



City of Moorhead

Mosquito Control Policy

Effective: 4/27/2026

Introduction

The City of Moorhead Mosquito Control program is conducted through the Public Works Department. The purpose is to address the prevalence of mosquito-borne diseases such as West Nile Virus and reduce nuisance mosquitoes.

This policy outlines the mosquito control activities and decision-making processes for mosquito testing and spraying. It aims to ensure consistency, safety, certainty, and efficacy in managing mosquito populations.

Objectives

- Maintain an effective and cost-efficient mosquito control program.
- Reduce the risk of mosquito-borne diseases.
- Ensure the safety of the public and protection of the environment.

Scope

This policy applies to all mosquito control activities conducted by the City of Moorhead for mosquito management.

Mosquito Control Services

Mosquito Surveillance and Larval Control

The first step in mosquito control includes surveillance of larval and adult mosquitoes. Field observations provide information on the presence of mosquito larva and adult mosquitoes. This service includes the identification and treatment of mosquito breeding sites to control the mosquito population at the larval stage, reducing the number of adult mosquitoes. Larval control includes treatment of standing water.

Throughout the active mosquito season, mosquito traps are operated to provide surveillance of adult mosquito populations and species identification. This data is the basis for determining further action including recommendations for spraying operations. Recommendations are provided to staff for acceptable action based on observed and existing conditions.

Truck-Mounted Ground Spraying

Truck-mounted ground spraying is performed to reduce nuisance adult mosquito populations. Truck-Mounted Ultra Low Volume (ULV) Sprayers are utilized to spray adulticide along city roadways. The service is conducted based on adult mosquito trap counts. When the nuisance mosquito threshold is exceeded and spraying is recommended, truck-mounted spraying is performed in targeted areas. Truck-mounted ground spraying is not intended to cover the entire city limits. It is performed in targeted areas that coincide with elevated trap counts based on testing and field observation.

Spraying does not commence until after sunset to reduce impact to non-targeted species such as pollinators. Moorhead residents have the option to opt out of this service which results in adulticide not being sprayed adjacent to private property.

Aerial Spraying

The aerial application of adulticide is performed with an airplane equipped with Ultra Low Volume (ULV) Sprayers. The aerial application is conducted for the entire City limits of Moorhead. Additionally, the application is timed along with West Fargo, ND and Fargo, ND to increase the impact on localized mosquito populations. Aerial spraying is conducted at a specified application rate of 0.0035 lbs./acre and does not commence until after sunset. These criteria are established to reduce the impact on non-targeted species such as pollinators.

The aerial spray must be approved by the Public Works Director, City Manager, and Mayor. It is conducted based on a conditions recommendation to aerial spray and the presence of West Nile Virus in the community. The Risk Reduction Matrix is used, and a risk level of high or more permits the decision to aerial spraying. The Risk Reduction Matrix is further explained in the Spraying Decision Process section of this document.

Spraying Decision Process

Assessment of Conditions

The Public Works Department manages the Mosquito Control program and service contracts associated with the program. Even though other entities provide services for the City of Moorhead, the Public Works Director, City Manager, and Mayor hold the decision authorization for spray activities based on this policy document.

On a regular basis the Public Works Director reviews the mosquito surveillance data and any recommendations for spray activity. When spray activity is recommended for the metro area, the condition data is compared with decision criteria established for the City of Moorhead. Aerial spraying is permitted when the conditions meet the Risk Reduction Decision Matrix of category 2 (high) or more. Truck-Mounted ground spraying is permitted in all categories when recommended. The Decision Matrix is shown in Figure 1.

Information reported by the MN Department of Health, ND Health and Human Services, CDC ArborNET, and Moorhead's Mosquito Surveillance provider will be used in determining the current risk category. The state and federal agencies will publish county specific data related to human and veterinary cases. The Mosquito Surveillance provider will provide location specific information related to positive testing of local mosquito pools and birds. Staff may receive specific location information and will utilize it when making decisions related to spray activities. Metro area is defined as Moorhead, MN, Dilworth, MN, Fargo, ND, West Fargo, ND, and Horace, ND.

If aerial spraying is permitted based on the conditions and the decision matrix, the Public Works Director, City Manager, and Mayor may authorize Aerial Spraying for the City of Moorhead and the Public Works Department will schedule the aerial spraying service.

If aerial spraying is not permitted based on the conditions and the decision matrix, the Public Works Director, City Manager, and Mayor may approve Truck-Mounted Ground Spraying in targeted areas. The Public Works Department schedules the truck-mounted ground spraying service.

Figure 1 – Risk Reduction Decision Matrix

Risk category	Probability of human outbreak	Definition	Activities and responses
0	None	<ul style="list-style-type: none"> No adult mosquito biting activity (vector species). No avian mortality noted. No suspected human cases documented. 	<ul style="list-style-type: none"> Monitor and maintain nuisance mosquito populations. Maintain surveillance activities for both nuisance and known vector species. Monitor national and regional arbovirus case documentation Organize disease surveillance live trapping when climatic conditions warrant (High temps >70 degrees – Low temps > 55) Treat known vector breeding sites with residual materials
1	Low	<ul style="list-style-type: none"> Biting adult mosquitoes active (vector species). -or- Epizootic activity expected based on onset of transmission in prior years. -or- Limited or sporadic epizootic activity in birds or mosquitoes. 	<ul style="list-style-type: none"> Response as in category 0, plus: Activate systemic program to monitor and reduce vector mosquito abundance. Conduct weekly RAMP test pools to monitor virus activity (mosquitoes and avian hosts) (July- Aug) Initiate community outreach focused on personal protection and residential source reduction. Monitor climatic conditions to evaluate future risk profile.
2	High	<ul style="list-style-type: none"> Sustained transmission activity in mosquitoes or birds for Metro Area. -or- Veterinary cases reported in Cass or Clay County -or- Human case or viremic blood donor reported in Cass or Clay County 	<ul style="list-style-type: none"> Response as in category 1 plus: Intensify and expand adult mosquito control in areas using ground and/or aerial applications where surveillance indicates human risk. Consider 14 to 21-day ULV intervals Intensify visible activities in community to increase attention to WNV transmission risk and personal protection measures. Work to address high risk populations. Intensify and expand surveillance for human cases.
3	Outbreak in progress	<ul style="list-style-type: none"> Conditions favor continued transmission to humans (i.e., persistent high infection rate in mosquitoes, continued avian mortality, seasonal mosquito population decreases not anticipated for weeks) -or- Multiple confirmed human cases or viremic blood donors. 	<ul style="list-style-type: none"> Response as in category 2 plus: Intensify emergency adult mosquito control program repeating applications as necessary to achieve adequate control. Monitor effectiveness of vector control efforts Emphasize urgency of personal protection, including use of repellents, through community leaders and media. Engage in 14 to 21-day interval region wide adult mosquito treatment regimen

Communication of Spray Activities

When spray activity is scheduled by the Public Works Department a public notification will be released. The public notification will provide the intended activity along with the scheduled date and time. Spray activities require specific environmental conditions and may be rescheduled based on the weather. The public notification will be released via City of Moorhead E-Notifications, website, and City of Moorhead social media.

Other Mosquito Control Initiatives/Activities

Public Education

The City of Moorhead provides public education related to personal protection from mosquito transmitted viruses. Information is located on the City of Moorhead website moorheadmn.gov.

Natural Predators

The City of Moorhead seeks to create habitat that supports natural predators to the mosquito population. Bats, dragonflies, and birds are known predators that feed on the mosquito population. City staff work to support habitat and foster favorable environments through maintenance activities and projects with area organizations.

Permethrin Resistance Testing

The City of Moorhead seeks to monitor resistance to the insecticide permethrin in the local mosquito population. Mosquito spray activities in the region utilize permethrin-based products and is known to be an effective form of mosquito control. The City of Moorhead seeks partnerships with local experts to conduct resistance testing in the mosquito populations. Testing results will be utilized as feedback to ensure the effectiveness of the mosquito control program and products utilized.

Conclusion

Effective mosquito control requires a coordinated and systematic approach that integrates surveillance, decision-making, and intervention. By following this policy, agencies and personnel can ensure the safety, efficacy, and sustainability of mosquito control efforts, and ultimately, protect public health and the environment.