

CENTRAL MASS. MOSQUITO CONTROL

www.cmmcp.org

MOSQUITO CONTROL IN CENTRAL MASSACHUSETTS

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ORGANIZATION STRUCTURE

Mosquito control districts in Mass. are state agencies. Their activities are performed pursuant to the provisions of Chapter 252 of the Massachusetts General Laws and special legislation (Acts and Resolves) that established the regional mosquito control projects/districts throughout the state. Each regional mosquito control project/district is overseen by a board of Commissioners appointed by the SRB, and also employs a director or superintendent to manage day-to-day mosquito control operations.

<https://malegislature.gov/Laws/GeneralLaws/PartIII/TitleIV/Chapter252>



- Districts operate under the authority of the State Reclamation & Mosquito Control Board (SRMCB)
- SRMCB has members from MDAR, DCR & MassDEP

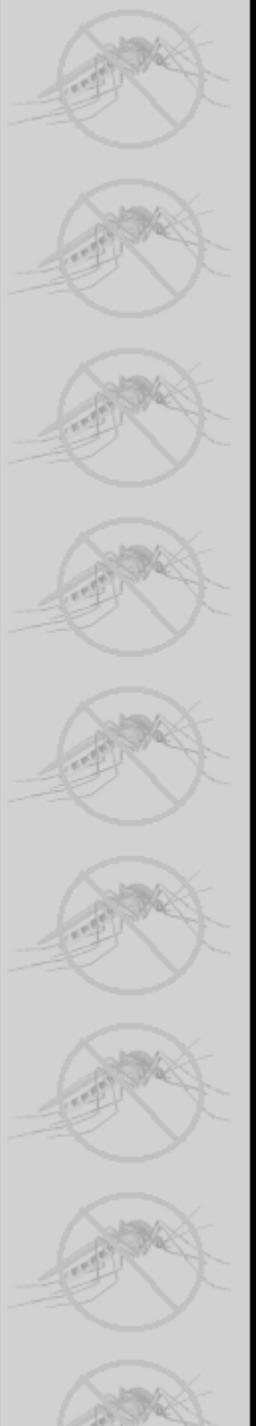


<http://www.mass.gov/eea/agencies/agr/pesticides/mosquito/>

MOSQUITO BIOLOGY

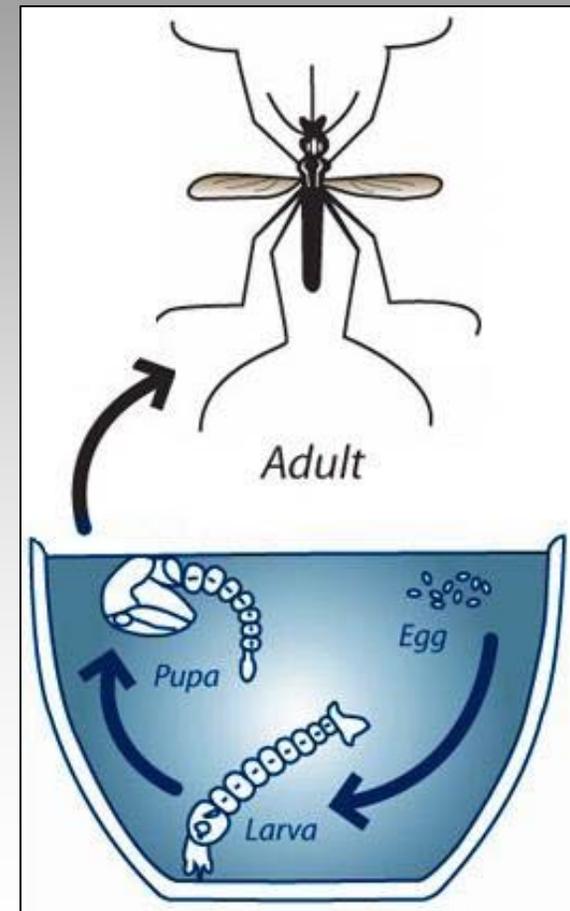
Understanding mosquito biology is an important aspect of our program. The first three life stages are aquatic, and we focus our control efforts at the larval and pupal stages using bacterial and/or environmentally sensitive products. By targeting these life stages, we can show great efficacy while they are concentrated in their aquatic medium, before they hatch out and disperse in the environment. Some species spend a great deal of time in the aquatic form, while others can develop very quickly through these life stages and emerge as biting adults.

<http://www.cmmcp.org/mosqinfo.htm>



4 stages of development

- Egg
- Larvae
- Pupae
- Adult



Mosquito Eggs

- Damp soil
- Containers
- Permanent water
- Emergent vegetation
- Dependent on species



Mosquito Larvae

- 4 stages called “instars”
- 1/8” – 1/4” long
- Breathes air
- Can develop in as few as 5 days into pupae



Mosquito Pupae

- Does not eat
- Breathes air like larvae
- Fully developed mosquito inside
- Final stage before adult



Mosquito Adult

- 2,600 species, ~162 in USA
- 51 species in Mass.
- Vector of several diseases in the Northeast
- Flight range <100 yds. to 25 miles



LARVAL MOSQUITO HABITAT

Each mosquito species has a preferred habitat to develop from egg through adult. Some are specialists and only found in one habitat type, other are generalists and are successful in several types of stagnant water environments. Knowing which species tend to develop in what types of habitat allows us to focus our efforts in these areas. Wetlands and suspected mosquito breeding sites are monitored from March through September to check for larval activity. By controlling mosquitoes in their larval stage the need for adult mosquito spraying is reduced.

<http://www.cmmcp.org/larviciding.htm>



Habitat Types

- Retention/Detention areas
- Woodland pools & Reflood areas
- Cedar/Maple swamps
- Permanent water
- Degraded ditches
- Artificial containers
- Salt marsh



Retention/Detention areas

- Mandated by Stormwater Phase II

Common Mosquito Species:

- *Cq. perturbans* (w/emergent vegetation)
- *Ae. vexans*
- *Anopheles spp.*
- *Culex spp.*





Common Woodland Pool Species:

- *Oc. excrucians**
- *Oc. abserratus**
- *Oc. canadensis*
- *Ae. vexans*

*Requires a freeze/thaw cycle
(cold-conditioning)



Reflood areas

- Include woodland pools, and
- Floodplains
- Areas with poor drainage
- Will flood after significant rain events



Cedar/Maple swamps

- Common in the Northeast
- Habitat for *Cs. melanura* – amplification vector of EEE in birds
- Difficult to sample & control as larvae due to subterranean habits





Permanent water

- Emergent vegetation – *Cq. perturbans*
- Difficult to sample & control as larvae due to unique breathing habits – will attach to roots of vegetation & breathe through the vascular system of the plant





CATTAIL MARSH - *Typha* spp.

(*T. latifolia*, *T. angustifolia*, *T. glauca*, *T. domingensis*)

Degraded Ditch systems

- *Culex spp.* if pollution evident
- *Anopheles spp.*
- Will contribute to reflood areas
(*Ae. vexans* & *Ae. cinereus*)





Container species

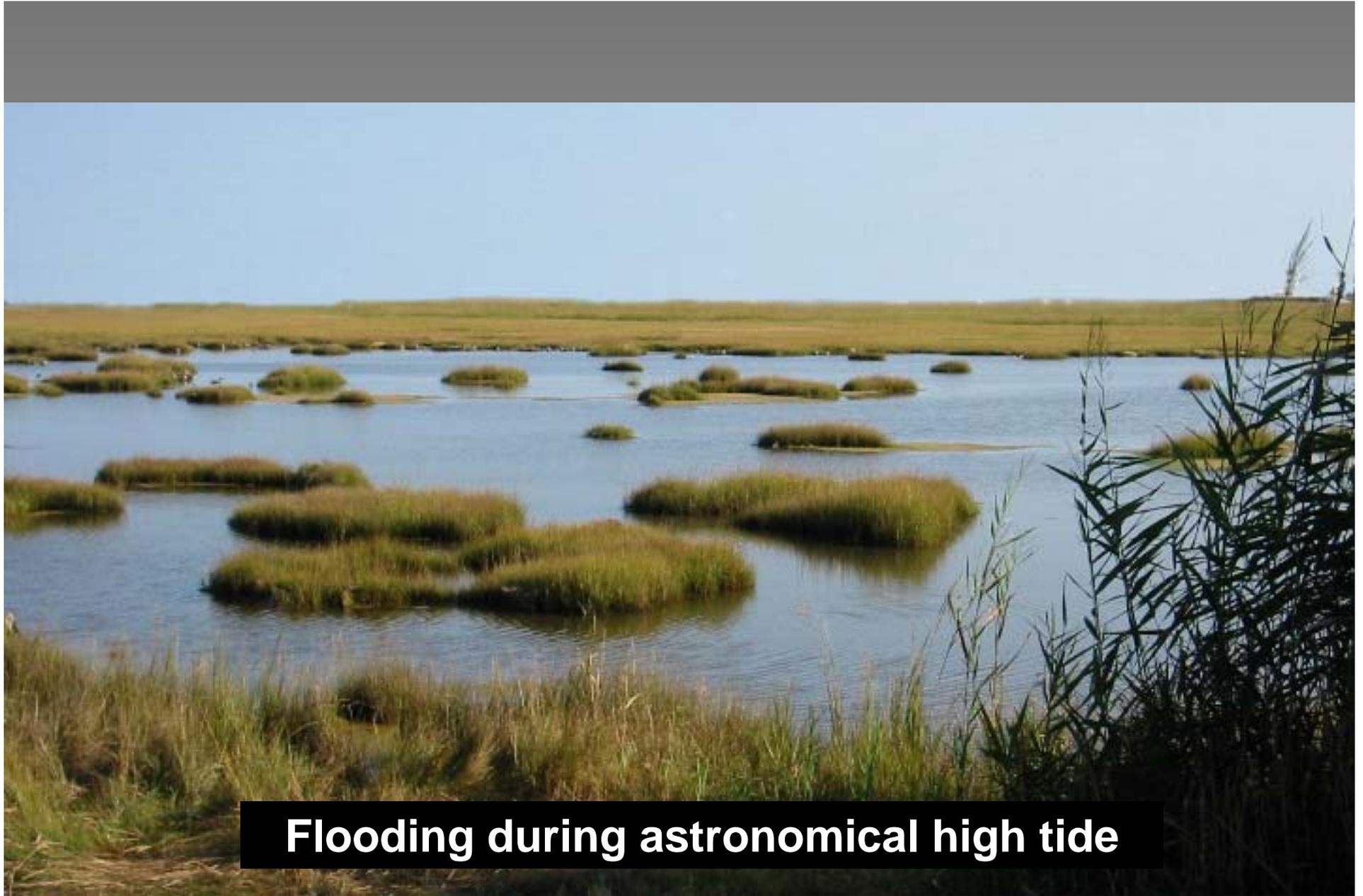
- *Oc. triseriatus*
- *Oc. japonicus*
- *Culex spp.*



Salt Marsh species

- *Oc. taeniorhynchus*
- *Oc. cantator*
- *Oc. sollicitans*





Flooding during astronomical high tide

Invasive plant species

- Alter the biodiversity of a habitat
- Can introduce mosquito species to an area dependant on emergent vegetation (*Cq. perturbans*).





PURPLE LOOSTRIFE - *Lythrum salicaria*



THE COMMON REED - *Phragmites australis* or *Phragmites communis*

MOSQUITO CONTROL IN MASSACHUSETTS

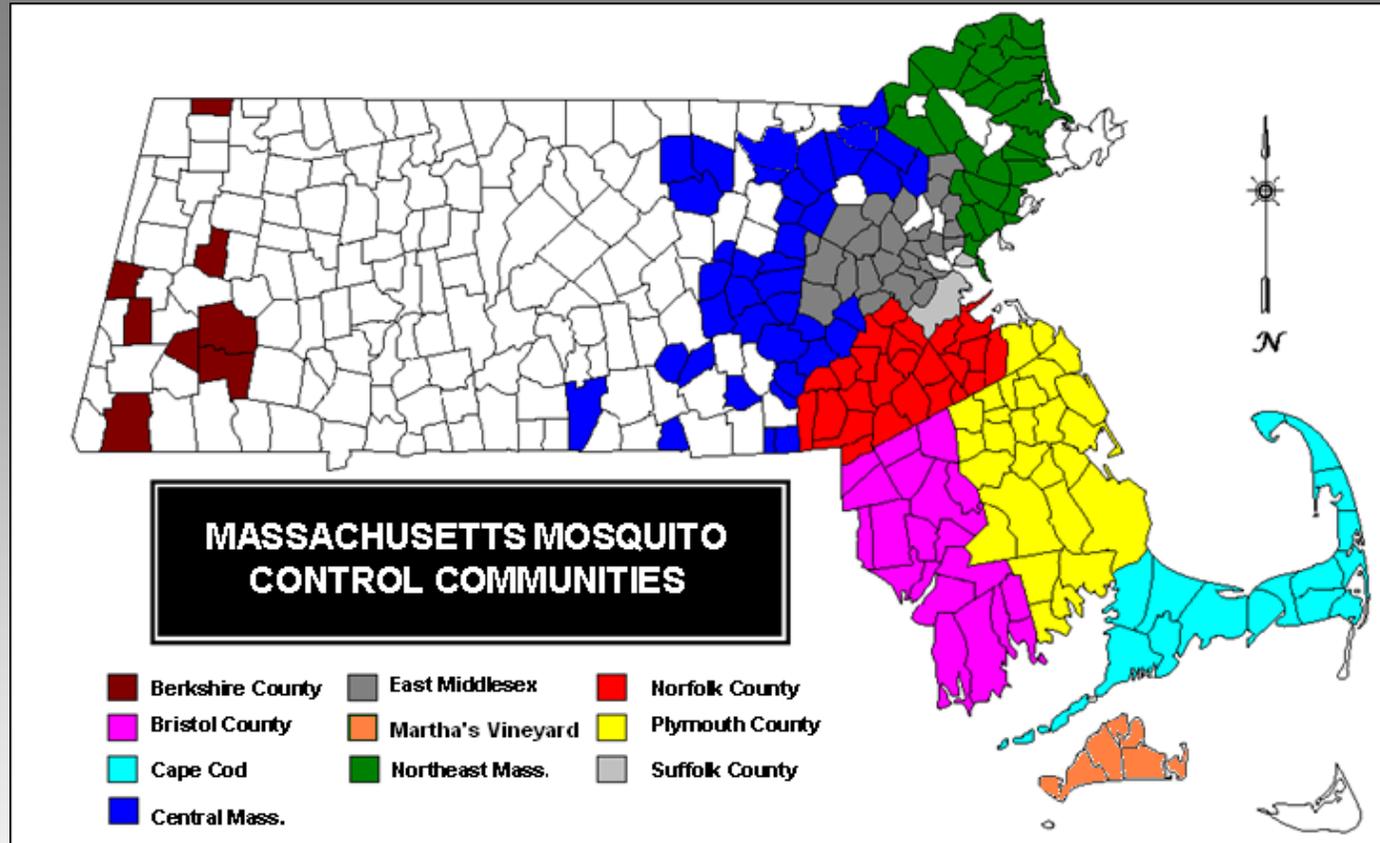
Historically mosquito districts were set up along county lines, but this is dependent on the district's enabling legislation – CMMCP encompasses communities in both Worcester & Middlesex counties. There are 11 organized districts in the state, but 2 are new (Martha's Vineyard & Nantucket) and only perform surveillance at this time. Smaller districts offer the most important components of a Integrated Mosquito Management program, while larger districts have the ability to offer additional services.



11 Mosquito Districts in Mass.

1. Berkshire County MCP
2. Bristol County MCP
3. Cape Cod MCP
4. **Central Mass. MCP**
5. East Middlesex MCP
6. Martha's Vineyard (new in 2013)
7. Nantucket (new in 2014)
8. NE Mass. Wetlands Mgmt. & MC District
9. Norfolk County MCP
10. Plymouth County MCP
11. Suffolk County MCP





Mosquito Districts in Mass.

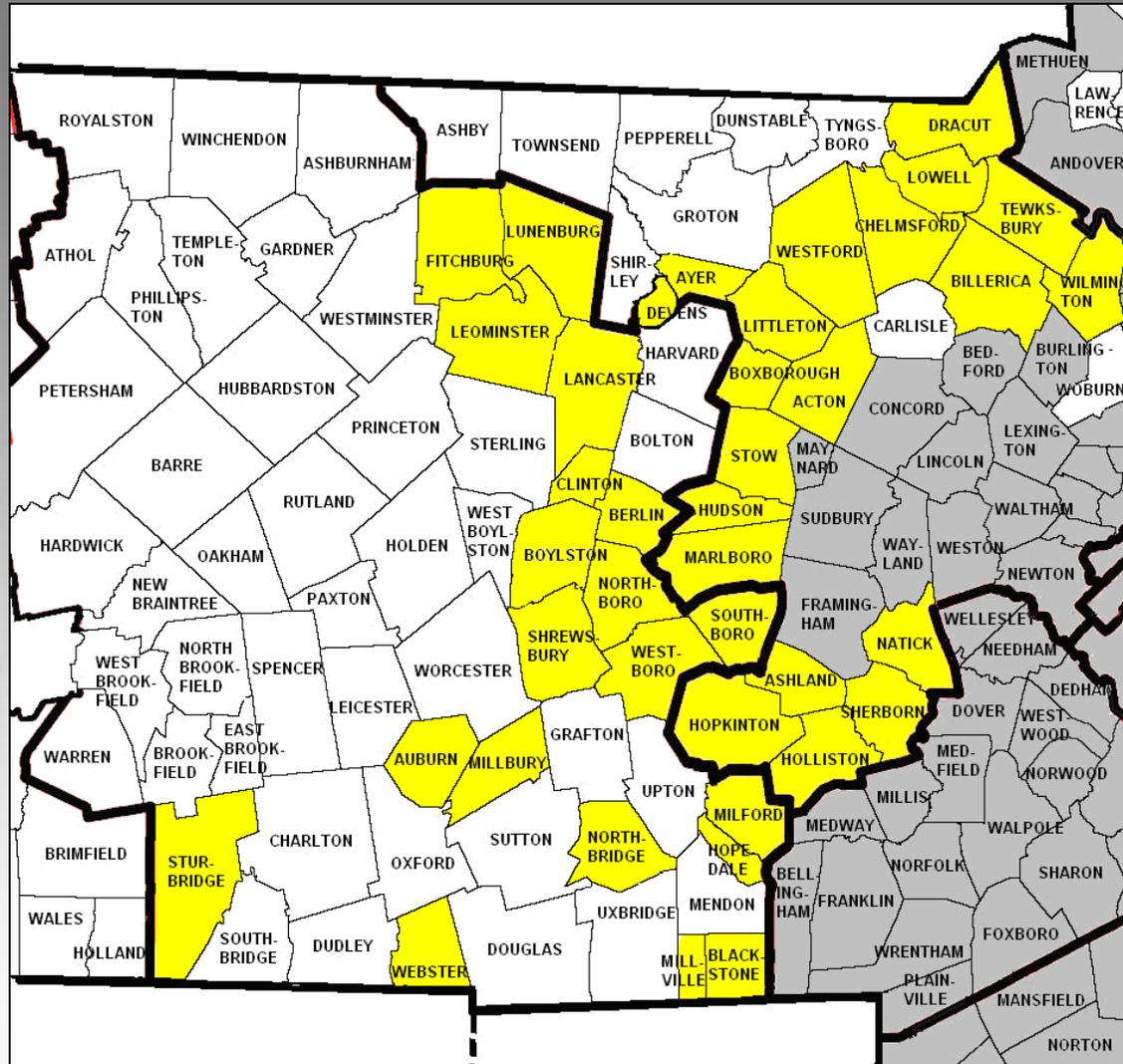


MASSACHUSETTS MOSQUITO CONTROL TOWN LISTING
2014

BERKSHIRE (413) 447-9808	BRISTOL (508) 823-5253	CAPE COD (508) 775-1510	CENTRAL (508) 393-3055	EAST MIDDLESEX (781) 899-5730	NORFOLK (781) 762-3681	NORTHEAST (978) 463-6630	PLYMOUTH (781) 585-5450	SUFFOLK (781) 899-5730
CLARKSBURG	ACUSHNET	BARNSTABLE	ACTON	ARLINGTON	AVON	AMESBURY	ABINGTON	BOSTON
HINSDALE	ATTLEBORO	BOURNE	ASHLAND	BEDFORD	BELLINGHAM	ANDOVER	BRIDGEWATER	CHELSEA
OTIS	BERKLEY	BREWSTER	AUBURN	BELMONT	BRAINTREE	BEVERLY	BROCKTON	
PITTSFIELD	DARTMOUTH	CHATHAM	AYER	BROOKLINE	CANTON	BOXFORD	CARVER	2 TOTAL
RICHMOND	DIGHTON	DENNIS	BERLIN	BURLINGTON	DEDHAM	DANVERS	COHASSET	
SHEFFIELD	EASTON	EASTHAM	BILLERICA	CAMBRIDGE	DOVER	GEORGETOWN	DUXBURY	
STOCKBRIDGE	FAIRHAVEN	FALMOUTH	BLACKSTONE	CONCORD	FOXBOROUGH	GROVELAND	E. BRIDGEWATER	
TYRINGHAM	FALL RIVER	HARWICH	BOXBOROUGH	EVERETT	FRANKLIN	HAMILTON	HALIFAX	
	FREETOWN	MASHPEE	BOYLSTOM	FRAMINGHAM	HOLBROOK	HAVERHILL	HANOVER	
8 TOTAL	MANSFIELD	ORLEANS	CHELMSFORD	LEXINGTON	MEDFIELD	IPSWICH	HANSON	
	NEW BEDFORD	PROVINCETOWN	CLINTON	LINCOLN	MEDWAY	LYNN	HINGHAM	
	N. ATTLEBOROUGH	SANDWICH	DEVENS	MALDEN	MILLIS	LYNNFIELD	HULL	
	NORTON	TRURO	DRACUT	MAYNARD	MILTON	MANCHESTER BY THE SEA	KINGSTON	
	RAYNHAM	WELLFLEET	FITCHBURG	MEDFORD	NEEDHAM	MARBLEHEAD	LAKEVILLE	
	REHOBOTH	YARMOUTH	HOLLISTON	MELROSE	NORFOLK	MERRIMAC	MARION	
	SEEKONK		HOPEDALE	NEWTON	NORWOOD	METHUEN	MARSHFIELD	
	SOMERSET	15 TOTAL	HOPKINTON	N. READING	PLAINVILLE	MIDDLETON	MATTAPOISETT	
	SWANSEA		HUDSON	READING	QUINCY	NAHANT	MIDDLEBOROUGH	
	TAUNTON		LANCASTER	SUDBURY	RANDOLPH	NEWBURY	NORWELL	
	WESTPORT		LEOMINSTER	WAKEFIELD	SHARON	NEWBURYPORT	PEMBROKE	
			LITTLETON	WALTHAM	STOUGHTON	N. ANDOVER	PLYMOUTH	
	20 TOTAL		LOWELL	WATERTOWN	WALPOLE	PEABODY	PLYMPTON	
			LUNENBURG	WAYLAND	WESTWOOD	REVERE	ROCHESTER	
			MARLBOROUGH	WELLESLEY	WEYMOUTH	ROWLEY	ROCKLAND	
			MILFORD	WESTON	WRENTHAM	SALEM	SCITUATE	
			MILLBURY	WINCHESTER		SALISBURY	WAREHAM	
			MILLVILLE		25 TOTAL	SAUGUS	W. BRIDGEWATER	
			NATICK	26 TOTAL		SWAMPSCOTT	WHITMAN	
			NORTHBOROUGH			TOPSFIELD		
			NORTHBRIDGE			WENHAM	28 TOTAL	
			SHERBORN			W. NEWBURY		
			SHREWSBURY			WINTHROP		
			SOUTHBOROUGH					
			STOW			32 TOTAL		
			STURBRIDGE					
			TEWKSBURY					
			WEBSTER					
			WESTBOROUGH					
			WESTFORD					
			WILMINGTON					
			40 TOTAL					

CENTRAL MASS. MOSQUITO CONTROL

www.cmmcp.org



LEGEND

-  Yellow – CMMCP towns
-  Gray – other Mosquito Districts
-  White – No control program

CMMCP Service Area 2014



1. ACTON
2. ASHLAND
3. AUBURN
4. AYER
5. BERLIN
6. BILLERICA
7. BLACKSTONE
8. BOXBOROUGH
9. BOYLSTOM
10. CHELMSFORD
11. CLINTON
12. DEVENS
13. DRACUT
14. FITCHBURG
15. HOLLISTON
16. HOPEDALE
17. HOPKINTON
18. HUDSON
19. LANCASTER
20. LEOMINSTER
21. LITTLETON
22. LOWELL
23. LUNENBURG
24. MARLBOROUGH
25. MILFORD
26. MILLBURY
27. MILLVILLE
28. NATICK
29. NORTHBOROUGH
30. NORTHBRIDGE
31. SHERBORN
32. SHREWSBURY
33. SOUTHBOROUGH
34. STOW
35. STURBRIDGE
36. TEWKSBURY
37. WEBSTER
38. WESTBOROUGH
39. WESTFORD
40. WILMINGTON

CMMCP Service Area

2014



CMMCP SUITE OF SERVICES

Member communities have 8 services available to them through our program. We are able to offer several services not available in smaller districts such as Source Reduction (tire recycling), Beaver Mitigation and Research & Efficacy. Property owners are able to exclude their properties from any part of our program.

<http://www.cmmcp.org/services.htm>



Services Offered:

- 1. Surveillance**
- 2. Public Education**
- 3. Ditch Maintenance**
- 4. Larval Control**
- 5. Source Reduction**
- 6. Beaver Mitigation (new)**

PROACTIVE

7. Adult Control

REACTIVE*

8. Research & Efficacy

CHECKS & BALANCES

*Adult control is considered proactive by many by reducing certain species before they can transmit virus

MOSQUITO SURVEILLANCE

Mosquito populations are monitored in both the larval and adult stages to determine the appropriate control methods to be employed, prevalent mosquito species, and disease transmission potential. CMMCP has instituted a program to supplement the Dept. of Public Health's arbovirus surveillance program for monitoring West Nile Virus in Massachusetts. These traps will be placed throughout out service area and can be quickly broken down and moved to respond to the immediate needs of monitoring for this and other mosquito-borne diseases. When WNV is confirmed in a member city or town, these traps are placed in areas that have been determined to harbor this virus.

<http://www.cmmcp.org/asp.htm>



Trap types

Gravid trap



CDC light trap



Resting boxes



Surveillance

- Adult mosquito surveillance will be performed in town at least once per week.
- If virus is identified, then additional traps will be placed in that area – intervention options will be discussed with the Board of Health.



Arbovirus Testing

Adult mosquito samples sent to Mass. Dept. of Public Health each week, tested for:

- West Nile Virus
- Eastern Encephalitis
- Other diseases (Highlands J, SLE, La Crosse, etc.)



2014 CMMCP Surveillance*

- 1,450 collections (1,026 tested)
- 18,697 specimens tested (23,263 total)
- 2 viral isolates in mosquitoes

1 WNV, 1 EEE



PUBLIC EDUCATION

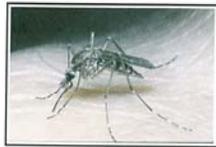
Educating the public about mosquitoes and their biology is an important aspect of our program. We offer a comprehensive curriculum geared towards school-aged children from Kindergarten to High School in member communities. We produce educational materials, and all member Town Halls are stocked with information on CMMCP, our programs, and how the homeowner can reduce mosquito populations. Project staff is available to meet with civic organizations, town/city boards, and to participate in Health Fairs. We have a program geared towards Senior Citizens, an at-risk group for mosquito diseases. We have a full service website, and are active in several social media platforms.

<http://www.cmmcp.org/education.htm>



Public Education

MOSQUITOES and you!!



CENTRAL MASS MOSQUITO CONTROL PROJECT

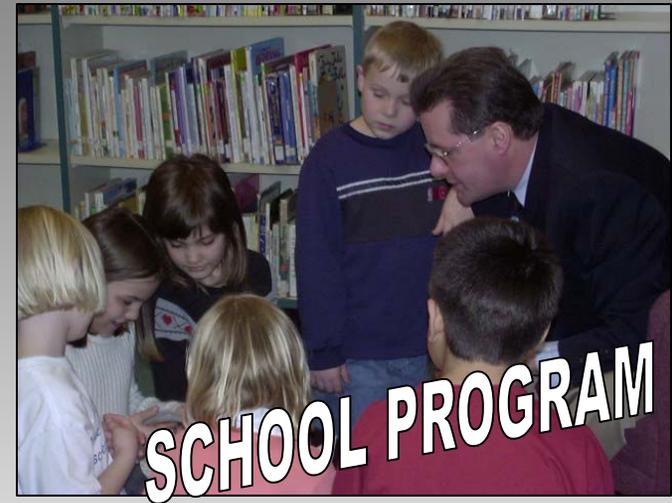
111 OTIS STREET
NORTHBOROUGH, MA 01532

Tel: (508) 393-3055
Fax: (508) 393-8492

for additional information, please
access our website at
www.cmmcp.org



BROCHURE



SCHOOL PROGRAM



BOOKMARKS



CENTRAL MASS. MOSQUITO CONTROL

www.cmmcp.org

Public Education

follow us on
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SENIOR PROGRAM

f Find us on
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SOCIAL MEDIA



Central Mass. Mosquito Control - Microsoft Internet Explorer provided by CMMCP

http://www.cmmcp.org/

Google

Central Mass. Mosquito Control

CENTRAL MASS. MOSQUITO CONTROL PROJECT

- KEY PUBLIC HEALTH MESSAGES
- INFORMATION ON TICKS
- INFORMATION ON DOG HEARTWORM
- INFO ON INSECT REPELLENT USE
- TIPS ON MOSQUITO PROTECTION
- SWIMMING POOLS & MOSQUITOES

- ABOUT CMMCP
- OUR SERVICES
- REQUEST SERVICE
- 2014 MOSQUITO SUMMARY
- MOSQUITO INFO
- PESTICIDE INFO
- MOSQUITO LINKS
- VIRUS INFO
- FAQ
- CONTACT US

Text only version



CMMCP is a partner in the EPA's PESP program. Click the logo for more details



CMMCP is a partner with the EPA's Waste Wise program. Click the logo for more details



photo by Tim Deschamps
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CMMCP website – www.cmmcp.org



Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs



2013 Secretary's Award for Excellence
in Energy and Environmental Education

Certificate of Excellence

Central Massachusetts Mosquito Control Project

CMMCP Education Programs

*In recognition for your dedication, commitment
and contributions to environmental education*



Richard K. Sullivan, Jr., Secretary

May 13, 2013

Date

**Our educational programs were recognized in 2013 by the
Secretary of EOEEA**

DITCH MAINTENANCE

Ditch maintenance is an integral part of an Integrated Mosquito Management (IMM) plan. Restoration of degraded wetland areas consists of selectively clearing brush and removing debris from drainage systems to restore historical flow patterns. This can be accomplished with hand tools such as rakes, clippers and chain saws or may require more extensive restoration using a specially designed, low ground pressure (3 psi or less) excavator or other mechanized equipment. Restoration of drainage systems reduces or often eliminates the need for periodic applications of pesticides to control the larval mosquito.

<http://www.cmmcp.org/restoration2.htm>



Ditch Maintenance

- All proposed work is assessed by a wetland scientist on staff (a former Conservation Agent)
- Most work is low impact using hand/power tools
- More extensive projects using low ground pressure equipment requires more site evaluation
- Work is done after receipt of property owner permission





Ditch Maintenance (Hopedale 1999)



← BEFORE

AFTER →



Ditch Maintenance (Shrewsbury 2004)



← BEFORE

AFTER →





Ditch Maintenance (Chelmsford 2010)



Ditch Maintenance (Natick 2010)

LARVAL MOSQUITO CONTROL

Wetlands and suspected larval mosquito habitats are monitored from March through September to determine the need for applications of environmentally sensitive products (typically *Bti*) to control and/or eliminate the larval mosquito. Targeting them in this life stage works to our advantage because they are concentrated and vulnerable – please we see upwards of 100% control after every application, with no non-target impacts. By controlling mosquitoes in their larval stage the need for adult mosquito spraying is reduced and sometimes eliminated.

<http://www.cmmcp.org/larviciding.htm>



Larval Control Products

- Bacterial (wetlands)
 - Bti (*Bacillus thuringiensis israelensis*)
 - Bs (*Bacillus sphaericus*)
- Insect Growth regulator (catch basins)
 - Methoprene (Altosid®)
- Surfactant/Oils (limited use)
 - refined mineral oil



Aerial Larval Control*



***NOTE:** this is the only program that is done with supplemental funding provided by member communities.

Aerial Larval Control (cont.)

- 3 towns in program, Chelmsford (~700 acres), Billerica (~600 acres) and Boxborough (~900 acres)
- Aimed at reducing dependence on the spray program and reducing spring species, as well as possible vector species.
- Can be done in summer also



Bti granules



in wetlands

in catch basins



Altosid® pellets

SOURCE REDUCTION

Reducing or removing larval habitat by recycling, waste disposal or other means is a permanent solution. Mosquito larvae are opportunistic and will create habitat in any container that holds water for more than a week. Empty and clean birdbaths and kiddie pools each week, cover or store inside anything that may capture and hold water, and dispose of or recycle any containers that are no longer needed.

<http://www.cmmcp.org/tires.htm>



Source Reduction

- New program for CMMCP (2010)
- Operates off grants & operating budget
- 13,500+ tires recycled to date in 37 member cities & towns

Tires in the environment are the preferred larval habitat of several species of mosquitoes, some that transmit West Nile Virus



Source Reduction

- Clean-up of large waste tire dumping sites that we have databased;
- Residential waste tire removal (curb-side);
- Removal of waste tires discarded on the side of the road; and
- Coordination with communities during recycle events, hazardous waste collections, river cleanups, etc.



ASHLAND, MA

1,300+ tires

BEFORE

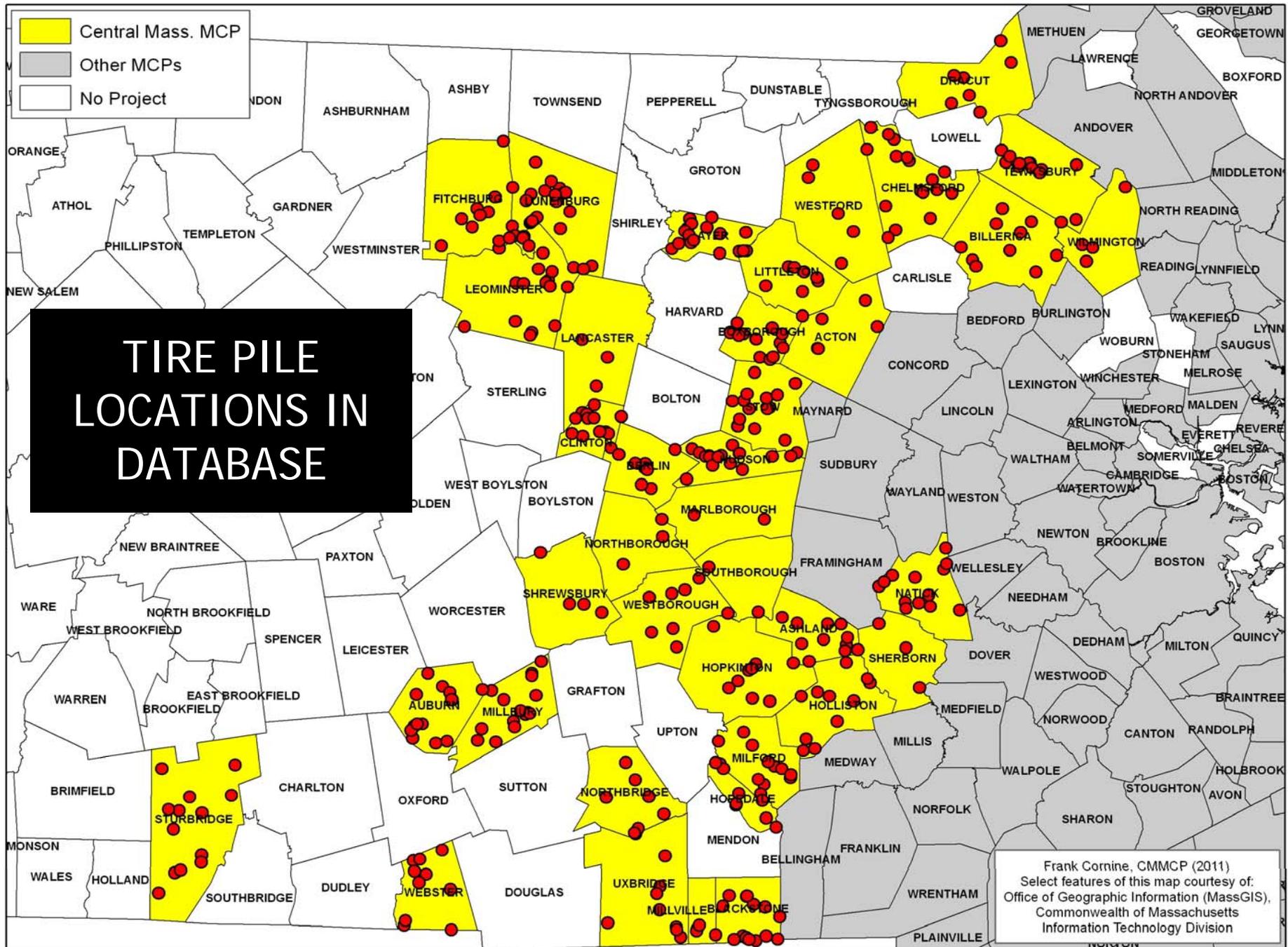


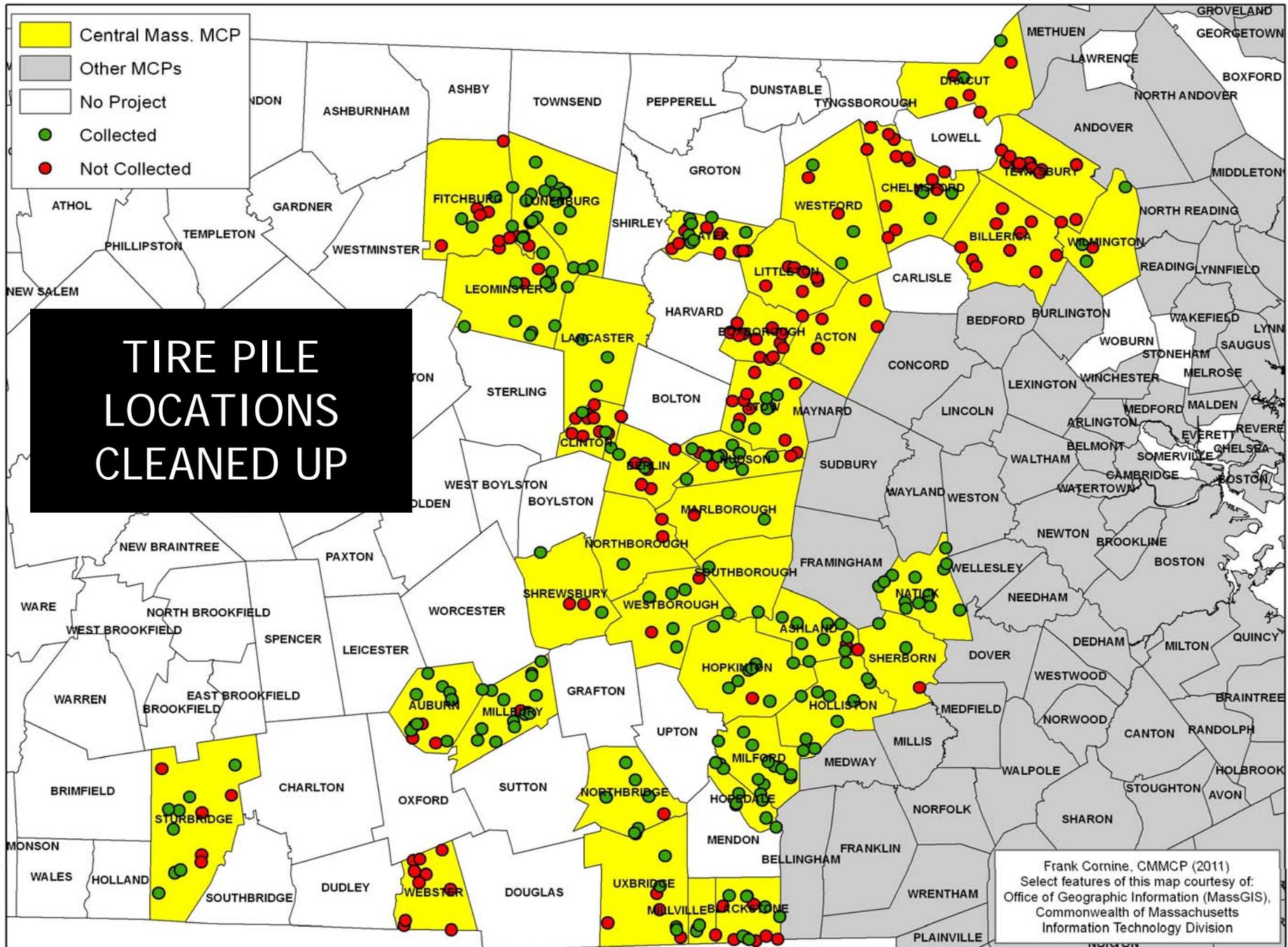
ASHLAND, MA

0 tires

AFTER







MassRecycle

presents the 2011

BRONZE

Institution & Nonprofit Award

to

Central Mass Mosquito Control Project

for

Outstanding efforts to increase recycling and reduce waste



Dmitriy Nikolayev

Dmitriy Nikolayev, President
November 15, 2011

Our tire program was recognized in 2011 by MassRecycle



From the EPA awards:

“Through this project, the organization has recycled 11,500 tires, which saved 192 staff hours in monitoring larval habitats, and resulted in usage of 720 pounds less of pesticides.”

Our tire program was recognized in 2014 by the EPA

BEAVER MITIGATION

Beavers in Massachusetts are a keystone species with beneficial aspects such as habitat creation for many wetland species, storage of floodwaters and recharging aquifers. But encroachment in some areas cause conflict such as roadway flooding, septic system failure and the creation of larval mosquito habitats. These new habitats can support mosquito species that transmit WNV and EEE.

Resolving conflicts with beavers include tolerance, exclusion, dam breaching or removal, water level control devices (WLCD) and trapping.

http://www.cmmcp.org/sbeaver_program.htm

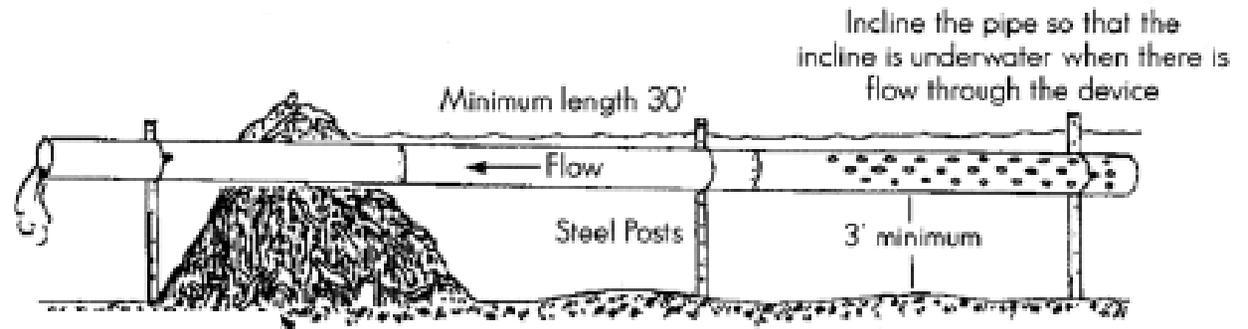


Beaver Mitigation

- New program for CMMCP (2014)
- Working under emergency permits through BOH & ConCom
- Installation of WLCD
- Dam breaching
- Licensed trappers on staff

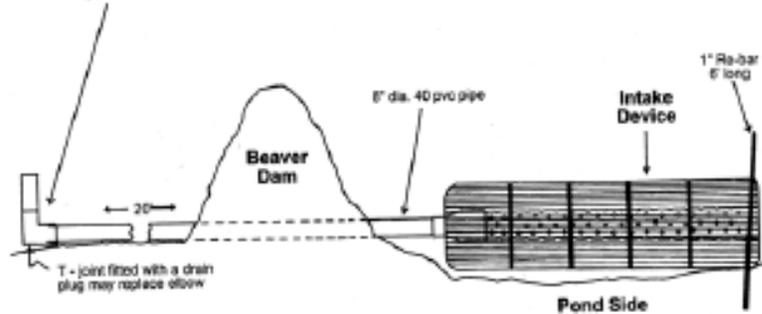


Pond Drain Pipe



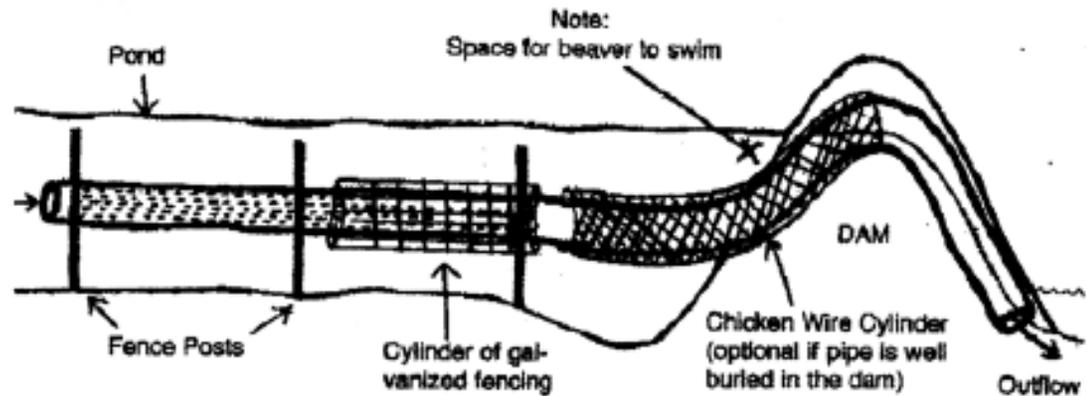
The Clemson Beaver Pond Leveler

Elbow and stand pipe are optional. Needed only to manage water level if maintaining pond is an objective



WLCD EXAMPLES

PWWV Flexible Leveler





HUDSON, MA



HUDSON, MA



HUDSON, MA

ADULT MOSQUITO CONTROL

When adult mosquito populations reach intolerable levels, hand-held or truck mounted sprayers are used to reduce the adult mosquito levels in residential areas. The Project has worked diligently over the past 25 years to reduce the dependency on adulticiding by increasing the emphasis on larval control, public education, source reduction and ditch maintenance.

<http://www.cmmcp.org/adulticide.htm>



Adult Control Product

- Sumithrin (d-phenothrin), a synthetic pyrethroid
- Not a residual product, rapid decomposition in the environment
- Low toxicity to humans, pets, etc.



Application rates

GROUND ULV APPLICATION

Apply ANVIL 10+10 ULV through a standard ULV cold aerosol or non-thermal aerosol (cold fog) generator. Consult the following table for examples of various dosage rates using a swath width of 300 feet for acreage calculations.

Dosage Rate	Fl. oz. ANVIL	Flow Rates in fluid oz./minute at truck speeds of:			
		5MPH	10MPH	15MPH	20MPH
Lbs Sumithrin®/acre	10+10 ULV per Acre				
0.0036	0.62	1.9 oz.	3.8 oz	5.7 oz	7.6 oz
0.0024	0.42	1.3 oz	2.5 oz	3.8 oz	5.1 oz
0.0012	0.21	0.6 oz	1.3 oz	1.9 oz	2.5 oz

The red box are the application rates of the 10% solution of sumithrin over the area the size of an acre – 43,560 sq. ft.

The green box is the typical application rate we use



Pyrethroids

- Animal Products (flea spray, flea shampoos)
- Restaurant applications
- Food & grain storage
- Available to homeowners as Yard Guard®, Repel®, etc.





Pyrethroids in Pet Products

ACTIVE INGREDIENTS:	
Phenothrin	85.7%
(S)-Methoprene	2.3%
OTHER INGREDIENTS: . . . 12.0%	
TOTAL	100.0%

Here is a common pet product using the same pesticides we use, but at higher rates

Adult Control

- If no service requests are received from residents, then no spraying will be done. Other work like larval control, landing counts, etc. may be performed in town on the scheduled day/evening
- If spraying is done for virus control, it will be done only after consultation with local and state officials



Exclusion properties (No Sprays)

- Letters sent to all City/Town Clerks in January
- Can register with Clerk, CMMCP or through our website
- Detailed list sent with all pesticide applicators & on GPS units

<http://www.cmmcp.org/exclusion.htm>



Spray Notifications

- Monthly schedules sent to all Boards of Health, City/Town Clerks & Police Dept. 2 weeks prior to start of each month
- Street listings on CMMCP phone system & website after 3:30pm each day
- Detailed listing given to Police Dept. each afternoon

<http://www.cmmcp.org/ulv.htm>



Landing Rates

- Landing rates >1 per min.*
- 157 landing rates in 2014**
- 17/157 (11%) had no application***

*from the Mass. Mosquito Generic Environmental Impact Report

** Landing rates are suspended after confirmation of virus – July 8, 2014.

***either below threshold or during nights with no service requests



RESEARCH & EFFICACY

While CMMCP is an agency charged with the *control* of mosquitoes, we strive to check for efficacy of our products and techniques, and whenever possible perform research in new or different areas of mosquito control. All of our results are posted on our website, and included in our annual reports to our member communities.

<http://www.cmmcp.org/research.htm>



Research & Efficacy

- New department for CMMCP (2007) – includes GIS capabilities
- Provides checks & balances
- Past studies:
 - Mosquito bloodmeal analysis
 - Pesticide resistance testing
 - Adulticide program efficacy evaluation
 - Host-seeking activity
 - Resident survey



Research & Efficacy (cont.)

Pesticide resistance (sumithrin/resmethrin)

- Using CDC protocols
- Done for past 7 years, no resistance noted in area



Research & Efficacy (cont.)

Resident Survey 2005-2010

- 92.3% (avg.) are satisfied with service
- 98.5% (avg.) will use service again
- 1,260 respondents from 6,000 (21%)



MOSQUITO-BORNE DISEASES IN MASS

Disease transmission is a complex cycle, but can be simplified like this: WNV and EEE are in the bird population (reservoir). Some mosquito species will transmit the virus among the birds (amplify), and some species can transmit the virus (vector) to other animals (incidental infection). When a mosquito bites, it injects a small amount of its saliva to act as a anti-coagulant (blood thinner). In the saliva is the virus. Not all viruses can be transmitted in this fashion.

<http://www.cmmcp.org/virus.htm>



ARBOVIRUS DISEASE TRANSMISSION CYCLE



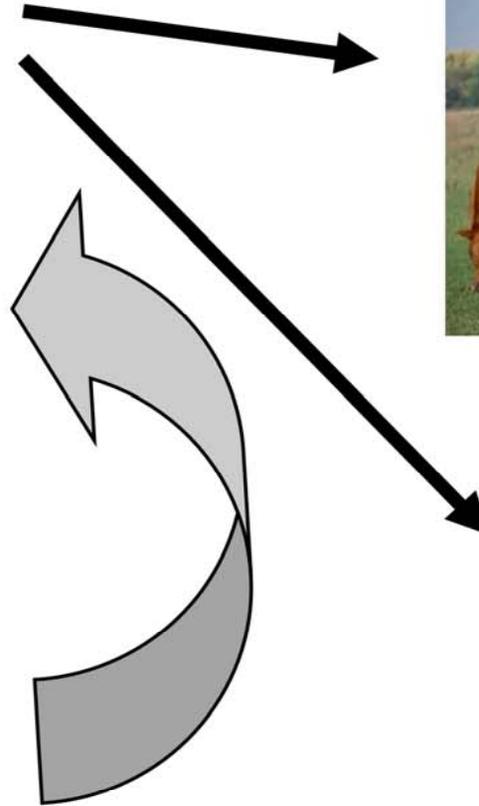
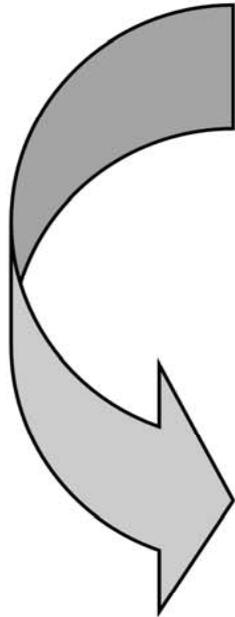
MOSQUITO (VECTOR)



BIRD (RESERVOIR)



INCIDENTAL INFECTIONS

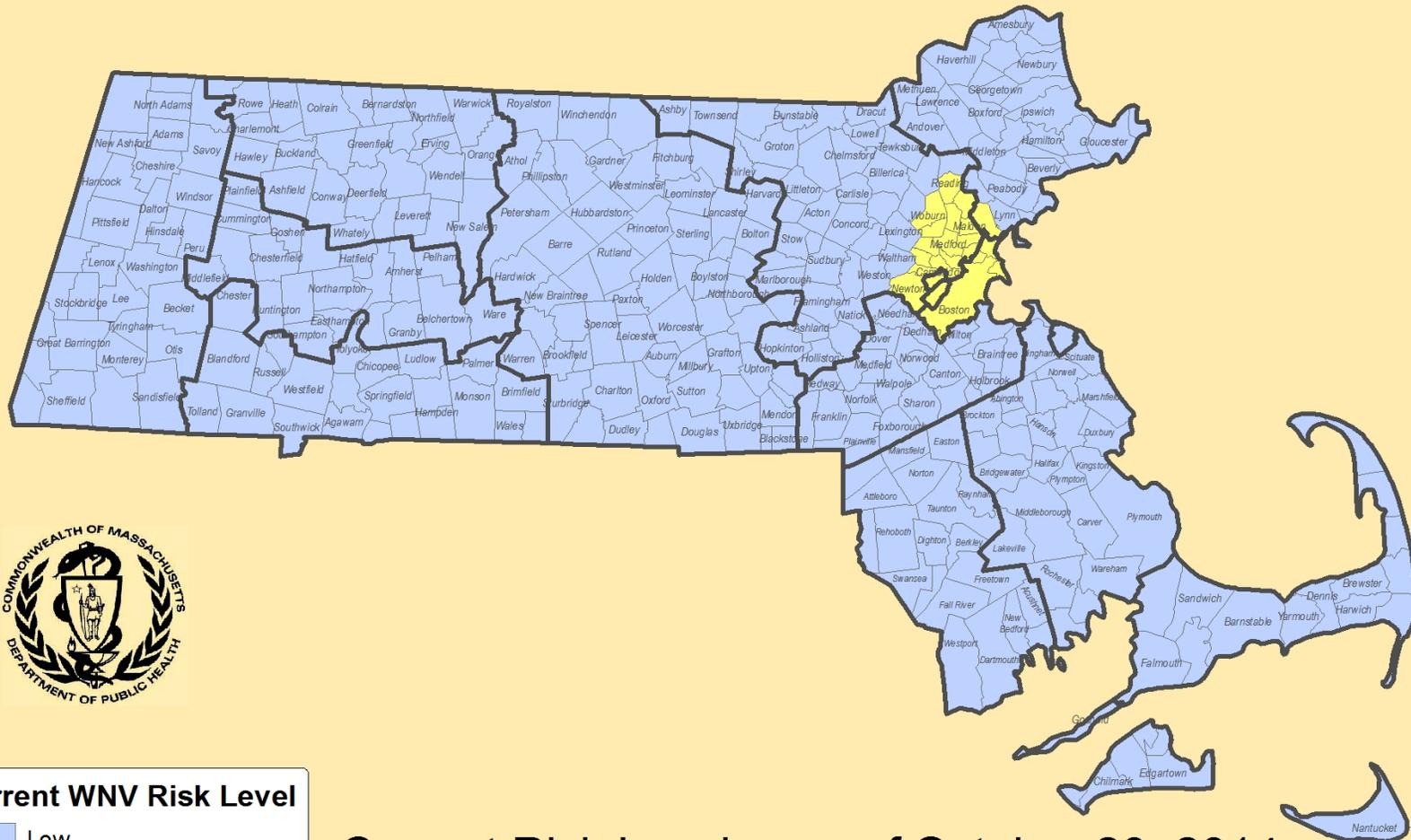


West Nile Virus

- Discovered in USA in New York in 1999
- Discovered in Mass. in 2000
- Firmly established in the Northeast



Massachusetts WNV Risk Categories



Current WNV Risk Level

- Low
- Moderate
- High
- Critical

Current Risk Levels - as of October 20, 2014
Risk levels reviewed daily, updated as needed

State Laboratory Institute
Arbovirus Surveillance Program

MA WNV Surveillance Summary

- October 31, 2014

Mosquito Pools Positive	56
Animals Positive	0
Humans Positive	5



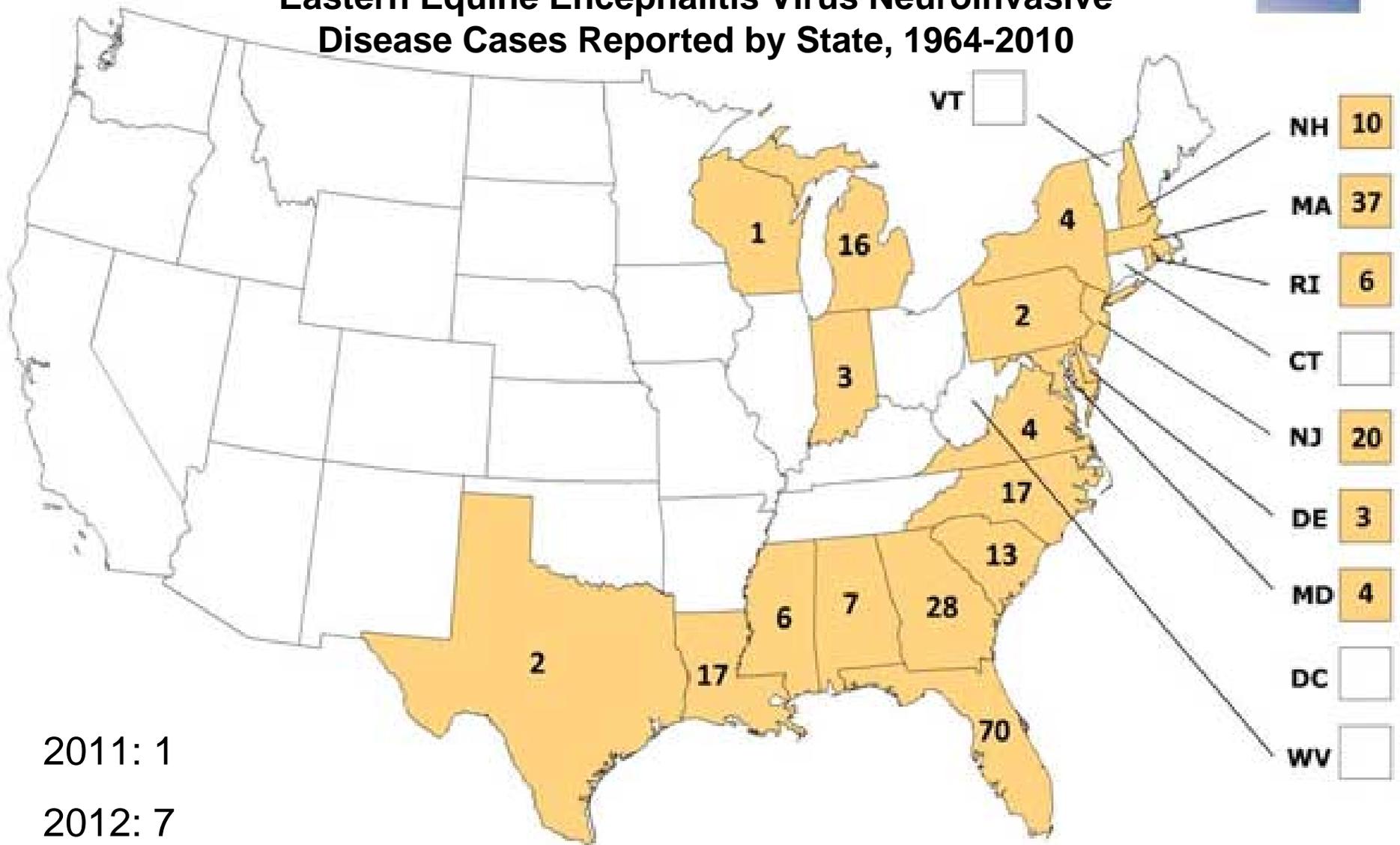
Eastern Equine Encephalitis

- 30-50% mortality
- Of the survivors, most have severe permanent neurological damage
- Most common in SE Mass. but may be moving west/north





Eastern Equine Encephalitis Virus Neuroinvasive Disease Cases Reported by State, 1964-2010

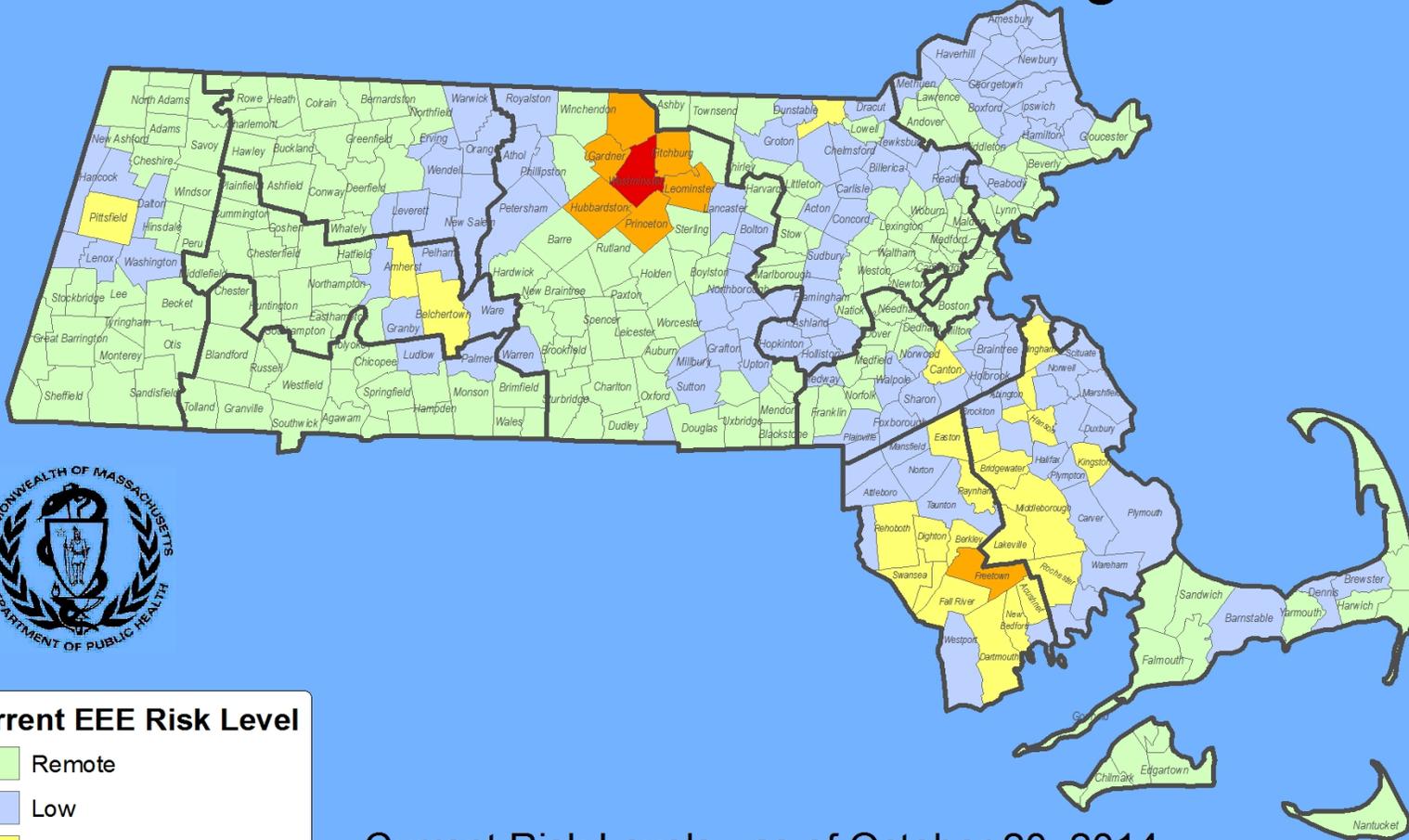


2011: 1

2012: 7

2013: 1

Massachusetts EEE Risk Categories



Current EEE Risk Level

- Remote
- Low
- Moderate
- High
- Critical

Current Risk Levels - as of October 20, 2014
 Risk levels reviewed daily, updated as needed

State Laboratory Institute
 Arbovirus Surveillance Program

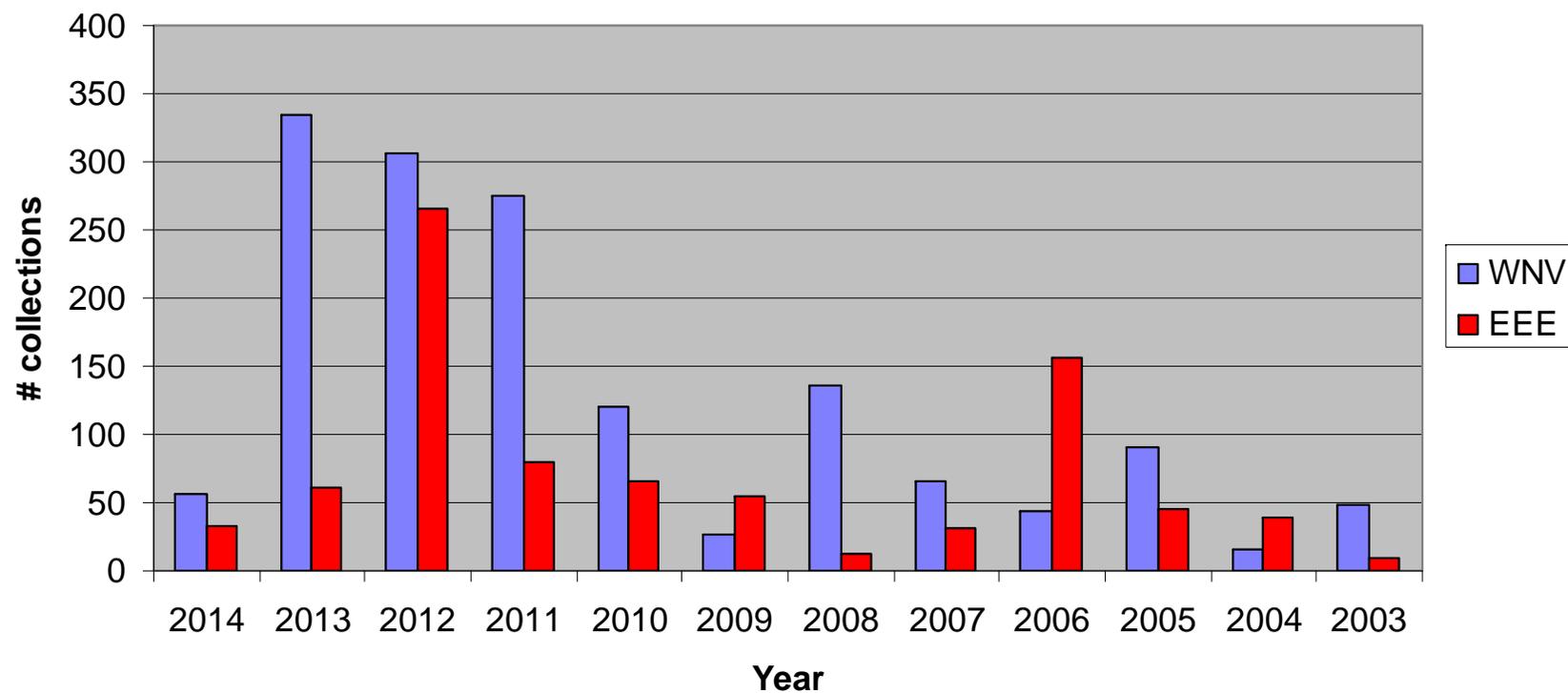
MA EEEV Surveillance Summary

- October 31, 2014

Mosquito Pools Positive	33
Animals Positive	2
Humans Positive	0



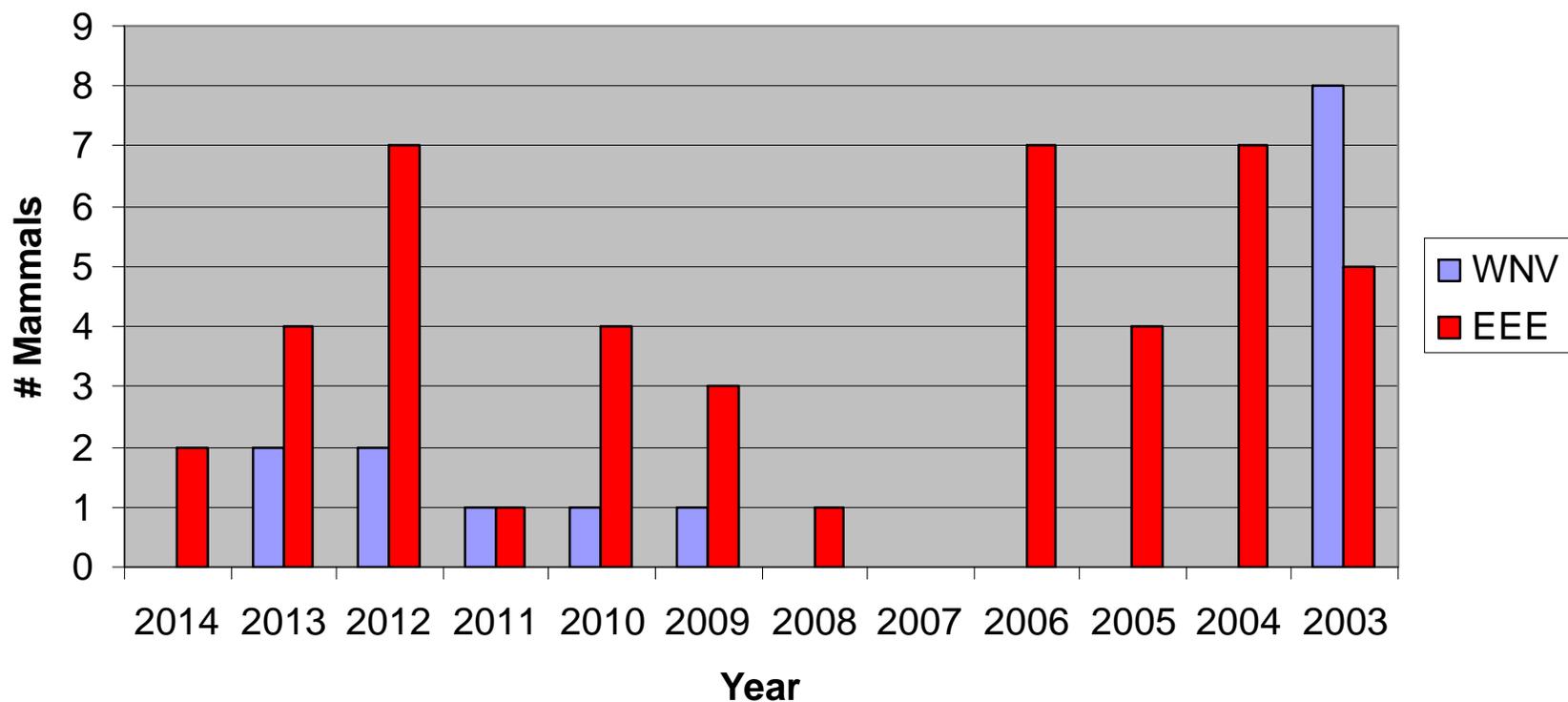
Statewide Mosquito Collections 2003-2014



Source: www.mass.gov/dph/mosquito



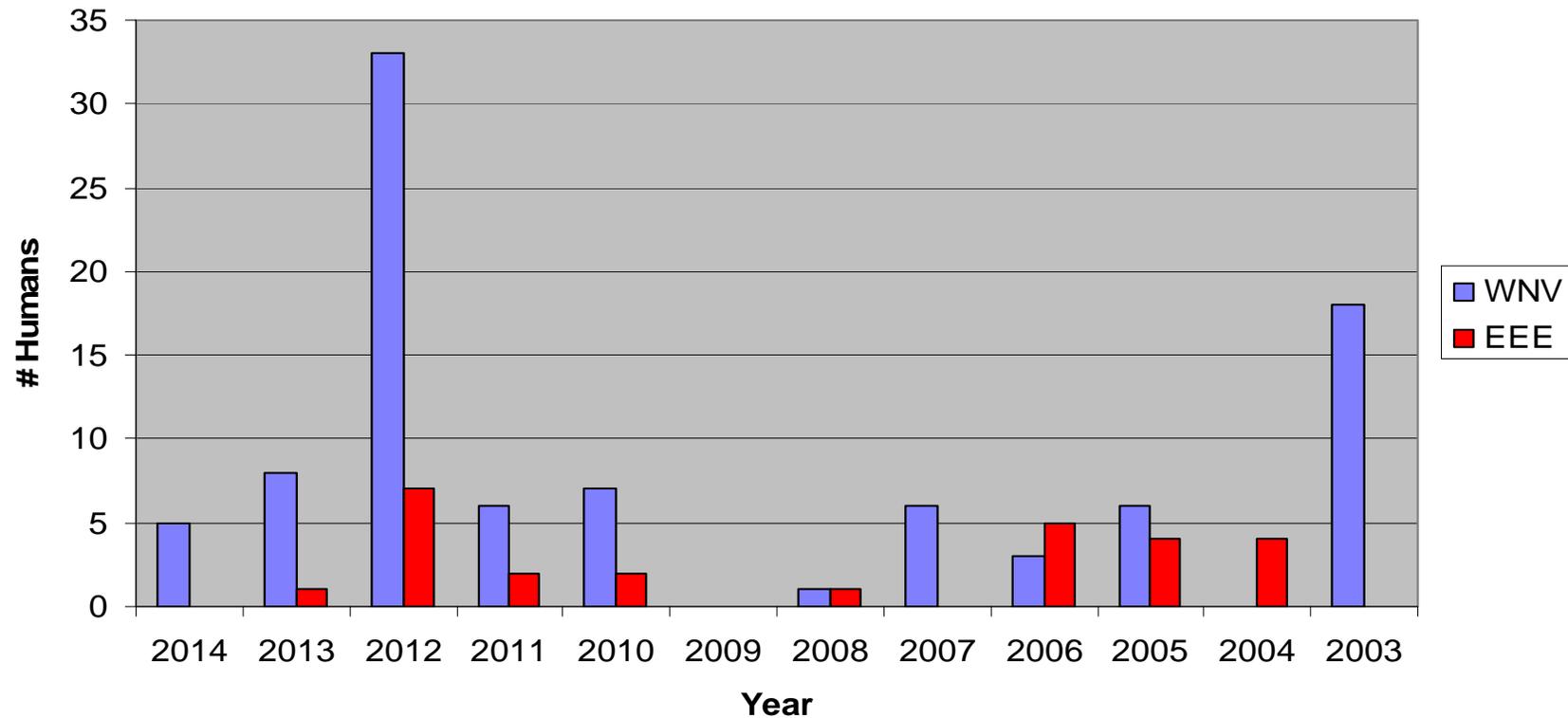
Statewide Mammal Cases 2003-2014



Source: www.mass.gov/dph/mosquito



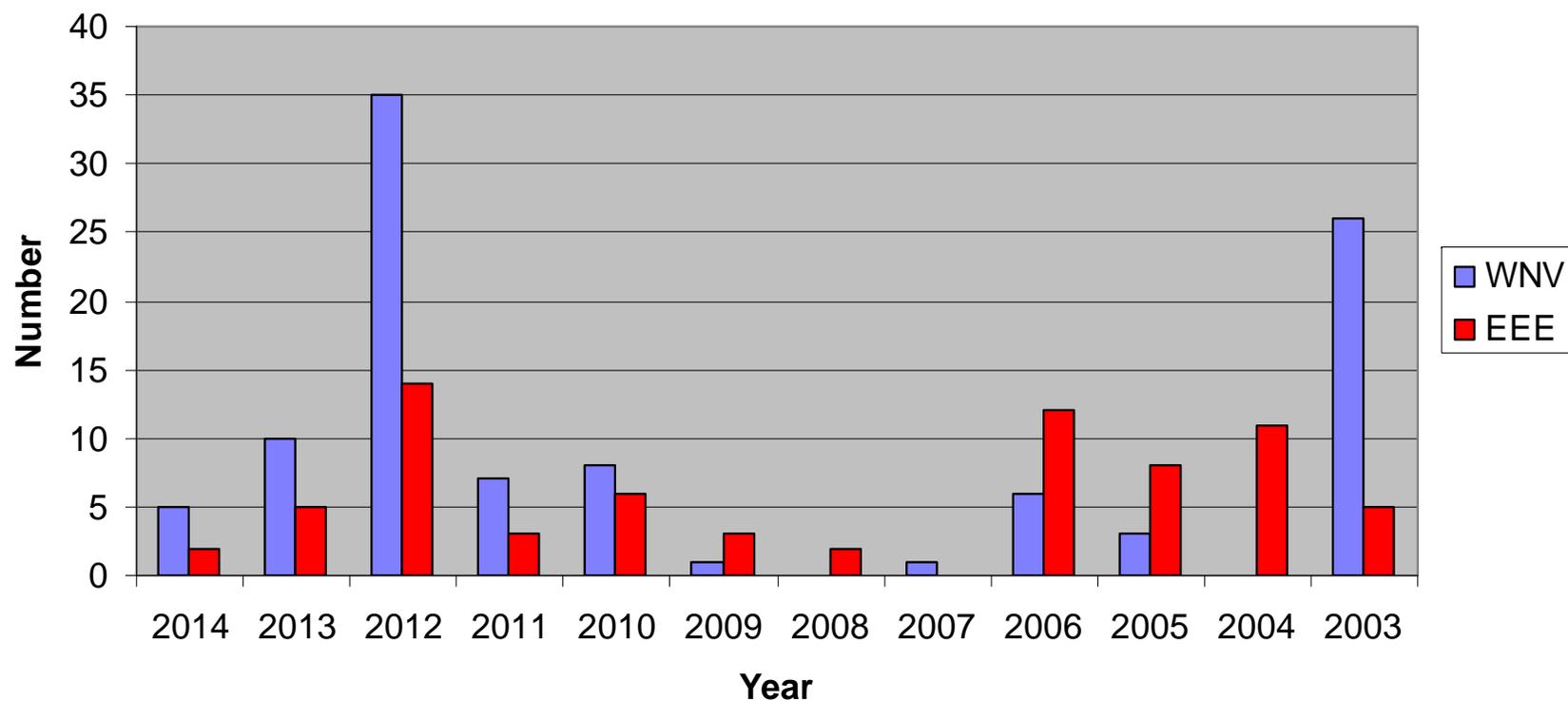
Statewide Human Cases 2003-2014



Source: www.mass.gov/dph/mosquito



Mammal & Human Cases Statewide 2003 - 2014



Source: www.mass.gov/dph/mosquito



PERSONAL PROTECTION MEASURES (PPM)

PPM are an important part of risk reduction from mosquito borne diseases, but must be maintained and direction followed closely. We recommend you follow the “5 D’s” for mosquito protection:

1. **DAWN & DUSK** (mosquito’s most active times)
2. **DRESS** (cover skin whenever possible)
3. **DEET** (use EPA approved repellents)
4. **DRAIN** (empty containers on your property)

<http://www.cmmcp.org/5ds.htm>



Repellents

- DEET
- Permethrin*
- Picaridin
- Oil of Lemon Eucalyptus (PMD)

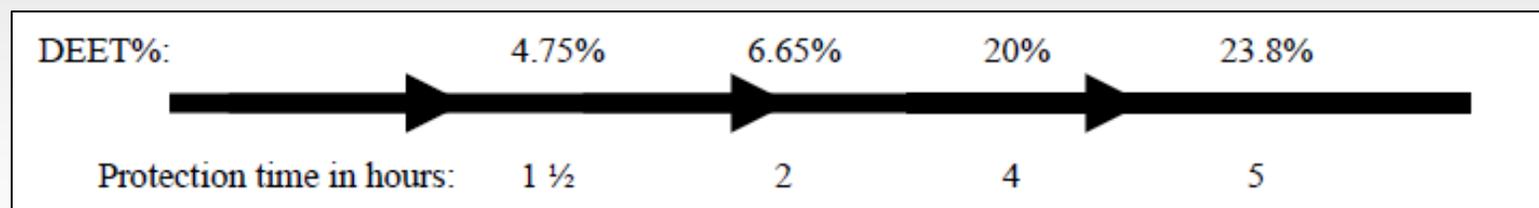
*clothing only

<http://www.cmmcp.org/repellent.htm>



DEET*

- The “Gold Standard” since 1946 (military use – 1957 civilian use)
- **READ THE LABEL** – under 30% recommended for children >2 months
- Not recommended for infants



*N,N-Diethyl-*m*-toluamide

Permethrin

- Contact insecticide
- Intended for use on clothing, bed nets, shoes, camping gear – **NOT ON SKIN**
- Follow label instructions
- Very effective against mosquitoes, ticks & other biting insects

READ THE LABEL



Picaridin & PMD

- Shorter effectiveness (comparable to low concentrations of DEET)
- Newer products, less data available
- Don't use PMD (oil of lemon eucalyptus) on children under 3 years of age

READ THE LABEL



Natural Repellents

- Limited data available of effectiveness and toxicity
- Look for products with an EPA registration number
- Just because it's "natural" doesn't mean it works or is safer than alternatives

READ THE LABEL



Application of Repellents

- Don't use repellents under clothing
- Don't use on cuts or irritated skin
- Don't use repellents near the mouth or eyes and use them sparingly around the ears. When using spray products, spray the product onto your hands first, and then apply it to your face.





Ticks

Tick control is not a service we currently offer due to our legislative setup, but we recognize there are many aspects of our program that can lend themselves to risk reduction from tick. Please check the link below for more information.

<http://www.cmmcp.org/tickcontrol.htm>



CENTRAL MASS. MOSQUITO CONTROL

www.cmmcp.org

CONTACT INFORMATION

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