

DRAGON MOSQUITO CONTROL, INC.

P.O. Box 46, Stratham, NH 03885

www.DragonMosquito.com

603.734.4144

March/April Update

Dragon crews began checking marshes, swamps, woodland pools and other wetlands for mosquito larval activity in April. Larval control has the greatest impact on mosquito populations because they are concentrated, immobile and accessible. When mosquito larvae are found, crews treat the water with a naturally occurring soil bacterium, *Bacillus thuringiensis israelensis* (Bti). Bti breaks down quickly in sunlight and does not harm people or their pets, animals, aquatic life, or other insects, including honeybees. This work continues throughout the season.

Dragon crews have:

- Distributed Public Notices
- Sent certified letters to State registered beekeepers
- Updated the no-spray registry for your town
- Received permission from the Dept of Agriculture to start controlling mosquitoes for 2022
- Checked wetlands for mosquito larvae and treated when necessary with Bti
- Monitored catch basins for larval mosquito activity

Homeowners should eliminate the places where mosquitoes may lay their eggs by emptying any containers that hold water such as buckets, wheelbarrows, pool covers, tarps, toys, trash barrels, canoes and boats. Cleaning out rain gutters or emptying your birdbath every few days will also make a difference.

In 2021, the majority of mosquitoes trapped in town were potential vectors of several mosquito borne diseases including West Nile Virus (WNV), Eastern Equine Encephalitis (EEE) and Jamestown Canyon Virus (JCV). The State Lab in Concord doesn't begin testing mosquitoes for EEE or WNV until July 1st because those diseases are found later in the summer and fall. We know spring mosquito species can transmit Jamestown Canyon Virus as May 14th has been the earliest case of JCV in New Hampshire. The illness is considered serious, but rare. JCV detection in humans has been increasing. The State has identified twenty human cases of Jamestown Canyon Virus since 2013. There were 5 human cases of JCV in 2021 including one death.

Avoiding mosquito bites remains the best way to prevent mosquito borne disease. Minimize your risk of infection by wearing long pants and long sleeves, using EPA registered insect repellent and avoid being outside at dusk and dawn whenever possible.

Preventing tick bites is also an effective strategy to avoid the diseases ticks carry. Ticks are most active during warmer months. EPA registered repellents defend against ticks. You can also take the following precautions to avoid tick bites. Don't walk in tall grass, stay in the center of trails, check for yourself and your pets for ticks and shower soon after enjoying outside activities to minimize your exposure.

**SPECIAL PERMIT APPLICATION
TOWN OF RAYMOND
2022**

1. DRAGON MOSQUITO CONTROL, INC.
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Mail: P.O. Box 46, Stratham, NH 03885
Phone: 603-734-4144
SARAH MACGREGOR, President

2. Same as Line 1

3. TOWN OF RAYMOND
Chief Paul Hammond, Interim Town Manager
Town Office Complex, 4 Epping St
Raymond, NH 03077
Phone: 603-895-3321
Fax: 603-895-0903

4. PREVIOUS PESTICIDE APPLICATIONS

In 2021, the Town of Raymond received Special Permit SP-096 to conduct a mosquito control program.

5. REASON FOR PESTICIDE APPLICATION

A. The Town of Raymond has a history of Eastern Equine Encephalitis and West Nile Virus in animals and mosquitoes. The widespread detection of Jamestown Canyon Virus in NH residents and mosquitoes last season is further cause for concern. The Town relies on a thorough larvicide program to reduce mosquito borne diseases and control mosquitoes.

Frequent larval surveys will be conducted to monitor activity in larval habitats such as red maple and cedar swamps, roadside ditches and woodland depressions from April into October. Sites are checked in the spring after the spring thaw and heavy rains. Catch basins are checked from late May into October.

Workers sample the stagnant water using dippers. The number of mosquitoes sampled in each positive dip is averaged. The average per dip and larval instar are recorded. Survey information determines the need for treatment and the appropriate insecticide for the situation. Larviciding is deemed necessary if a larval survey reveals an average of one larva every other dip. This is our action threshold. Larviciding and catch basin treatment dates from 2021 are located in Appendix C. The map of survey sites and a site list are located in Appendix D.

Adulticiding may be conducted when concerns of disease arise. In 2021, Raymond was placed in Low Risk Category 1, based on the State DHHS Arboviral Illness Surveillance, Prevention and Response Plan. Spot adulticiding may be done along the perimeter of the schools, parks and athletic fields in response to disease activity or during severe mosquito outbreaks to protect residents. No adulticiding was conducted in Raymond in 2021.

B. DETERMINATION TO SPRAY

Integrated Mosquito Management (IMM) guides all treatment decisions. IMM is a knowledge-based, surveillance-driven control strategy designed to employ all available control methods emphasizing human, animal, and environmental health, rational use of pesticides, and proper timing of applications. This technique has been in use for decades and is the foundation of a successful control program.

Field crews decide to treat mosquito larvae in wetlands when the action threshold has been met. The need for emergency spraying is determined by Town Officials and others involved with the schools, athletic teams, and recreation facilities in consultation with Dragon after reviewing trap data, disease test results and meteorological conditions.

6. DESCRIPTION OF APPLICATION

A. TARGET ORGANISMS: Mosquitoes

Aedes species
Anopheline species
Coquillettidia perturbans
Culex species
Culiseta species
Ochlerotatus species
Psorophora species

A total of 34 species of mosquitoes have been identified in Raymond. A complete list of adult species collected in Raymond is located in Appendix B.

Eastern Equine Encephalitis (EEE)

The primary vector of EEE is *Culiseta melanura*. Eleven species have tested positive for EEE at the State Lab in Concord. No Eastern Equine Encephalitis was detected in mosquitoes in 2021.

West Nile Virus (WNV)

West Nile Virus was detected in six mosquito pools in 2021. There were no human cases of WNV this season. Fourteen species have tested positive for WNV in New Hampshire. Four species of mosquitoes are found in catch basins. All are capable of carrying WNV.

Jamestown Canyon Virus (JCV)

In 2021, New Hampshire had four human cases of Jamestown Canyon Virus including one fatality and 14 positive mosquito pools. JCV detection in humans has been increasing over the last several years. New Hampshire has identified 19 human cases of Jamestown Canyon Virus since 2013 including two fatalities. The NH Department of Health and Human Services started limited testing of 15 mosquito species for JCV in 2021. Six species have tested positive for JCV in New Hampshire:

B. APPLICATION METHOD

(1) ADULTICIDE EQUIPMENT

Clarke Cougar cold aerosol insecticide generator with ULV nozzle
Stihl SR-400 backpack power mist blower with mist nozzle & ULV nozzle

(2) LARVICIDE EQUIPMENT

Maruyama backpack power mist blower with granular spreader
Stihl SR-400 backpack power mist blower with misting nozzle
Stihl SG-20 backpack hand pump sprayer with brass nozzle
Solo 425 PAF backpack hand pump sprayer with brass nozzle
Birchmeier Senior +Plus+ 20 litre backpack hand pump sprayer with brass nozzle
Birchmeier Iris 15 litre backpack hand pump sprayer with brass nozzle

FREQUENCY OF CALIBRATION: Larvicide equipment

Each backpack sprayer is calibrated for a particular applicator's use. Calibration is checked at the beginning of the season, after adjustment or repair to the spray system and when switching insecticides.

FREQUENCY OF CALIBRATION: Adulticide equipment

The sprayers are calibrated at the start of the spray season. Recalibration is done when changes are made to the insecticide discharge system or when the flow rate appears light or heavy.

D. PESTICIDE: Larvicides

Altosid Pellets WSP
EPA Reg # 2724-448

BVA 2 Mosquito Larvicide Oil
EPA Reg # 70589-1

Sunspray MLO
EPA Reg #86330-11

Fourstar Bti CRG
EPA Reg # 85685-4

Fourstar MBG
EPA Reg# 85685-3

MetaLarv SPT
EPA Reg # 73049-475

Natular G30 WSP
EPA Reg # 8329-91

VectoBac 12 AS
EPA Reg # 73049-38

VectoBac GS Biological Larvicide
EPA Reg # 73049-10

VectoBac GR Biological Larvicide
EPA Reg # 73049-486

VectoMax FG Biological Larvicide
EPA Reg # 73049-429

VectoPrime FG Biological Larvicide
EPA Reg # 73049-501

PESTICIDES: Adulticides

Cross Check Plus
EPA Reg #279-3206-10404

Essentria IC³
EPA Reg # - FIFRA 25(b) exemption

Flit 10 EC
EPA Reg # 8329-67

E. APPLICATION SCHEDULE

(1) NUMBER OF APPLICATIONS AND DATES

Each week, beginning in April and continuing throughout the season, fresh water larval habitats are checked for mosquito activity. Applications are made when the action threshold is reached. Catch basins surveys are also conducted throughout the season and treatment generally begins in June. Exact numbers and dates of applications are impossible to predict.

Adulticiding is conducted to supplement larviciding. When EEE or WNV becomes a public health threat, adulticide treatments may include spot treatments at high use areas. This may be implemented if disease positive mosquitoes, birds, horses or humans are found in or near Raymond.

(2) POTENTIAL APPLICATION AREAS

Raymond is an inland, rural community, with a total size of 29.3 sq. miles. Dragon has identified and mapped 84 larval habitats including cattail marshes, woodland depressions, swamps, and ditches. Last season, 621 catch basins were treated to combat WNV and EEE mosquitoes. Raymond Town Officials have identified eight sites considered high use areas.

ADULTICIDE SITES

Site	Location	Acreage
High School	Harriman Hill Rd	66.3 acres
Middle School	School St	14.0 acres
Elementary School	Old Manchester Rd	14.0 acres
Welch Field	Fremont Rd	15.0 acres
Cammett Fields	Cider Ferry Rd	18.0 acres
Riverside Park	Sundeen Parkway	20.0 acres
Liberty Skateboard park	Scribner Rd	0.75 acres
Town Common	Epping St	0.5 acres

The locations of the adulticide sites and larval habitats can be found on the town maps in Appendix D with an accompanying site list. Larvicide dates from 2021 are located in Appendix C.

F. ENVIRONMENTAL CONSIDERATIONS

(1) Integrated mosquito management techniques employed to reduce risk to the environment while enhancing control of mosquitoes include insecticide selection, formulation preference, weather analysis and population monitoring.

Population monitoring (larval surveys and adult surveillance) establishes the best time and location of treatment eliminating unnecessary or ineffective spraying. Meteorological information is used to track development cycles, and timing of treatment. Rainfall amounts, rain dates, wind and temperature are all important factors used to determine spray dates and locations.

The Shoreland Protection Act prohibits the application of pesticides within 50' of the reference line of any Public Waters except where granted under Special Permit. **We are requesting a waiver from this setback requirement for the Town of Raymond.** The following is a list of public waters for the waiver: Lamprey River, Pawtuckaway River, Dead Pond, Norton Pond, Governor's Lake, Onway Lake.

Insecticides with low toxicity, low persistence, low nontarget impact and acceptable mortality rates for target insects are important components for choosing the best product. Three organic products have been added to our control options.

Periodically, evaluating and rotating the pesticides we use is an important practice for effective Integrated Mosquito Management.

(2) A product we have used with continued success is the biological insecticide, *Bacillus thuringiensis israelensis* (Bti), which is a great choice for sensitive habitats where many species coexist. Bti is very specific to mosquito larvae, breaks down rapidly in sunlight, has low toxicity to non-target organisms and effectively controls mosquito larvae when applied properly. Bti is the insecticide of choice for larviciding. We have the option of using an organic formulation of VectoBac and Fourstar Bti CRG, which provides a 40-day residual.

The active ingredients of VectoMax FG and Fourstar MBG are *Bacillus thuringiensis israelensis* (Bti) and *Bacillus sphaericus* (Bsph). VectoMax FG is an organic product that provides residual control, optimal vegetation penetration and helps prevent resistance development. The non-organic brand is Fourstar MBG but has the same residual and vegetation penetration benefits.

Natular G30 WSP is organic, effective on all four instars of larvae and break down quickly into the soil. Spinosad is in its own chemical class and has a different mode of action that helps fight resistance. Natular will be used in catch basins.

Altosid is an effective way to control container mosquitoes where several species and lifestages may coexist. It has a longer residual than Bti and kills a wider range of mosquito lifestages than Bti. Altosid will be used in containers and catch basins.

VectoPrime FG is a dual action granular larvicide and insect growth regulator that mixes Bti and Altosid. This product provides the widest single-brood application window (1st to 4th instar, or pre-flood) with the industry's lowest rates for direct application to water.

When mosquitoes advance to the pupal stage, they stop feeding. Bti, Natular™ and Altosid are rendered useless at this stage. Suffocating pupae with a thin film of BVA 2 MLO or Sunspray MLO is the only effective control method available. Surfactants are the last straightforward way to control pupae before they hatch into winged adults and disperse.

We may use an adulticide made of essential plant oils called Essentria IC³. This minimum risk pesticide was used as a spot spray to control adult mosquitoes.

Synthetic pyrethroids have label precautions to safeguard bees, water, and applicators. Drift is of constant concern to an applicator. Adult mosquitoes are killed when they encounter the adulticide. These pyrethroids would be applied via backpack sprayers to control severe outbreaks of mosquitoes at recreation areas and athletic fields.

Bifenthrin has the benefit of a longer residual and therefore it can provide active control for weeks at a time. This makes it a valuable addition to our inventory. This pyrethroid is non-toxic to bees once dry, therefore would be a choice for sensitive areas where bees may forage. We added Flit 10 EC. A variety of pesticides allows the selection of the most effective insecticide.

All available mosquito adulticides have label restrictions regarding drift and toxicity to bees, water and associated organisms. These pyrethroids are chosen because of their relative safety. They are not organophosphates or cholinesterase inhibitors. They will photodegrade quickly in the environment. They do not leach through the soil, but bind to it and are broken down by microorganisms and sunlight. Adulticiding is done at night to avoid foraging bees.

(3) The New Hampshire Natural Heritage Bureau conducted a review for wildlife species that could be impacted by mosquito control pesticides. We have received the screening layer for 2022.

7. TREATMENT AND MONITORING AREAS

A. Town maps accompany this Special Permit application. The maps include larval habitats, adulticide sites, trap locations, conservation lands, wells, locations of EEE activity, and the 250' setback from public water supplies and tributaries.

B. DESCRIPTION OF TREATMENT AREAS

(1) Raymond Town Officials have identified eight sites considered high use areas. These sites may be sprayed when EEE or WNV become a public health threat. If a disease case occurs in mosquitoes, horses, humans, birds, or other animals, then spraying may be utilized in these high use areas. **Dragon requests an exception from the 250-foot well setback (as provided for in PES 502.5) at these sites.** A setback of 75 feet would allow a more complete treatment of two sites (A1 and A2) and the protection of ground water. They can be found on the town maps in Appendix D.

ADULTICIDE SITES

Site	Location	Acreage
High School	Harriman Hill Rd	66.3 acres
Middle School	School St	14.0 acres
Elementary School	Old Manchester Rd	14.0 acres
Welch Fields	Fremont Rd	15.0 acres
Cammett Fields	Cider Ferry Rd	18.0 acres
Riverside Park	Sundeen Parkway	20.0 acres
Liberty Skateboard park	Scribner Rd	0.75 acres
Town Common	Epping St	0.5 acres

(2) Currently, no potential treatment sites are located on state-owned lands in the Town of Raymond. If any potential treatment sites are found, we will follow the specifications laid out in the "*Policy for Mosquito Control on State Lands.*"

(3) The use of larvicides poses little threat to people in the treatment areas. According to label warnings, adulticides may harm bees; therefore, a large buffer zone is in place around all known apiaries. State registered beekeepers are notified of the spray operations and precautions employed for their apiaries through certified mail in the spring. Organic farms also receive a large buffer. Spraying of parks and school fields is done at night, to avoid people and foraging bees.

(4) There are several public water supply wells and surface waters in Raymond as delineated on the town maps in Appendix D, which is accompanied by a list of wells. Wells are located prior to any insecticide treatments, including those at the designated adulticide sites. No spraying, larviciding or adulticiding will be conducted near any water source. Source Water Protection Areas have been reviewed with insecticide treatments in mind.

C. LOCATION OF SURVEY SITES

Larval site surveys are conducted April into October. Larval habitats are checked after snow and ice melt or after heavy rains. Catch basins are checked throughout the season and treatment can begin as soon as late May or early June.

8. NOTIFICATIONS

A. Residents are notified of pending spray operations via public notices published in the local newspapers, as well as posted at the Town Hall, town website, Dragon website, Library, Safety Complex, Schools and the RCTV. The Selectmen and Town Manager will also receive a notice. Residents may sign up for the No-Spray registry on our website.

We understand the importance of protecting all species of bees. State registered beekeepers receive a notice of pending spray activity each spring via certified mail. A list of all known active apiaries can be found in Appendix E.

B. A sample of the final version of the 2022 public notice will be written in March when the start date for the season has been determined.

C. Each year, a handful of residents call or write requesting their property be excluded from any mosquito spraying. Reasons range from medical concerns, suspicions about insecticides, organic gardeners, and odor complaints. Anyone who does not want their property sprayed for mosquitoes will be excluded from any spray operations.

9. The proposed control program has not yet been voted on. Funding for the program will be voted on at Raymond's town meeting in March. Permit applications are submitted prior to this vote to ensure special permits are issued in time to begin larviciding in April.

10. The proposed control program will be conducted in accordance with the current New Hampshire Arboviral Illness, Surveillance, Prevention and Response Plan guidelines. The phased response plan is very similar to the response Dragon has recommended to its municipalities for decades.

11. SIGNATURES

Refer back to application for original signatures.



Town of Raymond

Activity Report

April 2022

Date	Activity
4-14	Survey behind 5 Stonepost Cir - swamp & cattails marsh
4-14	Survey Riverside Park - Sundeen Pkwy - shrub swamp
4-14	Survey across from 10 - 14 Manor View Dr - small swamp
4-14	Survey front of 15 & 17 Watson Hill Rd - small swamp
4-14	Survey behind 2 Eagle Hill Rd - woodland pools
4-14	Larvicide behind 2 Eagle Hill Rd - woodland pools
4-14	Survey behind 48 Sherman Dr to Lynwood Rd - swamp
4-14	Larvicide behind 48 Sherman Dr to Lynwood Rd - swamp
4-14	Survey left of 19 Watson Hill Rd - woodland pools
4-14	Larvicide left of 19 Watson Hill Rd - woodland pools
4-14	Survey 136 Harriman Hill Rd - small red maple swamp
4-14	Larvicide 136 Harriman Hill Rd - small red maple swamp
4-14	Survey across from 27 Poplar Dr - woodland pools
4-14	Larvicide across from 27 Poplar Dr - woodland pools
4-14	Survey right of 12 Smith Rd - woodland pools
4-14	Larvicide right of 12 Smith Rd - woodland pools
4-14	Survey Riverside Park - Sundeen Pkwy - swamp
4-14	Larvicide Riverside Park - Sundeen Pkwy - swamp
4-14	Survey left of 41 Ann Logan Cir - depressions and ditch
4-14	Larvicide left of 41 Ann Logan Cir - depressions and ditch
4-14	Survey across from 28 Long Hill Rd - small swamp
4-14	Larvicide across from 28 Long Hill Rd - small swamp
4-19	Survey Left of 3 Taft Way - large swamp
4-19	Survey intersection of Henry Ct & Enterprise Way - cattail marsh
4-19	Survey between 74 & 76 Lane Rd - small pond & pools
4-19	Survey left of 7 Chandler Ln - retention pond
4-19	Survey across from 1 - 7 Chandler Ln - wet meadow
4-19	Survey across from 39 Watson Hill Rd - woodland depressions
4-19	Survey front of 12 Colonial Dr - woodland pool
4-19	Survey left & behind of 27 West Shore Dr - swamp
4-19	Survey inside circle at Hollywood Dr - swamp
4-19	Survey left of 19 Deerfield Rd - small shrub swamp
4-19	Survey left of 33 West Shore Dr - woodland pool
4-19	Larvicide left of 33 West Shore Dr - woodland pool
4-19	Survey right of 18 Bald Hill Rd - shrub swamp

Town of Raymond

Activity Report

April 2022

Date	Activity
4-19	Larvicide right of 18 Bald Hill Rd - shrub swamp
4-19	Survey left of 5 Bald Hill Rd - shrub swamp
4-19	Larvicide left of 5 Bald Hill Rd - shrub swamp
4-19	Survey left of 6 Wildwood Ln - swamp and pools
4-19	Larvicide left of 6 Wildwood Ln - swamp and pools
4-25	Survey Essex Dr, behind Strikers East Bowling - swamp
4-25	Survey Essex Dr across from McDonalds - retention area
4-25	Survey between 74 & 76 Lane Rd - small pond & pools
4-25	Larvicide between 74 & 76 Lane Rd - small pond & pools
4-25	Survey right of 13 Saddle Path Rd - shrub swamp
4-25	Larvicide right of 13 Saddle Path Rd - shrub swamp
4-25	Survey left of 71 Batchelder Rd - depressions
4-25	Larvicide left of 71 Batchelder Rd - depressions
4-25	Survey left of 11 Twins Rd - depressions & swamp
4-25	Larvicide left of 11 Twins Rd - depressions & swamp
4-25	Survey catch basins on Essex Dr - Strikers East Bowling
4-25	Survey catch basins on Freetown Rd - Hannofords
4-25	Survey catch basins on Freetown Rd
4-25	Survey catch basins on Epping Rd
4-25	Survey catch basins on Epping Rd - Advance Autoparts
4-25	Survey catch basins on Epping Rd - Mobil Gas Station
4-25	Survey catch basins on Epping Rd - Sunview Apartments
4-25	Survey catch basins on Kings Dr
4-25	Survey catch basins on Arrow Ln
4-25	Survey catch basins on Freetown Rd - Rite Aid

