



Warren County Mosquito Extermination Commission

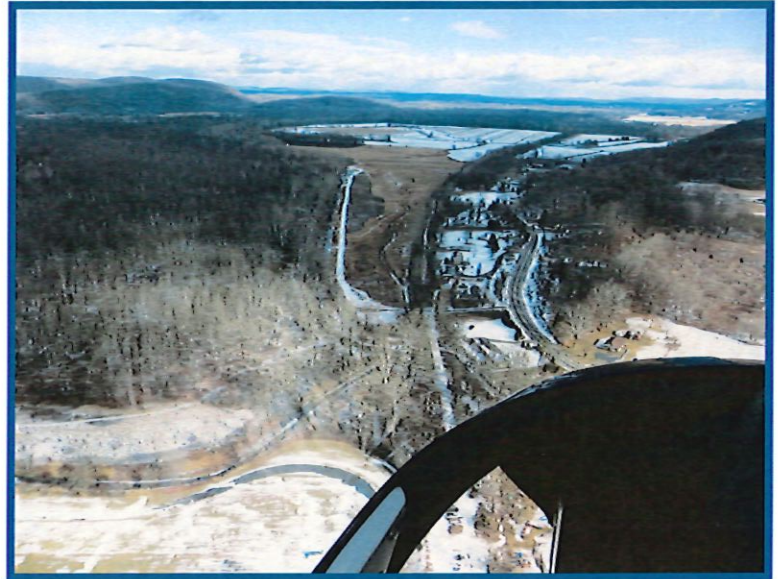


2025 ANNUAL REPORT

January 1, 2025 - December 31, 2025



Andrew Flohn
Retired September 1, 2025



SMCC Aerial Surveillance
January 2025



Warren County Bicentennial Celebration
Elizabeth Hankinson
June 2025



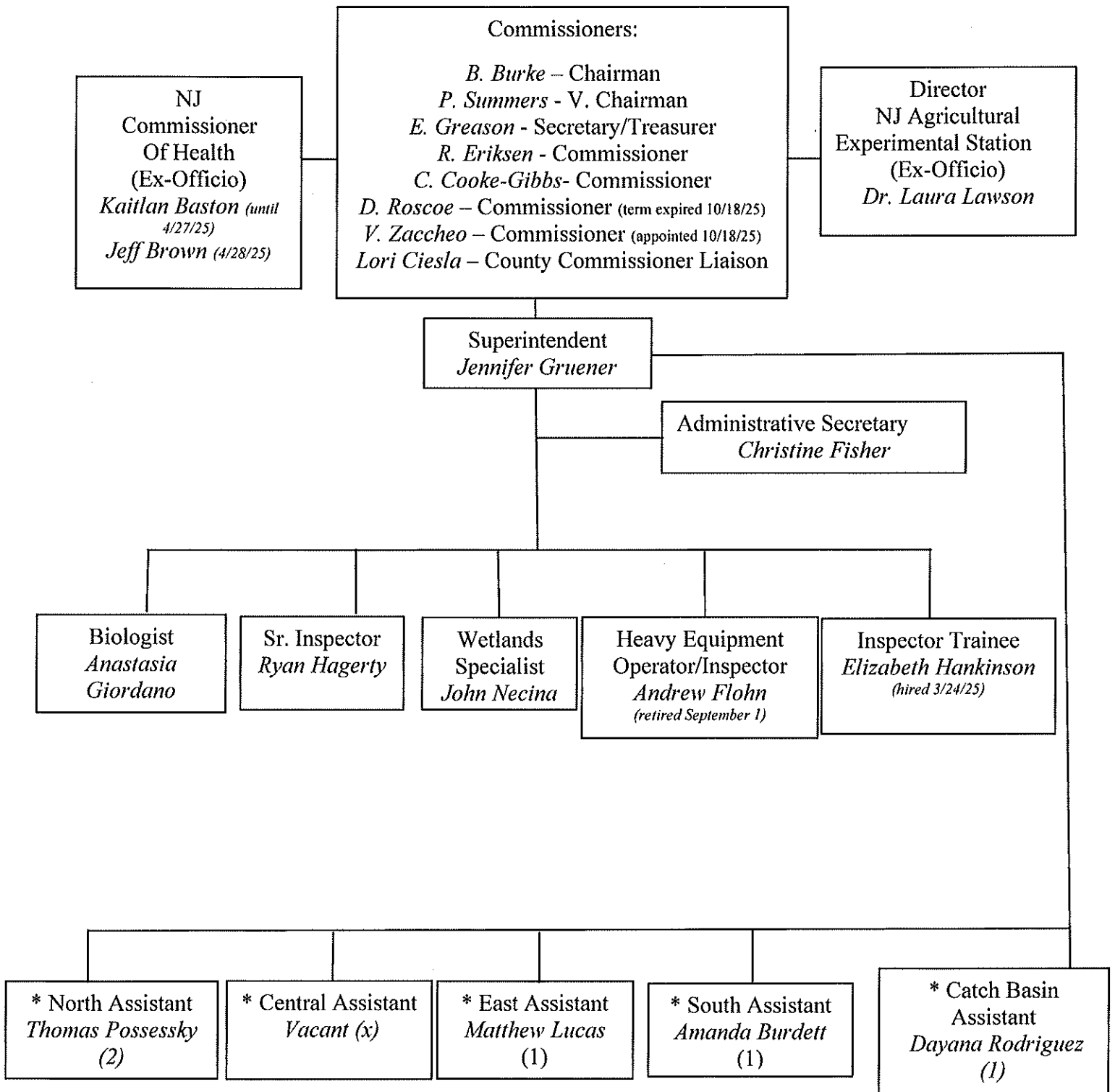
Dermacentor variabilis
nymph
July 2025

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2025
WARREN COUNTY MOSQUITO COMMISSION
ORGANIZATIONAL CHART



* Seasonal Position
 (x) Indicates number of seasons worked

I. ADMINISTRATION

A. Budget/Treasurer's Report

Following the body of this report are the final Budget and Treasurer's reports (Figures 1 & 2, respectively) for the year, which reflect the Commission's expenditures and financial status as of December 31, 2025.

Sixty-seven thousand dollars (\$67,000) from reserve funding was applied to the 2025 budget to contribute towards the following year's budget; most of this funding was planned to be used for the purchase of a replacement pickup truck and an enclosed trailer to house and transport the UAV. However, in March, an additional eight thousand, eight hundred and ninety-eight dollars (\$8,898.00) was approved to be moved from reserve funds for the emergency purchase of an ultra-low temperature freezer. Late in the year, the commission initiated the purchase of a 2026 Ford F150 Extended cab pick-up truck off the NJ state purchasing contract. Additionally, the decision was made to purchase a Ventrac Tractor off Sourcewell, the National Purchasing Cooperative, instead of the enclosed trailer.

As of December 31, 2025, there was \$65,352.26 unencumbered from the 2025 budget. This combined with \$272.54 in miscellaneous receipts, less the balance of the 2023-24 Tick Grant expended in 2025, \$8,309.50, plus the balance of the 2025-26 Tick Grant received \$8,782.86, and plus the \$46,182.90 left in reserves brought the total balance in reserve funding to \$112,281.06. An effort to keep these funds in reserve for capital purchases and unforeseen emergencies will be made.

In 2025, an audit was performed on the 2024 financial records by Nisivoccia & Company LLP, Newton, New Jersey with no recommendations made regarding the accounting procedures.

B. Personnel

1. Staff

The Commission operated with seven (7) full-time employees for most of 2025: Superintendent, Administrative Secretary, Wetlands Specialist, Biologist, Senior Inspector, Heavy Equipment Operator/Inspector, and Inspector Trainee. The Senior Wetlands Specialist had resigned late in 2024 to pursue a graduate degree in Botany, which prompted a reorganization of responsibilities. This restructuring created an opening for an Inspector Trainee position, which was formally authorized at the December 19, 2024, meeting. The position was advertised through social media and shared by word of mouth, with interviews conducted throughout January. Elizabeth Hankinson was selected and began her employment on March 24, 2025. Then, on September 1, 2025, Andrew Flohn, the Heavy Equipment Operator/Inspector, retired after 15 years of dedicated service to the Commission. The Heavy Equipment Operator/Inspector position was intentionally left vacant for the remainder of the year to allow time to evaluate the water management program and its alignment with the Commission's mission and priorities.

The Commission typically hires five seasonal employees: four Assistant Inspectors and one Disease Surveillance/Laboratory Assistant. However, persistent challenges with the Disease Surveillance/Laboratory Assistant role in 2024 led to a decision in 2025 for full-time staff (primarily the Biologist) to absorb those duties internally. This left four seasonal positions to fill. Two of the four Assistant Inspectors from 2024 initially planned to return; however, one withdrew her application in March, resulting in three open seasonal positions for 2025. Advertisements for the seasonal positions were posted on individual staff members social media pages, shared on Community Facebook sites, shared with municipal clerks for posting on their websites and/or social media, and shared at all the local area colleges through their career centers and with department professors at some of the colleges. Applications were received and interviews were conducted from January to March. Start dates for seasonal staff ranged from April 28, 2025, to May 19, 2025. The new employees received their initial in-house training during the first two days of employment followed by two weeks of field training.

The returning seasonal employee received refresher training on safe pesticide use, as well as on FieldSeeker software. One of the new hires was only available three days per week. Adjustments were made with full-time staff to accommodate her part-time schedule, which ultimately limited the amount of time staff could spend on other activities. Two seasonal staff separated from employment during the last two weeks of August, to return to college, while the two were able to remain through October.

2. Education/Training

The Commission makes a significant investment in their employees in terms of training, education, and attendance at professional meetings. In addition to the following training events, staff participated in the State Mosquito Control Commission's Peer Shadowing Program in 2025. The premise of the program was for personnel from one county mosquito control agency to visit another "host" county agency for one day during an assigned week. Participants and hosts were voluntary, and the Commission staff volunteered as both. The Commission hosted Ryan Dajczak from Mercer County as well as Alex Zarasinski from Passaic County. While Senior Inspector Ryan Hagerty and Biologist Anastasia Giordano visited Sussex County Mosquito Control. The experiences were beneficial to all agencies and participants involved as ideas and workflows were shared.

- **Mosquito Biology & Control/DEP Licensing Training/Tick Biology & Control/ IPM/Vector-borne Disease**

In order to expedite pesticide applicator/operator licensing, an in-house training program was developed in 2002 and was approved by NJDEP- Pesticide Control Program. This program has been updated, revised, and modified over the years to keep current with changing pesticide regulations and requirements. The Basic Pesticide Training Program along with 40 hours of on-the-job training fulfills the NJDEP requirements for pesticide operator licensing. Currently, Jennifer Gruener provides this training to new staff along with general mosquito biology, Right-to-Know/HazCom training, general safety training, and respirator training. Ms. Gruener is certified by the NJDEP to provide in-person basic pesticide training. This certification was renewed in 2025 to comply with changes that took place in the training requirements. Defensive driving, anti-discrimination and harassment training are provided online from PMA Companies Websource for all new staff. After their initial in-house training is completed, staff are accompanied by one of the full-time staff for their field training and to their respective surveillance routes.

All full-time staff, except the Administrative Secretary, are certified by the NJDEP to be commercial pesticide applicators with their core pesticide license as well as category 8B, specifically for mosquito control. New seasonal staff are trained and tested to obtain certification as pesticide operators. If a seasonal staff returns for multiple seasons, they are encouraged to obtain certification as a full applicator. Ms. Gruener holds additional certifications in categories 8A (Public Health), 10 (Demonstration & Research), and 11 (Aerial Applications). Since Mr. Hagerty directs the aerial larviciding program and is involved with the UAS program, he is also certified in category 11. Mr. Necina holds certification in category 11 and category 10 for use in the UAS program and also obtained his category 8A certification in 2025.

Additional virtual and in-person training sessions were attended to provide instruction on vector biology, vector borne diseases, basic pesticide safety, pesticide applications, and to obtain recertification credits, which apply for the requirements for maintaining pesticide applicator licenses. Those courses follow:

- Warren County MEC, "Basic Pesticide Safety Training": T. Possessky, A. Burdett, E. Hankinson, M. Lucas, & D. Rodriguez Fierer
- New Jersey Mosquito Control Association (NJMCA), "Northern Recertification Training

- Session”, St Elizabeth University: J. Gruener, D. Flohn, S. Giordano, R. Hagerty, & J. Necina
 - o “Southern Recertification Training Session”, Golden Nugget, A.C.: S. Giordano
- American Mosquito Control Association, “Best Practices for Integrated Mosquito Management”, virtual training: E. Hankinson & D. Rodriguez Fierer
- Rutgers, OCPE, “Mosquito Biology, Ecology, & Habitat Recognition”, asynchronous course: S. Giordano & R. Hagerty
- Rutgers, OCPE, “Mosquito Surveillance & Management”, New Brunswick: S. Giordano & R. Hagerty
- Northeast Center for Vectorborne Diseases (NEVBD), “Pre-season Insecticide Resistance Meeting”, Zoom: J. Gruener & S. Giordano
- NEVBD/State Mosquito Control Commission, “Advanced Mosquito Identification Course”, online & Assunpink WMA: S. Giordano
- Valent BioSciences, “Granular Deposition Swath Calculator for Drones or Aircraft”, Zoom: J.Gruener, J. Necina, & R. Hagerty
- NJ Department of Health, “NJ Tick Surveillance Meeting”, Zoom: S. Giordano
- Ohio State University, “Invasive Mosquitoes & Implications for Human Health around the World & Close to Home”, webinar: J. Gruener
- Coursera, “Bugs101 – Insect & Human Interactions”, online: E. Hankinson
- Public Tick IPM Working Group, “Wyoming’s First Tick-borne Disease Surveillance Program”, Zoom: E. Hankinson
- NEVBD, “Want Communication Help? Training on Stategic Approaches for Communication, Engagement, and Trust Building”, Zoom: J. Gruener, C. Fisher, E. Hankinson

- **- Right-To-Know/Hazard Communication Training**

Due to training requirements implemented in 2004, a written Hazard Communication Program with an in-house training program (incorporating information from prior Right-to- Know training requirements) was developed in 2005. This program is updated annually by Mrs. Gruener. All new staff members receive a copy of this written program. A list of Hazardous Substances and all of their Safety Data Sheets are also updated annually by Mr. Hagerty. Hazard communication and Right-to-know training is provided on the first day of work by Mrs. Gruener. Information is also supplied as necessary to contractors. Refresher training is given to staff once every two years along with Bloodborne Pathogens Awareness Training. PMA Companies provided this refresher training in 2024 to all staff that were due.

The annual Right-To-Know survey distributed by the New Jersey Department of Health and Senior Services was completed. This survey catalogs all hazardous materials used by the Warren County Mosquito Extermination Commission. Online reporting for the Right-To-Know Survey has been required since Survey Year 2013. The 2024 Right to Know Survey was completed by the 2025 deadline by Mrs. Gruener and Mr. Hagerty.

- **Respirator Training**

A written respiratory program and corresponding training program was developed in 2006 due to a label change requiring the use of N-95 respirators while handling *Bti* products. The program was put into policy format, reviewed and adopted as Commission policy in 2007. This policy was thoroughly reviewed and revised in 2019, and a new training program was developed. Fit testing and training take place annually for anyone who has the potential to need a respirator during that particular year. Jennifer Gruener is trained to perform fit testing.

- **Other Training (Safety, Purchasing, Pensions, Water Management/Stormwater, etc)**
- Warren County Public Safety, “CPR & AED Certification Training, American Heart Association”: J. Gruener, E. Hankinson, J. Necina, A. Burdett, M. Lucas, T. Possessky, C. Fisher, S. Giordano, & R. Hagerty
- NJ Division of Pensions & Benefits, “Pension Resources for the Employer”, GoToMeeting: J.Gruener
 - o “How to Update the Certifying Officer/Supervising Certifying Officer”, GoToMeeting: J. Gruener
- NJ Department of Treasury, “NJ Start 101”, webinar: J. Gruener
- Government Finance Officers Association, “Women at Work Conference”, Trenton: J. Gruener
- NJ League of Municipalities, “NJLM Mini Conference”, Ewing: J. Gruener
- NJIIF, “Workers Compensation Seminar”, Teams: J. Gruener
- NJ Learning Management System, “Habit Stacking”, myNewJersey: J. Gruener
- Government Records Council, “GRC’s 17th Annual OPRA Seminar”, Zoom: J. Gruener
- Rutgers, OCPE, “Water Management and Drainage”, New Brunswick: J. Necina
- Institute for Professional Development (IPD), “The Manager’s Role as Coach, Mentor, & Motivator”, GoToMeeting: J. Gruener
 - o IPD, “Collusion, Bid Rigging, Ethics in Procurement & Cooking the Books”: J. Gruener
- **Computer Software/New Technologies/UAS**
- NJIIF, “(Cyber) Security Awareness Training, Level 1”, Training Coalition: J. Gruener, C. Fisher, R. Hagerty, S. Giordano, A. Burdett, E. Hankinson, T. Possessky, J. Necina
- ESRI Training online, “ArcGIS Online Basics”: J. Gruener
 - o “Configuring an ArcGIS Online Organization”: J. Gruener
 - o ArcGIS Online: Getting Started: E. Hankinson
 - o ArcGIS Online: Editing Essentials: E. Hankinson
 - o ArcGIS Creating & Sharing GIS Content: E. Hankinson
- YouTube, “ArcGIS Pro Beginners Course”: E. Hankinson
- Entomology Society of America, “Harnessing AI for Sustainable Insecticide Discovery & Advancing Entomology”, webinar: J. Gruener
- Mari Spasialkan, “Tutorial: How to Create Custom Symbols (SVG Marker) for QGIS”, YouTube: J. Necina
- Pilot Institute, “The Best Drone Accessories – Never Fly Without These”, YouTube: J. Necina
- Steel City Drones, “Important Updates about DJI”, YouTube: J. Necina
- DJI Agriculture, “Introducing DJI Agras T100, A Fully Loaded Flagship Drone”: J. Necina
- Mahable Explains, “What is 3D Printing and How Does it Work?”, Mashable: J. Necina & R. Hagerty
- Jared Own, “How does a 3D Printer Work (A1 by Bambu Lab)”, YouTube: J. Neinca & R. Hagerty
- Wittworks, “I Wish I Knew This about 3D Printing 3 years ago”, YouTube: R. Hagerty & J. Necina

3. Commercial Driver’s License Testing Program

Our heavy equipment operator is the Commission’s CDL holder. The employee working in this title is included in with the County pool of employees to be randomly tested for drugs and alcohol, which is required by Federal DOT regulations. Upon the September 1, 2025, retirement of Andrew Flohn, no employees currently hold a CDL.

4. Employee Assistance Program

The Commission staff members were able to utilize the Employee Assistance Program (EAP) in 2025,

which is made available through the NJ Intergovernmental Insurance Fund, NJIIF. This program offers assessment, counseling, and referrals for a variety of personal and work-related problems, including those related to drug and alcohol abuse. EAP services are available by calling 1-888-243-5744 or visiting www.sandcreekeap.com; anonymity and confidentiality are assured.

C. New Jersey Mosquito Control Association (NJMCA)

The New Jersey Mosquito Control Association is the oldest mosquito control association in the country and celebrated its 112th Year Anniversary in 2025. The NJMCA is a state-wide professional organization comprised of members from the 21 county mosquito control agencies, the NJDEP Office of Mosquito Control Coordination, the State Mosquito Control Commission, Rutgers University's Center for Vector Biology, and other interested parties. The purpose of the NJMCA is to promote and encourage close cooperation among those directly and indirectly concerned with mosquito control work, stimulate educational activities to increase the knowledge of mosquito control, and advance the cause of mosquito control and related environmental concerns in the State of New Jersey and elsewhere. The NJMCA's primary goal is to promote, encourage, develop, and record safe, effective, and environmentally sound mosquito control activities in order to protect the health and welfare of the citizens of New Jersey, and to make this information available to all who may be interested or concerned with mosquito control activities. The strength of the mosquito control community in New Jersey is reflected in the strength and activity of this association.

In 2025, the NJMCA Conference was held at the Golden Nugget in Atlantic City from March 18 – March 21 with the following staff in attendance: A. Giordano, J. Gruener, R. Hagerty, & J. Necina. The theme of the meeting was, "Education: From In-House to Outreach" and presentations focused on public health communication. Ms. Giordano provided a presentation on strategies to collect, rear, and utilize wild-caught *Culex* mosquitoes for insecticide resistance testing at both the north and the south session, the NJMCA recertification training that proceeds the annual conference. On the last day of the conference, the NJMCA hosted its second annual short film festival, where Ms. Gruener participated with a film about proper capitalization when discussing vector-borne diseases.

Ms. Gruener serves as Trustee on the NJMCA Board. In addition, the following staff members were named to various committees including:

Jennifer Gruener: Editorial Committee, Legislative Committee

Christine Fisher: Membership Committee

John Necina: Archives Committee, Research and Development Committee

Ryan Hagerty: Legislative Committee

D. Associated Executives of Mosquito Control Work in New Jersey (AEMCNJ)

The regular membership of the Associated Executives of Mosquito Control Work in NJ consists of Superintendents and Directors of the county and state mosquito agencies, as well as representatives from the NJ Agricultural Experiment Station. Associate members may also be voted in but must be technical full-time mosquito control professionals. The main purpose of this Association is to promote, preserve, and protect professional standards of full-time mosquito control employees throughout the state. As a member of this operationally oriented organization in New Jersey, Jennifer Gruener attended most of these monthly meetings throughout the year. Association meetings in 2025 were a combination of in person and virtual meetings. Ms. Gruener was elected President of the Association in 2025.

Commission members who were named to the following committees:

Jennifer Gruener: Vector-borne Disease Working Group, Legislative Committee (co-chair)

E. American Mosquito Control Association (AMCA)

The AMCA is a professional association of individuals and organizations interested in mosquito and other vector control comprised of members from over 50 countries. The Commission maintains sustaining membership in the national association, which directly supports legislative and regulatory advocacy. The AMCA launched an Advocacy Center in 2025, making it easier than ever to contact legislative representatives and support mosquito control on a national level. Membership also includes but is not limited to lowered rates for attendance at national meetings, web access to member only information, technical advisor services, the *Journal of the American Mosquito Control Association*, *Wingbeats* - magazine for mosquito control, the *AMCA Newsletter*, monthly e-newsletters, and free webinars throughout the year on numerous relevant subjects. Starting in 2023, the AMCA technical advisor began sharing a monthly curate report with membership, which includes links to local legislation pertaining to mosquito control, pesticides, pollinators, and unmanned aerial systems. These reports continue to be reviewed by the Superintendent as they are received. In 2024, the AMCA formed a drone program to create clear and consistent regulatory compliance processes for AMCA members to use UAS (drones) safely, legally, and responsibly. They also offer accessible and relevant training resources for AMCA members and encourage the advancement of technologies that benefit their members. In 2025, the AMCA began providing regulatory compliance support through two universal Federal Aviation Administration (FAA) exemptions for commercial agricultural-related services using unmanned aircraft systems: one exemption applies to UAS weighing less than 55 lbs. and the other applies to UAS weighing more than 55 lbs. At this time, the Commission is not inclined to utilize the exemptions provided under the AMCA blanket since it is far more restrictive than the exemption the Commission obtained independently.

F. Northeast Mosquito Control Association (NMCA)

NMCA is a non-profit educational organization of nearly 250 mosquito research and control professionals from New England, New York, New Jersey, and Pennsylvania. Their objectives are to promote the efficiency of mosquito abatement and related activities, through the encouragement of research, development of procedure, and the interchange of information; to circulate among its members and other interested parties' pertinent knowledge relative to mosquito abatement and related subjects, and to encourage field trips and meetings of its members.

G. Entomological Society of America (ESA)

Membership in this association began in 2007 and continues annually. This membership allows our Commission access to valuable literature in multiple professional journals.

H. Public Tick IPM Working Group

Superintendent Gruener continued to participate in the Public Tick IPM Working Group, which is composed of tick experts, tickborne disease advocates, medical professionals, vector control professionals, and other interested parties. Ms. Hankinson also attended several webinars shared by the group in 2025. The group collaborates (via a monthly conference call) on Integrated Pest Management related activities, exchanges knowledge, and shares resources to expand the network and reduce the public's risk of exposure to infected ticks. This work is supported by the USDA National Institute of Food and Agriculture, Crop Protection and Pest Management Program through the North Central IPM Center.

I. U.S. EPA - Pesticide Environmental Stewardship Program

At the end of 1997, the New Jersey Mosquito Control Association (NJMCA) approved an extensive mosquito control strategy document for the Pesticide Environmental Stewardship Program (PESP) to be submitted under the American Mosquito Control Association's PESP partnership. The New Jersey document was based on the approved strategy document from the AMCA (the national organization) but goes beyond in specific areas of surveillance, biological control and water management, some of

which were pioneered in New Jersey and all of which are employed today. The New Jersey strategy document was accepted by the AMCA in March of 1998 establishing New Jersey as an official sub-partner. This document is frequently referred to around the country to outline details of a comprehensive mosquito control program. Warren County's current programs are consistent with the strategies outlined in this document and the Commission usually participates in the annual PESP survey from the EPA. On May 8, 2025, the EPA ended the Pesticide Environmental Stewardship Program due to the administration refocusing the agency's priorities on statutory work. The Commission will continue to follow the guiding principles of the PESP and provide public education on pest prevention and vector population management.

J. Safety Coalition

The Mosquito Commission is represented on the Warren County Safety Coalition where current safety related topics are discussed and information is disseminated. The Commission was not aware of any safety coalition meetings in 2025.

Mosquito Commission staff safety meetings are also held on occasions when appropriate. Superintendent Gruener meets with PMA Companies safety representative annually to ensure compliance with safety standards and to plan for safety training for employees. Safety training is listed in part B.2. under "other training" and a hard copy of safety training logs are kept in the office.

K. Records Retention

A request and authorization for records disposal was completed on the New Jersey Division of Archives and Records Management website, *Artemis* in 2025 for disposal of appropriate records. This request was forwarded first to Nisivoccia & Company LLP for necessary signatures, then uploaded to *Artemis* for final approval prior to our disposing of old records. Certain documents are considered permanent and will remain in our central files. Pesticide application records are retained in accordance with the NJ Pesticide Regulations and the NJPDES Pesticide General Permit, which combined, result in a 5-year retention of all pesticide records.

L. Insurance

In 2017, the Commission became an independent member of the NJ Intergovernmental Insurance Fund, NJIIF. The Commission had been insured through the County of Warren's policies with the NJIIF for its Public Officials/Employer Liability, Workers Compensation, General Liability, Excess Liability, and Automobile Liability coverages from 2004 through 2016 but had held its own separate policy for Pollution Liability with a different carrier. Confusion with a minor workers compensation claim spurred discussions with the County and the Insurance brokers, and it was decided that the Commission would be better served if it had its own policies under the NJIIF, separate from the County's. Now all the Commission's insurance policies, including Pollution Liability and Cyber Liability, are under the Commission's account with the NJIIF. All claims are managed through PMA Companies, which also offer a variety of training resources. In 2025, the Commission renewed its membership in the NJIIF for another 2-year period (through 2027) for the following insurance coverage: workers compensation, employers' liability, general liability (including public official liability), motor vehicle and equipment liability, property damage, environmental impairment liability, and cyber liability.

II. FACILITIES/EQUIPMENT

A. Facilities

The Commission continues to utilize the county owned building and grounds at 2 Furnace Street in Oxford, New Jersey. The building is shared with the Department of Weights & Measures, and the grounds are shared with the Oxford division of the County Road Department. A 44' aluminum shipping container is located in the yard behind the building and is used for storing all of the dry, non-

flammable pesticides. Liquid pesticides are stored in a temperature controlled chemical storage building located between the building and the shipping container.

Both office and yard space are extremely limited, so efforts are being made to make the best use of the space we have. The breakroom not only supports seasonal staff, but it also serves as an office to both the Wetlands Specialist and the Heavy Equipment Operator/Inspector, and the laboratory serves as an office to the Senior Inspector, Biologist, and Inspector Trainee. Storage sheds have been purchased for materials and supplies that need to be out of the elements but that can withstand the extreme temperatures of winter and summer. There is a storage shed designated for public relations, one for fish supplies, one for trapping supplies, one for water management supplies, and one for utility supplies. There is also a carport for storing the Polaris Ranger, the Forklift, and items tagged for the annual county auction. There is now an additional carport to provide cover for the fish holding tanks. The placement of this carport lessens the maintenance requirements on the tanks by reducing the amount of debris that fall into the holding tanks, and it provides shade, reducing algal growth in the tanks. Efforts are also made to keep vehicles and equipment under cover to extend their usable life; however, the larger excavator, bulldozer, Eager Beaver Trailer, the utility trailers, and all the service vehicles are currently stored out of doors due to limited garage space. The Commission-owned dump truck is kept in the garage as much as possible.

In March of 2023, the director of Public Works held a meeting with the superintendents of Weights & Measures and the Mosquito Commission to discuss the building and space needs of both entities. Several possibilities were discussed but the superintendent is not aware of any existing plans to address the issues.

B. Equipment

1 a. State Equipment

The following equipment is provided by the State Mosquito Control Commission (SMCC) for the Commission's use under an annual equipment use agreement:

- 1980 John Deere 350C Bulldozer
- 2003 Kobelco Low Ground Pressure Excavator with Powertilt
- 1988 Bausch & Lomb Stereo Zoom 7 Microscope with Fiber-Lite Illuminator
- 1990 Eager Beaver 20-Ton Tagalong Trailer
- 2001 Revco Freezer (lease ended May 31, 2025)
- 2023 EmTek Equipment Mats 4.5" x 42" x 14' (currently loaned to Middlesex)

The heavy equipment is the mainstay of our water management program. In a normal year, the excavator, along with the eager beaver trailer, are regularly utilized. However, due to the previously mentioned changes in staff in 2024 and 2025, the excavator was hardly used in 2025. The John Deere bulldozer was surrendered to the SMCC in 2023; however, the SMCC equipment use agreement states that the Commission is responsible for storing and ensuring the equipment under the agreement until the SMCC has an acceptable location to move it to. Early in 2024, the SMCC decided they would invest a substantial amount of money to refurbish this 44-year-old piece of equipment. The quotes were submitted to SMCC and in 2025 the project went out to bid. The state awarded the contract to AC Equipment in Rahway, and the state had the machine transported to the vendor in 2025 where it has remained since. It is also worth mentioning that SMCC purchased new EmTek equipment mats for use with the Kobelco towards the end of 2023; these mats were lent to Middlesex County MEC in June of 2024, and they remain on loan at this time where they are getting more use. In 2025, Middlesex County MEC also borrowed four of the Commission-owned hardwood mats for a large project they are involved in.

The Revco freezer was also surrendered to the SMCC in 2025. The SMCC had officially stopped

supporting the Revco freezers in 2017 and the Commission had several issues with the freezer that disrupted work efficiency over the 2024 mosquito season. Therefore, a new ultra-low volume freezer was purchased for the 2025 season, and the former state-leased Revco freezer was transferred to Camden County Mosquito Extermination Commission in May of 2025.

1 b. Commission Owned Equipment

The following surveillance/treatment equipment is owned by the Warren County Mosquito Commission. The Commission also owns numerous small pieces of surveillance, collection, and treatment equipment that are too cumbersome to list in this report.

- 2006 Polaris Ranger – Utility Vehicle
- 2006 16 ft Ringo Trailer
- 2022 EBY DO14K Aluminum Equipment Trailer
- 2013 AcrEase 44” Trail Mower
- 2012 London Fog ULV Sprayer
- 2016 Cougar ULV Sprayer with GPS/SmartFlow Assembly
- 2020 Clarke Electric Promist ULV Sprayer with GPS/SmartFlow Assembly
- 2-Maruyama Gas-powered Backpack Sprayers
- Maruyama Battery-powered Backpack Sprayer
- Bausch & Lomb – Stereo Zoom 5 Microscope
- Southern Precision Microscope
- AmScope Fiber Optic Illuminator
- 2021 Leica S8 APO Stereozoom Microscope with View 4K digital camera & software
- Tuttnauer 7-inch tabletop Autoclave
- RAMP Virus Testing System
- 2007 Clark Forklift
- Red Lion Aluminum 6.0 hp Trash Pump & hose (2015)
- 2014 Portable Capstan Winch
- Simpson 3200 Power Washer
- Northstar Tank Sprayer
- DJI Mavic 3E with support hardware & software
- 2024 Hylio Ag-210 UAS with treatment hardware & software
- Yale wire rope air hoist
- 2025 LSR ultra-low volume chest 11ft³ freezer
- Stihl Trimmer
- 2025 Stihl KombiSystem Multi-task trimmer
- 3-Stihl chainsaws
- 5-2025 Stihl battery operated hand trimmers

2. Vehicles

The Commission has a fleet of eight 4WD pickup trucks, and SUV, and a dump truck to utilize in its operations. Annual inspections of all our vehicles are performed prior to the end of January, before our season begins, in the event repairs are necessary as a safety measure and to avoid untimely delays during our busy season. The replacement Ford Ranger that had been ordered in 2024 was received in the spring of 2025. Then late in 2025, a Ford F-150 was ordered off the NJ State Contract to replace another aging Ford Ranger.

Almost all vehicles are kept equipped with 2-way radios utilizing the county frequency, lockable storage boxes, and a full complement of inspection, safety/emergency equipment and informational materials for distribution. The notebooks containing pesticide labels in each vehicle are updated annually with current labels for each of the products we use.

3. Computers

The Commission staff currently utilizes 6 desktop workstations, 2 laptops, and a Chromebook linked together by a local area network (LAN), which is held on an in-house server. The Superintendent, Administrative Secretary, Biologist, Senior Inspector, Wetlands Specialist, and Inspector Trainee each have their own workstations. All computer workstations are set up with upgraded battery backup units (Uninterrupted Power Supply- UPS) to protect against data loss in the event of power problems. This computer system has become integral to the daily operations of the Commission and is maintained by an outside IT company. As particular workstations age and become outdated, they are replaced. The Wetlands Specialist and Senior Inspector's workstations were updated in 2025.

The primary laptop is used for the Superintendent to work away from the office and with our LCD projector for educational purposes. The other laptop is shared by the Heavy Equipment Operator/Inspector, Seasonal Inspectors, Research Interns, and the Disease Surveillance/Laboratory Assistant as needed. Since the Coronavirus pandemic, the Commission has maintained software subscriptions that enable staff to remotely log into their computers from home, when necessary. Originally this service was provided by AnyDesk but was changed to LogMeIn late in 2022 with significant cost savings. The Commission has also maintained a subscription for GoToMeeting to allow for virtual Commission meetings and gives staff the ability to host other virtual meetings as needed.

The Commission website and staff email continue to be hosted by My Corporate Hosting service, which is updated quarterly and provides added security and support. Office 365 subscriptions are maintained for each desktop, which provides a more secure email for each member of staff and the original email addresses were preserved.

The Commission continued to use the FieldSeeker GIS data collection system from Frontier Precision for the 2025 season with 8 iPads. The remaining Mesa III tablets have been phased out, and two additional iPads were purchased in 2025 so that all staff are using the same device for data collection. The software seemed to perform much better on the iOS platform, which resulted in less downtime in the field.

4. Inventory

A comprehensive item inventory with corresponding replacement values was developed in 1996 and is maintained. The inventory list is modified as items are purchased or sold at the Warren County auction. A separate inventory is maintained for pesticides, which incorporates delivery and billing records to ensure loss prevention. Pesticide inventory is documented in excel and verified with product usage in FieldSeeker.

III. COMPLAINT RESPONSE

Service requests are directed to our office to complain of standing water, abandoned swimming pools, mosquitoes, and other related concerns. Specific information is obtained directly from the caller to deal with the problem most efficiently. Service requests are entered into the FieldSeeker database when received. The database automatically maps the request, and it becomes available on all the handhelds once they are synced with the FieldSeeker database. Each request is assigned to an inspector depending on the nature of the request and its location within the county. The inspector can complete the entire request digitally via the handheld, and then each request is closed by the Superintendent. A paper copy of each request is still generated and kept on file to ensure completion.

Our staff investigates all spray requests to verify the presence of adult mosquitoes before the Commission will apply insecticides with truck-mounted sprayers. In addition, staff work to locate the

source of the problem (the water where the larval mosquitoes are developing) and then apply appropriate control measures (larvicides with ground equipment or by aircraft; fish stocking and/or water management) to control the immature stages of the mosquitoes when necessary.

In 2025, service request numbers were high following above average spring rainfall, and although they were less abundant throughout the remainder of the season, they were received consistently until fall. In total, there were 193 service requests for the year, which was a 45% increase from the 133 requests received in 2024. The breakdown on 2025 service requests is as follows: 74.61% adult mosquitoes, 7.25% standing water, 5.70% swimming pools, 1.04% containers/tires, 1.04% stream blockages, and 10.36% other (fish requests, abandoned property concerns, black flies, and inquiries regarding operational procedures).

IV. VECTOR BORNE DISEASE

In 2025, the NJ Public Health & Environmental Laboratory (PHEL) continued panel testing for several viruses. All samples that are tested for West Nile virus (WNV) are automatically and simultaneously tested for Eastern equine encephalitis (EEE), Jamestown Canyon virus (JCV), and St. Louis encephalitis (SLE). The Commission's written trap placement plan was originally devised for West Nile virus surveillance but has been modified to include other mosquito-borne disease surveillance as well. It is updated annually or sooner if the need arises. The plan merges the trapping schedules and trap placements for all disease surveillance. It provides standard trap sites that have had a history of, or have a high potential for, disease activity. In addition to these standard sites, random sites throughout the county are also trapped for disease testing. This procedure enhances our ability to detect mosquito-borne disease activity in the county. The Commission's written trap placement plan was slightly revised in 2025 to reflect changes in disease activity and is provided in Figure 3. In 2025, routine trapping for Asian tiger mosquito (ATM) continued on a regular basis with the disease trapping schedule; those sites are also indicated on Figure 3. ATM surveillance is discussed further under Section V. A. 5 – BG Traps. The collections from these traps are often sent in for WNV, EEE, JCV, and SLE panel testing but other panel testing, specific to ATM such as the Zika, chikungunya, and dengue panel or the La Crosse panel, are available if the need arises.

A. Disease Response Guidelines

The Commission's Mosquito Borne Disease Response Guidelines were reviewed and revised in 2018 to provide consistency and to respect state restrictions on the use of identifiable personal information with respect to human disease involvement. These guidelines are based on the current knowledge regarding West Nile virus and take into consideration other potential disease detection. The current version can be found in Figure 4. This serves as a guide for communication, surveillance, and control when evidence of mosquito borne disease is noted in Warren County.

B. Vector Borne Disease Working Group (VBDWG)

This interagency group is comprised of representatives from the State Health Department, the State Public Health Laboratory, the NJ Office of Mosquito Control Coordination, the military, State Epidemiologists, the NJ Department of Agriculture-Division of Animal Health, US Department of Agriculture, Rutgers Center for Vector Biology, local epidemiologists, NJ Health Officers Association, and the Associated Executives of Mosquito Control in NJ (AEMCNJ). The superintendent is one of the AEMCNJ representatives for the group. The group typically meets every month during the active season (with sub-committees meeting during the off months) to discuss current activities and guide each agency in enhanced activities that would help address important public health issues caused by vector-borne disease in the state. Meetings in 2025 were held monthly from April through October with an additional meeting in December. They were a mix of in-person and virtual meetings.

Since 2021, the VBDWB has updated the Disease Surveillance Guidelines for the state and distributed

these guidelines to the 21 county mosquito agencies annually. These guidelines outline the species and ideal number of mosquito samples (pools) per week for each disease that the county agencies should aim to submit to the state testing laboratory to provide an accurate account of the presence of mosquito borne disease throughout the state.

C. VectorSurv

In 2025, New Jersey continued to utilize CalSurv for statewide arbovirus data management. This database system was developed by the University of California, Davis as a collaboration between the state, university, and county public health entities. The NJ Vector-borne Disease Working Group worked with the developers to customize the system for use by the NJ counties, creating JerseySurv. The Centers for Disease Control funded the entire effort, and more states/territories have joined, so the system has been renamed “VectorSurv”. Now the PHEL and the 21 counties, as well as Rutgers University and the NJ Office of Mosquito Control, have free access to this system.

Mosquito control and public health agencies who use the VectorSurv system do so through the Gateway, which is an online interface for managing and analyzing surveillance and control data related to mosquitoes, ticks, arboviruses, and insecticide resistance monitoring. The Gateway requires login credentials for each user, who must belong to an identified agency. Each agency maintains all the privileges to manage its own data and user accounts, and higher-level aggregate reporting functions are managed by the state. The counties enter the sample information for the specimens being sent to PHEL (or the Cape May laboratory) for disease testing and when the laboratory receives the samples and tests them, they enter the results. VectorSurv has the capacity to handle all trap data (including NJ light trap data) not just disease surveillance data. This system increases efficiency and communication between the various agencies and allows for data sharing and data analysis. In 2025, tick surveillance data and pools were also entered into this system.

Mosquito and tick testing results submitted from Warren County to the state are reported in the Vector-borne Surveillance Report produced by the NJ Department of Health, Communicable Disease Survey. This report is shared publicly along with an interactive dashboard that provides information on vector-borne disease incidence and trends as well as mosquito and tick activity. A year-end summary of mosquito borne disease taken from this report can be found in Figure 5.

D. West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, and Jamestown Canyon Virus

A chart showing real time disease activity by municipality is included on the Commission’s website to keep residents informed. Mosquito-borne disease surveillance activities are described below. The Commission has been monitoring for West Nile virus since its introduction into New Jersey in 1999; therefore, most historical disease data pertains to WNV. A map showing the locations of all cumulative WNV activity in Warren County to date (including mosquitoes, birds, and horses) can be found on the WNV Cumulative Positive Map, Figure 6. Locations of confirmed human cases are not publicly disclosed; therefore, these points are not shown on Figure 6. As mentioned earlier, in 2025 all samples submitted for WNV were simultaneously tested for EEE, SLE, and JCV. Although the Commission has periodically been able to test for these and other viruses before, the panel testing allows for a much more comprehensive surveillance program.

1. Bird Testing

The bird testing regime followed since 2001 was discontinued in 2016. This service is no longer available through the NJ Department of Health and Human Services; however, the NJ Department of Agriculture does occasionally test birds for WNV. In Warren County, dead bird reports are entered as service requests, and the area is trapped as soon as possible for mosquitoes that are likely to be carrying the virus. The mosquitoes caught from those areas are submitted for testing.

2. Mosquito Sampling/Testing

In 2025, a total of 470 pools (samples) of mosquitoes comprised of 9,732 mosquitoes from Warren County were submitted to the NJ PHEL for virus testing. The State Mosquito Control Commission covered the total costs of testing for each county (up to 20 pools per week). Please refer to Figure 6a, Mosquito Samples by Species Submitted to PHEL for Mosquito-borne Disease Testing to see the species and counts of mosquitoes submitted. A map of all the sites where mosquitoes were collected and submitted to PHEL in 2025 for disease testing can be found on Figure 6b, Mosquito-borne Disease Trapping Locations.

a. West Nile Virus

Currently, West Nile virus (WNV) is the primary mosquito-borne virus of concern in Warren County; therefore, the methodology of our disease surveillance program is centered on this disease. For West Nile virus surveillance, gravid traps were placed at locations throughout the county to target *Culex* mosquitoes, the primary vector of WNV. These traps were collected between April 29 and October 28 in 2025. Seventeen municipalities were sampled throughout the season, starting with sites on the trapping schedule, then supplemented with sites that had a high disease potential to fill geographic voids. Neighborhoods with positive WNV indicators were also focused on to assess the general mosquito activity as well as the WNV activity in those areas. *Culex* species (mostly *Cx. pipiens* and *Cx. restuans*) were tested since they are the known amplification vectors of WNV. If any of those pools tested positive, then additional trapping and/or testing was done to include other species that may bridge the disease to humans.

In 2025, Warren County had 16 WNV positive mosquito samples out of the 470 samples that were tested for WNV. This is a decrease in the elevated WNV activity that has been observed the previous two years, just slightly higher than the 1999-2022 county-average of 12 WNV positive samples per year. The first WNV positive pool of the year was collected from Washington Township on May 13. This was the earliest WNV has ever been detected in Warren County. It was detected a week earlier than 2024's first positive pool which had been the earliest detection to date at the time. The final WNV positive pools of the year were collected from Lopatcong Township on September 30, 2025. The sixteen (16) mosquito samples that tested positive for WNV from Warren County in 2025 were from the following townships: Allamuchy, Alpha, Belvidere (2), Franklin (3), Harmony (3), Hope, Knowlton, Lopatcong (2), Mansfield, and Washington Township. The species that tested positive for mosquito-borne disease in 2025 were all *Culex pipiens/restuans/salinarius mix* (16). This information can be found in Figure 6a and both positive and negative trap locations are mapped in Figure 6b.

Statewide, 2025 was also an above average year for WNV activity in the mosquito population. There were 1,159 positive pools (as opposed to 995 positive pools in 2024). West Nile virus was detected earlier than ever in the state in 2025 with four pools from week 16 (April 13-April 19, 2025) testing positive from Gloucester County. The last detection of virus in a positive mosquito pool occurred in week 44 (October 26-November 1, 2025), which was a week earlier than experienced in 2024. Every county in the state reported WNV positive mosquito samples with the highest positive mosquito activity being reported from the suburban corridor (Bergen, Hudson, Middlesex, Somerset, Hunterdon, Union, and Mercer Counties). Ninety percent (90%) of the WNV positive mosquito samples were *Culex* species and the remaining ten percent (10%) comprised 10 different species (*Aedes albopictus*, *Ae. cantator*, *Ae. japonicus*, *Ae. taeniorhynchus*, *Ae. triseriatus*, *Ae. vexans*, *An. bradleyi*, *An. punctipennis*, *An. quadrimaculatus*, and *Cs. melanura*).

b. Eastern Equine Encephalitis

To better conform to the Mosquito and Vector Surveillance Submission guidelines, the goal was to have some pools submitted for testing each week that would target Eastern equine encephalitis and

Jamestown Canyon virus vectors in addition to West Nile virus vectors. For Eastern equine encephalitis, the target species are *Culiseta melanura* and *Coquilleltidia perturbans*, the primary vectors of EEE. In 2025, there were nine pools of *Cq. perturbans* (totaling 273 specimens) collected and submitted for testing. There were no pools of *Cs. melanura* collected or submitted in 2025. Since the inception of panel testing at PHEL, all samples submitted for the WNV testing panel are also tested for EEE; therefore, 421 mosquito pools (9,483 mosquitoes) were tested for EEE. None of the mosquito samples from Warren County tested positive for EEE in 2025. If positive mosquitoes were to be found in any samples, more extensive trapping would have followed to determine the best course of action.

Statewide, EEE activity was slightly elevated in 2025 as compared to 2024 and 2023. There were twenty (20) positive mosquito pools in 2025, whereas there were seventeen (17) EEE positive mosquito pools in 2024 and eighteen (18) EEE positive mosquito pools in 2023. The breakdown for 2025 is as follows: Atlantic (12), Burlington (1), Camden (2), Cape May (2), and Morris (3). Ten positive pools were *Cs. melanura*, five positive pools were *Culex* species, two positive pools were *An. bradleyi*, and one positive pool each were *Ae. canadensis*, *Ae. japonicus*, and *An. punctipennis*.

c. Jamestown Canyon virus (JCV) and St. Louis encephalitis (SLE)

There was no targeted JCV trapping in Warren County for 2025 due to staff constraints and early flooding and larval activity. However, Jamestown Canyon virus is included in the West Nile virus multi-plex panel, so in the end, 421 pools (9,483 mosquitoes) submitted for WNV panel testing were also tested for JCV and SLE yielding no positive pools in Warren County for either of the two viruses. Statewide Jamestown Canyon virus was detected in five mosquito samples in the following counties: Atlantic, Mercer, Morris (2), and Sussex. There was no Saint Louis encephalitis activity in NJ in 2025.

3. Equine Cases

No horses were confirmed to have WNV in Warren County nor statewide in 2025. There was one confirmed EEE positive horse reported in 2025 in Burlington County.

4. Human Cases

The Commission is kept abreast of human cases being tested for mosquito-borne diseases via regional meetings (Associated Executives of Mosquito Control in NJ, Vector-borne disease working group, and NJMCA Board meetings). If the superintendent was notified of suspect human cases in Warren County via phone calls from the State Mosquito Control Commission, this would then prompt contact with the county health department for additional information. Information about each individual case is shared between the county health department and the mosquito commission superintendent. If a case is confirmed positive for mosquito-borne virus, the superintendent notifies the Commissioners as well as the County Board of Commissioners.

Fortunately, there were no confirmed human cases of WNV, EEE, JCV, or SLE detected in Warren County in 2025. There was one possible travel-related Zika human case (mentioned in section D) and this person also tested IgM positive for EEE; however, confirmation was not possible.

Statewide, there were 21 human cases of WNV reported in 2025: Atlantic (2), Bergen (2), Burlington, Camden, Essex, Gloucester, Hudson, Mercer, Middlesex (3), Monmouth (2), Morris (2), Passaic, Union (2), and Sussex. This was about half of the cases confirmed in 2024. In 2025, there were no reported associated deaths.

One human case of JCV was reported from Middlesex County in week 34 of 2025 (August 17-August 23).

There were no reported confirmed human EEE or SLE cases in the state of NJ in 2025.

D. Chikungunya Virus (CHIKV) and Dengue Virus (DENV) and Zika Virus (ZIKV)

Humans can serve as a reservoir for chikungunya (CHIKV), dengue (DENV), and Zika (ZIKV) viruses. Therefore, a mosquito can actually acquire enough virus from an infected person (while obtaining a blood meal) to pass that virus to another person. Unlike WNV, these viruses do not require a bird reservoir. *Aedes aegypti* and *Aedes albopictus* are both able to transmit the virus. *Ae. aegypti* is not present in Warren County but *Ae. albopictus* has become increasingly more abundant.

To date, there have not been any locally transmitted cases of CHIKV, DENV, or ZIKV in New Jersey. In 2025, there were travel related cases of dengue and Chikungunya in the state; however, there was considerably less disease activity than experienced in 2024. It is theoretically possible for local transmission to occur in Warren County in areas where *Ae. albopictus* are abundant (when travel related cases are present). Therefore, when reports of travel-related cases are reported to the Commission, follow up mosquito surveillance occurs as soon as possible and a request for testing is submitted to the State Mosquito Control Commission.

In 2025, there was one unconfirmed potential human Zika case in Warren County. Adult mosquito surveillance was conducted, and only a few mosquitoes of any species were collected; *Aedes albopictus* was absent altogether. Due to the nature of the case, the Warren County Health Department was unable to draw any conclusions and the circumstances surrounding it will likely never be confirmed. However, based on local disease surveillance and the low mosquito activity in that particular area, the commission does not believe local transmission was involved nor was there a public health risk in that community.

A detailed Zika Action Plan was developed and approved by the Commission in 2017. The Plan follows the recommendations set forth by the CDC for Zika Vector Control in the Continental United States and incorporates properties of the NJ DOH Interim Zika Virus Concept of Operations Plan and the AMCA Best Management Practices for Integrated Mosquito Management. The Commission's Zika Action Plan outlines the preparations and responses to various scenarios of a Zika virus epidemic. The actions laid out in this plan would also be applicable to many other vector-borne disease outbreaks.

E. La Crosse Encephalitis (LAC)

Mosquito testing for La Crosse encephalitis was made available through the NJ PHEL for 2019 by choosing a separate LAC/WNV panel test instead of the WNV/EEE/SLE/JCV panel testing. There was no suspected LAC activity in Warren County in 2025; therefore, no specific trapping was done for LAC. However, to adhere to the Mosquito and Vector Submission Guidelines that suggest 1-2 pools per week for LAC surveillance, pools were submitted for LAC testing as often as possible. *Aedes triseriatus*, the tree-hole mosquito, is the primary vector species for LAC and it is seldom caught in high numbers in Warren County traps; however, the greatest single collection in 2025 was 21 specimens from a BG trap set on July 29 in Independence Township. A majority of the pools were derived from gravid traps. In 2025, a total of 49 pools (totaling 249 mosquitoes) were submitted for LAC testing; all samples tested negative for LAC.

Statewide, there were two positive pools of La Crosse detected in Sussex County. There were no confirmed human cases of La Crosse in NJ in 2025.

F. Tickborne Disease

Since 2000, the number of tickborne diseases in Warren County has markedly increased. The tickborne diseases reported to the NJ State Health Department from Warren County include Lyme disease, alpha-gal syndrome, babesiosis, *Borrelia miyamotoi*, ehrlichiosis/anaplasmosis, Rocky Mountain spotted fever, hard tick relapsing fever, and Powassan virus. The State Health Department has not released the final number of cases per county of the aforementioned tickborne diseases for 2025 as of

the date of this report; however, once finalized it can be found at:
<http://www.nj.gov/health/cd/statistics/reportable-disease-stats/index.shtml>.

From 2010-2019, Warren County was consistently one of the top three counties for the highest incidence of Lyme disease in the state and experienced the highest incidence in both 2016 and 2017. Increasing numbers of other tickborne illnesses are also occurring and unfortunately, in 2013, there was a fatal case of Powassan virus that occurred in Warren County. The Board of County Commissioners passed a resolution in 2019 designating the county mosquito commission as the appropriate agency for tick surveillance in Warren County should funding become available. The Commission sought and has been awarded grant funding for tick surveillance since 2021.

One goal of the grant-funded tick surveillance project is to calculate the density of infected ticks in Warren County for a variety of tickborne pathogens. The tick testing panels were finalized in 2023; they are species specific and multi-plex in nature. All associated collection data and disease testing data was entered into VectorSurv.

Detailed information about the tick surveillance project can be found in Section VIII. D. Grant Funded Tick Surveillance.

V. SURVEILLANCE

Surveillance is the foundation of all the Commission's efforts and is a necessity to make sound, science-based decisions. Rainfall surveillance guides our efforts and allows for the most efficient use of Commission time. Rainfall events are tracked throughout the county so that inspection efforts are concentrated where the most flooding potential exists. Adult and larval mosquito surveillance is time-consuming, but it is an integral part of any integrated pest management (IPM) approach. County-wide mosquito surveillance not only provides the data needed to make control decisions but also provides an overall picture of mosquito productivity in the county. This information is useful in identifying where future problems may occur, such as invasive mosquito species and the potential introduction of emerging infectious diseases.

In January of 2025, the State Mosquito Control Commission offered to provide aerial surveillance flights for habitat surveillance via the state-contracted helicopter service to the counties that were interested. Three staff members expressed interest and submitted the maps of the areas of interest to the state program. On January 28, 2025, Mr. Hagerty, Mr. Necina, and Ms. Giordano were able to participate in the aerial surveillance flights and survey the sites of interest throughout the county and take pictures. Staff were flown over several larval habitats of interest including large air spray sites to locate low points, and an area adjacent to Stark Road in Knowlton Township that is typically hidden with dense canopy. Additionally, the wetlands specialist was flown along the Musconetcong River with staff from Hunterdon County to observe problem areas along the shared border of the two counties.

A. Adult Mosquito Surveillance

Routine surveillance for adult mosquitoes occurs at predetermined surveillance stations utilizing stationary New Jersey light traps. The locations of the 2025 Warren County surveillance stations can be seen in Figure 7. These stations are vital to our mosquito abatement efforts. They provide adult mosquito population data to direct and justify control measures and provide follow-up data to evaluate the control measures employed. The detailed 2025 seasonal synopsis of mosquito species collected from the routine surveillance stations can be found in Figure 7a. A summary of the overall number of mosquitoes collected from these stations is graphed on the New Jersey light trap Figure 7b.

In addition to routine surveillance, randomized adult mosquito surveillance is done throughout the county utilizing gravid traps, CDC traps, and BG sentinel traps. These traps are often set in response to

resident complaints of biting mosquitoes or for disease testing. Figure 8, The Five-Year Summary of the 2025 Disease, Complaint, and Field Study Surveillance Synopsis, shows a summary of the mosquitoes collected from these traps. Please note that only complete data was used to calculate the mosquitoes per trap night and species abundances beginning in 2022; that is, all malfunctioning traps and their collections (or lack thereof) were removed from the equation. If a trap was set and yielded no collection but was functioning upon retrieval, then it was included in the calculation. In 2025, there were eleven malfunctioning traps disregarded from the collection data.

Calls from residents are not necessarily used as a surveillance method themselves; however, they can help bring attention to areas with adult mosquito problems. Inspections made at the site of these service requests often include setting adult collection traps (usually CDC traps baited with CO₂ or BG traps baited with SweetScent and CO₂) to ascertain the mosquito species present and the extent of the problem. Occasionally it occurs where the CDC trap doesn't collect any mosquitoes, but the complaint persists. In those cases, residents are urged to gently swat and collect adult mosquitoes that are present and call our office so that a staff member can pick up what they have collected. If the collection includes biting mosquitoes, surveillance efforts can be repeated.

1. NJ Light Traps

Four New Jersey light trap (NJLT) surveillance stations were maintained in Warren County in 2025, a reduction from the seven that had been operating for the past several years, in an effort to reduce impacts against non-target & beneficial insects. The NJLTs were installed on May 5, 2025, and operated through October 20, 2025. Some of these traps have been monitoring the same areas for over 25 years. The consistency of placing light traps in an area for several years is beneficial to obtain a long-term picture of the mosquito production in that area. Mosquitoes from these traps are collected regularly by the cooperators and then picked up weekly by Commission staff. The collections are then sorted in the lab to isolate the mosquitoes from the other insects trapped. After prompt identification, the count and species information are entered directly into the New Jersey VectorSurv platform. Totals of all the NJLT collections for 2025 are found in Figure 9.

The top five mosquito species sampled through our NJLT surveillance in 2025 were: *Ae. vexans* (43.13%), *Culex spp.* (25.86%), *An. punctipennis* (10.73%), *Ae. trivittatus* (8.43%), and *An. quadrimaculatus* (2.89%). There was an average of 27.5 mosquitoes per trap night (T/N), which is a 92.57% increase from the average number of mosquitoes per trap night collected in 2024 (14.28 mosquitoes/TN). In 2025, there were 18,401 mosquitoes trapped in NJLT's compared to 16,200 mosquitoes in 2024 showing that overall populations were remarkably higher than the previous year. The greatest species diversity was observed at Ivaseczko's on Post Lane in Independence Township; the trap collected 24 different species throughout the course of the season (although some species were only collected in singular abundance). The least diverse trap in 2025 was Schulster's trap on Bear Creek Road in Allamuchy Township (13 species collected). The remaining traps collected 16 species (Woronowicz's on Pequest Road in Oxford Township) and 18 species (Mountain Lake Firehouse on Tamarack Road in Liberty Township). Compared to 2024, whose traps ranged in diversity from 11 to 21 different species, the 2025 season was comparable.

With funding from the State Mosquito Control Commission, Rutgers Center for Vector Biology began a statewide NJLT Surveillance program in 2003. This program ran for almost 20 years but ended at the conclusion of 2022. Included in this statewide program were three traps from Warren County: Pequest Road in Oxford Township (Woronowicz - Trap 2A); Young's Island Road in Independence Township (Ivaseczko - Trap 5), and Bear Creek Road in Allamuchy Township (Schulster - Trap 4A). The three chosen traps from Warren County, along with three chosen traps from Sussex County, represented the Northwest Rural region figures on the state report. No reports have been produced in recent years from the Center for Vector Biology; however, 2003-2022 weekly summaries are made available to all

mosquito control agencies in the state as part of the NJ State Surveillance program reports and can be found at: <http://vectorbio.rutgers.edu/surveillance.php>

2. Portable Carbon Dioxide Baited Light Traps

Historically, landing rates were used at our regular surveillance stations to augment the New Jersey light traps by collecting mosquito species that are not readily attracted to light. *Aedes trivittatus* is one of our primary summer nuisance species and falls into this category. With the onset of West Nile virus, it was deemed too dangerous to conduct regular landing rates. So, CDC traps baited with dry ice became a substitute for the human landing rates and were conducted regularly at NJLT locations for many years. However, the increased presence of *Aedes albopictus* in Warren County along with the increased demands of setting, identifying, and processing the disease surveillance traps made it burdensome to continue with the CDC trapping at our regular New Jersey light trap surveillance sites. There was very little to no new information being gleaned from double trapping each NJLT location with a CO₂-baited trap; therefore, in 2019, we ceased setting these additional traps. Nonetheless, CO₂-baited traps continue to be used for the majority of our service request/complaint trapping when host-seeking mosquitoes are being targeted. These traps are also used alongside our gravid traps for disease surveillance when species other than *Culex* are being sought as well as for conducting field studies near highly productive sites.

In 2025, CDC traps were set in response to residential complaints and service requests to validate an adult mosquito problem. CDC traps were also set on occasion in response to positive West Nile virus samples and historically have been used to target early season species that may be involved in Jamestown Canyon virus transmission. When looking at Figure 8 (Surveillance Synopsis), it is important to take these trap uses into consideration, namely being that CDC traps are not 100% synonymous with service requests.

3. Landing Rates

As previously stated, the presence of mosquito-borne diseases eliminated the use of landing rates as a routine means of surveillance. However, over the last couple of years, the commission has transitioned back to using landing rates when adult activity is high to expedite the flow from service request to adult mosquito control. This not only increases response turnaround but also alleviates pressure in the lab when trap counts can be overwhelming. In 2025, forty-four service requests were addressed via landing rate data and twenty-one landing rate samples were taken in response to service requests as opposed to setting a CDC trap. There were occasionally some additional landing rates that were field identified but no samples were taken for verification.

4. Resting Boxes

Resting boxes are primarily used to assess population levels of *Culiseta* species mosquitoes. *Culiseta melanura* is the primary species implicated in the amplification of Eastern equine encephalitis. After years of trapping *Cs. melanura* utilizing resting boxes in various sites throughout Warren County, this species was only found occasionally, which led to resting box surveillance being terminated in 2009. Resting boxes can be set periodically if requested by the state, but we have had better success collecting *Cs. melanura* from the NJLTs and CO₂-baited traps.

5. BG Sentinel Traps

BG sentinel traps are the standard trap type used to monitor *Aedes albopictus*. This type of trap is known to collect higher numbers of *Ae. albopictus* than the other traps mentioned because they are set low to the ground and are more in line with the flying height of a host seeking *Ae. albopictus*, they are baited with an additional human scented lure, and they use high contrast coloring. BG sentinel traps can be cumbersome to set and do not produce quality results if left out in the rain, so collections are often supplemented with other trap types. In the past, there have been several years when CDC traps

collected significantly more *Ae. albopictus* than BG traps did; however, as *Aedes albopictus* has become more established, that trend has ceased. There has also been preferential trap selection for BG sentinel traps for service requests in residential areas where *Aedes albopictus* is the assumed nuisance species. As a result, in 2025, fully operational BG traps collected 1,003 adult *Aedes albopictus* females, whereas fully operational CDC and gravid traps combined only yielded 154 *Aedes albopictus* adult females.

In 2025, BG Sentinel traps were deployed at set locations throughout the county to monitor the spread of *Ae. albopictus* (refer to Figure 3). Locations were chosen in areas with established populations as well as locations that had small or no prior collections of *Ae. albopictus*. BG traps were set bi-weekly in Belvidere, Blairstown, Hackettstown, Independence, Phillipsburg, Pohatcong, Washington Borough, and White Township. In 2025, *Aedes albopictus* adults were collected from every routine BG trap (although the Blairstown trap only collected one individual). There were 4949 adult *Ae. albopictus* females collected at these routine locations in 2025.

Because Phillipsburg has an established *Aedes albopictus* population, BG traps have been the primary device used to monitor the adult mosquito population in that portion of the county. Over the past two seasons, a transition has been made to primarily use BG traps in Phillipsburg so that the trap data between locations is consistent and can be compared from site to site and from season to season. There are six trap locations with historical data that are used to compare the populations from year to year and are generally trapped in preparation for an area wide adulticide following large influxes of residential service requests. In 2025, three of these locations were visited as a result of nearby service requests but were not prioritized due to the overall decrease in service requests from the area.

Over the past couple of seasons, *Aedes albopictus* has been found sporadically in municipalities where it was not previously established or collected in great abundance; if samples continue to be collected in these areas, it is likely that *Ae. albopictus* will be established county-wide. BG traps were chosen for this routine trapping so that populations could be easily compared to trapping done in other counties.

6. Ovitrap

Ovitrap are a unique surveillance method that targets the egg stage of container-type mosquitoes. The traps are simply small containers baited with organically rich water and are lined with egg laying paper or seed germination paper. It is a very labor-intensive trapping method, and since *Ae. albopictus* can be easily collected with other trap methods, it was decided to abandon the use of ovttraps as a regular surveillance method. However, ovttraps have been used to varying degrees since 2017 when there was a need to collect *Ae. albopictus* eggs for insecticide resistance workshops (see Research & Field Studies section VIII. A. Insecticide Resistance for more information). Commission staff have also been interested in utilizing lethal ovttraps as a control method for *Ae. albopictus* (see the Research and Field Studies section VIII. E. Lethal Ovttraps for more information).

7. *Aedes albopictus*

The most recent invasive species, *Aedes albopictus*, also called the Asian Tiger Mosquito (ATM), was first detected in Phillipsburg (at the Filmore Street Cemetery) on August 28, 2012, in both a gravid trap and a portable light trap which had been set following the report of a dead crow. Warren County was the last county in the state to fall prey to this invasive species. *Ae. albopictus* is a potential vector of several mosquito-borne diseases and unfortunately requires non-conventional means to control. Since 2017, this species has expanded its range within the county. In 2025, *Aedes albopictus* was collected in all but five municipalities (Frelinghuysen Township, Hardwick Township, Knowlton Township, Liberty Township, and Mansfield Township). Frelinghuysen & Hardwick now remain as the only municipalities in the county to not have any historical collections of *Ae. albopictus*, although some municipalities have had limited collections to date. See Figure 10 for a map of *Ae. albopictus* collections in 2025.

Aedes albopictus collections in 2025 were lower than the *Aedes albopictus* collections of 2024. A total of 1,157 adult female *Ae. albopictus* mosquitoes were collected across the following functioning trap types: CDC, BG, and gravid. This is a 25% decrease from the 1,540 adult females collected in 2024! Out of 507 total traps set in 2025 (including functional GT, BG, and CDC traps), a total of 134 traps (26.43%) collected *Ae. albopictus* (either males, females, or both). A total of 90 functioning traps (including BG, CDC, and gravid traps) were set in response to service requests; twenty-three (25.56%) of those traps were positive for *Aedes albopictus*. Traps set in response to service requests were the driving force for conducting adulticide applications specifically for *Aedes albopictus* nuisance and control. There was one area wide adulticide that occurred in the Phillipsburg area using this data approach.

B. Rainfall Monitoring

The State Climatologist's Office reported the annual average precipitation for the state was 38.88", which is 8.68" below the 1991-2020 normal. Below average precipitation was recorded for 10 months of the year, with only May and June experiencing above average precipitation. The state was in a drought warning for most of the year, with the heavier rains in May and June lifting the state into a drought watch only temporarily. For the state of New Jersey, 2025 was the driest year since 2001, the 2nd driest since 1981, and the 17th driest since 1895. The statewide average annual temperature was close to the 30-year normal; 0.1° F above the 30-year normal at 53.7°F. As usual, there were fluctuations in precipitation and temperature throughout the state for the different counties.

For Warren County, the rain gauge located in Oxford at the Commission office collected a total of 44.19 inches of precipitation for the year 2025. Rainfall amounts from this gauge are shown in Figure 11 for the months of April through September and reflect the rainfall that fell in the county in 2025. Please refer to Figure 11 for the ten (10) years of rainfall data from the Oxford rain gauge for the above-mentioned months.

The beginning of the 2025 mosquito season was shaping up to be a busy one as the county was above the 10-year average rainfall from early spring into the early summer months. However, by mid-July, rainfall totals were declining below the ten-year average; August saw a mere 2.12 inches of rainfall. Dry conditions persisted in the fall such that larval habitat never reflooded following the dry down in August.

While the records kept at our office are helpful in comparing one year to the next, it does not provide accurate knowledge of what goes on in other parts of the county. The Community Cooperative Rain, Hail and Snow (CoCoRaHs) network was identified in 2009 as a source of real time precipitation data. This nationwide network had an increase in sites in 2009, in part due to newspaper coverage regarding this network. Cooperators in the county include Secretary Christine Fisher and Superintendent Jennifer Gruener in addition to our Oxford office. The CoCoRaHs precipitation maps were referred to almost daily and served well in 2025 to identify rainfall patterns that needed attention in various parts of the county.

C. Larval Mosquito Surveillance

1. Breeding Site Inspections

A detailed route system throughout four districts is followed to monitor larval mosquito populations. Eleven thousand, one hundred and twenty-nine (11,129) inspections were performed at larval mosquito habitats throughout Warren County in 2025. Each year new sites must be added and sites that no longer pose a problem must be deleted from the site logbook and the detailed inspection route system. Inspection data is recorded in the field with handheld tablets. Site specific data is collected for every inspection and treatment, as per NJ Pesticide Control Regulations, and this data is then downloaded into the database at the end of every day. The FieldSeeker system allows for additional data to be

recorded in the field or in the office, such as ownership information, site access, and inspector comments. Inspection and treatment history are stored on the tablets and are available to the inspector in the field at the touch of a button. The Activity Summary chart on Figure 12 contains a breakdown of inspections and control measures in the field by township for the 2025 season.

2. Larval Dip Counts

Larval samples are taken at every location when possible. Larvae are transported back to the laboratory and reared to 4th instar or adult so that accurate identifications can be made. This information serves as justification for the pesticide application as well as documentation for permit applications for water management projects. Larval identifications are later entered into the FieldSeeker database for each site collection. Larval identification paper slips are also kept on hand for five years.

The first larvae of the season were collected March 3, 2025, in woodland pool in Mansfield Township and consisted of *Aedes canadensis*. Spring collections were dominated by *Aedes canadensis*, although there were occasional collections of other characteristic early spring and snow pool species, including *Aedes stimulans*, *Aedes cinereus*, and *Aedes excrucians*. There is a continuing trend of early collections of *Aedes vexans*, a common summer species, that is now being regularly collected as larvae throughout April; it was collected as early as late March in 2025! Overall, larval samples were minimal, in part due to time constraints, resource allocation, and precipitation trends, but there were notable collections of *Ae. vexans*, *Ae. trivittatus*, *Ps. ferox*, and *Culex* species for the collections that did occur.

D. Species List

The full New Jersey Species List (64 species), with Warren County species (46 species) bolded, can be found on Figure 13. There have been no new additions during the 2025 season. The most recent addition, *Aedes tormentor*, a floodwater species, occurred in 2021. Adult and larval collections of this species have been sporadic since then and there were no documented *Aedes tormentor* adults or larvae collected in 2025.

There have been no documented collections of *Aedes infirmatus* since a singular 2021 collection, so it remains unclear currently if there is an established population. Continued surveillance efforts must be made to collect additional adults and larvae before adding this species to Warren County's list.

VI. CHEMICAL CONTROL

All pesticide applications comply with pesticide regulations established by the NJ Department of Environmental Protection as well as the Pesticide General Permit of the NJ Pollutant Discharge Elimination System (NJPDES). The Recommendations for Insecticide Use in New Jersey, provided by the New Jersey Agricultural Experiment Station, are no longer followed for guidance in product selection and use since they are dangerously outdated (last publication 2012).

Particular insecticides have the ability to alter cholinesterase levels of exposed individuals. So, baseline cholinesterase levels are documented pre-season for each new employee that would be in contact with these insecticides. Currently, the only product in use in Warren County that would fit these criteria is Fyfanon ULV used for adult mosquito control (active ingredient malathion). Mid-season blood work is done when appropriate to check cholinesterase levels for employees who handle Fyfanon ULV regularly during the season. Appropriate action, if any, is taken based on test results. In 2025 Fyfanon ULV was used in rotation with the synthetic insecticide Zenivex in the adult mosquito control program. Employees deemed susceptible to the cholinesterase-inhibiting product avoided contact with it.

In 2010, a comprehensive plan was developed and put into place to address the New Jersey pesticide regulations that deal with the requirements of the School Integrated Pest Management (IPM) Act.

A complete list of public and private schools was compiled. Any known breeding sites on any of these properties were designated for long term briquets and preparations are in place for notification to be made before these are applied in the spring. After year-end, annual reports are sent to affected schools listing insecticide applications. In 2025, ten sites located on school properties required pesticide treatments.

Under the US Clean Water Act administered by the US Environmental Protection Agency, the New Jersey Department of Environmental Protection developed a Pesticide General Permit (PGP), which included a use pattern for mosquito control to operate under. The draft general permit went into effect in November of 2011 with renewals being issued every five (5) years. On February 13, 2020, a reissued General Permit under the PGP category was issued by the Department of Environmental Protection, which went into effect on March 1, 2020. The Commission received their permit on April 3, 2020. This permit was set to expire on February 28, 2025. A new draft NJPDES master permit was released in 2024, and the Commission submitted a renewal request for authorization under this permit in October of 2024. The Final Discharge to Surface Water General Pesticide Application Discharge General Permit was released in 2025, and authorization was granted on April 2, 2025, (with a guaranteed no gap in coverage) and is valid for another 5-year period. The general permit authorization is issued in accordance with the NJPDES Regulations (N.J.A.C. 7:14A-1 et seq.) and expires on March 31, 2030. This permit authorizes the applications of biological and chemical pesticides in water when such applications are made in, over, or near surface waters of the State for certain pesticide use patterns (including mosquito control). The PGP required the Commission to develop and operate under a Pesticide Discharge Management Plan (PDMP). The PDMP is updated annually and revised as necessary. The 2025 revision of the PDMP was completed on February 4, 2025. Other forms were developed (ex: adverse incident report) or existing forms modified (ex: adult mosquito control application cover sheet to allow conversion of application to acreage) to satisfy requirements of the General Permit.

A. Larviciding/Pupiciding

Controlling mosquito larvae before they can emerge as adult mosquitoes and cause problems remains the primary focus of our operations. Larviciding is performed when source reduction, water management, and/or biocontrols cannot be employed.

1. Ground Applications

Ground larviciding is a major component of our abatement program. The Biologist, Wetlands Specialist, Senior Inspector, Inspector Trainee, and Heavy Equipment Operator along with the seasonal inspectors manage the inspection routes during the season. The full-time staff members manage the ground larviciding before and after the seasonal staff are onboard and assist them during the seasonal peak. The seasonal inspectors carry out the bulk of the ground larviciding from June-August. In 2025, the new Inspector Trainee remained on a larval route for educational purposes. This also accounted for the part-time availability of one of the seasonal staff in 2025. The overlap of seasonal and full-time staffing allows us to keep up with inspecting and treating over 1000 sites currently. These districts and the number of sites in each township are shown in Figure 14, Inspection Districts & Site Breakdown. Inspection and treatment data for each site is recorded in the field with the use of the handheld tablets and that data is transferred into the FieldSeeker database at the end of every day. Treatment records can be quickly retrieved by site, date, inspector, insecticide, or municipality.

The majority of larval sites are treated with a liquid *B.t.i.* formulation using hand-pump compression sprayers. Extended release briquets are also utilized primarily in situations where there is a hazard or access concerns and in sites that are on school property. These briquets are utilized in the spring and provide season long control at these sites. Beginning in 2024, eight sites were selected from inspection district 3 for extended-release granular treatments. Extended-release granular treatments at these sites was again utilized in 2025 and each site was treated four times. In 2025, ground applications for larval

mosquito control took place from late March through the middle of October, albeit a majority of larval treatments concluded by mid to late September. A portion of treated sites were backchecked to determine insecticide effectiveness and to make sure seasonal inspectors were visiting the correct sites and correctly applying the insecticides.

Starting in 2012, a relatively new and innovative way to apply larvicides for *Aedes albopictus* control was used. Area-wide applications of Altosid Liquid Larvicide were performed utilizing a truck-mounted ultra - low volume (ULV) sprayer. This method allows the product to settle in small pockets of water that are not practical to treat using traditional methods; however, the application is extremely expensive in both dollars and time. A standard procedure for this unusual type of application was tested and published by the Rutgers Center for Vector Biology. Area-wide notification utilizing the County's alert system (RAVE mobile safety) was done prior to the applications as well as notification postings on the Commission's and pertinent town's websites and social media accounts. Only one ULV larvicide application was performed in 2025. This application took place on August 12th in conjunction with an area-wide adulticide in parts of Phillipsburg, Belvidere, and Greenwich Townships.

2. Catch Basins

Catch basins, also referred to as roadside storm drains, are numerous and provide perfect larval habitat for *Culex* and other container breeding mosquito species. Throughout the years, the county's catch basins have been inspected and the hundreds of basins that consistently hold water have been indicated on paper maps. Those paper maps are still referred to, but now the catch basins that the Commission treats are also mapped with the FieldSeeker GIS database system and treatments are logged in real-time. The approximate number of basins that need to be treated on each route are as follows: Central – 63 basins, East – 552 basins, North – 47 basins, South – 819 basins. Insecticides that provide 30-60 days of larval control are typically used for catch basin treatments. Ideally, commission staff aim to treat catch basins at least three times during the active season. It typically takes two staff members about a week to complete the south basins, three-four days for the East route basins, one day for the North route basins, and one or two days for the Central route basins.

In 2025, catch basin treatments were completed as time allowed, anywhere from two to three times during the active season, starting on June 4th with the North route basins. Secondary and tertiary treatments occurred between July & September.

3. Aerial Larviciding

Large tracts of larval habitat that cannot practically be treated by ground applications are indicated for treatment with fixed wing aircraft. Aerial larviciding is contracted annually. Bid specifications are revised and undergo attorney review during the off-season each year. In 2025, the bid packet was approved by the Commission at their December 2024 meeting and bid advertising occurred December 26, 2024. Bid opening occurred on January 14, 2025; Wings Aerial Applicators was awarded the Aerial Larviciding Contract by the Commission at their regular meeting on January 16, 2025.

All our aerial larviciding sites are digitally mapped and uploaded to an onboard navigation program, AgNav, which the pilot uses to accurately record his applications. The pilot uses these digital maps to pinpoint individual sites. In 2025, aerial larviciding sites were primarily inspected by the Senior Inspector with help from other staff as needed. Following significant rainfall events, sites were inspected and when sites met the criteria, they were added to the list for the pilot to perform aerial treatment. A granular formulation of *B.t.i.* was used in all aerial applications during the year.

There was a total of three aerial larviciding applications between May and July in 2025. From May 3rd through 5th, there was 1.86 inches of rain recorded at the Oxford rain gauge, which triggered a small

aerial treatment of 982 acres on May 7, 2025. May 31st through June 1st saw an additional 2.14 inches of rain fall at the Oxford rain gauge resulting in an aerial application of 258 acres on June 4th. From July 1st through July 2nd, there was 1.94 inches of rain recorded at the Oxford rain gauge creating conditions that under normal circumstances would have resulted in an additional aerial treatment over Fourth of July weekend. However, that application could not be conducted due to a temporary flight restriction that was put in place when the President of the United States was at his summer residence in Bedminster, NJ. This would have been the largest application of the year, impacting 1,529 acres. The final airspray of the season totaled 1,149 acres and was conducted on July 16th after 3.21 inches of rain was recorded at the Oxford rain gauge.

In 2025, aerial larviciding took place in Allamuchy, Frelinghuysen, Independence, Liberty, Oxford, and White Townships. Figure 15 maps the locations of the aerial sites and shows the number of times each airspray site was treated in 2025. Figure 15a contains a summary of the aerial larviciding applications that took place throughout the year as well as the acres aeriually larvicided each year since the beginning of the Commission's aerial larviciding program in 1987. The graph shows the trend line of increasing aerial acreage over time.

B. Adult Mosquito Control

Our adult mosquito control program continues to be based on our surveillance program. Ideally, large hatches of emerging adult mosquitoes are detected by staff and treated quickly to keep the adult mosquitoes from entering the populated areas and generating complaints. However, this does not always occur and does not account for species utilizing container source habitat. Service requests from the public are responded to and investigated as soon as possible. Prior to any adult mosquito control applications taking place, adult mosquito surveillance is conducted to justify the applications. Surveillance includes the setting of CO₂-baited portable light traps, landing rate collections, or disease monitoring. Spraying for adult mosquitoes is dependent upon the number and species of mosquitoes collected and/or if any mosquito-borne virus is present in the area.

1. Notification

The legal notice for area wide adult mosquito control was reviewed and updated for 2025. The schedule was developed for publication of this advertisement throughout the season in two newspapers (a legal ad in one paper, a display ad in the other) to best cover the entire county in accordance with pesticide regulations. Our advertising in 2025 continued to utilize two daily papers for better exposure; however, both of these papers discontinued publishing in print in 2025, so advertising was done through their online publications.

Due to increased notification requirements as of November 2001, a Question-and-Answer Sheet on our Commission's program was developed and approved by NJDEP- Pesticide Control Program (PCP) in April 2002. This fact sheet was updated in 2015 and reapproved by the PCP. It is assembled with other required packet components (information on any product we may use in a given year for adult mosquito control, a copy of our legal advertisement, etc.) and sent to each municipality in the county prior to March 31st each year. In 2025, a copy of the entire municipality packet was posted to the Commission website, mailed to each municipality, and emailed to each municipal clerk to facilitate easy access by the residents.

Since 2006, our website has been utilized to supply countywide adult mosquito control treatment information. Adult mosquito treatments were posted (by township) at least 12 hours prior to the scheduled treatment. All registered beekeepers within the county and three miles of the county border were notified by email 24 hours prior to any ground adult mosquito control treatments. Pesticide regulations require beekeeper notification of applications of products that are toxic to bees and occurring within a three-mile range of the hives; however, Commission staff sends a blast email to all registered beekeepers for every adult mosquito control application. The blast email is much more

efficient than identifying which hives are within three miles of each treatment for every application and is more useful to beekeepers that transport their hives around the County. Twelve-hour notification calls were made to those residents who requested pre-notification. In highly urbanized areas, the county's alert (RAVE) system was used to alert residents of the upcoming adult mosquito control treatments. In compliance with the School IPM Act, schools are notified of planned adult mosquito control applications on their property in advance to allow them to conduct the required 72-hour notification to parents.

Aerial approval forms were sent to municipalities where aerial larviciding takes place. Aerial larviciding is exempt from this requirement; however, this procedure is followed annually as a precaution in case there is an area-wide mosquito-borne disease outbreak where an aerial adult mosquito application might be necessary. This approval is only necessary to comply with FAA regulations if the area can be determined to be a congested area, which would be done on a case-by-case basis. Copies of the signed approvals that were obtained were forwarded to the contracted pilot prior to any aerial taking place in the respective municipalities.

2. Ground Treatments for Adult Mosquito Control

Our ground treatments for adult mosquito control operations ran from May 29, 2025, through October 21, 2025. A summary of our adult mosquito control applications broken down by municipality can be found within the Activity Summary on Figure 12. Typically, adult mosquito control efforts begin in May in response to flood water species, followed by permanent water and container breeding species; this held true in 2025. All WNV positive samples were responded to with targeted adult mosquito control applications to break the disease cycle and prevent human transmission.

After the two primary ULV sprayers were mounted on the trucks (but before they were used) flow rate and droplet size were calibrated to ensure that each sprayer was performing according to label specifications. Flow rate calibration for the Cougar sprayer and Promist ULV sprayer were both conducted on May 5, 2025. Droplets were calibrated using the DCIII AIMS machine for the Cougar and Promist ULV sprayers on May 8, 2025.

3. Aerial Adult Mosquito Control

Aerial adult mosquito control applications were not necessary in 2025.

VII. BIOLOGICAL CONTROL

A. Predatory Fish

The NJ State Mosquito Control Commission bio-control program was utilized again in 2025. Stocking fish in permanent/semi-permanent wet areas to control larval mosquito populations remains a vital part of our integrated pest management approach. Mosquito-eating fish are an excellent alternative to pesticide applications in certain situations. However, early in the spring of 2025, results were varied with larvae persisting where fish were visibly present. We do not fully understand why larvae were not fully controlled as there were several possibilities, but this resulted in several larvicide applications being necessary at these locations. As the season progressed, consistent larval control was obtained by the fish and further use of pesticides at these locations was no longer necessary. A total of 52,615 fish were stocked throughout Warren County in 2025 to control mosquito larvae. Stocking primarily occurred on the following dates: April 14, April 16, April 17, and May 21 (see Figure 12). Restocking for the remainder of the season was not necessary due to the lack of substantial flooding events. The substantial dry down that occurred as the season progressed has resulted in depleted fish populations at sites where fish are usually maintained heading into the 2026 season.

There were 44,000 *Pimephales promelas* (fathead minnows) stocked in Warren County in 2025. Fathead minnows have been utilized in our biological control efforts at sites that connect to streams and other bodies of water where native fish populations exist as per DEP regulations.

Gambusia affinis (mosquito fish) continue to work well in habitat types that retain water long enough to support the fish population, but stocking is limited to sites that are not connected to streams and don't have potential for overflow since this species is not native. Under correct conditions mosquito fish reproduce rapidly to establish a substantial population. A total of 8,615 *Gambusia affinis* were stocked at 9 sites on April 14th.

The Commission utilizes two 300-gallon livestock water tanks as temporary holding ponds for *Gambusia affinis* and fathead minnows after initial stocking is complete. The fish are held in these tanks until they are needed to stock areas as needed during the breeding season. This is extremely useful when stocking small amounts of fish in abandoned swimming pools. Rescue operations are performed when we know of an area that is in danger of drying down and those fish are relocated temporarily into our holding tanks. We use one purchased 30-gallon transportation tank, along with two fabricated 100-gallon transportation tanks, for our in-house stocking and fish rescue.

VIII. RESEARCH & FIELD STUDIES/COLLECTIONS

A. Insecticide Resistance Studies

Insecticide resistance is a heritable decrease in the sensitivity of an insect population to a particular insecticide or class of insecticides. It is reflected in the repeated failure of a product to achieve the expected level of control when used according to the label directions for that species. Resistance usually occurs when the insect population is repeatedly exposed to the same or very similar insecticides over many years. With a limited number of insecticide choices available to mosquito control professionals and the overlap with agricultural use, great care must be taken to manage insecticide resistance and monitor local mosquito populations for any sign of resistance. Building an effective monitoring program takes an investment of time, staff, and funding. It should be noted that insecticide resistance in mosquitoes is species specific and can be very localized. Additionally, baseline data for most species is not available.

Resistance to adult mosquito control products is the primary concern at this time since adulticide products in the United States have been limited to active ingredients with two modes of action for an extended period of time (organophosphates and pyrethroids). Resistance to both groups has been detected in mosquito populations in the United States. It has been hypothesized that at least some of this resistance stems from exposure due to non-public health uses, which are heavily biased towards pyrethroids.

There are several different ways to test for insecticide resistance in populations of adult mosquitoes. One of the most common ways currently in the United States is the CDC Bottle Bioassay. In this laboratory experiment, bottles are coated with a pre-determined dose of an active ingredient, and mosquitoes are introduced to the bottle for 2 hours while the number of dead and alive mosquitoes is recorded at regular time intervals. Resistance is determined by the percentage of mosquitoes that die (mortality rate) at the pre-determined threshold time (diagnostic time). The test is run for the entire 2 hours unless all mosquitoes have died earlier than the 2 hours.

The SMCC funded workshops for counties to learn and practice the CDC Bottle Bioassay technique and establish baselines for their local populations in 2017, 2018, and 2019. Commission staff participated in those workshops and results indicated that local populations of *Culex* mosquitoes in Warren County showed varying degrees of susceptibility to the products being used. Those initial workshops showed the Commission staff the importance and the possibility of performing their own in-house bottle bioassay testing.

Additionally, the Northeast Regional Center for Excellence in Vector-borne Diseases (NEVBD) at Cornell University has offered insecticide resistance testing on adult *Culex pipiens* and/or *Aedes albopictus* samples collected by public health agencies for several years. The samples are collected as eggs and/or larvae, shipped to the NEVBD, and raised there to the adult stage. The adult mosquitoes are tested using the CDC Bottle Bioassay technique. The commission first participated in NEVBD's program in 2019 with *Aedes albopictus*; the results showed moderate resistance of *Aedes albopictus* to etofenprox, an active ingredient in one of the adulticide products (Zenivex E4). Several collection and submission attempts for this species have been made each year since; however, due to the time investment it requires and the competing demands of daily operations in mosquito control, not enough *Aedes albopictus* eggs have been successfully submitted to repeat the testing.

The NEVBD is also able to perform enzyme testing for submissions that exhibit high resistance. The enzyme testing can provide insight into the mechanism of insecticide resistance being used by that particular resistant population. There are three primary mechanisms of insecticide resistance: metabolic resistance, altered target site resistance, and penetration resistance. For metabolic resistance, the components of an insect's metabolic system can adapt to more effectively breakdown insecticides (esterases, oxidases, glutathione-S transferases). When particular enzyme activity is higher than expected (compared to a susceptible population) the test indicates that this enzyme pathway is contributing to that population's insecticide resistance. If there is a lack of elevated enzyme activity it is more likely that the population is utilizing altered target-site resistance, also known as knockdown resistance. This information is extremely helpful operationally for managing these resistant populations.

Historic submissions of *Culex pipiens* from Washington Township, Belvidere, and Hackettstown collected in 2021 exhibited resistance to etofenprox, but thankfully, a 2022 collection of *Culex pipiens* from Washington Township exhibited susceptibility to malathion, the alternative active control ingredient used in Warren County. Bottle bioassays conducted in 2023 utilized *Culex restuans* because of an inability to collect *Culex pipiens* eggs; these results mirrored those exhibited by the *Culex pipiens* collections. In 2024, populations of both species were collected and utilized and drew the same conclusions- there was still high resistance to etofenprox but susceptibility to malathion. There was one submission of mosquitoes collected in Belvidere that was sent to NEVBD in 2024 that yielded the same results, and the enzyme testing indicated that the population did not have elevated oxidase enzymes.

There were eight egg collection events in 2025 between May 14 and August 15. The primary site of interest continued to be Meadow Breeze Park in Washington Township (5 collections) because of the historical data associated with it. The remaining three collections occurred at the commission office in Oxford. A total of 131 egg rafts were collected. There was only one *Culex pipiens* egg raft collected (from the office in Oxford); the remaining egg rafts were all identified to *Culex restuans*. In-house bottle bioassay testing was run on August 1 on the one *Culex pipiens* egg raft collected at the office in Oxford using active ingredient pyrethrum. At the diagnostic time of 45 minutes, there was only 36.5% mortality, indicating high resistance. This information did not come as a surprise since pyrethrum is classified as a pyrethrin- synthetic pyrethroids, like etofenprox, mimic these natural pyrethrins, and utilize the same metabolic pathways. However, this information needs to be explored further in future seasons since one egg raft is typically not a good indicator of the resistance in an entire population because the results are based on one female's offspring. There were no collections submitted to NEVBD for testing in 2025 due to a lack of adequate collections of the target species.

Now that commission staff have found techniques and strategies to successfully rear large abundances of robust, healthy adult mosquitoes, a future goal would be to revisit conducting our own caged-field trial. However, it is a very time-consuming process, not only leading up to the experiment but also during implementation. It must be noted that the information that can be gleaned from this kind of experiment is not to be undermined. After identifying resistance in our *Culex* populations, the commission has been cognizant of product rotation. Thus, continuing to test these populations would prove valuable. Selection pressure from mosquito control adulticides favoring resistance to etofenprox has been removed in these areas and can be used to determine if the degree of resistance is maintained or diminished in future years.

B. Mosquito Rearing Colony

There are often occasions when live mosquito larvae and/or adults are needed for insecticide studies and public outreach events. Since most events often occur during the off season, it is sometimes difficult to find live samples that are uniform in age. In the past, live larvae and/or aged adults were obtained from Rutgers University; however, they no longer maintain mosquito colonies for outreach purposes. In 2015, a colony cabinet was built and assembled in the laboratory for rearing mosquitoes in house. Initially, *Aedes atropalpus* eggs were taken from Rutgers stock and raised. This species is ideal for colonization since females can lay their first batch of eggs without a blood meal and those eggs are resistant to drying out. However, the *Ae.atropalpus* colony was finicky and required daily maintenance (including weekends), so in 2016, a colony of *Culex pipiens molestus* was started as a replacement. This species is also able to lay its first batch of eggs without a blood meal; however, the eggs must stay wet in order to remain viable. This colony has been very successful and is much easier to maintain. The colony continued to be maintained in 2025 with the goal of continuing maintenance throughout 2026.

Although the colony has been utilized in the past for insecticide resistance testing, it was not utilized for such purposes in 2025. Since it has repeatedly exhibited high levels of resistance to synthetic pyrethroids and no new mosquitoes or genetic stock has been introduced, it is assumed that the level of resistance will hold. The colony did, however, play an integral part in providing hands-on learning specimens for use in public outreach programs throughout local schools and communities. Additionally, in late fall, the commission was able to provide a robust quantity of all life stages to Sussex County, who had expressed interest in maintaining a colony for similar educational purposes.

C. Unmanned Aircraft Systems (UAS)/Unmanned Aerial Vehicles (UAV) – Drones

The commission's integration of the use of Unmanned Aerial Systems (UAS) technologies for mosquito control originated in 2016. A graduate student from the New Jersey Institute of Technology (NJIT) contacted the commission with interest in an independent study using UAS to locate mosquito habitat. In 2018 the commission entered into a teaming agreement with NJIT, which was renewed in 2019, and continued flying mapping missions with their students. Starting in 2021 the commission began pursuing its own interest in UAS technology by sending its now senior inspector to attend a UAS course offered by Warren County Community College. The wetlands specialist received a Part 107 certification in December of 2022 followed by the senior inspector in January of 2023. Late in 2023 the commission purchased its first drone, a mapping drone, the DJI Mavic 3 Enterprise (M3E).

During the 2025 season, staff conducted 15 mapping missions consisting of 29 mapping flights totaling 3 hours 38 minutes of flight time and 55 miles traveled, capturing approximately 5,914 images. Cumulatively, the UAS program totals 564 flights, 86 hours 41 minutes of flight time, and 1,338.26 miles traveled. All UAS operations were completed incident-free, reflecting the Commission's continued emphasis on safety, planning, and precision.

To process the raw mapping data collected the M3E into usable maps certain software is used to stitch individual geolocated pictures into a georeferenced orthorectified image that can be imported into GIS software for further processing. To reduce processing time, WebODM and ClusterODM were installed on the two newest workstations. WebODM provides the browser-based interface for organizing projects, selecting processing settings, and reviewing/exporting outputs. ClusterODM functions as a job manager that routes each processing task to available compute resources on the local network via NodeODM “processing nodes.” In practice, staff import imagery and submit a processing job in WebODM; WebODM forwards the job to ClusterODM; and ClusterODM assigns the work to the available node(s). This allows the Commission to leverage multiple computers to reduce turnaround time on larger datasets while keeping all processing on the local network as opposed to paid for web-based services.

To deal with the accumulating data the Commission evaluated storage options and a network-attached storage (NAS) system configured in RAID 5. RAID 5 is a data storage virtualization technique that offers a balance of performance, redundancy, and storage efficiency. The selected capacity will accommodate roughly 888 flights per year with multi-year retention. Options for storing and archiving processed datasets—either locally on workstations, on the NAS, or on the existing server—are being reviewed with the assistance of Amitech Computer Services.

After succeeding in employing M3E for mapping and inspecting mosquito habitat, the Commission pursued the purchase of a treatment drone. After much consideration in 2024, the Hyllo AG 210 was selected and received later that year. Then, the commission obtained a Certificate of Waiver or Authorization from the FAA permitting the commission to apply pesticide by the use of UAS technology.

Unfortunately for the 2025 season, Hyllo AG-210 treatment operations were limited due to weather, regulatory and site constraints, operational planning requirements, and intermittent mechanical/software issues typical of early adoption. A replacement spreader assembly and battery cable addressed several hardware concerns, and additional troubleshooting and workflow refinement is ongoing. It should be noted that significant time and effort was invested by the UAS team doing static flow calibrations, planning, trouble shooting, and execution of swath width testing. That data is now moot since the replacement of the spreader assembly and modifications were made.

UAS flights on State-administered lands require that drone waivers and a Special Use Permits be filed; however, maps and landing zones must be identified as well as other details for each site. There is also reason to believe that a drone waiver or special use permit may be required to allow UAS in wildlife management areas as well. Work on these waivers and SUPs was started in 2025; however, it was found to be extremely time consuming, so resources were redirected towards other projects.

The integration of UAS technology continues to enhance operational efficiency and mapping accuracy. The Commission remains optimistic about expanding this program, including additional treatment drones, as staff experience and procedures continue to develop.

D. Grant Funded Tick Surveillance Project

In 2021, the New Jersey Department of Health announced that a small amount of grant funding would be available to five counties for a tick surveillance project. The Commission submitted a Letter of Interest and an application and was awarded \$12,000.00 in grant funding along with four other counties. Grant funding runs on an off-center fiscal cycle from August - July and can possibly be renewed for a 5-year cycle. The first grant cycle was August 1, 2021 – July 30, 2022, grant funding was renewed for a second cycle from August 1, 2022 – July 30, 2023, a third cycle from August 1,

2023 – July 30, 2024, and a fourth cycle from August 1, 2024-July 30, 2025 The grant funding was renewed once again for the August 1, 2025 through July 30, 2026 tick surveillance year.

The NJDOH Grant Funded Tick Surveillance Project started in Warren County in the fall of 2021 with an emphasis on sampling *Ixodes scapularis* habitat since *Ixodes scapularis* are the perpetrator of the majority of tickborne disease in Warren County. While other species are occasionally collected, the emphasis on *Ixodes scapularis* remained in 2025. The state testing lab deprioritized *Dermacentor variabilis* and *Ixodes scapularis* males in 2025 because the former yielded extremely low infection rates to date in New Jersey and the latter does not require a blood meal to achieve sexual maturity. All surveillance sites are sampled using a 1-meter square drag and are ideally sampled for a total of 750 square meters (for density calculation purposes). A total of twenty-six sites were sampled throughout the year at varied frequencies. Collected ticks were identified to species and submitted to the Public Health and Environmental Lab (PHEL) for disease testing. *Ixodes scapularis* ticks are tested for the pathogens that cause anaplasmosis, babesiosis, Lyme disease, and hard tick relapsing fever. *Ixodes scapularis* ticks are also tested for Powassan virus. *Dermacentor variabilis* ticks are no longer being tested, therefore, there were no submissions of *Dermacentor variabilis* in the 2025 season.

The focal species during the spring collection season is *Ixodes scapularis* nymphs. Eighteen sites were visited between March 25 and June 12, 2025. Some locations were only sampled once during the presumed nymphal peak while a handful were sampled twice during the spring collection season. A total of 15,390 square meters were sampled resulting in 921 total ticks collected. The most abundant species collected was *Ixodes scapularis* (115 adult females, 97 adult males, and 557 nymphs), but there were also collections of *Ixodes dentatus* nymphs (3 total) and *Dermacentor variabilis*, the American dog tick (63 adult females, 49 adult males, and 1 nymph). There were 34 *Ixodes* larvae and 2 *Haemaphysalis longicornis* nymphs also collected. Since larvae have not had a previous blood meal, these specimens are not a public health concern and are not considered for disease testing.

A total of 660 pools containing 660 ticks were submitted to PHEL for disease testing throughout the spring tick surveillance season. A total of 231 pools were positive, which includes 56 co-infections and 4 tri-infections. The greatest number of positive pools (178) were positive for *B. burgdorferi*, the bacterium responsible for Lyme disease, while there were 37 pools positive for *A. phagocytophilum*, 10 pools positive for *B. miyamotoi*, and 69 pools positive for *B. microti*. Of notable concern was one positive pool for Powassan virus collected from the Hamilton and Pioneer Trails in the Delaware Water Gap National Recreation Area in Hardwick Township. There were no positive pools for *R. rickettsii*.

Collection efforts for the fall season, where the primary species of interest is *Ixodes scapularis* adults, began on September 22 and concluded on October 27. A total of twenty-five sites were sampled during this time, totaling 27,435 square meters. In addition to the sites visited in the spring, a strong effort was made to explore other sites throughout the county to start minimizing data gaps; a larger number of sites were visited on more than one occasion in the fall because of lack of mosquito activity that allowed the time allocation to make this happen. There were 507 specimens collected, including 239 adult female *Ixodes scapularis*, 248 adult male *Ixodes scapularis*, and 8 *Ixodes scapularis* nymphs as well as 1 *Ixodes* male not identified to the species level. There were also 11 *Haemaphysalis longicornis* larvae collected from one site. The greatest collection of ticks was from the Orchard Trail at Millbrook Village in the Delaware Water Gap National Recreation Area (74 specimens).

A total of 341 pools consisting of 341 adult and nymphal *Ixodes scapularis* ticks were submitted to PHEL for disease testing from the fall collection season. There were 41 pools positive for *A. phagocytophilum*, 179 pools positive for *B. burgdorferi*, 9 pools positive for *B. miyamotoi*, 60 pools positive for *B. microti*, and 5 pools positive for Powassan virus. These results include 55 co-infections,

14 tri-infections, and 2 quad-infections. Since there were no collections of *Dermacentor variabilis* in the fall, no ticks were tested for *R. rickettsii*. Most concerning were the five positive pools for Powassan virus, three of which were collected from the same site. The location and quantity of positive Powassan pools are as follows: Johnsonburg Swamp Preserve (Frelinghuysen) [1], Orchard Trail at Millbrook Village DWGNRA (Hardwick) [3], and Oxford Mountain (Oxford) [1].

Sites visited during the spring and fall collection seasons can be found in Figure 16 mapped alongside Lyme disease incidence data from 2017-2021 from the Warren County Health Department. A summary of the tick species and life stages collected at all sites during both the spring and fall collection periods can be found in Figures 16a and 16b. A summary of the number of positive pools for each site during each collection season can be found in Figure 16c.

As mentioned, the tick surveillance project was funded by a grant from the NJ DOH that was first awarded for the 2021/2022 grant year and was renewed for the 2022/2023, the 2023/2024, the 2024/2025, and the 2025/2026 grant year. This grant is provided through the Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases (ELC) Cooperative Agreement between the NJDOH and the Centers for Disease Control (CDC). The current ELC Cooperative Agreement between the NJDOH and the CDC is from 2023 – 2028 with a possibility of renewal for another 5-year cycle.

The NJDOH Tick Surveillance Grant runs on an offset fiscal year from August 1st through July 31st. So please note that the following figures are from 2 separate grant cycles but are presented here to align with the calendar year. In the year 2025, a total of \$11,526.64 was expended on the tick surveillance project. Payroll accounted for \$4,974.47, training and supplies totaled \$5,917.27, and mileage reimbursements totaled \$634.90. For the spring surveillance season there were 61.25 staff hours (mix of regular and overtime hours) at a cost of \$2,218.53 compared to the fall surveillance season when there was 96.75 staff hours (no overtime) spent, which totaled \$2,755.94. Staff hours were charged against the grant funding for surveillance, education, identification, and pooling.

E. Lethal Ovitrap

The gravid *Aedes* traps (GAT), a type of lethal ovitrap has not been used in Warren County since the 2023 experiment.

IX. WATER MANAGEMENT

Water Management allows for the elimination or reduction of mosquito breeding habitat and is an integral part of an integrated mosquito management approach. Water management includes habitat modification and/or source reduction and can be an effective long-term means of mosquito control. Major water management projects must gain prior approval from various state and federal agencies. Guidelines are detailed in the Commission's blanket permit issued by the NJ Department of Environmental Protection -Division of Land Resource Protection. Each blanket permit is valid for five years. The Commission's previous permit expired on May 10, 2023. A new blanket permit was applied for and received in the spring of 2023. Just like the old permit, it includes a Flood Hazard Area General Permit 2 (Mosquito Control Water Management Activities), Freshwater Wetland General Permits 1 (Maintenance and Repair of Existing Features) and 15 (Mosquito Control Activities), and a Water Quality Certificate. The new permit is valid from May 15, 2023, until May 14, 2028. The staffing changes that occurred in 2024 and 2025 resulted in a reduction of water management activities being pursued in 2025.

Ten water management complaints in nine townships were responded to in 2025.

A Washington Township resident called the Commission to report an unmaintained detention basin in Hawke Point development. Larval sampling yielded zero mosquitoes, but the basins will continue to be monitored. There are several basins in that development that are currently under construction. Once construction is complete, the wetlands specialist will follow up with the responsible party to ensure they are maintained.

A councilman from Alpha Borough called to report an unmaintained stormwater facility. The wetlands specialist inspected the facility, and it was dry. He also spoke with the construction manager that stated the facility only holds water underground and should not be found with standing water. There is no way to inspect the underground facilities at this time.

An Independence Township resident requested assistance with a defuncted storm water facility on his property. The detention basin is inspected as a routine site on the east route. The basin was already completely overgrown when the individual purchased the property and the homeowner was unaware of the maintenance responsibilities automatically assigned to him when he took ownership. The Superintendent researched the history of the basin with the help of Sandy Meyers from the Upper Delaware Watershed Soil Conservation and a representative from Finelli Engineering. The Superintendent inspected the basin with the Heavy Equipment Operator/Inspector to determine what remediations would be necessary to rehabilitate the basin. Discussion with Independence Township was started; no action was taken in 2025 but the project remains a possibility for the future.

A White Township resident reported standing water in ditches along Buckhorn Drive. The ditches were inspected and were found to be flowing.

A Harmony Township resident reported a clogged drain on state property along Harmony Station Road. The area was treated for mosquitoes, but no further action was taken.

An Allamuchy Township resident called to report flooding that she believed was due to a clogged pipe under Rydell Road. Upon investigation, the wetlands specialist discovered that although the pipe was not clogged, there was a substantial beaver dam along Trout Brook downstream from the sites. The location of the dam was noted, and it will be monitored.

A resident from Bear Creek Road in Frelinghuysen Township called to report a beaver dam on Trout Brook that was apparently flooding Bear Creek Preserve. The resident did not leave any contact information. Without being able to follow up with the caller, it is difficult to determine what part of Bear Creek Preserve he was referring to. However, it is highly likely that this is the same beaver dam located after the Allamuchy Township resident complaint as this dam is causing flooding on a portion of Bear Creek Preserve.

A Belvidere resident called to report standing water in the roadway along 6th and 7th streets. The area was inspected; no larvae had been found. This is an ongoing issue and has been reported to the town of Belvidere several times over the years.

A resident in Frelinghuysen along Mott Road that resides at a routine site requested that the Commission restore the old farm pond located on her property. The pond is very shallow and is treated routinely for larval mosquitoes. If the Commission were able to deepen the pond, it would be suitable for fish stocking. The resident was informed that the Commission cannot undertake this project at this time; however, it is a possibility in the future.

A resident from Port Murray called to report a large blockage in the Musconetcong River near the bridge that was causing excessive flooding in their yard. After some research, it was determined that

the caller was actually a resident of Morris County. This blockage is much easier to access from the Morris County side of the river anyhow so the complaint was turned over to Morris County Mosquito Control. Morris County had cleared blockages at this site previously and said they would be able to clear this blockage as well.

A. Activity Summary

1. Projects

a. FWW GP1&15/FHA GP2 Projects

There were no blanket permit projects performed in 2025.

b. Permit-By-Rule Ditch Clearing Projects

Regulated ditches and waterways can be cleared of blockages under a Permit-By-Rule 6 (removal of major obstructions from regulated waters with machinery). No ditch clearing projects were done in 2025.

2. Maintenance

a. Hand Cleaning

Hand cleaning for the maintenance of existing drainage structures was completed 62 times in 14 municipalities in 2025. Container dumps were completed 16 times in 6 municipalities. (Each recorded instance of a 'container dump' may, and often does, include the drainage of multiple sources of larval habitat in one area.)

b. Access Brushing

Hand clearing of brush for access to mosquito breeding sites was performed 92 times in 12 municipalities in 2025. In addition to this hand clearing at routine sites, chain sawing of fallen trees was performed along the airspray access roads to Young's Island in Independence on two occasions, Cat Swamp in Oxford on three occasions, and Axford Ave in Oxford on one occasion.

c. Trail Mowing

Trail mowing is performed using the Polaris Ranger and the ArcEase mower. Trail mowing was completed at only three of seven locations that are regularly maintained by the Commission for access. The locations mowed in 2025 included the following: Young's Island Road ditch system in Independence, Cat Swamp and Axford Avenue Wildlife Management Area in Oxford Township. Areas that were unable to be mowed included the Freeborn Lane ditch system in Allamuchy Township, the Bear Creek Road airspray access road in Allamuchy Township, the Love Pallet Company ditch system in Pohatcong Township, and the routine inspection site on Still Valley Road in Pohatcong Township. Mowing behind the office was also done on one occasion in 2025 with the push mower.

d. Stream Desnagging

This activity is regulated by Permit-By-Rule 6. All activities that meet the requirements of the Permits-By-Rule may be conducted without prior NJDEP approval. However, machinery must be situated outside the regulated water. They may be used to reach into the waterway to remove material but cannot be driven or otherwise placed in the regulated water.

Permit-By-Rule 5 (removal of accumulated sediment and debris from a regulated water by hand) was utilized once in 2025. This rule authorizes the removal of accumulated sediment and debris by hand provided no machinery besides handheld equipment is used in the regulated water, the bed and natural banks are not altered, fishery resource timing restrictions are followed, and disturbance is minimized.

A drainage pipe at Silver Fox Farm in Hope Township was dug out and repaired by hand, rocks and debris were removed, and these combined actions restored flow to the Muddy Brook Tributary and prevented further flooding events.

B. Stormwater Facilities

Stormwater facilities comprise a significant portion of larval mosquito sites in the county and the lack of maintenance on these facilities continues to be at the source of the problem. The NJ stormwater rules that were enacted in 2004 consist of two rules; one governs how municipalities will regulate new development with respect to stormwater and a second requires municipalities to comply with new permits that control how municipal storm systems are managed. The NJDEP has developed a guidance manual with input by various constituents including the Warren County Mosquito Control Commission and several other NJ Mosquito Control agencies. Of particular interest and concern to mosquito control agencies is the recommendation of Best Management Practices (BMP's) such as constructed wetlands and infiltration basins. These systems are known to breed mosquitoes without proper design, construction, and maintenance. Underground stormwater facilities are becoming more common in Warren County. These present nearly impossible conditions for inspecting and treating. Without surveillance capabilities, it is unknown whether these underground structures will produce mosquitoes, which is problematic.

Detention basins have one or more inlets and one outlet structure. If designed and constructed correctly, water should drain from these within 72 hours. Infiltration basins have one or more inlets and no outlet structure. Water should infiltrate these within 72 hours. Retention basins have one or more inlets and no outlet structure. These should hold water year-round and usually have aeration or fish to prevent them from becoming larval habitat.

There are different ways that basins can provide larval mosquito habitat. Clogged drainage holes in outlet structures cause water to back up and stagnate in low flow channels. If a basin is mowed under saturated soil conditions, ruts are created that collect water and serve as larval mosquito habitat. Lack of maintenance can cause basins to convert into mosquito-producing wetlands. Infiltration basins without the proper substrate will hold water longer than they should. A sumped outfall structure is one in which the bottom of the structure is lower than the bottom of the pipe that is meant to convey the water out of the structure. This causes water to stagnate in the concrete structure. The length of time that the water remains depends on the depth of the water which can measure anywhere from 1" to 12" or sometimes more. Many species of mosquitoes will utilize this larval habitat.

Many of the stormwater basins that the Commission is aware of are inspected and treated, if necessary, on a weekly basis. Staff regularly hand clean stormwater facilities along their respective routes when practical. Most trash racks and low-flow channels can be cleaned with hand tools relatively easily; however, this work takes time. This activity is included in the Activity Summary under Hand Cleaning, section IX.A.2.a.

In 2016, the Commission was notified of a resource called the New Jersey Hydrologic Modeling Database. This electronic database is available online and is the culmination of several decades of data collection efforts by NJ Soil Conservation Districts and the NJ Department of Agriculture. It shows mapped locations of stormwater facilities throughout New Jersey. The list of stormwater facilities on this database is periodically checked against the Commission's own database.

C. Tires

Since 2008, a cooperative agreement between the Warren County Planning Department and the WCMEC has allowed for a shared 45' trailer to be placed at the County Road Department facility in Belvidere. The trailer is filled, by both road department staff and mosquito commission staff, as

abandoned tires are found throughout the year. At year end, the trailer is picked up by a recycling facility and replaced with an empty trailer for the next year. In the past, payment alternated between the Commission and the Warren County Planning Department. However, since 2017 the Planning Department has been receiving a grant that covers the cost of the tire recycling. The number of tires picked up by Commission staff is listed by municipality in Figure 12 Activity Summary. In cooperation with the Musconetcong Watershed Association (MWA), every year since 2011 we have picked up tires from their river clean-up sites and added them to the trailer we utilize for recycling.

The PCFA tire recycling program, launched in 2015, was continued in 2023. The program was brought about by the Warren County District Landfill, in conjunction with the Warren County Board of Commissioners, the Warren County Mosquito Control Commission, and the Warren County Health Department. One of the stated purposes in mind was to help control West Nile virus and other diseases spread by mosquitoes. The landfill located at 500 Mt. Pisgah Avenue in Oxford began accepting tires with or without rims from residents, small businesses, and farming communities in Warren County only. The fees were: \$2.50 for tires up to 22", \$5.00 each for tires 22.5" to 24", and \$10.00 each for tires 24.5" to 50".

If tires are seen on private property, attempts are made to contact the property owners. This is an opportunity to educate them about tires and their ability to produce mosquitoes and the diseases those mosquitoes can transmit. Residents are advised to keep tires under cover and dry, or to recycle them through PCFA. If time and space allow, employees offer to take the tires to our trailer. If a resident isn't home at the time the tires are seen, any present mosquito breeding is abated, and a door knocker is left for the resident. The visit is documented, and a return visit is made when time allows to follow up on the situation.

In 2025 a resident from Knowlton Township called to request a tire pick up. She had recently purchased the property and found several tires in woods, initially reporting about 8 tires. The site was inspected and it was found to be a substantial tire pile. Staff were dispatched and 108 tires were retrieved from the site and brought to the recycling trailer. Additionally, 38 abandoned tires were retrieved from Jenny Jump State Park in collaboration with park staff. These tires were included in the recycling trailer as well.

D. Catch Basins

No specific measures were taken in 2025 to encourage clean out of catch basins to keep water flowing but this is to be done routinely by departments of public works under existing stormwater legislation. Larval inspection and control in catch basins was summarized under VI. A. 2. Catch Basins.

E. Swimming Pools

Abandoned swimming pools can be prolific mosquito producers. A spreadsheet of unmaintained swimming pools has been kept since 2012. The spreadsheet is divided by district and contains the addresses and inspection notes for each pool. Ms. Fisher reviews all the unmaintained pool complaints for each year and updates the spreadsheet accordingly. The list is updated as pools are taken down or restored to use. By the end of 2025, 49 unmaintained pools, located in 18 townships, remained on the list. This number is down nineteen pools from 2024. The pools that are found producing mosquitoes are stocked with mosquito-eating fish or treated with a long-lasting control product and reported to the Warren County Health Department.

F. Beaver Management

A new beaver dam was identified along Trout Brook in the area of Lenape Lane in Allamuchy Township following a service request from an upstream resident. The dam was active in the spring

and summer of 2025, causing three upstream aerial larviciding sites to remain wet throughout much of the summer. This dam will continue to be monitored.

G. Site Plan Review

Copies of Land Use Regulation Permit applications are periodically received by our Commission and are to be reviewed and comments/suggestions made when appropriate.

Warren County has been the target of a growing number of Wetland Mitigation sites in recent years. When the Commission is made aware of these sites, the plans are sought and reviewed. Comments on these plans are given to the respective Township Land Use Boards and other interested parties, when requested. Mitigation sites are often previously ditched farm fields that are being restored to natural wetlands. The Commission has been monitoring these sites by attending township meetings and conducting site inspections.

The Commission is currently aware of six wetland mitigation sites in Warren County. Roes Island mitigation site is located off Island Road in Independence and Liberty Townships. Kenco wetland restoration site is located off Alphano Road in Independence Township. The Trout Brook wetland preservation/mitigation bank is located at 203 Bear Creek Road. The Pequest River mitigation bank is located at 55 Gibbs Road in Allamuchy Township. The Oxford Western mitigation bank is located off Lower Denmark Road in Oxford. The Watergate Wetlands Restoration project is located off Old Mine Road in the Delaware Water Gap National Recreation Area. The Commission has been monitoring these sites when time allows by conducting site inspections. Growing numbers of larval and adult mosquitoes are being found at these completed mitigation sites. The burden of inspection and treatment of these sites is proving to be quite time consuming. Discussions seeking reimbursement from the state for partial or total costs for mosquito control on state owned and/or state created mitigation sites began with the State Mosquito Control Commission in 2018.

In 2025, no inspections were performed at wetland mitigation sites.

X. PUBLIC EDUCATION

A. Literature/Poster Distribution

Files with handouts on pesticides, general mosquito control, ticks, etc. that are commonly requested are kept on hand in the office and in each of the vehicles for easy access and distribution to concerned residents.

B. Community/School Presentations/Displays

The Commission offers *Mosquito & Ticks: An Interactive Approach* to all fourth-grade classes in Warren County. Emails outlining the program are periodically sent to all fourth-grade teachers in the County. The program includes PowerPoint presentations covering ticks, mosquito biology and control and hands-on learning stations. The learning stations include live mosquitoes and fish, a preserved dog heart with heartworm disease, mosquitoes and ticks preserved in resin, activity sheets and games. Two microscopes, insect eye viewers and molded mosquito life cycle models were added to the program.

The Commission has a table-top tri-fold display that is used for inside venues and is generally left on display for extended periods of time. The information on the display is developed and changed periodically by Ms. Fisher. Our staffed displays are generally for one-to-two-day events, with the exception of the Warren County Farmers' Fair, which is an eight-day event. These displays familiarize the public with the Commission's activities and teach the public to recognize mosquito larvae in their own backyards.

Several notices were prepared for the townships for their Facebook pages and websites to warn against high West Nile virus activity and to promote community action *Dump & Drain* campaigns after high rainfalls.

In 2025, the following presentations were given regarding mosquitoes and mosquito control:

Presentation/Display List:

Hope Green Fair
National Mosquito Control Awareness Week
Warren County Bicentennial Celebration
Warren County Farmer's Fair
Longmeadow Farm's Harvest Festival

The Warren County Farmer's Fair display theme for 2025 was *Mosquito Myths, Facts, & Tick Facts*. The display featured myths and facts about mosquitoes and tick facts. The new tablecloths, with a 'Dump Standing Water' message imprinted were debuted. The dump standing water message with water being poured out of a bucket was created to be large enough to be read from a distance so even if a person does not speak to a staff member at events, they come away with a message of what to do to reduce mosquito populations. Educational fliers, pens, repellent wipes and mosquito swatter handouts, as well as the photo board, Albo Annie, and the all-time favorite mosquito eating fish, were available in the display booth.

The tabletop tri-fold board and handouts were displayed in the foyer of the County administration building April 8-15, 2025, at the Richard Gardner Branch of the Warren County Library April 15-22, 2025, and at the Southwest Branch of the Warren County Library April 22-30, 2025 for World Malaria Day and Heartworm Awareness Month. The display was again set up at the Richard Gardner Branch of the Warren County Library June 2-9, 2025, at the Administration office June 9-16, 2025 and at the Southwest Branch, June 16-30, 2025 for National Mosquito Control Awareness Week. The display was prearranged to be exhibited during the beginning of the reading program at the Southwest branch to reach more viewers.

Pohatcong Township Elementary School
Great Meadows Elementary School (Twice, 2024-2025 and 2025-2026 School years)
Phillipsburg Elementary School
Oxford Township School
Allamuchy Elementary School
Blairstown Elementary School
Belvidere Elementary School
Memorial Elementary School

At Phillipsburg and Belvidere Elementary Schools both 4th and 5th grade students viewed the presentation. Staff members spent six half days at Phillipsburg Elementary School, giving presentations to twenty-two classes of 4th and 5th grade students, educating 396 students. The presentation was shortened to work with Phillipsburg's timeframe; it was deemed an important outreach location due to the high *Aedes albopictus* populations in the area. A total of 723 students were educated on mosquitoes and ticks in 2025.

C. Office/Truck Files

Files with commonly requested handouts on pesticides, general mosquito control, ticks, etc. were maintained in each of the vehicles for easy access and distribution to concerned residents. This collection of handouts includes a flier on mosquito control in Spanish. These files were revamped in 2020 and continued to be available in 2025.

D. Ticks/Lyme Disease

A presentation on ticks and prevention of Lyme disease is included in the Commission's program that is offered to county schools, *Mosquitoes & Ticks: An Interactive Approach*. One of the four hands on station includes preserved ticks of various species and life stages so that the children can appreciate their small size and varying appearances. Children are also provided with tick bookmarks or identification cards, provided to the Commission by the NJ DOH, the CDC, and Rutgers and also worksheets to assist in their education. The Commission includes tick information with other educational handouts for the public during routine inspections as well as at educational events.

E. Presentations/Publications

Practical strategies to collect, rear, & utilize wild-caught Culex mosquitoes for insecticide resistance testing, by Anastasia Giordano presented at the NJMCA Recertification Training Sessions, March 11, 2025 & March 18, 2025.

To Capitalize or not? Common mistakes and easy rules to follow for vector-borne diseases, by Jennifer Gruener presented at the 2025 NJMCA Annual Meeting Film Festival March 21, 2025.

F. Internet Presence

In 2005, the Commission arranged for its own website utilizing the domain name www.warrencountymosquito.org. The domain name www.warrencountymosquito.com also continues to be registered. Information for the Warren County Mosquito Extermination Commission was updated on the Rutgers hosted website within NJ Mosquitoes: Biology and Control at www.njmosquito.org. A link to this site is provided on the general web page for Warren County <http://www.co.warren.nj.us/>.

The Commission's original website content was finalized in February 2006. Minor modifications were made to the website following subsequent reviews and comment from the public. The website was updated in 2015 to be more compatible with current handheld devices and with current browser technology and web standards, to allow Commission staff to update more areas of the website, and to give the website an updated appearance. In 2021, the website had to be moved to a new host server since the current server could no longer support the outdated code it was written in. Since the cost of migrating to a new platform was above the quote threshold, it was temporarily moved, along with the staff email, until a more permanent solution could be found. Quotes and proposals for redesigning the website were sought and the quote from Computer Images Web was approved in December 2021. The website redesign and transfer took place and went live in 2022.

Unfortunately, in October 2022, the website was blacklisted by Google due to security issues. Although a specific cause was not determined, it was thought that the website or email addresses were hacked. Amitech Computer Services, the company that provides IT services for the commission, recommended My Corporate Hosting Solutions be contacted to handle the website and email addresses. The current website and email were reviewed, security suggestions were made, a quote received and accepted. My Corporate Hosting Solutions placed the website and email addresses on separate servers for the most security, Wordfence security was added to prevent intrusion attacks and allow MCHS to block other countries from accessing the website. Also, WordPress semi-annual updates are run to keep the website's WordPress core, themes, and plugins up-to-date, and the email system was changed to Office 365.

Adult mosquito control information has been provided on the Commission website for County residents to access since 2006. A link to this information is predominantly displayed on the main page of our website. In 2018, a link to the municipal information packet was added to the main page of the website. In 2020, a link to the aerial larviciding treatment information was added to the main page of the website.

G. Media Coverage

The Commission was featured on the nightly news of the TV station WFMZ Z(channel 69) on June 17, 2025. The spot centered around the early start to the season and featured an interview with Ms. Gruener, footage of larval sampling done from boats at Mountain Lake in Liberty Township and footage of Ms. Giordano pooling mosquitoes for disease testing.

Ms. Gruener provided an interview for the Express Times/Lehigh Valley Live, which appeared in their publication on August 21, 2025.

Several radio interviews with WRNJ were conducted throughout the season.

Notices were supplied to townships where aerial larviciding and adult mosquito control took place for posting on their websites and social media platforms. The municipalities of Allamuchy, Alpha, Belvidere, Franklin, Harmony, Hope, Knowlton, Lopatcong, Mansfield, and Washington Township, were supplied with notices for posting on their website and Facebook pages regarding WNV activity. The County mass notification system, Rave, was used to send alerts to the entire county following a significant rainfall event to ask residents to dump any standing water on their property. Rave was also use on August 12, 2025, to alert certain areas of Greenwich, Pohatcong, Belvidere, and Phillipsburg municipalities about adult mosquito control taking place due to high populations of *Aedes albopictus* mosquitoes.

H. National Week Observance

In May, Tickborne Disease Awareness Month was promoted by sharing multiple blurbs and NJDOH and CDC graphics on the County Facebook and Twitter pages and also on municipal websites and social media forums. In April for World Malaria Day and Heartworm Awareness Month and in June for National Mosquito Control Awareness Week, displays were set up in the Administration Building, the Southwest Branch and the Richard Gardner Branch of the Warren County Library System. Photos of the National Mosquito Control Awareness Week displays were shared with the NJ Mosquito Control Association and shared on their Facebook page.

ACKNOWLEDGEMENTS: The following staff members contributed to the text and/or figures included in this report: Jennifer Gruener, Christine Fisher, Anastasia Giordano, Ryan Hagerty, and John Necina.

LIST OF ABBREVIATIONS

AEMCNJ	Associated Executives of Mosquito Control in New Jersey
AIMS	Army insecticide measurement system
AMCA	American Mosquito Control Association
ATM	Asian Tiger Mosquito (<i>Aedes albopictus</i>)
ATV	All-terrain vehicle
BG	BioGents
BMP	Best Management Practices
BTI	<i>Bacillus thuringiensis israelensis</i>
CDC	Center for Disease Control and Prevention
CHIKV	Chikungunya virus
CO ₂	Carbon dioxide
COA	Certificate of Authorization
CoCoRaHS	Community Collaborative Rain, Hail, & Snow Network
CWA	Clean Water Act
DENV	Dengue virus
DWGNRA	Delaware Water Gap National Recreation Area
EEE	Eastern equine encephalitis
ELC	Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases
ESA	Entomological Society of America
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHAGP	Flood Hazard Act General Permit
FWWGP	Fresh Water Wetlands General Permit
GIS	Geographic Information System
GPS	Global Positioning System
GT	Gravid Trap
IPM	Integrated Pest Management
IR	Insecticide Resistance

JCV	Jamestown Canyon virus
KDR	Knockdown Resistance
LAC	La Crosse virus
LCD	Liquid Crystal Display
MSI	Municipal Software Incorporated
MWA	Musconetcong Watershed Association
NEVBD	Northeast Regional Center for Excellence for Vector-borne Diseases
NJDEP	New Jersey Department of Environmental Protection
NJDOH	New Jersey Department of Health
NJIIF	New Jersey Intergovernmental Insurance Fund
NJLT	New Jersey Light Trap
NJPDES	New Jersey Pollutant Discharge Elimination System
NMCA	Northeast Mosquito Control Association
PCP	Pesticide Control Program
PDMP	Pesticide Discharge Management Plan
PGP	Pesticide General Permit
PESP	Pesticide Environmental Stewardship Program
PCFA	Pollution Control Finance Authority
PHEL	Public Health Environmental Laboratory
PMA	Pennsylvania Manufacturers Association Insurance Group
SLE	Saint Louis encephalitis
SMCC	State Mosquito Control Commission
UAS/UAV	Unmanned Aviation System/ Unmanned Aviation Vehicle
USFWS	United States Fish & Wildlife Service
ULV	Ultra-low volume
VBDWG	Vector-borne Disease Working Group
WNV	West Nile virus
ZIKV	Zika virus

FIGURE INDEX – 2025

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1	Budget Report
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5	NJ Vector Surveillance Summary
6	WNV Cumulative Positive Map
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7a	Surveillance Synopsis- Routine Surveillance
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8	Surveillance Synopsis - Disease, Complaint and Field Study
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11	10 year Rainfall Comparison-Oxford, NJ
12	Activity Summary (Inspections, Treatments etc.)
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14	Ground Larviciding Inspection Districts & Site Breakdown
15	Airspray Site Treatments
15a	Summary of Aerial Applications
16	Routine Tick Surveillance Site Map
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Expenditure Budget

GENERAL FUND

Activity to 12/31/2025

*ACTIVITY = Budget - (Balance + Encumbered) (You can include the break out by journal from the report options)

Account Number	Description	Budget	Activity Encumbered	Balance	% of Budget
105010	M-01 Salaries/Wages	505,197.00	469,861.98	- 35,335.02	93.00%
105020	M-02 Benefits	117,109.00	115,475.50	- 1,633.50	98.60%
105030	M-03 Insurance	26,569.00	26,569.00	-	100.00%
105040	M-04 Telephone/Internet	5,992.00	4,436.53	- 1,555.47	74.00%
105050	M-05 Legal Ads/Advertising	2,814.00	2,619.59	- 194.41	93.10%
105060	M-06 Meetings/Memberships	10,625.00	10,358.72	- 266.28	97.50%
105070	M-07 Professional Services	3,080.00	1,157.04	- 1,922.96	37.60%
105080	M-08 Permits/Eng/Water Mgmt	675.00	402.68	- 272.32	59.70%
105090	M-09 Contract Services	32,950.00	30,487.68	- 2,462.32	92.50%
105100	M-10 Fish/Insecticides/Licenses	62,326.00	62,207.18	- 118.82	99.80%
105110	M-11 Vehicle/Equipment Maint	40,175.00	32,375.42	- 7,799.58	80.60%
105120	M-12 Office Supplies	3,950.00	3,761.65	- 188.35	95.20%
105130	M-13 Shop Supplies	3,000.00	2,887.76	- 112.24	96.30%
105140	M-14 Lab/Field Supplies	9,565.00	8,970.97	- 594.03	93.80%
105150	M-15 Equipment Purchase	120,898.00	108,001.04	- 12,896.96	89.30%
TOTALS		944,925.00	879,572.74	- 65,352.26	

Figure 1
Budget Report

Grant Expenses

GENERAL FUND

Activity to 12/31/2025

* ACTIVITY = Budget - (Balance + Encumbered) (You can include the break out by journal from the report options)

Account Number	Description	Budget	Activity Encumbered	Balance
106108	GRANT - TICKS SURVEILLANCE PROJECT	- (8,782.86)	-	8,782.86
TOTALS		- (8,782.86)	-	8,782.86

2025 BUDGET REVENUES

2024 Fund Balance Utilized:

2024 Budget Utilized April 18, 2024	67,000.00	
	<u>8,898.00</u>	

\$75,898.00

County Appropriations:

1st Quarter- January 16, 2025	212,171.00
2nd Quarter - April 4, 2025	218,952.00
3rd Quarter- July 11, 2025	218,952.00
4th Quarter- October 17, 2025	<u>218,952.00</u>
	<u>869,027.00</u>

\$869,027.00

BUDGET REVENUE YTD

\$944,925.00

2025 RECEIPTS - Regular Checking Account

2024 Unused Fund Balance	<u>46,182.90</u>	
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\$46,182.90

2025 Misc. Receipts:

January Interest	2.13
February Interest	2.16
March Interest	1.52
April Interest \$2.25, overcharge refund 77.99	80.24
May Interest \$1.80, \$7.20 metal recycling	9.00
June Interest	1.03
July Interest \$	1.82
August Interest \$	1.90
September Interest	1.22
October Interest	1.76
November Interest \$2.28	2.28
December Interest \$1.96, \$165.52 airbag class acti	<u>167.48</u>
	272.54

\$272.54

Reimbursable Grant Funds-Tick Grant Balance (24-25 spent in 25)	-8,309.50
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Reimbursable Grant Funds -Tick Grant Balance(24-25 balance left '25)	<u>8,782.86</u>
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473.36

\$46,928.80

DISBURSEMENTS - YTD

879,572.74

\$879,572.74

BALANCE IN REGULAR ACCOUNT AS OF 12/31/25

\$112,281.06

Reconciliation of Bank Balance & Budget Report Balance

Balance in Account as of 12/31/25	112,281.06
Plus Budgeted Revenues Not Received to Date	0.00
Plus 24-25 Tick grant expended in '25	8,309.50
Minus Reimburseable expenses received but not expended	-8,782.86
Minus Unused Fund Balance from Previous Year	-46,182.90
Minus YTD Misc Receipts Not Included in Budget Revenue	-272.54
Minus Encumbered Funds	0.00
Outstanding Contra to Receipts (not encumbered to date)	<u>0.00</u>

BUDGET REPORT BALANCE UNENCUMBERED-Remaining amount from 2024 Budget

\$65,352.26

(Page 1 Budget Report Bottom - Last Column)

100001 Pnc Bank - Regular

From 12/01/2025 to 12/31/2025

Date	Source	PO#	Contract#	Check #	Vendor #	Vendor/Description	Budget	Debit	Credit	Encumber	Payment	Balance (DR)
						ACTIVITY/BALANCE BEFORE 12/01/2025	- 881,132.06	754,360.25				248,852.71
12/08/2025	DJ 346	12017		12082025	410	WARREN CO. MOSQUITO EXT. COMM			16,949.34			231,903.37
12/18/2025	DJ 350	12022		6766	389	TRACTOR SUPPLY		7.95				231,895.42
12/18/2025	DJ 351	12020		6765	100	CORY BROTHERS		477.38				231,418.04
12/18/2025	DJ 352	12019		6764	501	IPD, Institute for Professiona		100.00				231,318.04
12/18/2025	DJ 353	12016		6763	459	Amazon Business		89.25				231,228.79
12/18/2025	DJ 354	12015		6762	192	JENNIFER GRUENER Reimbursement		939.07				230,289.72
12/18/2025	DJ 355	12014		6761	440	John Necina Reimbursement		400.00				229,889.72
12/18/2025	DJ 356	12021		6761	440	John Necina Reimbursement		169.65				229,720.07
12/18/2025	DJ 357	12012		6760	453	GoTo Technologies USA Inc.		523.02				229,197.05
12/18/2025	DJ 358	12010		6759	252	NJ ADVANCE MEDIA		65.86				229,131.19
12/18/2025	DJ 359	11971		6758	425	WB MASON CO. INC. BLANKET		113.28				229,017.91
12/18/2025	DJ 360	11852		6757	23	ALL SEASONS AUTOMOTIVE LLC BLANKET		262.87				228,755.04
12/18/2025	DJ 361	12023		6757	23	ALL SEASONS AUTOMOTIVE LLC		2,008.81				226,746.23
12/18/2025	DJ 362	11851		6756	411	WARREN COUNTY BLANKET		571.95				226,174.28
12/18/2025	DJ 363	11850		6755	435	WILSON PRODUCTS BLANKET		12.25				226,162.03
12/18/2025	DJ 364	11849		6754	373	T MOBILE BLANKET		59.80				226,102.23
12/18/2025	DJ 365	11846		6753	156	GEBHARDT & KIEFER BLANKET		33.00				226,069.23
12/18/2025	DJ 366	11843		6752	94	COMCAST BLANKET		221.86				225,847.37
12/18/2025	DJ 367	11837		6751	118	DIGIT PAYROLL CORPORATION BLANKET		111.40				225,735.97
12/18/2025	DJ 368	11835		6750	30	AMITECH ON-SITE COMPUTER SERVI BLANKET		614.20				225,121.77
12/22/2025	DJ 369	12030		12222025	410	WARREN CO. MOSQUITO EXT. COMM		16,666.85				208,454.92
12/30/2025	RJ 80					Airbag class action settlement-2007 & 2008 Ford Rangers		165.52				208,620.44
12/31/2025	RJ 79					Reg Acct Int		1.96				208,622.40
12/31/2025	DJ 373	12038		6786	84	CHRISTINE A. FISHER		23.20				208,599.20
12/31/2025	DJ 374	12037		6785	440	John Necina Reimbursement		116.14				208,483.06
12/31/2025	DJ 375	12036		6784	459	Amazon Business		390.51				208,092.55
12/31/2025	DJ 376	12035		6783	192	JENNIFER GRUENER		82.34				208,010.21
12/31/2025	DJ 377	12034		6782	404	US POSTMASTER		526.00				207,484.21

100001 Pnc Bank - Regular

From 12/01/2025 to 12/31/2025

Date	Source	PO#	Contract#	Check #	Vendor #	Vendor/Description	Budget	Debit	Credit	Encumber	PO	PO	Payment	Balance (DR)
12/31/2025	DJ 378	12033		6781	323	ROCKY'S HARDWARE INC			26.99					207,457.22
12/31/2025	DJ 379	12032		6780	486	Charmingly Unique			256.25					207,200.97
12/31/2025	DJ 380	12031		6779	370	SWIFT PRINT SOLUTIONS LLC			432.00					206,768.97
12/31/2025	DJ 381	12029		6778	456	My Corporate Hosting Solutions			2,046.00					204,722.97
12/31/2025	DJ 382	12028	25-COMG-99562	6777	503	Atlantic Tomorrows Office 1NJCP - State Contract #25-COMG-99562			5,200.00					199,522.97
12/31/2025	DJ 383	12027	112624-TTC	6776	502	Storr Tractor Company National Cooperative - Sourcewell Contract #1		39,948.48						159,574.49
12/31/2025	DJ 384	12026		6775	252	NJ ADVANCE MEDIA		136.17						159,438.32
12/31/2025	DJ 385	12025		6774	480	GPAJ		125.00						159,313.32
12/31/2025	DJ 386	12024		6773	291	PETTY'S TIRE & AUTO CENTER INC		1,859.72						157,453.60
12/31/2025	DJ 387	12018		6772	478	ES Opco USA, LLC		305.10						157,148.50
12/31/2025	DJ 388	12013	24-FLEET-77712	6771	500	Ciocca Ford of Flemington 1NJCP- T2099, contract #24-FLEET-77712		44,343.50						112,805.00
12/31/2025	DJ 389	11976		6770	266	NJMCA INC		350.00						112,455.00
12/31/2025	DJ 390	11851		6769	411	WARREN COUNTY BLANKET		102.49						112,352.51
12/31/2025	DJ 391	11850		6768	435	WILSON PRODUCTS BLANKET		12.25						112,340.26
12/31/2025	DJ 392	11837		6767	118	DIGIT PAYROLL CORPORATION BLANKET		59.20						112,281.06
							-	167.48	136,739.13	-	-	-	-	112,281.06

													-	881,299.54	891,099.38	-	-	112,281.06
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Figure 2
Treasurer's Report

100002 PNC Bank - Payroll

From 12/01/2025 to 12/31/2025

Date	Source	PO#	Contract#	Check #	Vendor #	Vendor #	Vendor/Description	Budget	Debit	Credit	Encumber	PO Payment	PO Balance (DR)
							ACTIVITY/BALANCE BEFORE 12/01/2025	-	552,177.44	545,653.77			6,623.67
12/01/2025	DJ 345			12012025	446		Digit Pay- Net Payroll PR 2025-24 Taxes			3,992.97			2,630.70
12/08/2025	RJ 77						PR 2025-25	16,949.34					19,580.04
12/11/2025	DJ 347			12112025	446		Digit Pay- Net Payroll Pr 2025-25 DD			10,334.54			9,245.50
12/15/2025	DJ 348			12152025	446		Digit Pay- Net Payroll PR 2025-25 Taxes			4,084.33			5,161.17
12/18/2025	DJ 349			1225	101		COUNTY OF WARREN Employee contributions PR 2025-24 & 25			2,367.74			2,793.43
12/22/2025	RJ 81						Dep PR 2025-26	16,666.85					19,460.28
12/24/2025	DJ 370			1222425	446		Digit Pay- Net Payroll PR 2025-26 DD			11,371.23			8,089.05
12/29/2025	DJ 371			122925	446		Digit Pay- Net Payroll Pr 2025-26 Taxes			4,209.52			3,879.53
12/30/2025	DJ 372			123025	285		PERS PERS CLI December			2,693.43			1,186.10
								-	33,616.19	39,053.76			1,186.10
								-	585,793.63	584,707.53			1,186.10

100003 Fulton Bank - SUI

From 12/01/2025 to 12/31/2025

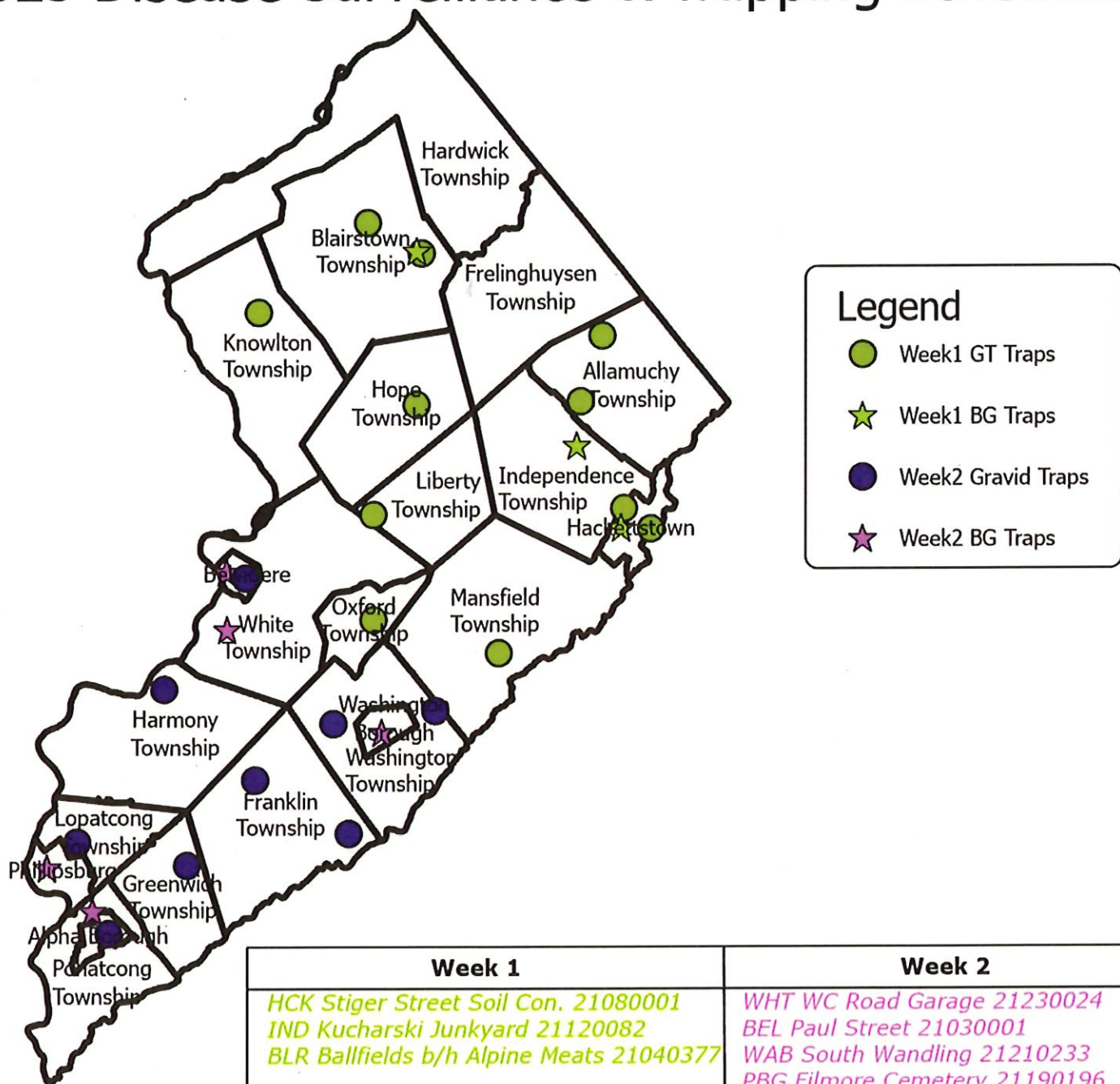
Date	Source	PO#	Contract#	Check #	Vendor #	Vendor/Description	Budget	Debit	Credit	Encumber	PO	PO	Payment	Balance (DR)
						ACTIVITY/BALANCE BEFORE 12/01/2025	-	965.82						8,100.71
12/31/2025	RJ 82					Interest SUI		0.07						8,100.78
							-	0.07						8,100.78
							-	965.89						8,100.78

100004 Fulton Bank Retirement Pay

From 12/01/2025 to 12/31/2025

Date	Source	PO#	Contract#	Check #	Vendor #	Vendor/Description	Budget	Debit	Credit	Encumber	PO	PO	Payment	Balance (DR)
						ACTIVITY/BALANCE BEFORE 12/01/2025	-	5,002.34						25,864.46
12/31/2025	RJ 82					interest Retirement		0.22						25,864.68
							-	0.22						25,864.68
							-	5,002.56						25,864.68

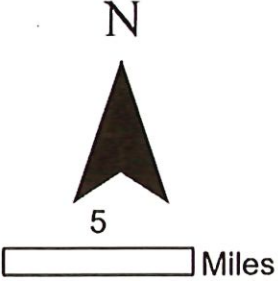
Warren County Mosquito Control Commission 2025 Disease Surveillance & Trapping Schedule



Legend

- Week1 GT Traps
- ★ Week1 BG Traps
- Week2 Gravid Traps
- ★ Week2 BG Traps

Week 1	Week 2
<p><i>HCK Stiger Street Soil Con. 21080001</i> <i>IND Kucharski Junkyard 21120082</i> <i>BLR Ballfields b/h Alpine Meats 21040377</i></p> <p>BLR Cobblewood 21040001 BLR Footbridge Park 21040008 KNL Station Road PK Trail 21130004 HOP Sandy Lane 21110091 LIB Mountain Lake 21140135 ALL Kasper Road 21010011 ALL Freeborn Lane 21010230 HCK Alumni Field 21080009 HCK East Baldwin 21080083 MNS Towpath Morris Canal Trail 21160017 OXF Cat Swamp 21170042</p>	<p><i>WHT WC Road Garage 21230024</i> <i>BEL Paul Street 21030001</i> <i>WAB South Wandling 21210233</i> <i>PBG Filmore Cemetery 21190196</i> <i>PHT Crestwood Park 21200517</i></p> <p>ALP Marino Fields/Vulcanite 21020236 BEL Cemetery 21030220 FRK Whites Road Canal 21050279 FRK W Asbury Anderson 21050001 GRN Iron Wolf Rd 21070045 HRM Reeder Rd- Rotondi's 21100044 LOP Edwards St Ballfield 21150033 PBG Filmore Cemetery 21190196 WAT Meadow Breeze Park 21220029 WAT Morris Canal Trail 21220153</p>



WARREN COUNTY MOSQUITO EXTERMINATION COMMISSION
MOSQUITO-BORNE DISEASE RESPONSE GUIDELINES

PURPOSE

This is to serve as a guideline for a course of action to be taken in the event of the known presence of any mosquito-borne disease through either identification of the presence of the disease in mosquito populations or as evidenced by the illness or death of an animal/human from a mosquito borne disease within Warren County. While the focus is primarily on eastern equine encephalitis (EEE) and West Nile virus (WNV), other diseases that would be responded to include but are not limited to La Crosse encephalitis, St. Louis encephalitis, malaria, dengue fever, and concentrated cases of dog heartworm.

PROCEDURE

- A. In the event of positive disease test results from mosquitoes, sentinel chickens or the resident wild bird population (taking into consideration the migratory habits and nesting behavior of the particular bird species involved) the following procedures, as appropriate, will be implemented:**
1. Notify Commissioners promptly.
 2. Communicate with NJAES, Center for Vector Biology Director.
 3. Communicate with the Office of Mosquito Control Coordination Administrator.
 4. Disseminate information to employees regarding the disease situation and necessary precautions.
 5. Increase adult mosquito surveillance efforts in the area utilizing available traps and baits/lures as appropriate for the target mosquito species (such as portable traps, NJ light traps, resting boxes etc.). The object is to collect additional species for virus testing within and adjacent to known mosquito breeding sites in the area.
 6. Submit subsequent collections for virus testing either through the State Surveillance Program or another source, depending on what services are available (including testing at our facility).
 7. Based on surveillance data, larvicide and/or adulticide by ground and/or by air, if warranted.
 8. Discuss disease situation at next monthly Commission meeting.
 9. Relay disease related information at next monthly meeting of Associated Executives of Mosquito Control Work in NJ.
 10. Public notification is to be implemented as appropriate for the particular situation.

Continued...

WARREN COUNTY MOSQUITO EXTERMINATION COMMISSION
MOSQUITO-BORNE DISEASE RESPONSE GUIDELINES

Page 2

- B. In the event that the illness or death of a human, horse or other domesticated animal (including pets, livestock, zoo animal etc.) is confirmed to be due to a mosquito borne disease of public health importance and suspected to have been contracted in Warren County, the following procedures, as appropriate will be implemented.**
1. Notify Commissioners promptly.
 2. Communicate with the NJAES, Center for Vector Biology Director.
 3. Communicate with the Office of Mosquito Control Coordination Administrator.
 4. Disseminate information to employees regarding the disease situation and necessary precautions.
 5. Increase adult mosquito surveillance efforts in the area utilizing available traps and baits/lures as appropriate for the target mosquito species (such as portable traps, NJ light traps, resting boxes etc.). The objective is to collect additional species for virus testing from:
 - a. known and potential mosquito breeding sites in the immediate and adjacent areas and,
 - b. in the vicinity of the original virus isolation and/or detection of animal illness/death.
 6. Increase larval mosquito surveillance and control methods in the area.
 7. Coordinate activities with other counties and state departments/agencies as appropriate.
 8. Communicate with the Warren County Health Department and any other Warren County agencies involved.
 9. Notify the Warren County Board of Commissioners.
 10. Based on surveillance data, larvicide/adulticide by ground and if warranted, by air.
 11. Continue surveillance and testing to further assess the disease situation. Submit post treatment collections for virus testing either through the State Surveillance Program or another source, depending on what services are available.
 12. Prepare a news release with review by the Mosquito Commission Chair, the Warren County Health Officer and the Director of the Public Information Department if available. Coordinate information details to be released with the NJ Health Department and SMCC and direct any inquiries regarding human case information to the NJ Health Department. Do not include any identifiable information in the release (address or municipality, detailed health information, etc.). Refer to the EEE Protocol approved by the Associated Executives of Mosquito Control in NJ when preparing the press release. Refrain from using language that might be alarming (i.e. no scare tactics). Suggest the use of repellent and avoidance (staying indoors, maintaining screens on doors and windows etc.) and let the public know that the Commission is fully aware and is responding accordingly.
 13. Seek guidance from Rutgers regarding assessment and response in area of the disease threat.
 14. If the situation becomes more than we can handle with our own adulticiding equipment and personnel, ask for assistance from the State Mosquito Control Commission and the use of the State Airspray Program.
 15. Request emergency funds from the Warren County Board of Commissioners if the Mosquito Commission budget is not sufficient to continue the needed response and reserve funding has already been expended.
 16. Discuss disease situation at next monthly Commission meeting.
 17. Relay disease related information at next monthly meeting of Associated Executives of Mosquito Control Work in New Jersey.

Mosquito-borne Disease Summary

Eastern equine encephalitis (EEE)

- Twenty (20) EEE positive mosquito pools were reported in 2025; ten of which were *Culiseta melanura*, and the remainder were split between 8 different species from 3 different genera
- Five counties had EEE positive mosquitoes: Atlantic (12), Burlington (1), Camden (2), Cape May (2), and Morris (3).
- One equine case of EEE was reported from Burlington County from an unvaccinated horse
- No human cases of EEE in NJ in 2025

West Nile virus (WNV)

- WNV in mosquitoes was higher in 2025 than in the previous 5 years.
- 1,159 WNV positive pools were collected; the majority of which were *Culex* species (985). All counties collected positive mosquitoes.
- Positive mosquitoes were collected earlier in the season than ever before (week 16 from Gloucester County) beating last year's record of a positive pool in week 18.
- There were 21 WNV human cases in 2025 from: Atlantic (2), Bergen (2), Burlington, Camden, Essex, Gloucester, Hudson, Mercer, Middlesex (3), Monmouth (2), Morris (2), Passaic, Sussex, and Union (2).
- There were three viremic blood donors reported in 2025.

Other mosquito-borne viruses

- One (1) human case of Jamestown Virus (JCV) from Middlesex County was reported in week 34 of 2025.
- Five (5) mosquito pools were reported positive for JCV in 2025 from Atlantic, Morris (2), Mercer, and Sussex Counties.
- The positive mosquitoes were *Coquillettidia perturbans* (2), *Aedes albopictus*, *Ae. sollicitans*, and *Anopheles punctipennis*.
- Two mosquitoes tested positive for LaCrosse encephalitis from Sussex County in weeks 26 and 34.
- There were no positive mosquitoes for St Louis encephalitis, dengue virus, chikungunya virus, or Zika virus in 2025.
- Travel-related human cases of dengue virus were down from 2024.
- There was a human case of malaria in Morris County in 2025 that cannot be ruled out as locally transmitted at this time.

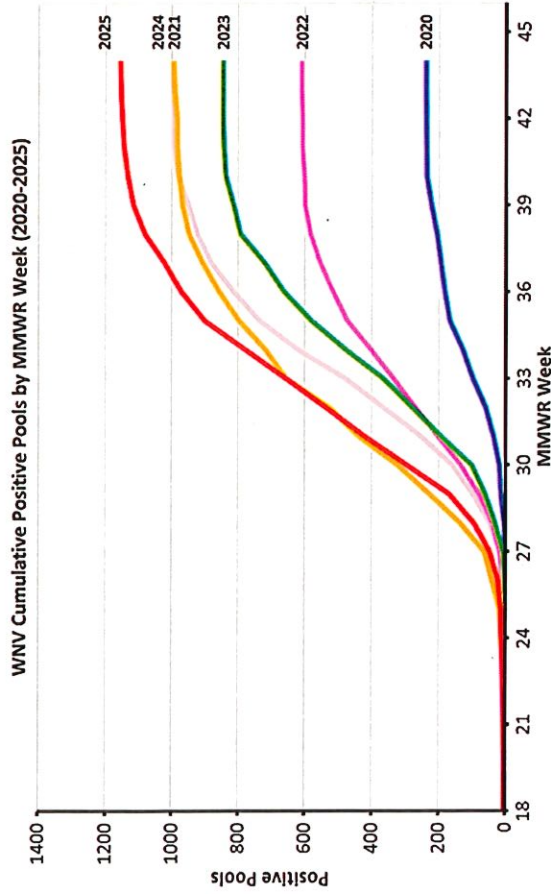
NJ VECTOR SURVEILLANCE SUMMARY 2025

“Vector-borne Surveillance Report”

Excerpts from 2025 Week 45 Report published by the NJ Department of Health, Communicable Disease Service

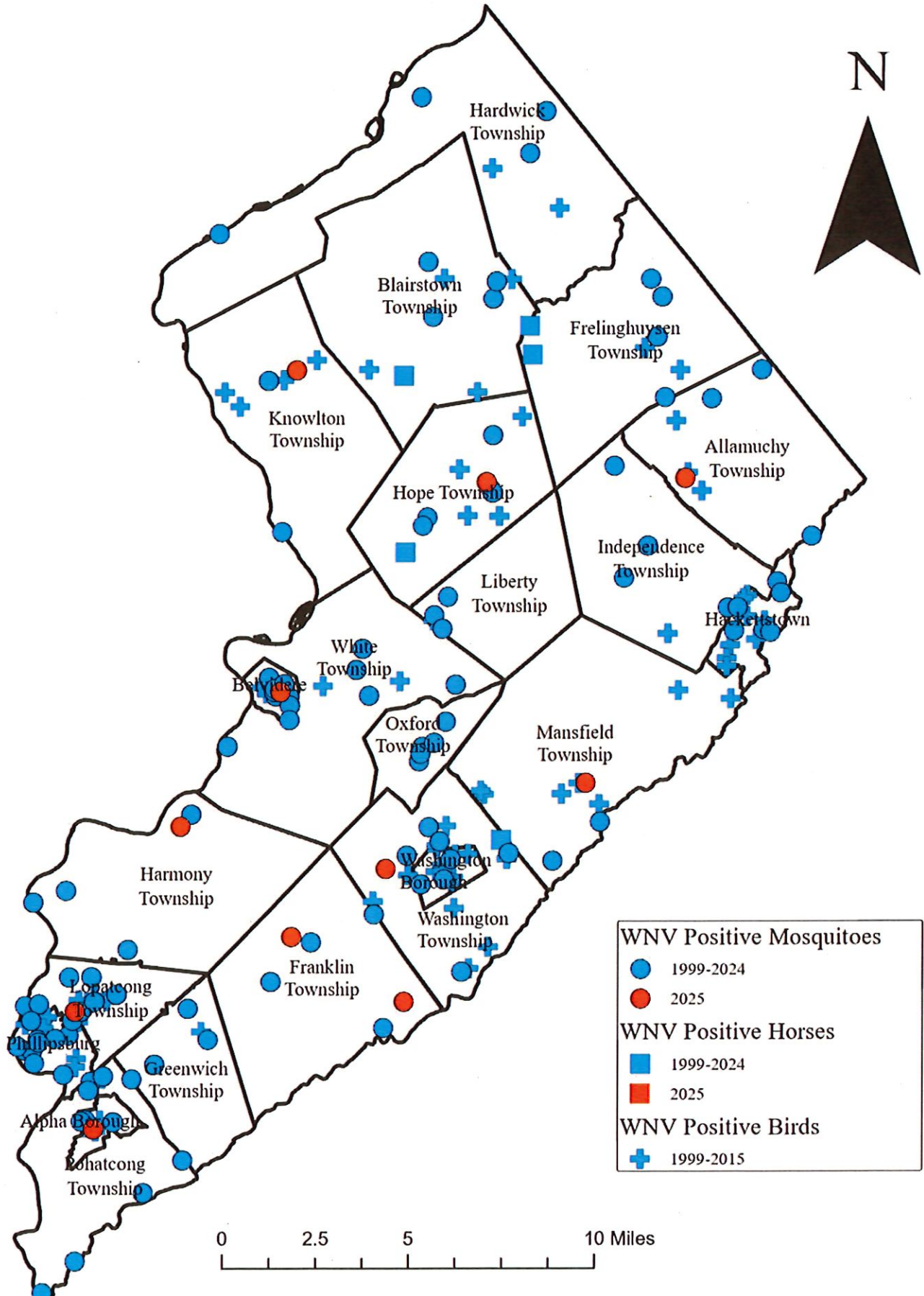
The full report can be found at:

<https://www.nj.gov/health/cd/statistics/arthoviral-stats/index.shtml>



The above graph shows cumulative WNV positive pools for the years 2020 (least active year) through 2025 (most active).

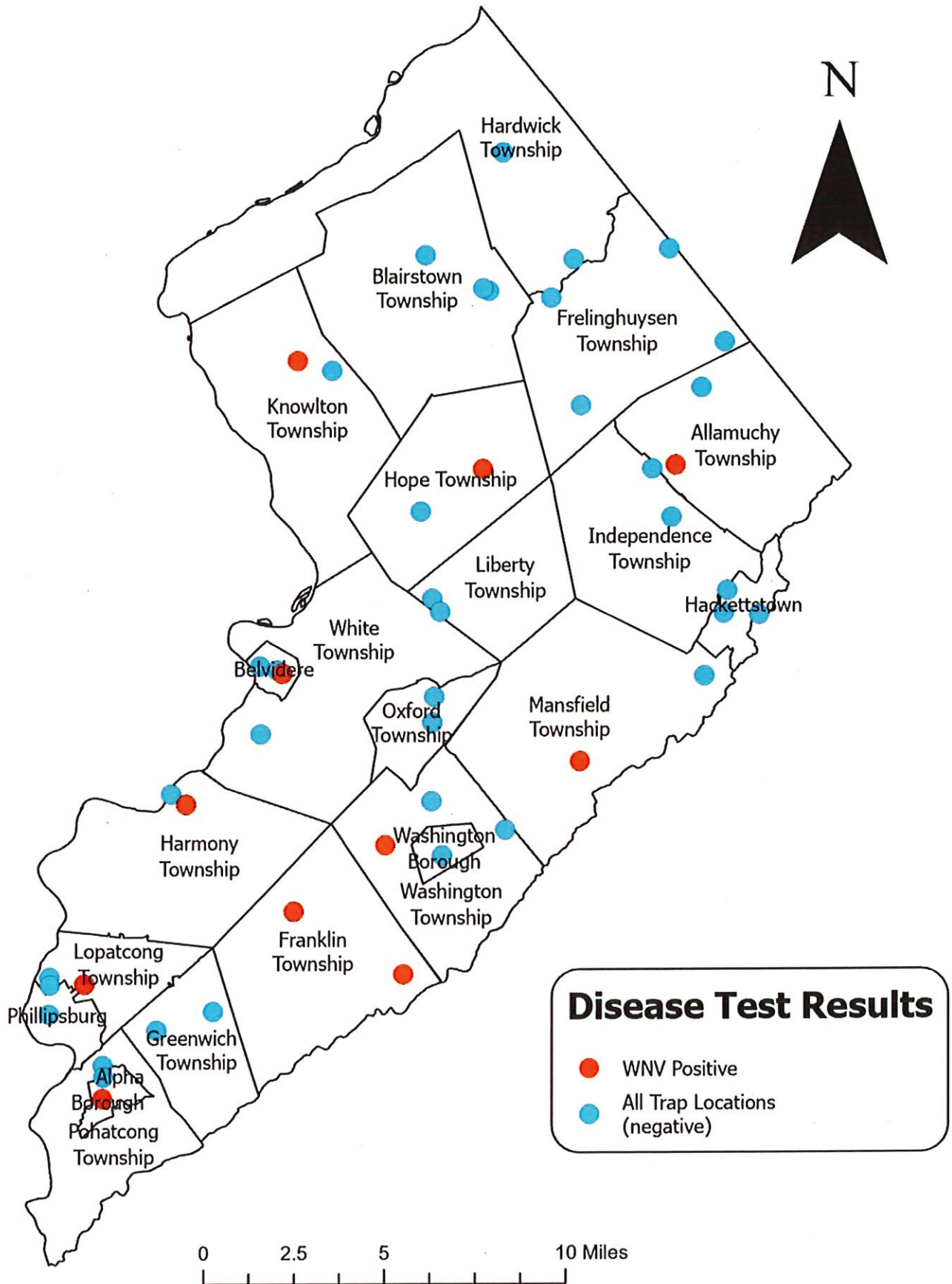
Warren County Mosquito Control Commission Cumulative WNV Positives 1999-2025



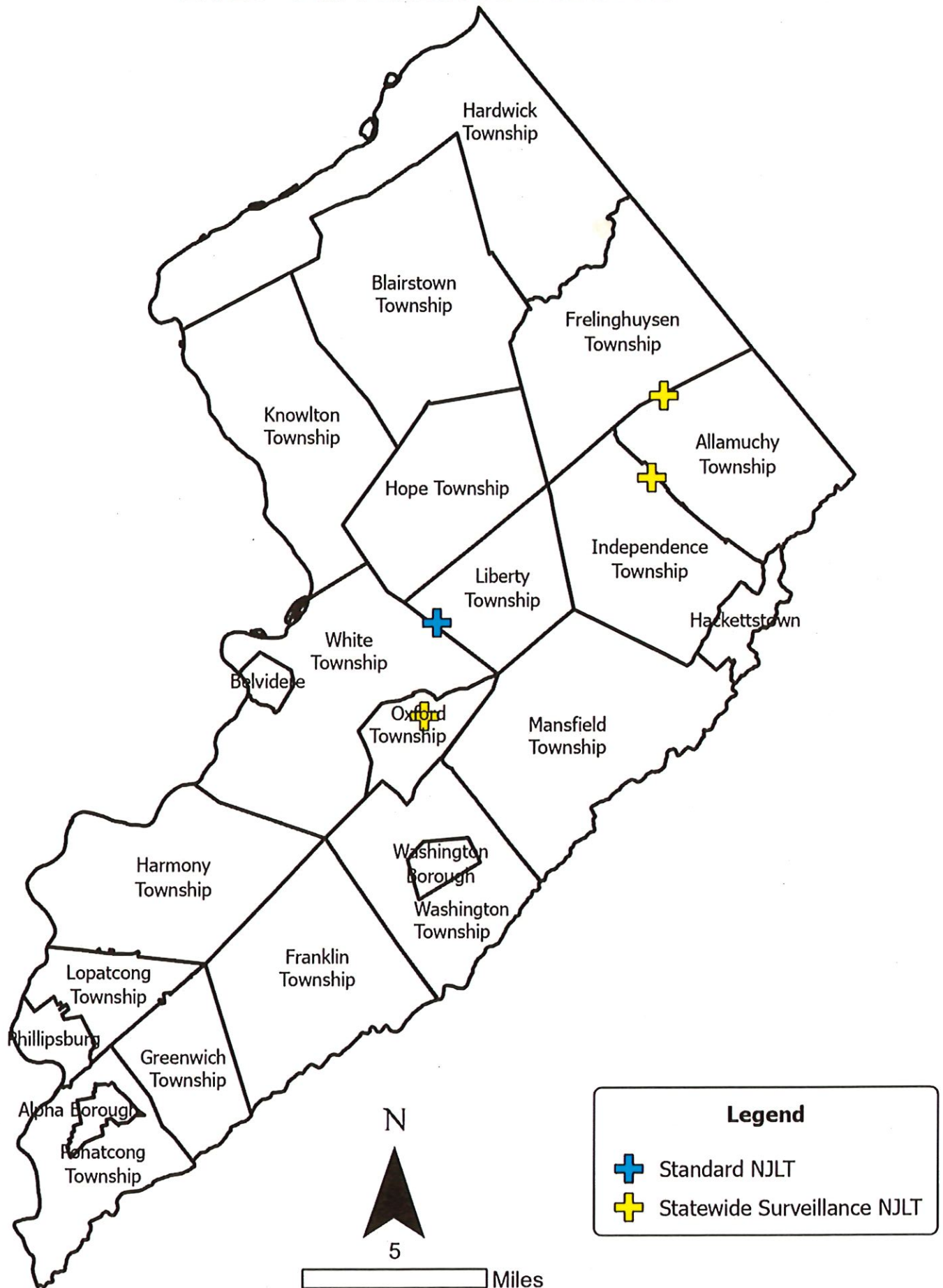
Mosquito Samples by Species
Submitted to PHEL for Mosquito-borne Disease Testing

Species	# Pools	# Mosquitoes	WNV+	EEE+	SLE+	JCV+	LAC+	ZIKV+	DENV+	CHIKV+
<i>Culex pipiens/restuans/salinarius</i>	273	7,900	16	0	0	0	0	0	0	0
<i>Ae. japonicus</i>	70	732	0	0	0	0	0	0	0	0
<i>Ae. triseriatus</i>	49	249	0	0	0	0	0	0	0	0
<i>Ae. albopictus</i>	35	342	0	0	0	0	0	0	0	0
<i>An. punctipennis</i>	15	102	0	0	0	0	0	0	0	0
<i>Cq. perturbans</i>	9	273	0	0	0	0	0	0	0	0
<i>Cx. erraticus</i>	6	37	0	0	0	0	0	0	0	0
<i>Ae. canadensis</i>	6	8	0	0	0	0	0	0	0	0
<i>Cx. restuans</i>	3	7	0	0	0	0	0	0	0	0
<i>An. quadrimaculatus</i>	2	6	0	0	0	0	0	0	0	0
<i>Ae. stimulans</i>	1	75	0	0	0	0	0	0	0	0
<i>Cx. pipiens</i>	1	1	0	0	0	0	0	0	0	0
Total	470	9,732	16	0	0	0	0	0	0	0

Warren County Mosquito Control Commission 2025 Disease Trap Locations



Warren County Mosquito Control Commission 2025 Surveillance Stations



Routine Surveillance Five Year Summary

	2021		2022		2023		2024		2025	
NJ Light Traps	28.60/Trap Night	32,465	11.24/Trap Night	12,666	31.01/Trap Night	34,952	14.28/Trap Night	16,200	27.5/Trap Night	18,401
Mosquitoes Caught										
Species Caught	Ae. vexans Culex spp. An. walkeri An. punctipennis An. quadrimaculatus An. trivittatus Ae. brad/cru Ps. ciliata Ps. howardii Cq. perturbans Cs. melanura Ur. sapphirina Ae. sticticus Ps. ferox Ae. japonicus Ae. stimulans Ps. columbiae Ae. canadensis Ae. cinereus Ae. triseriatus Ae. aurifer Ae. cantator Ae. tormentor Ae. excrucians Damaged Or. signifera Ae. grossbecki Ae. infirmatus	37.67% 22.64% 10.12% 7.63% 3.50% 3.04% 3.02% 2.73% 2.57% 1.97% 1.29% 1.19% 0.84% 0.48% 0.46% 0.31% 0.27% 0.06% 0.05% 0.05% 0.02% 0.02% 0.02% 0.01% 0.01% 0.01% 0.003% 0.003%	Ae. vexans Culex spp. An. punctipennis An. quadrimaculatus Ae. trivittatus Cq. perturbans Ur. sapphirina An. walkeri Cs. melanura Ae. japonicus Ae. cinereus Ae. stimulans Ae. sticticus Ae. triseriatus Ps. ciliata Ps. howardii Or. signifera Ps. ferox Ae. canadensis Ps. columbiae Ae. aurifer Ae. excrucians An. brad/cru Damaged Ae. albopictus Ae. tormentor	31.97% 26.11% 11.52% 8.93% 5.11% 4.84% 3.58% 1.82% 1.37% 1.35% 0.87% 0.55% 0.42% 0.39% 0.35% 0.20% 0.17% 0.12% 0.11% 0.08% 0.05% 0.03% 0.03% 0.02% 0.02% 0.01% 0.01% 0.01%	Culex spp. Ae. vexans An. punctipennis An. quadrimaculatus Ps. ciliata Ae. trivittatus Ur. sapphirina Ae. cinereus Ps. howardii Cq. perturbans An. brad/cru Cs. melanura Ae. japonicus Ps. ferox Ae. sticticus Ae. stimulans Ae. triseriatus Ae. columbiae Or. signifera An. walkeri Ae. canadensis Ae. excrucians Ae. aurifer Ae. albopictus Damaged	39.69% 32.40% 9.30% 5.32% 2.40% 1.91% 1.50% 1.43% 1.28% 1.24% 1.00% 0.93% 0.43% 0.29% 0.17% 0.15% 0.15% 0.11% 0.10% 0.07% 0.06% 0.03% 0.01% 0.01% 0.01% 0.01%	Culex spp. Ae. vexans An. punctipennis An. crucians An. quadrimaculatus Cq. perturbans Cs. melanura Ur. sapphirina Ae. cinereus Ae. japonicus Ae. trivittatus Or. signifera Ae. stimulans An. walkeri Ae. triseriatus Ae. fitchii Ps. ciliata Ps. howardii Ps. columbiae Ae. sticticus Ae. albopictus Ae. aurifer Ae. canadensis Ps. ferox Ae. excrucians Cs. inornata	44.52% 15.25% 9.04% 7.72% 6.55% 5.70% 3.30% 2.39% 1.44% 1.43% 0.60% 0.50% 0.34% 0.30% 0.28% 0.12% 0.10% 0.09% 0.08% 0.06% 0.04% 0.04% 0.04% 0.04% 0.04% 0.02% 0.02%	Ae. vexans Culex spp. An. punctipennis Ae. trivittatus An. quadrimaculatus Ae. cinereus An. walkeri Ae. japonicus Ur. sapphirina Ae. excrucians Cs. melanura Ae. triseriatus Cq. perturbans An. crucians Ae. stimulans Ps. ferox Ps. ciliata Ae. canadensis Ae. stimulans Or. signifera Ae. aurifer Ps. howardii Ae. albopictus Ae. fitchii Cs. inornata Ps. columbiae Damaged	43.13% 25.86% 10.73% 8.43% 2.89% 2.46% 1.28% 0.93% 0.70% 0.53% 0.47% 0.46% 0.42% 0.42% 0.34% 0.33% 0.12% 0.10% 0.10% 0.09% 0.08% 0.08% 0.02% 0.01% 0.01% 0.01% 0.01%

Figure 7a

NJ Light Trap Yearly Comparisons

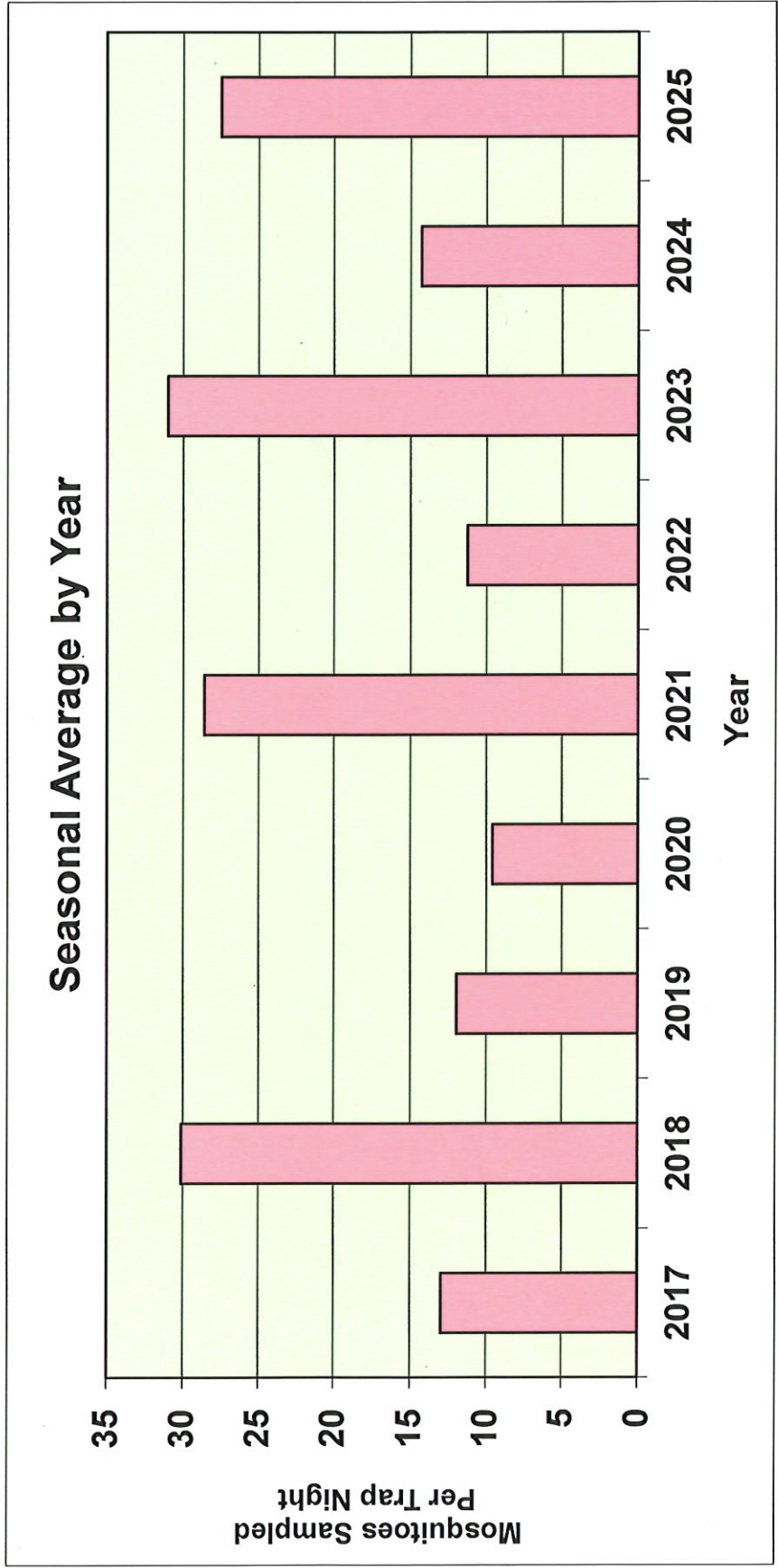


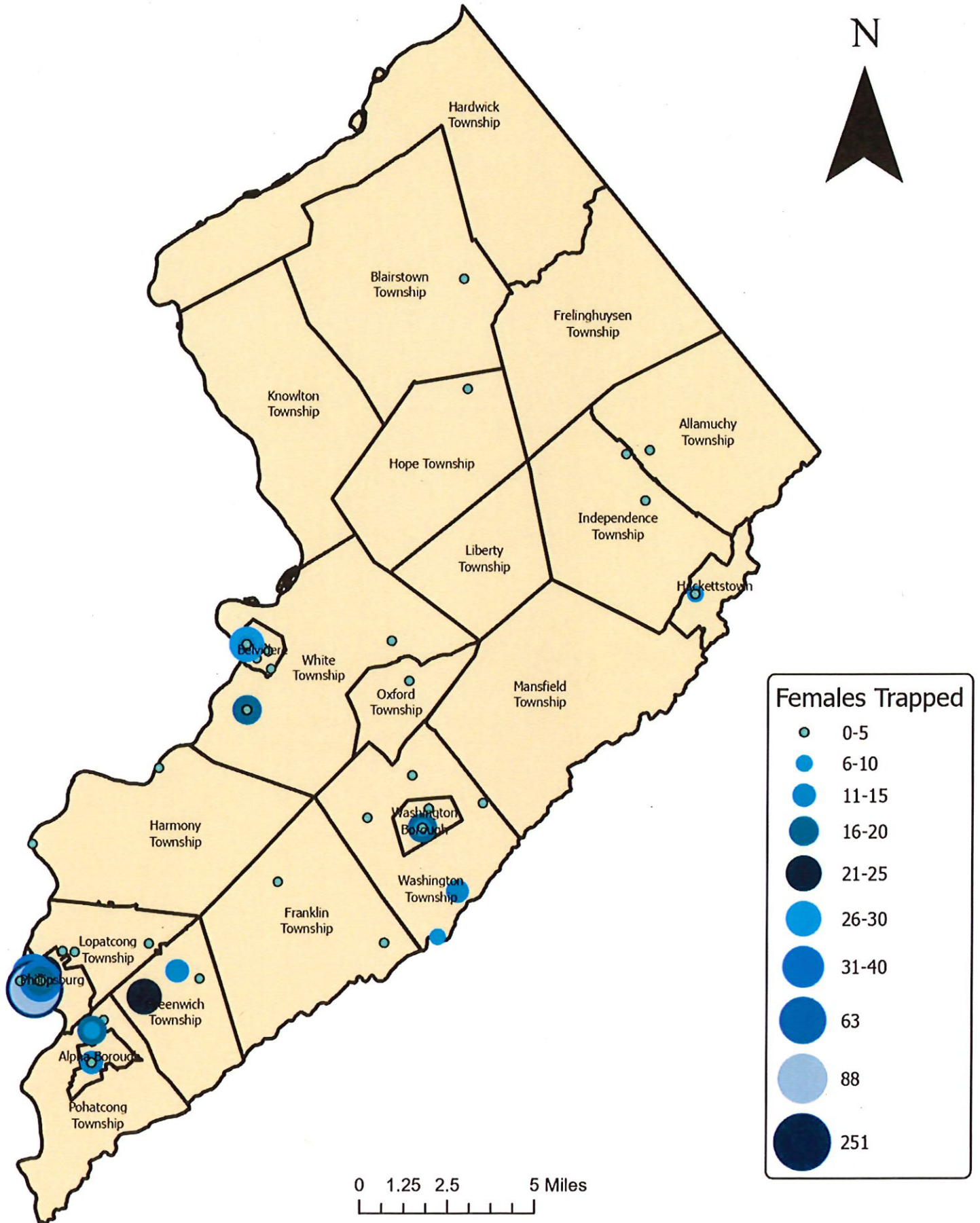
Figure 7b

Warren County Light Trap Collections
2025

LOCATION (site no.)	AEDES													ANOPHELES				CULICETA			PSOROPHORA				UR	TOTAL							
	<i>Ae. albopictus</i>	<i>Ae. auriifer</i>	<i>Ae. canadensis</i>	<i>Ae. cantator</i>	<i>Ae. cinereus</i>	<i>Ae. excrucians</i>	<i>Ae. fitchii</i>	<i>Ae. grossbeckii</i>	<i>Ae. infirmatus</i>	<i>Ae. japonicus</i>	<i>Ae. stimulans</i>	<i>Ae. tomentosus</i>	<i>Ae. triseriatus</i>	<i>Ae. tritarsus</i>	<i>Ae. vexans</i>	<i>An. punctipennis</i>	<i>An. quadrimaculatus</i>	<i>An. walkeri</i>	<i>An. bradleykrucians</i>	<i>Cq. perturbans</i>	<i>Cx. spp</i>	<i>Cs. inornata</i>	<i>Cs. melanura</i>	<i>Cs. morsitans</i>			<i>Or. signifera</i>	<i>Ps. cristata</i>	<i>Ps. columbianus</i>	<i>Ps. ferox</i>	<i>Ps. howardi</i>	<i>Ur. sapphirina</i>	Damaged
Woronowicz; Pequest Road, Oxford (2A)	2				26	13	1			47	2	11	15	533	85	55	2		12	442									1	90			1337
Sehulster; Bear Creek Road, Altamuchy (4A)				7					21		4	24	355	42	9	10			16	480				1	1				6		976		
Iwaszko; Post Lane, Independence (5)	2	1	3		191	85			87	18	60	82	1509	545	377	21			9	2047	1		9	4	21	2	60	9	5	1	11737		
Mountain Lake Fire Company, Liberty (7)		13	16		228				15			8	3	440	1303	90	203	78	41	1789			78	11			1	5	28		4351		
TOTAL	4	14	18	0	452	98	1	0	171	18	62	85	1551	1975	531	236	78	78	4758	2586	1	87	0	16	22	2	61	15	129	1	18401		
% OF TOTAL CATCH	0.02%	0.08%	0.10%	0.00%	2.45%	0.53%	0.01%	0.00%	0.93%	0.10%	0.34%	0.45%	8.43%	43.13%	10.73%	2.89%	1.28%	0.42%	0.42%	25.86%	0.01%	0.47%	0.00%	0.09%	0.12%	0.01%	0.33%	0.08%	0.70%	0.01%	100%		

Figure 9

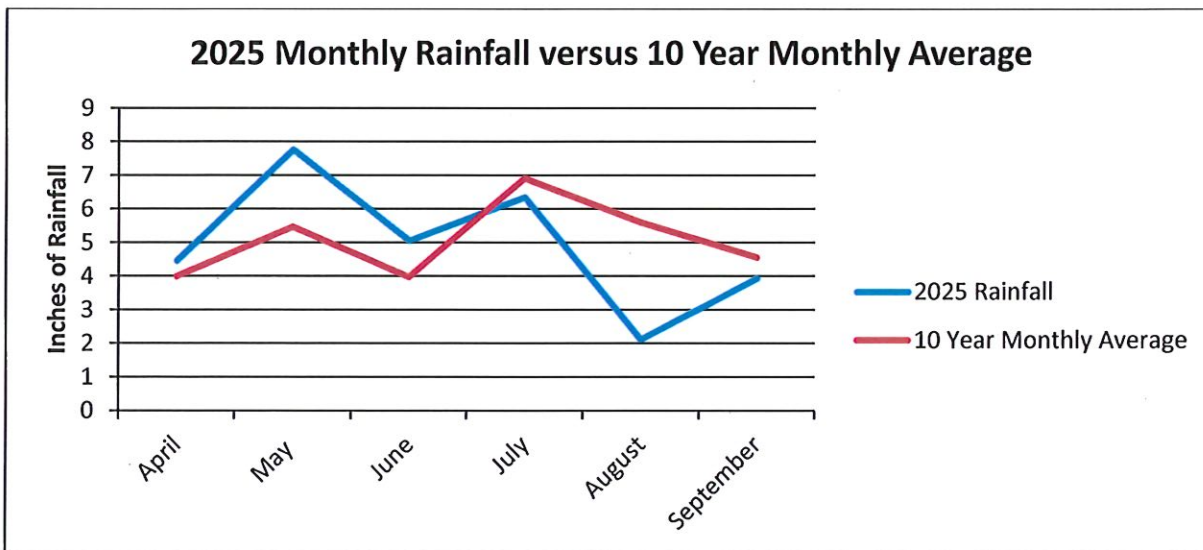
Warren County Mosquito Control Commission 2025 *Aedes albopictus* Distribution



Oxford Rainfall Comparison over Ten Years (April – September)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
April	2.61	3.87	4.49	4.28	3.74	1.91	8.42	2.06	4.12	4.45
May	3.29	4.98	4.81	10.46	4.57	4.70	5.98	3.39	4.71	7.77
June	3.21	4.13	3.57	4.92	3.07	3.11	3.94	7.41	1.37	5.06
July	2.87	8.34	6.54	9.55	6.00	6.83	1.97	16.42	4.34	6.35
August	4.20	4.89	8.23	5.33	8.34	7.45	1.66	7.01	6.76	2.12
September	2.50	3.40	6.77	1.56	3.91	11.35	4.4	6.78	0.99	3.94
TOTAL	18.68	29.61	34.41	36.10	29.63	35.35	26.37	43.07	22.29	29.69

2025 Seasonal Rainfall vs. Ten Year Average



2025 Activity Summary

Figure 12

MUNICIPALITY	Catch Basin Treatments	Routine Larval Inspections	Larval Samples	Service Requests Received	Service Request Adult Samples	Larvicide/Pupicide Applications	Number of Fish Site Stockings	Water Management	Tires Collected	Brush Cutting	Adulticide Applications	Total	
ALL	142	998	36	16	5	4	146	4	0	0	6	9	1,366
ALP	24	20	0	5	5	0	9	0	0	0	0	4	67
BEL	50	75	2	5	3	1	21	0	0	1	1	4	163
BLR	53	906	3	16	9	5	183	7	0	1	0	13	1,196
FRK	59	276	0	2	0	0	60	0	0	61	0	3	461
FRL	3	748	22	32	19	5	213	6	3	0	10	19	1,080
GRN	233	184	4	4	5	0	41	0	4	0	0	4	479
HCK	421	383	4	5	1	0	79	0	1	0	0	0	894
HDW	21	534	1	10	4	2	112	11	0	0	0	6	701
HRM	8	334	4	9	5	0	139	0	1	12	1	4	517
HOP	16	620	6	13	10	5	134	3	4	1	19	10	841
IND	119	1,051	40	11	8	2	188	8	1	0	5	7	1,440
KNL	22	1,060	4	16	11	2	139	9	2	102	1	11	1,379
LIB	50	568	21	7	5	0	155	7	0	0	8	3	824
LOP	242	308	1	3	3	0	87	0	6	0	0	4	654
MNS	243	539	7	1	0	0	99	3	1	0	1	1	895
OXF	68	627	46	1	1	0	140	1	10	1	6	1	902
PBG	72	11	0	13	5	0	14	0	0	2	0	2	119
PHT	156	414	9	5	2	1	96	0	2	0	0	2	687
WAB	126	114	0	1	2	0	25	0	3	14	0	0	285
WAT	269	636	8	7	6	0	132	2	4	3	1	4	1,072
WHT	67	723	17	11	7	2	185	6	20	2	33	7	1,080
TOTAL	2,464	11,129	235	193	116	29	2,397	67	62	200	92	118	17,102

* indicates at least one area-wide application for *Aedes albopictus* control

New Jersey Mosquito Species – 2025

Bolded Species - Sampled in Warren County

Genus *Aedes* (Meigen)

1. *Aedes abserratus* (Felt and Young)
2. *Aedes atlanticus* (Dyar and Knab)
3. *Aedes albopictus* (Skuse)
4. *Aedes atropalpus* (Coquillett)
5. *Aedes aurifer* (Coquillett)
6. *Aedes canadensis canadensis* (Theobald)
7. *Aedes cantator* (Coquillett)
8. *Aedes cinereus* (Meigen)
9. *Aedes communis* (De Geer)
10. *Aedes dorsalis* (Meigen)
11. *Aedes dupreei* (Coquillett)
12. *Aedes excrucians* (Walker)
13. *Aedes fitchii* (Felt and Young)
14. *Aedes flavescens* (Miller)
15. *Aedes grossbecki* (Dyar and Knab)
16. *Aedes hendersoni* (Cockerell)
17. *Aedes implicates* (Vockeroth)
18. *Aedes infirmatus* (Dyar and Knab)
19. *Aedes intruden* (Dyar)
20. *Aedes japonicus* (Theobald)
21. *Aedes mitchellae* (Dyar)
22. *Aedes provocans* (Walker)
23. *Aedes punctor* (Kirby)
24. *Aedes sollicitans* (Walker)
25. *Aedes spencerii spencerii* (Theobald)
26. *Aedes sticticus* (Meigen)
27. *Aedes stimulans* (Walker)
28. *Aedes taeniorhynchus* (Say)
29. *Aedes thibaulti* (Dyar and Knab)
30. *Aedes tormentor* (Dyar and Knab)*
31. *Aedes triseriatus* (Say)
32. *Aedes trivittatus* (Coquillett)
33. *Aedes vexans* (Meigen)

Genus *Anopheles* (Meigen)

34. *Anopheles atropos* (Dyar and Knab)
35. *Anopheles barberi* (Coquillett)
36. *Anopheles bradleyi* (King)
37. *Anopheles crucians* (Weidemann)
38. *Anopheles earlei* (Vargas)
39. *Anopheles punctipennis* (Say)
40. *Anopheles quadrimaculatus* (Say)
41. *Anopheles walkeri* (Theobald)

Genus *Coquillettidia* (Dyar)

42. *Coquillettidia perturbans* (Walker)

Genus *Culex* (Linnaeus)

43. *Culex erraticus* (Dyar and Knab)
44. *Culex pipiens* (Linnaeus)
45. *Culex restuans* (Theobald)
46. *Culex salinarius* (Coquillett)
47. *Culex tarsalis* (Coquillett)
48. *Culex territans* (Walker)

Genus *Culiseta* (Felt)

49. *Culiseta inornata* (Williston)
50. *Culiseta melanura* (Coquillett)
51. *Culiseta minnesotae* (Barr)
52. *Culiseta morsitans* (Theobald)

Genus *Orthopodomyia* (Theobald)

53. *Orthopodomyia alba* (Baker)
54. *Orthopodomyia signifera* (Coquillett)

Genus *Psorophora* (Robineau-Desvoidy)

55. *Psorophora ciliata* (Fabricius)
56. *Psorophora columbiae* (Dyar and Knab)
57. *Psorophora cyanescens* (Coquillett)
58. *Psorophora discolor* (Coquillett)
59. *Psorophora ferox* (von Humboldt)
60. *Psorophora howardii* (Coquillett)
61. *Psorophora mathesoni* (Belkin & Heinemann)

Genus *Toxorhynchites* (Theobald)

62. *Toxorhynchites rutilus septentrionalis* (Dyar and Knab)

Genus *Uranotaenia* (Lynch- Arribalzaga)

63. *Uranotaenia sapphirina* (Osten Sacken)

Genus *Wyeomyia* (Theobald)

64. *Wyeomyia smithii* (Coquillett)

46 species in Warren County

*Most recent addition 7/7/21

2025 GROUND INSPECTION/LARVICIDING DISTRICTS

Known Mosquito Production Sites by Control Approach

DISTRICT 1 (North)									
Township	Regular Sites	Ext Release Briquets	Fish Sites	2 Person Sites	Aerial Sites	Untreated Sites	Ext Release Granual	DT Tablet Sites	TOTAL
Blairstown	55	7	11	0	0	0	0	0	73
Hardwick	29	6	22	0	3	5	0	0	65
Knowlton	60	3	11	0	0	0	0	0	74
Total	144	16	44	0	3	5	0	0	212

DISTRICT 2 (East)									
Township	Regular Sites	Ext Release Briquets	Fish Sites	2 Person Sites	Aerial Sites	Untreated Sites	Ext Release Granual	DT Tablet Sites	TOTAL
Allamuchy	56	1	6	6	18	1	0	0	88
Hackettstown	15	3	0	0	0	16	0	0	34
Independence	62	13	5	5	1	6	0	0	92
Mansfield	48	1	1	1	0	0	0	0	51
Total	181	18	12	12	19	23	0	0	265

DISTRICT 3 (Central)									
Township	Regular Sites	Ext Release Briquets	Fish Sites	2 Person Sites	Aerial Sites	Untreated Sites	Ext Release Granual	DT Tablet Sites	TOTAL
White	39	4	8	1	6	0	0	3	61
Hope	39	9	10	6	2	0	5	4	75
Liberty	35	2	9	0	4	0	1	0	51
Frelinghuysen	57	8	6	1	6	0	2	0	80
Total	170	23	33	8	18	0	8	7	267

DISTRICT 4 (South)									
Township	Regular Sites	Ext Release Briquets	Fish Sites	2 Person Sites	Aerial Sites	Untreated Sites	Ext Release Granual	DT Tablet Sites	TOTAL
Alpha	4	0	0	0	0	0	0	3	7
Belvidere	6	0	0	2	0	0	0	1	9
Franklin	18	2	1	0	0	0	0	0	21
Greenwich	12	0	1	0	0	0	0	0	13
Harmony	30	0	5	0	0	6	0	0	41
Lopatcong	18	0	0	0	0	0	0	4	22
Oxford	30	4	6	3	14	2	0	2	61
Phillipsburg	1	0	0	0	0	0	0	0	1
Pohatcong	23	16	3	0	0	0	0	2	44
Washington Boro.	8	1	0	0	0	0	0	0	9
Washington Twsp.	38	7	6	0	0	0	0	3	54
Total	188	30	22	5	14	8	0	15	282

GRAND TOTAL	683	87	111	25	54	36	8		1,026
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DISTRICTS 1, 2, 3 & 4 Catch Basins

Catch basins throughout the county, inspected and treated bimonthly	1500+
Swimming pools (abandoned/unused) constantly changing status	60+

KEY:

Regular Sites Inspected regularly by one or more inspectors

Ext Release Use of an extended release product for season long control-
-primarily for safety concerns & visited only periodically

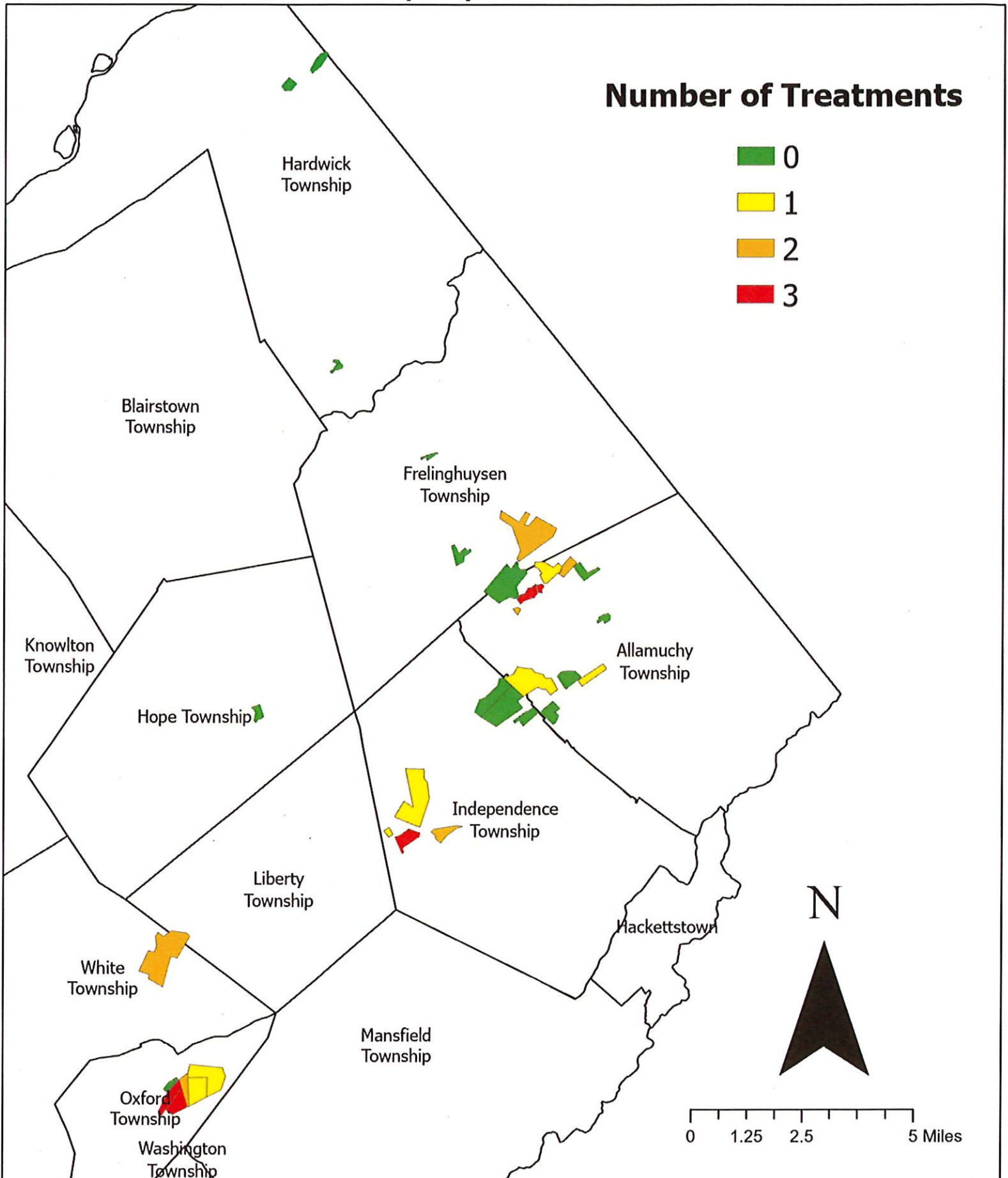
Fish Sites where fish are regularly used for larval/pupal control
-sites visited periodically to check on status of fish

2 Person Sites where inspection in pairs (2 people) is advisable
-primarily due to either size of the flooded area or a safety issue

Aerial Parcels of land inspected seperated and larvicided using aircraft

Untreated While periodically monitored for breeding these sites are left untreated
-primarily due to lack of human population or large size.

Warren County Mosquito Control Commission 2025 Airspray Site Treatments



Summary of 2025 Aerial Applications

Figure 15a

Date	Area	Township	Acres Treated	
5/7/2025	Cat Swamp	Oxford	102	982
	Mountain Lake Bog	Liberty/White	242	
	Dragstrip & Herbies	Independence	90	
	Youngs Island	Independence/Allamuchy	193	
	Rydell Road	Allamuchy	41	
	Rydell & Shades of Death	Allamuchy	5	
6/4/2025	Bear Creek	Allamuchy	309	258
	Cat Swamp	Oxford	132	
	Dragstrip	Independence	51	
	Rydell Road	Allamuchy	41	
	Rydell & Shades of Death	Allamuchy	5	
7/16/2025	Bear Creek	Allamuchy	29	1149
	Cat Swamp	Oxford	132	
	Axford Ave/Cat Swamp	Oxford	205	
	Mountain Lake Bog	Liberty/White	242	
	Dragstrip	Independence	269	
	Herbies	Independence	39	
	Rydell Road	Allamuchy	41	
	Bear Creek	Frelinghuysen	221	

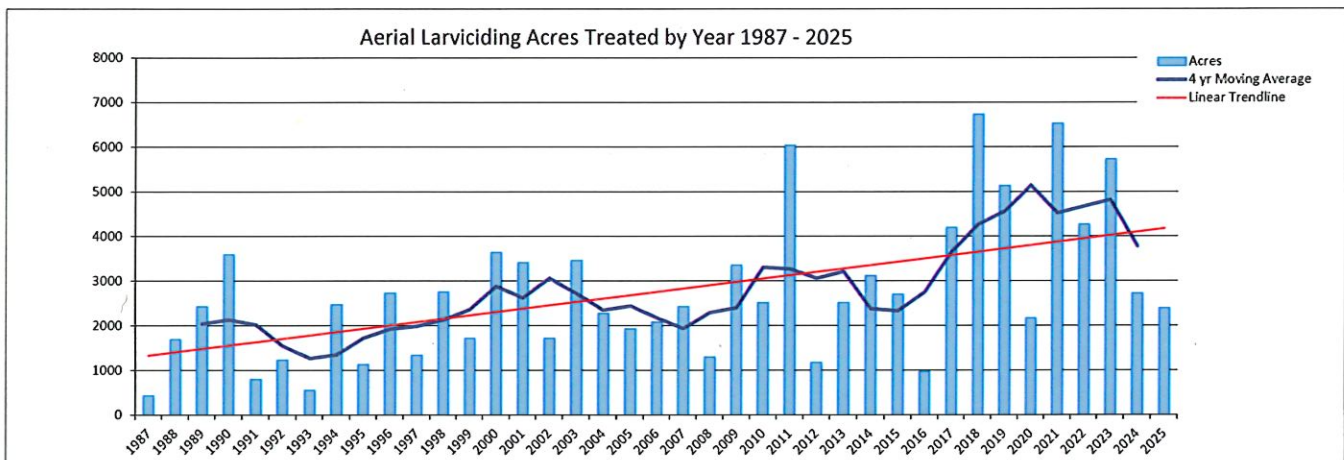


Figure 16c

2025 Tick Pool Summary - SPRING

Site Name	Township	# pools	# ticks tested	# pools positive							Number of total positive pools
				A. phagocytophilum	B. burgdorferi	B. miyamotoi	B. microti	R. rickettsii	POW		
Kinney Road Morris Canal Trail	Allamuchy	37	37	-	12	-	-	-	-	-	12
Paulinskill Valley Trail at Footbridge Park	Blairstown	7	7	-	-	-	-	n/a	-	-	0
Ballfields on Rt94 behind Alpine Meats	Blairstown	n/a	n/a	No ticks tested							
Asbury Firehouse Ballfields	Franklin	n/a	n/a	No ticks tested							
Frelinghuysen Forest Preserve	Frelinghuysen	83	83	9	18	1	10	n/a	-	-	38
Johnsonburg Swamp Preserve	Frelinghuysen	62	62	4	14	-	7	n/a	-	-	25
Strykers Road Morris Canal Trail	Greenwich	n/a	n/a	No ticks tested							
Morris Canal Greenway Richline Hill Road	Greenwich	n/a	n/a	No ticks tested							
Florence Kuipers Morris Canal Trail	Hackettstown	102	102	3	20	1	2	n/a	-	-	26
White Lake Orange Trail	Hardwick	n/a	n/a	No ticks tested							
National Water Gap: Coventry Pond Trail	Hardwick	31	31	1	10	1	2	n/a	-	-	14
National Water Gap: Orchard Trail at Millbrook Village	Hardwick	69	69	2	15	3	7	n/a	-	-	27
National Water Gap: Hamilton/Pioneer Trail	Hardwick	46	46	5	11	1	7	n/a	1	-	25
Merrill Creek Reservoir	Harmony	9	9	0	1	0	0	n/a	-	-	1
Swayze Mill Park	Hope	n/a	n/a	No ticks tested							
Paulinskill Valley Trail at Station Road	Knowlton	26	26	4	15	-	4	n/a	-	-	23
Hainesburg River Road Wildlife Management Area	Knowlton	2	2	-	1	-	1	n/a	-	-	2
Port Murray Preserve Morris Canal Trail	Mansfield	104	104	6	37	2	22	-	-	-	67
Jane Chapel Pequest Road WMA	Mansfield	30	30	1	17	-	3	n/a	-	-	21
Oxford Mountain	Oxford	18	18	-	1	1	1	n/a	-	-	3
Delaware Heights Athletic Fields	Phillipsburg	n/a	n/a	No ticks tested							
Shabbecong Mountain Preserve	Washington Borough	n/a	n/a	No ticks tested							
Dick Flint Trail	Washington Township	31	31	2	6	-	3	n/a	-	-	11
Lake Marguerite	Washington Township	1	1	-	-	-	-	n/a	-	-	0
Pohatcong Arboretum	Washington Township	2	2	-	-	-	-	n/a	-	-	0
White Township Ballfields	White Township	0	0	No ticks tested							0
TOTAL		660	660	37	178	10	69	0	1	1	295

*56 co-infections

*4 tri-infections

2025 Tick Pool Summary - FALL

Site Name	Township	# pools	# ticks tested	# pools positive						Number of total positive pools
				A. phagocytophilum	B. burgdorferi	B. miyamotoi	B. microti	R. rickettsii	POW	
Kinney Road Morris Canal Trail	Allamuchy	7	7	-	3	1	2	n/a	-	6
Paulinskil Valley Trail at Footbridge Park	Blairtown	2	2	1	1	-	-	n/a	-	2
Ballfields on Rt194 behind Alpine Meats	Blairtown	0	0	No ticks tested						0
Asbury Firehouse Ballfields	Franklin	2	2	-	-	-	-	n/a	-	0
Frelinghuysen Forest Preserve	Frelinghuysen	2	2	-	1	-	-	n/a	-	1
Johnsonburg Swamp Preserve	Frelinghuysen	51	51	7	30	-	8	n/a	1	46
Strykers Road Morris Canal Trail	Greenwich	12	12	-	5	-	2	n/a	-	7
Morris Canal Greenway/Richline Hill Road	Greenwich	11	11	-	5	1	1	n/a	-	7
Florence Kuipers Morris Canal Trail	Hackettstown	15	15	2	4	-	1	n/a	-	7
White Lake Orange Trail	Hardwick	2	2	-	1	1	-	n/a	-	2
National Water Gap: Coventry Pond Trail	Hardwick	52	52	2	28	1	6	n/a	-	37
National Water Gap: Orchard Trail at Millbrook Village	Hardwick	74	74	9	47	3	22	n/a	3	84
National Water Gap: Hamilton/Pioneer Trail	Hardwick	36	36	8	19	1	6	n/a	-	34
Merrill Creek Reservoir	Harmony	2	2	-	1	-	1	n/a	-	2
Swayze Mill Park	Hope	0	0	No ticks tested						0
Paulinskil Valley Trail at Station Road	Knowlton	10	10	2	4	-	2	n/a	-	8
Hainesburg River Road Wildlife Management Area	Knowlton	5	5	-	4	-	1	n/a	-	5
Port Murray Preserve Morris Canal Trail	Mansfield	21	21	2	8	1	4	n/a	-	15
Jane Chapel Pequest Road WMA	Mansfield	2	2	1	-	-	-	n/a	-	1
Oxford Mountain	Oxford	7	7	1	3	-	1	n/a	1	6
Delware Heights Athletic Fields	Phillipsburg	2	2	-	1	-	1	n/a	-	2
Shabbecong Mountain Preserve	Washington Borough	3	3	2	2	-	-	n/a	-	4
Dick Flint Trail	Washington Township	0	0	No ticks tested						0
Lake Marguerite	Washington Township	n/a	n/a	No ticks tested						
Pohatcong Arboretum	Washington Township	7	7	3	4	-	-	n/a	-	7
White Township Ballfields	White Township	16	16	1	8	-	2	n/a	-	11
TOTAL		341	341	41	179	9	60	0	5	294

*55 co-infections
 *14 tri-infections
 *2 quad-infection