

**Draft**  
**Scoping Document for the Draft**  
**Generic Environmental Impact**  
**Statement (GEIS) for the Nassau**  
**County Mosquito Control and**  
**Surveillance Program**

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**Prepared for:**

**Nassau County Department of Public Works**  
**and**  
**Nassau County Department of Health**

**Prepared by:**

**ECOLOGY AND ENVIRONMENT, INC.**  
90 Broad Street  
New York, New York 10004

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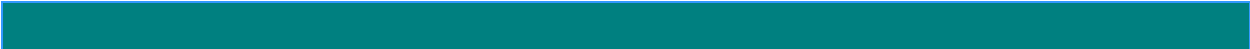
  

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# List of Abbreviations and Acronyms

CDC	Centers for Disease Control
EAF	environmental assessment form
ECL	Environmental Conservation Law
EEE	eastern equine encephalitis
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
GEIS	generic environmental impact statement
IPM	integrated pest management
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSDS	Material Safety Data Sheet
NCDOH	Nassau County Department of Health
NCDPW	Nassau County Department of Public Works
NEPA	National Environmental Policy Act
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOS	New York State Department of State
SEQRA	State Environmental Quality Review Act
SHPO	State Historic Preservation Office

## List of Abbreviations and Acronyms (cont.)

SWB	storm water recharge basin
ULV	ultra-low volume
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WNV	West Nile virus

# 1

## Introduction

### 1.1 Nassau County Mosquito Control and Surveillance Program

The Nassau County Department of Public Works (NCDPW) and Department of Health (NCDOH)'s Mosquito Control and Surveillance Program incorporates what is known as the integrated pest management (IPM) approach, which focuses on long-term suppression or prevention with a minimal impact on the environment and on non-target organisms. IPM principles promote using all reasonable measures to prevent mosquito problems by properly identifying species, monitoring population dynamics, and using physical, biological, or chemical population-control methods to reduce the mosquito population to acceptable levels. Specifically, IPM helps control the spread of mosquitoes through surveillance of mosquito breeding areas, preventing the development of adult mosquitoes; trapping adult mosquitoes; testing the trapped mosquitoes for disease; responding to complaints; and treating infested areas.

The objective of this *Scoping Document for the Draft Generic Environmental Impact Statement (GEIS) for the Nassau County Mosquito Control and Surveillance Program* is to identify any potentially significant adverse impacts of the program and to preclude consideration of impacts that are irrelevant or insignificant. This draft scoping document has been made available for review and comment by agencies involved in developing the draft GEIS, other interested agencies, and the public. Adequate meeting and review time has been planned to ensure their input on the final scope of the Program.

The GEIS will address all future mosquito control program activities by Nassau County, including water management in Nassau County that affect mosquito and mosquito larvae populations.

### 1.2 New York State Environmental Quality Review Act Considerations

The New York State Environmental Quality Review Act (SEQRA), as set forth in Article 8 of the New York State Environmental Conservation Law (ECL) and the SEQRA-implementing regulations located in 6 New York Codes, Rules, and Regulations (NYCRR) Part 617, applies to any public agency with the authority to issue a discretionary permit or approval for an action or to an agency that funds



or directly undertakes an action. The Mosquito Control and Surveillance Program described below requires review in accordance with SEQRA because Nassau County is funding and approving the Program.

The draft *Generic Environmental Impact Statement (GEIS) for the Nassau County Mosquito Control and Surveillance Program* will be developed in accordance with 6 NYCRR Part 617.10(a) of the SEQRA regulations. SEQRA defines a GEIS as “an entire program or plan having wide application or restricting the range of future alternative policies or projects.” “[G]eneric EISs and their findings should set forth specific conditions or criteria under which future actions will be undertaken or approved, including requirements for any subsequent SEQRA compliance.”

SEQRA requires the review of any action taken by a governmental body that might have an effect on the environment. If the proposed action will have an effect on the environment, the action is then classified as a Type I, Type II, or Unlisted action.

- Type I actions are specifically listed in NYCRR Part 617.4(6)(i) as “a project or action that involves the physical alteration of 10 acres.” NYCRR Part 617.2(ab) includes in the definition of “physical alteration” any “application of pesticides, herbicides, or other chemicals.”
- Type II actions include activities conducted on an emergency basis for the protection of life, health, property, or for the preservation of natural resources (6 NYCRR §617.5(b)(33)).

Because the ongoing seasonal nature of the program fails to meet the standard of an “emergency” under this part the Nassau County Department of Public Works has undertaken the SEQRA review of the Program as a Type I action.

Under SEQRA, the agency must take a “hard look” at the potential environmental impacts of the proposed action through the process of completing an Environmental Assessment Form (EAF). If the agency finds that environmental impacts are potentially significant through its review of an EAF, then the agency must issue a “positive declaration” of potential impacts and proceed with a draft environmental impact statement (EIS). This step was completed on June 24, 2009, with the filing of the EAF with the New York State Department of Environmental Conservation (NYSDEC), a declaration of lead agency status by the Nassau County Department of Public Works,(NCDPW) and the positive declaration. The next step in the SEQRA process is scoping.

### **1.3 Description of the Scoping Process**

SEQRA defines scoping as the process by which the lead agency, the NCDPW in this case, identifies the potentially significant adverse impacts related to the proposed action that are to be addressed in the draft GEIS, including the content and level of detail of the analysis, the range of alternatives, the mitigation meas-

ures needed, and the identification of non-relevant issues. Scoping provides the preparers of the GEIS with guidance on matters that must be considered and provides an opportunity for early participation by involved agencies and the public in the review of the proposed action [6 NYCRR Part 617.2(af)].

Although SEQRA indicates that scoping is not required [6 NYCRR Part 617.8], it may be initiated by the lead agency or preparer of the GEIS. If scoping is conducted, then it must include the opportunity for public participation. The lead agency may either determine a time period for the public to review the draft scope document and provide written comments or hold a series of meetings for interested individuals and agencies to comment and/or provide written material on the draft scope document. The lead agency must then provide a final written scope to the project sponsor, all involved agencies, and any individual who has expressed an interest in writing to the lead agency within 60 days of receipt of a draft scope. The final scope of the draft GEIS should include the following:

- A brief description of the Program
- The potentially significant adverse impacts identified both in the positive declaration and as a result of consultation with the other involved agencies and the public, including an identification of the particular aspect(s) of the environmental setting that may be affected by the Program
- The extent and quality of information needed for the preparer to adequately address each impact, including an identification of relevant existing information, required new information, and the required methodology(ies) for obtaining new information
- An initial identification of mitigation measures
- The reasonable alternatives to be considered
- An identification of the information/data that should be included in an appendix rather than the body of the GEIS
- Any prominent issues that were raised during scoping and determined to be not relevant or not environmentally significant or that have been adequately addressed in a prior environmental review [6 NYCRR Part 617.8(f)].

Nassau County has decided to conduct a formal scoping process, including a public scoping period, because of the importance of the county's mosquito control program and the number of agencies, individuals, and other groups within the county that have expressed an interest in the program.

This draft scoping document was prepared by the Nassau County Department of Public Works with support from consultants and is being disseminated for public review on 10/13/2009. A public scoping meeting will be conducted by the Nas-

## **1. Introduction**

sau County Department of Public Works on November 18, 2009. There will be an afternoon session from 2pm to 4pm and an evening session from 7pm to 9pm.

Comments on this scope document may be made at the public scoping meeting. Written comments will be accepted via mail at the following address:

Nassau County Department of Public Works  
c/o: Mosquito Control Comments on Draft Scope  
1194 Prospect Avenue  
Westbury, NY 11590-2723

Written comments will also be accepted via e-mail at:

[MosquitoControl@nassaucountyny.gov](mailto:MosquitoControl@nassaucountyny.gov)

NCDPW will accept comments until 5:00 p.m. on December 31, 2009.

# 2

## Nassau County Mosquito Control and Surveillance Program Overview

### 2.1 Introduction

#### 2.1.1 Mosquito-Borne Diseases

Mosquitoes carry many diseases that can affect human, livestock, and wildlife populations. Fortunately, many of the worst diseases, including yellow fever and dengue fever, are not present in the United States. Malaria cases are known to occur in the United States, however very few are local mosquito-borne transmitted cases. The last reported local mosquito-borne transmission case occurred in Florida in 2003 (CDC, 2003). The majority of malaria cases diagnosed in the United States each year are imported by travelers who have traveled to regions where malaria transmission is known to occur, such as Africa and Asia. Congenital infections and infections resulting from exposure to blood are also reported in the United States (CDC, 2009). In Nassau County, mosquitoes represent a nuisance and they do carry diseases such as the West Nile Virus that represent a public health concern.

#### West Nile Virus

West Nile virus (WNV) is a viral disease that was first reported in North America in 1999 and has spread across the United States. It produces flu-like symptoms that can be mild but have resulted in fatalities. There is no known treatment for the disease and care is limited to the management of symptoms.

Birds have been implicated as the reservoir or source of the West Nile virus. When a mosquito bites a bird that is infected with WNV, the mosquito can then spread the virus to another bird, animal, or human. The American crow is especially sensitive to WNV. Although most birds are sick for only a few days and fully recover with immunity to a new infection, crows are likely to die from the disease. (For this reason part of the Mosquito Control Program is to record information on dead birds and to test the birds for WNV.)

Recent cases of WNV in humans in New York State show that Nassau County has a higher incidence of the disease than other counties in the state. Table 2-1 shows the total cases of WNV in New York State for the last few years. These cases were all reported from July to October, with the greatest number of cases in August and September each year.

## 2. Nassau County Mosquito Control and Surveillance Program Overview

**Table 2-1 Cumulative Human West Nile Virus Cases by New York County (2005 to 2008)**

	2008	2007	2006	2005
Bronx County	1	2	1	3
Kings County	3	6	0	3
Nassau County	20	2	5	12
New York County	1	1	1	1
Niagara County	0	0	1	0
Onondaga County	0	0	1	0
Queens County	5	7	2	5
Richmond County	5	2	8	2
Rockland County	0	1	0	0
Suffolk County	9	0	2	9
Wayne County	0	0	1	0
Westchester County	2	1	2	3
Totals	46	22	24	38

Source: [http://diseasemaps.usgs.gov/wnv\\_historical.html](http://diseasemaps.usgs.gov/wnv_historical.html)

These data indicate that WNV is a serious disease in Nassau County. The higher incidence of WNV is most likely a result of relatively high human population densities located in the suburban areas of the County that could potentially have sources of standing water. Standing water provides a breeding ground for mosquitoes..

### Eastern Equine Encephalitis

Horses and other large mammals are also susceptible to infection from mosquito-borne viral illnesses, including not only WNV but also eastern equine encephalitis (EEE). Horses and humans are not considered reservoirs or a source of infection for EEE.

The EEE virus is transmitted to humans through the bite of an infected mosquito. There has never been a human case of EEE in Nassau County, and only two human cases have been diagnosed in New York State in the past 20 years. A vaccine is available to protect horses, but there is no vaccine for humans.

EEE symptoms in humans usually appear within 5 to 15 days after the bite of an infected mosquito. Symptoms range from a mild flu to inflammation of the brain, coma, and death. It is one of the most pathogenic mosquito-borne diseases in the U.S. with a reported case fatality rate of 35%.

### 2.1.2 Mosquito Habitat and Seasonality

#### Mosquito Habitat

Mosquitoes have four distinct stages in their life history: the egg, larva, pupa, and adult. Adults feed on plant materials; only females feed on the blood of birds or mammals to provide the nourishment needed for their eggs to develop. Adults mate and the females lay eggs in water or damp soil that may become inundated.



## **2. Nassau County Mosquito Control and Surveillance Program Overview**

The eggs hatch into larvae, which look wormlike and feed on microorganisms, including algae. They grow and molt through four stages and undergo a metamorphosis during which they become pupae, the non-feeding stage where the wings develop internally. The pupae emerge as adults to complete the life cycle.

The larvae, also known as “wrigglers,” and the pupae, sometimes called “tumblers,” require a water habitat. Although the larvae live and get their food in the water, they must come to the surface for air or obtain air from the underwater portions of aquatic plants. Mosquitoes have adapted to most kinds of aquatic habitats except running water and the open water of lakes, seas, and oceans.

Different species of mosquitoes prefer certain types of aquatic habitat and can be categorized based on this preference. Habitat types are permanent pools; transient water; floodwater; and artificial containers (e.g., tires and un-maintained swimming pools) and natural containers such as holes in tree stumps. Mosquitoes preferring permanent pools are generally found in fresh bodies of quiet water. Typical habitats are permanent, shallow marginal ponds, lakes, and smaller impoundments. Transient habitats include waters found in storm drains, roadside ditches, clogged streams, and puddles. Both permanent and transient habitats for mosquitoes are present in Nassau County. Floodwater mosquito species prefer areas that are intermittently inundated with water. (The tidal marshes on the county’s north and south shores provide extensive areas of floodwater habitat.) Artificial containers and holes in trees are extremely common in all residential areas of the county. Swimming pools, bird baths, rain gutters, old tires, pails, cans, children’s toys, or any object that can collect and hold water may serve as a breeding site.

### **Mosquito Season**

The mosquito life cycle is temperature-dependent. Mosquitoes are usually active beginning in March and remain active until freezing weather. Nassau County’s mosquito control program operates throughout the year. The busiest time begins in May and lasts until October, but mosquito larvae have been found as late as November. Mosquitoes sometimes over-winter as adults in residences, street drains, and other warm/moist places, emerging on mild days. Storms from April through October bring about mosquito breeding as do higher than normal tides, which affect the egg hatching of the salt marsh mosquito.

The duration of the life cycle during the growing season depends on temperature and species and can take as little as four days or as long as several weeks to complete the entire life cycle. The accumulation of water, with the presence of organic matter in any container, depression, or object for as little as four days or as long as one to two weeks can serve as a breeding site for mosquitoes. Thus, rainfall plays a significant role in the reproductive cycle of the mosquito. Air temperature is also a factor as cold weather reduces mosquito activity.

## **2. Nassau County Mosquito Control and Surveillance Program Overview**

### **2.2 Legal and Regulatory Setting**

#### **2.2.1 State and Federal Pesticide Regulations**

Under the authority of Chapter XII, Title F, Sections 12-20.0 – 12-29.0 of the Nassau County Administrative Code, Nassau County is responsible for controlling and/or exterminating mosquitoes in the county. Accordingly, the county's mosquito control unit addresses mosquito infestations that threaten public health or that create significant nuisance problems in the communities in which they occur.

All activities of the county's Mosquito Control Program are conducted in strict compliance with all applicable state and federal regulations. When pesticides are needed, only those registered for use in New York State are used. The county files for and obtains NYSDEC Aquatic Pesticide permits for any product that may be used. These permits are applied for every year and the county complies with conditions stated in these permits and follows the product label directions for use of these pesticides. In accordance with the State Pesticide Reporting Law, a report of all pesticide usage is required to be sent to NYSDEC each year.

#### **2.2.2 State and Federal Coastal Zone and Wetland Regulations**

Some wetlands management activities require permits from NYSDEC and, potentially, from the U.S. Army Corps of Engineers (USACE). Activities within a coastal zone require a Consistency Review from the New York State Department of State (NYSDOS). Any work conducted in National Wildlife Refuges requires review under the National Environmental Policy Act (NEPA) and may require federal special use permits.

### **2.3 History of Nassau County's Mosquito Control Program**

Mosquito control began in Nassau County in 1915 as a response to mosquito-borne malarial outbreaks (Nassau County 2005). Kerosene and No. 2 fuel oil were used to coat bodies of standing water, suffocating the mosquito larvae and reducing the adult mosquito populations. The malarial threat was under control by 1920, but the practice of spraying oil on standing water continued for mosquito nuisance control. In the 1930s, after the formation of a Mosquito Commission in Nassau County, ditching became an effective way of draining salt marshes, thereby reducing mosquito breeding areas. In 1948, the NCDPW took over mosquito control in Nassau County. At that time existing control measures were improved by mechanizing ditching procedures, using spray trucks, and using new mosquito-control products. When the NCDOH joined the Mosquito Control Program in 1996, surveillance activities were greatly enhanced, as were analytical and virus-testing abilities (Nassau County 2002).

In 1999, with the outbreak of West Nile virus, Nassau County expanded its Mosquito Control Program using IPM principles. IPM uses non-chemical means to control pests, including mosquitoes, wherever possible. Pesticides are used only if other methods of control fail and the potential risk of not controlling the mosquitoes outweighs the risk of disease or nuisance they might cause. As part of the



## **2. Nassau County Mosquito Control and Surveillance Program Overview**

Program developed for this GEIS, a Mosquito Control Plan will be developed annually to manage the mosquito problem in the County. The current Plan will be included as an appendix to the draft GEIS.

### **2.4 Nassau County's Mosquito Control and Surveillance Program**

#### **2.4.1 Monitoring Mosquito Populations**

Monitoring the mosquito larval and adult stages is an integral part of any effective IPM program. Two methods of monitoring actual and/or potential mosquito populations are “dipping” for larvae and “trapping” adult mosquitoes with CDC (Centers for Disease Control) light traps, Gravid traps, Faye-Prince traps, and New Jersey light traps (see Section 2.341.2 below)

##### **2.4.1.1 Dipping for Mosquito Larvae**

The most effective means of controlling mosquito populations is to identify breeding sites so that they can be modified to prevent standing water conditions conducive to mosquito breeding and/or treated to kill the larvae before they become flying, biting, adult mosquitoes.

“Dipping” for larvae is the sampling technique used to estimate the number of larvae present in standing water. A dipper consists of a long pole with a cup on the end. Larvae are collected, counted, and, when feasible, identified as to species and larval stage to determine the type of mosquito that is breeding in the body of water and the necessary treatment.

The results from the dipping surveys determine if control measures are necessary and what measures to take to reduce mosquito populations. IPM practices call for using pest control products only when mosquito numbers are high, so dipping plays an important role in minimizing the use of pesticides. When numbers of larvae are excessive, physical control methods and/or the appropriate larvicide may be applied. All chemical treatments are applied in compliance with the product labels and permits obtained from NYSDEC.

##### **2.4.1.2 Trapping**

Nassau County uses four different kinds of traps: CDC light traps, gravid traps, Faye-Prince traps, and New Jersey light traps. Trapping provides important and detailed information about mosquito populations:

- The adult mosquito population throughout the county at any given time can be estimated.
- Specific areas with high mosquito populations can be identified.
- The genus and species of the mosquitoes can be identified.
- The mosquitoes can be tested for diseases, particularly WNV and EEE.



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- The effectiveness of control methods can be assessed.

When the number of adult mosquitoes is found to be high, those breeding areas are examined and documented. The appropriate control methods are then implemented at the sites as necessary. After trapping, the mosquitoes are delivered to the NCDOH laboratory for identification and enumeration. The mosquitoes are then sorted into groups or “pools” by species and type and shipped to the New York State Department of Health (NYSDOH) laboratory for viral testing.

### Trapping Methods

**CDC Light Traps.** CDC light traps use a combination of light (battery-operated) and carbon dioxide to attract mosquitoes. Carbon dioxide comes from the sublimation of dry ice, which is simply frozen carbon dioxide. Dry ice converts directly to gaseous carbon dioxide at ambient temperatures. CDC traps are placed at designated trap sites throughout the season.

**Gravid Traps.** “Gravid” refers to the female mosquito when she is heavy with eggs. Generally, a blood meal is required to provide the nourishment necessary to develop and deposit her eggs. Gravid mosquitoes are considered to have a higher probability of carrying disease because they are more likely to have taken a blood meal.

A gravid trap consists of a tray containing standing water and a high amount of organic matter necessary to nourish mosquito larvae once they emerge from their eggs. Just above the water level in the tray is a cylinder with a battery-driven fan. As mosquitoes fly into the tray to deposit their eggs on the putrid water, the fan sucks the mosquitoes into a collection bag. Gravid traps are more effective later in the season when mosquitoes have obtained blood meals; therefore fewer gravid traps are set than CDC traps.

**Faye-Prince Traps.** Faye-Prince traps use only carbon dioxide as an attractant and capture active daytime mosquitoes. The trap design is based upon the attractiveness of contrasting glossy black and white panels and uses a wind-orienting cover.

**New Jersey Light Traps.** New Jersey light traps attract mosquitoes solely by light and are suitable for monitoring the large numbers of salt marsh mosquitoes found on the shores of Nassau County. New Jersey light traps are somewhat limited because they require an electrical outlet rather than batteries. New Jersey traps also tend to damage the mosquito specimens, which makes species identification difficult, so the county uses New Jersey traps only to estimate mosquito populations without particular attention to the species.

## **2. Nassau County Mosquito Control and Surveillance Program Overview**

### **2.4.2 Water Body Surveys**

#### **2.4.2.1 Boat Surveys**

There are more than 100 bodies of land (hummocks, meadows, marshes, fields, islands) on the south shore bays of Nassau County. Most of these bodies of land are under water at high tide and therefore are not suitable mosquito breeding grounds. However, the few islets that do remain wholly or partially above a typical high tide are capable of breeding the golden salt marsh mosquito (*Ochlerotatus sollicitans*) and other salt marsh mosquito species. These mosquitoes are periodically monitored by boat.

#### **2.4.2.2 Salt Marsh Surveys**

Salt marsh areas, especially those on the south shore of Nassau County, are potential breeding sites for mosquitoes. High tides, storm water, or heavy rains can cause areas not normally covered by daily tidal activity to flood, hatching mosquito eggs within minutes of contact with the water. Therefore, at the beginning of each week during mosquito season, the marsh areas are surveyed and larvicide is applied where necessary.

#### **2.4.2.3 Upland Surveys**

In addition to the salt marsh surveys, many upland stream, drain, pond, and freshwater marsh surveys are made to determine mosquito breeding potential and especially to determine the suitability of these sites as breeding areas for the swamp mosquito (*Culiseta melanura*) and the Northern house mosquito (*Culex pipiens*), mosquitoes that are involved in the bird-to-bird/human transmission of EEE and WNV.

#### **2.4.2.4 Storm Water Recharge Basin Surveys**

Storm water recharge basins (SWBs), commonly called sumps, are designed to return surface water runoff to the groundwater table. There are approximately 780 SWBs in Nassau County, and 612 are managed by the county. The remaining 196 are managed by local municipalities. At times, these SWBs retain enough water for mosquitoes to breed. Some SWBs become a dumping ground for old tires and debris that collect rainwater and serve as ancillary breeding sites for mosquitoes. The NCDPW removes these items from the SWBs on a regular basis.

### **2.4.3 Mosquito Control Activities**

Nassau County applies the IPM principles to all of its pest-control activities. The cornerstone of Nassau County's control strategies is the combination of obtaining reliable information and monitoring the effectiveness of the control. In some situations, no treatment is necessary. For example, mosquito-eating fish or insect predators such as dragonfly and damselfly larvae might be present, or a puddle might dry up before the onset of larval development. The IPM approach avoids targeting non-target organisms, especially those that are located in environmentally sensitive areas such as freshwater wetlands. All of Nassau County's control measures comply with NYSDEC-issued permits. Furthermore, all pesticides are



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applied in accordance with the product labels and all applicable pesticide regulations.

### **2.4.3.1 Drainage Ditching**

Approximately 1,000 miles of drainage ditches were constructed up through the 1950's to reduce salt marsh mosquito populations as well as to improve drainage along the shoreline of the south shore barrier islands, hassocks, and islets. The natural forces of wind, rain, tides, and major storms continually influence the marsh topography, resulting in new and altered mosquito breeding areas, and so the county occasionally maintains (restores) the drainage ditches. Well-maintained ditches provide habitat for killifish that feed on mosquito larvae, facilitate tidal water movement, and also create a suitable habitat for waterfowl.

### **2.4.3.2 Larvicides**

Nassau County uses four larvicides to control mosquito populations:

- BTI (*Bacillus thuringiensis* var. *israeliensis*) is a naturally occurring soil bacterium that is eaten by the larvae, infecting and killing them. It is available in granular form or in a doughnut-shaped briquette. It is target-specific to mosquitoes but does not kill the pupae stage because pupae do not eat.
- Vectolex CG (*Bacillus sphaericus*) is also a naturally occurring bacterium that infects mosquito larvae. It persists well in the organic rich environments favored by the *Culex* species of mosquitoes. It too is ineffective against the non-feeding pupae.
- Altosid (methoprene) is an insect-growth regulator that prevents mosquito larvae from changing into adults. It is sometimes called a juvenile hormone. It is applied in a briquette form for manually treating SWBs and other sites requiring long-acting control (approximately 30 days).
- Agnique is a non-toxic liquid larvicide that is sprayed from a spray bottle over the surface of pools and spreads as an invisible monomolecular film over the water, reducing the surface tension, making it difficult for larvae and pupae to attach to the surface. The film also drowns the larvae and pupae by blocking their breathing tubes.

The NCDPW has a contract with a private company for spraying larvicide by helicopter if high larval populations in non-populated, inaccessible marsh areas are predicted. The helicopter is able to spray large non-populated, inaccessible areas with a suitable larvicide, usually a liquid formulation of Altosid. Areas sprayed include the marshy areas of Jones Beach, Lido Beach, and a number of islets and hummocks on the south shore of Nassau County. Decisions as to when and where to treat are based upon the salt marsh surveys, tidal conditions, and boat surveys. The helicopter is not used on a regular basis. It was used 10 times in 2008.

## **2. Nassau County Mosquito Control and Surveillance Program Overview**

### **2.4.3.3 Adulticides**

Adult mosquitoes are sensitive to a number of contact pesticides. The adulticide of choice for mosquitoes is a product named Scourge (Resmethrin 4.14% and Piperonyl butoxide 2.42%, in organic solvent), which can be sprayed by an ultra-low volume (ULV) generator mounted on the back of a pickup truck. Driven at a constant 5 miles per hour (mph) rate, this method can treat large areas on either side of a roadway. Spraying must be done at times of low wind, usually early morning or late afternoon, to minimize drift.

Adulticide application is performed in accordance with product labeling and NYSDEC regulations. Applications are not conducted within 150 feet of fresh-water wetlands, except for an emergency response to a viral breakout, which would be issued by NYSDOH. Furthermore, adulticides are not applied where runoff is directed into bays or other bodies of water.

Adulticides are not applied directly to water or wetlands because of the sensitivity of fish to this product. Waterbodies could be subject to drift of runoff from adulticides, but amounts entering the water are not expected to exceed U.S. Environmental Agency (EPA) limits because the County uses ULV application techniques and because adulticides rapidly biodegrade.

All state and federal threatened and endangered species are avoided during adulticide application. Habitat information is provided by NYSDEC and coordination with NYSDEC minimizes impacts on threatened and endangered species. U.S. Fish and Wildlife Service (USFWS) access restrictions and county setback restrictions are followed.

### **2.4.4 Pesticide Training and Certification**

NYSDEC requires certification and continuing education for people who work with pesticides. Individuals applying pesticides must know how to safely store, handle, and apply pesticides. Personnel in the Nassau County mosquito program are required to take a 30-hour course, pass the state test for certification in category VIII (Public Health), and then attend refresher courses and training sessions.

# 3

## Information Used in the Development of the Draft GEIS

In order to develop a draft GEIS that adequately addresses environmental issues related to the Program the following topics were evaluated and reviewed for their relevance.

### 3.1 Description of the Issues

The Mosquito Control and Surveillance Program is in place to aid in limiting public exposure to mosquito-borne diseases when they are detected and to prevent overpopulation of nuisance mosquitoes during the mosquito season. Present-day mosquito-borne human health threats in Nassau County appear to be limited to the West Nile virus. Eastern equine encephalitis (EEE), another mosquito-borne disease, has periodically occurred in horses in Suffolk County<sup>1</sup> and has appeared in Nassau County once in a horse in 2005. EEE has yet to affect the human population. The GEIS will discuss the human health concerns of these two diseases and explore the potential likelihood of other mosquito-borne diseases; historical malaria outbreaks will also be discussed. Health experts may be consulted for their knowledge of this subject.

The human health risk of West Nile virus and other potential mosquito-borne diseases will be evaluated based on local and national data sets and projections in order to create a risk profile for mosquito-borne diseases in Nassau County. Historical data will be reviewed and incorporated only as necessary in order to create the best estimate of current human health risk.

The potential impacts of the Program will be evaluated by comparing its potential impacts with mosquito presence and behaviors in Nassau County. Current treatment practices, including control measures that may limit outdoor activities or access, will be discussed. Land uses throughout the County will be discussed in relation to the Program.

#### 3.1.2 Environmental Setting

Mosquito breeding grounds and habitats include several ecological areas that may be affected by certain control methods. Tidal and freshwater wetlands, streams,

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<sup>1</sup> <http://www.co.suffolk.ny.us/departments/healthservices/Press%20Releases/Archive/2008%20Agust/20080818%20Mosquito%20Sample%20Tests%20Positive%20for%20Eastern%20Equine%20Encephalitis%20Virus.aspx> Accessed June 23, 2009.

### **3. Information Used in the Development of the Draft GEIS**

ponds, and lakes are the primary ecological areas with mosquito-breeding potential. These sensitive environmental areas will be discussed and evaluated for ecosystem impacts, man-made impacts, and their future health. Potential impacts will be compared with the need to protect against potential health risks of mosquito-borne disease and with the need to control nuisance mosquito populations..

#### **3.1.3 Mosquito Management**

A variety of mosquito management methods will be evaluated and compared with Nassau County's current Mosquito Control Program. Close analyses will be made of nearby programs, including those of New York City and Westchester and Suffolk counties. This information will be used to develop some of the alternatives considered in the GEIS. This section in the GEIS will also discuss the following aspects of the County's Mosquito Control Program:

- Public education
- Natural control methods
- Physical control methods
- Chemical control methods
- Surveillance and testing

Finally, the Program's effectiveness and efficiency in controlling and preventing mosquito-borne disease and nuisance mosquitoes will be compared with other management alternatives, including taking no action.

#### **3.1.4 Potential Environmental Impacts**

The potentially significant adverse impacts on tidal and freshwater wetlands and other natural water habitats and on non-target species will be discussed in the draft GEIS. Wetlands and other natural waterways will be evaluated for future health and functionality as habitat for a variety of aquatic organisms, plants, and wildlife. Non-target species will be evaluated to determine the degree that physical and chemical controls may have on sensitive species and their associated food webs. The evaluation will include marine organisms and commercially important species found in coastal waters, endangered species, and waterfowl and other birds that depend on wetlands or water habitats.

#### **3.1.5 Potential Public Health Impacts**

Human health impacts will be evaluated for the potential negative impacts of chemical controls on sensitive populations such as children, the elderly, immune-compromised, and pregnant women. These impacts will be compared with the potential exposures and risks of other pesticide uses within the County.

### **3.2 Limiting Factors**

Several limiting factors are anticipated that may complicate the analysis of certain issues.

#### **3.2.1 Nuisance Mosquitoes versus Disease Potential**

The primary purpose of the Program is disease prevention made necessary by human cases of WNV in recent years. Controlling populations of nuisance mos-

### **3. Information Used in the Development of the Draft GEIS**

quitoes during specific seasons is a secondary measure within the Program. It is difficult to quantify any potential health risks based on mosquito populations alone because people may receive an insect bite many miles from their home, and mosquitoes can be carried by winds over great distances. It will remain an assumption that control of mosquitoes will limit the exposure of humans to disease.

#### **3.2.2 Unpredictability of Mosquito Populations**

Many factors come into play when evaluating mosquito populations, including seasonal weather patterns, temperature, weather and wind patterns associated with storms, and the availability of breeding areas. Yearly trends in populations cannot be easily predicted or planned.

#### **3.2.3 Mosquito and Bird Transport**

Mosquitoes and birds that test positive may not have acquired WNV where they were caught or found, making it difficult to ascertain the original location of the disease and prevent further spread. The NCDOH has analyzed the number of positive results in each tested mosquito pool and evaluated the number of neighboring positive breeding pools as a means of measuring the prevalence of WNV-positive insects and specific locations.

#### **3.2.4 Data Quality and Literature Review**

The draft GEIS will incorporate a literature review of studies performed for other areas, including New York City, Suffolk County, and Westchester County, only as they are directly applicable to mosquito control in Nassau County. Nassau County's sensitive locations, populations, practices, and implementation of mosquito control may not be the same as other areas. Data sets and types of studies available may be limited.

In addition to reviewing research performed for other areas of New York State that have implemented a mosquito control plan, a thorough literature review will be conducted in order to support information presented in the draft GEIS.

# 4

## Potentially Significant Adverse Impacts

No new impacts are anticipated from the Program. The SEQRA process will examine the impacts of the Mosquito Control Program and consider the long-term impacts of continuing the program into the future. Because the Program may continue for years to come, the accumulation of small impacts over many years must be carefully considered. Wherever appropriate, the draft GEIS will address potential impacts with greater scrutiny and further analyses to fully determine the impacts associated with the proposed Program. The impact areas that could be significant and lead to the commitment to conduct more detailed analyses in the GEIS include public health and natural resources. In addition, all of the impacts described below could potentially occur throughout the long-term duration of the program, so even small adverse impacts could be considered significant.

### 4.1 Human Health Impacts

Mosquito control is largely mandated because of the real public health risks associated with mosquito-borne diseases, in particular the West Nile virus. The potential risks of West Nile virus and other mosquito-borne diseases must be weighed against potential adverse impacts on the public from spraying larvacides and adulticides. These chemicals are much less biologically active in humans and pets because they target insects specifically, but more analysis is required to review potential long-term effects and the potential impacts from an accidental spill of concentrated chemicals. Chemicals used in the mosquito program will be analyzed and discussed in detail in the draft GEIS. Chronic effects, including carcinogenesis and sub-lethal effects, acute effects, and cumulative effects from these chemicals will be discussed and the risks will be determined. Direct and indirect exposures will also be evaluated. Direct exposure may occur through air, water, and soil. Indirect exposure may occur if chemicals accumulate on local fruits and vegetables. Vulnerable populations such as the elderly, immunocompromised people, children, and fetuses will be included in the risk-determination analyses. Risks to these populations from insecticide exposures must be balanced against the increased sensitivity of these same populations to serious health consequences from exposure to the West Nile virus. If human health were adversely impacted by the Program, these impacts could be significant. Thus, this impact category is potentially important and the draft GEIS will examine these potential impacts in more detail.



## **4.2 Natural Resources**

### **4.2.1 Non-Target Organisms**

Nassau County is rich in natural resources, including birds, fish, shellfish, and estuarine organisms such as turtles and amphibians. There is a potential for Program activities, including maintaining ditches and spraying chemicals, to affect these resources. If these impacts were widespread, they could be significant.

The sensitivity of fish to actions such as maintaining ditches and spraying chemicals will be examined in detail because of the known toxicity of adulticides to fish. For example, the manufacturer of Scourge (Bayer) indicates in their Material Safety Data Sheet (MSDS) that rats (a human surrogate) are killed only at an acute oral dose of 2,700 milligrams per kilogram (mg/kg). This lack of sensitivity in mammals contrasts with the sensitivity of fish. For example, the Sheepshead minnow (*Cyprinodon variegates*) is killed at a concentration of only 0.0088 milligram per liter (mg/L) in water. Also, since the larvacides and adulticides target insects, the potential impacts on non-target insects and other related animals, such as lobsters, will be evaluated.

Below are some examples of potential impacts of the Program on non-target organisms that will be analyzed in the draft GEIS:

- Indirect impacts on food web interactions;
- Direct impacts on commercial species such as clams, lobsters, and crabs;
- Direct impacts on endangered species, including the piping plover;
- Insect species: some mosquito-control techniques discriminate among the species that they affect, but other control techniques do not discriminate species;
- Indirect and direct impacts on birds, including an impact assessment of overflights (e.g., helicopters) at marshes on nesting and resting birds;
- Indirect impacts on insectivorous species, including birds, fish, bats, and larger insects. Studies will be conducted to identify any ecological impact(s) caused by the removal of prey from a system;
- Direct and indirect impacts on household pets such as outdoor dogs and cats. This evaluation may be difficult because pets may be exposed to other carcinogenic agents often found in the home.

If NYSDOH declares a public health emergency, adulticides will be applied via the most appropriate means for each site. Impacts on threatened and endangered species and their habitat could occur if NYSDOH declares a public health emergency. Otherwise, all state-listed and federally listed threatened and endangered species would be avoided. Habitat information is provided by NYSDEC, and coordination with NYSDEC minimizes impacts on threatened and endangered spe-

## **4. Potentially Significant Adverse Impacts**

cies. USFWS access restrictions and county setback restrictions also will be followed.

### **4.2.2 Wetlands and Other Water Bodies**

Tidal and freshwater wetlands, streams, ponds, and lakes are primary ecological areas for mosquito-breeding. These sensitive areas will be discussed and evaluated for ecosystem impacts, man-made impacts, and the future health of these ecosystems.

Chemical application (larvicides and adulticides) is performed under NYSDEC permits and in accordance with the product labels. Chemicals are not applied directly to water or wetlands. Applications are not conducted within 150 feet of freshwater wetlands, except for an emergency response to a viral breakout, which is issued by NYSDOH. Adulticiding is conducted only when disease is detected, or other control measures are deemed ineffective. Furthermore, adulticides are not applied where runoff is directed into bays or other bodies of water.

Water bodies could be subject to drift of runoff from adulticides, but amounts entering the water are not expected to exceed EPA limits because the county uses ULV application techniques and because adulticides rapidly biodegrade. Spraying is conducted at times of low wind, usually early morning or late afternoon and when there is no rain predicted, to minimize drift and runoff.

The potential impacts discussed here will be evaluated with respect to effective control of nuisance mosquito populations and protection against the potential health risks of mosquito-borne disease while maintaining the integrity of wetlands and other water bodies.

### **4.2.3 Groundwater Supply**

It is unlikely for chemical treatments to affect groundwater drinking water supplies, although the products proposed for use degrade very rapidly and have low toxicity for humans. Most of the chemical treatments will dissipate before hitting the ground. This topic will be evaluated in the GEIS.

### **4.2.4 Surface Water Quality**

Surface waters are used by birds, reptiles, fish, and shellfish. Nassau County has extensive coastal estuarine resources as well as inland lakes and streams. The far eastern end of Jamaica Bay, which is a State-Listed Critical Environmental Area, also borders Nassau County. Surface water quality could be subject to drift of runoff from adulticides, but amounts entering the water are not expected to exceed EPA limits because the county uses ULV application techniques and because adulticides rapidly biodegrade.

Lobsters and clams in particular may be affected by runoff of larvicides and adulticides, so the potential impacts on surface water quality will require further analysis in the draft GEIS. Due to the large surface areas involved, this impact category could be significant.

## **4. Potentially Significant Adverse Impacts**

### **4.3 Hazardous Materials**

The larvacides and adulticides used to control the mosquito population are classified as hazardous materials in their concentrated forms. The transport, storage, and disposal of any unused chemicals could create hazards due to inadvertent exposures. These risks will be evaluated in the GEIS. In addition, the unlikely but potentially catastrophic spill of a large quantity of insecticide will be evaluated. Various scenarios, such as the crash of a helicopter or a truck loaded with pesticides running into a wetland, also will be considered.

### **4.4 Socioeconomic Impacts**

The Program costs could have socioeconomic impacts, but the medical costs of an outbreak of West Nile virus need to be weighed against the direct Program costs. Because the current Mosquito Control Program is ongoing, the current costs of the Program must be compared with the potential elimination or alteration of the Program through the various alternatives. These costs will be evaluated in the GEIS.

### **4.5 Open Space Resources**

Numerous parks and nature preserves provide open space and recreational areas in Nassau County. The public values the open space resources of Nassau County, including inland parks, the beaches, and the coastal estuaries. Use of these resources can be limited by the presence of nuisance mosquitoes and the risk of disease from mosquito vectors. On the other hand, use of these open spaces would be affected during spraying. Therefore, impacts on open space resources from the Program could be both positive and negative. The impact of the Program on open space resources, with an emphasis on potential adverse impacts, will be part of the GEIS.

### **4.6 Cultural Resources**

The State Historic Preservation Office (SHPO) lists 286 cultural resources in the county. Some of these are multiple listings at the same site, but numerous distinct sites exist in the county. The Program is not anticipated to impact cultural resources, but since the use of these resources could be temporarily affected by the Program, they will be inventoried and the potential impacts will be described in the draft GEIS.

### **4.7 Air Quality**

Spraying would not adversely affect air quality: pesticides remain localized as aerosols, are deposited on the ground, and rapidly biodegrade. Emissions from vehicles used for the surveillance and treatment of mosquitoes would be another impact on air quality. Both types of impacts will be considered in the draft GEIS. Because the sprays are not regulated air pollutants, the potential impacts of the insecticides on human health and ecological systems would be evaluated in other sections of the GEIS.

**4.8 Noise**

Most chemical treatments are conducted by truck-mounted equipment. It is also possible that helicopters and small planes could be used for aerial applications. The potential impacts from the noise of these activities would be part of the GEIS analyses.

**4.9 Waterfront Revitalization Program**

The Program will be analyzed for compliance with the Waterfront Revitalization Plan of Nassau County and the plans that have been developed by local communities in the county's coastal zone. Certain preserve areas will be designated as no-spray areas as part of the Program to comply with restricted uses in some of the waterfront areas.

**4.10 Energy and Greenhouse Gases**

The potential impacts of the Program on energy use and the emission of greenhouse gases will be analyzed. NYSDEC has issued recent guidance on the measurement of greenhouse gases, and this policy will be followed in the GEIS. Impacts are anticipated to include vehicle emissions from the surveillance and spraying programs, construction equipment emissions during ditch maintenance, and emissions from the manufacture of chemicals.

**4.11 Quality of Life**

Residents of Nassau County enjoy diverse lifestyles. Many people choose to live in Nassau County because of the employment opportunities as well as the proximity to beaches, natural areas, and open space. Worries about WNV and EEE may weigh on people's minds and limit their enjoyment of the outdoors. These issues can all impact the quality of life experienced by Nassau County residents. These issues will be evaluated and compared in the GEIS to determine how the quality of life may be impacted by the program.

# 5

## Mitigation Measures

Mitigation includes actions designed to avoid or minimize adverse impacts. The program includes many activities that can be considered mitigation. For example, ULV spraying and spraying only when there is little wind could be considered mitigation, but as these they are already part of the Program, they will not be called out in the GEIS as distinct mitigation. Instead, the Program description will describe such activities as efforts to avoid and minimize impacts.

Mitigation will include additional activities currently not in the Program or current annual Plan that might further reduce impacts. This could be the use of alternative treatments, development of criteria that further minimize the use of adulticides, or other Program components that will become apparent through the analyses conducted for the GEIS.

# 6

## Reasonable Alternatives

NYCRR 617.9(b)(5)(v) describes reasonable alternatives as actions that “are feasible, considering the objectives and capabilities of the project sponsor. The description and evaluation of each alternative should be at a level of detail sufficient to permit a comparative assessment of the alternatives discussed. The range of alternatives must include the no action alternative.”

The No Action Alternative will describe the effects of discontinuing the Program. It will evaluate costs, both positive and negative, of not having a mosquito-control program and consider ecological benefits and public health impacts. It will also consider how state-ordered abatement activities might render the No Action alternative untenable.

In accordance with §617.9(b)(5)(v), the reasonable alternatives will include alternative

- (a) sites
- (b) technology
- (c) scale or magnitude
- (d) design
- (e) timing
- (f) use
- (g) types of action.

Besides the No Action Alternative, the alternatives to be evaluated will include the following:

- Active management of physical habitats combined with use of traps and biological controls such as stocking mosquito-eating fish, deploying bird and bat houses, etc. rather than using pesticides;
- Alternative chemical treatments;
- Alternative rates and methods of chemical treatments;
- Using natural pesticides derived from plants and other natural sources (e.g. garlic oil);



## **6. Reasonable Alternatives**

- Alternative management of highway catch basins and drain ditches;
- Alternative salt marsh water management techniques such as open marsh water management, which includes construction of interconnected pools to harbor insect-feeding fish, rather than grid ditches.

Each of these alternatives will be evaluated for its potential for effective mosquito control; the ability to evaluate and monitor effectiveness; public health impacts; environmental impacts; impacts on fisheries; and feasibility (including costs).

Monitoring data and performance evaluations of the alternatives from other pest-control programs will be used to evaluate the alternatives. Not all of the alternatives will be analyzed to the same extent. If, for example, an alternative is found to have negative public health impacts compared with the program, the evaluation of that alternative would be truncated after that determination.

# 7

## **Environmental Parameters Determined to be Not Significant**

The following is a list of environmental parameters that are identified in the SEQRA Environmental Assessment Form that have been determined to be not significantly affected with respect to the Nassau County Mosquito Control and Surveillance Program and thus will not be addressed in the GEIS.

### **7.1 Transportation**

No significant impacts on transportation are anticipated from the Program. There might be very short-term disruptions of traffic when using trucks to spray, but the disruptions would not be at any one place for long. These potential adverse impacts will not be described in the GEIS.

### **7.2 Visual Resources**

No impacts on visual resources are anticipated from the Program. The only impacts on landforms and viewshed would be the maintenance of ditches. Since these ditches already exist, maintenance activities are not expected to be a significant impact.

### **7.3 Land Use, Zoning, Community Facilities, and Public Policy**

The Program is not expected to impact any land uses either in the short-term or the long-term. Public policy already supports mosquito abatement activities, both for health reasons and nuisance control, so the proposed action supports public policy.



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