Metropolitan Mosquito Control District
Budget in Brief
For the Fiscal Year Beginning January 1, 2023

This document is a brief look at the proposed 2023 budget for the Metropolitan Mosquito Control District (MMCD). The information provided helps the reader understand our organization, the services we provide and the funding sources used to provide those services. On behalf of our 2022 Board of Commissioners and staff we thank the citizens of our seven-county metropolitan service area for the opportunity to provide these valuable services.

Metropolitan Mosquito Control Commission (2022)

Anoka:	Mike Gamache Mandy Meisner Robyn West
Carver:	Gayle Degler Tom Workman
Dakota:	Mary Hamann-Roland Laurie Halverson Liz Workman
Hennepin:	Kevin Anderson Angela Conley (Chair) Chris LaTondresse
Ramsey:	Jim McDonough Nicole Frethem (Secretary) Rafael Ortega
Scott:	Michael Beard Dave Beer
Washington:	Gary Kriesel (Vice Chair) Fran Miron

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Mission, Vision, Values

The Metropolitan Mosquito Control District provides biting insect control and tick monitoring to the citizens of the seven Minneapolis-St. Paul metropolitan counties, under the direction of the Metropolitan Mosquito Control Commission board - 18 elected commissioners.

Mission Statement

The Metropolitan Mosquito Control District's mission is to promote health and well-being by protecting the public from disease and annoyance caused by mosquitoes, black flies, and ticks in an environmentally sensitive manner.

Vision Statement

To be the leading mosquito abatement district in the world. MMCD leads through innovation, technology, stewardship, partnership, public service and effectiveness.

Value Statement

MMCD values integrity/trust, cooperation, respect, and competence in our interactions with colleagues and customers.

MMCD Demographics

Date Initiated:	1958
Service Area:	2,970 square miles
Population census 2020	3.163 million 1.2 million households
Counties Included:	Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington

MMCD Services

The Metropolitan Mosquito Control District (MMCD) protects public health and well-being using an integrated pest management approach in its control of disease transmitting and human biting mosquitoes. The majority of control targets immature mosquitoes that develop in over 80,000 unique wetland settings and over 79,000 catch basins and 25,000 other man-made habitats within the seven-county service area. Control of adult mosquitoes is also conducted to reduce the risk of disease and annoyance.

MMCD monitors and controls immature black flies that develop in five major rivers and numerous small streams located within the service area. Immature black flies are treated with a natural soil bacterium (*Bti*) under a permit issued by the Minnesota Department of Natural Resources.

MMCD monitors the distribution of deer ticks that are capable of transmitting Lyme disease, human granulocytic anaplasmosis (formerly known as ehrlichiosis), babesiosis and Powassan virus. MMCD works closely with the Minnesota Department of Health in providing information to citizens to reduce the risk of tick transmitted diseases.

MMCD provides information, using a diverse network of outlets and venues, designed to inform citizens about its activities and to assist citizens in managing the impact of biting insects and ticks on their health and well-being.

Background

MMCD, created by the legislature in 1958, serves 3.163 million citizens (Met Council 2020 census in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties). It is governed by a board of 18 elected county commissioners representing those counties and is supported by property taxes. A diagram depicting the Legislative, Regulatory and Advisory Structure can be found on page 8 of this document.

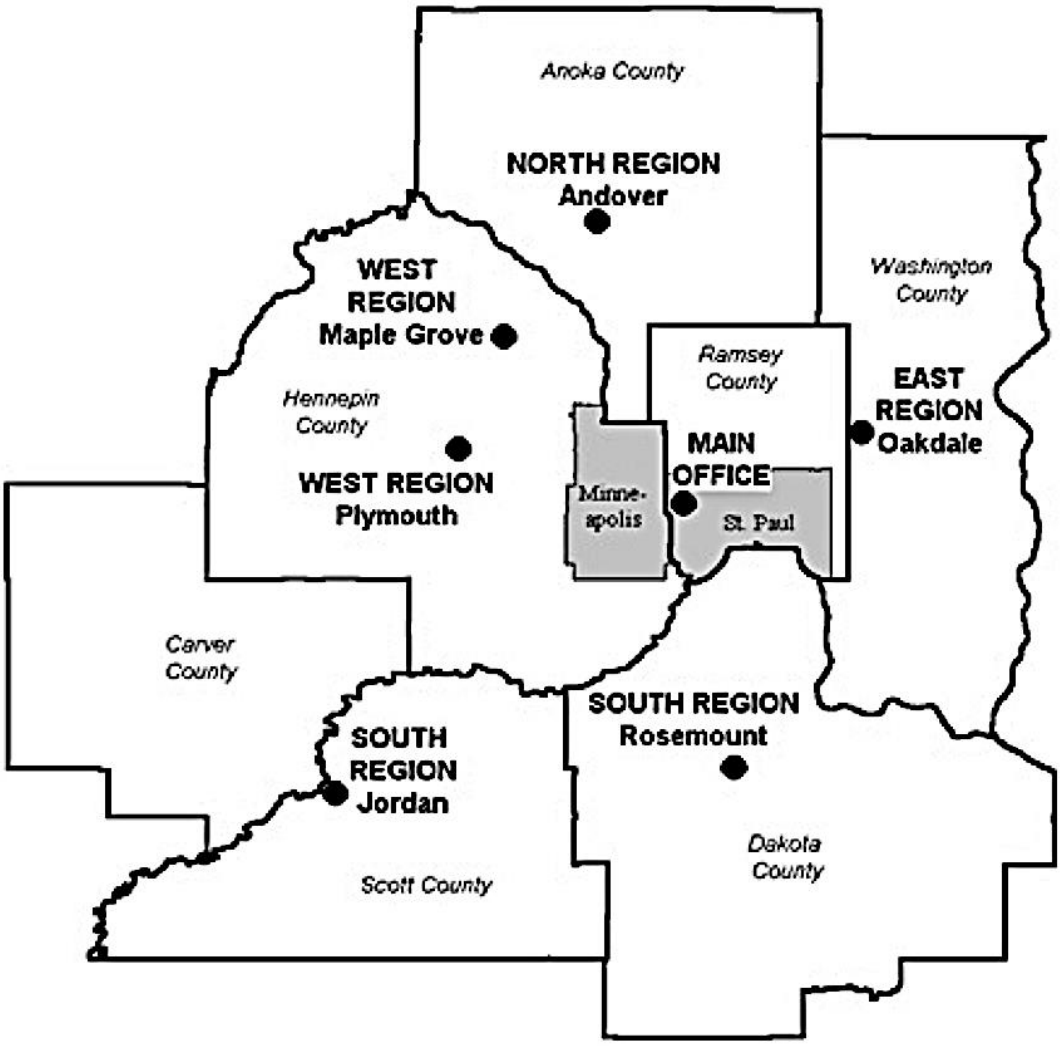
The District currently provides its services through the work of 185 seasonal staff and 54 regular full-time staff. licensed to apply control materials by the Minnesota Department of Agriculture. Staff are stationed at seven facilities throughout the District area (map on page 7 of this document) A diagram depicting MMCD's organizational structure can be found on page 9 of this document.

The Twin Cities metropolitan area stretches outward from the central cities of Minneapolis and St. Paul to the surrounding suburbs and rural areas, including some 189 cities and townships. The region's natural environment (including over 900 lakes) and wildlife are prized by its citizens. However, the natural environment also provides abundant habitat for mosquitoes, black flies, and ticks.

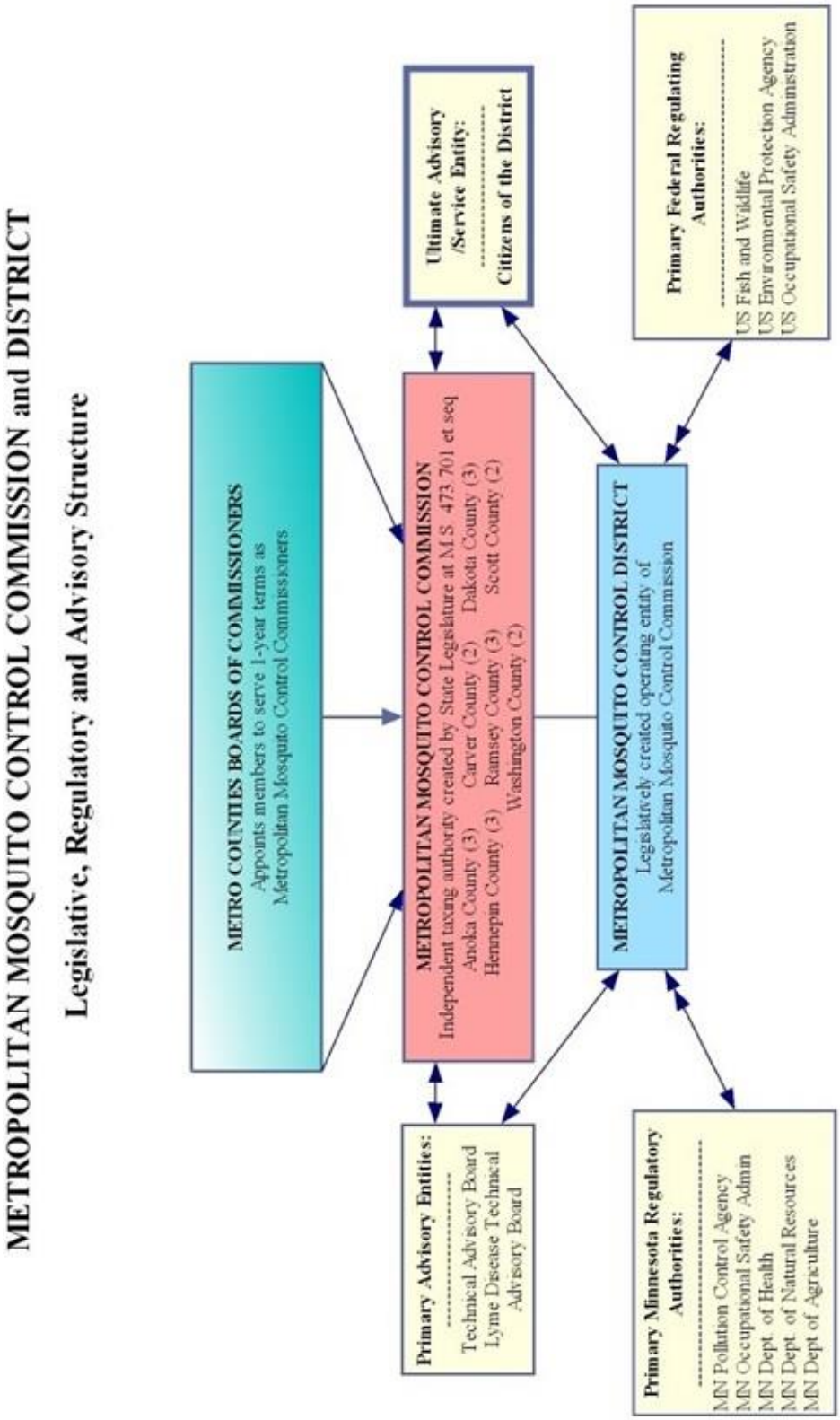
- The District's 2,970 sq. mi. area includes approximately 209,000 acres of wetlands that are prime habitat for mosquito larvae. For most townships in the north and northwest parts of the District, mosquito-producing wetlands (marshes, roadside ditches, wet pastures, woodland pools) cover between 15 and 50% of the township.
- Over 79,000 storm water catch basins and 25,000 other manmade habitats require treatment to control mosquito vectors of West Nile virus. Woodlots throughout the District are home to the mosquito that can carry La Crosse encephalitis. This disease primarily affects children and the adult mosquitoes that transmit it seldom fly more than ¼ mile from where they develop.
- Human or animal cases of other mosquito-borne viruses, including western equine encephalitis, eastern equine encephalitis, and Jamestown canyon virus have also been known to occur (infrequently) in this area. Dog heartworm, a parasite carried by mosquitoes that causes disease in dogs, is endemic in the area.
- Woodlands throughout the District (primarily the northeastern half) harbor the tick that can carry Lyme disease, human granulocytic anaplasmosis, babesiosis and Powassan virus.
- The five major rivers in the area (Mississippi, Minnesota, Rum, Crow and South Fork Crow) all are known to produce black flies ("biting gnats"), and river flood plains can produce high numbers of floodwater mosquitoes.

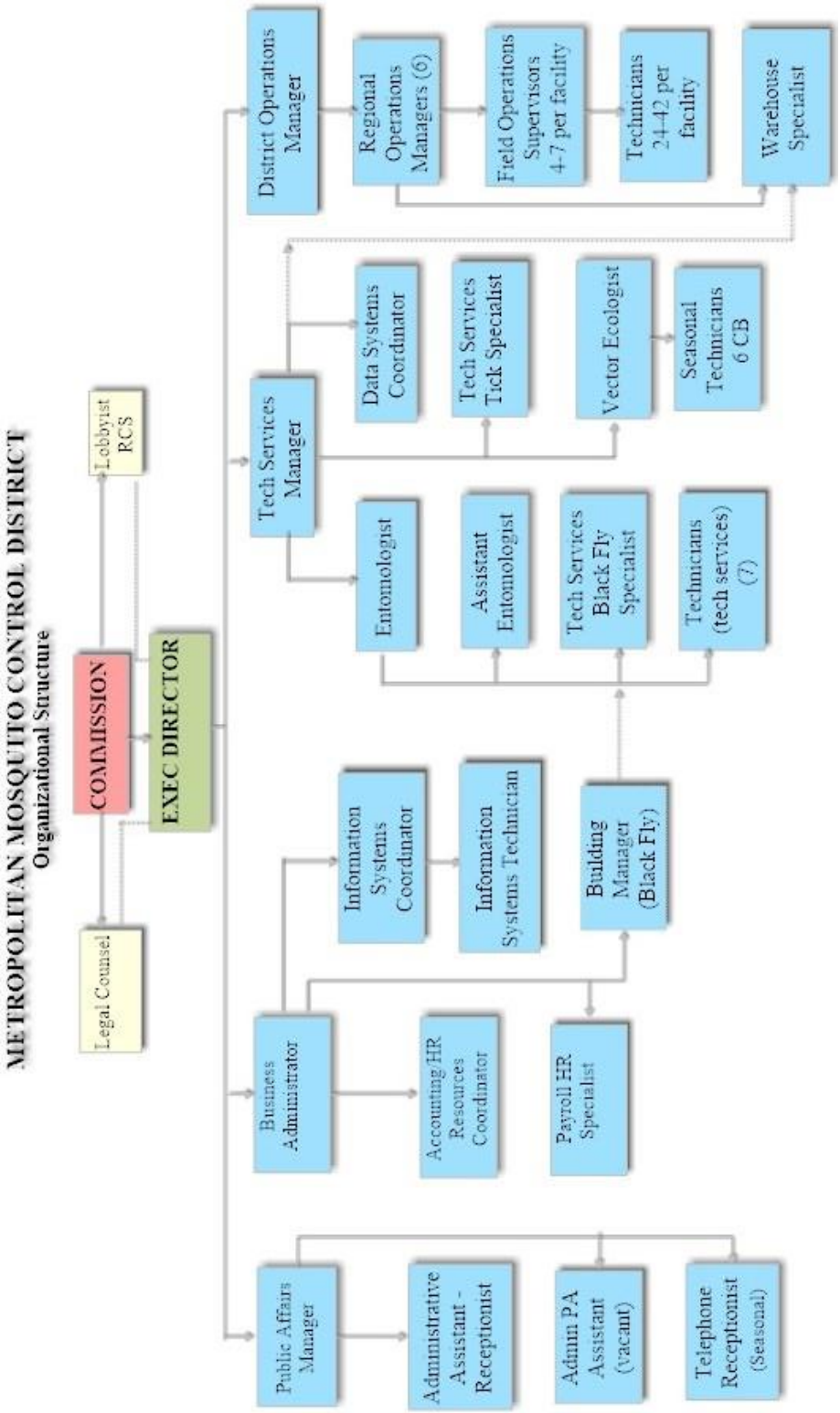
To provide the most service to the most District citizens, MMCD focuses its larval control operations in areas where the most people live (priority zone 1). Services including disease prevention and public event treatments are provided throughout the District.

Counties included in the Metropolitan Mosquito Control District, with higher human population priority zone 1 shaded, and county and city/township boundaries, 2022.



Locations of the St. Paul headquarters and six field facilities of the Metropolitan Mosquito Control District.


METROPOLITAN MOSQUITO CONTROL COMMISSION and DISTRICT
Legislative, Regulatory and Advisory Structure
METRO COUNTIES BOARDS OF COMMISSIONERS
Appoints members to serve 1-year terms as
Metropolitan Mosquito Control Commissioners
METROPOLITAN MOSQUITO CONTROL COMMISSION
Independent taxing authority created by State Legislature at MS 473.701 et seq
Anoka County (3) Carver County (2) Dakota County (3)
Hennepin County (3) Ramsey County (3) Scott County (2)
Washington County (2)
METROPOLITAN MOSQUITO CONTROL DISTRICT
Legislatively created operating entity of
Metropolitan Mosquito Control Commission
Ultimate Advisory
/Service Entity:
Citizens of the District
Primary Federal Regulating
Authorities:
US Fish and Wildlife
US Environmental Protection Agency
US Occupational Safety Administration
Primary Advisory Entities:
Technical Advisory Board
Lyme Disease Technical
Advisory Board
Primary Minnesota Regulatory
Authorities:
MN Pollution Control Agency
MN Occupational Safety Admin
MN Dept. of Health
MN Dept. of Natural Resources
MN Dept of Agriculture



The Executive Director is appointed by the Commission

Financial Policies

MMCD's financial policies/guidelines provide the basic background upon which overall concepts for fiscal management of the District are based. The policies guide the decision-making process of the Commission and are designed to provide a stable foundation to minimize the impact of changing conditions. The following multi-year policies provide a basis upon which program proposals can be judged:

- The District will maintain a working capital flow balance sufficient to minimize short term borrowing with the long-term goal of maintaining a positive cash balance.
- The District will continue to take advantage of investment opportunities to maximize the return on investment which will help reduce operating costs.
- The District will avoid large fluctuations in its property tax levy. However, actual expenditures may vary from year to year, resulting in fluctuations in fund balance and cash.
- Cash balances will be invested in conservative instruments which bring reasonable return and meet statutory requirements. Collateral will be held on investments as required in statute.
- The District is not currently authorized to issue bonds. Any major projects need to be budgeted in a fiscal year and financed from the fund balance or a levy increase or through the bonding authority of the member counties. The District may use tax anticipation notes to support short-term operational needs but will seek to minimize interest expense when interest rates are high and, if necessary, incur additional interest expense when interest rates are `low.
- The District's fund balance may reflect the results of these policy guidelines such as maintaining a cash flow balance for working capital, equipment replacement, facility maintenance, other major projects or long-term obligations. The District will maintain five-year capital and operating plans as guides to program and financial direction.
- The District's financial statements are audited annually, currently being conducted by the firm HLB Tautges Redpath. Financial statements will be produced in accordance with GAAP for fund accounting. The District also prepares Government-wide financial statements based on accrual accounting.
- The governmental fund is the general operating fund of the District used to account for all financial activities of the District.
- The primary source of revenue is property tax. Investment income and miscellaneous revenues make up a small portion of total District revenue.
- The Commission adopts an annual budget for the fiscal year starting the following January.

Budget Guidelines

MMCD's primary source of revenue (99% projected for 2023) is property tax collected from the seven participating counties; investment income and miscellaneous revenues make up the remaining 1% of the District revenue.

MMCD's board of Commissioners has directed staff to develop a 2023 budget that maintains desired service levels, manages operations and includes a capital budget plan that identifies the current capital needs of the district. The 2023 operating and capital budget is $19,993,910 which represents a 1% increase over 2022. The 1% increase is due in large part to operational plans to expand services.

The Metropolitan Mosquito Control Commission approved a capital budget planning guide that gave the Commission, staff, and the public an outline of future capital needs in order to meet expected service demands. The capital budget is updated annually with sensitivity to population growth and current economic trends (pages 15-17).

Property Tax Levy for 2023

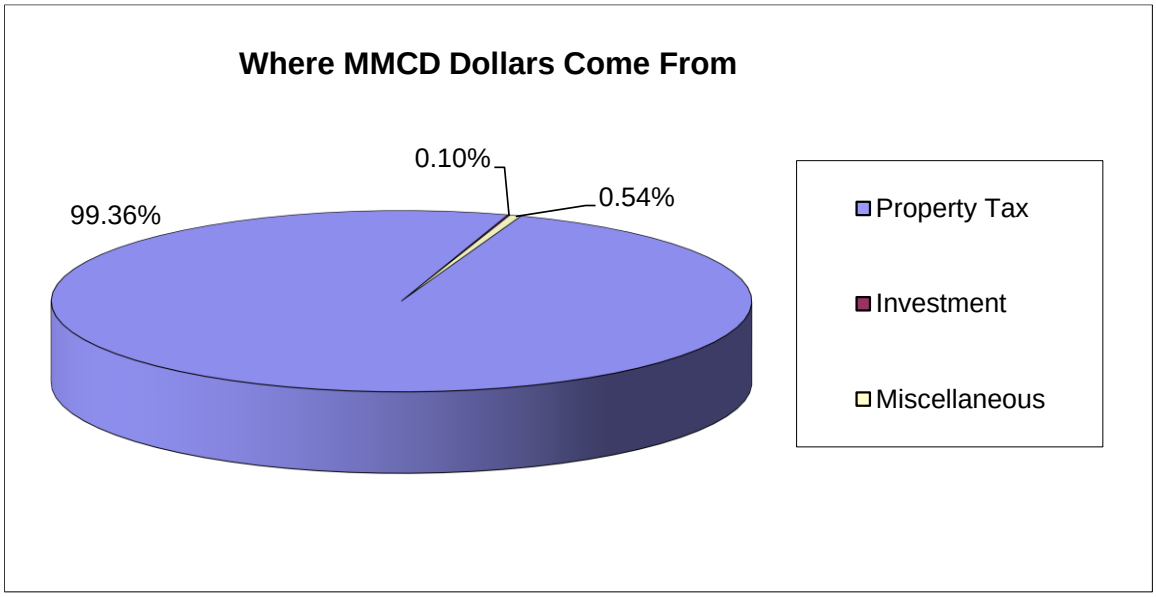
Weather conditions have a significant impact on MMCD's program. The annual expenditure budget is based on need and past experience. Recent annual weather variations have made the budget process a challenge. 2022 was the fifth service year in a row that weather conditions were drier than typical with fewer large treatment events, resulting less expenditures.

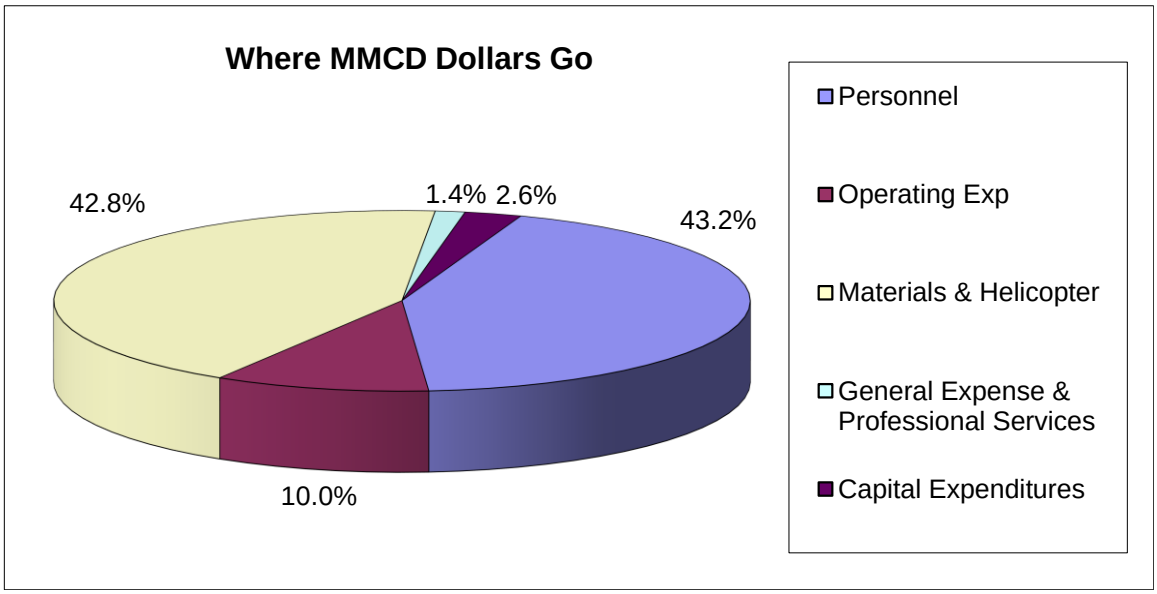
As of 2016 the Fund Balance was $2.1 million below the minimum determined by the policy. MMCD responded by incrementally increasing the payable property tax levy over the next seven years to narrow the gap between the levy payable and the expense budget and to increase the Fund Balance. We also held budget increases to a minimum and implemented expenditure reductions steps to save an amount equal to the difference between the budget and the levy. By the end of 2019, the Fund Balance had been restored to the minimum determined by the policy.

In 2023 MMCD's payable property tax levy will be $19,419,470 which is a 2% increase over the 2022 levy, a continuation of the plan to reach parity between the payable property tax levy and the expense budget.

Where MMCD Dollars Come From and Where They Go

The pie charts below illustrate where MMCD revenues come from and where dollars are scheduled to be spent by major function for 2023.





General Fund Revenue and Fund Balance

The General Fund is the operating fund of the District and is used to account for all financial activities. The table on page 14 summarizes the revenues and expenditures of the fund, including the ending balance which is the difference between revenue and expense plus retained reserves. The District's fiscal year is the calendar year.

The table on page 14 shows the beginning fund balance, the property tax levy (alphabetically by county) and any miscellaneous revenue and a summarized breakdown of District expenditures by major categories, a more detailed description of expenditures is included in the table on page 15.

The table on page 14 also shows the Ending Fund Balance, which includes the following: Non-spendable and Committed - which includes control materials carried forward from year-to-year, $1,500,000 for emergency disease or nuisance control and other funds that are assigned for future use. Unassigned/working capital which is made up of approximately 55% of the succeeding year budget less 90% of control material in stock and two percent of the levy for tax delinquencies should be maintained to provide working capital prior to tax collections which are received in July of the next operating year.

Components of the 2022 Year End Fund Balance:

Non-spendable	Control Materials in Stock		$3,000,000
Restricted			0
Unrestricted			
Committed	Emergency Disease Vector Control		1,500,000
Assigned	Employee benefits payable		$1,079.928
Unassigned	Working Capital: 55% of 2023 budget less 90% of control materials in stock	$ 8,263,631	
	2% for property tax delinquencies	$ 388,389	
	Remaining unassigned	0	
Total unassigned			$ 8,652,020
Total Fund Balance			$ 14,231,948

	Actual 2019	Actual 2020	Actual 2021	Approved 2022	Proposed 2023
Beginning Balance	**$14,726,928**	**$17,696,175**	**$22,818,534**	**$26,165,783**	**$25,587,711**
Revenues/Sources					
Property Taxes					
Anoka County	**$1,651,491**	**$1,700,239**	**$1,771,755**	**$1,801,059**	**$1,837,080**
Carver County	**$651,304**	**$661,245**	**$667,310**	**$670,181**	**$683,585**
Dakota County	**$2,390,290**	**$2,435,571**	**$2,450,506**	**$2,478,836**	**$2,528,413**
Hennepin County	**$8,419,357**	**$8,640,370**	**$8,625,821**	**$8,793,964**	**$8,969,843**
Ramsey County	**$2,606,036**	**$2,664,781**	**$2,673,674**	**$2,791,070**	**$2,846,891**
Scott County	**$869,122**	**$865,377**	**$880,508**	**$902,433**	**$920,482**
Washington County	**$1,552,182**	**$1,557,754**	**$1,591,980**	**$1,601,153**	**$1,633,176**
Market Value Credit	-	-	-	-	-
Total Property Taxes	**$18,139,782**	**$18,525,337**	**$18,661,553**	**$19,038,696**	**$19,419,470**
Other Financing Sources	$0	$0	$0	$0	$0
Miscellaneous	$412,655	$80,788	$166,410	$125,000	$350,000
Total Other Sources	**$412,655**	**$80,788**	**$166,410**	**$125,000**	**$350,000**
Total Revenue	**$18,552,437**	**$18,606,125**	**$18,827,963**	**$19,163,696**	**$19,769,470**
Expenditures/Uses					
Commissioners	$2,780	$705	$624	$3,600	$3,600
Control Operations	$14,199,943	$13,182,273	$14,190,274	$18,162,201	$18,343,823
Capital Outlay	$667,746	$269,275	$365,746	$527,520	$527,520
Administration	$1,012,630	$900,890	$924,070	$1,048,447	$1,058,931
TOTAL	**$15,883,099**	**$14,353,143**	**$15,480,714**	**$19,741,768**	**$19,933,874**
Ending Fund Balance					
Nonspendable/Committed/Assigned	$6,556,126	$7,621,567	$6,387,858	$6,387,858	$6,387,858
Unassigned/Working Capital/Tax Delinquencies	$11,140,049	$15,196,967	$19,777,925	$19,199,853	$19,035,448
TOTAL	**$17,696,175**	**$22,818,534**	**$26,165,783**	**$25,587,711**	**$25,423,306**
Amount From Fund Balance Used For Expenditures	**$2,669,338**	**($4,252,982)**	**($3,347,249)**	**$578,072**	**$164,405**

	ADMINISTRATION	2019 ACTUAL	2020 ACTUAL	2021 ACTUAL	2022 BUDGET	2023 PROPOSED
1	Salary and Wages	$761,158	$694,649	$717,995	$829,429	$837,723
2	Building Expense	$57,013	$56,073	$47,264	$50,980	$51,490
3	Office Supplies	$59,746	$15,717	$25,700	$33,219	$33,551
4	Travel and Mileage	$2,377	$1,164	$560	$3,912	$3,951
5	Insurance	$11,287	$9,336	$10,194	$12,916	$13,045
6	Interest	$0	$0	$0	$0	$0
7	General Expenses	$119,702	$123,951	$122,357	$117,991	$119,171
8	Repair and Maintenance	$1,347	$0	$0	$0	$0
9	Total Admin. Operations	$1,012,630	$900,890	$924,070	$1,048,447	$1,058,931
10						
11	Administration Capital	$0	$0	$0	$0	$0
12						
13	Total Administration -	$1,012,630	$900,890	$924,070	$1,048,447	$1,058,931
14						
	COMMISSION					
15	Per Diem	$0	$0	$0	$0	$0
16	Travel and Mileage	$2,780	$705	$624	$3,600	$3,600
17						
18	Total Commissioners -	$2,780	$705	$624	$3,600	$3,600
19						
	CONTROL/MONITORING					
20	Salary and Wages	$6,561,904	$6,407,924	$6,671,683	$7,799,058	$7,877,049
21	Rent and Building Costs	$851,853	$836,572	$814,924	$940,653	$950,060
22	Supplies & Expenses	$321,860	$320,460	$323,273	$341,883	$345,302
23	Control Materials	$4,013,552	$3,541,119	$4,031,856	$5,732,385	$5,789,709
24	Helicopter	$1,746,405	$1,487,582	$1,588,428	$2,520,888	$2,546,097
25	Transportation Expenses	$156,594	$120,679	$173,442	$213,964	$216,104
26	Insurance	$239,335	$220,445	$230,214	$242,066	$244,487
27	General Expenses	$109,931	$80,442	$149,452	$162,604	$164,230
28	Repair and Maintenance	$198,509	$167,050	$207,002	$208,700	$210,787
29	Total Control Operations	$14,199,943	$13,182,273	$14,190,274	$18,162,201	$18,343,823
30						
31	Control Capital	$667,746	$269,275	$365,746	$527,520	$527,520
32						
33	Total Control Division -	$14,867,689	$13,451,548	$14,556,020	$18,689,721	$18,871,343
34						
35	TOTAL ANNUAL BUDGET	$15,883,099	$14,353,143	$15,480,714	$19,741,768	$19,933,874
	Levy	$18,139,782	$18,525,337	$18,661,553	$19,038,696	$19,419,470
	Revenue - other sources	412,655	80,788	166,410	125,000	350,000
	Fund Balance (end of year)	$15,598,370	$19,851,513	$23,198,762	$22,620,690	$22,456,285
	Amount from FB used for exp.	($2,669,338)	($4,252,982)	($3,347,249)	$578,072	$164,405

MMCD Capital Budget

Capital Budget is developed as the current year expenditures and of a broader outline of the future capital needs. Every year Metropolitan Mosquito Control Commission reviews and updates a long-term strategic plan for the District. This plan is used as a guide to meet future needs and expected service demands. The capital budget is predicated on several overarching factors:

- That metropolitan area citizens believe mosquito control is an important service to them.
- That mosquito and tick-borne diseases remain a threat to the public health of metropolitan residents.
- That population growth and development will increase the need for more intense and effective control activity in the expanding metropolitan area.
- That the property tax base will eventually grow through development, thus reducing the demand on current taxpayers to meet expanded service needs.

The Capital Budget is presented in three segments:

Capital Equipment Plan

The capital equipment plan represents new items to meet the expanded needs of service demands, and a replacement strategy for each major type of purchase, vehicles, field equipment, technology (IT), and other support-based activities. These replacement costs are consistent with the practices of MMCD relative to equipment life cycles and general serviceability of equipment. Some replacement is determined by upgrades or normal wear. The equipment budget for 2023 is $477,520 (more details on page 17).

Capital Maintenance Plan

The capital maintenance plan represents significant repairs and maintenance of the MMCD's current facilities which consists of replacement, repair, upgrade and general upkeep of facilities. Examples include: roof repair and replacement, major parking lot repair or replacement, HVAC equipment replacement, land improvements, and the like.

As an ongoing process, each year we will evaluate each of the facilities and identify areas that need attention in an effort to continue to take a proactive approach to facility maintenance, totaling $50,000.

Capital Facilities Plan

The capital facilities plan was developed to ensure that MMCD facilities are adequate to address needs of the respective service areas over the next seven years, at least two years beyond the planning horizon. The facilities need to effectively house the equipment, employees and provide storage for treatment product in a safe and secure environment. The facility planning was driven by development patterns and the projected service expansion. Currently all the facilities provide adequate space for all essential needs and are owned by MMCD, with exception of the Oakdale facility which is leased and will suit our needs for several more years.

It is anticipated that any future facility expansions would be financed with tax-exempt bonds issued over a maximum fifteen-year term. MMCD does not possess bonding authority, so it must work expansions through arrangements with the respective counties or municipal entities, at present there are no plans to expand any of the facilities for the next few years.

2023 Capital Plan Summary:

Capital Equipment (see breakdown page 18)	$477,520
Capital Maintenance	50,000
Capital Facilities	-0-
Total	$527,520

Capital Equipment Plan 2023

Vehicles *$303,920*

Trucks and Hybrid cars
(15-year replacement cycle)

Field and Lab Equipment *$ 79,600*

Microscopes
(20-year replacement cycle)

Boats and motors (generally used for black fly treatments)
(8-year replacement cycle for boats)

Treatment Drone

ULV Foggers
UTVs
Forklifts
(10-year replacement cycle)

Technology *$94,000*

Hardware
Replacement of network equipment.

Software
Software applications are classified as intangible assets.

MMCD Strategic Objectives

MMCD has established strategic objectives designed to accomplish the mission in light of current conditions and upcoming needs to meet citizen expectations. MMCD operates within a team concept and uses full-time teams that represent technical knowledge bases and part-time teams and ad-hoc work groups that represent cross-functional issues such as equipment, human resources, information systems, etc.

1. **Maximize treatment capacity and efficacy through improved strategies, techniques, and products**

    - Manage available resources (personnel, control materials, equipment) to maximize services.
    - Evaluate new control materials and formulations to obtain more cost-effective products.
    - Incorporate development patterns and human population densities into service level determinations.
    - Evaluate operational and management practices for both productivity improvement and cost reductions.

2. **Ensure the environmental impacts of treatment are minimized**

    - Use surveillance-based Integrated Pest Management strategies to effectively control targeted species.
    - Effectively train staff to ensure proper treatments.
    - Utilize research, control results and technical expertise to determine control methods that mitigate potential adverse non-target effects.

3. **Optimize outreach and communication**

    - Ensure messages to citizens are both accurate and easy to understand.
    - Monitor citizen expectations through website, surveys, social media and phone calls.
    - Ensure that commission members and other public officials are adequately informed regarding policy, management, and operational decisions.
    - Make information available to citizens via the MMCD website and social media.
    - Maintain open communication with constituent communities, media and other stakeholders.
    - Market and present the school curriculum.

4. Reduce the incidence of mosquito and tick-borne diseases through surveillance, control, and education

- Maintain intensive focus on preventing local vector-borne illnesses with surveillance for vector species and pathogens and by managing vector populations.
- Remain current on new information related to chikungunya, Zika, and *Borrelia mayonii*; communicate important findings to staff and the public.
- Consult CDC, MDH and other experts; consider their recommendations when developing new vector-borne disease prevention strategies.
- Remain aware of and educated on vector-borne pathogens and of non-native vectors that could arrive in the District.
- Educate citizens on vector-borne illnesses using traditional media, social media, printed materials and public presentations.

5. Ensure that resources are sufficient to fulfill MMCD's mission

- Determine resources (staff, equipment, control materials) required to provide mosquito and black fly control and Lyme tick surveillance.
- Address long-term needs including vehicles, equipment, information systems, and facilities.
- Consider potential changes in demographics, climate, and technology when determining long-term needs.
- Ensure that all staff have the necessary training required to carry out the operational mission.

6. Incorporate Sustainable Operations into all future activities and plans.

- Educate employees about and involve employees in planning and executing wide ranging sustainability actions.
- Evaluate, devise and implement ways to reduce energy used to complete District operations.
- Research and evaluate how renewable energy technologies can be integrated into District operations.
- Reduce the amount of waste generated.
- Promote employee health and wellness.
- Seek out opportunities for employees to serve their communities by involving themselves in philanthropy, donations and volunteering.

7. Develop a safety-first organizational culture that promotes a safe healthy work environment.

- Promote a safety-first culture to reduce incidents and associated costs
- Expect safety first attitudes and practices
- Train personnel in safety expectations
- Investigate incidents and identify root causes

Specific projects and achievements designed to further the District's strategic objectives are reviewed each year by the Management Team.

Progress in 2022

1. **Maximize Treatment Capacity and Efficacy:** For a third season we implemented operations modified in response to the COVID-19 pandemic. We were able to increase larval mosquito treatments outside of P1 primarily to control spring *Aedes* and cattail mosquitoes. Very dry conditions reduced larval control needs later in the season. We added more treatment sites to control *Simulium tuberosum* to our black fly treatment permit.

2. **Minimize Environmental Impacts:** We maintained employee pesticide certification training to ensure treatments follow pesticide label requirements designed to minimize non-target impacts. We worked with Legislators to optimize legislation designed to protect pollinators while preserving public health protection services provided by MMCD.

3. **Optimize Outreach:** We monitored citizen input, mosquito abundance, staff workload and ongoing operations information to develop timely messages that clearly communicate services that District staff can provide as well as other strategies citizens can employ. We added more tools (e.g., electronic "submit a tip" form) to our website to enhance communication with citizens.

4. **Reduce Mosquito and Tick-borne Disease:** In 2022 we documented and responded to the detection of WNV activity and increased human risk that occurred earlier than in 2021 and in part was supported by hot dry conditions. We collaborated for the sixth year with the CDC-funded Center of Excellence for Vector-borne Disease overseen by Medical Entomologists at the University of Wisconsin, Madison. MMCD is part of a multi-agency collaboration to watch for introductions of the Asian Longhorned tick (*Haemaphysalis longicornis*) and red sheep tick (*Haemaphysalis punctata*).

5. **Ensure Sufficient Resources:** For a third season we diversified our seasonal employee recruitment to attract enough qualified applicants to fill positions required to deliver services. We were able to restore all 2017 service cuts in 2022 (three years early) because of a favorable financial status of MMCD.

6. **Sustainable Operations:** The COVID-19 pandemic impacted some sustainability programs. In 2022 vehicle replacements (sustainability-related fleet upgrades) have been delayed by COVID-19 related supply chain disruptions. Increased ventilation in our facilities did not significantly increase electricity usage. Working remotely when the job allowed significantly decreased commuting miles and time, both to our offices and to attend meetings.

7. **Safety First Working Environment:** In 2022 we continued to implement safe working strategies developed in 2020 using the most current CDC Guidelines. We maintained remote staff training and met remotely throughout the year. We continued COVID-19 investigatory and tracing strategies to detect potential exposures as quickly as possible and prevent additional exposures to keep staff safe and preserve our ability to deliver services. Because employees have followed these procedures, no employees have been infected by COVID-19 while at work since the beginning of the pandemic in March 2020.

2022 OPERATIONS UPDATE

Administration

MMCD administration enables operations staff to accomplish their tasks in an effective and efficient manner while controlling and coordinating resource use. Staff seeks to work with the public to identify and define citizen expectations, and these service level expectations are communicated to the Commission.

Achievements in 2022

1. MMCD's 2021 financial statements were audited by a private firm, HLB Tautges Redpath.

2. The District focused on the human capital by inventing time and resources to address staff concerns, their development and retention. Reviewing the current full time staff structure, evaluating the current team process and making changes that will have a positive impact on the District in the short and long term. The District continues to review and enhance human resource tools and opportunities to all staff through a variety of mediums.

3. The District continues to review investment strategies, with the COVID-19 Pandemic, and interest rates continued at record lows, decisions remain to reinvest as terms mature, in an effort to receive the best possible return on short term investments.

Public Affairs

District Public Affairs / Education is the bridge between public relations and government affairs. MMCD Public Affairs strives to effectively communicate the program to metro citizens, elected officials, governmental agencies and organizations that interact with MMCD.

Achievements in 2022

1. Staff continued to work closely with the Minnesota Department of Health in creating consistent messages designed to reduce risk of West Nile virus and other mosquito- and tick-borne illness. MMCD continues to be viewed by local broadcast and print media as an organization that provides timely, credible information to people throughout the upper Midwest, and valuable services to metro area residents.

2. MMCD staff continued developing a relationship with the Minneapolis Park and Recreation Board which will include assisting in the response to public questions and developing a new working agreement.

3. MMCD public affairs staff continued to work closely with the Minnesota Department of Agriculture and the University of Minnesota Extension Service in educating licensed applicators and refining control methods. These efforts enhance MMCD's reputation as a source of technical information about mosquitoes, ticks, and disease prevention.

4. MMCD increased use of social media – Facebook, Twitter, Instagram, and TikTok – to communicate directly with citizens and media. Our web site continued to feature frequently updated information including scheduled treatments, site maps, and educational information.

5. MMCD launched a new phone system and front desk messaging to streamline communications with the public. Residents are directed to the "Submit a Tip" feature and other communication tools on our website to make interactions between the public and staff clearer and quicker.

Mosquito Control

Mosquito control activities reduce regional populations of mosquitoes that affect the physical health and social well-being of citizens in the metropolitan area. Control is accomplished in an environmentally sensitive manner, using techniques and materials evaluated for safety and effectiveness.

For regional control, the District focuses on mosquitoes in their aquatic larval stage because dense populations of larvae are concentrated in discrete habitats where control materials can be applied efficiently. The District uses two soil bacteria, *Bacillus thuringiensis* var. *israelensis* (*Bti*) and *Bacillus sphaericus* (*Bs)*, another biological larvicide (spinosad) and an insect growth regulator (methoprene) to control mosquito larvae. Larval habitats are mapped and sampled to treat those areas that produce the most human-biting mosquitoes.

Control priority is given to sites near areas of high human population. Breeding sites with a history of consistent mosquito production receive priority during broods followed by sites observed to breed less often. This effort also includes collecting waste tires, other water-holding containers and filling wet tree holes to remove breeding sites of mosquitoes that may transmit La Crosse encephalitis, a potentially serious viral disease of children. The majority of control activities are regional larval control. Adult mosquito control is conducted in localized areas where mosquitoes of public health concern have been found, or where additional control is needed to reduce nuisance mosquitoes, primarily in park and recreation areas, for public events, and to respond to citizen requests for assistance with significant mosquito numbers in their neighborhoods.

Additional services are provided to combat disease-bearing species such as *Aedes triseriatus* (vector of La Crosse encephalitis), *Cx. pipiens*, *Cx. restuans,* and *Cx. tarsalis* (vectors of WNV, *Cx. tarsalis* is also a vector of western equine encephalitis), *Culiseta melanura* (vector of eastern equine encephalitis), *Aedes albopictus* and *Aedes japonicus* (both capable of transmitting several diseases). When surveillance indicates an increase in health risk, appropriate resources are used to reduce the threat. Control services also reduce populations of mosquitoes that can transmit Jamestown Canyon virus to people and heartworm to dogs.

In addition, staff provide information concerning mosquitoes, their habitats, and their control to the public as well as to public agencies including an annual review of District programs by the District's Technical Advisory Board comprised of specialists from various state and local agencies. Our staff are in a unique position to serve as a resource for other wetlands concerns due to our extensive wetland mapping and frequent visits to area wetlands.

Achievements in 2022

1. Precipitation in 2022 was low in March and April, higher in May and very low in June through September. This resulted in one large brood of spring *Aedes* and one large and seven small-medium broods of *Aedes vexans* (typical season has four large broods).
2. In 2022 staff treated 129,497 acres to control larval spring *Aedes*, floodwater (*Ae. vexans*), *Culex* and cattail mosquitoes (*Coquillettidia perturbans*). During the last five years (2018-22), the average annual total was 175,559 acres (minimum = 129,497 acres and maximum = 213,749 acres).
3. Staff responded to 1,460 citizen phone calls in 2022. In 2021 MMCD received a total of 1,191 calls.
4. In 2022, WNV was detected in 42 (first on June 22) of 617 mosquito samples tested by MMCD (compared to 60 of 852 mosquito samples tested in 2021).
5. In 2022, District staff eliminated a total of 12,932 larval habitats including 92 tree holes, 1,087 containers and 11,753 tires.
6. Staff completed more than 301,813 catch basin treatments to control *Culex* mosquitoes as part of the District's West Nile virus control program.
7. In 2022 staff treated 1,696 acres to control adult mosquitoes. During the last five years (2018-22), the average annual total was 14,101 acres (minimum = 1,696 acres and maximum = 37,681 acres). Control was lower in part because of much lower adult mosquito abundance overall.

Technical Services

The District's Integrated Pest Management program relies on environmental and technical information such as monitoring and evaluation. Surveillance, data management, equipment calibration and efficacy testing are essential to direct control activities, monitor success, and develop public information.

Achievements in 2022

Surveillance and Lab

1. Identified over 11,159 mosquito and black fly larval samples to help field staff direct resource use to the most valuable locations for control in 2022. This follows the same pattern as during the previous last two years when fewer collections were made because of lower larval mosquito occurrence.
2. Identified 7,361 adult mosquito and black fly samples in 2022. These samples help evaluate overall populations and program success as well as directing treatments.
3. The cool temperatures in April and early May delayed the start to the mosquito season. The first larval sample was taken on March 18, 2022. June and July warmed up, but little rain fell through mid-July. Consequently, we've only recorded two major broods, one being the spring *Aedes* brood and the other a major floodwater brood resulting from rain in late May. There have been seven other small, localized broods through September. The first mosquito emergence occurred in mid-May and peak levels of floodwater species occurred June 6. Thereafter, the average number of mosquitoes detected was well below the 10-year average. Adult cattail mosquito (*Cq. perturbans*) emergence began in early June. Adults of this species emerge in June through July with peak emergence usually occurring around July 4. On July 6, 2022, the population peaked at 55 mosquitoes per trap.

Data Management

1. Field staff completely transitioned to new GIS software (QGIS -open source, no license fees) for desktop mapping, producing paper reference maps, producing "To-Fly" files for use by helicopter pilots, and basic data exploration. We continued expanding in-house training resources and support to augment the many training resources available on the web. A few legacy processes in the lab still using MapInfo are planned for transition in the fall.
2. Our on-phone Mobile Map system had a major upgrade that improved usability and added the ability for Field Technicians to update many kinds of map information directly from the field. This is part of "Webster" MMCD's web-based data management system and database (developed with Houston Engineering Inc.)
3. We implemented a new on-phone Catch Basin Treatment recording system. This uses the map improvements we have made in the past few years to enable digital recording of individual catch basin treatments, replacing the

paper-based recording system previously used. This app leverages improvements in our catch basin location inventory made from data shared by cities.

4. We expanded our data entry/reporting system to include virus test submissions and results (expected completion by late summer). This system was designed to be compatible with other systems across the country for disease reporting.
5. We moved our field data systems to a larger cloud-based server to accommodate the overall expanded use.
6. We continued testing UAV (drone) use for treatments in field operations. Two seasonal technicians received their licenses to operate the treatment drone. They, in consultation with our first two pilots, completed treatments of 343 acres of ground sites with Altosid P35. Field staff are impressed by the ease and accuracy of drone treatment compared with treating by hand for sites larger than about 1 acre. Challenges include quickly-evolving software and hardware, and figuring out how to re-balance workload in field crews. Our regular photo drone pilots also continued testing uses for those devices to aid surveillance in the field.

Deer Tick Distribution Study

1. Continued multi-year sampling at 100 sites to monitor changes in deer tick populations. These ticks are the major vector of Lyme disease and human anaplasmosis, and according to MDH cases have been high statewide (most recent released data: 2020). Analysis of MMCD's 2022 samples is ongoing.

Black Fly Control

Control teams manage black fly larval populations throughout the greater metropolitan area, using environmentally sensitive and cost-effective materials, in order to reduce the level of annoyance by black fly adults. This is achieved by monitoring larval populations and treating those areas where predetermined threshold levels are met or exceeded.

Black flies develop in rivers and streams and are best controlled in the larval stage using a liquid formulation of *Bti*. Five large rivers converge within the District, creating the potential for producing large populations of gnats throughout the spring and summer. Five black fly species found in this area are particularly annoying to humans and are targeted for control. In the spring (beginning in mid-April), many local small streams produce an aggressive human-biting black fly species called *Simulium venustum*. The most productive of these small streams are surveyed and treated when larval populations reach threshold levels. Starting in 2021, *Simulium tuberosum* was included in the small stream treatment program for the first time due to the increased population of this human-biting species in recent years.

The District has extensively studied the ecology of local rivers since the beginning of our black fly control program in 1984. These studies have shown that treatments have not affected the overall diversity or biomass of (non-target) organisms living in the rivers.

Achievements in 2022

1. The amount of material needed to control black fly larval populations is related to the levels of flow (discharge) in the rivers that we monitor and treat throughout the District. River flows were above average April through June and nearer average July to September with 46 large river treatments completed. In 2022, *S. tuberosum* was included in DNR permit for all small stream sites. In early May, 11 small stream treatments were made for *S. tuberosum* and 29 for *S. venustum*. Studies done in 2021 showed that *S. tuberosum* has a second generation and the 2022 permit allows a second treatment for *S. tuberosum*, if warranted. In mid-June, 15 small stream sites over the *S. tuberosum* threshold were treated. Our six-year history of the number of treatments and amount of material used is summarized in Table 1. Our adult monitoring network, which is a series of sweep-net collections throughout the district, has shown dramatically reduced numbers of adults overall since District wide treatments began in 1995 (Figure 1).

2. We continue to work with the Minnesota Department of Natural Resources to monitor long-term, non-target impacts of our larval treatments on the District's rivers and streams. Samplers were placed on the Mississippi River in 2022.

The monitoring conducted on the Mississippi River since 1995 has shown no measurable impacts to non-black fly macroinvertebrates due to our treatments.

Table 1. Number of Treatments and Gallons of liquid *Bti* applied to control Black Fly Larvae for the most recent six years (all rivers and small streams).

Year	# of treatments	*Bti* used (gal.)
2017	63	3,620.60
2018	47	3,034.20
2019	68	4,405.20
2020	101	4,085.00
2021	110	1,171.74
2022	101	3,609.97

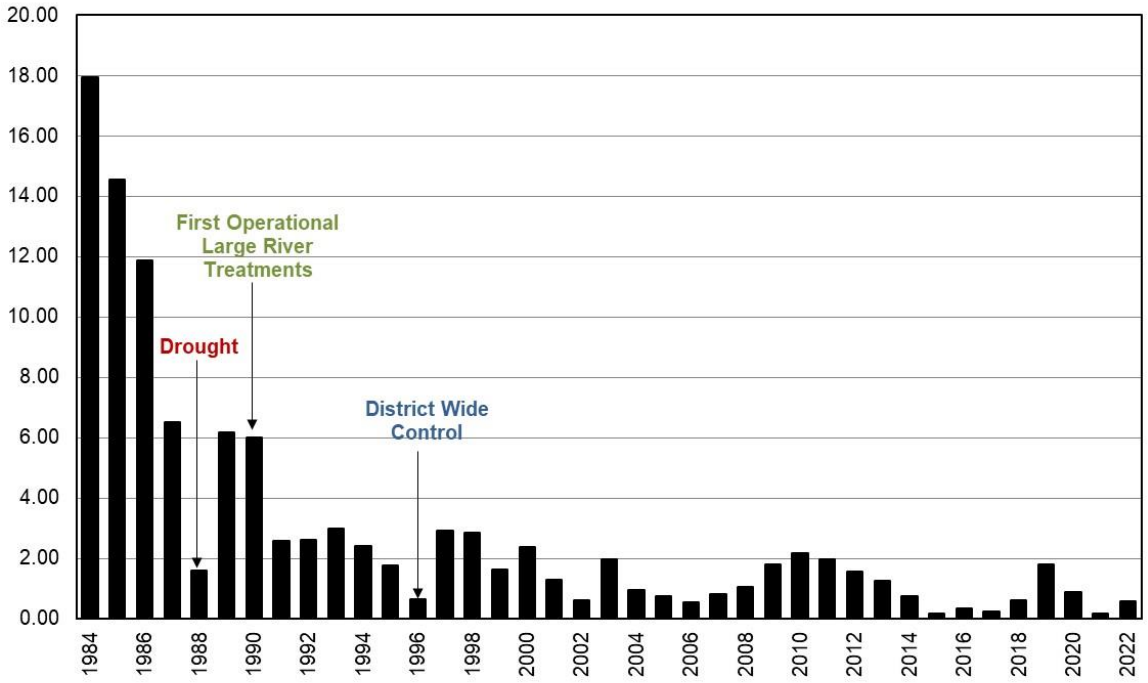


Figure 1. Daytime Sweep Net Collections, 1984-2022.