



Commonwealth of Massachusetts
Department of Public Health

Helping People Lead Healthy Lives In Healthy Communities

Mosquito-borne Disease Surveillance and Response in Massachusetts

PHC - July 12, 2017



Massachusetts State Public Health Laboratory

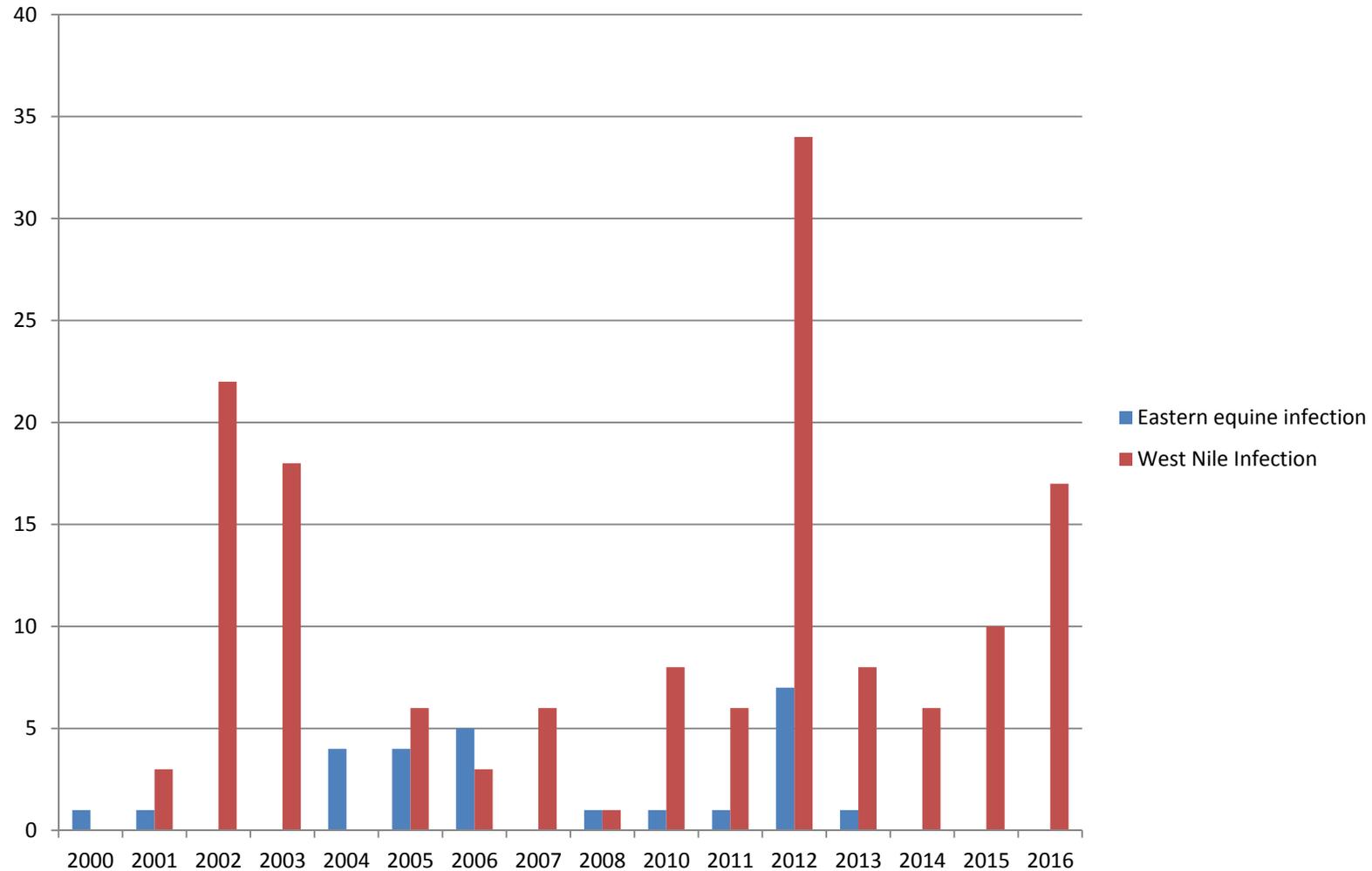
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Deputy State Epidemiologist and
State Public Health Veterinarian
Bureau of Infectious Disease and
Laboratory Sciences



Core concepts

- EEE and WNV are annual realities in Massachusetts that are addressed using well-documented protocols.
- The Commonwealth's arbovirus response is seen across the country as a national model.
- Massachusetts has had the longest experience with EEE in the nation, and is one of two states with the largest number of cases.
- Recent years have provided evidence of possible expansion of EEE activity in Massachusetts and New England.
- 2012 was a reminder that there can be significant fluctuations in WNV activity

Number of Human Cases of EEE and WNV in Massachusetts by Year, 2000-2016

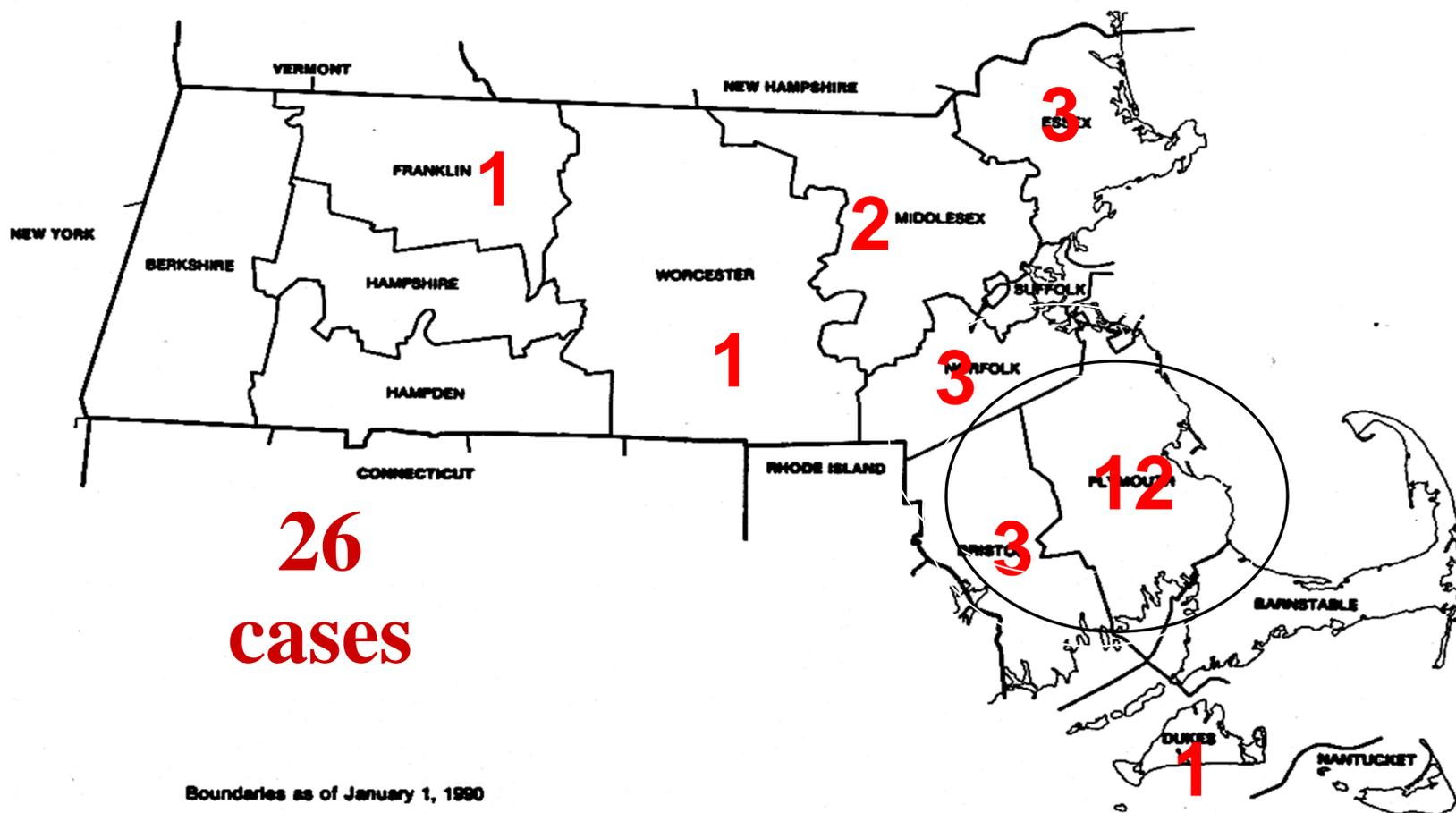


Habitats for EEE versus WNV

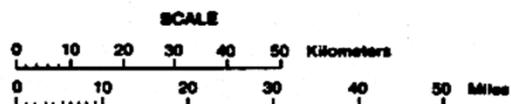
- Eastern equine encephalitis (EEE)
 - Red maple/white cedar swamps are source habitat (for birds and mosquitoes)
 - Type of habitat most common in SE MA
- West Nile virus
 - Urban habitats that accumulate small collections of stagnant water are source habitat



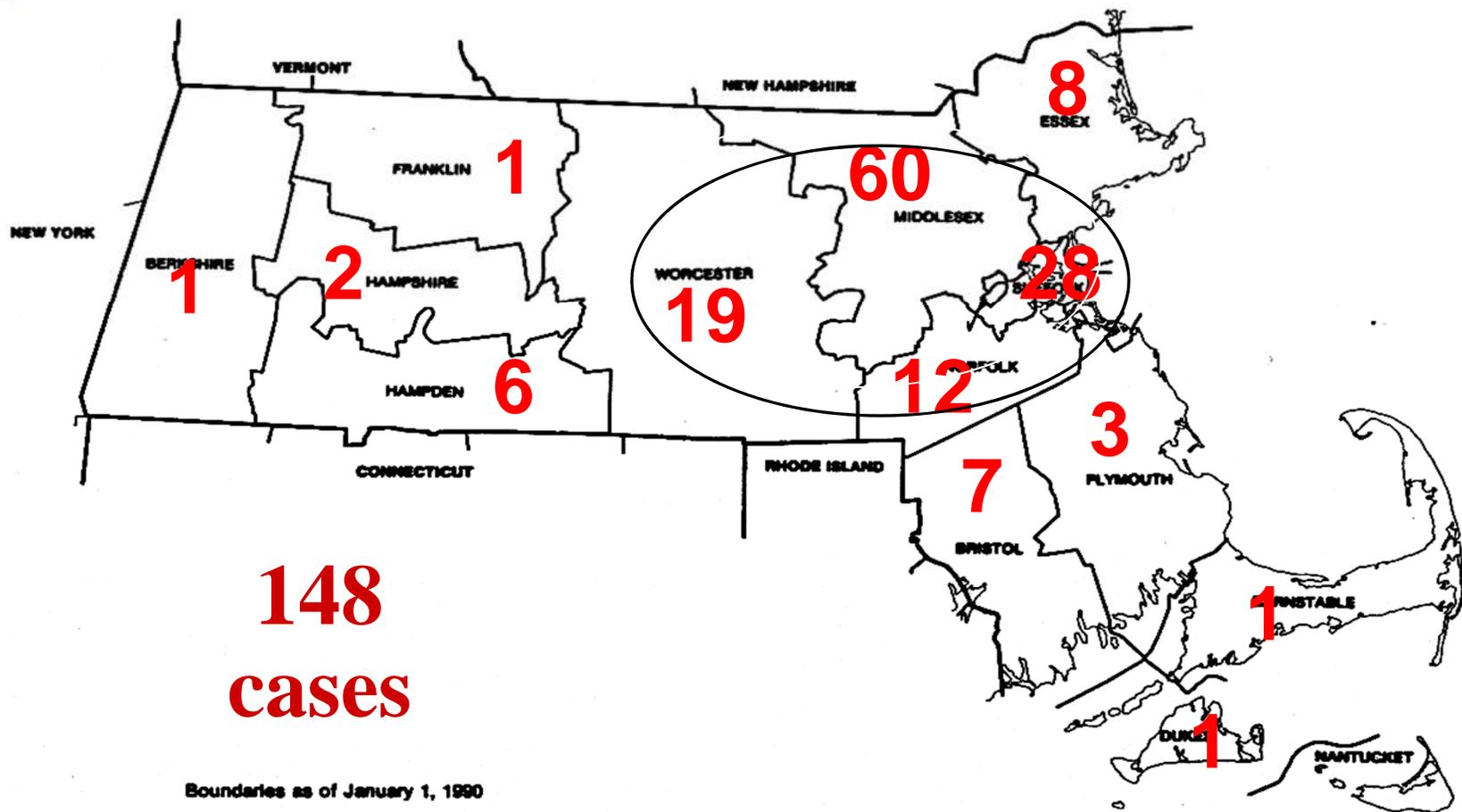
Human EEE Cases by County of Residence, 2000-2016



Boundaries as of January 1, 1990

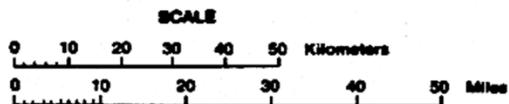


Human WNV Cases by County of Residence, 2001-2016



148
cases

Boundaries as of January 1, 1990



An Interagency Effort: Arbovirus (ARthropod BORne Virus) Surveillance and Response

- **Executive Office of Health and Human Services**
 - Department of Public Health
 - Bureau of Laboratory Science
 - Bureau of Infectious Disease
 - Bureau of Environmental Health
- **Executive Office of Energy and Environmental Affairs**
 - State Reclamation and Mosquito Control Board
 - Department of Agricultural Resources
 - Department of Conservation and Recreation
 - Department of Environmental Protection
- **Local Mosquito Control Projects**
- **Local Health Departments**

MDPH Arbovirus Program Overview

Surveillance

- Set and collect traps from long-term sites in southeastern MA
 - Collaborate with Mosquito Control Projects (MCP) on their surveillance efforts in member communities

Laboratory Testing and Correlation with Patient Information

- Test specimens for EEE/WNV infection
 - Mosquitoes, suspect animal & human specimens

Risk Analysis and Communication

- Identify areas at risk for human disease
- Communicate findings with local health agents, MCP's and the public
- Provide information to guide the control actions to reduce the risk of disease

Massachusetts Department of Public Health

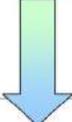
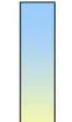
2017

Massachusetts Arbovirus Surveillance and Response Plan

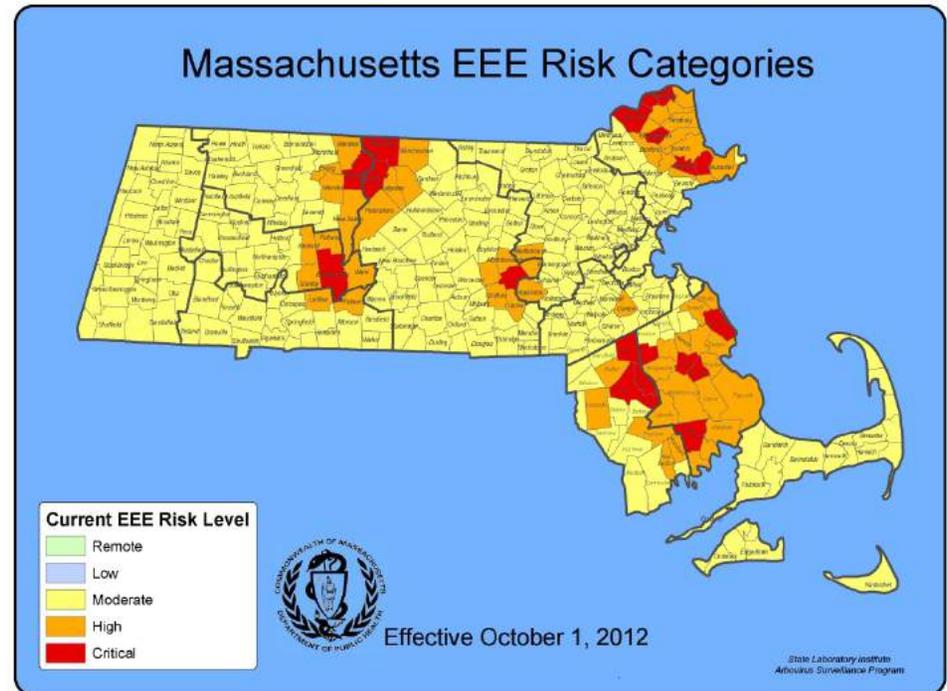
Monica Bharel, MD, MPH
Commissioner
Massachusetts Department of Public Health

Kevin Cranston, MDiv
Assistant Commissioner
Director, Bureau of Infectious Disease and Laboratory Sciences

Outlines phased public health response to mosquito, animal and human surveillance data for both WNV and EEE

Key to Color Coding on Risk Maps		
Risk	What it Means	What You Should Do
Remote 	<p>Multiple cases of human disease caused by EEE or WNV are considered <u>highly unlikely</u> at this time.</p> <p>No human, animal or mosquito infections have been identified in the area so far this year.</p>	<ul style="list-style-type: none"> • Repair screens • Dump standing water twice weekly
Low 	<p>Multiple cases of human disease caused by EEE or WNV are considered <u>unlikely</u> at this time.</p> <p>Infected mosquitoes <u>have been found</u> in the area this year, but no human or animal infections.</p>	<ul style="list-style-type: none"> • Repair screens • Dump standing water twice weekly • Wear mosquito repellent when outdoors during peak mosquito hours (from dusk to dawn) • Wear long sleeves and long pants when outdoors during peak mosquito hours (from dusk to dawn) • Use mosquito netting on baby carriages and playpens outdoors • Arrange neighborhood cleanups to get rid of mosquito breeding sites
Moderate 	<p>Multiple cases of human disease caused by EEE or WNV are considered <u>moderately likely</u> at this time.</p> <p>There have been multiple infected mosquitoes <u>this year</u> in addition to human or animal cases <u>last year</u>.</p>	<ul style="list-style-type: none"> • Repair screens • Dump standing water twice weekly • Wear mosquito repellent when outdoors during peak mosquito hours (from dusk to dawn) • Weather permitting, wear long sleeves and long pants when outdoors during peak mosquito hours (from dusk to dawn) • Use mosquito netting on baby carriages and playpens outdoors • Arrange neighborhood cleanups to get rid of mosquito breeding sites • Be aware of stagnant water on private property (e.g. unused swimming pools) and report to the local board of health.
High 	<p>Multiple cases of human disease are considered <u>very likely</u> at this time.</p> <p>There have been infected mosquitoes repeatedly in the area</p>	<ul style="list-style-type: none"> • Repair screens • Dump standing water twice weekly • Wear mosquito repellent when outdoors • Weather permitting, wear long sleeves and long pants when outdoors during peak mosquito hours (from dusk to dawn) • Use mosquito netting on baby carriages and playpens outdoors • Arrange neighborhood cleanups to get rid of mosquito breeding sites • Be aware of stagnant water on private property (e.g. unused swimming pools) and report to the local board of health. • Avoid outside areas with obvious mosquito activity • Adjust outdoor activity to avoid peak mosquito hours (from dusk to dawn) • Avoid overnight camping near freshwater swamps where EEE activity is likely • Consider cancelling or rescheduling outdoor gatherings, organized sporting events, etc. during peak mosquito hours
Critical 	<p>Multiple cases of human disease are <u>extremely likely</u> at this time.</p> <p>There has been at least one human and/or animal case of disease or rapid escalation of indications of risk in the area this year.</p>	<ul style="list-style-type: none"> • Repair screens • Dump standing water twice weekly • Wear mosquito repellent when outdoors during peak mosquito hours (from dusk to dawn) • Wear long sleeves and long pants when outdoors during peak mosquito hours (from dusk to dawn) • Use mosquito netting on baby carriages and playpens outdoors • Arrange neighborhood cleanups to get rid of mosquito breeding sites • Be aware of stagnant water on private property (e.g. unused swimming pools) and report to the local board of health. • Avoid outside areas with obvious mosquito activity • Avoid overnight camping near freshwater swamps where EEE activity is likely • Towns should work with their community around cancelling or rescheduling outdoor gatherings, organized sporting events, etc. during peak mosquito hours

Example of Risk Analysis Communication

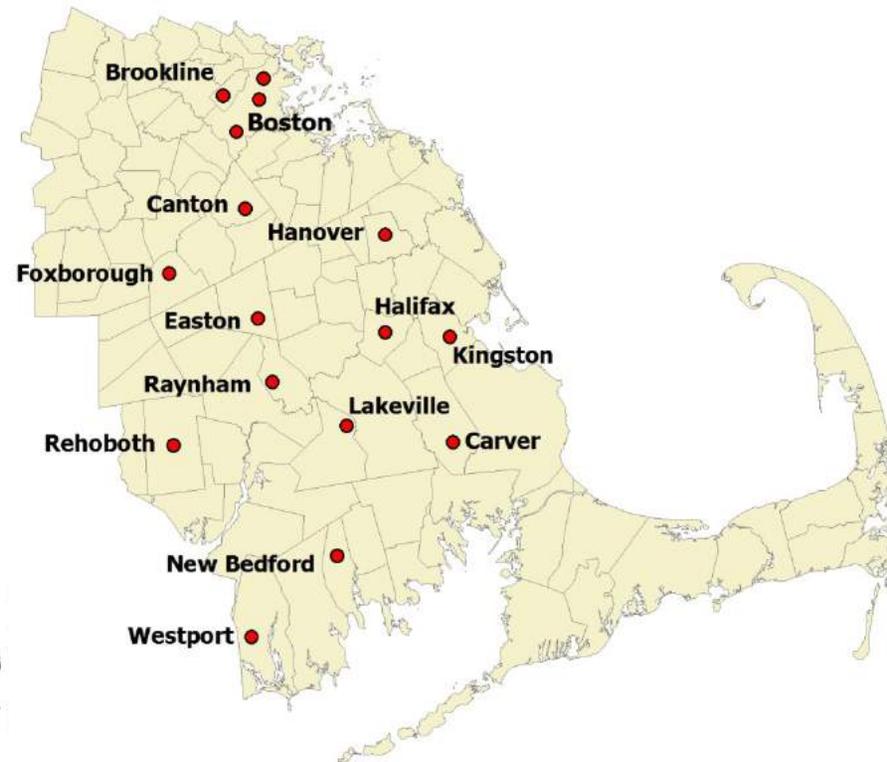


Updated daily throughout the season and accessed through MDPH website

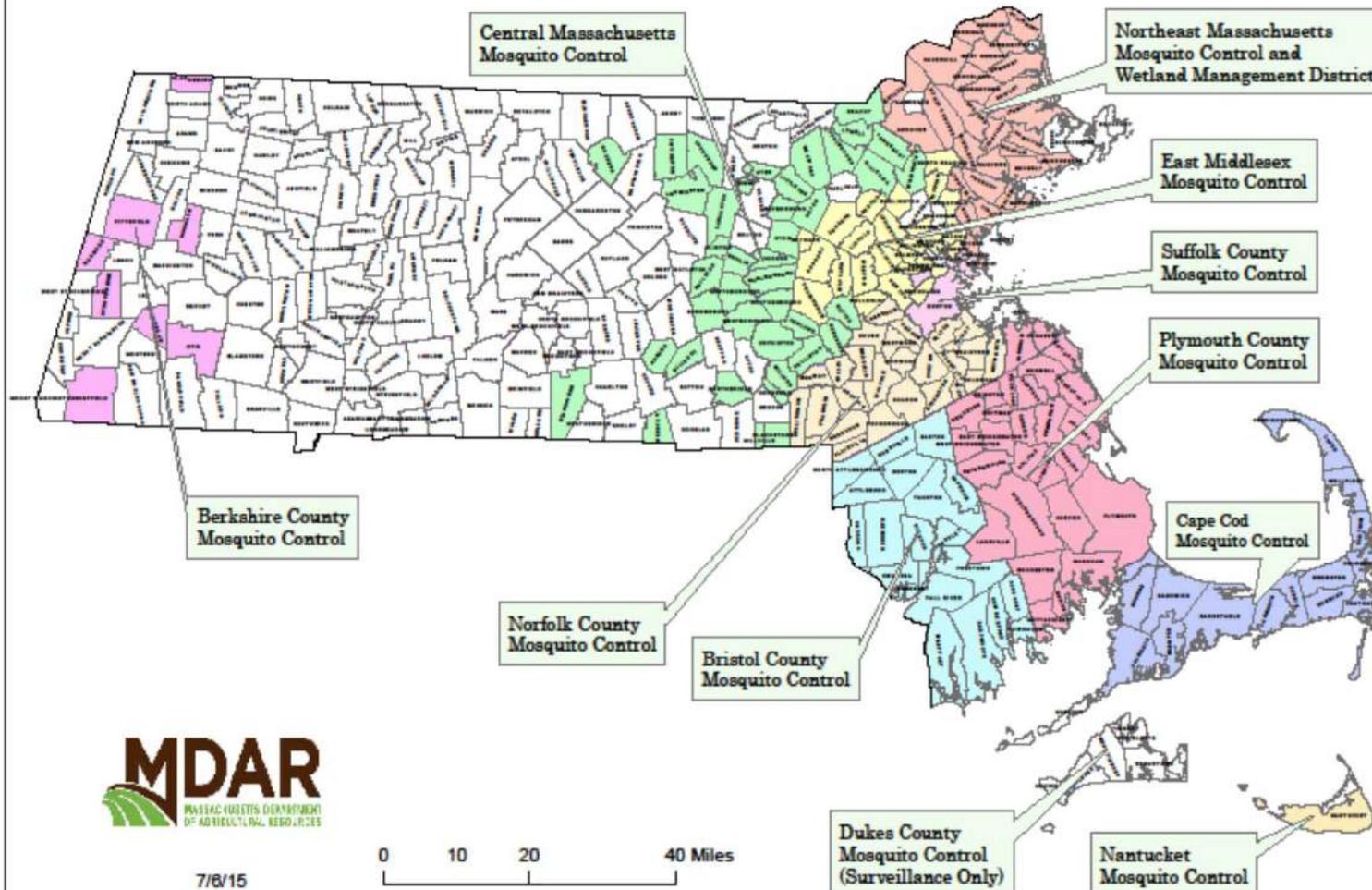


MDPH Long-term Trap Sites, focused on EEE

MDPH Long-term Mosquito Trap Locations



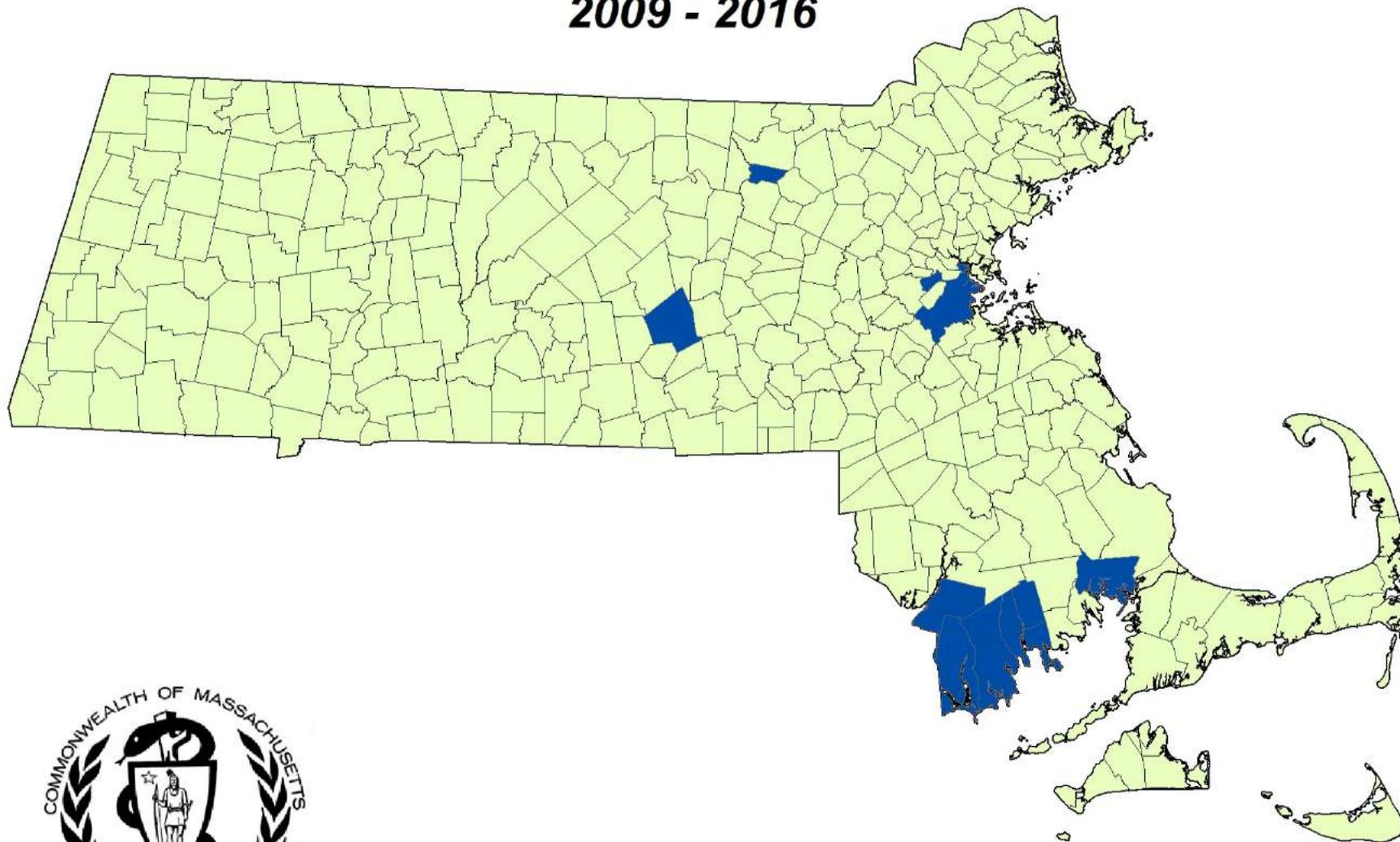
Mosquito Control Projects and Districts Commonwealth of Massachusetts



7/6/15

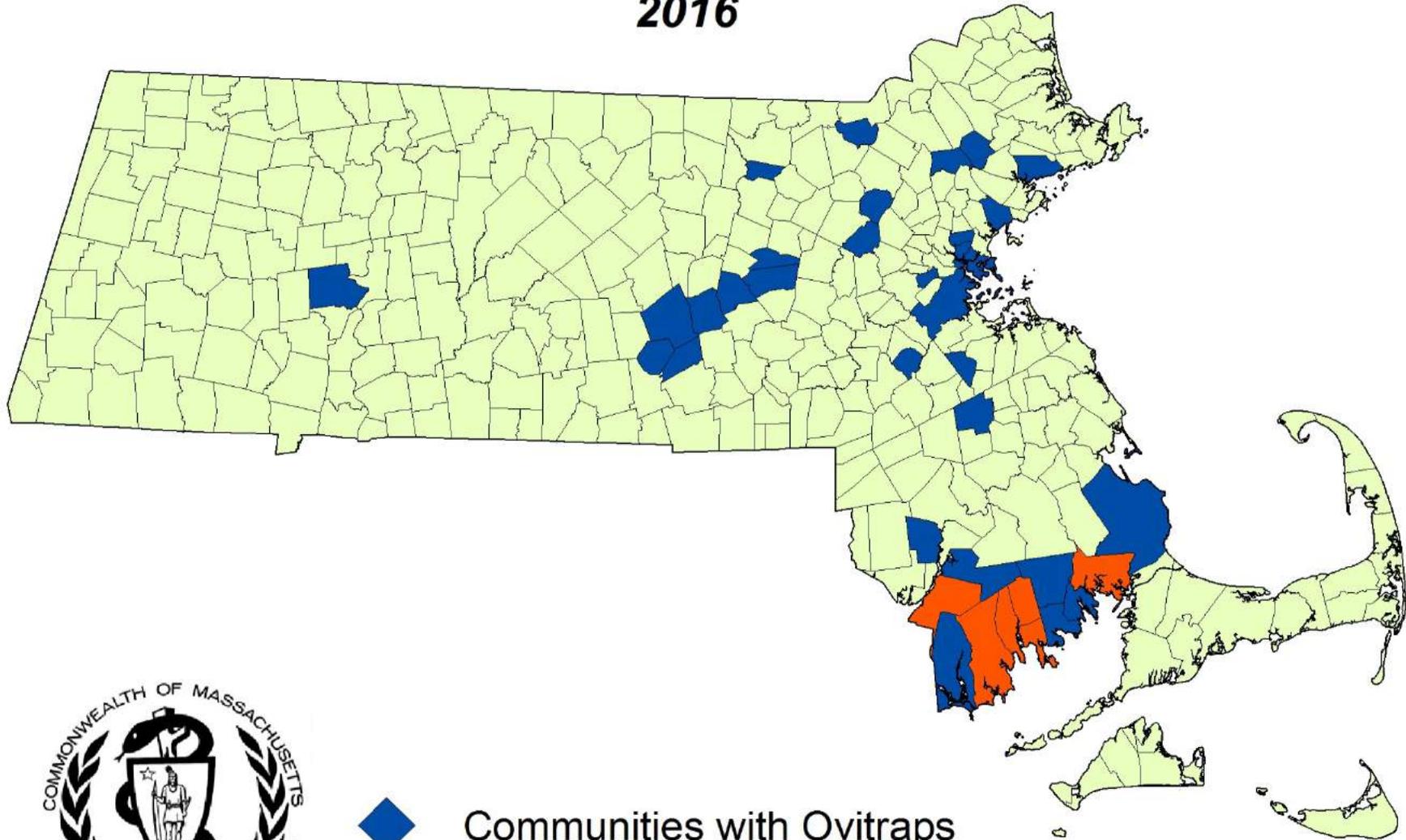
0 10 20 40 Miles

Historical Aedes Albopictus Collections **2009 - 2016**



n=10

Massachusetts Aedes Albopictus Ovitrap Effort 2016



Communities with Ovitrap



Ae. albopictus detections

Ae albopictus Overwintering Project



