



2023 Wetland Health Evaluation Program

Dakota County, Minnesota

2023 Wetland Health Evaluation Program Report Dakota County, MN



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February 2024

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Acknowledgements

The following organizations participated in and provided funding for the 2023 Wetland Health Evaluation Program

Local Government:

Dakota County Environmental Resources Department Dakota County Parks Department City of Apple Valley City of Burnsville City of Eagan City of Farmington City of Hastings City of Hastings City of Lakeville City of Mendota Heights City of Rosemount City of South St. Paul City of West St. Paul North Cannon River Watershed Management Organization

Special Recognition:

Mark Gernes, Joel Chirhart, Michael Bourdaghs, John Genet; MPCA Technical Experts Paula Liepold, Dakota County WHEP Coordinator Jeff Korpik, Citizen Monitoring Coordinator Katie Farber, Carolyn Dindorf; Bolton & Menk, Inc.

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Special thanks to all the WHEP volunteers who donated their time.

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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Executive Summary Dakota County Wetland Health Evaluation Program 2023

Dakota County began sponsoring the Wetland Health Evaluation Program (WHEP) in 1997. Since then, 202 wetlands have been monitored by many volunteers across the County. In 2023, ten cities, one watershed management organization, and Dakota County Parks sponsored WHEP teams, monitoring 39 different wetlands. One of these wetlands (E-47) was monitored for the first time in 2023. Two of these wetlands (NC-1 and NC-3) were too dry to monitor. 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 2023 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 (68%) and vegetation (65%). One wetland site rated excellent for invertebrates: EVR-P14 (AV-13). Five wetland sites rated excellent for vegetation: Crystal West (B-1), Tamarack Swamp (DC-3), East Jenson (DC-4), BB's Wetland (DC-6), and Lilypad Pond (DC-7). Eleven (30%) of the wetlands scored poor for invertebrates and eight (22%) of the wetlands scored poor for vegetation. There was agreement between invertebrate and vegetation wetland health ratings for 21 of the wetlands monitored in 2023. In general, water levels were lower again in 2023, the third consecutive year of drought conditions. This likely impaired invertebrate collection and challenged vegetation releve placement that would encompass both shoreline and open water.





A trend analysis was conducted for each of the wetlands monitored in 2023 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, two wetlands are improving, 18 wetlands are stable, and one is declining. Vegetation trends show three of the wetlands improving, 23 are stable, and one is declining. Ten wetlands show variable invertebrate data over the years of their monitoring and four wetlands show variable vegetation data. Nine wetlands did not have enough years of data to demonstrate a health trend.

Thirty 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 2023, 140 Dakota County WHEP volunteers donated more than 2,500 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 welldrained 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 <u>www.bwsr.state.mn.us</u> 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

Paula Liepold and Emily Gable, Dakota County Environmental Resources Department staff, manage WHEP. Paula and Emily state that a dataset containing 25 plus years of biological information is rare. The

continues due program to investments by Dakota County, partner cities, watersheds - and, most important, volunteers. Just this year, 140 volunteers donated more than 2,500 hours in training, macroinvertebrate sample collection and identification, and vegetation surveys to collect and report this valuable biological data. We are also grateful for support from the Pollution Minnesota Control Agency and Bolton & Menk consultants. We look forward to



EMILY GABLE

continuing this important work in the new year."



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, "Being a part of WHEP is a great experience. I have enjoyed it ever since I joined in 2007. It is great getting out to different parts of the county and working with the teams. Thanks to all of the Team leaders for their hard work and to Paula, Emily, Katie, Carolyn, Mark and Joel. I look forward to next season!"

JEFF KORPIK

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.

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





DRAGONFLY GRAPHIC: MPCA 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 2023, 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 2023, Bolton & Menk cross-checked the vegetation plots of four wetlands: Apple Valley's Hidden Valley (AV-1), Hastings' Lake Rebecca (H-6), Lakeville's DNR 393 (L-8), and South St. Paul's Anderson Pond (SSP-1). Bolton & Menk also reviewed the invertebrate samples from sites AV-1, B-2, DC-1, DC-4,



CONNIE FORTIN, CAROLYN DINDORF, KATIE FARBER, DOUG KLIMBAL, CARALIE RANDOLPH

E-34, F-9, H-6, L-8, MH-2, R-4, SSP-1, 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 FCI.

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.

INVERTEBRATE IBI				VEGETATION I	BI
SCORE INTERPRETATION			SCO	RE INTERPRET	ATION
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%

Table 2.1 Interpretation of site IBI scores.

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 2023 Sampling Season Results

During the 2023 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. Eleven of these wetlands were sampled twice through citizen cross-checks. Four wetland vegetation samples and twelve 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 2022 sampling season. Based on invertebrate scores, one of the wetlands rated excellent, 21 rated moderate and 19 rated poor. Invertebrate scores ranged from 8 to 24 out of a maximum of 30 points. Based on vegetation scores, 3 wetlands rated excellent, 29 rated moderate, and 9 rated poor. Vegetation scores ranged from 11 to 29 out of a maximum of 35 points.

2023 Wetland Ratings

FIGURE 3.1.1 2023 WHEP WETLAND RATINGS

Several of the sites showed different ratings for vegetation versus invertebrates. Eighteen 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 <u>www.mnwhep.org</u>.

City	Excellent Moderate		lent Moderate		P	oor
	Invert	Veg	Invert	Veg	Invert	Veg
Apple Valley	1	0	3	4	0	0
Burnsville	0	1	3	3	1	0
Dakota County Parks	0	4	6	4	2	0
Eagan	0	0	1	2	1	0
Farmington	0	0	0	0	2	2
Hastings	0	0	3	3	1	1
Lakeville	0	0	2	2	0	0
Mendota Heights	0	0	1	2	1	0
North Cannon River	na	na	na	na	na	na
Rosemount	0	0	4	2	0	2
South Saint Paul	0	0	1	1	1	1
West Saint Paul	0	0	1	1	2	2
Totals	1	5	25	24	11	8

Table 3.1.1	Wetland	Ratings	by City	Based or	n IBI Scores
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Values are listed as number of wetlands rated in each category for Invertebrates/Vegetation

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



Figure 3.1.2 2023 Invertebrate Scores. Shows the distribution of wetland health ratings for each site monitored in 2023.



Figure 3.1.3 2023 Vegetation Scores. Shows the distribution of wetland health ratings for each site monitored in 2023.

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 <u>AIS Identification Guide</u> by the University of Minnesota CFANS, and the <u>Aquatic Invasive Species Early Detectors: A How to Guide</u> 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 2023 were as predicted. Many of the WHEP wetlands have been found to contain invasive species. In 2023, a species of mosquito fern (*Azolla* sp.) was found in one WHEP wetland: Apple Valley's Hidden Valley (AV-1). Reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), curly-leaf pondweed (*Potamogeton crispus*), Eurasian water-milfoil (*Myriophyllum spicatum*), and mystery snails (*Cipangopaludina chinensis*) are common wetland invaders that were observed in wetlands monitored in 2023. Reed canary grass was observed in 26 of the wetlands, purple loosestrife was observed in 6 of the wetlands, mystery snails were found in 7 of the wetlands, curly-leaf pondweed was observed in 2 of the wetlands, and Eurasian water-milfoil was found in one of the wetlands. 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 additional wetlands, but not specifically identified as the

invasive species. The history of invasive species presence in WHEP monitored wetlands can be found at <u>www.mnwhep.org</u>.

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. In addition, an ANOVA comparing IBI scores for natural, created and stormwater, showed no statistically significant difference between the three scores.

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 8, 8, 8. The highest invertebrate scores, respectively, are 17, 24, 26. The lowest vegetation scores for created, stormwater, and natural wetlands, respectively, are 15, 9, 11. The highest vegetation scores, respectively, are 23, 29, 33.

Wetland health scores vary from year to year. In 2023, 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 <u>www.mnwhep.org</u> 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 <u>www.mnwhep.org</u> 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 1.1 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

In 2023, Dakota County WHEP 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 \pm 10 percent (\pm 0.2 Quantab Units)³.

Thirty-three of the 39 wetlands were tested for chloride. Winter Salt Watch results for the current year can be seen at <u>www.mnwhep.org</u>. A wide-range of chloride concentrations were observed. Nine of the wetlands measured less than 30 ppm (off the chart). One wetland measured chloride levels exceeding the chronic standard, Schwarz Pond (R-4) in Rosemount. Figure 3.1.5 shows the comparison of chloride levels to the invertebrate and vegetation scores calculated in 2023. Only one sample was collected from each wetland. There is not enough data to analyze a trend or complete statistical analysis.

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. <u>stormwater.pca.state.mn.us</u>

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

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 trainings; 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 2023 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 AV-1 were inconsistent, differing by 8 points. The vegetation scores were all consistent. 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-17 and L-8 were identical. Vegetation scores between citizen team and cross-check team for sites DC-4, MH-2, R-26, and SSP-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:

• *AV-1*: The Eagan team identified a more diverse invertebrate community than the cross-check team. This affected the Leech, Odonata, Snail, and Total Taxa Metrics.

Citizen Team	Cross-Check Team	Wetland Evaluated	Invertebrate Score Comparison		Vege Score Co	tation mparison
			Citizen	x-check	Citizen	x-check
Apple Valley	Farmington	AV-1	22	14	17	11
Burnsville	Eagan	B-17	20	20	17	19
DCP Team #1	DCP Team #2	DC-4	20	22	33	33
Eagan	Burnsville	E-47	14	12	19	23
Farmington	NCRWMO	F-3	12	14	11	17
Hastings	Mendota Heights	H-6	18	24	21	19
Lakeville	Rosemount	L-8	18	18	25	19
Mendota Heights	Hastings	MH-2	14	20	19	19
Rosemount	Lakeville	R-26	16	12	13	13
South St. Paul	West St. Paul	SSP-1	8	14	13	13
West St. Paul	South St. Paul	WSP-4	16	14	15	17

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







3.2.2 2023 Quality Control Checks

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-2, DC-1, DC-4, E-34, F-9, H-6, L-8, MH-2, R-4, SSP-1, and WSP-4 were reviewed for invertebrate identification accuracy; AV-1, H-6, L-8, and SSP-1 were reviewed for vegetation identification accuracy.



Apple Valley's Hidden Valley

- HASTINGS' LAKE REBECCA
- LAKEVILLE'S

SOUTH ST. PAUL'S ANDERSON POND

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 errors were not recognized. There was a total of 12 errors found in the vegetation datasheets; 11 transfer errors and 1 metric calculation 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 three 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, 202 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 <u>www.mnwhep.org</u>. Section 4.0 includes the sites sampled in 2023 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.















4.0 Wetland Evaluations

4.1 Apple Valley Wetlands

Four wetlands were monitored within the City of Apple Valley in 2023. This is the 26th year the City has participated in WHEP! Twenty wetlands have been monitored in Apple Valley since the initiation of WHEP in 1997.

Team Leader: Tom and Cindy Taintor

Team Members: Sam Berger, Brad Blackett, Reed Ellingson, Dexter Ellingson, John Fitch, Stacey Hansen, Karen Levisen, Matt Monaghan, Grace Monaghan, Harper Monaghan, Michelle Stressman, Jill Smook, Greta

Wuebben, Kevin Wuebben, and Miles Wuebben.



TOM AND CINDY TAINTOR



Apple Valley WHEP Sites Monitored in 2023

Tom and Cindy Taintor are co-leaders for the Apple Valley WHEP team. They have been involved with WHEP for many years. Cindy commented, "Almost every year that I've been part of WHEP, and certainly since being team leader, I've thought that this was the best season so far. The Apple Valley team makes this job fun. Experienced volunteers know the ropes and show new members how the field work and the lab work is done. I deeply appreciate how smoothly the team works together and that they include everyone. Our youngest members are too small for waders, but they happily hunt for and pick up trash, assist with the salt checks, and help pick through vegetation samples while the bigger folks get to go out in the water and work on shore preserving and labeling the samples.

"Memorable wildlife this year were the little garter snake that Brad bravely and carefully extricated from landscaping netting where it had been stuck. We also encountered a very large snapping turtle on the bank of one pond.

It moved too quickly for a photo. People out in the water were concerned when they heard the excitement, but the snapper swam off in the opposite direction, so no worries. Low water levels were challenging and actually prevented us from getting a usable sample in our cross-check pond. While we were hunting for water there, we found a lot of cattails, *Sparganium*, a little mud, and a very cute family of ducklings. We were able to sample all 4 of our ponds in Apple Valley and had conversations with several people who were curious about what we were doing. We're always happy to explain about WHEP.

"I enjoy learning about the wetland plants and critters, and the opportunity to collect reliable information about the health of local wetlands. I 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."

Samantha Berger is the Water Resource Specialist at the City of Apple Valley and has been coordinating the WHEP program since 2019. She commented, "The past few years I've had the chance to attend the Volunteer Appreciation event and love to see the variety and passion of all the volunteers. Apple Valley is excited to utilize this program to help us track the wetlands in Alimagnet Park as the City begins the process with Dakota County to establish a Natural Resource Management Plan for the Park. Our hope is to gather before and after data as we begin making improvements to the vegetative communities in the park over the next few years with help from Dakota County."



SAMANTHA BERGER

Apple Valley General Wetland Health

Figure 4.1 presents an overall view of wetland health for all the 2023 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 moderate to excellent wetland health based on invertebrate data. All four wetlands scored moderate wetland health based on vegetation data. The invertebrates and vegetation scores for AV-1, AV-12, and AV-13 were inconsistent, differing by 24, 13, and 31 percent, respectively.





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-53, 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 northem 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 continue monitoring over time as a reference wetland. 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 vegetation 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.

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 gets deep fairly 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 (*Circium* sp.), beebalm (*Monarda* sp.), and vervain (*Verbena* sp.). Cattails (*Typha* sp.), reed canary grass (*Phalaris arundinacea*), bur-reed (*Sparganium* sp.), and bulrush (*Scirpus* sp.) surround the wetland. Pondweed (*Potamogeton* sp.) dominated the water column. Water nymph (*Najas* sp.) and coontail (*Ceratophyllum* sp.) were also observed. Duckweeds (*Lemna* sp. and *Spirodela* sp.), water-meal (*Wolffia* sp.), mosquito fern (*Azolla* sp.), and algae clustered over much of the water surface. Spike-rush (*Eleocharis* sp.), water plantain (*Alisma* sp.) and smartweed (*Polygonum* sp.). Species of 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)

2023 Data (AV-1)	Invertebrates 🕺	Vegetation
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (17)
Cross-check Rating (IBI score)	Poor (14)	Poor (11)
Trend 1998-2023	Variable	Variable



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

Site Summary: Hidden Valley has been surveyed 23 times since 1998. The invertebrate and vegetation health scores were inconsistent in 2023, differing by 24 percent; however, both scores indicated moderate wetland health. In general, the invertebrate and vegetation scores have been variable over the years fluctuating between excellent and poor. The vegetation scores have been similar the past three years. Variability in data may be due to factors such as changes in water level and monitoring location within the wetland. AV-1 was cross-checked by another team in 2023. The invertebrate scores between the teams were also inconsistent, differing by 26 percent between invertebrate scores and 18 percent between vegetation scores. The Apple Valley team observed a larger diversity of invertebrates and vegetation species than the crosscheck team. The Apple Valley team included a greater number of emergent forbs and grasses than the cross-check team indicating that plot placement varied between the two teams. This site was also crosschecked by Bolton & Menk. The third-party review verified most of the vegetation within the plot set by the Apple Valley team.



JOHN FITCH, DEXTER ELLINGSON, BRAD BLACKETT

4.1.2 Belmont Park (AV-6)

Belmont Park (AV-6), also known as BD-P10, is a 1.3-acre, type 3 wetland within the Black Dog subwatershed of the Black Dog Lake Watershed. The wetland watershed is 202 acres with 32 acres of direct drainage, and it is 20 percent impervious. There are three inlets in the eastern border of the wetland, one inlet along the northern border, and one inlet along the southern border. There is a lift station at the northwest corner of the wetland. It is designated as a Manage 1, Restore wetland with a goal to continue to monitor periodically and to assess its condition post-sediment removal and road construction conducted in 2017. The wetland is within a largley residentail area, but immediately surrounded by parkland with a wooded buffer.

Wetland Health

Site Observations: The wetland slope is fairly steep and the substrate is very mucky. Cattails (*Typha* sp.) reed canary grass (*Phalaris arundinacea*), and arrowhead (*Sagittaria* sp.) surround the wetland shoreline, and trees extend along the southern border. Coontail (*Ceratophyllum* sp.) heavily dominated the water column of the wetland. Water-nymph (*Najas* sp.) was also found. There were no floating vegetation within plot; however, notes indicate that algae was present. Water plantain (*Alisma* sp.), clearweed (*Pilea* sp.), and smartweed (*Polygonum* sp.) were also observed. Species of leeches, dragonflies, damselflies, snails, trueflies, crustaceans, and true bugs were collected.





REED ELLINGSON

2023 Data (AV-6)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Moderate (17)
Trend 2002-2023	Stable	Stable

Table 4.1.2 Belmont Park (AV-6) Wetland Health based on IBI



Figure 4.1.2 Invertebrate and vegetation trends for Belmont Park (AV-6)

Site summary: This is the ninth time that this wetland has been monitored for WHEP since 2002. The invertebrate and vegetation scores were consistent, both scoring health ratings of moderate. Compared to initial years of data, the trends are declining; however, a few years of data may be skewing the trend, as many years of data appear similar.

4.1.3 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 in 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 in the northwest corner of the wetland, and one inlet along the southwestern shoreline. There is 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 mucky. The water level was low in 2023. Trees surround the wetland, including willow (*Salix* sp.), cottonwood (*Populus* sp.), and ash (*Fraxinus* sp.). Fallen branches and logs lie underwater. Coontail (*Ceratophyllum* sp.) dominated the water column.



CINDY TAINTOR, DEXTER ELLINGSON, STACY HANSEN, REED ELLINGSON, AND BRAD BLACKETT

Water-nymph (*Najas* sp.) was also found. Duckweed (*Lemna* sp.) and water-meal (*Wolffia* sp.) densely covered the surface of the water. Very little emergent vegetation was present, but included sedges (*Carex* sp.), reed canary grass (*Phalaris arundinacea*), jewelweed (*Impatiens* sp.), and smartweed (*Polygonum* sp.). Species of leeches, dragonflies, damselflies, snails, trueflies, crustaceans, and truebugs were collected. Mystery snails were also present.

Table 4.1.3 Everest Pond (AV-12) Wetland Health based on IBI

2023 Data (AV-12)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (20)	Moderate (19)
Trend 2007-2023	Stable	Stable

Figure 4.1.3	Invertebrate and	vegetation tr	ends for Everest	Pond (AV-12)
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Site summary: This is the fifth time that AV-12 has been monitored since the initial survey in 2007. The invertebrate and vegetation scores were inconsistent in 2023, differing by 23 percent; however, both scores indicate moderate wetland health. Health scores appear stable.

4.1.4 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, including 25 acres of 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 City is planning a drawdown of Long Lake in the fall of 2023, which may affect the ponds.



Wetland Health

Site Observations: EVR-P14 is primarily surrounded by residential properties. The wetland slope is steep and the substrate mucky. Cattails (*Typha* sp.) and reed canary grass (*Phalaris arundinaca*) surround the wetland. Coontail (*Ceratophyllum* sp.) filled the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) scattered the water's surface. Low water levels affected vegetation plot placement excluding most emergent plants nearshore. Willows (*Salix* sp.), maple trees (*Acer* sp.), and very few emergent vegetation were represented. Species of leeches, dragonflies, damselflies, caddisflies, snails, trueflies, crustaceans, and bugs and beetles were collected. Tadpoles and fish were found in bottle traps.



CINDY TAINTOR, REED ELLINGSON, DEXTER ELLINGSON

2023 Data (AV-13)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Excellent (24)	Moderate (17)
Trend 2008-2023	Stable	Declining

Table 4.1.4 EVR-P14 (AV-13) Wetland Health based on IBI



Figure 4.1.4 Invertebrate and vegetation trends for EVR-P14 (AV-13)

Site summary: This is the fourth time that AV-13 has been monitored since the initial survey in 2008. The invertebrate and vegetation scores were inconsistent in 2023, differing by 31 percent. The invertebrate score indicates excellent wetland health while the invertebrates score indicates moderate wetland health. Low water levels affected the vegetation plot placement which excluded emergent vegetation nearshore and likely affected the vegetation score; however, dense submergent vegetation provided adequate habitat for a thriving invertebrate community. Tadpoles and fish were found in the bottle traps. More years of data will help determine reliable health trends.

4.2 Burnsville Wetlands

Four wetlands were monitored within the City of Burnsville in 2023. This is the 26th year the City has participated in WHEP! Seventeen wetlands have been monitored in Burnsville since the initiation of WHEP in 1997.

Team Leader: Caitlin Hughes-Parry

Team Members: Don Ackerman, Kristen Anderson, Kenneth Britton, Emily Caouette, Stacy Erickson, Alec Erickson, Doug Hansell, Nic Jacobs, Yousef Mansour, Nadine Mansour, Sally McNamara, Quinn McNamara, Shannon Pipho, Chelsea Schaibly, Tom Ward, and Rae Winegardner


Caitlin has been the Burnsville WHEP Team leader since 2021. She acknowledged, "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 itself is a truly exceptional 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 a curiosity and compassion for these spaces. My favorite thing about WHEP is spending beautiful summer evenings getting muddy with a handful of incredible humans and the occasional frog. The 2023 season was our best season yet; we surveyed four Burnsville wetlands and a cross-check site in Eagan and had an outstanding group of both veteran and new volunteers."

Linnea Wier is the city contact for the Burnsville WHEP team. Her role is to select wetlands for evaluation and provide support as needed. Linnea says "This long-term data set is really valuable information that the City of Burnsville can use to track wetland health over time. Some of the sites are within active habitat restoration areas, while others are more urban. The data collected by WHEP volunteers is a valuable tool to use as changes occur in both types of landscape.

"We could not do this without the many dedicated volunteers over the years. In addition to putting in many hours of work, the volunteers are adaptable and persistent despite hot weather and variable water levels. So, Thank You! Your efforts contribute to the management and protection of the City's natural resources."



CAITLIN HUGHES-PARRY



LINNEA WIER

Burnsville General Wetland Health

Figure 4.2 presents an overall view of wetland health for all the 2023 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 poor to 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-2, B-12, and B-17 were inconsistent, differing by 23, 13, 13, and 18 percent, respectively.



EMILY CAOUETTE, TOM WARD, DOUG HANSELL, AND SHANNON PIPHO



Figure 4.2 Burnsville site scores (percent) for the 2023 sampling season

4.2.1 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. 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.). Coontail (*Ceratophyllum* sp.), pondweed (*Potamogeton* sp.), and bladderwort (*Utricularia* sp.) filled the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.), arrowhead (*Sagittaria* sp.), sedge (*Carex* sp.), spike-rush (*Eleocharis* sp.), bulrush (*Scirpus* sp.), and purple loosestrife (*Lythrum* salicaria) were also present. Slender Riccia (*Riccia fluitans*) and purple-fringed Riccia (*Ricciocarpus natans*) were also observed. Species of dragonflies, damselflies, caddisflies, snails, trueflies, crustaceans, and beetles and bugs were collected.

2023 Data (B-1)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Moderate (18)	Excellent (29)
Trend 1999-2023	Variable	Stable

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





Site Summary: Crystal Lake West has been surveyed 22 times since 1999. The invertebrate and vegetation health scores were inconsistent in 2023, differing by 23 percent. The invertebrate score indicates moderate wetland health while the vegetation score indicates excellent wetland health. Invertebrate 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 presence of tadpoles and crayfish may also impair the invertebrate population. The vegetation score improved in 2023. The presence of bladderwort and nonvascular vegetation enhanced the vegetation score.

4.2.2 Kelleher (B-2)

Kelleher (B-2) is a 0.41-acre wetland located within the MH-3A drainage area of the Credit River Watershed. The MH-3A drainage area is 700 acres with 10 percent impervious surface. Kelleher wetland has no inlets or outlets. It is a protected wetland as part of the City's wetland management plan with goals for flood protection, sediment control, and nutrient removal.



Kelleher is a depressional wetland located within the Kelleher Park, which is adjacent to Murphy-Hanrehan Park (owned by Three Rivers Park District). The wetland lies within an area that the City actively manages as oak savanna. Management activities include prescribed burning, hand seeding, and buckthorn removal.

Wetland Health

Site Observations: The wetland slope is gentle and the substrate is fairly solid. Oily residue was observed on the surface of the water in 2023. Arrowhead (*Sagittaria* sp.) and reed canary grass (*Phalaris arundinacea*) dominate the shoreline. Duckweed (*Lemna* sp.), purple-fringed Riccia (*Ricciocarpus natans*), and slender Riccia (*Riccia fluitans*) scatter on the open water. There were no submergent vegetation within the releve. Beggar-ticks (*Bidens* sp.), water hemlock (*Circuta* sp.), sedges (*Carex* sp.), bulrush (*Scirpus* sp.), and floating pennywort (*Hydrocotyle ranunculoides*) were also observed. Species of leeches, dragonflies, damselflies, snails, trueflies, crustaceans, and bugs and beetles were collected.



Shannon Pipho, Caitlin Hughes-Parry, Rae Winegardner

Table 4.2.2 Kelleher (B-2) Wetland Health based on IBI

2023 Data (B-2)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Moderate (23)
Trend 1998-2023	Stable	Stable

Figure 4.2.2 Invertebrate and vegetation trends for Kelleher Wetland (B-2)



Site summary: This is the seventh year of recorded data for this wetland since 1998. Though both health scores indicate moderate wetland health, the invertebrate and vegetation scores were inconsistent, differing by 13 percent. The health trends appear stable. With the exception of a couple of years, most of the vegetation and invertebrate data scores are consistent.

4.2.3 Terrace Oaks Burnsville Parkway South (B-12)



Terrace Oaks Burnsville Parkway South (B-12), is a 1.7-acre, type 3 wetland located within the E-23 watershed. The drainage area is 68 acres and 5 percent impervious. It has no inlets, but does have one outlet on the north side. The wetland is part of the City's stormwater management plan, and is designated as an Improvement Class with the goal to improve the existing habitat.

The wetland is in a depression surrounded by rolling hills, oak savanna, and woodland. It is bordered to the north by Burnsville Parkway. Several phases of oak savanna restoration have occurred within the park and the drainage area of the wetland, including 19 acres in the park's northwest corner (initiated in 2015), 26 acres surrounding the wetland (2019), and 22 acres in the park's east section

which drain into the wetland (2022). These projects involve large-scale woody removal, seeding with native grasses and wildflowers, follow-up control of invasive species and prescribed burning. As of winter 2022, buckthorn has been removed and trees have been thinned from all areas surrounding the wetland.

Wetland Health

Site Observations: The wetland slope is gentle to flat. The wetland substrate is mucky. Willows (*Salix* sp.), cottonwood trees (*Populus* sp.), reed canary grass (*Phalaris arundinacea*), and cattail (*Typha* sp.) surround the wetland. Duckweeds (*Lemna* sp. and *Spirodela* sp.) spread across the surface of the water. There was only a fragment of water beggar-ticks (*Megalodonta beckii*) found in the water column. Arrowhead (*Sagittaria* sp.), water plantain (*Alisma* sp.), spike rush (*Elocharis* sp.), and reed canary grass dominated the vegetation plot. Bulrush (*Scirpus* sp.), beggar ticks (*Bidens* sp.), and purple fringed Riccia (*Ricciocarpus natans*) were also present. Leeches, dragonflies, damselflies, caddisflies, trueflies, and beetles and bugs were collected.



SHANNON PIPHO AND EMILY CAOUETTE

Table 4.2.3 Terrace Oaks Burnsville Parkway South (B-12) Wetland Health based on IBI

2023 Data (B-12)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Poor (14)	Moderate (21)
Trend 2015-2023	Not enough data	Not enough data



Figure 4.2.3 Invertebrate and vegetation trends for Terrace Oaks Burnsville Parkway South (B-12)

Site summary: This is the third time that Terrace Oaks Burnsville Parkway South has been monitored for WHEP since 2015. The invertebrate and vegetation scores are inconsistent, differing by 13 percent. The invertebrate score indicates poor wetland health while the vegetation score indicates moderate wetland health. Mostly emergent vegetation and little to no submergent vegetation was found in the vegetation plot in 2023. In addition, water levels were shallow, and tadpoles were found in the bottle traps. More data would help determine a reliable health trend.

4.2.4 Alimagnet Powerline ROW (B-17)

Alimagnet Powerline right-of-way (ROW, B-17) is a 2.8-acre, type 5 wetland located within the Alimagnet Lake subwatershed (1,239 acres) of the Vermillion River Watershed. The wetland watershed is 20 acres and includes 10 percent impervious surface. There are no inlets or outlets. The wetland is part of the City's wetland management plan. It is designated as a Protection Class Wetland and is being managed to maintain or improve existing habitat.

Alimagnet Powerline ROW wetland is a large, round, open water wetland within a naturally vegetated area of Alimagnet Park. A large powerline and ROW run along the east side of the wetland, and an unpaved trail runs 30 feet from the north side. Buckthorn removal has



occurred in the surrounding woodland, and additional units within the park are undergoing or will undergo larger scale woodland restoration, involving buckthorn removal in addition to some tree thinning.

Wetland Health

Site Observations: The wetland has a gentle slope and the substrate mucky, but not sticky. The wetland is mostly open water with little emergent and submergent vegetation. The water is very clear. Horned pondweed (*Zannichellia* palustris) and coontail (*Ceratophyllum* sp.) sparsly intersperse the water column, and no floating vegetation is present. Arrowhead (*Sagittaria* sp.), cattail (*Typha* sp.), spike-rush (*Eleocharis* sp.), bulrush (*Scirpus* sp.), cut grass (*Leersia* sp.), reed canary grass (*Phalaris arundinacea*), cottonwood (*Populus* sp.) and oak (*Quercus* sp.) trees were present. Species of leeches, dragonflies, damselflies, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

2023 Data (B-17)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (20)	Moderate (17)
Cross-check Rating (IBI score)	Moderate (20)	Moderate (19)
Trend 2010-2023	Not enough data	Not enough data

Table 4.2.4 Alimagnet Powerline ROW (B-17) Wetland Health based on IBI





Site summary: This is the fourth time that B-17 has been monitored for WHEP since 2010. Both the invertebrate and vegetation scores indicate moderate wetland health; however, the scores are inconsistent, differing by 18 percent. This wetland was cross-checked by another team. The invertebrates and vegetation data between teams were similar. More years of data would help determine a reliable health trend.

4.3 Dakota County Parks Wetlands

Two teams monitored eight wetlands for Dakota County Parks in 2023. This is the ninth year that Dakota County has monitored wetlands with WHEP. Ten wetlands have been monitored for the Parks Department since 2015.

Team Leaders:

Marianne McKeon Buck (Team 1) Jennifer Kanz (Team 2)

Team 1 Members:

Paul Leeder, Mark Niznik, Alan Nordquist, Gabrielle Robinson-Bajuscik, Tina Shepard, William Smith, Abigail Sloot, and Asta Stark

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



Dakota County WHEP Sites Monitored in 2023



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 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 expressed, "Thanks to all of the volunteers this year. We survived the mud and heat, and we saw lots of cool critters!"

Chris Klatt is Dakota County Parks' WHEP contact. He stated, "Dakota County Parks' mission is to enrich lives by providing high quality recreation and education

opportunities in harmony with natural resource preservation and stewardship. We're currently maintaining over 1,000 restored acres and actively restoring an additional 900 acres within the County Park system. To ensure we're having a positive impact on wetland plant communities, thereby enhancing their habitat value, we're committed to ongoing monitoring of our restorations. We are grateful for the opportunity WHEP provides to engage volunteers to study the health of the wetlands in Lebanon Hills Regional Park, both to inform the success of past restoration efforts, and inform future needs to improve water and habitat quality in our Parks."



CHRIS KLATT

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 m^2 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.



DAKOTA COUNTY PARKS TEAM



Figure 4.3 Dakota County Parks site scores (percent form) for the 2023 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 farily mucky with many fallen logs. Small representations of several plants are present including duckweed (*Lemna* sp.), water-meal (*Wolffia* sp), pondweed (*Potamogeton* sp.), arrowhead (*Sagittaria* sp.), cattail (*Typha* sp.), sedges (*Carex* sp.), bulrush (*Scirpus* sp.), dogwood (*Cornus* sp.), willows (*Salix* sp.), cottonwood (*Populus* sp.), and several other upland forbs. Leeches, dragonflies, damselflies, caddisflies, snails, fingernail clams, trueflies, and beetles and bugs were collected. Mystery snails were also present.

2023 Data (DC-1)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (23)
Trend 2015-2023	Not enough data	Not enough data

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

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



Site summary: This is the sixth time that Empire Lake has been monitored by WHEP since 2015. The invertebrate and vegetation scores were consistent, and both scores indicate moderate wetland health. This wetland has a higher diversity of emergent vegetation; however, the plants are only sparsely represented and no submergent and little floating vegetation was represented. Both health trends appear to be declining; however, both scores improved in 2023. More years of data will help determine a more reliable wetland health trend.

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



BUCK POND

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. Species of vegetation represented in the vegetation releve included pondweed (*Potamogeton* sp.), arrowhead (*Sagittaria* sp.), sedges (*Carex* sp.), spike-rush (*Eleocharis* sp.), bulrush (*Scirpus* sp.), and reed canary grass (*Phalaris arundinacea*), and several upland forbs and grasses. Leeches, dragonflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

2023 Data (DC-2)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Moderate (21)
Trend 2015-2023	Stable	Improving



Site summary: This is the ninth 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 completion of the restauction in the area. For whenever and floating leaved plants were consistent and plants were completed in 2022; however

invertebrate trend is stable. The vegetation trend is showing improvement, especially since completion of the restoration in the area. Few submergent and floating leaved plants were represented in 2023; however, several emergent forbs and grasslike plants were present. This may be due to plot placement.

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 largescale 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.



TAMARACK SWAMP

Wetland Health

Site Observations: The wetland slope is gentle and the substrate is solid. The wetland was described as dry at the time of the vegetation survey in early July (both 2022 and 2023). Though a high diversity of emergent forbs, grasslike plants, and trees were present, no submergent or floating leaved vegetation were represented. Sensitive fern (*Onoclea sensibilis*), smartweed (*Polygonum* sp.), arrowhead (*Sagittaria* sp.), sedges (*Carex* sp.), spike-rush (*Eleocharis* sp.), bulrush (*Scirpus* sp.), and several other upland forbs were present. Leeches, damselflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles, including many *Corixidae* species were collected.



DAKOTA COUNTY PARKS WHEP VOLUNTEER

2023 Data (DC-3)	Invertebrates 🤾	Vegetation
Wetland Health Rating (IBI score)	Poor (12)	Excellent (27)
Trend 2016-2023	Stable	Improving

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



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

Site summary: This is the eighth consecutive year that Tamarack Swamp has been monitored by WHEP. The invertebrate and vegetation scores were inconsistent, differing by 37 percent. The vegetation score indicates excellent wetland health. A high representation of emergent woody, grasslike, and forb species add to the vegetation diversity. The invertebrate score indicates poor wetland health. Low water levels and lack of aquatic vegetation may have impaired the invertebrate community in 2023. There is a high proportion of *Corixidae*, which is an indicator of poor wetland health. Data is similar in 2022 and 2023. The invertebrate wetland health trend appears stable while the vegetation trend appears to be improving.

4.3.4 Jensen Lake East (DC-4)

Jensen Lake (DC-4) is a 50-acre, type 5 wetland located in the Lower Minnesota River watershed. The pond's watershed is approximately 330 acres with seven percent impervious surface. The watershed in this area of the south metro has been greatly changed/altered with the building of roads, commercial industry, and residential areas. The general water flow is still in the same direction; however, altered with the addition of Pilot Knob Road culverts and overall landscape



altering. There is a culvert running under Pilot Knob Road that connects two small ponds on either side of the road. The pond adjacent to Jensen Lake was created to collect sediment, salt, and fertilizers from entering into Jensen Lake. When this pond reaches a certain depth, the excess water flows into Jensen without these contaminants. Jensen Lake drains into Sedge Pond in the northeast corner. There are raingardens that filter runoff from the Jensen Lake Trailhead parking lots and native plantings downslope of these infiltration basins.

Historically, the land north of Jensen Lake was agriculture and pastured land. The woodland surrounding Jensen Lake was most likely grazed with cattle. The Natural Resource Department is in the process of restoring 175 acres in the surrounding adjacent acres in Lebanon Hills. The north-facing woodland slope of Jensen Lake was identified by the MN DNR as a high-quality Mesic Oak Forest. The north and east woodlands were more degraded with invasive species like buckthorn and honeysuckle which were removed and treated during restoration of this area. There are patches of reed canary grass and non-native cattails still present. Baseline data is wanted to monitor the change over time in this natural area as the land is restored and maintained to the proper native plant community. Along with vegetation surveys, turtle visual and trapping surveys, and insect surveys, Dakota County would like the invertebrate and plant survey information that WHEP supplies to monitor this restoration area. The goal is to minimize invasive species and maximize the cover of native species.



DAKOTA COUNTY PARKS WHEP TEAM

Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is fairly solid. Vegetation within the releve was largely diverse, though low in population sizes. Coontail (*Ceratophyllum* sp.) densly filled the water column. Water-nymph (*Najas* sp.), and bladderwort (*Utricularia* sp.) were also found. Yellow water-lily (*Nuphar* sp.) covered the surface of the water. White water-lily (*Nymphaea* sp.) and duckweed (*Lemna* sp.) were also present. Dogwood (*Cornus* sp.), cottonwood (*Populus* sp.), oak (*Quercus* sp.), sedge (*Carex* sp.), three-way sedge (*Dulichium arundinaceum*), bulrush (*Scirpus* sp.), iris (*Iris* sp.), arrowhead (*Sagittaria* sp.), bur-reed (*Sparganium* sp.), and several other emergent forbs and grasses were represented. Leeches, dragonflies, damselflies, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

2023 Data (DC-4)	Invertebrates	Vegetation			
Wetland Health Rating (IBI score)	Moderate (20)	Excellent (33)			
Cross-check Rating (IBI score)	Moderate (22)	Excellent (33)			
Trend 2016-2023	Stable	Stable			

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Table 4.5.4 Jensen Lake Last	(DC-4) пеани	Daseu on	muex	OI DIOUC	megnity	y



Figure 4.3.4 Invertebrate and vegetation trends for Jensen Lake East (DC-4)

Site summary: This is the seventh year that Jensen Lake East has been monitored by WHEP since 2016. The invertebrate and vegetation scores were inconsistent with each other, differing by 27 percent. The invertebrate score indicates moderate wetland health while the vegetation score indicates excellent wetland health. The invertebrate health trend appears stable. The excellent vegetation rating in 2023 tilted the vegetation health trend to improving. There is a large diversity of vegetation represented, including many upland forbs and trees. This site was cross-checked by another WHEP team. The scores between the teams are consistent. The vegetation data is very similar.

4.3.5 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.

Wood Pond is near a restored and maintained prairie. Historically, the area was used for grazing.



Upstream wetlands to the north and west were not completely restored with previous restoration efforts. Continuous monitoring will serve to observe changes as activities progress.

Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is solid beneath a layer of organic matter. The wetland dried-up between the macroinvertebrate sampling in mid-June and the vegetation survey in late July; however, the team commented that this wetland was drier in 2022 when unable to be sampled. Though a high diversity of emergent forbs, grasslike plants, and trees were present, they were represented in low proportions. Beggar-ticks (Bidens sp.), water arum (Calla palustris), marsh marigold (Caltha palustris), water hemlock (Cicuta sp.), jewelweed (Impatiens sp.), arrowhead (Sagittaria sp.), sedges (Carex sp.), three-way sedge (Dulichium sp.), marsh fern (Thelypteris sp.) and a few other upland forbs and grasses were present. Sparse populations of coontail (Ceratophyllum sp.), waterweed (Elodea sp.), yellow water lily (Nuphar sp.), white water lily (Nymphaea sp.), and duckweed (Lemna sp.) were observed in the water. Reed canary grass (Phalaris arundinacea) and purple loosestrife (Lythrum salicaria) were also present. Leeches,



MARK NIZNIK

dragonflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

Table 4.3.5 \	Wood Pond	(DC-5)) Health based	on Index	of Biotic	Integrity
		()				

2023 Data (DC-5)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Moderate (23)
Trend 2018-2023	Stable	Stable



Figure 4.3.5 Invertebrate and vegetation trends for Wood Pond (DC-5)

Site summary: This is the fifth year that Wood Pond has been monitored by WHEP since 2018. The invertebrate and vegetation scores were consistent with each other, and both scores indicate 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. This wetland was too dry to survey in 2022.

4.3.6 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, with natural oak forest surrounding the wetland. This wetland is significant

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due to the presence of Blanding's turtles that live in the area throughout most of the year. 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. Dragonflies, damselflies, snails, fingernail clams, crustaceans, and bugs and beetles were collected.



BBS WETLAND

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	(,				

2023 Data (DC-6)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Excellent (27)
Trend 2018-2023	Variable	Stable



Figure 4.3.6 Invertebrate and vegetation trends for BB's Wetland (DC-6)

Site summary: This is the sixth consecutive year that BB's Wetland has been monitored by WHEP. The invertebrate and vegetation scores were inconsistent with each other, differing by 24 percent. The invertebrate score indicates moderate wetland health, and the vegetation score indicates excellent wetland health. Vegetation health scores have been identical for three consecutive years. The 2023 invertebrate score is also identical to 2022. Despite identical health scores for the past 2 to 3 years, the population make-up for both invertebrates and vegetation is different in 2023 than in 2022.

4.3.7 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 surfacePondweed (*Potamogeton* sp.), bladderwort (*Utricularia* sp.), coontail (*Ceratophyllum* sp.), and milfoil (*Myriophilium* sp.) crowd 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.), reed canary grass (*Phalaris arundinacea*), and other upland forbs, grasses, and woody species were represented in vegetation releve. Leeches,



LILYPAD POND

dragonflies, mayflies, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

2023 Data (DC-7)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (20)	Excellent (33)
Trend 2010-2023	Variable	Variable

Table 4.3.7 Lilypad Pond (DC-7) Health based on Index of Biotic Integrity



Figure 4.3.7 Invertebrate and vegetation trends for Lilypad Pond (DC-7)

Site summary: This is the seventh year (sixth 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 27 percent. Invertebrate data indicates a moderate wetland health.

The vegetation data indicates excellent wetland health. The invertebrate and vegetation communities are more diverse in 2023 than 2022. The denser vegetation likely provided habitat for the invertebrate population. There was little to no submergent vegetation in 2022. Data appears variable, and sampling location likely impacts results.

4.3.8 Thompson Lake (DC-13)

Thompson Lake (DC-13), formerly WSP-2, is a 10acre, 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. The wetland had dried up between the invertebrate collection in late-June and the vegetation survey in early-August. 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.) and water-smartweed (Polygonum sp.) floated on the surface of the water. Coontail (Ceratophyllum sp.), waterweed (Elodea sp.), water-milfoil (Myriophyllum sp.), and pondweed (Potamogeton sp.) were in the water column. Sedges (Carex sp.), flatsedge (Cyperus sp.), three-way sedge (Dulichium arundinaceum), rush (Juncus sp.), bulrush (Scirpus sp.), water plantain (Alisma sp.), pickerelweed (Pontedaria cordata), arrowhead (Sagittaria sp.), bur-reed (Sparganium sp.), and several other emergent grasses, forbs, and woody species were present. Leeches, dragonflies, damselflies, caddisflies, snails, true flies, and crustaceans, and bugs and beetles were collected.



DAKOTA COUNTY PARKS WHEP TEAM COLLECTING INVERTEBRATES

2023 Data (DC-13)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Poor (12)	Moderate (23)
Trend 1999-2023	Stable	Improving

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

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



Site summary: This is the twelfth time that Thompson Lake has been monitored by WHEP, and the second 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 inconsistent with each other, differing by 26 percent. The invertebrate score indicates poor wetland health while the vegetation score indicates moderate wetland health. Vegetation diversity is high; however, little submergent and floating vegetation presence may impact invertebrate habitat potential. Data is similar for monitoring years 2022 and 2023. The invertebrate health trend is stable while the vegetation health trend appears to be improving.

4.4 Eagan Wetlands

Two wetlands were monitored within the City of Eagan in 2023. The City has 26 years of data! Forty-six wetlands have been monitored in Eagan since the initiation of WHEP in 1997.

Team Leader: Hannah Figura and Chris Figura

Team Members: Nicole Deziel, Paul Edsten, Bekka Ginzburg, Craig Harnagel, Diane Lazarus, Rob McKenna, Mark Niznik, Jenna Olson, Brian Raney, William Smith, Greg Svendsen, and Finn Ward



This is Hannah Figura's fourth year as Eagan WHEP team leader, with her father Chris assisting as an equipment and administrative assistant. Hannah is currently a student at the University of Wisconsin–Stevens Point where she is majoring in Water Resource Management with a focus in wetland delineation. "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."





JENNA OLSON AND JESSIE KOEHLE

Eagan's new Water Resources Manager, Jenna Olson, brings with her years of experience managing Water Resources

HANNAH FIGURA

Policy and Programs for the City of Burlington, Vermont. Jenna's background includes stormwater management, green infrastructure, and environmental law and policy. She is settling in nicely and is already adored by her Eagan team! Jenna has a young family, a cat, dog, and Betta fish at home, and enjoys cooking, gardening, paddling, hiking, and good jokes. (Don't mention anything to her about spiders, though!) Alongside Jenna, Water Resources Specialist Jessie Koehle continues to enjoy her 16+ year career with Eagan's Lakes and Wetlands program, using her background in fisheries and aquatic science to serve Eagan's community in a multitude of ways. You can find Jessie teaching one of the many free fishing events around Eagan, driving the plant harvester, pulling in fishing survey nets, taking water samples from a canoe,

measuring oxygen levels in lakes through the ice in wintertime, or at her desk mulling over the piles of water-quality-related data every year that pour in from government and volunteer sources alike. Jessie's

kiddos are getting older but still keep her busy, and in her free time she enjoys reading, cooking, and gardening, and would like to spend more time fishing herself!

Everyone on the Eagan Lakes and Wetlands team appreciates all the hard work that WHEP volunteers put in every year, and knows 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. 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 2023 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 2023. The Eagan wetlands exhibited poor to moderate wetland health based on invertebrate data, and moderate wetland health based on vegetation data. The invertebrates and vegetation scores for E-34 were inconsistent in 2023, differing by 19 percent.



Figure 4.4 Eagan site scores (percent form) for the 2023 sampling season

4.4.1 McCarthy Lake (E-34)

McCarthy Lake (E-34), also known as JP-9, is an 11.3-acre, type 5 wetland within the Eagan-Inver Grove Heights Watershed within the City's "J" stormwater district that eventually drains to Fish Lake. The watershed has 220 acres with approximately 15 percent impervious surface. There are four inlets: one on the north, south, west, and east shores. The inlet on the eastern shore is notably large and near the suggested access site for WHEP surveys. There is one outlet on the northernmost point of the wetland. Water flows northwest from this point. The wetland is included in the City's stormwater management plan, and is designated as a Class L3 lake which the City intends to support for wildlife habitat, diverse wetland vegetation, educational opportunities, and aesthetics. The City has a general wetland management plan.



The area immediately surrounding McCarthy Lake is fairly unimpacted as it is within Patrick Eagan Park. Large wooded natural areas help protect the shoreline. About 2/3 of the watershed is residential or roadway. Stormwater from the street and residential runoff feeds into this lake. Water clarity is often poor. Raingardens filter water from parking lot near playground. There are steep banks in some places; sediment removal is possible. Future BMP additions are being considered.

Wetland Health

Site Observations: The wetland slope is gentle. The bottom of the wetland is composed of woody debris and silt. Pondweed (*Potamogeton* sp.), waterweed (*Elodea* sp.), coontail (*Ceratophyllum* sp.), and water-crowfoot (*Ranunculus* sp.) fill the water column. Duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) float across the wetland surface. Smartweed (*Polygonum* sp.), flatsedge (*Cyperus* sp.), and cutgrass (*Leersia* sp.) were also present in the releve. Dragonflies, damselflies, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and beetles and bugs were collected.

2023 Data (E-34)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (22)	Moderate (19)
Trend 2012-2023	Not enough data	Not enough data

Table 4.4.1 McCarthy Lake (E-34) Wetland Health based on Index of Biotic Integrity



Figure 4.4.1 Invertebrate and vegetation trends for McCarthy Lake (E-34)

Site summary: This is the second time that E-34 has been surveyed since 2012. The invertebrates and vegetation scores were inconsistent, differing by 19 percent; however, both scores indicate moderate wetland health. More years of data will help determine a more reliable wetland health trend.

4.4.2 Almquist Lake (E-47)

Almquist Lake (E-47), also known as BLP-4, is a 9.4-acre, type 5 wetland within the Eagan-Inver Grove Heights Watershed, within the City's "BL" stormwater district that eventually drains to Thomas Lake. The watershed has 245 acres of direct drainage with 30 percent impervious surface. There are three inlets: one in the northwest, southwest, and southeast corners of the wetland. There is one outlet along the northwestern shore near an inlet. The water is pumped with electric pump up and out to other storm pipes down the line. The wetland is included in the City's stormwater management plan, and is designated as a Class L3 lake which the City intends to support for wildlife habitat, diverse wetland vegetation, educational opportunities, and aesthetics. The City has a general wetland management plan.



The entire watershed is residential or roadway. Stormwater from street and residential runoff feeds into this lake. Water has had poor clarity and high phosphorus for more than a decade. Large wooded natural areas help protect shoreline. One storm pond intercepts water from the northwest corner. Future BMP additions are currently being considered.

Goldfish, along with bullheads and minnows, were found in the pond. In Fall 2022, a chemical treatment of rotenone was applied in hopes of removing the invasive goldfish and improve water quality and ecosystem health. In the fall of 2023, aluminum sulfate (alum) was then applied to the pond to reduce phosphorus. A small number of remaining goldfish were found to have survived the rotenone and subsequent winter, so attempts were made at netting them out with the help of an electroshocking boat, but still some escaped. Future attempts at goldfish control may involve stocking bluegill which have been known to eat carp eggs and limit reproduction. We plan to survey this pond again in future to examine the effects goldfish control and alum treatment have on plant and insect communities.

Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is sand, gravel, and muck. Pondweed (*Potamogeton* sp.), and water-nymph (*Najas* sp.) dominate the water column. Coontail (*Ceratophyllum* sp.) is also present. Duckweed (*Lemna* sp.) and yellow water lily (*Nuphar* sp.) sparsely float on the open water. Sedges (*Carex* sp.), reed canary grass (*Phalaris arundinacea*), and small representations of other emergent forbs were also present. Leeches, damselflies, snails, trueflies, crustaceans, and bugs and beetles were collected.

2023 Data (E-47)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Poor (14)	Moderate (19)
Cross-check Rating (IBI score)	Poor (12)	Moderate (23)
Trend 2023	Not enough data	Not enough data

Table 4.4.2 Almquist Lake (E-47) Wetland Health based on Index of Biotic Integrity

Site summary: This is the first time that Almquist Lake has been surveyed for WHEP. The invertebrate and vegetation scores were consistent; however, the invertebrate score indicated poor wetland health while the vegetation score indicated moderate wetland health. This wetland was cross-checked by another WHEP team. The vegetation scores between teams were inconsistent, differing by 12 percent. The cross-check team estimated a greater Carex cover than the City team which enhanced the Carex Metric score and overall vegetation score by four points. 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 2023. The City has 26 years of data! Nine wetlands have been monitored in Farmington since the initiation of WHEP in 1997.

Team Leader: Rick Schuldt

Team Members: Melanie Chaput, Josiah Hakala, Denise Hennigar, Rollie Greeno, Katie Koch-Laveen, and Calan Schuldt.

Rick Schuldt has been involved with the Farmington WHEP team for 13 years, including 7 years as team leader. He spent two years in the US Army following graduation from the University of Minnesota with a major in Wildlife Management. He enjoyed over 30 years of employment with the US Fish and Wildlife Service as a fisheries biologist and regional manager. His career included years of field work on Great Lakes tributaries in the Sea Lamprey Control Program. Following retirement from the Regional Office in the Twin Cities he chose to volunteer with WHEP which afforded him the opportunity to continue learning about aquatic plants and creatures of our wetlands.

This year has provided challenges due to another very dry summer. The city reduced surveys to include two wetlands as opposed to our normal three. One of the two included Autumn Glen, a shallow wetland in the city. We were able to sample macroinvertebrates though the water was very low. The site became completely dry for only the second year during 13 years of sampling. It was not possible to sample wetland plants. As a result of the dry conditions the city replaced Autumn Glen with a deeper wetland, the Cambodia Avenue site. Due to the experience of last year we attempted to move up our sampling dates for our sites to as early as possible but low water proved unavoidable. Special thanks are warranted for the great turnout of our volunteers throughout the year.

Farmington WHEP Sites Monitored in 2023





ROLLIE GREENO, CALAN SCHULDT, MELANIE CHAPUT, JOSIAH HAKALA, DENISE HENNIGAR, KATIE KOCH-LAVEEN, AND RICK SCHULDT



RICK SCHULDT IN THE LAB

Farmington General Wetland Health

Figure 4.5 presents an overall view of wetland health for all the 2023 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. Both wetlands indicate poor wetland health based on invertebrate and vegetation scores. Invertebrate and vegetation health scores were inconsistent for F-9, differing by 16 percent.





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. Anglers use this site to launch kayaks, canoes, and small boats, though not heavily accessed. This wetland has had low water conditions since 2021. With the exception of cattails, emergent plants were not included in the vegetation plot due to the retreating shoreline. Duckweeds (Lemna sp. and Spirodela sp.), water-meal (Wolffia sp.), and algae (more than usual) covered the open water. Pondweed (Potamogeton sp.) filled the water column. Water milfoil (Myriophyllum sp.) and coontail (Ceratophyllum sp.) were also present. Invasive species, including curly-leaf pondweed (Potamogeton crispus) and Eurasian water-milfoil (Myriophyllum spicatum) were identified. Dragonflies, mayflies, snails, tureflies, crustaceans, and one beetle were collected.

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

2023 Data (F-3)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Poor (12)	Poor (11)
Cross-check Rating (IBI score)	Poor (14)	Moderate (17)
Trend 1998-2023	Stable	Variable



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

Site summary: Kral Pond has been monitored for 26 consecutive years. The invertebrate and vegetation scores were consistent in 2023, and both scores indicate poor wetland health. Low water levels since 2021



DENISE HENNIGAR AND CALAN SCHULDT

are likely impairing invertebrate and vegetation communities. The vegetation data has been variable throughout the years, and the scores appear to gradually undulate each decade. The invertebrate scores are consistently poor with the exception of data collected in 1998, 2014, and 2022. This site was cross-checked by another WHEP team. The vegetation scores were inconsistent between teams, differing by 18 percent. The City team estimated a high cover of cattail in the releve which negatively affected the Persistent Litter Metric. The teams actually had very similar vegetation survey data, minor differences greatly impacted the overall scores. Plot placement and survey timing may have caused differences in data collection between teams.

4.5.2 Cambodia Avenue (F-9)

Cambodia Aveune (F-9) is a 5-acre, type 5 wetland within the Vermillion River Watershed. The wetland drainage area is 24 acres with 9 percent impervious surface. There is one inlet on the southwest corner of the wetland and one outlet in the northeast end of the wetland. It is included in the City's Stormwater Management Plan, and is designated as a Manage 2 wetland. The management goals are to monitor and document how different land uses impact man-made wetlands over time.



A wide buffer zone with native vegetation surrounds the wetland. Much of the surrounding area is agricultural land; however, development of residential homes exists to the north and west of the wetland.

Wetland Health

Site Observations: The wetland slope is steep at the shoreline. The substrate is mucky with firm sand beneath. It is a small wetland surrounded by cattails (*Typha* sp.) with open water covered by white water lilies (*Nymphaea* sp.) and duckweeds (*Lemna* sp. and *Spirodela* sp.). Dense populations of coontail (*Ceratophyllum* sp.) dominated the water column. Pondweed (*Potamogeton* sp.) was also present. No emergent vegetation was found in releve. Dragonflies, mayflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected. Five northern pike were captured in the bottle traps.



CALAN SCHULDT, KATIE KOCH-LAVEEN, AND DENISE HENNIGAR TABULATE PLANT DATA

2023 Data (F-9)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Poor (14)	Poor (11)
Trend 2018-2023	Improving	Stable

Table 4.5.2 Cambodia Avenue (F-9) Wetland Health based on Index of Biotic Integrity

Figure 4.5.2 Invertebrate and vegetation trends for Cambodia Avenue (F-9)



Site Summary: This is the sixth consecutive year that Cambodia Avenue wetland has been surveyed for WHEP. Invertebrate and vegetation scores were inconsistent with each other, differing by 16 percent; however, both scores indicate poor wetland health. The wetland is crowded with vegetation providing invertebrate habitat; however, the diversity of vegetation is low. Five northern pike were caught in the bottle traps in 2023. This is the second year the northern pike have been present in bottle traps, which per the DNR may have resulted from adults that traveled upstream from the Vermillion River to spawn. Rick Schuldt commented, "Why the fish chose to squeeze through the small hole of the bottle traps is a mystery." The vegetation trend appears fairly stable through



ROLLIE GREENO, CALAN SCHULDT, DENISE HENNIGAR, AND MELANIE CHAPUT PROCESS BOTTLE TRAPS

the years of monitoring for WHEP. Overall, the invertebrates scores have improved each year surveyed; however, the score declined again in 2023. Low water levels and the presence of fish may have impacted the invertebrate population.

4.6 Hastings Wetlands

Four wetlands were monitored within the City of Hastings in 2023. The City has 25 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: Tricia Bremer, Sophie Keith, Todd Keith, Rolf Lalone, Rick Logan, Mary Miller, Mike Nelson, Dwight Smith, and Dani Weinel.



JESSIE ECKROAD AND ALEX THEISEN

The 2023 season was Jessie Eckroad's ninth 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 fortunate to count many of her teammates as friends.

Jessie's favorite WHEP activity is identifying macroinvertebrates in the lab and spending time in the field with her husband.

John Caven is the Assistant City Engineer for the City of Hastings. He has been the WHEP City contact and administrator since 2010. His role includes selecting the wetlands to be monitored as well as being a communication link for the City. He said, "The dedicated volunteers had another successful year to which is very much appreciated by the City of Hastings. The health of area ponds depend on the surrounding land management practices. The many hours of hard work provide the data necessary for City officials to make informed decisions. Thank you!"



JOHN CAVEN

Hastings WHEP Sites Monitored in 2023

Hastings General Wetland Health

Figure 4.6 presents an overall view of wetland health for all the 2023 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 moderate wetland health for both invertebrate and vegetation scores in 2023. Invertebrate and vegetation scores for H-4 and H-57 were inconsistent, differing by 21 and 10 percent, respectively.



John Kaufman, Dwight Smith, Jenz Kaufman, Rolf Lalone, and Julia Kaufman



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. Sparse vegetation was present. Coontail (*Ceratophyllum* sp.), pondweed (*Potamogeton* sp.), Sago pondweed (*Stuckenia pectinata*), duckweeds (*Lemna* sp. and *Spirodela* sp.), water-meal (*Wolffia* sp.), sedges (*Carex* sp.), cattail (*Typha* sp.) and reed canary grass (*Phalaris arundinacea*) 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, dragonflies, caddisflies, snails, true flies, crustaceans and one water boatman (*Corixidae* sp.) were collected.

2023 Data (H-4)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Poor (10)	Moderate (19)
Trend 2001-2023	Stable	Stable

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



Figure 4.6.1 Invertebrate and vegetation trends for Stonegate Treated (H-4)
Site summary: This is the 23rd consecutive year that Stonegate Treated has been surveyed! The invertebrates and vegetation scores were inconsistent in 2023, differing by 21 percent. The invertebrate score indicates poor wetland health while the vegetation score indicates moderate wetland health. The scores are variable over the years. 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 for 2022 and 2023 are similar. 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 shorline 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. Maple trees (*Acer* sp.) hang over the plot. Coontail (*Ceratophyllum* sp.), pondweed (*Potamogeton* sp.), and waterweed (*Elodea* sp.), fill the water column. Duckweed (*Lemna* sp.) and water-meal (*Wolffia* sp.) cover the open water. Sedges (*Carex* sp.), spike-rush (*Eleocharis* sp.), bulrush (*Leersia* sp.), cut grass (*Leersia* sp.), smartweed (*Polygonum* sp.), arrowhead (*Sagittaria* sp.), bur-reed (*Sparganium* sp.), beggar-ticks (*Bidens* sp.), and reed canary grass (*Phalaris arundinacea*) were also present. Leeches, dragonflies, caddisflies, snails, trueflies, crustaceans, and bugs and beetles were collected.

2023 Data (H-6)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (18)	Moderate (21)
Cross-check Rating (IBI score)	Excellent (24)	Moderate (19)
Trend 2003-2023	Stable	Stable

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

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



Site summary: This is the 21st 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 2023. The invertebrates scores between the two teams were inconsistent, differing by 20 percent. The cross-check team collected a greater diversity of leeches, snails, mayflies, and caddisflies than the City team. The location may have affected collection results. The vegetation data is similar between the teams. This vegetation releve at this site was also cross-checked by Bolton & Menk. The vegetation data between the City team and third party were very similar.

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 sampling for invertebrates was challenging due to dense algae cover. Coontail (*Ceratophyllum* sp.), pondweed (*Potamogeton* sp.), and water-nymph (*Najas* sp.) filled the water column. Duckweed (*Spirodela* sp.) and water-meal (*Wolffia* sp.) floated on the water. Sedges (*Carex* sp.), reed canary grass (*Phalaris arundinacea*), cattail (*Typha* sp.), arrowhead (*Sagittaria* sp.), and a few other emergent forbs were present. Leeches, dragonflies, mayflies, caddisflies, snails, 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

2023 Data (H-56)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Moderate (19)
Trend 2005-2023	Variable	Stable



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

Site summary: This is the eighteenth year that H-56 has been monitored for WHEP since 2005. The invertebrate and vegetation scores are very consistent, and both scores indicate moderate wetland health. Both sets of data are similar to 2022. The invertebrate scores are variable, ranging between poor and excellent. The vegetation scores appear fairly stable, despite a few years of data above or below a stable range.

4.6.4 Cari Park Pond (H-57)

Cari Park Pond (H-57) is a 0.78-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 riprap, 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. Water levels were higher during the vegetation survey in late-July than during the invertebrate survey in mid-June. The team commented that the wetland is stinky. 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. Cattails (*Typha* sp.), bulrush (*Scirpus* sp.), and reed canary grass (*Phalaris arundinacea*) dominated the shoreline. Small populations of water plantain (*Alisma* sp.), smartweed (*Polygonum* sp.), and a few other upland emergent forbs were also present. Coontail (*Ceratophyllum* sp.) was found in the water column. Duckweed (*Lemna* sp.) and water-meal (*Wolffia* sp.) sparsely float on the water surface. Leeches, dragonflies, damselflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected.

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

2023 Data (H-57)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Poor (15)
Trend 2013-2023	Stable	Stable



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

Site summary: This is the 11thconsecutive year that Cari Park Pond has been monitored. The vegetation and invertebrate scores were considered inconsistent, differing by 10 percent. The invertebrate score indicates moderate wetland health while the vegetation score indicates poor wetland health. The long-term health trends appear stable for both sets.

Invertebrates Trend

Vegetation Trend

4.7 Lakeville Wetlands

Two wetlands were monitored within the City of Lakeville in 2023. The City has 26 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: Nate Barnes, William Barnes, Tom Goodwin, Loren Knutson, Kim Menard, Jillian Walechka-Olson, Alli Nickel, Andrew Nowak, Nora Renner, Lili Yu, and Ziran Yu.



STEVE WESTON



Lakeville WHEP Sites Monitored in 2023

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 college and find environmental jobs. "This year we found the wetlands at their lowest water levels, suffering from the severe drought. The low survey results show that the Lakeville wetlands that we surveyed were significantly stressed."

Ann Messerschmidt is the WHEP contact at the City of Lakeville. Her role is to

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



ANN MESSERSCHMIDT

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 2023 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 moderate wetland health in 2023. The invertebrates and vegetation scores for sites L-7 and L-8 were inconsistent, differing by 18 and 11 percent, respectively.



STEVE WESTON, ALLI NICKEL, BILL BARNES, AND ANDREW NOWAK



Figure 4.7 Lakeville site scores (percent) for the 2023 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.



LAKEVILLE WHEP VOLUNTEERS

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 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. Duckweeds (*Lemna* sp. and *Spirodela* sp.) were 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.), water plantain (*Alisma* sp.), smartweed (*Polygonum* sp.),



ALLIE NICKEL AND ANDREW NOWAK

jewelweed (*Impatiens* sp.), and purple loosestrife (*Lythrum salicaria*) were also present. Leeches, mayflies, snails, fingernail clams, trueflies, and bugs and beetles were collected.

2023 Data (L-7)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Moderate (25)
Trend 2002-2023	Stable	Stable

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



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

Site summary: This is the 22nd consecutive year that DNR 387 has been monitored for WHEP. The invertebrate and vegetation scores were inconsistent in 2023, differing by 18 percent; however, both scores indicate moderate wetland health. The diversity of invertebrates declined in 2023 compared to 2022. The vegetation populations shifted slightly too. The invertebrate and vegetation both appear to have long-term stable health trends.

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

Kim Menard



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.



BILL BARNES

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. Water-nymph (*Najas* sp.) and pondweed (*Potamogeton* sp.) dominated the water column. Coontail (*Ceratophyllum* sp.), water beggarticks (*Megalodonta beckii*), and water milfoil (*Myriophyllum* sp.) were also represented. Water-shield (*Brasenia schreberi*) and duckweeds (*Lemna* sp. and *Spirodela* sp.) floated the open water. Sedges (*Carex* sp.), bulrush (*Scirpus* sp.), spike-rush (*Eleocharis* sp.), rush (*Juncus* sp.), threeway sedge (*Dulichium arundinaceum*), arrowhead (*Sagiattaria* sp.), water plantain (*Alisma* sp.), smartweed (*Polygonum* sp.), and several other emergent grasses and forbs were observed. Leeches, dragonflies, mayflies, snails, fingernail clams, trueflies, and one water boatman (*Corixidae*) and four beetles were collected.

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

2023 Data (L-8)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (18)	Moderate (25)
Cross-check Rating (IBI score)	Moderate (18)	Moderate (19)
Trend 2002-2023	Variable	Stable



Site summary: DNR 393 has been monitored 22 consecutive years. The invertebrate and vegetation scores were considered inconsistent, differing by 11 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. This wetland was cross-checked by another team. Invertebrate scores between the teams were identical and their data very similar. The vegetation scores between the teams were inconsistent, differing by 17 percent. The Lakeville team identified a larger diversity of emergent forbs, grasslike plants, and woody species. Likely, the differences are due to plot placement at the wetland. The vegetation releve at this site was also cross-checked by Bolton & Menk. The vegetation identified by the Lakeville Team and Bolton & Menk was very similar.

4.8 Mendota Heights Wetlands

Two wetlands were monitored within the City of Mendota Heights, in 2023. The City has 26 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: Meg Gruman, Gayl Gustafson, Joan O'Donnell, Angela Richardson, Emma Richardson, Michelle Skog, Krista Spreiter, Mary Stade, Carol Strojny, Anneliese Tatham, Camille Wang, Noelle Wang, and Bri Wilde.



Darcy Tatham has been involved with WHEP for over 20 years. She was a volunteer with the West St. Paul team her first year and then became the "reluctant" team leader the following year when the previous team leader moved to the East Coast. Through the years she's been the team leader for West St. Paul and South St. Paul, but mainly for Mendota Heights. She raves, "My volunteer group is wonderful, as is Krista, my contact at the city. They all keep me inspired and involved."

This year the team encountered a situation which they had not come across before. They learned that the residents living around one of their WHEP sites elected for a chemical application to be completed on the pond to eradicate the vegetation in the pond, for aesthetic reasons. Darcy states, "My team had just

finished our first macroinvertebrate monitoring visit at this site when we were approached by a resident who informed us that the first of several treatments had just taken place four hours prior to our arrival."





The team was disappointed and concerned. Darcy explains, "We, as a team, collectively thought that this pond had many indications of being a healthy pond, such as with the presence of white-water lilies and bladderwort." She wonders, "Did the residents consider the long-term health of the pond, the potential health impacts to the families and the neighboring wildlife, or the need for ongoing maintenance? Or did they just go for the quick fix? I know that not everyone has the same values and outlooks. Sometimes we do need to modify our expectations in light of the greater good, but sometimes we need to stand up for what we believe. As individuals and as a society we need to consider the broader implications of what we do every day and their impact on the environment. A conversation can only begin if people know what is at stake and are willing to listen and ask questions. The WHEP program provides a way for residents to get involved and see wetlands from perhaps a different view than they are used to. They learn from the experts in the field and from participating in the monitoring, giving them a valuable background and insight that can help aid future conversations about the role of wetlands in our communities."

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. She affirms, "They have taught me a lot about the program, and I am continually impressed with their dedication, experience, and knowledge. They volunteer a lot of their time and passion, providing the City and the program with invaluable data. The City uses that data to monitor our wetlands for changes that may occur over time or with surrounding practices, and how they respond to pressure from development and other environmental stressors, as well as looking for ways to protect and improve them. The City is very thankful to our WHEP team!"



KRISTA SPREITER

Mendota Heights General Wetland Health



DARCY TATHAM, ANNELIESE TATHAM, MICHELLE SKOG, MARY STADE, GAYL GUSTAFSON, CAROL STROJNY, AND CAMILLE WANG

Figure 4.8 presents an overall view of wetland health for all the 2023 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 2023. Invertebrate and vegetation scores indicate poor to moderate wetland health for MH-2 and moderate wetland health for MH-9.



Figure 4.8 Mendota Heights' site scores (percent) for the 2023 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 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 additional 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 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 buckthorn, amur maple, and garlic mustard are present in the area; however, the park and surrounding buffer is undergoing a native restoration in order to remove invasive species and re-establish a native vegetative buffer. The surrounding area includes residential neighborhoods in Mendota Heights.



GAYL GUSTAFSON AND MICHELLE SKOG AT CROSS-CHECK SITE AT LAKE REBECCA

Wetland Health

Site Observations: Copperfield is part of a chain of ponds within an established neighborhood, but it is City-owned with no houses around it. The pathway to the pond is flat and wooded, with a vegetated buffer around the water's edge. The wetland slope is gentle, and the substrate is mucky, but not "boot-swallowing" mucky like in 2022. Water levels were very low again in 2023. The wetland is surrounded by cattail (*Typha* sp.) and the surface of the water is covered with white-water lily (*Nymphaea* sp.), duckweeds (*Lemna* sp. and *Spirodela* sp.), and water-meal (*Wolfia* sp.). Pondweed (*Potamogeton* sp.) and coontail (*Ceratophyllum* sp.) thrive in the water column. Spike rush (*Eleocharis* sp.) was the most prominent emergent plant. Several other small populations of emergent grasses and forbs were also present, including arrowhead (*Sagittaria* sp.), water plantain (*Alisma* sp.), beggar-ticks (*Bidens* sp.), reed canary grass (*Phalaris arundinacea*), and purple loosestrife (*Lythrum salicaria*). Leeches, dragonflies, damselflies, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and truebugs were collected.

2023 Data (MH-2)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Poor (14)	Moderate (19)
Cross-check Rating (IBI score)	Moderate (20)	Moderate (19)
Trend 1998-2023	Variable	Stable

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





Site Summary: This is the 25th 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 consistent in 2023; however, the invertebrate score indicates poor wetland health while the vegetation score indicates moderate wetland health. This wetland was crosschecked by another team. The invertebrate scores were inconsistent between the teams, differing by 20 percent. The cross-check team found a large diversity of leeches and dragonflies which enhanced the invertebrate score. In addition, the teams collected different proportions of Corixidae which affected the Corixidae Proportion Metric scores. The vegetation identification was similar between the two WHEP teams. Water levels likely affect sampling location in the wetland, habitat type



ANNELIESE TATHAM, ANGELA RICHARDSON, CAMILLE WANG, AND DARCY TATHAM

present, and diversity of species. In addition, tadpoles and fish may impact the invertebrate population.

4.8.2 Hagstrom-King Pond (MH-9)



Hagstrom-King Pond (MH-9) is a 3.0-acre, type 4 wetland located within the Lower Mississippi Watershed. The watershed is 20 acres and 25 percent impervious. There is one inlet on the north side, one inlet on the south side, and one outlet on the east side of the pond. Hagstrom-King Pond is part of the City's stormwater management plan and is managed for aesthetics.

Hagstrom-King is located in Hagstrom-King Park just north of Interstate-494 and west of Delaware Avenue. The pond lies to the west of a baseball field. There is a playground, trails, and other ponds

in the area. The surrounding area is mostly residential, but the pond is buffered by natural areas.

Wetland Health

Site Observations: The wetland has a short, significant slope. The substrate is slightly mucky with many fallen branches on the bottom. There are houses around all but one section of the pond that is adjacent to a city park. There is a walking path, basketball courts, and baseball fields nearby. A vegetation survey was conducted early (mid-June) in 2023 to record vegetation presence prior to impact of a chemical treatment on the pond. White water-lilies (*Nymphaea* sp.), duckweeds (*Lemna* sp. and *Spirodela* sp.), water-meal (*Wolffia* sp.) covered the surface of the water. Pondweed (*Potamogeton* sp.) and coontail



WHITE WATER-LILY AT HAGSTROM-KING POND POST TREATMENT

Dakota Co. WHEP 2023 Report

February 2024 P a g e | **8 0** (*Ceratophyllum* sp.) dominate the water column. Bladderwort (*Utricularia* sp.), water crowfoot (*Ranunculus* sp.), water nymph (*Najas* sp.), and water celery (*Vallisneria americana*) were also present. Cattail (*Typha* sp.), water plantain (*Alisma* sp.), arrowhead (*Sagittaria* sp.), smartweed (*Polygonum* sp.), sedges (*Carex* sp.), and several other upland grasslike plants and forbs were represented in smaller proportion. A second vegetation survey was conducted in mid-July (post-chemical treatment) which showed a decrease in submergent and floating leaved vegetation density and representation. Decreased populations of water crowfoot, pondweed, white water-lily, and water-meal remained in or on the water. White water-lily was curled and browning. Leeches, dragonflies, mayflies, caddisflies, snails, fingernail clams, trueflies, crustaceans, and beetles and bugs were collected.

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2023 Data (MH-9)	Invertebrates 🤾	Vegetation
Wetland Health Rating (IBI score) Pre-herbicide application	Moderate (22)	Moderate (25)
Wetland Health Rating (IBI score) Post-herbicide application	na	Moderate (17)
Trend 2002-2023	Stable	Stable





Site summary: This is the fifth time that MH-9 has been monitored for WHEP since 2002. The invertebrate and vegetation scores are consistent and indicate moderate wetland health. The wetland health trends appear stable. Submergent vegetation and invertebrate populations were diverse in mid-June. However, recent chemical treatments initially impacted the vegetation presence at this site (as indicated by a vegetation survey conducted post-herbicide application in mid-July) and may have lasting impacts in the future. Many

fish were collected in the bottle traps in 2023. More years of data will help determine a more reliable health trend.

4.9 North Cannon River Watershed Management Organization

Two wetlands were attempted to be monitored for North Cannon River Watershed Management Organization in 2023. This is the seventh 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: Nathan Buerkle and Vanessa Czeszynski



This is Shamus Collins first year as team leader of the North Cannon River WHEP team, and has participated in WHEP since 2022. He 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. Many thanks to Jeff Korpik for helping me learn the ropes of my new role."



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

Drought conditions impacted the two NCRWMO sites in 2023. There was little to no standing water at either of the wetlands. The environments were not suitable for completing surveys for aquatic environments. The invertebrate scores have ranged from poor to excellent over the years of surveys. The vegetation scores have ranged from poor to moderate. The invertebrate and vegetation scores have been inconsistent with each other several years of surveys.

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. There was little to no water in Loretto Wetland in 2023. The team attemped to survey this site three separate times in 2023, with no luck. The team commented, "The Northfield site was clearly experiencing drought conditions. After three survey attempts, the water level never reached a sufficient depth to submerge the macroinvertebrate traps, even immediately after the largest rainstorm of the season. Efforts by another team tasked with cross-checking the site to set macroinvertebrate bottle traps resulted in most traps floating away; of the few that remained in



LORETTO WETLAND IN JULY

place, none were submerged upon examination the next day. There was sufficient water to sustain some aquatic life as well as dense, tall vegetation. The shallow water may have provided a breeding environment for the numerous flying insects that were observed immediately upon arrival at the site." In 2022, abundant populations of pondweed (*Potamogeton* sp.), water-crowfoot (*Ranunculus* sp.), water beggar-ticks (*Megalodonta beckii*), and duckweeds (*Lemna* sp. and *Spirodela* sp.) were recorded. Water plantain (*Alisma* sp.), cattails (*Typha* sp.), bulrush (*Scirpus* sp.), spike-rush (*Eloeocharis* sp.), and manna-grass (*Glyceria* sp.) were also present. In addition, leeches, dragonflies, damselflies, snails, fingernail clams, trueflies, crustaceans, and bugs and beetles were collected in 2022.

2023 Data (NCR-1)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	na	na
Cross-check Rating (IBI score)	na	na
Trend 2017-2023	Variable	Stable

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





Site summary: This is the seventh consecutive year that Loretto Wetland has been monitored by WHEP volunteers. Low water levels prevented invertebrate and vegetation surveys in 2023. The cross-check team scheduled to survey this site in 2023, also found limitation in the sampling process. The site was initially too dry to set bottle traps. After a rain event, the team attempted to set bottle traps again, but the water drained too quickly to collect an invertebrate sample in the 48-hour period. Invertebrate scores have ranged from poor to excellent over the years of monitoring. Various species of leeches, dragonflies, snails, trueflies, crustaceans, and beetles and bugs have been represented over the years. The vegetation scores have been fairly stable. Records of water levels within the vegetation releves have ranged between 0-1 meter deep in the years of monitoring. Spike-rush, reed canary grass, pondweeds, duckweeds, water plantain, bur-reed (Sparganium sp.), and cattails have been consistently present at this site. More years of data will help determine a more reliable health trend.



SET BOTTLE TRAP AFTER RAIN EVENT

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 gentle, and the substrate is mucky. There are no trees, as it is located in the remnants of a agricultural field. There was no water present at Jordan Wetland in 2023. The team attempted to survey this site three separate times, with no luck. The team commented, "Lush low-growing plants indicated that there was still sufficient water to sustain plant life but no environment compatible with aquatic life. The surrounding area is broadly agricultural and sparsely populated, with a low to medium traffic highway immediately adjacent to the property." In 2022, water-crowfoot (*Ranunculus* sp.) floated in the water. Water-plantain (*Alisma* sp.), arrowhead (*Sagittaria* sp.), cut grass (*Leersia* sp.), and cattail (*Typha* sp.)



JORDAN WETLAND WITHOUT WATER

dominated the vegetation releve. Reed canary grass (*Phalaris arundinacea*), manna-grass (*Glyceria* sp.), three-way sedge (*Dulichium arundinaceum*), spike-rush (*Eleocharis* sp.), and iris (*Iris* sp.) were also present. In addition, leeches, dragonflies, damselflies, snails, trueflies, crustaceans, and bugs and beetles were collected in 2022.

2023 Data (NCR-3)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	na	na
Trend 2020-2023	Not enough data	Not enough data

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

Site summary: This is the fourth consecutive year that Jordan wetland has been monitored by WHEP volunteers. The absence of standing water prevented invertebrate and vegetation surveys in 2023. Invertebrate and vegetation scores have ranged from poor to moderate over the years of monitoring. Various species of leeches, dragonflies, snails, trueflies, crustaceans, and beetles and bugs have been represented over the years. Standing water has only been recorded within the vegetation releve in 2020. Other years reported no water during the vegetation surveys conducted at this site in early to mid-July. Reed canary grass, water plantain, bur-reed (*Sparganium* sp.), and cattails have



JORDAN WETLAND WITHOUT WATER

been consistently present at this site. Duckweed and pondweed were present in 2020. Various grasslike plants and emergent forbs have been represented one year or another. 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 2023. The City has 26 years of WHEP data! Twentyfour wetlands have been monitored in Rosemount since the start of WHEP.

Team Leaders: Jane Porterfield and Stephan Hoche

Team Members: Susie Freiburger, Emily Hoche, Reed Huey, Sheryl Lyke, Abate Terefe, Greta Willander, and Tom Willander.



JANE PORTERFIELD

Rosemount WHEP Sites Monitored in 2023



Jane Porterfield is the co-team leader for Rosemount. She has been involved in WHEP since its induction in 1997. She 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 became a first-time coleader for the Rosemount WHEP team this year. He commented, "I have been part of WHEP for three years, and my daughter, Emily, has been participating for two

years. She has enjoyed learning much while serving her community. We had a lot of fun with a great group of enthusiastic volunteers.

"Wetlands are essential to life in general, they provide valuable ecosystems services. Assuring the health of these wetlands facilitates the well-being of our communities. Monitoring the wetlands provides important insights into how we are doing as caretakers of the environments we live in. I am thankful to be part of this team."



STEPHAN HOCHE

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."



Rosemount General Wetland Health

JANE BYRON

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.

Wetland designation

<u>Required buffer</u>

Preserve Wetlands75 feetManage I Wetlands50 feetManage II Wetlands30 feetUtilize Wetlands15 feet in non-agricultural areas only

Figure 4.10 presents an overall view of wetland health for all the 2023 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 moderate wetland health for each of the sites. The vegetation scores indicate poor to moderate wetland heath. The invertebrate and vegetation scores for R-4 and R-26 were inconsistent, differing by 17 and 15 percent, respectively.





4.10.1 Schwarz Pond (R-4)

Schwarz Pond (R-4), also known as WMP #431, is an 11acre, type 5 wetland in the Erickson Pond subwatershed of the Vermillion River Watershed. The subwatershed is 1,832 acres with 25 percent impervious surface. There is one inlet on the northwest shoreline, one inlet on the southern shoreline, and one inlet on the eastern shoreline of the wetland. There is one outlet on the eastern side of the wetland at the liftstation. It is included in the City's stormwater management plan and is designated to preserve with a management goal to maintain wetland and its existing functions, values, and wildlife habitat.



This is a medium sized pond surrounded by parkland and institutional land uses. The pond receives suburban and parkland runoff, and disturbances associated with those land uses. Upstream ponds and large buffers mitigate for the existing runoff. Some buckthorn removal and vegetation management has occurred in nearby parkland in recent years.

Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is solid. The water level is very shallow again in 2023. A wooded canopy exists on one side of the pond. Reed canary grass (*Phalaris arundinacea*) and arrowhead (*Sagittaria* sp.) buffer the eastern shoreline of the wetland near where the vegetation releve was set. No submergent vegetation was present. Very little duckweed (*Lemna* sp. and *Spirodela* sp.) and water-



2023 Data (R-4)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (18)	Poor (15)
Trend 1998-2023	Stable	Stable

Table 4.10.1 Schwarz Pond (R-4) Wetland Health based on Index of Biotic Integrity



REED HUEY



Figure 4.10.1 Invertebrate and vegetation trends for Schwarz Pond (R-4)

Site summary: This is the ninth time Schwarz Pond has been monitored since 1998. The invertebrate and vegetation health scores were inconsistent, differing by 17 percent. The invertebrate score indicates moderate wetland health while the vegetation score indicates poor wetland health. The vegetation diversity was low in 2023; however, the vegetation species present has been fairly consistent and the wetland health trend is stable. Variability in invertebrate presence each year has affected the scores; however, the invertebrate long-term trend is stable. Water level, collection location, and the presence of fish and muskrats likely affect collection results.

4.10.2 Birger Mitigation Area (R-15)

Birger Mitigation Area (R-15) is a 0.6-acre, type 5 open water wetland within the Birger Pond subwatershed of the Vermillion River Watershed. The subwatershed is approximately 897 acres with 20 percent impervious surface. There is one inlet on the northeast shoreline, and no outlets. Birger Pond is part of the City's stormwater management plan and is designated to preserve with a management goal to maintain wetland and its existing functions, values, and wildlife habitat. The wetland has a small, undedicated buffer surrounded



by parkland and residential properties. The near shore habitat may have been impacted by high water in recent years. Fish kill of minnows and bullheads occurred over winter.

Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is solid. It is primarily open water. The berm was not visible in 2023, flooded by Innisfree Park Lake. The water did recede approximately one foot between the invertebrate survey in mid-June and the vegetation survey in mid-July. Living trees were in water one to two feet deep. Many dead logs were in the water. The vegetation survey was conducted near a peninsula on higher ground; however, the water got deep fast and a 5x20 meter plot was set. Dense populations of pondweed (*Potamogeton* sp.) and coontail (*Ceratophyllum* sp.) crowded the submergent zone. Duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) floated on the surface of the water. Spike-rush (*Eleocharis* sp.), sedges (*Carex* sp.), reed canary grass (*Phalaris arundinacea*), cattail (*Typha* sp.), arrowhead (*Sagittaria* sp.), smartweed (*Polygonum* sp.), and a few other emergent forbs were represented.. The shoreline has a buffer of overhanging trees including willow (*Salix* sp.), cottonwood (*Populus* sp),



TOM AND GRETA WILLANDER

and maple (*Acer* sp.). Leeches, dragonflies, caddisflies, snails, true flies, crustaceans, and beetles and bugs were collected. Egrets were observed.

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2023 Data (R-15)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Moderate (21)
Trend 2005-2023	Not enough data	Not enough data

Figure 4.10.2 Invertebrate and vegetation trends for Birger Mitigation Area (R-15)



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Site summary: This is the fifth time that R-15 has been monitored since 2005. The invertebrate and vegetation scores were consistent, and both scores indicate moderate wetland health. Invertebrate and vegetation scores are similar in most recent surveys; however, flip-flopped since initial surveys in 2005 and 2007. This wetland has high water which is affecting plot placement and may be negatively impacting emergent vegetation community. More years of data will help determine a more reliable health trend.

4.10.3 WMP 332 (R-20)

WMP #332 (R-20) is a one-acre, type 5 open water wetland in the Birger Pond subwatershed of the Vermillion River Watershed. The subwatershed is approximatley 897 acres of which 20 percent is impervious surface. There is one inlet on the east side of the wetland and one outlet on the south side of the wetland. This wetland is included in the City's stormwater management plan and is designated to preserve with a management goal to maintain wetland and its existing functions, values, and wildlife habitat.

R-20 is surrounded by residential areas with several roads adjacent to the wetland. There is a 75 foot buffer around the wetland. Stormwater runoff from the roads, and nutrient loading from turfgrass maintenance of residential lawns may impact the wetland health.





ROSEMOUNT WHEP TEAM

Wetland Health

Site Observations: The wetland slope is gentle. The substrate

is firm. The wetland is at the bottom of a steep hillside. A large vegetative border surrounds the area. Sumac (*Rhus* sp.) and other woody trees surround the wetland. Coontail (*Ceratophyllum* sp.) dominated the water column. White water-lily (*Nymphaea* sp.) covered the surface of the water. Cattail (*Typha* sp.), arrowhead (*Sagittaria* sp.), spike-rush (*Eleocharis* sp.), and bulrush (*Scirpus* sp.) emerged along the shoreline. Slender Riccia (*Riccia fluitans*), purple-fringed Riccia (*Ricciocarpus natans*), duckweeds (*Lemna* sp. and *Spirodela* sp.), water-meal (*Wolffia* sp.), pondweed (*Potamogeton* sp.), and reed canary grass (*Phalaris arundinacea*) were also present. Leeches, dragonflies, caddisflies, snails, trueflies, crustaceans, and beetles and bugs were collected.

Table 4.10.3 WMP 332 (R-20) Wetland Health based on Index of Biotic Integrity

2023 Data (R-20)	Invertebrates 🤾	Vegetation
Wetland Health Rating (IBI score)	Moderate (20)	Moderate (23)
Trend 2009-2023	Stable	Stable



Figure 4.10.3 Invertebrate and vegetation trends for WMP 332 (R-20)

Site summary: This is the sixth time that R-20 has been monitored by the WHEP volunteers since 2009. The invertebrate and vegetation scores were very consistent, and both scores indicate moderate wetland health. This wetland is within a natural area with a wide vegetative buffer. A few plants heavily dominate the vegetation plot while several other plants are more sparsely represented. Long-term wetland health trends are stable.

4.10.4 Erickson Pond (R-26)

Erickson Pond (R-26), also known as WMP #620, is a 1.9-acre, type 3 wetland within the Vermillion River Watershed. The watershed is 1,832 acres of which 25 percent is impervious surface. There is one inlet with a rock spillway from the pond to the south, but no outlets. The wetland is included in the City's stormwater management plan and is designated to preserve with a management goal to reduce the presence of invasive wetland plant species and enhance the vegetative diversity of the wetland basin.

Erickson Pond lies in a depression surrounded by hiking trails, parks, oak forest, woodlands, and restored native prairie. The basin area was included in the City's Erickson Pond Water Quality and Habitat Enhancement Project. This project, constructed in 2008, provides improved stormwater treatment to treat runoff from the downtown area that drains to Erickson Pond. Prior to the project, large amounts of stormwater discharged directly into the wetland basin. The stormwater now



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enters treatment cells prior to discharge to the wetland. The wetland is also currently undergoing vegetation management to minimize invasive species and a five-acre native prairie has been planted in the adjacent upland. There is also a 75-foot buffer that helps pre-treat stormwater draining into the wetland.

This wetland infiltrates the stormwater from a large commercial area. There is some indication that this may be leading to high chloride levels during times of snow melt. The basin also receives water from the nearby splashpad which has led to more water in the basin than predicted during construction of the surrounding ponds and splash pad.

Wetland Health

Site Observations: The wetland slope is gentle and the substrate is very mucky and fallen branches and logs are in the water. Cattail (*Typha* sp.), arrowhead (*Sagittaria* sp.), river bulrush (*Bolboschoenus fluviatilis*), bulrush (*Scirpus* sp.), and purple loosestrife (*Lythrum salicaria*) dominate the shoreline. There were no submergent plants present in 2023. Duckweeds (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.) float on the surface of the water. Water plantain (*Alisma* sp.), smartweed (*Polygonum* sp.), and several other emergent forbs were sparsely represented in the vegetation releve. Leeches, dragonlies, damselflies, fingernail clams, true flies, crustaceans, and many beetles and bugs were collected.

2023 Data (R-26)	Invertebrates	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Poor (13)
Cross-check Rating (IBI score)	Poor (12)	Poor (13)
Trend 2012-2023	Improving	Variable

Table 4.10.4 Erickson Pond (R-26) Wetland Health based on Index of Biotic Integrity





Site summary: This is the seventh time Erickson Pond has been monitored since 2012. The invertebrate and vegetation scores were inconsistent in 2023, differing by 16 percent. The invertebrate score indicates moderate wetland health while the vegetation score indicates poor wetland health. Scores are variable over the years for both invertebrates and vegetation, but invertebrate scores may be improving overall. Corixidae proportions have decreased in the last few surveys which positively influences the invertebrate score. The dense cattail population and water level is affecting vegetation plot placement and may be impairing the emergent plant community. This site was crosschecked by another WHEP team. The invertebrate scores were inconsistent between teams, differing by 13 percent. The Rosemount team collected a higher diversity of leeches and had a lower Corixidae proportion. The vegetation scores were the same. The vegetation observed by each team varied slightly, but did not impact the IBI score.



ABATE TEREFE AND STEPHAN HOCHE

4.11 South St. Paul Wetlands

Two wetlands were monitored in South St. Paul in 2023 by the South St. Paul team. The City has 18 years of WHEP data! Four wetlands have been monitored in South St. Paul since the start of the WHEP program.

Team Leader: Anneliese Tatham

Team Members: Peter Clementson, Quinton Dornisch, Allison Matney, Jeff Parsons, Conor Resnikoff, Carissa Roell, and Darcy Tatham.



ANNELIESE TATHAM

Heights WHEP team. This was her second season as a WHEP team leader. Anneliese graduated from UMN Morris with a degree in Environmental Science, where her professors encouraged her curiosity for ecology and Minnesota's natural landscapes. In her free time, she enjoys gardening, hiking, knitting and playing with Gemma, the family pup. She loves that WHEP connects community members with experts like Joel, Mark & Katie to keep everyone, no matter how experienced, learning while keeping tabs on the wetlands in our own backyards. Thanks to the South St. Paul team for their hard work and dedication this year!

Anneliese grew up tagging along with her mom Darcy & the Mendota

South St. Paul WHEP Sites Monitored in 2023



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 2023 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 2023, the invertebrates and vegetation health scores ranged from poor to moderate. The invertebrates and vegetation scores SSP-3 was inconsistent, differing by 18 percent.



Figure 4.11 South St. Paul site scores (percent) for the 2023 sampling seaso

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



February 2024 P a g e | **9 6** 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. Coontail (*Ceratophyllum* sp.) filled the water column. Small populations of pondweed (*Potamogeton* sp.), duckweed (*Lemna* sp.), and smartweed (*Polygonum* sp.) were the only other plant species in the vegetation releve. Leeches, trueflies, crustaceans, and beetles and bugs were the only invertebrates collected. Invasive species including goldfish (*Carassius auratus*) and mystery snails (*Cipangopaludina chinensis*) were abundant. Many fish were caught in the bottle traps.

2023 Data (SSP-1)	Invertebrates 🕺	Vegetation
Wetland Health Rating (IBI score)	Poor (8)	Poor (13)
Cross-check Rating (IBI score)	Poor (14)	Poor (13)
Trend 2001-2023	Variable	Stable

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





Site Summary: This is the fifteenth time that Anderson Pond has been monitored since 2001. The

invertebrate and vegetation scores are consistent, and both scores indicate poor wetland health. The invertebrate scores are variable. Very few invertebrates were collected in 2023, 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 was low in 2023. Very dense coontail was present, but little to no floating-leaved or emergent vegetation. This site was cross-checked by another WHEP team. The invertebrate scores between the two teams were inconsistent, differing by 20 percent. The major difference in score was due to the Corixidae Proportion Metric. The South St. Paul team collected 6 water boatman (Corixidae) out of a total of 9 beetles and bugs in the bottle traps. The cross-check team collected no water boatman out of a total of 30 beetles and bugs in the bottle trap. The cross-check team also collected damselflies and mayflies which were not collected by South St. Paul team. The teams found very similar vegetation presence. The vegetation plot at this site was also cross-checked by Bolton & Menk who confirmed the South St. Paul team's data.



CONOR RESNIKOFF, ALLIE MATNEY, JEFF PARSONS, QUINTON DORNISCH, AND ANNELIESE TATHAM



CONOR RESNIKOFF AT LEVANDER POND

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, Mn/DOT 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 fairly solid. The wetland surface is covered in duckweed (*Lemna* sp. and *Spirodela* sp.) and water-meal (*Wolffia* sp.). Coontail (*Ceratophyllum* sp.) and pondweed (*Potamogeton* sp.) fill the water column. Sedges (*Carex* sp.), cattails (*Typha* sp.), willow trees (*Salix* sp.), and cottonwood trees (*Populus* sp.) were also present in the vegetation releve. No other emergent grasses or forbs present. Leeches, dragonflies, damselflies, trueflies, crustaceans, and bugs and beetles were collected. Fairy shrimp (*Streptocephalus sealii*) have been found in this wetland consistently since 2012, though not noted in 2023. A few large truck tires were in the pond. Ducks were observed.



ALLIE MATNEY AT LEVANDER POND

2023 Data (SSP-3)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Moderate (20)	Moderate (17)
Trend 2009-2023	Variable	Stable

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

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



Site summary: This is the fifteenth consecutive year of monitoring LeVander Pond. The vegetation and invertebrates scores were inconsistent with each other in 2023, differing by 18 percent. Both scores indicate 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.



QUINTON DORNISCH AT LEVANDER POND

4.12 West St. Paul Wetlands

Four wetlands were monitored in West St. Paul in 2022 by the West St. Paul team. The City of West St. Paul has 23 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 and Katie Schletty

Team Members: Peter Clementson. Lizzie Gelderman, Julia Goldman, Pazao Lee, Payeng Lee, Cassy Lenz, Kat Geislinger, Maverick Waltz, and Holly Whittlef.



JIM CHASTEK

52 4 OTA HEIGHT 952 45 WSP4 8 WSP7 14 73 63 62 INVER, GROVE HEIGHTS

Jim Chastek is the co-team leader of the West St. Paul team. He explained, "I have volunteered with WHEP for a little over 20 years. It is mainly getting into ponds that attracted me to the program. Last year was my first time as a leader, sharing co-leadership with Katie Schletty which has been

a great partnership from my perspective. 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."



KATIE SCHLETTY

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West St. Paul WHEP Sites Monitored in 2023

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 General Wetland Health

Figure 4.12 presents an overall view of wetland health for all the 2023 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 2023. The invertebrate and vegetation scores for WSP-7 were inconsistent, differing by 22 percent.



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Figure 4.12 West St. Paul site scores (percent) for the 2023 sampling season
4.12.1 Duck Pond (WSP-3)

Duck Pond (WSP-3) is a 2.5-acre, type 5 wetland within the Highway 110-494 subwatershed within the Lower Mississippi River Watershed. The subwatershed is 65 acres. It is publicly owned, and is part of the City's stormwater management plan. It is designated as A4P Duck Pond. There is an inlet on the north side of the wetland, and an outlet on the east side. Although Duck Pond is located within a densely populated area, it is largely surrounded by trees and not widely visible from the road. The shoreline contains woody debris from fallen branches or trees. The lack of aquatic vegetation and the decline of wildlife in the area is of concern.



Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is very mucky. The wetland is surrounded by trees. Very little vegetation was present in 2023. No submergent or emergent forbs were present. Duckweed (*Lemna* sp.) and watermeal (*Wolfia* sp.) floated on the surface of the water. Manna grass (*Glyceria* sp.), reed canary grass (*Phalaris arundinacea*), and woody plants were the only other vegetation present in the vegetation releve. Leeches, dragonflies, damselflies, snails, trueflies, crustaceans, and bugs and beetles were collected.



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Table 4.12.1 Duck Pond (WSP-3) Wetland Health based on Index of Biotic Integrity

2023 Data (WSP-3)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Poor (14)	Poor (15)
Trend 1999-2023	Stable	Stable



Figure 4.12.1 Invertebrate and vegetation trends for Duck Pond (WSP-3)

Site Summary: This is the eighth time that Duck Pond has been surveyed since 1999, and the sixth consecutive year of monitoring this site since 2017. The invertebrate and vegetation scores were consistent in 2023, and both scores indicate poor wetland health. The vegetation trend is stable with similar scores from each monitoring event. The invertebrate scores have some variability, but the wetland health trend is stable. The wetland has very low diversity of vegetation which likely impacts the invertebrate community, especially since it lacks submergent vegetation.

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 gentle. The wetland substrate is mucky. Cattails (*Typha* sp.) prominently surround the shoreline. Patchy populations of coontail (*Ceratophyllum* sp.) and pondweed (*Potamogeton* sp.) were present in the water column. Duckweed (*Lemna* sp.) and water-meal (*Wolfia* 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.), reed canary grass (*Phalaris arundinacea*), water plantain (*Alisma* sp.), arrowhead (*Sagittaria* sp.). Leeches, dragonflies, caddisflies, trueflies, crustaceans, and beetles and bugs were collected.

2023 Data (WSP-4)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Moderate (16)	Poor (15)
Cross-check Rating (IBI score)	Poor (14)	Moderate (17)
Trend 2000-2023	Stable	Declining

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





Site Summary: This is the sixth time that Weschcke Pond has been surveyed by WHEP volunteers, since 2000. The invertebrate and vegetation scores were consistent; however, the invertebrate score indicates moderate wetland health while the vegetation indicates poor wetland health. The absence of snails impeded the invertebrate score. Similar vegetation has been represented over the years of monitoring. A larger coverage of persistent litter impeded the vegetation score in 2023. 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.



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Scores between the two teams were consistent. The invertebrate data was similar between teams. The cross-check team did find submergent vegetation while the West St. Paul team did not. Otherwise, vegetation data was similar too. More years of monitoring will help determine a more reliable health trend.

4.12.3 Humboldt Pond (WSP-7)

Humboldt Pond (WSP-7), once known as Vivian Pond, is a 1.2-acre, type 4 wetland within the Simons Ravine District drainage area. Its watershed is 23 acres. It is publicly owned, and it is part of the City's stormwater management plan. It is designated as SR1P Humboldt Pond. There is one inlet on the east side, but no outlets. The wetland is located south of Marthaler Park, west of Robert Street.



Wetland Health

Site Observations: The wetland slope is gentle. The wetland substrate is mucky. Very sparse populations of water-crowfoot (*Ranunculus* sp.) and duckweeds (*Lemna* sp. and *Spirodela* sp.) were present. Trees and cattails (*Typha* sp.) surround the pond. Few emergent grasslike plants and forbs were represented within the vegetation releve. Leeches, trueflies, crustaceans, and bugs and beetles were collected.

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2023 Data (WSP-7)	Invertebrates 🧩	Vegetation
Wetland Health Rating (IBI score)	Poor (8)	Moderate (17)
Trend 2001-2023	Declining	Stable





Site Summary: This is the sixth time that Humboldt Pond has been surveyed since 2001. The invertebrates and vegetation scores were inconsistent, differing by 22 percent. The invertebrate score indicates poor wetland health while the vegetation score indicates moderate wetland health. Invertebrate and vegetation abundance and diversity is very low (nearly non-existent) in this wetland. Low persistent litter presence and the identification of moss in the vegetation releve enhanced the vegetation score in 2023. The invertebrates and vegetation data are fairly similar since 2021. With the exception of 2022, the vegetation scores appear stable. Invertebrate health has been declining since initial data in 2001.



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