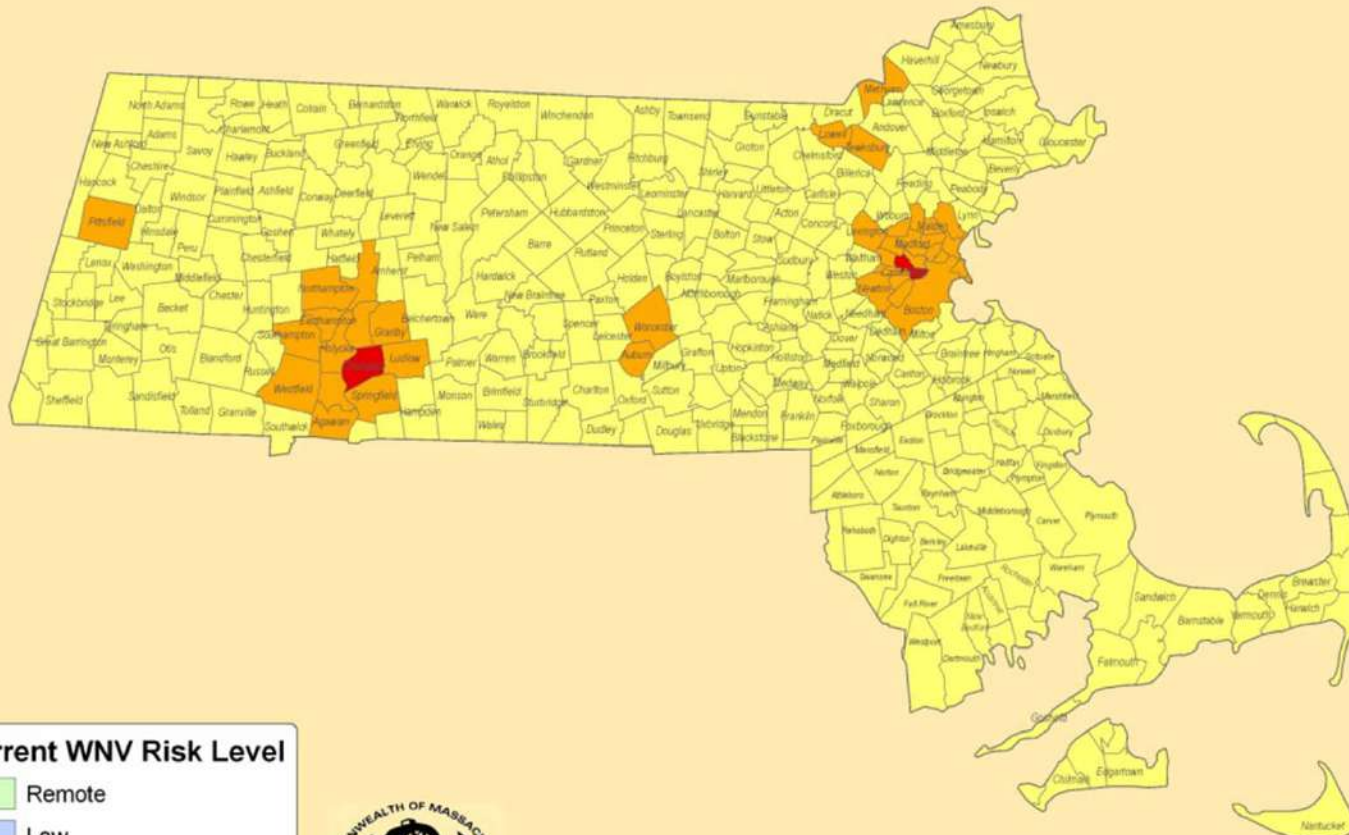


Interventions

**How do we control these
arboviruses??**

Massachusetts WNV Risk Categories



Current WNV Risk Level

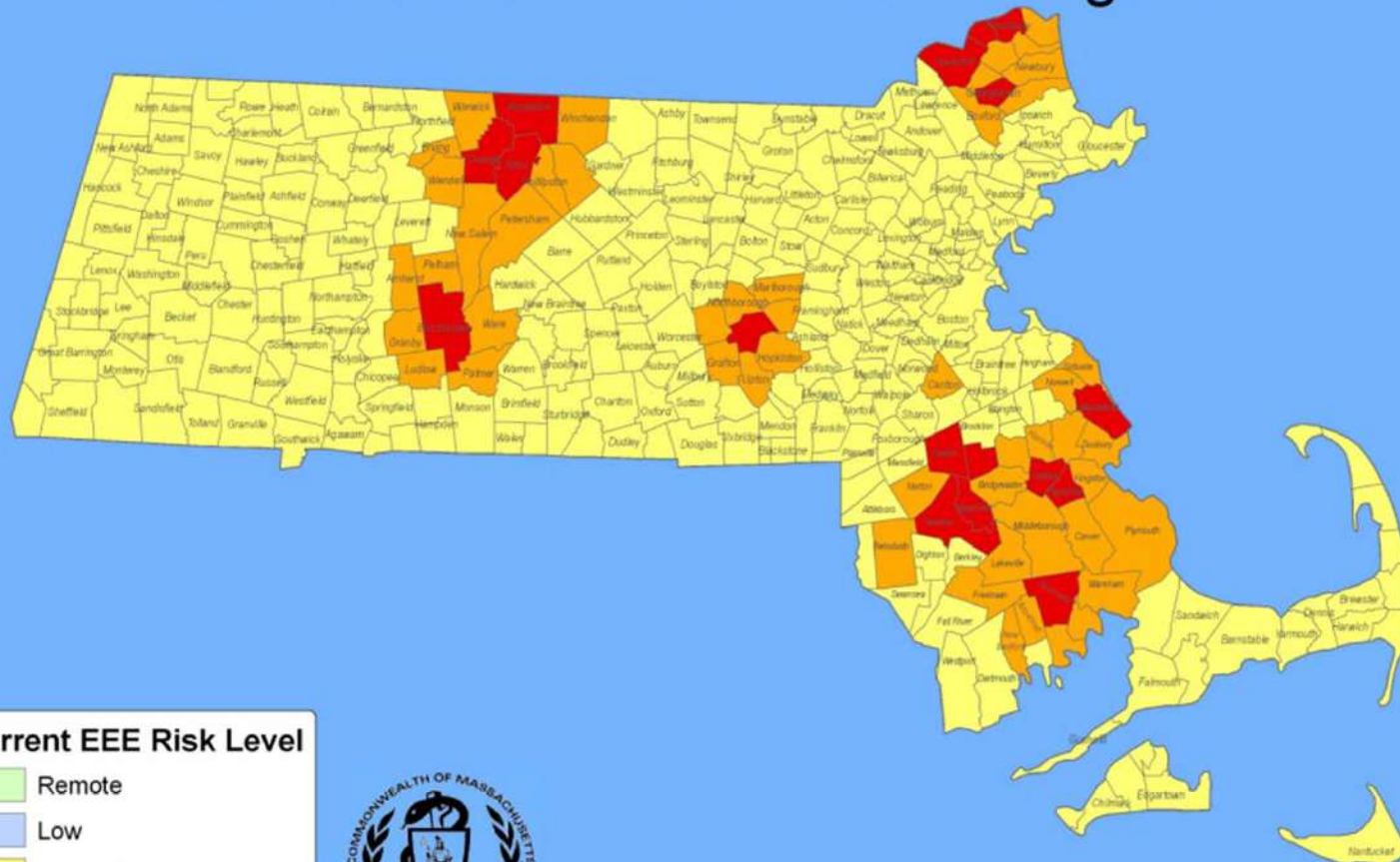
- Remote
- Low
- Moderate
- High
- Critical



Effective September 20, 2012

State Laboratory Institute
Arbovirus Surveillance Program

Massachusetts EEE Risk Categories



Current EEE Risk Level

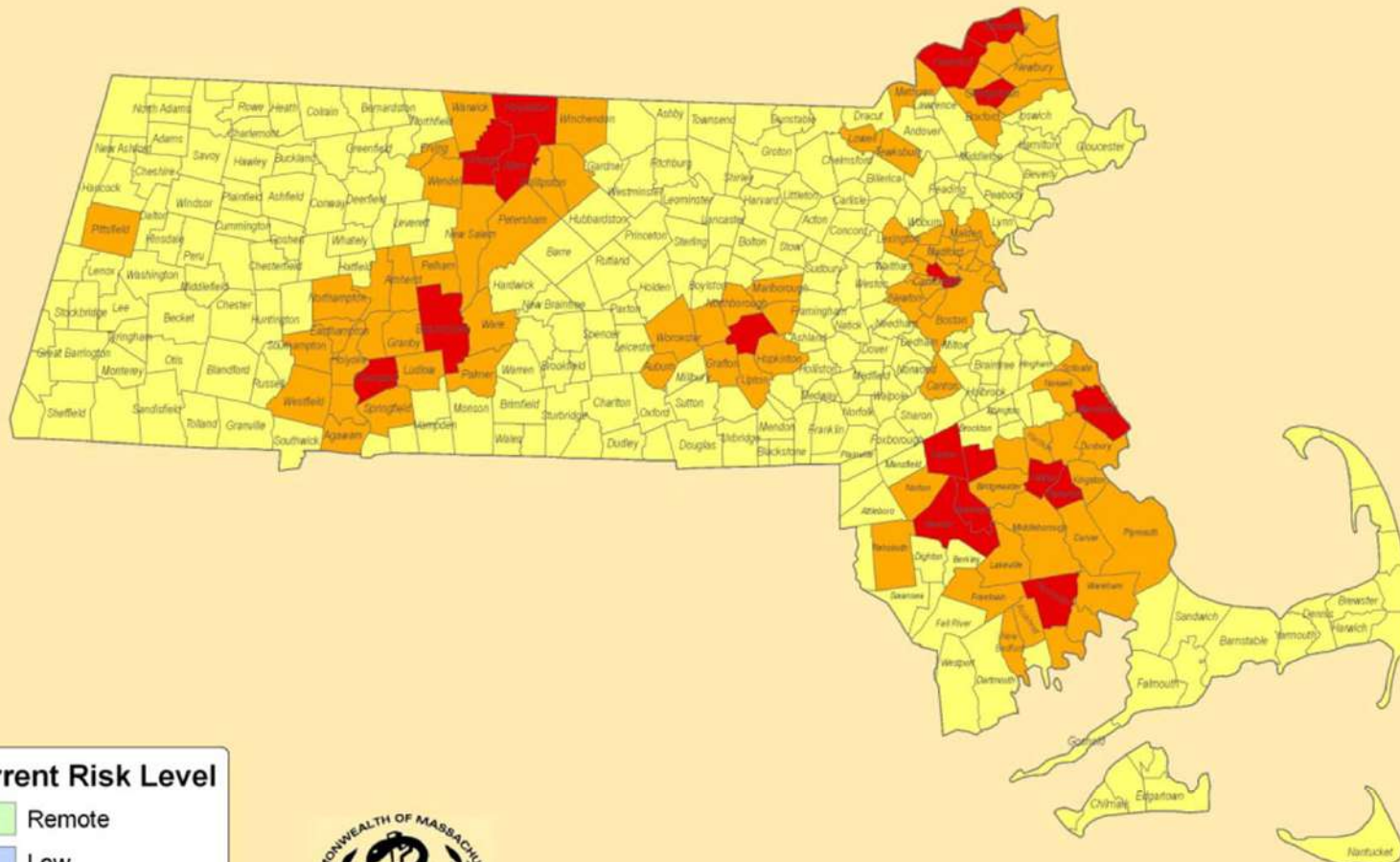
- Remote
- Low
- Moderate
- High
- Critical



Effective September 24, 2012

State Laboratory Institute
Arbovirus Surveillance Program

Mosquito-Borne Illness Risk Map



Current Risk Level

- Remote
- Low
- Moderate
- High
- Critical



Effective September 24, 2012

State Laboratory Institute
Arbovirus Surveillance Program

Mosquito Abatement Practices

Water Management

Larviciding

Adulticiding

Larvicide Program

To reduce the emergence of adult mosquitoes in areas where mosquito larvae are present and targeted to specific water source

- Control the larval and pupal stages
 - No control measures for the egg stage
- Use biological pesticides when applicable
- Rely on MassGIS photos and MADEP wetland layers

Hand & Aerial

- Database for hand applied larvicide requests
 - Record time and date
 - Wet or dry
 - Larvae present or not
 - Calculate application rate based on product
 - Catch basins
- Helicopter applications
 - Pre and Post data collection from known breeding sites and non-treatment control sites for comparison
 - Application normally made in the spring before the tree's leaf out
 - Not all MCP have an aerial larvicide program

Larviciding for WNV

- *Cx. pipiens*
 - Lots of small containers in people's yards
 - Catch basins
 - High organic matter

Larviciding for EEE

- *Cs. melanura*
 - Habitat usually within sensitive areas
 - Low pH
 - Research has shown few products work due to habitat, water conditions or have difficulty delivering into crypts
 - Biorational product- *B. sphaericus* shows potential in a laboratory setting

Larviciding for EEE

- *Cq. perturbans*
 - Cattail areas are extensive
 - Delivering product to where larvae are within the root systems
 - Larvae do not surface so hard to evaluate control measures

Breathes air
through plant root



Plant
Root

Adult Control

Ground vs. Aerial

Mosquito Adulticides

- Pesticides designed to travel as an aerosol through the air to come in contact with adult mosquito
- Small droplets remain airborne for a period of time necessary to come in contact with a mosquito
- Down wind movement of adulticide droplets are essential to their effectiveness

•

•

Products

- Pesticide
 - Anvil® 10+10 (Sumithrin 10.0% and Piperonyl Butoxide 10.0%)
- Rate of Application
 - 0.21 to 0.62 oz/acre

Why Anvil?

- Synthetic Pyrethroid = quick knockdown
- Highest Oral LD 50 > 10,000 mg/kg
- No Aquatic setback
- Most environmentally sensitive adulticide
- Registered for use in MA
- No biting frenzy
- Non Corrosive, No Paint Spotting
- Virtually Odorless

Making Applications

Starts with either a residential request or population levels in our traps that warrant control measures for nuisance or vector reasons

Adult Control – Truck

ultra-low volume (ULV)



ULV Spraying Parameters

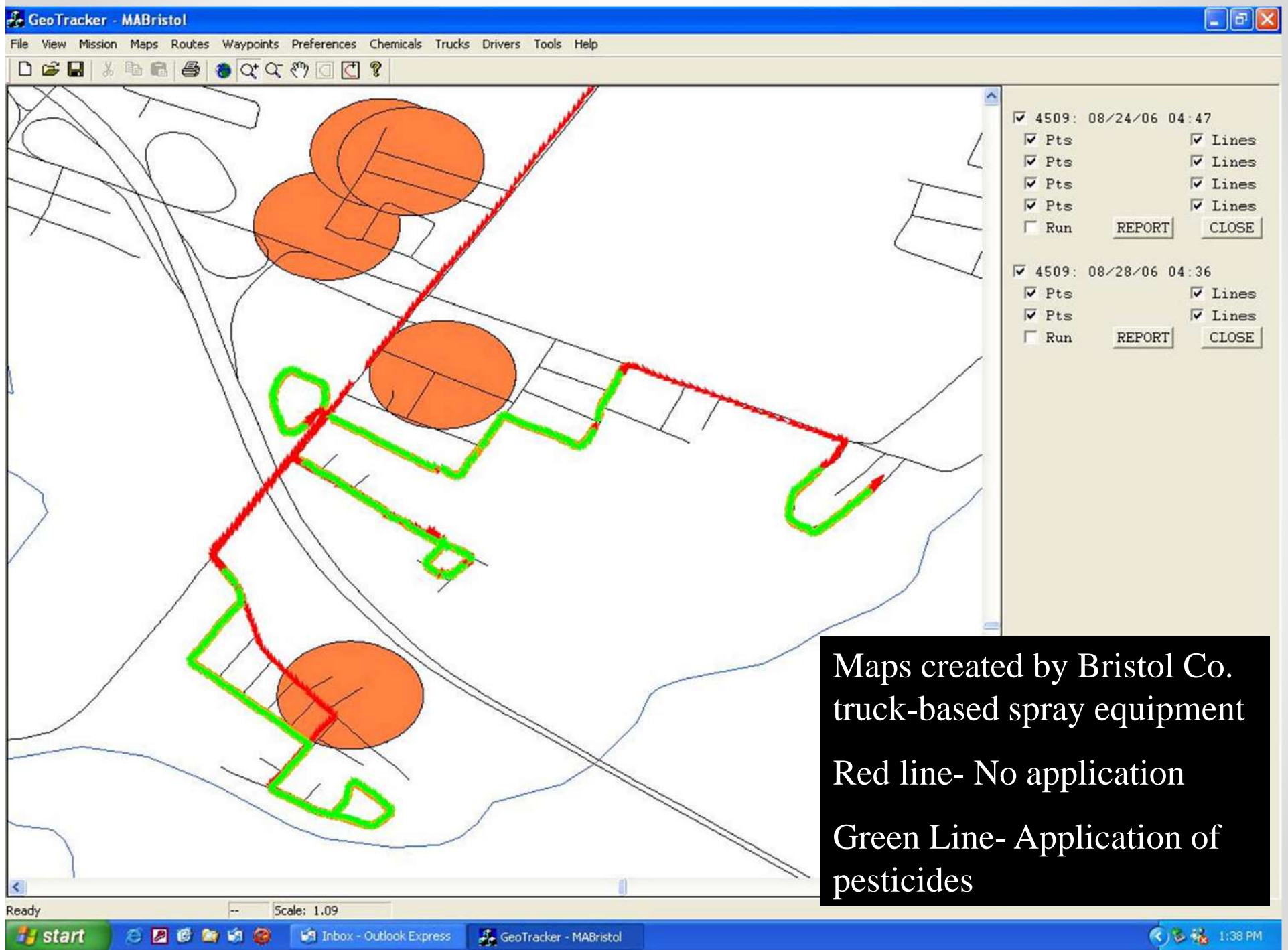
- 5-15 mph
- Not less than 55° F
- Not while raining
- Not in winds of greater than 10 mph
- Between dusk and dawn
- Nozzle position or angle has no effect
- Spray leaving cul-de-sacs
- Turn spray off for pedestrians

Truck Obstacles

- Schools and Day cares
- Other NO Spray Areas
- Physical Objects
- Effective Range
 - 300ft Range
 - ~ 90% at 100 ft.
 - More product within the first 100 ft.
 - ~ 50% at 200 ft.
 - ~ 10% at 300 ft.

What the Driver sees

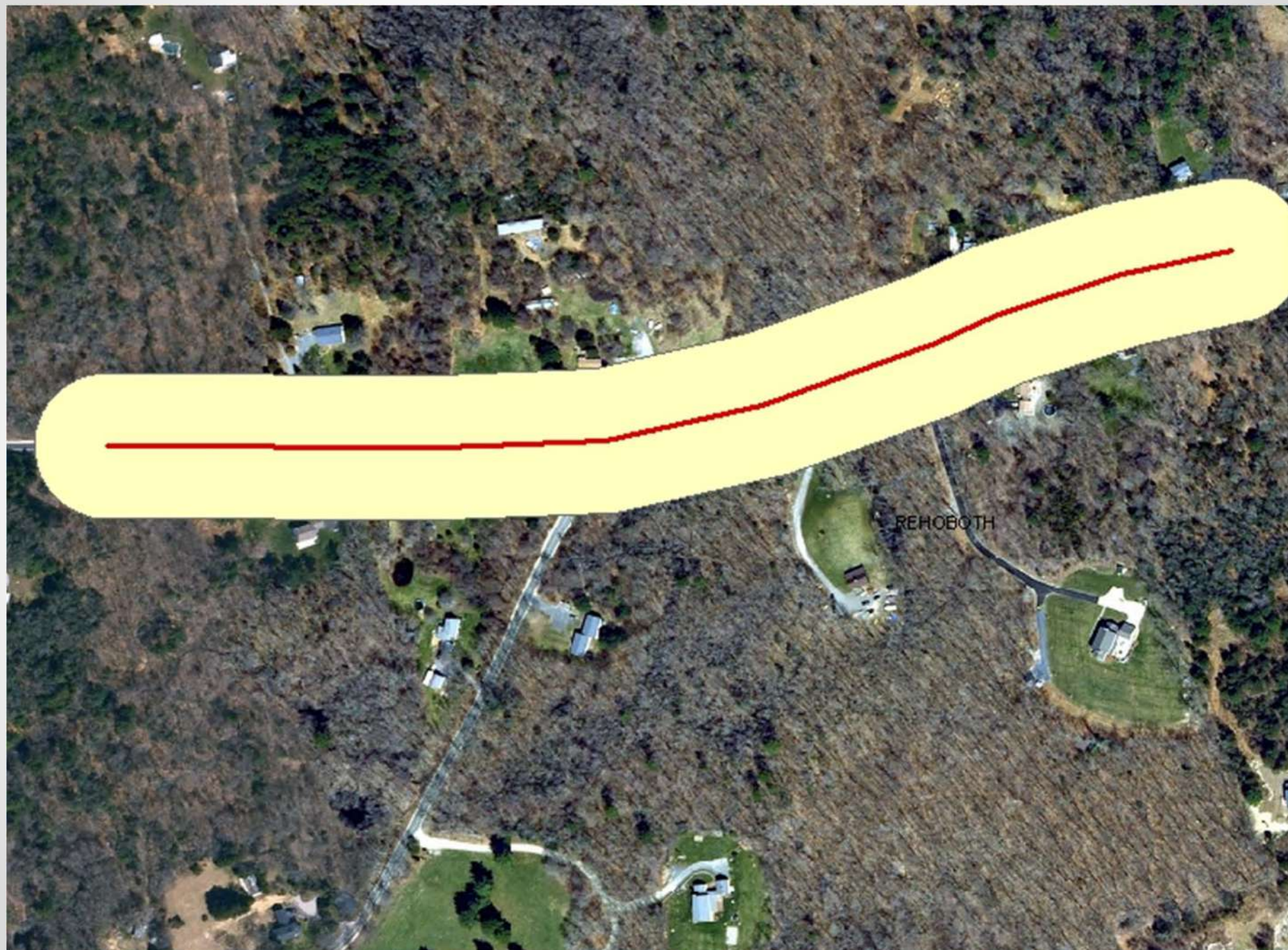
- Can add any data layers that you need
 - Wetlands
 - Priority Habitat
 - Individual No Sprays
 - Schools and Daycares

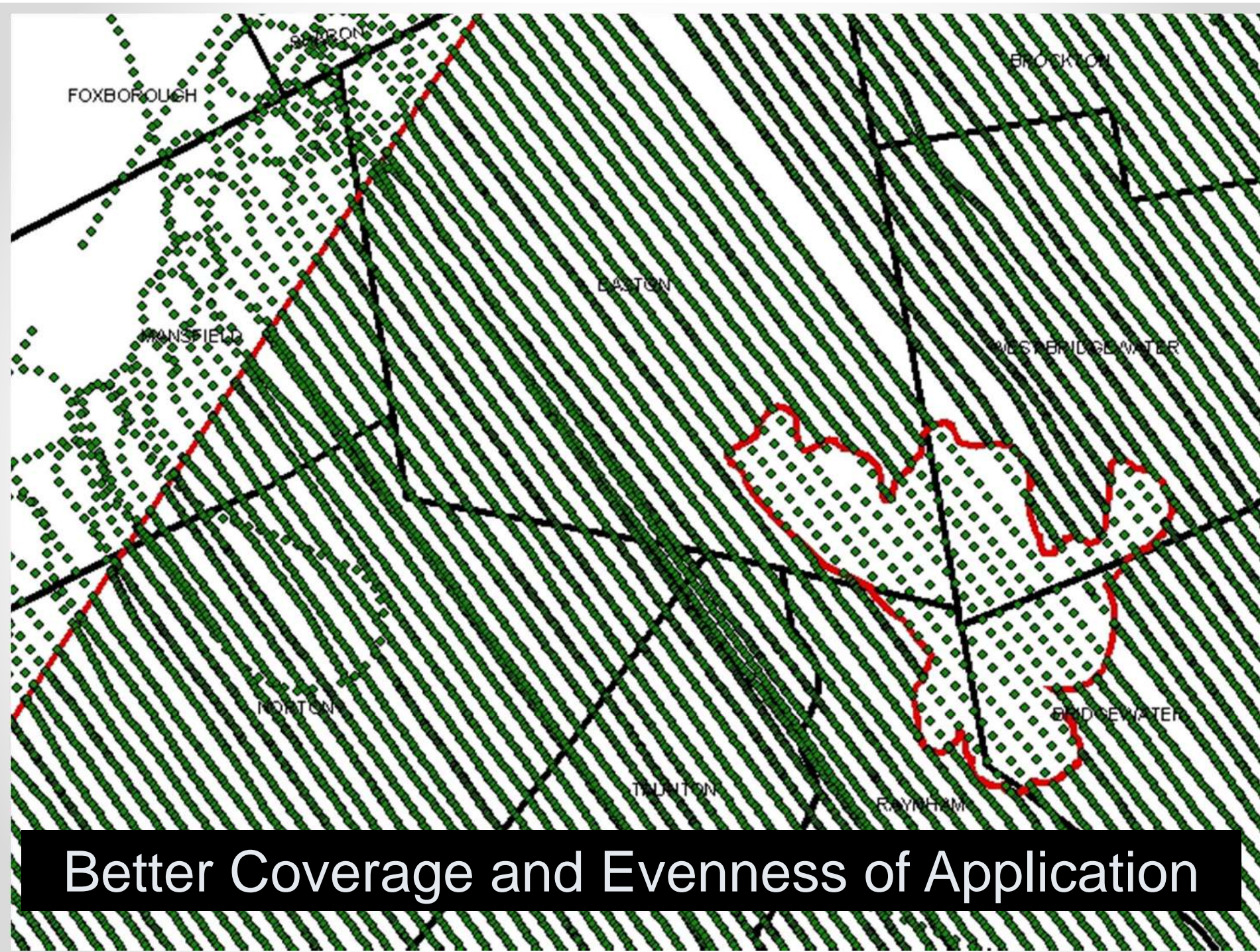


WNV vs. EEE Control

- WNV tends to be found in areas where backyard breeders are responsible and they don't fly very far
 - Truck-based application work best
 - May require multiple applications because of rebounding
- EEE tends to be found in the swamp areas
 - Aerial applications work best







Better Coverage and Evenness of Application

Aerial Applications in Southeast MA for EEE

- 1956, 1957, 1958- DDT
- 1973, 1974, 1975- Malathion
- 1990- Malathion
- 2006, 2010, 2012- Anvil

Aerial Adulticiding Goal

Primary Goal

- Knock out/reduce immediately “mammal biters”

Secondary Goal

- Halt/ slow down amplification between birds and mosquitoes

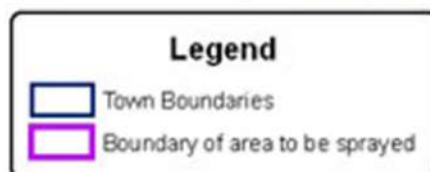
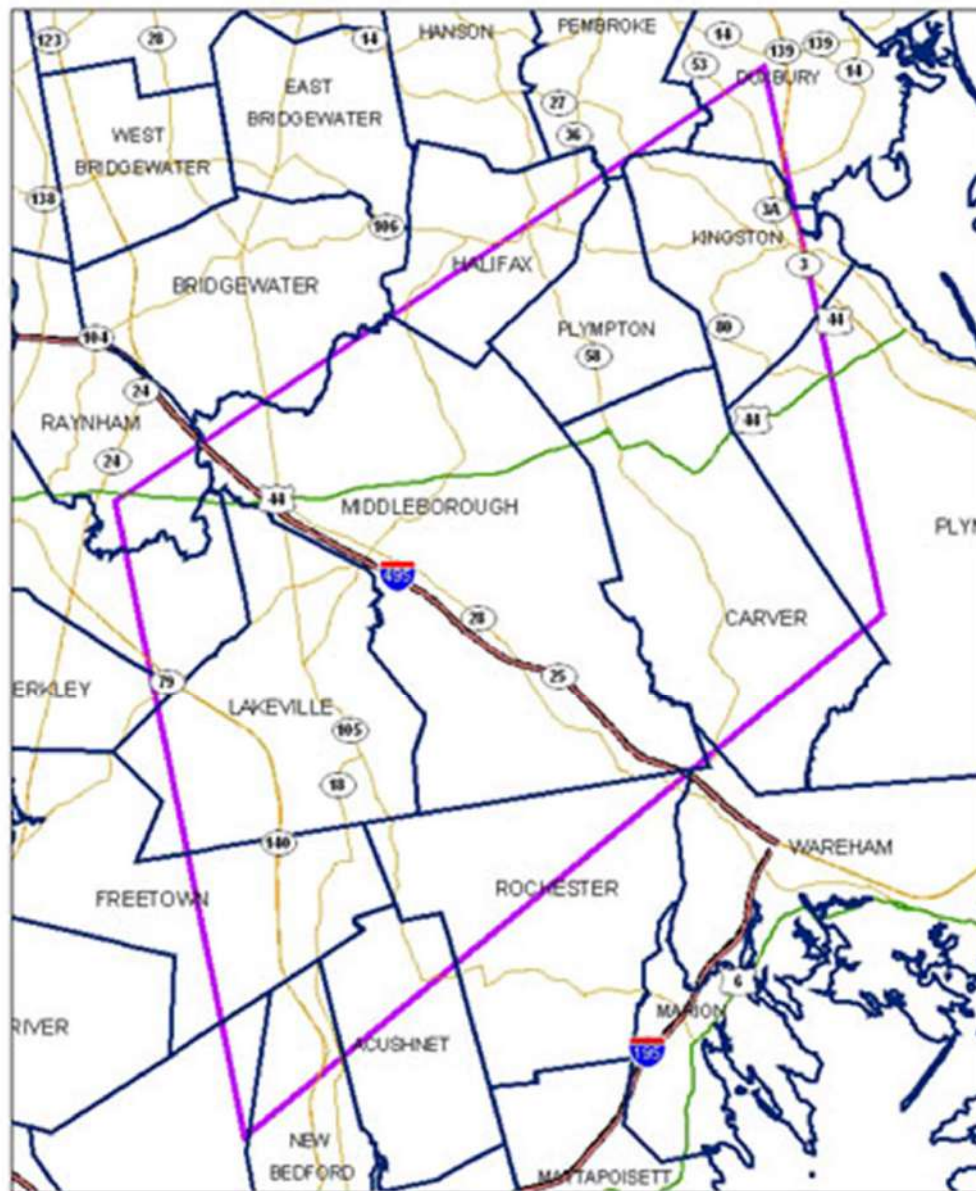
Aerial Adulticiding Staging Area

- Operational decisions are made with input from many state agencies, special interest groups, local officials and MCPs
- Pilot and ground crew briefings
- Calibration Tests
- Efficacy Trapping
- Droplet and Weather Data

●



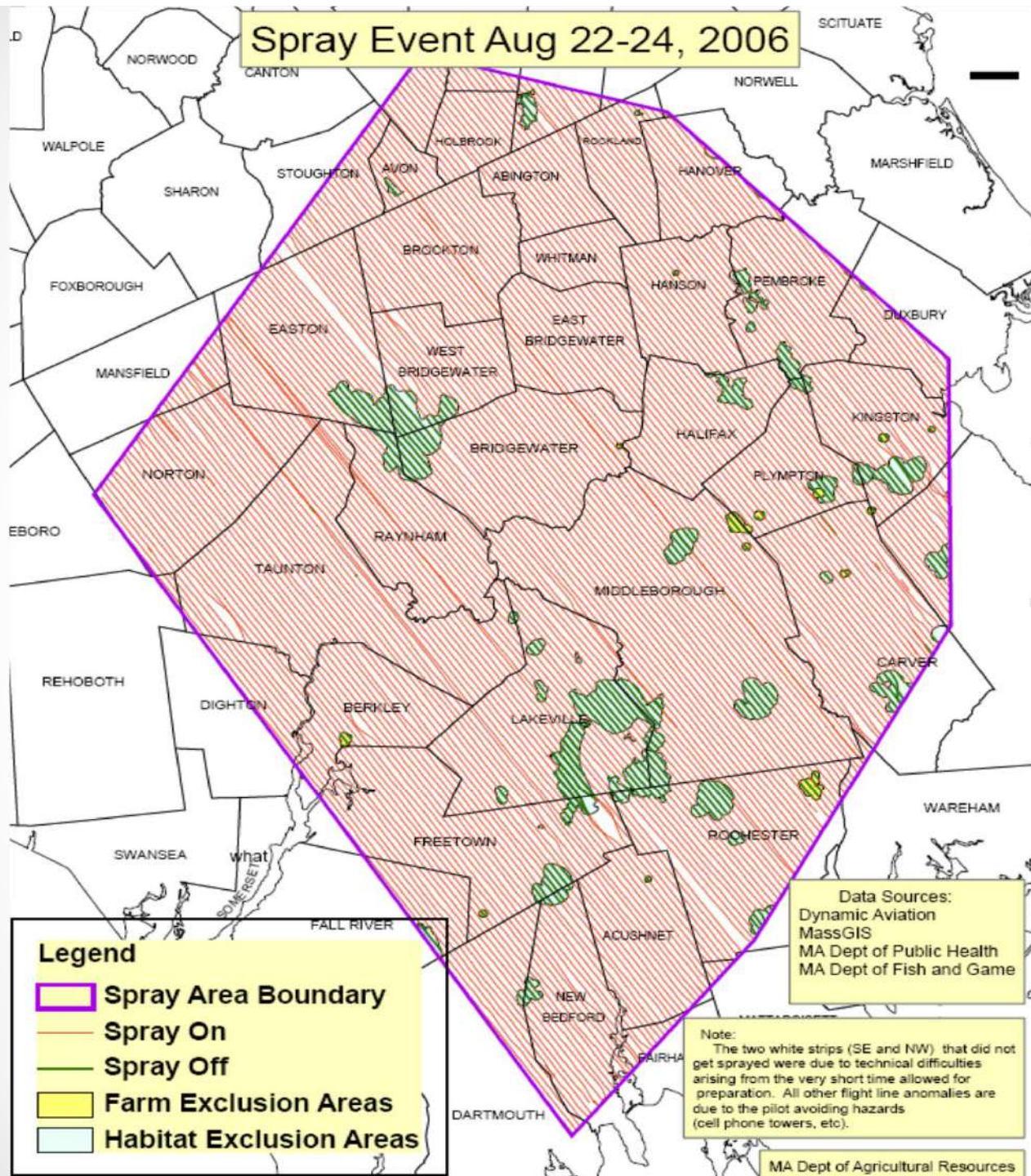
First
Application
2006



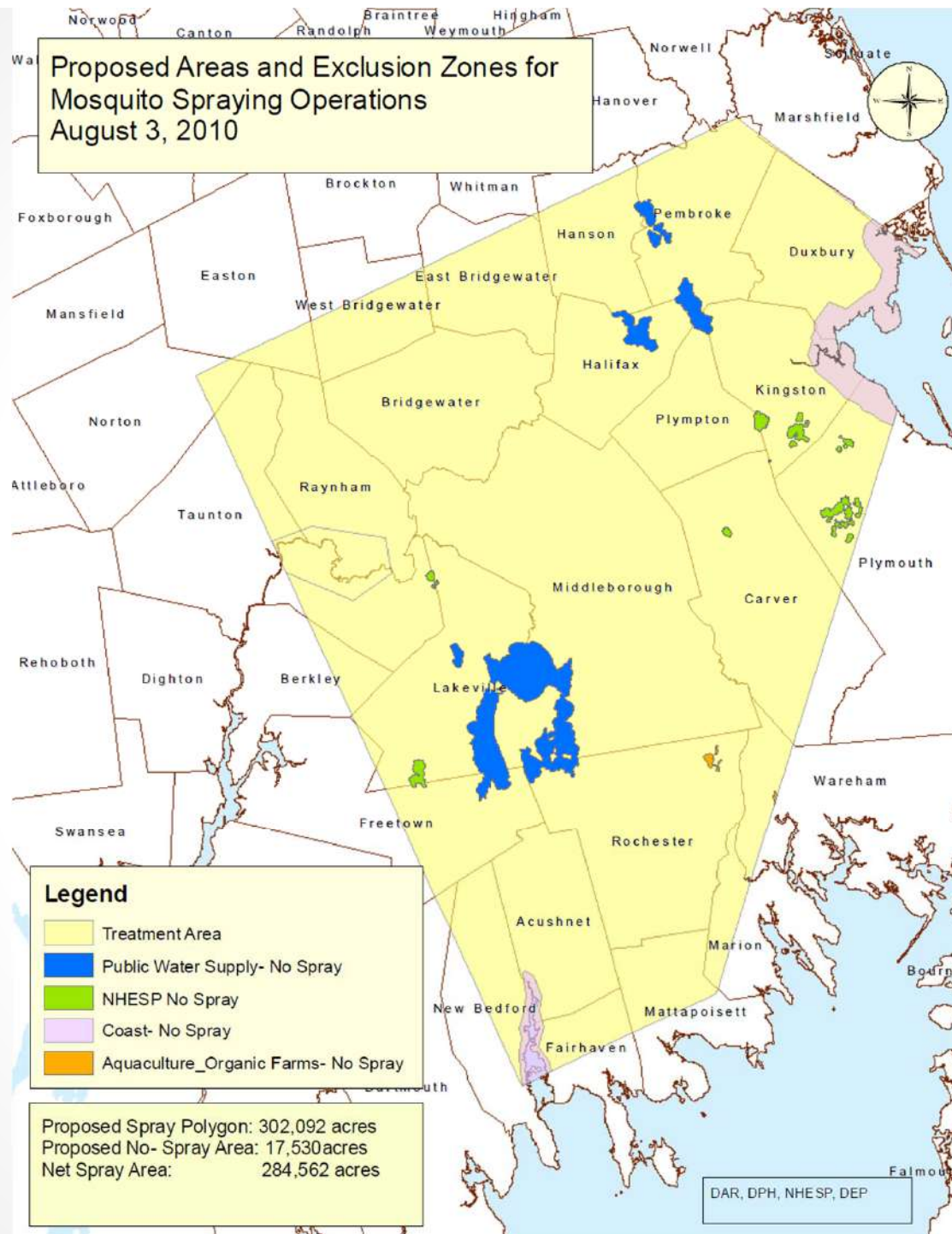
MA Dept of Agricultural Resources



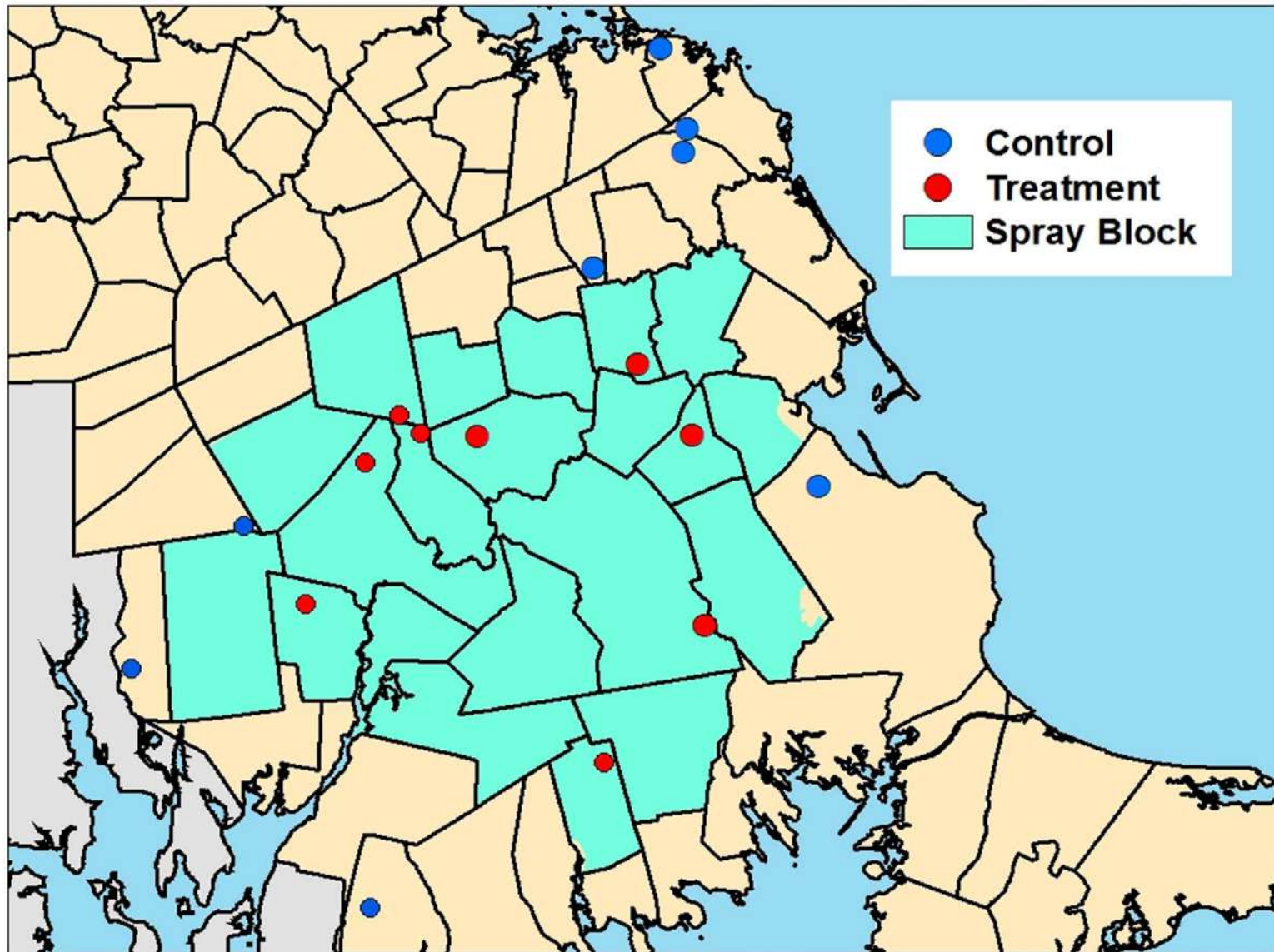
Spray Event Aug 22-24, 2006



**Proposed Areas and Exclusion Zones for
Mosquito Spraying Operations
August 3, 2010**



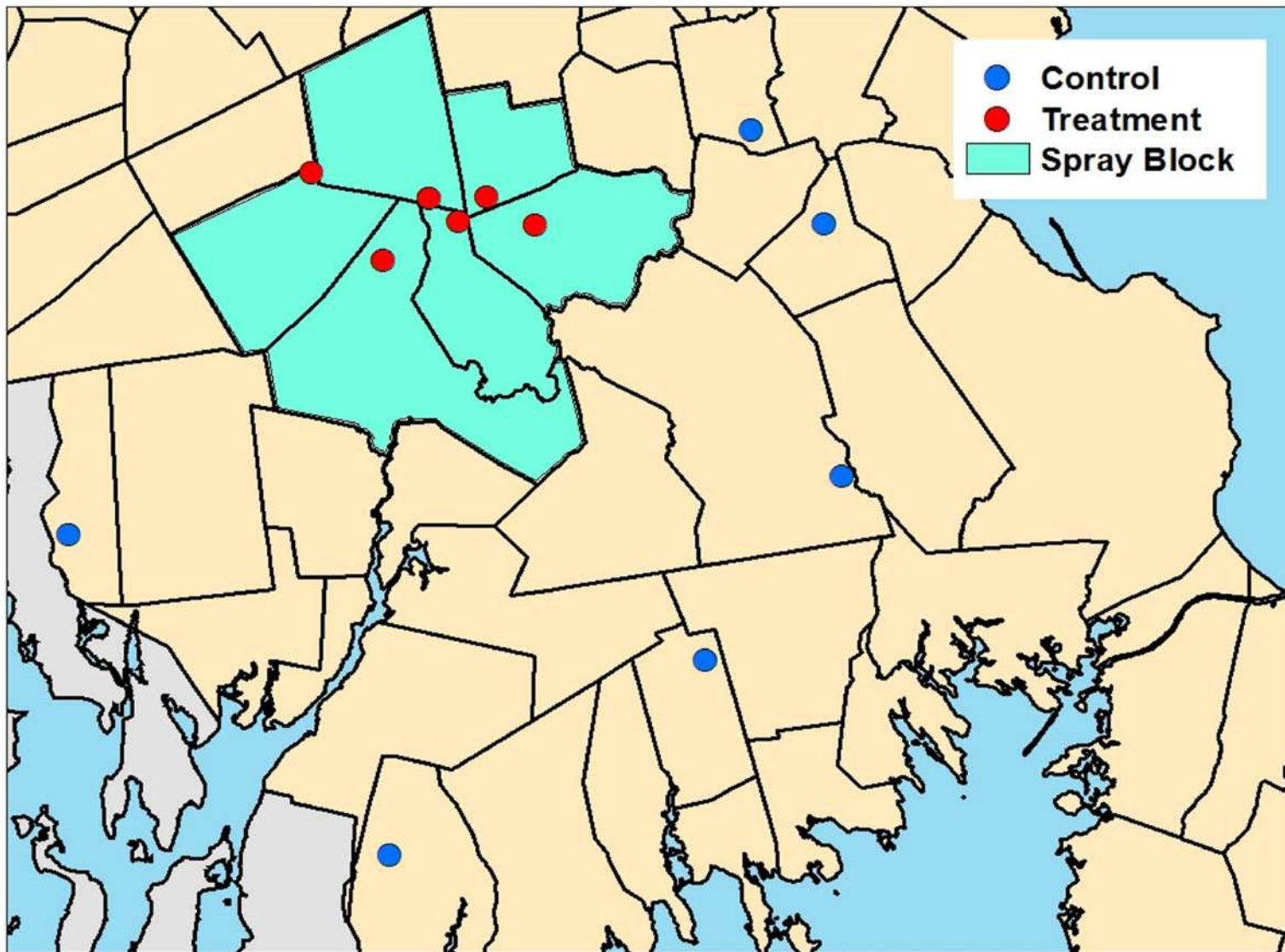
Map of Spray Block and Traps for Aerial Intervention 20-22 July 2012



Efficacy

	Treatment night of 20 July 2012	Treatment night of 22 July 2012
<i>Cs. melanura</i>	66.8%	14%
<i>Cq. perturbans</i>	86%	No control
<i>Oc. canadensis</i>	55.4%	No control
Total	75.1%	No control

Map of Spray Block and Traps for Aerial Intervention on 13 August 2012



Efficacy for Application 13 Aug 2012

	% Control
<i>Cs. melanura</i>	73.9
<i>Cq. perturbans</i>	63.3
<i>Oc. canadensis</i>	No control
<i>Ae. vexans</i>	44.7
Overall	47.2

NO human cases to date
have been reported within
the Aerial spray zone

...

Aerial efficacy is primarily based on
the chemical chosen, temperature,
wind speed, and droplet size

Aerial Adulticiding Environmental Monitoring

- Bees-MDAR
- Water Supplies-DEP
- Macroinvertebrates-DEP
- Cranberries-DPH
- Non-Target Species-DFW

Risk Communication

Protecting Yourself- 5D's

- Avoid outdoor activities at **Dusk** and **Dawn**
 - **Dress**: Wear long sleeves and pants when outdoors
- Use repellents and follow the label:
 - **DEET**
 - Picaridin
 - Oil of Lemon Eucalyptus
 - Permethrin (great for ticks)
- **Drain**: Remove Standing Water

The Future of EEE and WNV in MA

- Both viruses are here to stay
- Periodic epidemics
 - Unknown how often epidemics of WNV will occur
 - EEE epidemic occurrences have increased with unknown causes
- Key to management is interrupting the virus cycle by reducing the vector population
 - Water management
 - Larviciding
 - Adulticiding

Thank You!

...

