VILLAGE OF NORTHBROOK
ENVIRONMENTAL QUALITY COMMISSION
Thursday, March 18, 2021

Important Notice:

Pursuant to Section 7(e) of the Illinois Open Meetings Act (5 ILCS 120/7(e)) of Governor Pritzker's Executive Order 2021-04, this meeting of the Northbrook Environmental Quality Commission will be **conducted remotely** through a video conference call and will not be held at Village Hall. If you wish to hear the discussion or watch the meeting remotely, please contact Michaela Kohlstedt, Deputy Director of DPS, at michaela.kohlstedt@northbrook.il.us for call-in or viewing instructions

Audio conference: **Dial: 408-418-9388**
Access code: 187 198 9394

Individuals wishing to watch the video conference at the Village Hall may call 847-664-4051 by 4pm Thursday March 18 to reserve a seat where there is limited seating (8 seats) and masks will be required as well as maintaining proper social

REMOTE MEETING
AGENDA

7:00 P.M.

1) Call To Order
2) Review of Minutes – February 18, 2021 Meeting
3) Hear From the Audience – Items not on the agenda
4) Community Planning Report
5) Northbrook Sustainability Baseline Assessment & Climate Action Plan Team Update
6) Pesticide Discussion with the North Shore Mosquito Abatement District
7) Discussion of the Proposed Green Steward Award for 2022
8) Updates on Other Items:
    a) Communication Initiatives & Messaging
    b) Solar Permit Data
    c) Village Plastic Bag Recycling Update
    d) Recycling & Waste Data – Solid Waste, Electronics, Recycling, Light Plastics, Composting
9) Old Business
10) New Business
11) Remarks for the Good of the Order
12) Next Scheduled Meeting – April 15, 2021
13) Adjourn.

The Village of Northbrook is subject to the requirements of the Americans with Disabilities Act of 1990. Individuals with disabilities who plan to attend this meeting and who require certain accommodations in order to allow them to observe and/or participate in this meeting, or who have questions regarding the accessibility of this meeting or the facilities, are requested to contact Greg Van Dahm or Debra J. Ford (847-664-4014 and 847-664-4013, respectively) promptly to allow the Village of Northbrook to make reasonable accommodations for those persons. Hearing impaired individuals may call the TDD number, 847-564-8465, for more information.

Jeremy Reynolds, Chair of the EQC

SUMMARY OF THE
CLIMATE ACTION PLANNING TEAM MEETING
VILLAGE OF NORTHBROOK
March 1, 2021

Call to Order

Deputy Director of Development and Planning Services Michaela Kohlstedt called the CAPT meeting to order at 5:00 p.m. in a remote meeting through Zoom virtual meeting platform. Ms. Kohlstedt was present in the Village Hall, but there were no members of the public in attendance in the building.

Roll Call

The following Members were in attendance: Trustee Israel, Trustee Ross, John Albrecht, Frank Bleeker, Steven Elisco, Jill Franklin, Robyn Kole, Pat Lederer, Clare Poupard, Len Rago, Aaron Stash, Patti Vile, Sandy Weiss, Joan Scovic, Pat Lederer, Nell Badgley, and Derrik Chen.

Members absent: Melissa Hirsch, Kim Ptak, and Scott Robson.

The following Village Staff were in attendance: Michaela Kohlstedt, Madeline Farrell, Corey Friedman, Erik Jensen, Matt Morrison, Kelly Hamill, Chan Yu, and Swati Pandey.

Also Present: paleBLUEdot consultant Ted Redmond, Greenest Region Corps Member Tessa Murray.

Public Comments Regarding Items Not on the Agenda

No members of the public were present at the meeting.

Welcome and Meeting Goal Overview

Member Rago inquired on how many actions are expected for the final CAP, to which Mr. Redmond estimated 3-5 actions per strategic goal, with the largest subcategories (like Buildings/Energy) totaling around 40-60 action items. Member Vile asked how long paleBLUEdot will be involved in the CAP process and Mr. Redmond responded that he anticipates staying until June and following up regularly as needed.

Before moving into subteam breakout sessions, Trustee Israel spoke on incorporating action items that represent initiatives already in progress (SolSmart designation, electrification of Village fleet vehicles, etc.) into sector goals. Trustee Israel encouraged members to make note of listed items already in progress and consider these priorities to include in the finalized plan. Director of Public Works Kelly Hamill agreed and added that the CAP serves as an opportunity to make these in-progress improvements public-facing, educational, and allowing for sustained growth towards carbon neutral.

Trustee Ross encouraged members to attend the tour of Northbrook Park District's new Net Zero Energy facility at Techny Prairie Activity Center. The Park District's Director of Marketing Joan Scovic reiterated that all CAPT members are welcome to sign up for a tour to learn about the green functions and how Net Zero Energy is achieved in the facility.

Mr. Redmond reminded members that the intent of this meeting is to complete the review of ranking actions by screening criteria to refine the proposed items by priorities using the ActionFinder tool. The screening criteria are as follows: support, impact of implementation, potential for success, affordability, and overall cost to benefit. Upon reviewing definitions of criteria, Trustee Israel requested "overall cost to benefit" be changed to "overall benefit to cost" as it more aligns with the actual ratio being weighed against each other in this screening component. Mr. Redmond agreed and offered to adjust this language and upload a revised document.

Breakout Round 1: Transportation/Land Use, Waste Management, Local Food

Director Kohlstedt reported back to the group for the Local Food subteam, which finished rating all actions and discussed making repetitive items into combined actionable goals. The subteam will begin to sort between potential partners and primary responsibility-holders for each action before the next CAPT meeting.

Assistant to the Village Manager Madeline Farrell shared that the Waste Management group also began consolidating items, and clarified language in terms of requiring or encouraging waste practices for commercial and residential goals.

Member Stash said the Transportation and Land Use subteam continued ranking items as a group from where they left off at February's meeting and noted that many items need more clear language. Member Scovic added that sometimes too many goals appear in one item, and the group should parcel out what in these items suit Northbrook best before the next meeting.

Breakout Round 2: Buildings and Energy, Climate Health and Safety

When the CAPT returned from the second breakout session, Trustee Israel reported that the Buildings and Energy team clarified many aspects of this sector's goals. He explained that some actions were revised from requirements to encouragements (such as pushing commercial and multi-family buildings to go all-electric). The team also decided to remove benchmarking as a major commitment due to its high cost and relatively low benefit to emissions mitigation. Additionally, the large upfront cost of receiving LEED or Energy Star certification for Village buildings was cited as a reason to remove this action.

For Climate Health and Safety, Member Weiss explained that all actions ranked below 4 were agreed upon as unfeasible or redundant and removed from the list. The group discussed its role as an actor for strategies of climate resiliency more than mitigation, but still includes items that mitigate greenhouse gasses through committing to air quality improvements.

Breakout Round 3: Water and Waste Water, Greenspace/Tree, Climate Economy

Trustee Ross represented the Climate Economy team that agreed upon the ranking score of 4 as a threshold for prioritization of action items, but made note of goals they wish to be looked at by Ted for guidance on what is considered feasible.

Trustee Israel added that the Water team agreed to use 4 as a threshold number as well, with any item ranked 4 or above moving onto assignments of primary and secondary stakeholders for next week's meeting. The team also narrowed down multiple repetitive items into a larger consolidated goals. Member Rago added that based on their helpful discussion with Director Hamill, activities already moving forward in the Village increased favorably in ranking.

For the Greenspace and Tree Canopy team, Member Stash explained that this group has few items ranked lower than 4 therefore needs a higher threshold number than the other teams. Mr. Redmond responded that the next step is for paleBLUEdot to work in each subteam's ActionFinder spreadsheet and will establish a threshold they think is best for each group that has not already decided on a number. Actions that fall below the threshold will not be deleted but rather change in color on the document, to denote that these items have moved to a standby list.

Member Scovic inquired on when the team will be specifying language of each action, regarding whether Northbrook will move forward to require, incentivize, or advocate for each agreed upon climate initiative. Mr. Redmond suggested members should flag and bold items that need wordsmithing between now and during the next meeting. Establishing a consensus on the language in each goal will occur at April's CAPT meeting.

Next Steps

Mr. Redmond clarified that members should flesh out one primary responsibility-holder for each action before the next meeting (March 8, 2021 at 6:00 p.m.). This should be one singular Northbrook entity such as: one Village Department (Public Works, Development and Planning Services), Board of Trustees, Park District, School District, or Public Library. Additional supporters may be included as secondary partners, but it is important to assign responsibility to a small group that understands its commitment.

Adjourn

At this time, Ms. Kohlstedt told members any questions can be directed to her or Tessa Murray via phone or email. She adjourned the meeting at 7:02 p.m.

Respectfully submitted,
/s/ Tessa Murray
Recorder

SUMMARY OF THE
CLIMATE ACTION PLANNING TEAM MEETING
VILLAGE OF NORTHBROOK
March 8, 2021

Call to Order

Director of Development and Planning Services Michaela Kohlstedt called the CAPT meeting to order at 6:00 p.m. in a remote meeting through Zoom virtual meeting platform. Ms. Kohlstedt was present in the Village Hall, but there were no members of the public in attendance in the building.

Roll Call

The following Members were in attendance: Trustee Israel, Trustee Ross, John Albrecht, Frank Bleeker, Steven Elisco, Jill Franklin, Pat Lederer, Clare Poupard, Len Rago, Aaron Stash, Patti Vile, Sandy Weiss, Joan Scovic, Becky Mathison, Melissa Hirsch, Nell Badgley, and Derrik Chen.

Members absent: Kim Ptak, Corey Friedman, Robyn Kole
The following Village Staff were in attendance: Michaela Kohlstedt, Madeline Farrell, Erik Jensen, Matt Morrison, Kelly Hamill, Chan Yu, and Swati Pandey.
Also Present: paleBLUEdot consultant Ted Redmond, Greenest Region Corps Member Tessa Murray.

Public Comments Regarding Items Not on the Agenda

No members of the public were present at the meeting.

Preparation for Subteam Breakouts

The intent of this meeting is to assign primary responsibility and potential advocates for each given action in the ActionFinder online spreadsheet. Mr. Redmond specified that the primary responsibility-holder may be one specific Village Department, Commission, staff member, Board of Trustees, etc. in Northbrook.

In the adjacent column, multiple potential partners may be added. These supporting actors may include Northbrook Public Library, Park District, school districts, Cook County, non-profit organizations, or private businesses relevant to the associated action. The list of partners serves as an opportunity for CAPT members to provide input on useful resources for each action, but does not necessitate a commitment from parties outside the Village.

At this time, Member Weiss spoke as a representative of the Environmental Quality Commission and explained that they discussed their participation in the CAP roll-out plan during their most recent meeting in February. Commissioners agreed they can provide best support to the CAP in regards to community communications and education initiatives with their Village staff liaison.

Mr. Redmond explained that since every action is ranked, paleBLUEdot worked through each sector's spreadsheet to establish a threshold number for selection. Any action scored below the threshold is now highlighted in red and can be included in the backup document, provided to the Village as standby actions to be revisited. Green items are actions falling below the threshold number based on the subteam's rankings that Mr. Redmond believes members should revisit to include in the final document.

Between this CAP meeting and the next (April 12), paleBLUEdot will draft the Climate Action Plan using the detailed actions as recommended by the team. This document will include predictive models of greenhouse gas emissions reductions, potential community-wide cost savings, examples of language for municipal code changes, and data from the baseline assessments as associated with the chosen actions. Mr. Redmond stated this serves as the public-facing element of the CAP, while Village staff will receive an implementation matrix for use internally. The implementation matrix is an editable, searchable excel spreadsheet including helpful team comments to guide Village staff. It includes a rough schedule, arranging actions into priority levels of short to long-term goals. Mr. Redmond separated the team into breakout groups and said each subteam session will last 30 minutes.

Breakout Round 1: Transportation/Land Use, Waste Management, Local Food

When the CAPT returned from breakout sessions, Member Stash explained the Transportation/ Land Use team assigned primary actors to more than one group when the Board and Village should collaborate to accomplish an action. Potential partners listed include the Chamber of Commerce (COC), Bicycle Task Force, and local businesses.

For Waste Management, Trustee Israel reported the team assigned partners to all but 4 actions. In this sector, the Village shares the majority of responsibility with secondary partners including the Environmental Quality Commission, Industrial and Commercial Development Commission, and Advanced Disposal / Waste Management. Trustee Israel also mentioned the team is unclear on how to structure waste collection for units not included in the Village's contractual pickup services.

Trustee Ross reported that Local Food completed assignments, largely shared between the Village Departments of Development and Planning Services (DPS), Public Works (DPW), and Board of Trustees. Frequent potential partners listed include the EQC, COC, Community Gardens, Farmers Market, Northfield Township Food Pantry, and the Organic Gardener.

Breakout Round 2: Buildings and Energy, Climate Health and Safety

Upon return from breakout groups, Trustee Israel reported the Buildings and Energy finished assigning all actions to Village DPS, Public Works, and the Board of Trustees. Member Elisco mentioned that the team agreed to modify language in some actions.

Ms. Kohlstedt said the Climate Health and Safety team did not finish but made a plan to complete assignments. Member Poupard reported that primary responsibility-holders include Village Communications staff and potential partners such as the Police and Fire Department.

Breakout Round 3: Water and Waste Water, Greenspace/Tree, Climate Economy

Member Weiss represented the Climate Economy team that mainly listed responsibility-holders such as the Village DPS, Board of Trustees, Plan Commission, and COC.

Trustee Israel stated the Water team's actions frequently listed Village DPS, Public Works, Communications staff, and EQC as responsible parties. Member Rago mentioned that some actions Mr. Redmond asked the team to revisit were removed again.

Member Stash explained that beyond Village staff, main supporting actors list included Northbrook Park District, Forest Preserve District of Cook County, and local businesses to collaborate on Greenspace/Tree Canopy goals.

Next Steps

The next CAPT meeting will be held on April 12 at 6:00 p.m. Mr. Redmond clarified that paleBLUEdot will create two items for the CAPT to review at April 12's meeting: the public-facing document of the CAP and the implementation matrix. All agreed upon actions are included in both, with emission reduction targets separated by sectors and goals. Short-term goals will be considered "priority 1", to be completed within 1-3 years of adopting the plan. Mr. Redmond thanked the team for their hard work and participation in the CAP workshops.

Adjourn

At this time, Ms. Kohlstedt told members any questions can be directed to her or Tessa Murray via phone or email. She adjourned the meeting at 8:15 p.m.

Respectfully submitted,
/s/ Tessa Murray
Recorder

Facts About
Mosquito Barrier TREATMENTS

We all love a pleasant backyard, but we do not love the mosquitoes that go with it. Many companies offer services to control mosquitoes on private property. This fact sheet examines these services and why you should exercise caution when using them.

What is a Mosquito Barrier Treatment?

Private companies that sell services to control mosquitoes in your yard most often use barrier treatments. Barrier treatments are insecticide applications designed to remain active for an extended period on surfaces where mosquitoes rest and feed. They are generally applied as a mist or spray directly to plant leaves, turf, mulch or other surfaces to create a "barrier" around a space. Adult mosquitoes that encounter insecticide residues on treated surfaces usually die.

Another form of adult mosquito control involves ultra-low-volume (ULV) insecticide applications. Typically, specially trained and licensed mosquito control personnel apply ULV insecticides with a truck-mounted sprayer that quickly kills flying adult mosquitoes on contact. Unlike barrier treatments, ULV treatments break down rapidly and are not intended to persist in the environment or leave behind residues on surfaces. Both barrier and ULV treatments commonly use insecticides containing pyrethroids, one of the most widely used classes of insecticides, to kill adult mosquitoes.

Problems with Barrier Treatments and Insecticides

Inefficient

To maximize the effectiveness of barrier treatments, applicators must thoroughly apply the insecticide to the many mosquito resting and feeding spaces of shrubs, trees and plants, while trying to avoid flowers, blooms, food crops or drift of the product into adjacent areas as required by insecticide labels. In addition, barriers require repeated treatments each year to remain effective, because the product's toxicity begins decreasing immediately after application. These thorough and frequent barrier applications on outdoor surfaces increase the potential for exposure for humans, pets, pollinators and other beneficial insects.

A more effective and targeted way to control mosquitoes involves killing them before they develop into adults. Mosquitoes usually lay their eggs near standing water, or areas that will hold standing water for several days after a rain.

A more effective and targeted way to control mosquitoes involves killing them before they develop into adults.

Immature mosquitoes, or larvae, hatch from these eggs, swimming and feeding on algae, fungi and other organisms in the water before becoming biting adults. Control of mosquito larvae is more efficient than adult control, because standing water is generally limited in size and number of locations. Less use of insecticides decreases the potential for exposure or impacts on people, pets and beneficial insects.

Continued on next page

Information provided by:

IPM Institute of North America

MIDWEST GROWS GREEN

Madison, WI
773.878.8245
MidwestGrowsGreen.org

Problems with Barrier Treatments and Insecticides (cont.)

Human Health

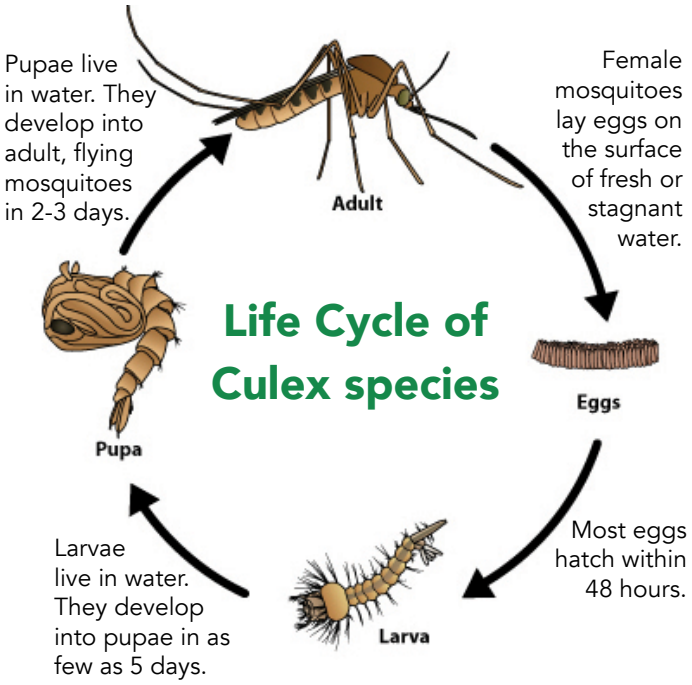
The Environmental Protection Agency regulates pyrethroids and other insecticides. The agency has determined that the benefits of managing mosquitoes that carry diseases such as West Nile Virus, dengue and Zika outweigh the risks of these chemicals to human health. However, the EPA mentions the potential for human health risks of pyrethroids used in barrier treatments by including statements on product labels such as, "excessive use or accidents may pose risks" or "Only protected handlers may be in the area during application". Studies have linked high and prolonged exposure to pyrethroids to effects on the human reproductive, skeletal, cardiovascular, immune and endocrine systems.[1] If you or your neighbor decides to use a barrier treatment, limit your exposure and risk by staying indoors and shutting windows during application. Insist that a properly licensed individual makes the application and follows the product label for instructions on dose, personal protective equipment, application timing, application frequency, and application location.

Resistance

The pyrethroid class of insecticides has become less effective over time in controlling mosquitoes, because mosquitoes have developed resistance to these chemicals. A Loyola University-Chicago lab sampled Culex pipiens mosquitoes, which can carry West Nile Virus, in the North Chicago Suburbs in 2018 and 2019 for resistance to public health ULV adult control insecticides. The lab exposed 1,151 mosquitoes to the pyrethroid Sumithrin in treated bottles and 1,463 to the pyrethroid permethrin in treated bottles. After 45 minutes, approximately 78.5% of mosquitoes died in the Sumithrin treated bottles and 83.3% died in the Permethrin treated bottles. These results failed to match US Centers for Disease Control (CDC) expectations that 100% of the mosquitoes would die under these conditions. The surviving mosquitoes pass their resistance to the next generation decreasing the ability of pyrethroids to control mosquitoes and disease outbreaks over time. We need to limit the use of pyrethroids to times when they are truly needed to prevent mosquitoes from developing greater resistance.

Collateral Damage

The toxicity of barrier treatments poses risks to non-target species and the environment. While pyrethroids and other common mosquito control products have low toxicity to mammals and birds when applied correctly, these products can be toxic to aquatic life and insects that serve as a primary food source for these animals.[2] Also, the extended length of time these barrier insecticides remain toxic increases the potential for harm to beneficial insects, pollinators and mosquito predators such as dragonflies.



EGGS

- Adult, female mosquitoes lay eggs on the surface of fresh or stagnant water. Water sources can include barrels, ornamental ponds, unmaintained swimming pools, puddles, creeks, ditches, and marshy areas.
- A female Culex mosquito lays eggs one at a time. Eggs stick together to form a raft of 100 to 300 eggs. The raft floats on the water

LARVA

- Larvae hatch from mosquito eggs and live in water.
- Larvae can be seen in the water. They are very active and are often called "wigglers."
- They feed on a variety of things found in the water.
- Larvae shed their skin (molt) several times during this stage.

PUPA

- Pupae live in water. Pupae do not have external mouthparts and do not feed during this stage.
- An adult mosquito emerges from a pupa and flies away.

ADULT

- Adult female mosquitoes bite people and animals. Mosquitoes need blood to produce eggs.
- After blood feeding, female mosquitoes look for water sources to lay eggs. Several days pass between feeding and looking for a place to lay eggs.
- Culex mosquitoes don't fly long distances but have been known to fly up to 2 miles (3.2 km).

Diagram and images provided courtesy of the US Centers for Disease Control and Prevention.

[1] Chrustek et al. 2018. Current research on the safety of pyrethroids used as insecticides. Medicina 54, 61
[2] EPA. 2020. Permethrin, Resmethrin, d-Phenothrin (Sumithrin): Synthetic Pyrethroids for Mosquito Control.

Alternatives to Barrier Insecticides

Eliminate Standing Water

Any standing water can provide space for mosquitoes to breed. Monitor, eliminate, or treat these potential mosquito breeding sites:

- Dump out or drain toys, garden equipment, plant pots, buckets and other containers that can hold water once per week
- Cover rain and water barrels with fine-meshed screens to prevent adult mosquito access for egg-laying
- Clean clogged gutters
- Regularly clean pool covers, grill and furniture covers, swimming pools, hot tubs, birdbaths and other permanent water fixtures.
- Pick up trash and discarded debris. Mosquitoes can breed in an area as small as a bottle cap!
- Stock ornamental ponds with fish that eat mosquito larvae or use a bubbler to keep water moving
- Change the water in pet bowls daily
- Monitor flat roofs, such as car ports, without adequate drainage
- Remove hollow tree stumps or tree rot holes
- Fix leaky outdoor faucets
- Empty plant saucers, buckets and watering cans
- Drill a hole in the bottom of tire swings to allow drainage

Encourage Natural Predators

Diverse backyard ecosystems can keep mosquito populations in check, because many birds, bats, spiders and adult dragonflies eat adult mosquitoes. In water features, goldfish, guppies, fat-headed minnows, bass, bluegill, catfish and dragonfly nymphs consume mosquito larvae.

Prevent Contact with Mosquitoes

- Ensure that mosquitoes cannot enter indoors by using well-sealed screens and weather stripping.
- Use yellow, non-insect-attractive outdoor lighting.[3]
- Avoid being outdoors at dawn and dusk, when mosquitoes are most active.

Prevent Mosquito Bites

- Cover exposed skin with long-sleeved and light-colored shirts, long pants and socks. Dark colors such as black, navy blue and red stand out to mosquitoes, especially during dusk.[4]
- Many natural plant extracts and oils repel mosquitoes for up to several hours. The most popular, effective and EPA approved natural repellents include citronella and PMD from lemon eucalyptus.[5]
- To ensure the efficacy and longevity of a mosquito repellent, select formulations which are EPA approved and have an EPA registration number. Caution should be taken when applying a repellent, natural or synthetic, to children.

Know your Mosquito Abatement District

Whether you know it or not, you may live in a Mosquito Abatement District (MAD). Approximately 700 MADs exist across the U.S. with the sole purpose of controlling mosquitoes and limiting the spread of mosquito-borne diseases. Most of these districts implement Integrated Pest Management (IPM), a proven method that aims to employ mosquito prevention practices that cause the least harm to people and the environment.

MADs that practice effective IPM primarily control mosquitoes in their immature stages when they reside in readily identifiable locations such as catch basins, ditches and other flood prone areas. MADs eliminate these breeding grounds by dumping or draining standing water or by using a product to kill the larvae. Larval control commonly involves bacteria that damage the digestive or nervous system of mosquito larvae when consumed, without harming other organisms.

MADs that practice IPM will, also, monitor adult mosquito populations for abundance and potential to spread diseases to humans and animals. These MADs will choose to conduct adult control only after the surveilled mosquito population exceeds science-based abundance and disease thresholds. If needed to control adult mosquitoes, MADs employ trained and skilled technicians to apply adult mosquito control products as safely and effectively as possible. Typically, these applications involve ULV treatment, not barrier sprays.

To find out if you live in a MAD or how your community controls mosquitoes, contact your local public health department or the American Mosquito Control Association at **www.mosquito.org**. Here are some links to local MADs in Illinois:

[3] EPA. 2020. Tips to Prevent Mosquito Bites.; [4] Nierenberg, C. 2011. Why some people are mosquito magnets. NBC News;
[5] Ferreira Maia, M. & Moore, S. 2011. Plant-based insect repellents: a review of their efficacy, development and testing. Malaria Journal 10.

Annual Report 2020

North Shore Mosquito Abatement District

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NORTH SHORE MOSQUITO ABATEMENT DISTRICT

2020 ANNUAL REPORT

TRUSTEES

John M. Zbesko, President
Nelson Howard, Vice-President
Kathleen Kendrick, Secretary
William Zimmer, Treasurer
Carol Blustein

EXECUTIVE DIRECTOR

Mark Clifton, Ph.D.

Report prepared by Dave Zazra, Communications Manager, under the direction of Mark Clifton, Executive Director, with the assistance of the NSMAD staff.

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Preface

2020 marked the 93rd year of public health service to the residents and visitors of the 14 communities that encompass the North Shore Mosquito Abatement District.

By February, we recognized the rapidly unfolding pandemic could have an impact on our operations and made proactive and detailed plans to ensure we had adequate viral testing supplies, mosquito control materials and seasonal staff. We developed operational continuity, social distancing and sanitation protocols to ensure that our staff would be safe and healthy and could continue our mission of protecting the public health of the communities we serve.

Despite the potential for serious disruptions to our operations, 2020 was a highly productive and successful year. Our staff was able to conduct 105,383 treatments to stormwater catch-basins (a 5% increase from 2019) and 3,772 treatments to standing water sites (a 15% increase from 2019) as well as complete more than 4,000 inspections for mosquito activity. Part of this increase in activity is due to new efficiencies gained from operational software implemented at the end of 2019. However, the bulk of the credit should be attributed to the effort our essential seasonal and full-time staff exhibited during the season. They were adaptable, focused, and steadfast despite challenging conditions. Staff understood that because of the pandemic, residents would be relying on the numerous parks and forest preserve areas within the District for recreation and exercise more than ever before and that ensuring these spaces remained useable throughout the season was a top priority.

Despite a second consecutive year of record-breaking rainfall in May, early season larval treatments helped to keep populations of nuisance mosquitoes below the 10-year average in almost every week of the season and only exceeded adult mosquito treatment thresholds once. A relatively dry June and July kept vector mosquito populations close to 10-year averages with no dramatic spikes in population which can drive the risk of human infection. After building through July, the West Nile Virus (WNV) infection rate of mosquitoes peaked during the last week of August before dropping rapidly in the first two weeks of September. Unfortunately, one human case of West Nile virus occurred in the District, with onset reported during the last week of September. This demonstrates that the risk of human infections remains even after sustained declines in mosquito populations and WNV activity.

In 2018, the NSMAD began a tick collection program to monitor species and abundance of potential tick vectors of disease within the District. While this component of the NSMAD's program is new and evolving, this report contains the first surveillance results from the last two years. The goals of this program are to identify what species of ticks are currently present, monitor and document the spread of invasive tick species in the area, and document any pathogens which may be present in the ticks we collect.

In this report, you will find the details of the 2020 season including information on mosquitoes collected, laboratory results and our control activities. Together these metrics demonstrate the various aspects of the NSMAD's comprehensive vector control program.

Introduction to The North Shore Mosquito Abatement District

The passage of the *Mosquito Abatement District Act* (Chap. 111 ½, Illinois Revised Act) by the Illinois legislature in September 1927, prompted a group of citizens to work for the establishment of a mosquito abatement program for the North Shore of Cook County. This led to the organization of the North Shore Mosquito Abatement District (NSMAD), which was officially chartered on December 8, 1927.

Area Served

The District serves approximately 330,000 residents in the municipalities of Deerfield (east of Pfingsten and south of Lake Cook Road only) Evanston, Glencoe, Glenview (east of Pfingsten Road), Golf, Kenilworth, Lincolnwood, Morton Grove (east of Washington Street), Niles (east of Harlem Avenue), Northbrook (east of Pfingsten Road), Northfield, Skokie, Wilmette and Winnetka.

The area covered by the NSMAD consists of 70 square miles of Cook County's North Shore. This sprawling and diverse area includes more than 900 miles of streets, 40,000 catch basins, 26.9 miles of rivers, 31.8 miles of railroad rights of way, 2.9 miles of ravines, 21.8 miles of bike trails, 17.8 miles of Forest Preserve District trails and approximately 3,500 acres of Forest Preserve District land.

Organization

A five-person Board of Trustees governs the North Shore Mosquito Abatement District. Trustees are residents of the District and are appointed by the Cook County Board President and serve without compensation. Operation of the District is supported by taxes levied on property located within the boundaries of the member townships.

The NSMAD employs seven full-time staff members throughout the year and between 10 to 14 seasonal staff members during the months of April through October.

The District office, laboratory and maintenance facility is located at 117 Northfield Road, Northfield, Illinois.

Mission Statement

The NSMAD controls mosquito populations in the District to:

1. Reduce the risk of disease from mosquito-borne illness
2. Minimize the negative impact mosquitoes have on quality of life

Public Health and Mosquitoes

Mosquitoes are responsible for the transmission of many debilitating and potentially deadly diseases around the globe, such as Malaria, Yellow Fever, Dengue, Zika, Filariasis and many forms of viral encephalitis. These diseases are transmitted through the bite of an infected female mosquito.

In the United States, mosquito-borne viral encephalitis is the primary health concern of public health agencies. West Nile Virus (WNV), St. Louis Encephalitis (SLE), Eastern Equine Encephalomyelitis (EEE), Western Equine Encephalitis (WEEV), and La Crosse Encephalitis (LAC), are serious diseases with symptoms ranging from mild or flu-like to severe, including paralysis, coma and death. In northern Illinois, WNV is the mosquito-transmitted virus of greatest concern. Recovery from these diseases can be a long and painful process, with some people never fully recuperating. Unfortunately, there are no vaccines for humans for any of these diseases at this time, and prevention relies on mosquito control and avoiding mosquito bites.

Operations: Integrated Pest Management

Our abatement program is based on the principles of integrated pest management (IPM). IPM utilizes a thorough understanding of the biology and ecology of the mosquitoes and mosquito-transmitted viruses that occur in the District and employs a comprehensive surveillance program to provide the information needed to develop action thresholds and to make sound decisions about mosquito control activities. In addition, IPM utilizes the full range of mosquito control tools and procedures and applies them as appropriate for a given situation.

There are four principal components of the NSMAD Integrated Pest Management Program:

- **Surveillance/Action Thresholds**
- **Larval Control/Source Reduction**
- **Adult Mosquito Control**
- **Public Outreach/Education**

Surveillance Program and Determining Action Thresholds

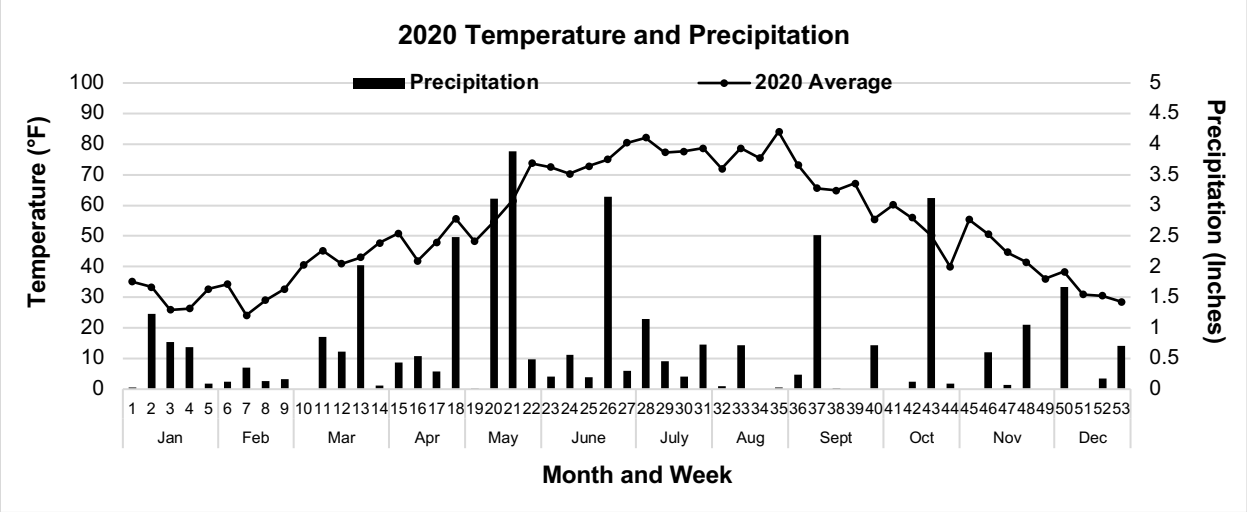
The surveillance program monitors local mosquito population abundance and the prevalence of WNV-infected mosquitoes in the area. We also collect data about weather patterns that are associated with mosquito abundance and WNV activity levels. This information is evaluated against our evidence-based action thresholds and helps us make decisions regarding appropriate control methods.

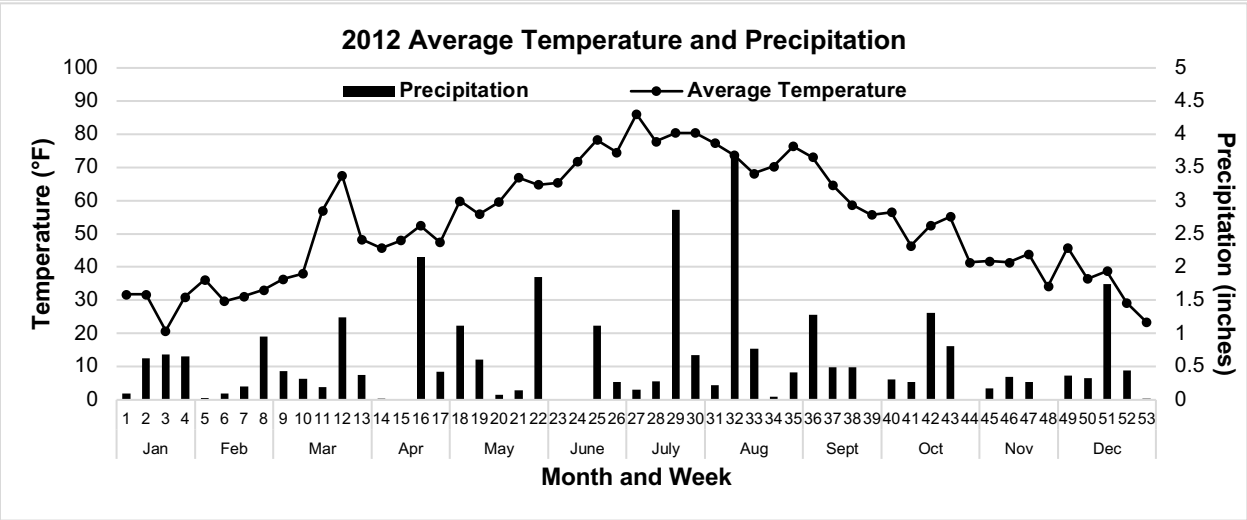
Environmental Surveillance

Weather conditions have a significant influence on the type and number of mosquitoes produced in the NSMAD. Temperature and rainfall patterns are monitored throughout the year, and help determine when we initiate our surveillance and control efforts and to anticipate the type of mosquito problems we will encounter. Heavy, flooding rains early in the year tend to create large broods of nuisance mosquitoes that can affect the quality of life in the area, while warm and dry early-season conditions tend to create a favorable environment for increased *Culex* mosquitoes and a greater risk of WNV transmission during the latter part of the summer.

Weather Monitoring

The graphs on the following page show the weekly precipitation and average temperature for the 2020 season (top graph) and 2012 (the last outbreak year; bottom graph). Average temperatures during spring 2020 were cooler with greater amounts of precipitation than in 2012. Large rainfall events during late-April, mid-July, early-September and late-October led to large broods of floodwater/nuisance mosquitoes.





Monitoring Mosquito Populations

We utilize mosquito traps, strategically placed throughout the District to monitor mosquito abundance and WNV infection rates. Nine New Jersey Light Traps (NJLT) are placed in residential yards. These traps are used primarily to monitor the abundance of nuisance mosquitoes in the area. Mosquitoes are attracted to a light source in the trap and a fan blows the mosquitoes into a jar where they are killed and held until picked up by one of the NSMAD field technicians. New Jersey Light Traps are run four nights/week and the collections are made once per week.

Gravid traps are placed at 19 sites throughout the District and are used to capture *Culex* mosquitoes, the vector of WNV and other mosquito-transmitted diseases in this area. These traps are run seven days a week and the collections are returned to the laboratory for processing three times per week. Gravid traps provide a measure of the abundance of *Culex* mosquitoes. In addition, the mosquitoes are tested for the presence of WNV. Mosquitoes collected from the traps are identified to species and sex, then female *Culex* mosquitoes are grouped into batches of 50 or fewer mosquitoes and tested in our laboratory for WNV via Real Time Quantitative Polymerase Chain (RT-qPCR). This information is used to provide an estimate of the WNV risk in the area. In addition to being used by the NSMAD, the data is shared with the Illinois Department of Public Health (IDPH) and the Cook County Department of Public Health (CCDPH) for use in developing statewide and countywide WNV risk evaluations.

Larval mosquito populations are monitored either by directly observing the larval habitat for the presence of mosquito larvae and pupae in the water, or by taking water samples from the aquatic habitats using a standard volume dipper and examining the sample for the presence of larvae or pupae.

2020 West Nile Virus Surveillance Summary

As of the date of this report, the Illinois Department of Public Health is reporting 38 human WNV cases have occurred statewide with three deaths. There were 32 from Cook County. Of the human cases reported in Cook County, one was from a community served by the NSMAD. Symptom onset of the case in the NSMAD occurred during week 35.

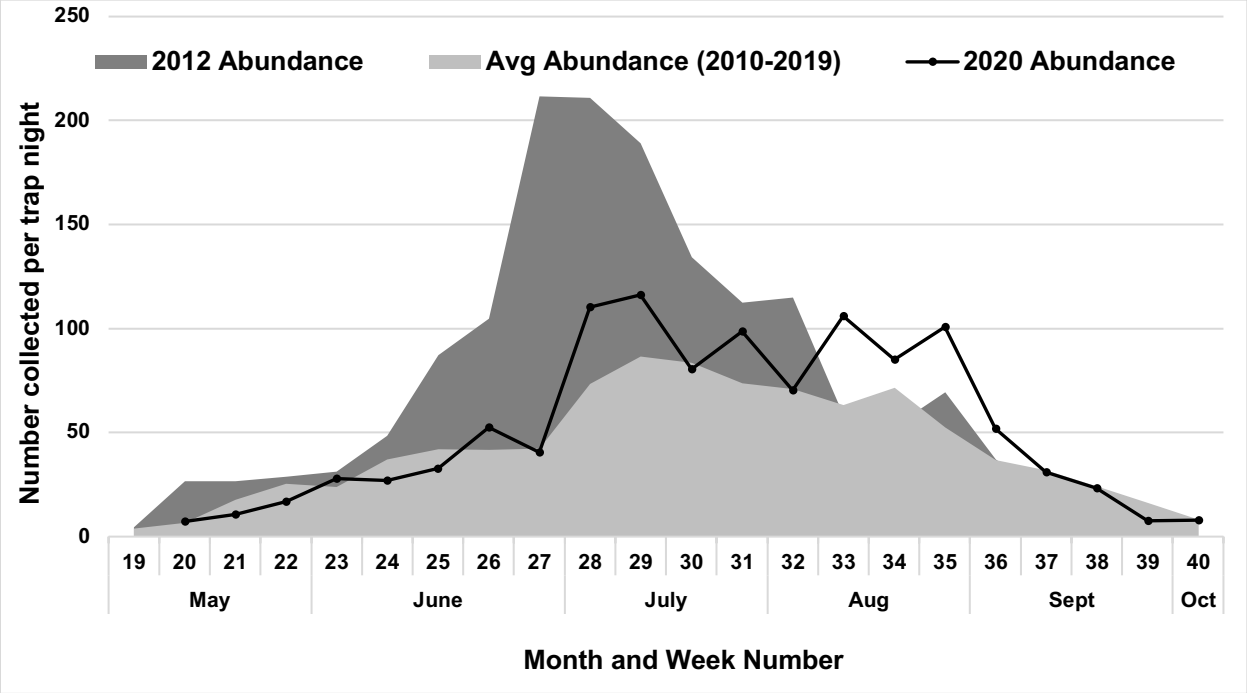
2020 NSMAD WNV Test Results

During 2020, a total of 151,042 *Cx. pipiens/restuans* mosquitoes were collected in gravid traps. Of these, 96,108 were tested for WNV in a total of 2,174 batches, 104 more than 2019. Evidence of WNV was detected in 685 batches, 246 more than 2019, with positive batches found in all of the municipalities where our gravid traps are placed (see table below).

Municipality	# Positive Batches	# Batches Tested	# of Mosquitoes Tested
Evanston	201	556	24,508
Glencoe	24	76	2,971
Glenview/Golf	74	209	8,825
Kenilworth	23	86	3,559
Lincolnwood	43	148	7,066
Morton Grove	42	128	5,770
Niles	34	103	4,362
Northbrook	15	71	2,764
Northfield	25	119	5,366
Skokie	133	408	18,466
Wilmette	39	128	5,779
Winnetka	32	142	6,672
Totals	**685**	**2,174**	**96,108**

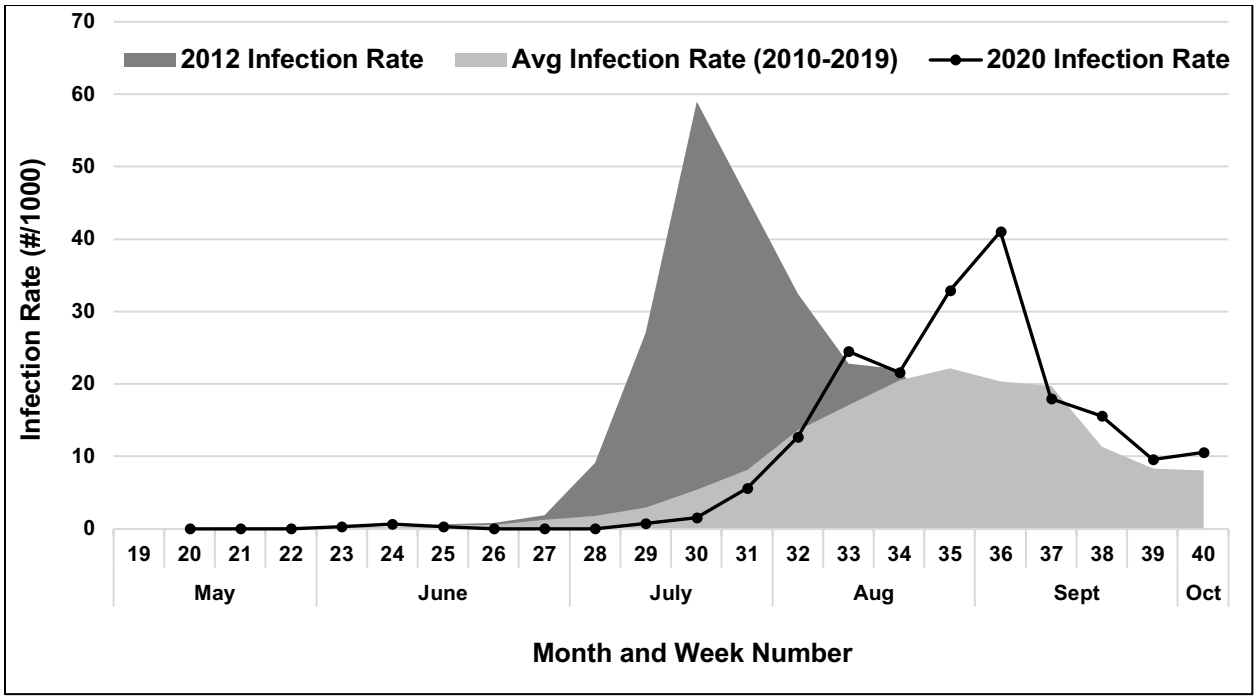
Trap collections for WNV surveillance started May 11, 2020 (week 20). In the graphs on the following pages, 2020 surveillance results are shown as the black line, results obtained during 2012 (the most recent WNV outbreak year with 20 human cases in the District) are shown in the dark grey area, results obtained between 2010 and 2019 (excluding 2012) represent non-outbreak years (0-4 cases per year) and are shown in the light grey area.

Vector Species Abundance: *Cx. pipiens/restuans* abundance in our gravid traps were below average during the first several weeks of the season, and remained about average until week 26-27, when a sharp increase occurred in week 28. Abundance remained above average until week 36 when the typical late season decline occurred. WNV surveillance ended October 2, 2020.



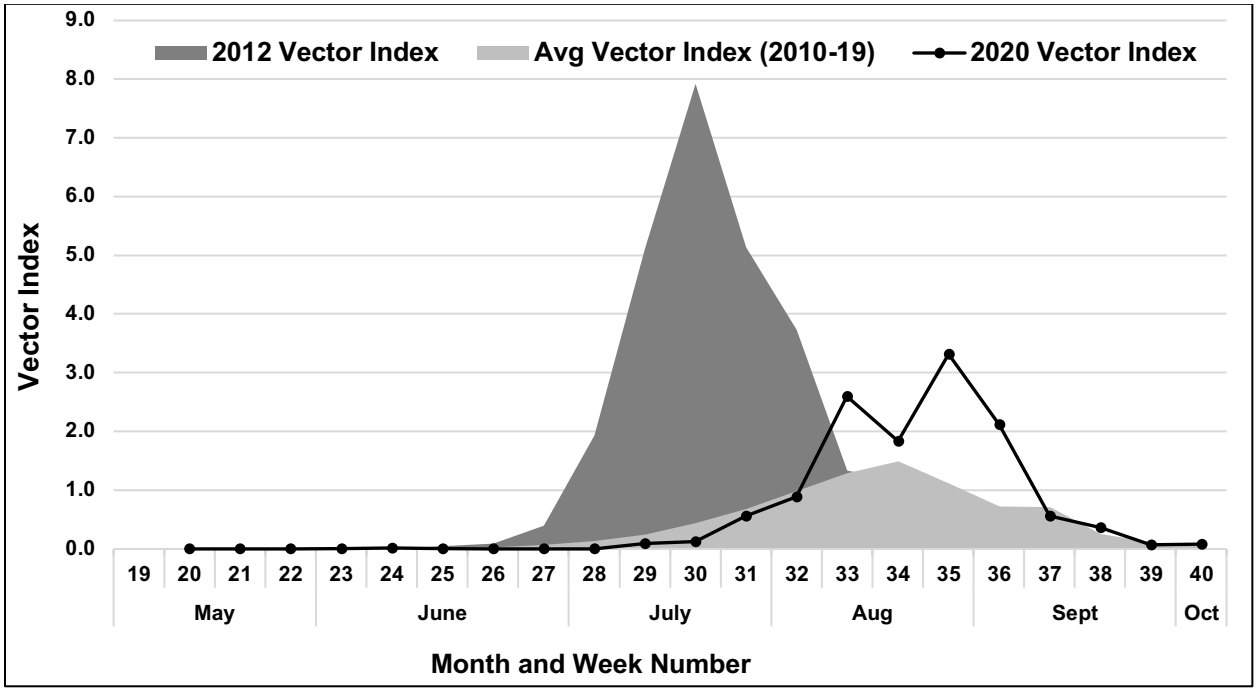
WNV Infection Rate: WNV infection in *Cx. pipiens/restuans* (shown in the graph below as the Maximum Likelihood Estimate of the Infection Rate per 1,000 mosquitoes) was first detected during week 21. At that point, the infection rate was low at .90/1,000. Infected mosquitoes were consistently found somewhere in the District during every subsequent week of the surveillance season.

The prevalence of West Nile Virus in mosquitoes remained low from week 20 through week 32, then increased rapidly and reached moderately high levels of 24-51 infected mosquitoes per 1,000 captured. This high rate of infection lasted for approximately four weeks through week 37. Infection rates during that period were considerably above the non-outbreak-year levels. By week 38, the infection rate had decreased to lower levels and continued to decline through the remainder of the season with a slight uptick in the last week of NSMAD surveillance.



WNV Vector Index: The Vector Index combines the *Cx. pipiens/restuans* abundance and infection rate data to produce an estimate of the number of WNV infected mosquitoes in the area. This index is associated with human risk of WNV infection and helps us identify locations and time periods when risk increases. In the NSMAD surveillance program, a vector index >1 occurring early in the season is associated with increased risk of multiple human WNV cases.

During 2020, the Vector Index did not exceed 1.0 until week 33, about a week earlier than in 2019. It peaked at 3.32 during week 35 and remained at increased risk levels until week 37 before dropping off into decreased risk levels for the remainder of the season.



NSMAD Human WNV Cases
Per Year by Community

Year	Evanston	Glencoe	Glenview	Golf	Kenilworth	Lincolnwood	Morton Grove	Niles	Northbrook	Northfield	Skokie	Wilmette	Winnetka	Total
2002	30	3	16	0	4	3	12	8	3	2	49	22	6	**158**
2003	1	0	0	0	0	0	0	0	0	0	3	0	0	**4**
2004	1	0	0	0	0	0	0	0	0	0	1	0	0	**2**
2005	8	0	4	0	1	0	4	3	2	0	8	6	3	**39**
2006	3	0	0	0	0	1	0	0	2	0	2	1	1	**10**
2007	1	0	1	0	0	0	0	0	0	0	1	1	0	**4**
2008	1	0	1	0	0	0	0	0	0	0	1	0	0	**3**
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2010	1	0	0	0	0	0	0	0	1	0	0	0	0	**2**
2011	0	0	1	0	1	0	0	0	1	0	0	0	0	**3**
2012	10	0	3	0	0	0	2	0	0	1	3	1	0	**20**
2013	0	0	0	0	0	0	0	3	0	0	1	0	0	**4**
2014	1	0	1	0	0	0	1	0	0	0	0	0	0	**3**
2015	0	0	0	0	0	0	0	0	1	0	2	0	0	**3**
2016	1	0	1	0	0	0	0	0	0	1	0	0	0	**3**
2017	2	1	1	0	0	0	0	0	0	0	0	0	0	**4**
2018	1	0	1	0	0	3	0	0	1	0	1	0	0	**7**
2019	0	0	0	0	0	0	0	0	0	0	0	1	0	**1**
2020	0	0	0	0	0	0	0	0	0	0	0	1	0	**1**
Total	**61**	**4**	**30**	**0**	**6**	**7**	**19**	**14**	**11**	**4**	**72**	**33**	**10**	**271**

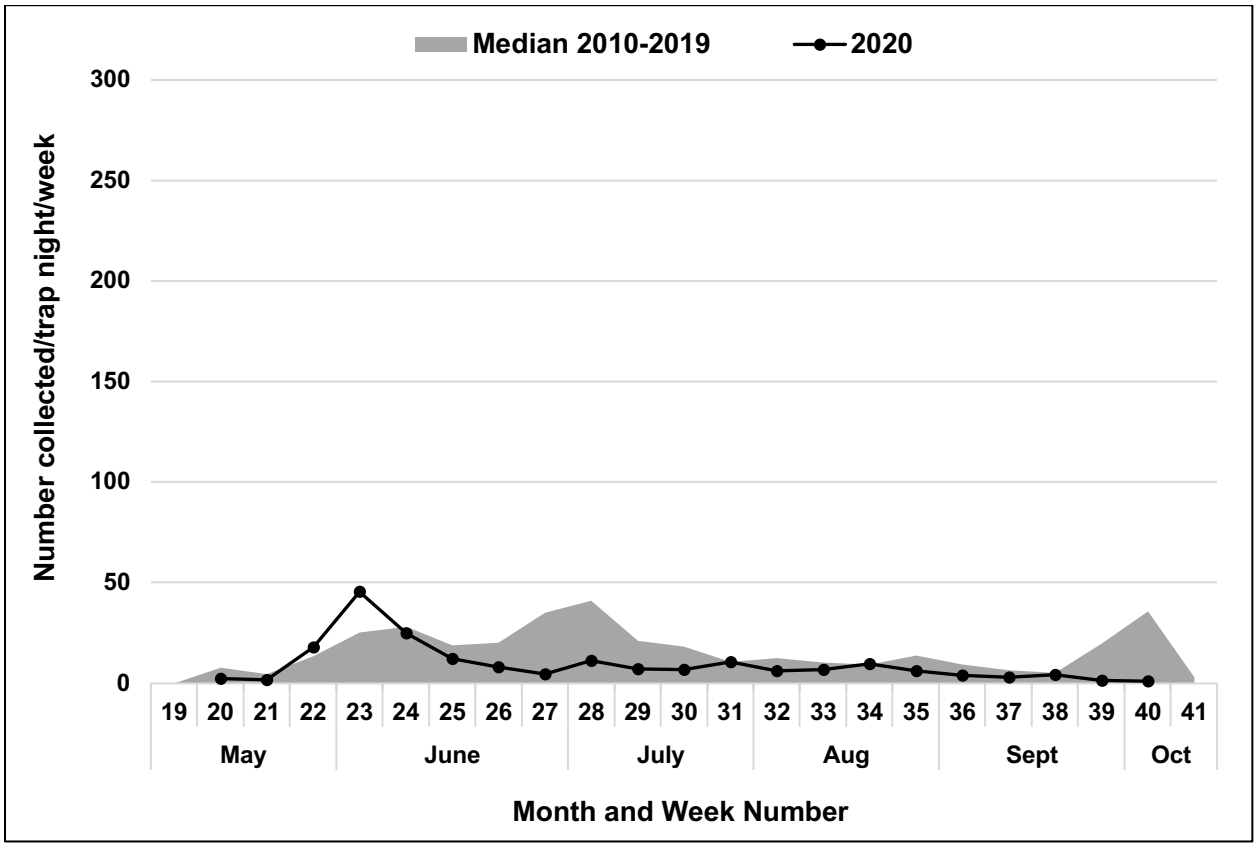
The first West Nile virus outbreak in the NSMAD occurred in 2002. Human WNV cases have occurred in the District each subsequent year with the exception of 2009. Following 2002, outbreaks have occurred in 2005, 2006 and most recently in 2012. Human cases of WNV have been reported from every town served by the NSMAD, with half of the reported cases in the District occurring in Skokie and Evanston.

Nuisance Mosquito Surveillance

New Jersey Light Traps (NJLT) are placed in nine locations throughout the District to sample biting adult mosquitoes that affect quality of life. Specimens are collected four nights per week, identified and counted to provide an estimate of the biting mosquito abundance in the District. This information is used to determine nuisance mosquito levels and plan larval and adult control activities. The graph below shows the median number of mosquitoes (all species) collected per trap night, per week during 2010-2019 in the grey area. The black line indicates the number collected per week during 2020. In general, biting mosquitoes become very noticeable to residents when the abundance reaches 20-30 mosquitoes per trap night.

During 2020, sampling using NJLTs began in mid-May (week 20). There was one spike (week 23) in the floodwater mosquito population during the 2020 season. This increase coincided with large rainfall events during weeks 20 and 21 (see 2020 Temperature and Precipitation graph on page three).

New Jersey Light Trap Collections



2020 Female Mosquitoes Collected by Species

Illinois is home to approximately 75 different mosquito species. The three most commonly collected species are *Aedes vexans*, the primary floodwater/nuisance species found in the District and *Culex pipiens/restuans*, the primary West Nile virus vectors in the region. The third most abundant species is the invasive Asian Bush Mosquito, *Aedes japonicus.* The number of each species collected by NSMAD surveillance during 2020 is shown below.

		Trap Type		
Mosquito Species		**New Jersey**	**Gravid**	**Totals**
Aedes	***albopictus***[1]	0	**3**	**3**
Aedes	*canadensis*	3	0	0
Aedes	*excrucians*	5		5
Aedes	*grossbecki*	6	0	0
Aedes	*japonicus*	33	882	915
Aedes	*stimulans*	0	0	0
Aedes	*sticticus*	0	0	0
Aedes	*triseriatus*	21	328	349
Aedes	*trivittatus*	36	7	43
Aedes	***vexans***[2]	**4,641**	**20**	**4,661**
Anopheles	*barberi*	0	0	0
Anopheles	*punctipennis*	36	33	69
Anopheles	*quadrimaculatus*	32	2	34
Culex	***pipiens/restuans***[3]	**1,725**	**148,137**	**149,862**
Culex	*erraticus*	18	0	18
Culex	*salinarius*	0	0	0
Culex	*tarsalis*	0	0	0
Culiseta	*inornata*	23	3	26
Coquillettidia	*perturbans*	1	0	1
Orthopodomyia	*signifera*	1	2	3
Psorophora	*ciliata*	1	0	1
	ferox	0	0	0
	howardii	0	0	0
Uranotaenia	*sapphirina*	148	18	171
	Totals	**6,730**	**149,435**	**156,165**

1 *Aedes albopictus* is a potential vector of Chikungunya, and Zika virus
2 *Aedes vexans* are the primary nuisance/floodwater species found within the NSMAD
3 *Culex pipiens/restuans* are the primary WNV vector species found within the NSMAD

Mosquito Control

Mosquito larvae develop in water and are found in a variety of water-holding habitats including numerous types of man-made structures. **Larval Control** is aimed at killing mosquitoes while in their larval stages when they are the most concentrated and accessible. **Source reduction** is the physical elimination and/or reduction of aquatic breeding sites. Our employees are trained to identify potential breeding sources and remove and properly discard them when possible. When the physical elimination of a breeding site is not possible, we utilize a variety of insecticide products specifically designed for larval mosquito control.

During an average season, approximately 90 percent of the District's field program is focused on controlling mosquito larvae. We treat approximately **3,000** off-road sites and more than **40,000** stormwater catch basins every year. Swampy lowland areas, new construction sites, ditches along roadways, railroad right-of-ways, flooded yards, storm sewers and other small, temporary impoundments of water, are potential sources that can produce a brood of mosquitoes in 6-10 days. Fishponds and ornamental pools are also potential mosquito sources. These and other similar habitats are mapped and inspected periodically for the presence of mosquito larvae and are treated when natural predators are not present. Inspection and treatment of these types of areas continues throughout the summer on a weekly basis.

The NSMAD utilizes three categories of larval control products: growth regulators, bacterial insecticides and surface oils. Growth regulators contain methoprene, an insect hormone that is similar to that found naturally in mosquito larvae. Pellet formulations containing methoprene are used to treat small enclosures of water such as poorly maintained ornamental ponds, abandoned swimming pools and catch basins that frequently produce *Culex* mosquitoes. When placed in these sites, the pellets slowly release the active ingredient into the water and prevent mosquito larvae from developing past the pupal stage for at least 30 days. Liquid formulations can be utilized in our ultra-low volume spray machines allowing us to treat the more densely urban areas of the District when necessary. Methoprene-containing formulations are categorized as bio-rational products that have limited effects on non-target organisms.

The bacterially derived larval control products used by the NSMAD contain active ingredients produced by naturally occurring, soil inhabiting, bacteria species: *Bacillus sphaericus* (*B.s.*)*, Bacillus thuringiensis var. israelensis* (*Bti*) and *Saccharopolyspora spinosa* (Spinosad). These larvicides pose very little risk to humans and other animals. In order to treat small marshes, wastewater, drainage systems, tire dumps, and natural or man-made aquatic sites and catch basins, we apply these bacterial larvicides in granular formulations either by hand, backpack sprayer or in liquid formulations via our Buffalo Turbine for larger sites. *Bti* and *B.s.* granules are used in a variety of habitats ranging from temporary floodwater sites to permanent water sites. *Bacillus sphaericus* performs very well in stagnant and polluted water-areas where the encephalitis transmitting *Culex* breed. Spinosad is derived from a naturally occurring bacterium and is a reduced risk, larval control product formulated as both short-duration and extended-release products for use in a variety of larval habitats.

Surface oils are used when late-stage larvae or pupae are present. These products prevent pupae and larvae from attaching to the water surface to breathe, resulting in their death. Surface oils are quick acting short duration products.

The NSMAD **adult mosquito control** program is comprised of barrier applications and truck mounted, ultra-low-volume (ULV) insecticide applications. Barrier control consists of applying a mosquito insecticide to vegetation (shrubs and bushes, tall grasses, hedges) and surfaces where mosquitoes rest. Care is taken to avoid applying barrier treatments to flowering plants to reduce the potential impact on pollinators. Barrier applications are utilized to protect a limited size area for a relatively short period of time. Under ideal weather conditions, these applications can reduce local biting mosquito numbers for up to four weeks. The NSMAD occasionally uses barrier control to reduce mosquito biting before municipal promoted community events in public

areas, such as picnics, movies in the park, and other special events. We use Flit™ for barrier control treatments.

The NSMAD's truck mounted ULV sprayers are an essential tool when controlling adult mosquitoes is required. It is used only when action thresholds are met and is applied only in the evening when host-seeking mosquitoes are active. The ULV adult mosquito control operations are used to immediately reduce the adult mosquito population to reduce the number of WNV-infected mosquitoes in an area, to interrupt WNV transmission and to limit the production of new mosquitoes in the area. The ULV technology uses specially designed spray devices to deliver very small amounts of insecticide per acre in a fine aerosol mist that contacts and kills flying mosquitoes. The NSMAD currently uses Duet™, at a rate of 1.25 ounces per acre, for ULV applications. This insecticide contains the active ingredients Sumithrin and Prallethrin, and a Piperonyl Butoxide synergist, providing a quick knockdown of adult mosquitoes with no residual effect.

The NSMAD only conducts ULV adult mosquito control operations at night when mosquitoes are most active and other insects are not. This minimizes exposure to non-target insects such as bees, butterflies and other pollinators.

As part of the adult mosquito control program, the NSMAD maintains a Prior Notification List for residents who wish to be informed before adult mosquito control operations occur in their neighborhood. Residents can sign up for notification via our website to receive either an email or text message alerting them to scheduled adult mosquito control operations, as well as other important mosquito related news. When operations are scheduled, an email or SMS message will be sent to the resident, typically with a 24-hour advance notice.

Persons unable to receive email or SMS notification may contact our office to arrange to be notified via telephone. Residents who wish to have their property skipped during adult mosquito control operations must provide the NSMAD with a physician's note supporting a medical reason for such action. Please contact us for instructions on submitting your request.

The NSMAD also maintains a list of beehives in the area and avoids applying adult mosquito control products in areas where active beehives are present. These actions, in addition to spraying at night when bees are inactive, provides an added measure of pollinator protection.

2020 Control Activities Summary

Larval mosquito control

During the 2020 season, the NSMAD treated the following with larval control products:

- 556 floodwater sites
- 2,383 permanent water sites
- 237 Drainage Ditches
- 46,752 catch basins (two – three times each)

Wide Area Larval Control applications

- Four ULV nights

Adult mosquito control

During the 2020 season, the NSMAD treated the following with adult mosquito control products:

- One barrier treatment
- Two ULV application nights

Public Health and Ticks

Ticks are responsible for the transmission of many pathogenic bacteria and viruses. Lyme disease, Rickettsial diseases, Babesiosis, Ehrlichiosis, Anaplasmosis, Tularemia and Heartland Virus are among the diseases that can be transmitted by the 15 known species of ticks found in Illinois. These pathogens are transmitted through the bite of an infected female tick. In general, male ticks will attach to a human host but do not feed long enough or in amounts that facilitate infection.

Distributions of ticks and tick-borne pathogens are increasing nationwide. For example, Black-legged Ticks (*Ixodes scapularis*) capable of transmitting Lyme disease were relatively unknown outside of the Northeast USA thirty years ago but are now widespread throughout the Midwest and East. The Lone Star Tick (*Amblyomma americanum*) previously restricted to Southern and Southeastern states has been expanding its range northward into the Northeast and Midwest. In Illinois, the incidence of tick-borne illness has remained relatively low but is expected to continue to increase due to the expansion of the ranges of many tick species.

Tick Biology

In general, the tick life cycle consists of four stages: Egg, Larva, Nymph and Adult. These stages do not happen in a single season but instead progress over multiple years and often multiple blood meal hosts. Feeding on blood is required for development and reproduction and is, therefore, vital for the tick life-cycle. A habit of blood feeding on multiple hosts also enables the transmission of pathogens such as Lyme disease from one organism to another. For many species of ticks, eggs hatch in the spring to become larvae. Larvae seek an initial blood meal by climbing up vegetation, extending their arms and attaching to an animal that may pass by (this is known as questing). Often this first meal may be a small mammal such as a mouse, squirrel or chipmunk. Larval ticks will become engorged with blood, drop off the host and remain dormant until the spring. During Spring, potentially infected larval ticks will molt into nymphs and pursue a second blood meal. For ticks such as the Black-legged or Deer Tick, a second blood meal can involve a wide variety of organisms including deer or humans. The nymphal tick will molt again into an adult during the summer which will again pursue a third blood meal. This third blood meal will be used to provision eggs for hatching the following spring.

Tick Surveillance

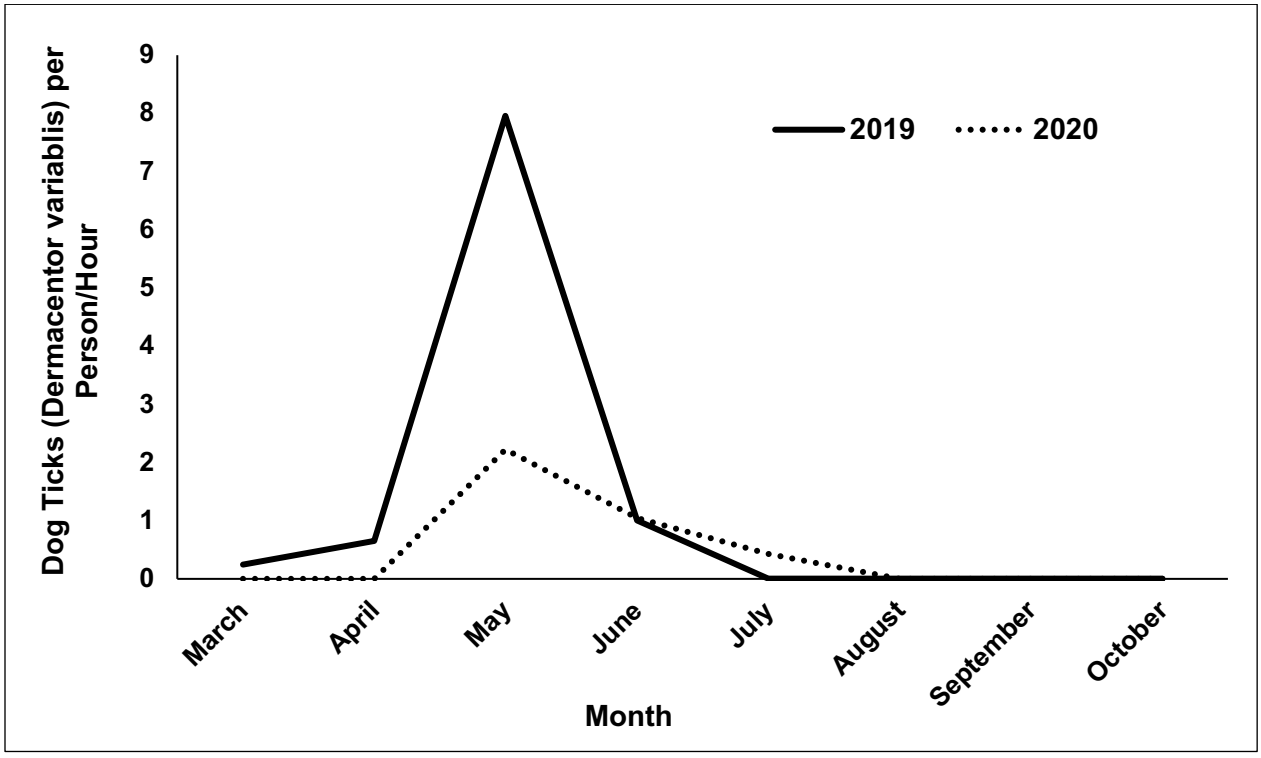
Tick-borne illnesses are an emerging public health challenge that requires monitoring for the species of ticks and pathogens present. Establishing a surveillance system will help guide future public health responses. Tick collections are accomplished by dragging a piece of fabric (tick drag) through woodland habitat and periodically collecting any ticks that have attached. These ticks are identified under a microscope to life stage, gender and species and are stored for pathogen testing at a later date at either the NSMAD or the Illinois Natural History Survey labs.

Monitoring Tick Populations

Beginning in 2019, the NSMAD started to utilize periods of decreased mosquito activity to conduct tick drags in forested areas and identify the species collected, as well as, their relative abundance (ticks per person hour). The information collected will help the NSMAD communicate with the public and public health authorities about the tick-borne diseases.

Tick Collection Results

		2019		2020	
Tick Species	**Life Stage**	**Male**	**Female**	**Male**	**Female**
American Dog Tick (*Dermacentor variabilis*)	Larvae	0	0	0	0
	Nymphs	0	0	0	0
	Adults	53	46	19	27
Lone Star Tick (*Amblyomma americanum*)	Larvae	0	0	0	0
	Nymphs	0	0	0	0
	Adults	0	0	0	0
Blacklegged / Deer Tick (*Ixodes scapularis*)	Larvae	0	0	0	0
	Nymphs	0	0	0	0
	Adults	1	0	0	0
Brown Dog Tick (*Rhipicephalus sanguineus*)	Larvae	0	0	0	0
	Nymphs	0	0	0	0
	Adults	0	0	0	0
	Total	**54**	**46**	**19**	**27**



Tick Control

Currently, there are no universally accepted methods for tick control. Personal protective measures such as repellent use, proper clothing and personal behavior remain the best method for preventing tick-borne illness. Acaricides and other pesticides need to be applied in much greater quantities than for mosquito or other insect control to be effective. Proper landscaping around one's home can have a great impact on minimizing tick habitats and further reducing risk.

Operational Research

The NSMAD maintains an active operational research program to evaluate new methods for controlling mosquitoes and mosquito-borne diseases safely and effectively. In 2020, the NSMAD teamed up with researchers from the University of Wisconsin-Madison, the University of Illinois and Loyola University-Chicago to conduct a variety of research projects.

The largest and most complex of these projects was an evaluation of wide-area larval control treatments for reducing vector mosquito populations along with the risk of disease. As part of this project, the NSMAD quantified viral activity daily and in multiple species of mosquitoes over an entire season. The results of this comprehensive and detailed study will help us better understand, prevent, and communicate the risks of West Nile infection to the communities we serve.

Other projects included: quantifying mosquito resistance to control products, assessing the genetic background of vector mosquitoes, a retrospective analysis of 10 years of mosquito surveillance, and new evaluations of stormwater catch-basin control materials. Together these projects help guide NSMAD staff in implementing the most effective strategies for reducing risks to public health in the District while also advancing the science of vector control Nationally.

NSMAD Integrated Pest Management Protocol Summary

The table below is excerpted from the NSMAD Pesticide Discharge Management Plan (PDMP) and summarizes the management options, associated surveillance and action thresholds, and the application methods used in the NSMAD integrated pest management program.

Pest Management Options(PMO)	Surveillance / Threshold	Application Method
No Action (Larval)	• Dip sample shows no signs of larvae present • Larvae predators present in habitat • Adverse weather is forecast	N/A
No Action (Adult)	• Adverse weather is forecast • Environmental conditions • Mosquito population below threshold	N/A
Pesticide Application (Larval)	• Weather or environmental conditions • Rainfall producing standing water in forested areas • Larval surveillance conducted by dip samples of standing water and containers holding water containing 1-5 larvae per dip on average • Seasonal temperature and precipitation changes warrant the beginning of larval control in catch basins and off-road sites • Inspecting catch basins and other sources of stagnant water for breeding and larval activity • Institutional knowledge and experience • Inspecting known mosquito breeding habitats	Hand or broadcast spreader application of either granular or briquet product using the application rates stipulated on the product labels. Broadcast application of liquid larvicide product via Buffalo Turbine or ULV spray equipment as stipulated on product label.
Source Reduction - Urban	• Property checks for mosquito breeding and larvae in pools, ponds, fountains and any other container with the ability to hold water • Larval dip counts looking for presence of mosquito larvae in containers.	Removing and or emptying containers that hold water.
Source Reduction - Forested	• Weather conditions • Environmental conditions • Rainfall producing standing water in forested areas • Institutional knowledge and experience • Inspecting known mosquito breeding habitats	Flood prevention, removing and or emptying containers that hold water, ditch clearing, debris removal, increasing flow of water.
Pesticide Application ULV (Adult Control)	• WNV positive mosquito pool found via RAMP or PCR test resulting in an infection rate ≥5/1000 • WNV, SLE, EEE, or other vector /mosquito borne virus positive human, bird or other animal reported within the district or its border • High count or significant increase of public health risk mosquitoes (*Cx. pipiens*) in trap collection (daily average greater than 45 mosquitoes per trap for ≥ 2 weeks) • Resident complaints of mosquitoes. • High count or significant increase of nuisance mosquitoes in trap collection (daily average greater than 25 mosquitoes per trap) • Combination of precipitation and temperature per institutional knowledge and experience	Ultra-Low Volume (ULV) application of insecticide via hand or truck mounted spray equipment applied as stipulated on the product labels.
Pesticide Application Barrier (Adult Control)	• Resident complaints of mosquitoes • Public gatherings and events • Any combination of light trap counts, gravid counts, WNV or other positive pools of mosquitoes, dip samples or environmental and weather conditions • Areas inaccessible to truck ULV	Insecticide applied to vegetation using a handheld or backpack sprayer as stipulated on the product labels.
Public Relations and Education	• Continual	• Media Relations • Public Information Booth/Events • Website • Intergovernmental Agency Relations • Community Outreach • Social media • Email and SMS messaging

Education and Communications

The NSMAD website (www.nsmad.com) provides residents a user-friendly interface with easy access to a wealth of information and links. We made improvements to the site this year with the inclusion of a new interactive map of the District. Residents are encouraged to visit our website to find out where and when adult mosquito control operations will be taking place (we utilize embedded Google Maps to provide a better visual reference), report biting activity, standing water and any other concerns regarding mosquitoes. Residents can sign up for email and/or SMS text message blasts to provide the most current information regarding our adult mosquito control operations, the risk of infection and other important mosquito news. Additionally, minutes from the NSMAD Board of Trustee's meetings can be found on our website.

The NSMAD Twitter feed (@NorthShoreMAD) is used to provide information on adult mosquito control operations and other important news items and information.

In addition to our website and Twitter feed, the NSMAD has a 24-hour hotline (847-446-9434 and follow the prompts) that residents can call to learn the status of our adult mosquito control program, inform us of matters that we can address (i.e. increased adult mosquito activity in a specific area) and report standing water sites.

Media and Community Relations

During the season, a weekly status report is distributed via email with updates about our surveillance and operations along with insight regarding mosquito-borne illness risk. This report is delivered to more than 120 stakeholders and members of the news media. It is also posted on the front page of our website for residents and the general public. We actively pursue news media opportunities to cover timely topics such as repellent usage, WNV activity, trap counts, testing data, and when adult mosquito control operations are to be conducted in the District. The NSMAD was consulted on numerous news stories this past year. We provided information for at least 15 news items regarding mosquitoes, mosquito-borne illness and personal protection measures to the Chicago Tribune, the Chicago Sun-Times, the Daily Herald, Pioneer Press, The Daily Northwestern, Evanston Now, the Evanston Roundtable, Patch and other community publications, as well as, WMAQ-TV, WLS-TV, WBBM-TV, WGN-TV and WBBM-News Radio.

During a typical season, the NSMAD public information booth visits numerous public events throughout the year. The Communications Manager, along with other staff members, attend these events to educate residents regarding personal protection methods and answer questions about mosquitoes and our control program. This season, due to the effects of the COVID-19 pandemic, the public information booth did not attend any events, as they were cancelled by their respective hosts. We look forward to participating in the numerous local spring and summer events when they begin again.

In an attempt to continue our outreach activities, we placed advertisements focusing on West Nile virus prevention on the Evanston Round Table and Evanston Now, two local newspaper's websites, for the summer season.

We utilize the GovDelivery System to alert our subscribers about adult mosquito control operations, West Nile virus activity and risk, as well as, other important mosquito information during the season. Additionally, we post adult mosquito control operations and WNV activity our website's front page.

2020 Budget

Purchase of Equipment & Supplies	$ 124,093.00
Mosquito Control Products	$ 320,080.00
Building Maintenance & Repairs	$ 17,300.00
Capital Improvements Fund	$ 90,400.00
Utilities	$ 25,800.00
Legal & Audit	$ 28,780.00
Salaries & Wages (7 Full-Time & 16 Seasonal)	$ 774,084.00
Social Security	$ 59,200.00
IMRF	$ 35,600.00
Liability Insurance	$ 62,000.00
Health Insurance	$ 101,100.00
Contingency	$ 6,500.00
	$ 1,644,937.00

2020 Staffing

Full Time Staff

- Executive Director: Mark Clifton
- Field and Shop Technician: Justin Bamberg (April 2020)
- Chief Field Inspector: James Binnall (Retired, February 2020)
- Operations Manager: Marlon Henry
- GIS Manager/Field Supervisor: Amy Runde
- Vector Biologist: Christopher Xamplas
- Communications Manager: David Zazra
- Internal Operations Manager: Jennifer Zimmer

Seasonal Staff

- Laboratory: two technicians
- Field Operations: 14 technicians

2020 Pesticide Usage

Larval Control Products

Altosid® P35	875 lbs.
Altosid® Pellets	537 lbs.
Altosid® SR-20	17 gallons
Altosid® XR	19 lbs.
BVA Oil	8 gallons
FourStar® 180	1 lb.
FourStar® Bti 45 Day	7 lbs.
FourStar® 45 Day	6 lbs.
FourStar® 90 Day	9 lbs.
FourStar® Bti 150 Day	8 lbs.
Natular™ G30	3362 lbs.
Natular™ T30	3 lbs.
Natular™ XRT	23 lbs.
VectoBac® WDG	0 lbs.
VectoPrime® FG	1047 lbs.
VectoLex® FG	2274 lbs.
VectoLex® WDG	41 lbs.
VectoLex® WSP	1296 lbs.

Adult Mosquito Control Products

Duet™ ULV	43 gallons
Flit™ 13.3	0.98 gallons

2020 Vehicles and Equipment

Vehicles

1 2007 GMC Canyon 4x4 Pick-Up Truck
1 2011 Ford F250 4x4 Pick-Up Truck w/ Snow Plow
1 2011 Ford Escape SUV
1 2012 Ford F150 Pick-Up Truck
1 2012 Toyota Tacoma Pick-Up Truck
1 2014 Ford F150 Pick-Up Truck
1 2015 GMC Sierra K1500 4x4 Pick-Up Truck
1 2015 GMC Canyon Crew Cab Pick-Up Truck
2 2016 GMC Canyon Pick-Up Truck
1 2016 GMC Sierra K1500 4x4 Pick-Up Truck
2 2018 GMC Canyon Pick-Up Truck
1 2019 Ford F250 Flatbed Truck
2 2019 GMC Canyon Pick-Up Truck
1 2020 Ford F150 Crew Cab Pick-Up Truck
1 2020 Ford Ranger Pick-Up Truck

Equipment

Application Equipment

6 Cougar Ultra Low Volume Sprayers (Gas Engine)
2 ProMist Dura Ultra Low Volume Sprayers (Electric)
7 Stihl® Backpack Sprayers
4 Maruyama Backpack Sprayers
1 Vortex Granular Spreader
1 Stihl® Manual Backpack Sprayer
1 Buffalo Turbine Mist Sprayer

Trap Equipment

10 BG Sentinel™ Traps
4 BG Counters
10 CO_2 Traps
30 Gravid Traps
18 New Jersey Light Traps
8 Encephalitis Virus Traps (EVS)
11 Gravid *Aedes* Traps (GAT)
3 Passive Box Traps

MEMORANDUM
VILLAGE OF NORTHBROOK
DEVELOPMENT AND PLANNING SERVICES DEPARTMENT

TO: ENVIRONMENTAL QUALITY COMMISSION

FROM: TESSA MURRAY, GREENEST REGION CORPS MEMBER

DATE: MARCH 18, 2021

SUBJECT: GREEN STEWARD AWARD

INTRODUCTION

At the January 2021 EQC meeting, Deputy Director Yu first proposed the addition of a Green Award for individuals in Northbrook dedicated to environmental stewardship in the community. As the current Green Awards necessitate an attachment to a home or business with environmentally-friendly projects, a Green Steward Award encourages participation from any residents and employers/employees within the Village Northbrook involved in sustainability programs bettering the community. This addition would be an inclusive step in capturing a larger portion of Northbrook's population, making it easier for students and renters that cannot demonstrate eco-friendly behaviors on a property or business to be recognized for efforts working through community programs.

For the Commissioners' consideration, please see below for the potential Green Steward Award application for 2022.

Another item for the EQC to consider is whether or not to accept nominations for the awards. If this is a direction that the EQC would like to take, then we can specify more clearly on the award forms that nominations can also be submitted on behalf of applicants that people believe would qualify.

Lastly, staff would like to discuss the idea of awarding a sapling to be planted in honor of the annual winners for all green awards rather than providing a plaque. The thought behind this is that it may be more environmentally friendly in keeping with the goals of the group, and those receiving the awards, to encourage additional tree planting in the community. Recipients could choose to have the tree planted on their property, in the right-of-way, or elsewhere in coordination with the Village.

Village of
Northbrook

1225 Cedar Lane Northbrook, Illinois 60062 847.272.5050 www.northbrook.il.us

Green Steward Award Application

The Village of Northbrook's Green Steward Award program seeks to promote environmentally-friendly practices in Northbrook by recognizing individuals that have a positive impact on the environment by participating in sustainability programs through daily behaviors, the Northbrook schools, various community gardening organizations, the Park District, citizen's activist groups, or similar entities.

Who is Eligible?

Residents located within the corporate limits of the Village of Northbrook, or those who work within the corporate limits of the Village of Northbrook.

How to Apply

Applicants interested in applying for the Green Steward Award should complete this application and submit it to the Village of Northbrook at tessa.murray@northbrook.il.us by March 31, 2022. Only email submissions will be accepted. Applicants should describe their practices and sustainable efforts with as much detail including what programs they employ, how long they have been participating in these actions, and the outcomes of these practices. Pictures may be attached to this application.

Review of Application and Awards

Applications will be reviewed by members of the Village's Environmental Quality Commission. They will choose 1 winner for the Green Steward Award. Awards will be announced at a Summer 2022 Village Board meeting.

Name:_____ Address: _____ _____ Phone: _____

Email: _____

Description of sustainable practices and efforts implemented (use additional sheets if needed):

Outcomes of these efforts:

Submitted by:

I hereby acknowledge that the information included in this application is correct to the best of my knowledge.

Signature: _____ Date: _____

For Office Use Only:

Application Received On:

Village of
Northbrook

1225 Cedar Lane Northbrook, Illinois 60062 847.272.5050 www.northbrook.il.us

Green Steward Award
Program Information

Purpose

The Village of Northbrook is a committed partner to improving the environment and encouraging sustainable practices. To this end, the Village recognizes the importance of government and residents working together to set and reach goals of environmental sustainability. For this reason the Board of Trustees and Environmental Quality Commission have created the Green Steward Award Program. The Green Steward Award program will seek to promote environmentally-friendly practices in Northbrook by recognizing individuals that have taken steps with meaningful results to make a positive impact on the environment.

What Types of Practices May Be Recognized by the Green Steward Award

The Village is seeking applicants that are taking steps to minimize their impact on the environment. Each year the Environmental Quality Commission will select a category of sustainability on a rotating basis to highlight. The intent is to provide guidance to residents applying for the Green Steward Award on areas in which to focus their application. For 2022, the Environmental Quality Commission has selected the category of ____. While the Village is looking more favorably on ____ this year, any applicant taking sustainable action is welcome to apply. The chosen category does not preclude residents from submitting applications for achievements related to any other facet of sustainability.

Eligibility

An applicant must be live or work within the corporate limits of the Village of Northbrook.

How to Apply

Complete and email an application and send it to tessa.murray@northbrook.il.us. Only email submissions will be accepted.

Questions

Questions about the Green Steward Award program or how to apply for the award can be answered by the Department of Development and Planning Services at 847-664-4057 or tessa.murray@northbrook.il.us.

Application Timeline

The process will open February 1, 2022, and applications will be accepted until March 31, 2022. Winners will be announced at a Village Board meeting.

Selection Committee

The Selection Committee is composed of representatives of the Village of Northbrook's Environmental Quality Commission.

How the Program Works

Applicants in Northbrook are asked to fill out an application. Applications will be reviewed by members of the Selection Committee. Applicants should be as specific as possible with the description of their efforts and where possible quantify the benefits of their efforts. Pictures will help with applications. One winner will be chosen.

Awards

The winner will be announced at a Village Board meeting in Summer 2022. The winner will be recognized in the Village Newsletter. The winner will receive an award and may be recognized at a Village event such as Earth Day or a Village of Northbrook Board of Trustees meeting.