VILLAGE OF DOWNERS GROVE
Report for the Village Council Meeting
7/8/2025

SUBJECT:	SUBMITTED BY:
Mosquito Spraying Discussion	Dave Fieldman Village Manager

SYNOPSIS

Discussion of the mosquito abatement practices focusing on the conditions that prompt a mosquito aerial spraying and potential operational changes.

STRATEGIC PLAN ALIGNMENT

The 2023-25 Long Range Plan includes *Exceptional Municipal Services* and *Steward of Environmental Sustainability* as Strategic Goals. The Environmental Sustainability Plan provides guidance and recommendations related to this topic.

FISCAL IMPACT

Each mosquito spraying costs approximately $11,600 (total contract is $57,817.68 for 2025, this includes larvicide applications, a booster larvicide, and 1 spray of adulticide).

RECOMMENDATION

Action at the discretion of the Village Council.

BACKGROUND

During recent informal discussions with the Village Manager, several Council members indicated a desire to discuss the Village's current mosquito control practices with a focus on the conditions that prompt a community wide mosquito spraying. The primary policy issue appears to be balancing the efforts to prevent the spread of the West Nile Virus (WNV) in humans and the potential negative impacts on the pollinator population (bees, butterflies, dragonflies, etc).

WNV was first discovered in Illinois in 2002. Since then, there have been nearly 3,000 human cases of WNV in Illinois and as many as 316 documented cases in DuPage County. The natural host of WNV is birds, but one of the predominant mosquito species in the northern Illinois area (Culex or "House Mosquito") is known to feed on both birds and humans. This results in the risk of transmission of WNV to humans. Therefore, mosquito abatement can be considered a public health risk management strategy.

As part of the efforts to reduce the spread of WNV in humans, the Village operates a complete Integrated Pest Management (IPM) program. However, as noted by the USEPA, certain active ingredients in pesticides may be toxic to beneficial insects upon direct exposure. Therefore, the aerial spraying component of mosquito abatement programs can negatively impact pollinator populations.

Environmental Sustainability Plan Guidance and Recommendations

The recently adopted Environmental Sustainability Plan (ESP) includes a series of vision statements, goals, key recommendations, and objectives that discuss strategies to promote biodiversity and reduce the environmental impacts of Village services. Below are relevant excerpts from the ESP:

> *Ecology Vision Statement*: "Every home, business, and institution within Downers Grove will find a way to give back to nature rather than take more from it. Holistic efforts by the community will result in stronger relationships with nature, more biologically diverse landscapes, connectivity between natural habitats and the built environment, cleaner air and water, and nature-rich neighborhoods. The result will be a healthier and more resilient Downers Grove."
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> *Key Recommendations:*
> - Actively improve biodiversity and habitat restoration on Village properties and through partnerships with other local government entities
> - Consider enhancing green procurement practices that prioritize sustainable goods and services
> - Continue to invest in projects and ongoing Village services that increase natural habitat, enhance community resilience, and reduce emissions
>
> *Village Objectives:*
> - Improve weed and pest management practices to protect local wildlife and the quality of waterways

Village of Downers Grove Pollinator Program

The Village takes steps to enhance the pollinator population by establishing and maintaining pollinator habitats. There are 27 Village owned naturalized areas designed to enhance stormwater management and provide habitats for pollinators. The Downers Grove Park District owns the Belmont Prairie.

DuPage County Department of Public Health

The DuPage County Health Department operates the Vector Control program which is designed to protect the community from disease vectors, such as mosquitoes and ticks, through public education and awareness as well as through surveillance and control activities. To help DuPage County residents protect themselves against West Nile virus (WNV), the DuPage County Health Department has created a Personal Protection Index (PPI) that will provide the amount of WNV activity in the County, as well as prevention steps that are recommended. The Department also conducts surveillance activities for WNV with partner agencies seasonally, from May through October, by operating mosquito collection traps located throughout DuPage County. These traps are designed to capture the Culex species of mosquitoes, which is the primary transmitter of WNV in the area. After collection, the mosquitoes are tested for the presence of the virus to predict the risk of human exposure. More information is available on their website. The DuPage County Health Department does not specifically recommend when a municipality should conduct an aerial spraying for mosquitoes.

Village of Downers Grove Mosquito Abatement Program

The Village operates a mosquito abatement program, also known as an Integrated Pest Management (IPM) program. The goal of the program is to reduce the spread of WNV in humans by minimizing the mosquitoes which may carry the virus (Culex species of mosquitoes). Many of the Village's existing efforts towards promoting pollinators and managing mosquito abatement align with elements of the Bee City USA's recommendations for an IPM program.

The Village currently contracts with Clarke Environmental Mosquito Management, Inc. (Clarke) to manage and implement the IPM program. Clarke also provides services for many DuPage County communities. Below are the components of the IPM program that Clarke is responsible for:

> **Surveillance:** Clarke uses publicly available surveillance data, as well as their own testing sites throughout DuPage County to monitor mosquito populations and positivity rates of traps throughout DuPage County.

Larvicide: One round of 5,320 larvicide tablets in catch basins and inlets, followed by a booster in 400 catch basins. The active ingredient used in the tablet is Spinosad, derived from a naturally occurring bacterium found in soil.

Adulticide: At the discretion of the Village, Clarke conducts an aerial spray along 167 miles of Village ROW. Clarke uses the EPA approved DUET with an ultra-low volume (ULV) fogging machine mounted on the back of a truck. The active ingredient in DUET is a pyrethroid that emulates naturally derived insecticides found in chrysanthemum flowers. At the direction of the Village, Clarke does not spray in the area immediately adjacent to the Belmont Underpass pollinator garden and the pollinator garden located at the Downers Grove Public Library.

The determination to conduct ULV spraying is made through a consultation process between Clarke and Village staff. Clarke will make a recommendation to spray when one or more of the following factors are present:

- A human case of WNV in or near Downers Grove
- One or more test sites within Downers Grove have are positive for WNV
- Multiple test sites in surrounding areas around Downers Grove test positive for WNV
- There is an overall upward trend in the positivity rate of traps in DuPage County

Staff and Clarke will also factor in whether surrounding communities are also spraying in an attempt to reduce positivity rates of WNV. The Village does ***not*** conduct ULV spraying as a preventative measure or to combat nuisance mosquitoes.

Clarke's website includes additional information about their program:
https://www.clarke.com/blog/top-10-resident-questions/
https://www.clarke.com/blog/mosquito-control-and-beneficial-pollinators/

Illinois Department of Public Health
The IDPH states that control of the Culex larvae is a priority. The IDPH also states the following about adulticide:

> " Adult mosquito control (also called fogging, spraying or adulticiding) is the mosquito control method most familiar to the public. However, aerosol fog kills only mosquitoes that contact insecticide droplets, and the fog soon dissipates. Although the local mosquito population is reduced, fogging does not prevent mosquitoes from re-entering the area. ***Because only a part of the local adult mosquito population is reduced for a few days by fogging, municipalities should give priority to larval mosquito control of Culex mosquitoes. Nonetheless, when the risk of human disease is present, the only method that will reduce the population of WNV-infected mosquitoes throughout a community is adulticiding.*** Treatment for control of WNV-infected adult mosquitoes is a valid and legal option for local officials to employ as a supplement to larviciding."

The IDPH has adopted the Joint Statement on Mosquito Control in the United States (US EPA) as a recommendation. The IDPH does not specifically recommend when a municipality should conduct an aerial spraying for mosquitoes.

Effectiveness of Aerial Spraying and Impacts on Pollinators
Staff found the following articles and information which may address the effectiveness of aerial spraying and the impacts on pollinators (see attached). Excerpts from Clarke's website are also attached.

Policy Considerations

Based on the key findings of research and evaluation of current practices, staff recommends continued use of larvicide as a frontline defense against WNV in the community. In regards to the use of ULV spraying as a means of adulticide, unless directed otherwise by the Village Council, staff intends to continue to conduct an aerial spray when one or more of the following factors are present:

- A human case of WNV in or near Downers Grove
- One or more test sites within Downers Grove have are positive for WNV
- Multiple test sites in surrounding areas around Downers Grove test positive for WNV
- There is an overall upward trend in the positivity rate of traps in DuPage County

The Council could consider establishing a threshold for conducting the use of ULV spraying based on the following:

1. Routine ULV spraying as a preventative measure for WNV and nuisance mosquitoes
2. One positive WNV sample in a trap within Downers Grove
3. Multiple positive WNV samples in traps within Downers Grove and/or surrounding communities
4. Ongoing positive WNV samples in Downers Grove for more than three weeks
5. DuPage County Health Department increases the Personal Protection Index to Moderate (includes one human case of WNV)
6. DuPage County Health Department increases the Personal Protection Index to High (includes multiple human cases of WNV)
7. Do not conduct ULV spraying

In addition, the Council could consider operational changes that include one or more of the following:

1. Work with Clarke to install additional traps throughout Downers Grove to enhance surveillance and provide localized data
2. Change the chemicals used in ULV spraying to an non-synthetic pesticide that has the following attributes:
   a. Has the same effectiveness as the currently used pesticide
   b. A botanical pesticide that derived from chrysanthemum flower and is certified by the Organic Material Review Institute
   c. Rapid breakdown (typically within 4 hours in direct sunlight) and reduces residual contact risk for non-target insects
   d. Would increase the cost of spraying from $11,583 to $15,364
3. Create additional “no spray zones” near ecologically sensitive areas

ATTACHMENTS

Articles
Excerpts from Clarke’s Website

Articles

Ultra-low volume (ULV) adulticide treatment impacts age structure of Culex species (Diptera: Culicidae) in a West Nile virus hotspot

Ultra-low-volume space sprays in mosquito control: a critical review

NONTARGET EFFECTS OF THE MOSQUITO ADULTICIDE PYRETHRIN APPLIED AERIALLY DURING A WEST NILE VIRUS OUTBREAK IN AN URBAN CALIFORNIA ENVIRONMENT

Mosquito Sprays: Investigating Their Impact on Pollinators

Toxicological impacts of synthetic pyrethroids on non-target aquatic organisms: A review

More than 75 percent decline over 27 years in total flying insect biomass in protected areas

Butterfly declines in protected areas of Illinois: Assessing the influence of two decades of climate and landscape change

Insect Declines in the Anthropocene

Dispersal of Adult *Culex* Mosquitoes in an Urban West Nile Virus Hotspot: A Mark-Capture Study Incorporating Stable Isotope Enrichment of Natural Larval Habitats

Clarke's Website Excerpts

Clarke's website includes the following information:

> WHAT ARE THE IMPACTS OF MOSQUITO SPRAY TREATMENTS ON CATERPILLARS, BUTTERFLIES, OR LIGHTNING BUGS?
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> (Ahh… you were waiting for this one!) This one gets tricky and can be very product-specific, ***but generally***, the answer is, have no fear! Download this fact sheet from the CDC that breaks down more details on mosquito spray applications. While the EPA has determined that certain active ingredients in pesticides may be toxic to beneficial insects upon direct exposure, four key things reduce this risk for mosquito control applications:
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> 1. We don't spray just the active ingredients. We use highly-refined formulations, most of which contain less than 5% of an active ingredient.
> 2. ULV treatments used for adult mosquito control distribute a very, very small amount of product specific to mosquito control – usually an ounce or less to treat an acre (which is roughly four typical suburban home lots or a football field). Why so little? Because the dose is specific to mosquitoes, which are much smaller in weight than most beneficial insects. For reference, mosquitoes weigh between 2 and 10mg each. A firefly weighs at least 20mg. The average honey bee weighs 100mg.
> 3. Next, that very small amount of product is delivered in super-tiny droplets – think 15 droplets on a pinhead. The droplets float through the air and work by making physical contact with adult mosquitoes in-flight.
> 4. And lastly, we usually treat beginning at dusk, when mosquitoes are most active and other beneficial insects are not.
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> WON'T MOSQUITO SPRAYING HURT THE BEES?
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> Mosquito spraying and bees – this is another sensitive issue and one that everyone takes very seriously. Firstly, the same protective measures followed to protect other beneficial insects also apply to bees, and mosquito control programs are encouraged to maintain transparent relationships with local beekeepers and provide advance treatment notifications. There has also been a lot of fieldwork and research published by very reputable academic institutions, such as Louisiana State University, that demonstrate mosquito control applications, when conducted according to all label guidelines, do not present a material risk to pollinators. For example, this article summarizing field research conducted by LSU demonstrates that ULV treatments for mosquito control **do not** harm honey bees, even in cases of direct spray applications.