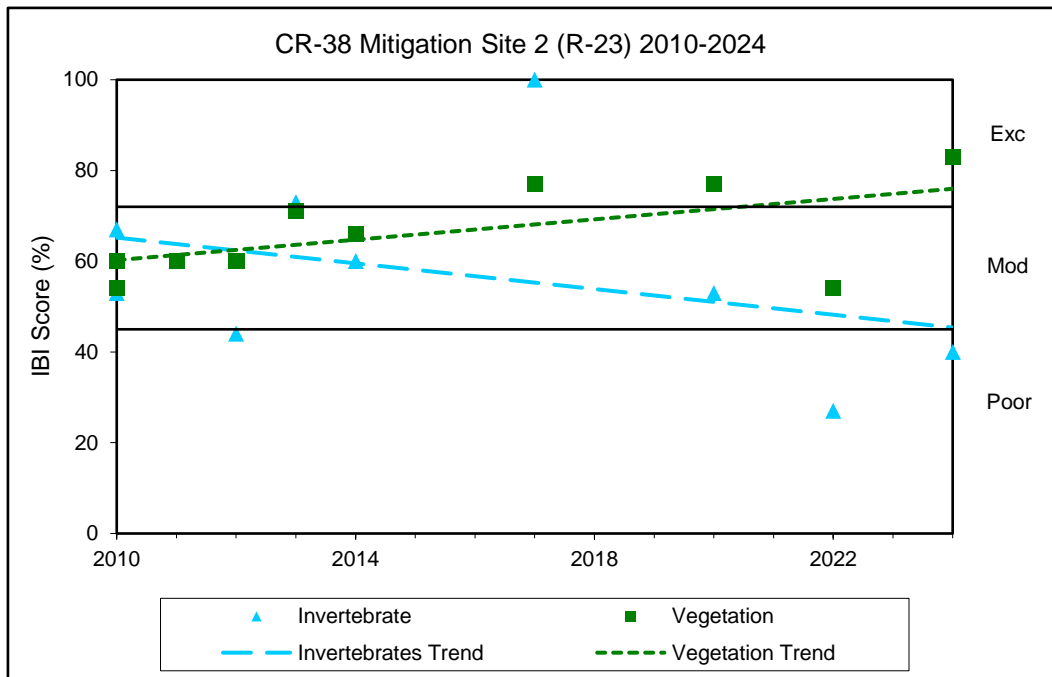
2024 Data (R-23)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (12)	Excellent (29)
Trend 2010-2024	Variable	Stable

Figure 4.10.4 Invertebrate and vegetation trends for CR-38 Mitigation Site #2 (R-23)



Site summary: This is the ninth time that R-23 has been monitored by WHEP since 2010. The invertebrate and vegetation scores were inconsistent in 2024, differing by 43 percent. The invertebrate score indicates poor wetland health while the vegetation score indicates excellent wetland health. Despite the excellent health rating, the vegetation diversity was low and the populations of each species observed were sparse. The presence of non-vascular plants and bladderwort enhanced the vegetation score. There was little to no submergent and floating vegetation, and reed canary grass over-dominated the site. There were also tadpoles and water fowl that may be impacting both the vegetation and invertebrate presence.

4.11 South St. Paul Wetlands

Two wetlands were monitored in South St. Paul in 2024 by the South St. Paul team. The City has 24 years of WHEP data! Four wetlands have been monitored in South St. Paul since the start of the WHEP program.

Team Leader: Ben Linton and Mara Ranta

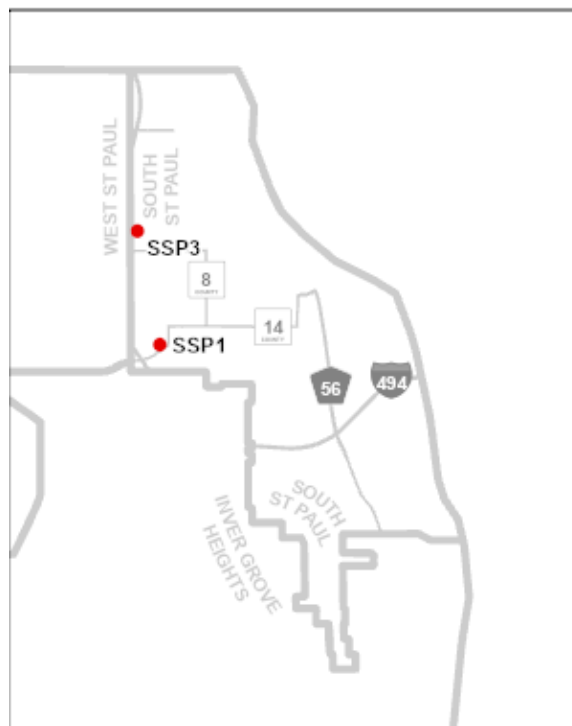
Team Members: Tasha Clark, Simon Handwerger, Elio Magnuson, Conor Resnikoff, Anneliese Tatham, Sage Tomasko, and Rachel Titus

Mara Ranta and Ben Linton were first time co-leaders for the South St. Paul team in 2024. Mara and Ben are both students pursuing environmental science degrees at Metropolitan State University. Before this year they had never heard of WHEP and decided that not only were they excited to volunteer with the program but that they were also interested in being coleaders for the South St. Paul team. Mara and Ben both have a love for learning about freshwater ecosystems and WHEP was a great experience to learn even more. Some



MARA RANTA AND BEN LINTON

South St. Paul WHEP Sites Monitored in 2024



memorable wildlife moments from this season include Mara accidentally stepping on a snapping turtle in the wetland at Copperfield Pond, Rachel making friends with a very large leech, and having a muskrat swim around us while we were working at Anderson Pond. Huge thanks to everyone involved in the program for the help and support, and a special thanks to everyone on the South St. Paul team for their time, enthusiasm, and bearing with us as we learned alongside them.

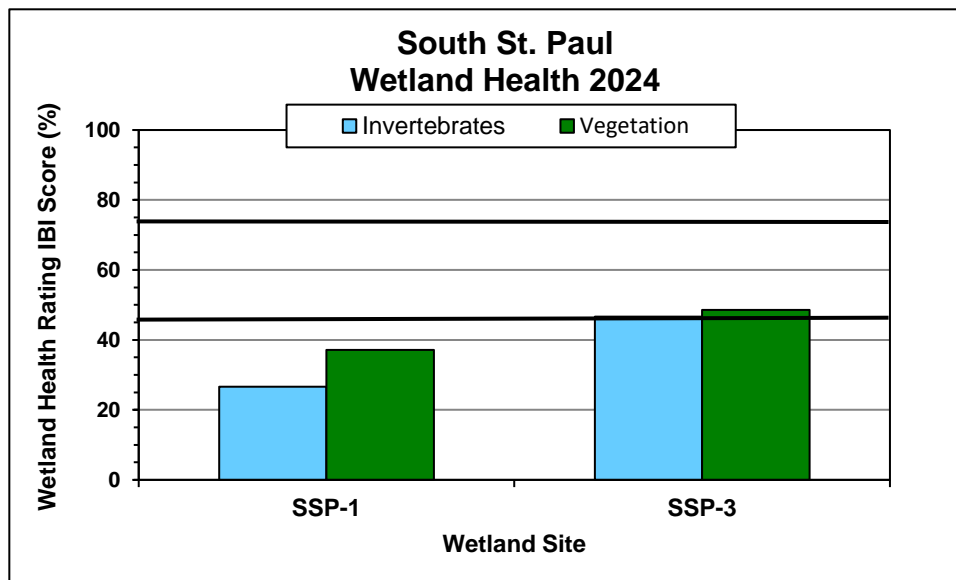
The City of South St. Paul has relatively few wetlands compared to most cities which is why it is important to monitor the functionality and health of this limited natural resource in the community to ensure it is protected. The City appreciates the WHEP program, and its volunteers help in monitoring the wetlands' health, and will continue to support the program.

South St. Paul General Wetland Health

Figure 4.11 presents an overall view of wetland health for all the 2024 monitoring sites in South St. Paul based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.11 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. In 2024, the invertebrates and vegetation health scores ranged from poor to moderate. The invertebrates and vegetation scores for both wetlands was

poor and the vegetation scores ranged poor to moderate. The invertebrate and vegetation scores were consistent with each other for each wetland.

Figure 4.11 South St. Paul site scores (percent) for the 2024 sampling season



4.11.1 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 three inlets: one inlet on the north side of the wetland, one inlet on the west side, and one inlet on the south side. There is also an outlet on the south side of the wetland. It is part of the City's Stormwater Management Plan.



Virtually all the area that contributes to this wetland is fully developed. In 2008, the City performed an extensive dredging of Anderson Pond. The cattails are returning on the east and west sides of the pond. A separate maintenance cell was created near the northwest inlet to facilitate future dredging and other maintenance activities. Additional dredging was done in 2011 and 2012. 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). The pond is in an older established residential area surrounded by roads, apartment blocks, and houses.

Wetland Health

Site Observations: The wetland has a gentle entrance, but water deepens quickly. The wetland substrate is mucky. A thick band of cattails (*Typha* sp.) surrounds about 75 percent of the wetland shoreline. The area

without the cattails has large overhanging trees, including black walnut (*Jugulans* sp.), maples (*Acer* sp.), willows (*Salix* sp.), and dogwoods (*Cornus* sp.). Very low diversity of aquatic vegetation was represented in the releve. Coontail (*Ceratophyllum* sp.) dominated and filled the water column. Sparse populations of pondweed (*Potamogeton* sp.) and duckweeds (*Lemna* sp. and *Spirodela* sp.) were the only other plant species in the vegetation releve. Dragonflies, damselflies, trueflies, crustaceans, and 8 *Corixidae* were the only invertebrates collected. Goldfish (*Carassius auratus*) were observed.

Table 4.11.1 Anderson Pond (SSP-1) Wetland Health based on Index of Biotic Integrity



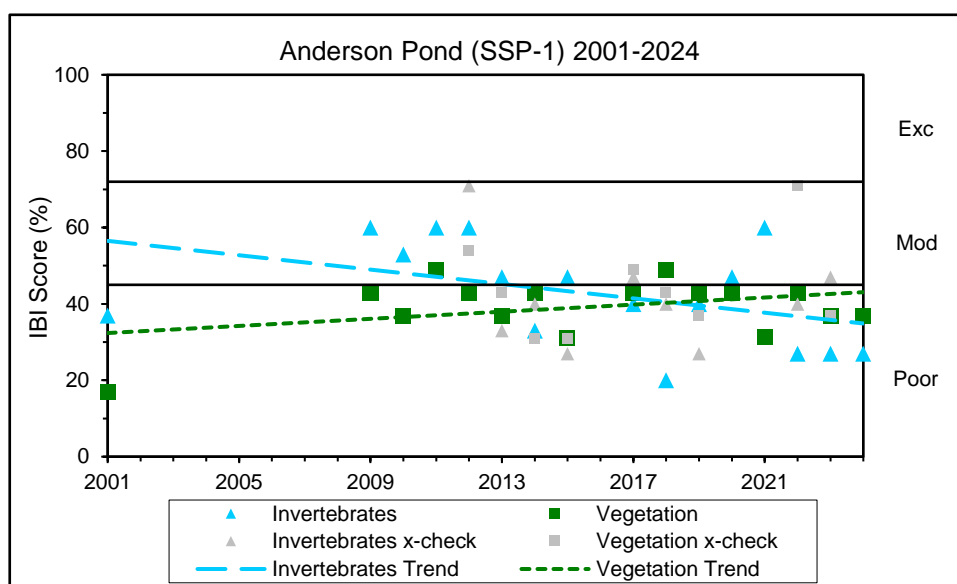
2024 Data (SSP-1)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (8)	Poor (13)
Trend 2001-2024	Variable	Stable

Figure 4.11.1 Invertebrate and vegetation trends for Anderson Pond (SSP-1)



Site Summary: This is the 16th time that Anderson Pond has been monitored for WHEP since 2001. The invertebrate and vegetation scores are consistent, and both scores indicate poor wetland health. The invertebrate scores are variable, though data has been very similar in recent years. Very few invertebrates were collected in 2024, but many fish were found in bottle traps. It is likely that predation impacts the invertebrate population. The vegetation trend appears stable. Highway 52 contributes stormwater input to the wetland. The encroachment of cattail and fluctuating water levels may complicate vegetation plot placement impacting the vegetation score. The vegetation diversity and abundance was low in 2024. Very dense coontail was present, but little to no floating-leaved or emergent vegetation. The data for both invertebrates and vegetation in 2024 is similar to 2023. In 2024, the vegetation plot at this site was also cross-checked by Bolton & Menk who confirmed the South St. Paul team's data.

4.11.2 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, one on the north side, and one on the east side. There is one outlet on the north side of the wetland. It is part of the City's stormwater management plan.



Virtually all of the area that contributes to this wetland is fully developed. In 2008, LeVander Estates, a new development was completed on the east side of LeVander Pond. A trail was constructed down to the pond. During an upgrade at the Wentworth/Thompson interchanges, Minnesota Department of Transportation (MnDOT) installed a pretreatment basin south of the pond to improve drainage. Highway 52 is a major contributor to LeVander Pond as is the City of West St. Paul.

Wetland Health

Site Observations: The wetland slope is gentle. The substrate is moderately mucky. The wetland surface is covered in duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.). Coontail (*Ceratophyllum* sp.) and pondweed (*Potamogeton* sp.) grow in the water column. Cattails (*Typha* sp.), reed canary grass (*Phalaris arundinacea*), willow trees (*Salix* sp.), cottonwood trees (*Populus* sp.), and alder-buckthorn (*Frangula alnus*) were also present in the vegetation releve. No other emergent grasses or forbs were present. Leeches, dragonflies, mayflies, snails, trueflies, crustaceans, and bugs and beetles were collected.

Table 4.11.2 LeVander Pond (SSP-3) Wetland Health based on Index of Biotic Integrity



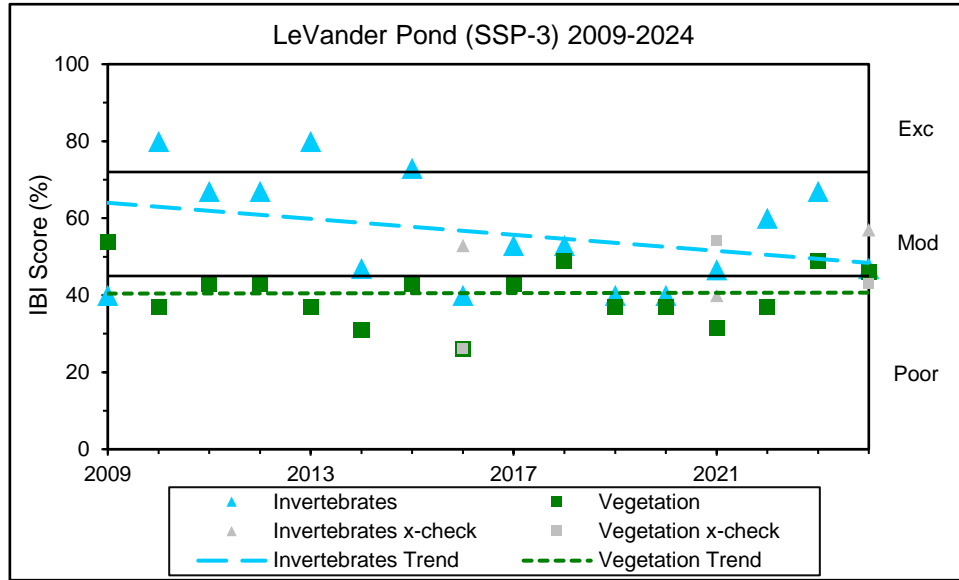
2024 Data (SSP-3)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (14)	Moderate (17)
Cross-check Rating (IBI score)	Moderate (16)	Poor (15)
Trend 2009-2024	Variable	Stable

Figure 4.11.2 Invertebrate and vegetation trends for LeVander Pond (SSP-3)



MARA RANTA, BEN LINTON, AND
ELIO MAGNUSON

Site summary: This is the 16th consecutive year of monitoring LeVander Pond for WHEP. The vegetation and invertebrates scores were consistent with each other in 2024; though the invertebrate score indicates poor wetland health while the vegetation score indicates moderate wetland health. The invertebrate scores have fluctuated between poor and excellent over the years. The presence of dragonflies, mayflies, and caddisflies have varied through the years and influence the scores. The vegetation trend is stable. This wetland has historically lacked emergent vegetation representation, and other species of vegetation represented are found year after year. The invertebrate and vegetation data for 2024 is very similar to 2023. This site was cross-checked by another WHEP team. Both teams collected similar data, and scores were all consistent with each other.

4.12 West St. Paul Wetlands

Four wetlands were monitored in West St. Paul in 2024 by the West St. Paul team. The City of West St. Paul has 26 years of WHEP data! Eleven wetlands have been monitored in West St. Paul since the City became involved with WHEP in 1999.

Team Leader: James Chastek

Team Members: Will Chastek, Molly Davis, Lorena Escobosa Alcanar, Lizzie Gelderman, Jason Grafft, Lewis Jolly, Nicky Kerr-Anderson, Betsy Lehman, Kate Miller, and Maverick Waltz.



JIM CHASTEK

Jim Chastek has been the team leader of the West St. Paul team since 2023. He previously explained,

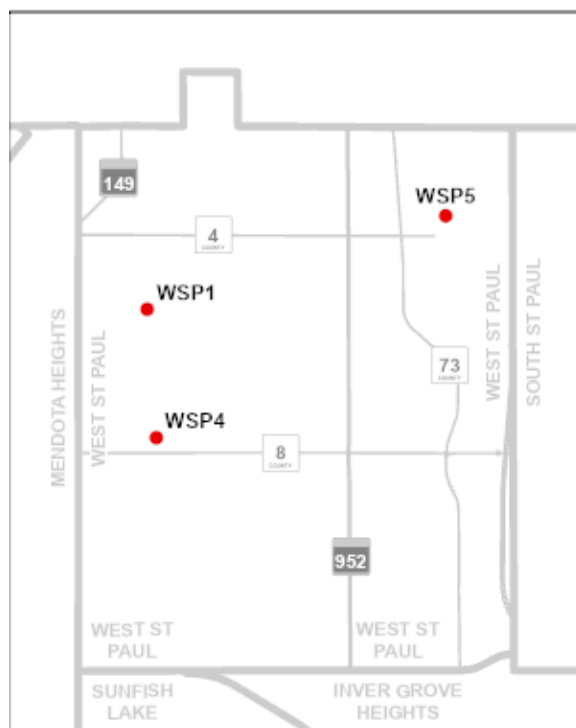
“I have volunteered with WHEP for a little over 20 years. It is mainly getting into ponds that attracted me to the program. I appreciate the training and the support as new questions come up. The beauty and the fine details in plants and tiny wetland invertebrates is probably the thing that most keeps me involved. We have a fun group to work with and that means a lot to me.”

Dave Schletty is the Assistant Parks & Recreation Director at the City of West St Paul. He assists with the City’s coordination of the program. Dave helps select which wetlands to monitor each year and then reviews the data. With so few wetlands within the 95 percent-developed 5-square-mile City, Dave understands the importance of keeping them healthy. He also supervises the City’s Environmental Committee and shares the WHEP data with the group, so together they help educate residents about improving water quality and how to implement best practices. Dave is thankful the dedicated volunteers, “I’ve helped the group a couple times and commend them on their dedication to making the City a better place to live. While the work may seem like a small thing, the data they gather really goes a long way in planning and improvements to the City’s stormwater infrastructure.”



DAVE SCHLETTY

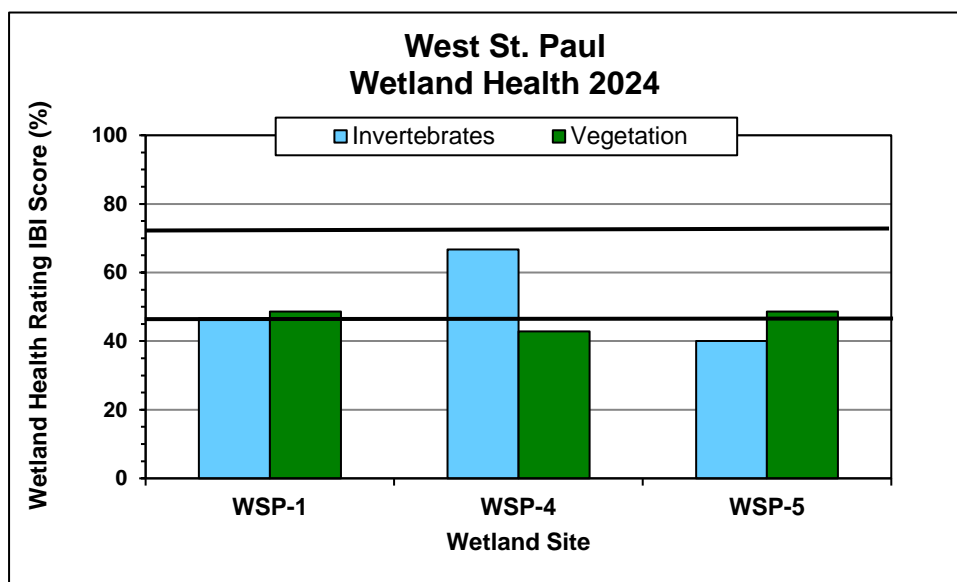
West St. Paul WHEP Sites Monitored in 2024



West St. Paul General Wetland Health

Figure 4.12 presents an overall view of wetland health for all the 2024 monitoring sites in West St. Paul based on the IBI scores for invertebrates and vegetation presented as a percent. Figure 4.12 also illustrates the consistency between the IBI scores (in percent form) for each wetland sampled. Invertebrate and vegetation scores that differ by ten percent or less are considered consistent. Based on the IBI scores, a wetland health rating is assigned as excellent, moderate or poor. The West St. Paul wetland ratings ranged from poor to moderate wetland health in 2024. The invertebrate and vegetation scores for WSP-4 were inconsistent, differing by 24 percent.

Figure 4.12 West St. Paul site scores (percent) for the 2024 sampling season



4.12.1 Mud Lake (WSP-1)

Mud Lake (WSP-1), also known as RW7, is a 3.1-acre, type 3 wetland within the Riverview Tunnel Drainage District. The drainage area is approximately 34 acres, with no impervious surface. It is publicly owned, and is part of the City’s stormwater management plan. The wetland management goal is to improve water quality through better education of residents surrounding the wetland. There are inlets on the southeast and northwest corners of the wetland, and one outlet in the northeast corner.



Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is very mucky, “like taffy.” Teams explain that it is very difficult to walk through this wetland. The shoreline has a very wide (15-20 ft) cattail (*Typha* sp.) fringe. In 2024, the water level seems higher than normal and difficult to wade beyond the cattails. Duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) cover much of the surface of the pond. Coontail (*Ceratophyllum* sp.) and pondweed (*Potamogeton* sp.) represented the submergent

vegetation. Reed canary grass (*Phalaris arundinacea*) and a few emergent forbs were sparsely represented in the vegetation releve. Leeches, snails, true flies, crustaceans, and beetle and bugs were collected.

Table 4.12.1 Mud Lake (WSP-1) Wetland Health based on Index of Biotic Integrity



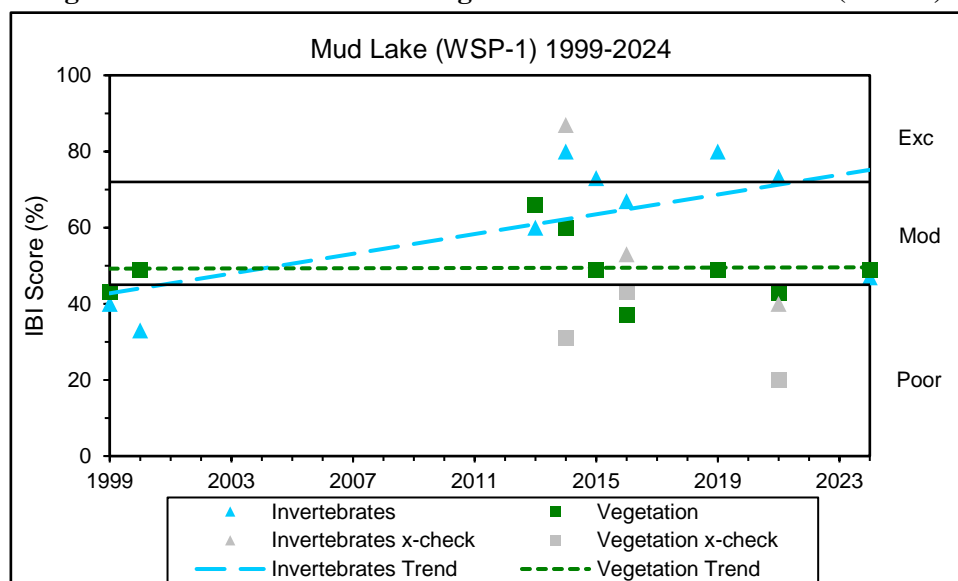
2024 Data (WSP-1)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (14)	Moderate (17)
Trend 1999-2024	Variable	Stable

Figure 4.12.1 Invertebrate and vegetation trends for Mud Lake (WSP-1)



Site Summary: This is the ninth time that Mud Lake has been surveyed for WHEP since 1999. The invertebrate and vegetation scores were very consistent in 2024, though the invertebrates score indicates poor wetland health and the vegetation score indicates moderate wetland health. The invertebrate score is lower in 2024 than in more recent surveys. The vegetation trend is stable with similar scores more recent monitoring events. The wetland has very low diversity of vegetation which likely impacts the invertebrate community.



BETSY LEHMAN, NICKY KERR-ANDERSON,
AND JASON GRAFFT

4.12.2 Weschcke Pond (WSP-4)



Weschcke Pond (WSP-4) is a 21.9-acre, type 4 wetland within the Ivy Falls Creek Watershed. The watershed is 42.4 acres. It is publicly owned, and part of the City's stormwater management plan. It is designated as IF1BP Weschcke Pond. It has one inlet on the south side and one outlet on the north side. This wetland was recently rebuilt and expanded with the Wentworth reconstruction in 2019.



Wetland Health

Site Observations: The wetland slope is steep. The wetland substrate is very mucky. Cattails (*Typha* sp.) prominently enclose the shoreline. Coontail (*Ceratophyllum* sp.) and pondweed (*Potamogeton* sp.) were present in the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) covered the surface of the water. Several emergent forbs and grasses were also observed in the vegetation releve, including sedges (*Carex* sp.), spike-rush (*Eleocharis* sp.), cut grass (*Leersia* sp.), water plantain (*Alisma* sp.), arrowhead (*Sagittaria* sp.), and beggar-ticks (*Bidens* sp.). Reed canary grass (*Phalaris arundinacea*) and purple loosestrife (*Lythrum salicaria*) were also present. Leeches, dragonflies, damselflies, mayflies, snails, trueflies, crustaceans, and beetles and bugs were collected.

Table 4.12.2 Weschcke Pond (WSP-4) Wetland Health based on Index of Biotic Integrity

2024 Data (WSP-4)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Moderate (20)	Poor (15)
Cross-check Rating (IBI score)	Moderate (20)	Moderate (17)
Trend 2000-2024	Stable	Stable

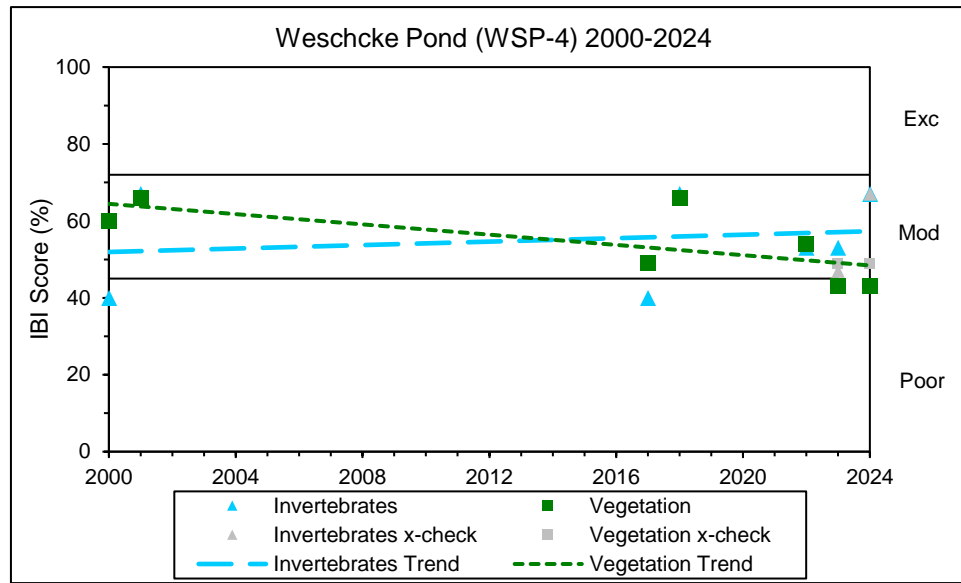


LEWIS JOLLY AND LORENA ESCOBOSA



NICKY KERR-ANDERSON, JASON GRAFFT
AND MAVERICK WALTZ

Figure 4.12.2 Invertebrate and vegetation trends for Weschcke Pond (WSP-4)



Site Summary: This is the seventh time that Weschcke Pond has been surveyed by WHEP volunteers, since 2000. The invertebrate and vegetation scores were inconsistent with each other, differing by 24 percent. The invertebrate score indicates moderate wetland health, while the vegetation score indicates poor wetland health. Similar vegetation has been represented over the years of monitoring. A larger coverage of persistent litter impeded the vegetation score in 2024. The invertebrate data is similar from year to year, and the health trend is stable. The vegetation health trend may be declining. Rising prevalence of persistent litter may continue to impact this wetland. This site was cross-checked by another WHEP team. Scores between the two teams were consistent. The invertebrate and vegetation data was similar between teams. The cross-check team included woody plants in the vegetation releve which aided the vegetation score. This is likely a difference in plot placement between teams.

4.12.3 Lily Lake (WSP-5)

Lily Lake (WSP-5), also known as RW24P, is a 6.4-acre, type 3 wetland within the Riverview Tunnel Drainage District. Its watershed is 22 acres. It is publicly owned. There is one inlet from Carrie Street east of the Carrie Stanley intersection. There is an outlet on the north end to Bernard Street. It is part of the City's stormwater management plan. The wetland management goal is to improve water quality through better stewardship and education of residents surrounding the wetland.

Wetland Health

Site Observations: The wetland slope is steep. The wetland substrate is sandy and firm. The water level deepens quickly upon entry. It is surrounded by houses and trees, including willows (*Salix* sp.), cottonwoods (*Populus* sp.), and elms (*Ulmus* sp.). Coontail (*Ceratophyllum* sp.) fills the water column. White water



lily (*Nymphaea* sp.) and duckweeds (*Lemna* sp. and *Spirodela* sp.) float upon the surface of the water. Pondweed (*Potamogeton* sp.), arrowhead (*Sagittaria* sp.), and smartweed (*Polygonum* sp.) were also represented in the vegetation releve. Buckthorn (*Rhamnus cathartica*) and reed canary grass (*Phalaris arundinacea*) are present. Leeches, snails trueflies, crustaceans, and six bugs and beetles were collected.

Table 4.12.3 Lily Lake (WSP-5) Wetland Health based on Index of Biotic Integrity



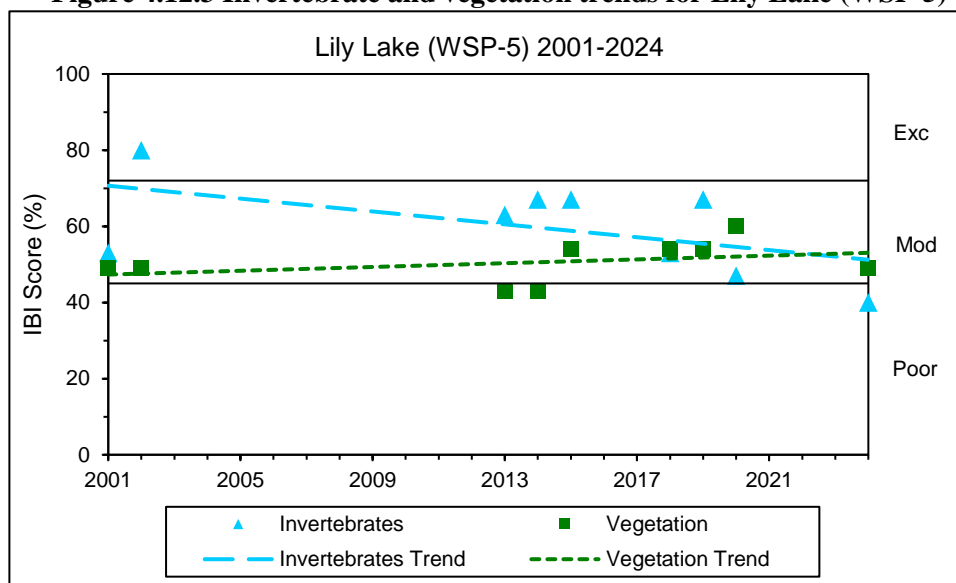
2024 Data (WSP-5)	Invertebrates 	Vegetation 
Wetland Health Rating (IBI score)	Poor (12)	Moderate (17)
Trend 2001-2024	Declining	Stable

Figure 4.12.3 Invertebrate and vegetation trends for Lily Lake (WSP-5)



Site Summary: This is the ninth time that Lily Lake has been surveyed for WHEP since 2001. The invertebrates and vegetation scores were consistent, though the invertebrate score indicates poor wetland health while the vegetation score indicates moderate wetland health. Except for coontail, there is very low abundance of vegetation. There is low diversity of vegetation and invertebrates, in general. The invertebrate collection may be impacted by the presence of fish and tadpoles. The vegetation health trend appears stable while the invertebrate scores have declined in recent surveys.