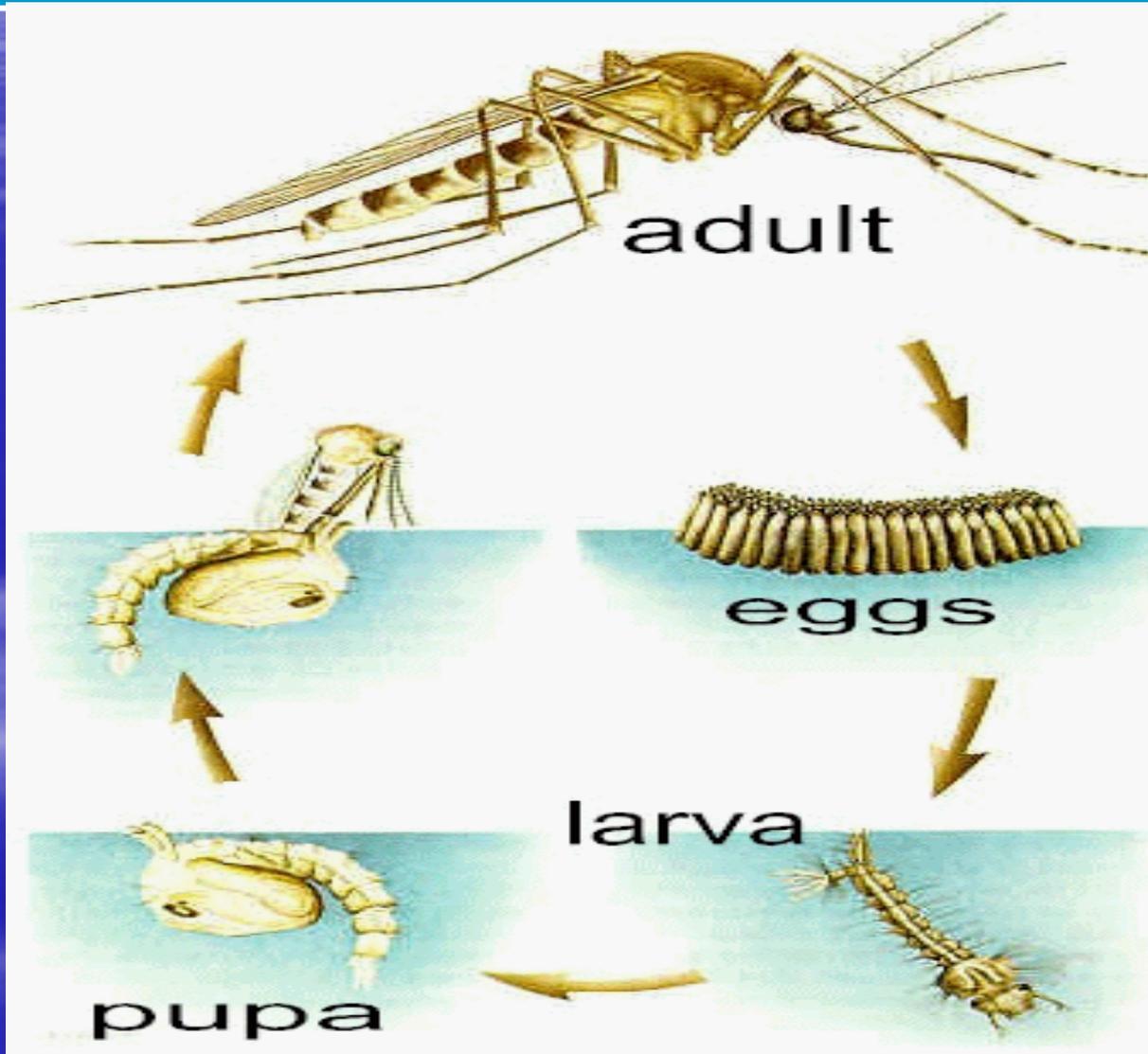


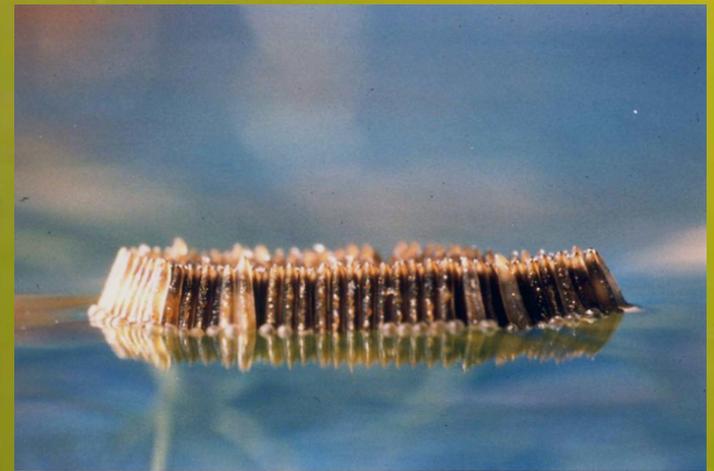
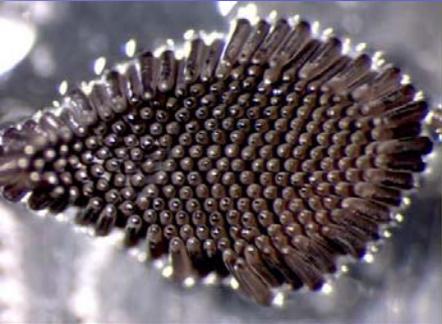
Mansfield Mosquito Surveillance Program 2013

Mosquito Life Cycle



Mosquito Eggs

200-300 at a time



Mosquito Eggs

- Did you know??
 - A female mosquito will need a blood meal before she lays her eggs
 - Mostly at night
 - Can lay eggs every third day until she dies.
 - Mosquito eggs can survive dormant for months to years before finding suitable times to hatch.
 - Eggs can lay dormant anywhere
 - Wood piles
 - Tree holes
 - Areas of exposed soil
 - All you need is some warm weather, suitable wet conditions and BINGO! Mosquitoes!!

Mosquito Larva

- Breathes through air siphon that adheres to the surface of the water
- Multiple larva are usually found in the same area
- “wrigglers”, wiggle away from the water surface when they sense danger (vibration of water surface)



Mosquito Pupa



- Air siphon remains attached to surface during pupa stage

Identifying Mosquitoes

Common Mosquito Populations

- Mansfield Common Mosquito Populations
 - Southern House Mosquito (*Culex quinquefasciatus*)
 - *C. quinquefasciatus* (focus mosquito)



Common Mosquito Populations

- Asian Tiger (*Aedes albopictus*)
 - Majority of citizen complaints
 - Most Common Problem



Common Mosquito Populations

– Flood Plane Mosquitoes (*Psorophora* and *Aedes*)

- Common citizen complaint
- Common after heavy rains

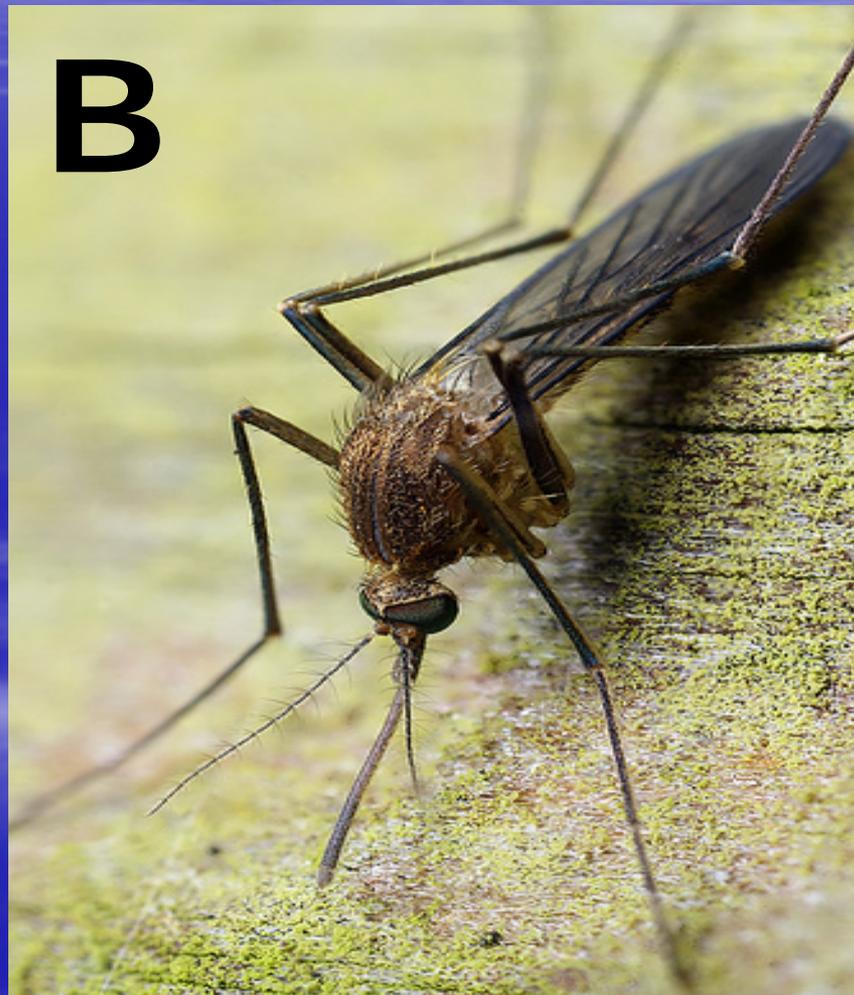


Female?

A



B



But... Who am I??



CRANE FLY

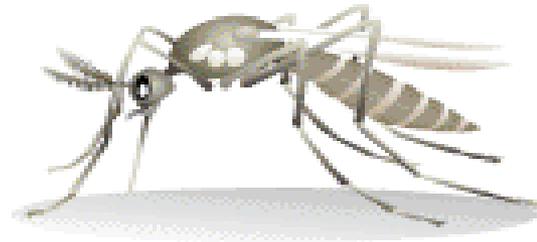


How do mosquitoes end up with
WNV in the first place?

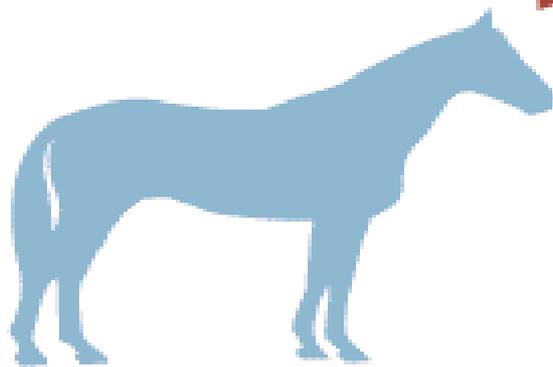
Avian-Borne Disease Transmission



Bird



Mosquito



Horse



Human



Tarrant County and Mansfield Approach

Proactive Prevention
(Not Reactive)

Participation in TC Program

- Now requiring Interlocal Agreement
 - Make sure all participating cities participate
 - Responsibilities identified
 - Cities collect samples and turn in for testing
 - County identifies species, male/female, and performs tests
- County makes recommendations based on the response plans
 - Only a recommendation – cannot mandate cities to spray
 - If aerial spraying decision made – cities would be able to use their contract price

Mansfield Surveillance Program

- Sample and submit mosquitoes for testing.
- Sample from fixed, focus locations.
- Use larvicides in areas where we suspect, have identified larval activity.
- Continue focusing on high risk and highly populated areas. This includes around daycares and senior citizen areas.
- Provide information to the public once West Nile Virus risk and means to reduce the risk.
- Conduct enforcement activities on properties where mosquito breeding is present, or where habitat exists to allow breeding.



Mansfield Habitat Removal Program

- Identify areas in drainage easement that need to be regrade to keep from ponding water
- Treat with larvicide if not able to schedule removal before season
- Notices to property owners



Ornamental Pond or Standing Fountain

Neglected Swimming Pool or Spa

Clogged Rain Gutter

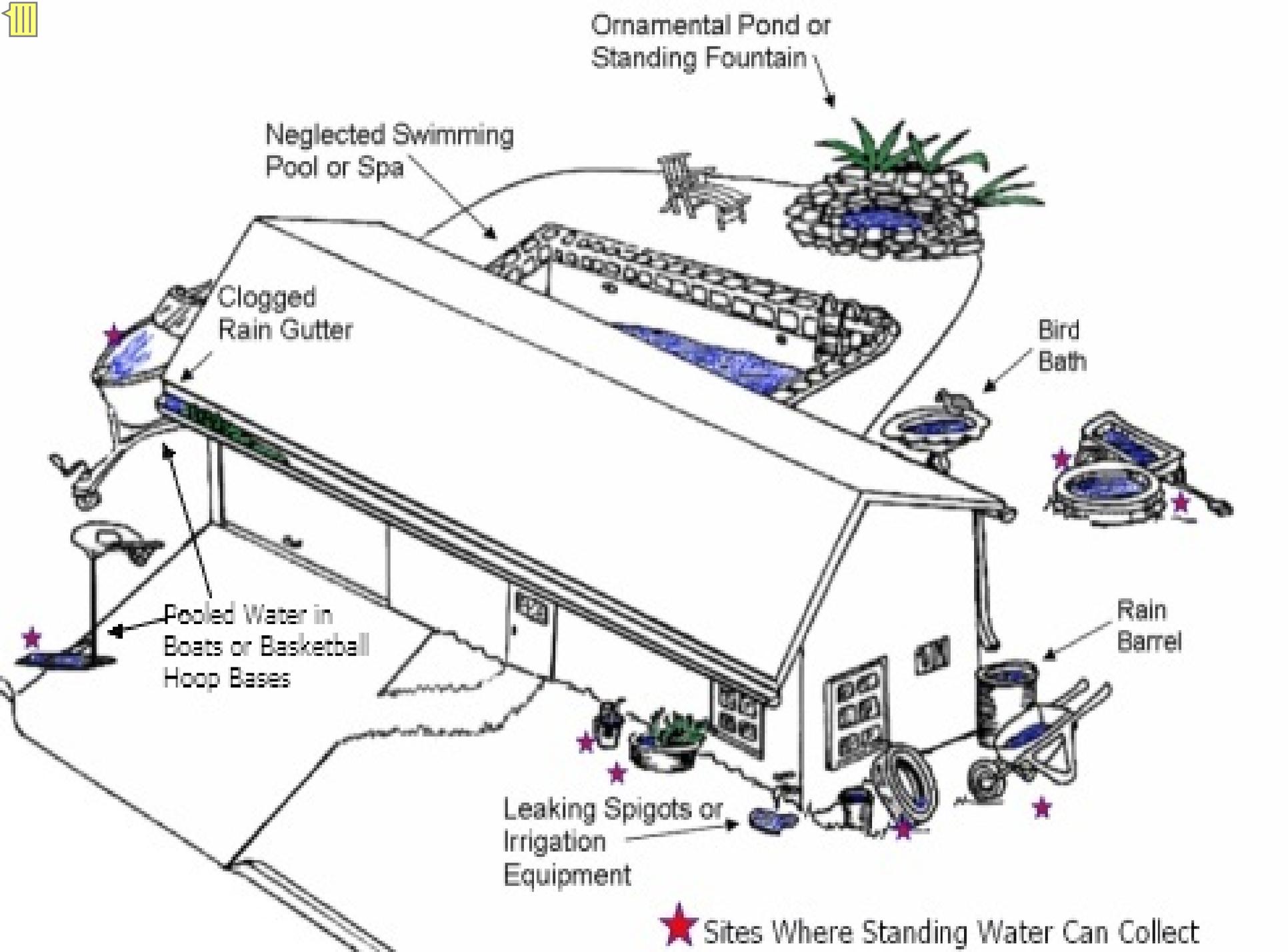
Bird Bath

Pooled Water in Boats or Basketball Hoop Bases

Rain Barrel

Leaking Spigots or Irrigation Equipment

★ Sites Where Standing Water Can Collect



Trapping with a Gravid (pregnant female) Trap



Gravid Trap Set-Up

- Pick a secured location
- Place trap near mosquito habitat
- Add stinky water
- Attach motor, net and battery
- GPS location (or use website map) and complete form



What's New This Year

- Tarrant County updated mosquito response plan
 - Updated our plan to be consistent with TCPH
- Begin season earlier – possibly extend later
- Increase number of traps
- Likely to spray earlier, possibly more frequently
 - Decision to spray will be based on mosquito activity and presence of WNV

Why make changes

- Previous data collected not useable for statistical analysis
- Get ahead of mosquito population to keep from WNV from amplifying
- After a few years of consistent data collection – will be able to use more statistically based decision tree

Trapping Techniques

Static Trapping

Rotation Trapping



Static Trapping

- Locate “hot spot” areas in city
 - Dense populations – senior activity – youth outdoor activity
- Use these “hot spots” to determine static trap locations
 - Static traps are traps that will be placed in the same location every week to gather consistent data.
- Static trapping will take place throughout the entire season
- Every mosquito will be counted for population density records, 30 will be pulled at random for testing

Rotation Trapping

- Rotating traps are response traps that move around city as needed.
 - Complaints
 - Human Case response
 - General surveillance
- Only 1 of 6 traps available for rotation trapping
- Limited by how much space is available at Tarrant County Lab

Surveillance Start Date

- Mosquito submissions will begin April 1st
- Drop off days and weeks will be scheduled on a case by case basis

Sampling Information

Notes from the Lab

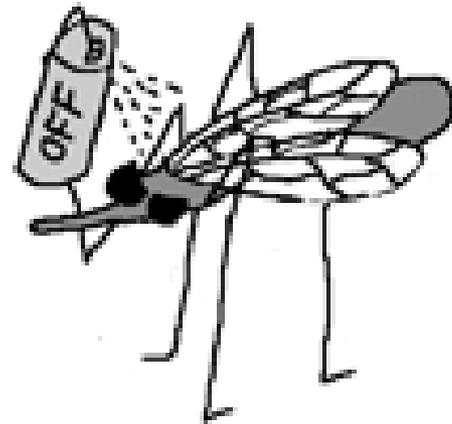
- Mosquito submissions will be tested every Tuesday afternoon in most cases
 - City submissions must be in by 10am on Tuesday afternoon to be tested for that week.
 - Any submission made after 10am on Tuesday will be tested the following week
- Static Trap locations will be tested every week regardless of positive or negative results.

What attracts mosquitoes to their blood meal?

- Scent, Site, Temperature of target
 - Lactic Acid- *Ae. Aegypti*
 - Cholesterol levels
 - CO₂ in breath (up to 100ft away), “odor plumes” similar to pheromones
 - Temperature of skin
 - Estrogen
- Mosquitoes are blind until they are within 30ft of their target
- The higher the humidity, the easier it is for the mosquito to hunt you down –Moisture magnets!

How do Mosquito Repellants work?

- Stinky to mosquitoes
- Does not make you invisible
- Research to help track down what makes some people “not targets” v. those of you who are “chewed up” by mosquitoes



mosquito dating

Repellant Information

■ What is DEET?

- *N,N*-Diethyl-*meta*-toluamide
- Chemical Compound derivative that “stinks” to mosquitoes
- Only compound endorsed by the CDC until 2005
- Lasts for up to 4 hours

■ Other Effective Repellants?

- Oil of lemon eucalyptus, also known as p-menthane-3,8-diol
- Picaridin, a derivative of piperidine, a chemical related to black pepper
- Oil of lemon eucalyptus and picaridin are found in products such as Repel Lemon Eucalyptus and Off! Botanicals
- Both can also last up to 4 hours

West Nile Virus Infection

- Most people infected never have symptoms, or only slight flu-like issues
- Initial symptoms similar to flu
- Small minority develop more severe encephalitis
- In extreme cases, it can lead to death

2012 West Nile Virus Outbreak

- 48 States reported WNV present in people, birds or mosquitoes
- 5,387 cases of West Nile Virus infection reported
 - 2,734 (51%) classified as neuroinvasive including 243 deaths
 - 2,653 (49%) classified as non-neuroinvasive
- 80% of humans infected have no symptoms

2012 Trap Results

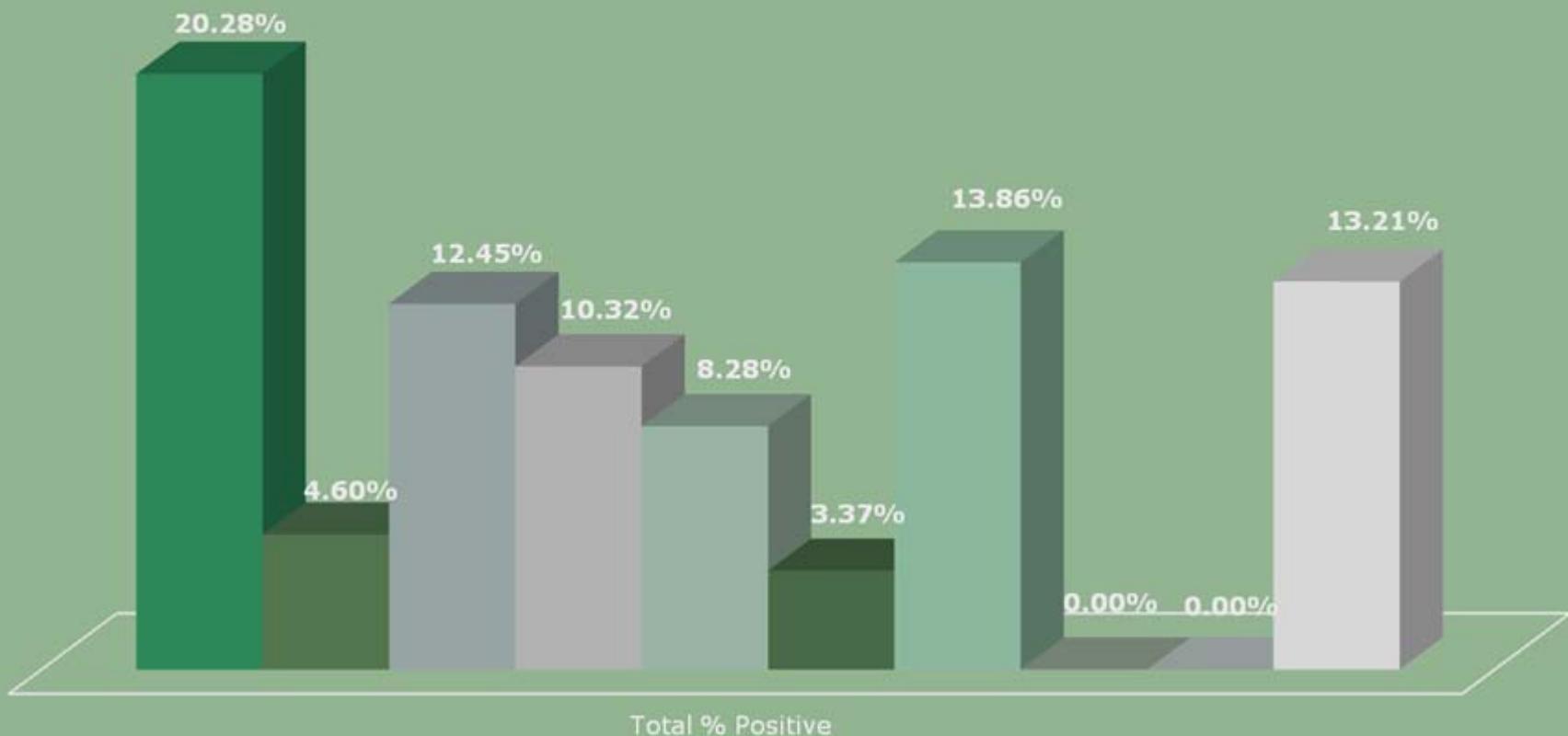
Statistics

- 2003- 636 Total Samples, 129 Positives, or 20%
- 2004- 454 Total Samples, 21 Positives, or 4.6%
- 2005- 482 Total Samples, 60 Positives, or 12%
- 2006- 378 Total Samples, 39 Positives, or 10%
- 2007- 338 Total Samples, 28 Positives, or 8.28%
- 2008- 208 Total Samples, 7 Positives, or 3.37% (minus City of Fort Worth participation)
- 2009- 202 Total Samples, 28 Positives, or 13.86%
- 2010- 112 Total Samples, 0 Positive or 0%
- 2011- 83 Total Samples, 0 Positive or 0%
- 2012- 757 Total Samples, 100 Positive or 13.21%

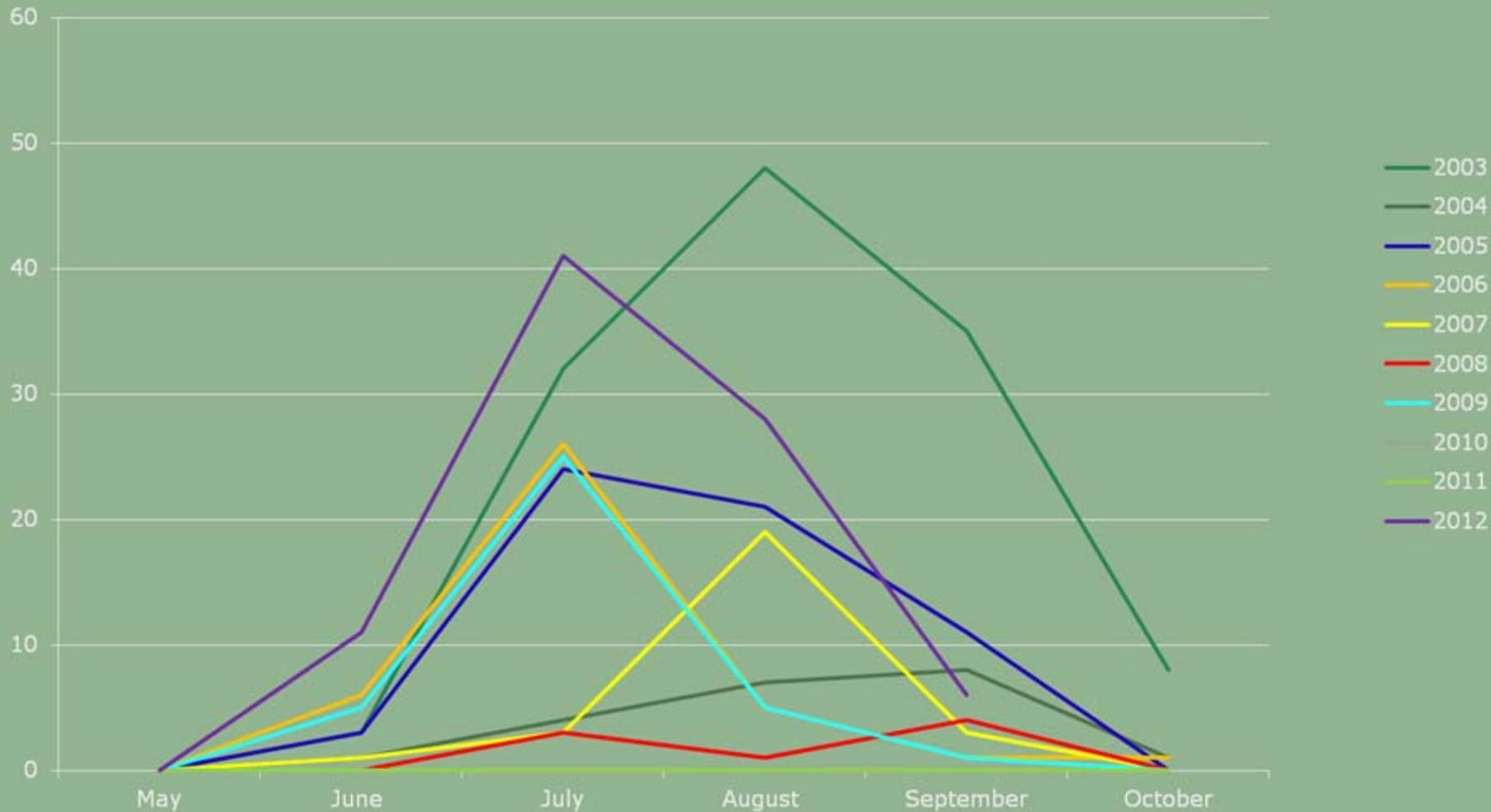
Many of the 2012 samples were submitted after the peak of the WNV

Tarrant County Mosquito Surveillance WNV Pool Positives

■ 2003 ■ 2004 ■ 2005 ■ 2006 ■ 2007 ■ 2008 ■ 2009 ■ 2010 ■ 2011 ■ 2012(to date)



Tarrant County WNV Mosquito Pool Positives by Month 2003-2012



2012 Surveillance Results

2012	Total Number	% of total
submitted	757	
In-Process	0	0.00%
Positive	100	13.21%
Negative	657	86.79%
As of 10/31/2012		100.00%

What happened??

- 280 West Nile Virus infections confirmed in Tarrant County
 - 11 deaths
- Change in bird migratory patterns?
 - Weather Related?
 - Food Related?

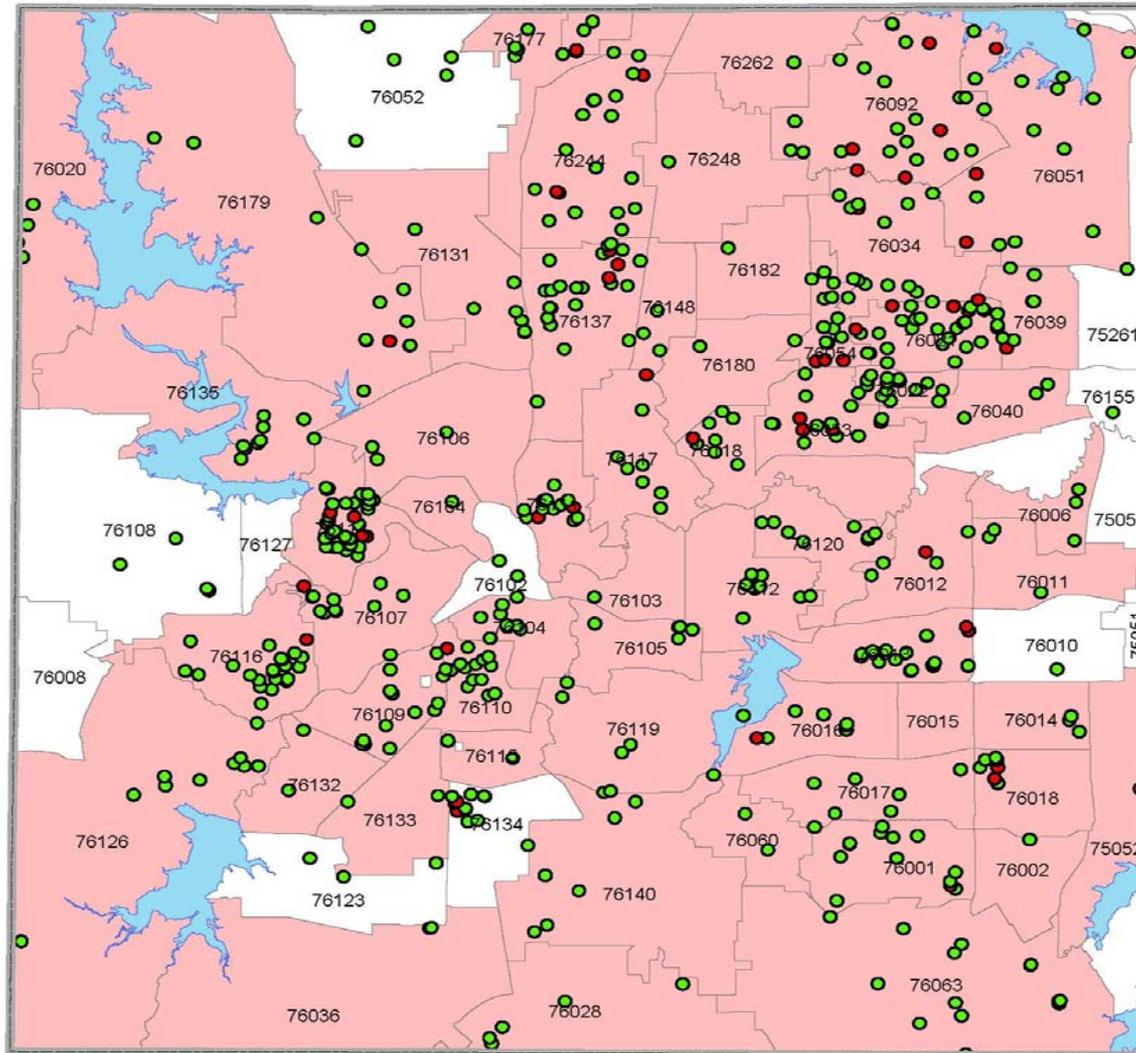


Mosquito Adulticiding Capabilities

- Contractor on retainer to provide adulticide activities
- Most likely consist of targeted backpack or truck based ULV spraying
- Other methods available may be used in unique situations – i.e. perimeter curtain at parks

Tarrant County WNV
Surveillance
Final Map 2013

Geographic Distribution of West Nile Virus in Tarrant County as of 11/02/2012



These data were prepared by Tarrant County Public Health for its use, and may be revised any time, without notification. Tarrant County Public Health does not guarantee the correctness or accuracy of any features on this map. Tarrant County assumes no responsibility in connection therewith. Said data should not be edited by anyone other than designated personnel, or through written approval by GIS Manager. These data are for informational purposes only and should not create liability on the part of Tarrant County Government, any officer and/or employees thereof.

Legend

- Positive Pool (s)
- Negative Pool (s)
- No human case(s)
- Human case(s)
- Water





Questions?