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HEALTH UNIT

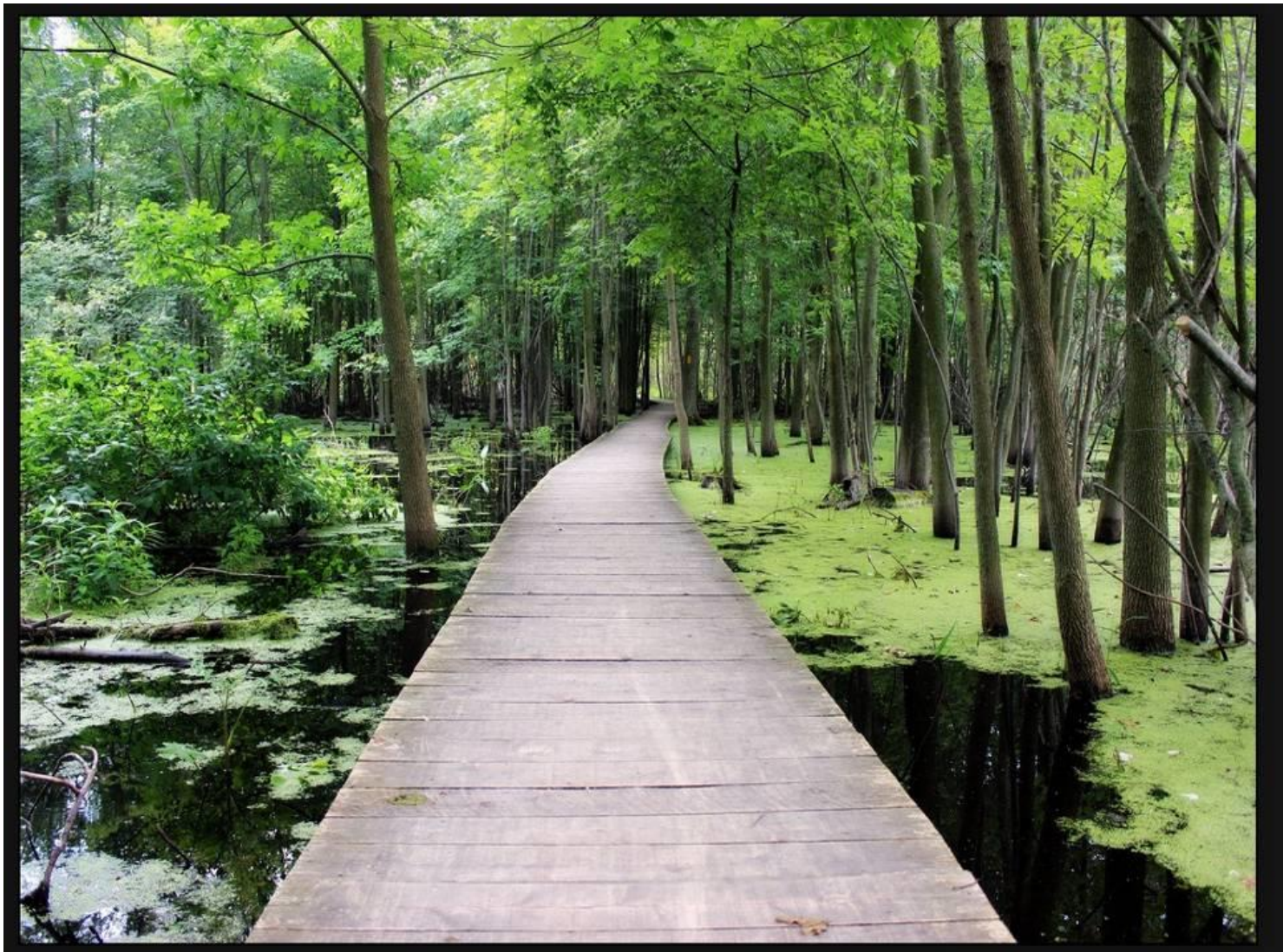
Vector-Borne Diseases: A Middlesex-London update on West Nile virus and Lyme disease

Ontario Vector Control Association
March 27, 2017

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Middlesex-London Health Unit

London, Ontario
Population: 355,000





Middlesex County Boundary



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The Middlesex-London Health Unit's Vector-Borne Disease Program

- Human surveillance of vector-borne diseases, including West Nile Virus, Eastern Equine Encephalitis and Lyme Disease
- Larval mosquito surveillance & identification
- Standing water larviciding
- Catch basin larviciding
- Adult mosquito trapping & viral testing
- Tick surveillance
- Public education & personal protection methods
- Intake & investigation of mosquito and tick concerns
- Reporting and analysis of seasonal data and trends

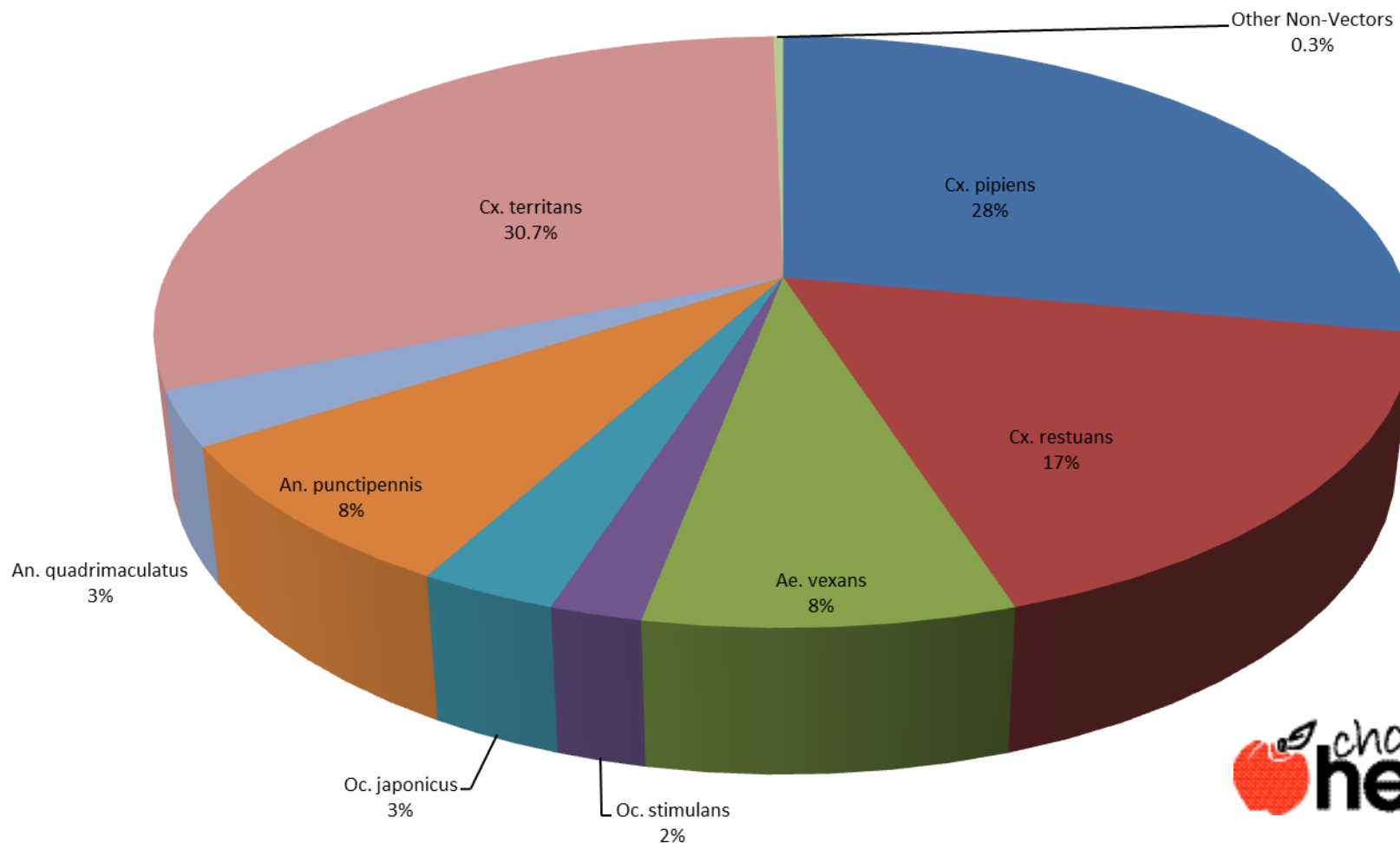
Human Surveillance

- West Nile Virus, Lyme Disease and Eastern Equine Encephalitis are reportable under the Ontario *Health Protection and Promotion Act*
- Comprehensive investigation conducted: travel history, known insect bites, symptoms, etc.
- Risk levels are determined by evaluating human infection rates

Larval Surveillance & Identification

April to October 2016 : 18,126 larvae were identified representing 21 different species

2016 Larval Species Composition



Surface Water Sites

- In 2016, there were over 838 larvicide treatments at 261 monitored sites
- 11.8 hectares of standing water were treated in Middlesex-London
- VectoBac® 200G, VectoBac® 1200L and Vectolex®
- Storm Water Management Facilities promote optimal growth for mosquito larvae
- Environmentally Sensitive Areas- 300ha of Land/Bog/Marsh



Surface Water Site Evaluation

- We came up with a evaluation template and received ministry input
- Used our students to help compile site details and yearly data
- We completed this template for all 263 standing water sites

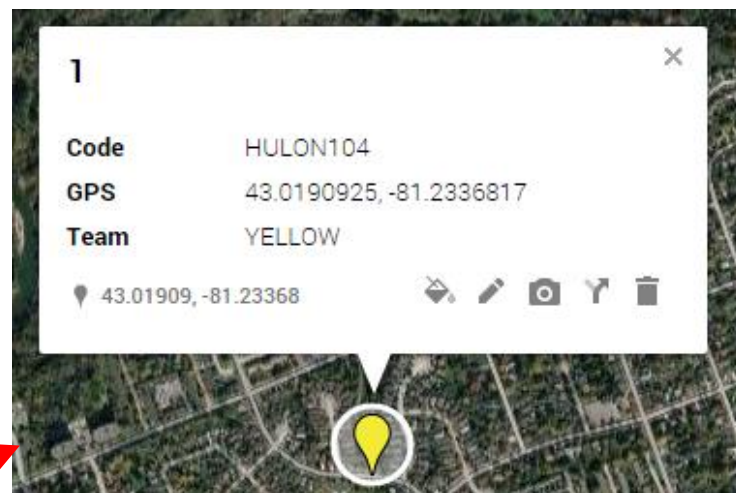
Site Code & Municipality	What Type of Water?	Surrounding Points of Interest?	Proximity to Adult Trap	Enzoonotic Vectors Present in Trap	Municipal Rep	Positive Activity? (Past or Present)	Complaint or Inquiry	Pip and Rest Present in 2016	# Treatment s in 2016	Weeks Pip and Rest Present in 2015	# Treatment s in 2015	Weeks Pip and Rest Present in 2014	# Treatments in 2014	Weeks Pip and Rest Present in 2013	# Treatment s in 2013	Notes
HULON031	SWMF-F	Retirement community, golf course	<2km	23,25,26,27,28,30,31,32,33,34	No	bird, trap	Yes	21,22,24,25,26,27,29,30,31,33	13	24,25,26,28,29,30,32,35,36,37	13	23,26,28,31,32,34,35,36,37	11	23,24,25,26,28,31,32,33,34,35,36,37,38	15	Stormwater pond in riverbend, vector larvae always found here

Surface Water Site Evaluation

- Agreed to a “3 tier” system to help define all site variables
 - Tier 1- Site needs to be visited every week
 - Tier 2- Site needs to be visited every other week
 - Tier 3- Site need to be visited once a month
- Used a “Blind Review” strategy
- This resulted in:
 - 94 Tier 1’s
 - 84 Tier 2’s
 - 68 Tier 3’s
- 10 sites were removed or merged, 7 sites defined as Pollution Control Plants
- Remaining 246 sites



Surface Water Site Locations



- **3,298** field visits
- **105,134** roadside catch basins were treated
- A total of **18,126** mosquito larvae were identified in 2016
- Of the **327** complaints/investigations, **52** were related to standing water concerns

Catch Basins and Pollution Control Plants

- Approximately 30,000 catch basins in London & 5,000 in surrounding municipalities are treated in 3 evenly spaced rounds
- 105,134 catch basins were treated during the season.
- Approximately 788 non-roadside catch basins treated
 - Non-roadside catch basins: parks, hospitals, private backyards & government buildings
- 8 Pollution Control Plants are treated
- Altosid® pellets, granules, and briquettes



Adult Mosquito Trapping

Middlesex-London Adult Surveillance: June 6 – September 26, 2016

- 23 CDC Light traps (4 to 6 feet off the ground)
- 23,317 adult mosquitoes collected
- 75% of all adult mosquitoes identified by Entomogen were WNV and EEE vector species
 - 4 WNV positive adult mosquito pools all *Cx. pipiens*

Ontario and Canada

- 211 positive mosquito pools identified in Ontario
- 341 positive mosquito pools identified in Canada



West Nile Virus Activity 2002-2016

West Nile Virus Positive Activity 2002- Present												
Year	Human			Mosquito			Birds			Horses		
	MLHU	ONTARIO	CANADA	MLHU	ONTARIO	CANADA	MLHU	ONTARIO	CANADA	MLHU	ONTARIO	CANADA
2016	0	49	100	4	211	341	n/a	17	33	1	2	
2015	1	26	80	5	94	173	5	23	43	0	3	
2014	0	11	21	4	56	219	4	6	18		1	23
2013	4	53	115	4	198	318	9	36	89	0	15	57
2012	7	252	428	17	464	605	23	34	65	0	6	37
2011	2	72	101	11	278	285	9	49	22	0	4	7
2010	0	5	5	2	56	85	5	16	24	0	0	1
2009	1	4	13	0	14	37	1	6	10	0	1	6
2008	0	4	36	0	62	122	1	150	150	0	2	6
2007	1	15	2215	0	51	1682	2	79	139	0	0	109
2006	3	42	151	13	169	499	7	256	273	0	3	13
2005	3	101	225	12	291		6	300		0	5	
2004	0	14	25	2	69		6	250		0	9	
2003	1	89	1481	2	135		4	242		0	9	
2002	9	394	414	22	598		15	287		1	101	
A note on human data: ** Numbers include all cases, probable, confirmed, travel related and asymptomatic												

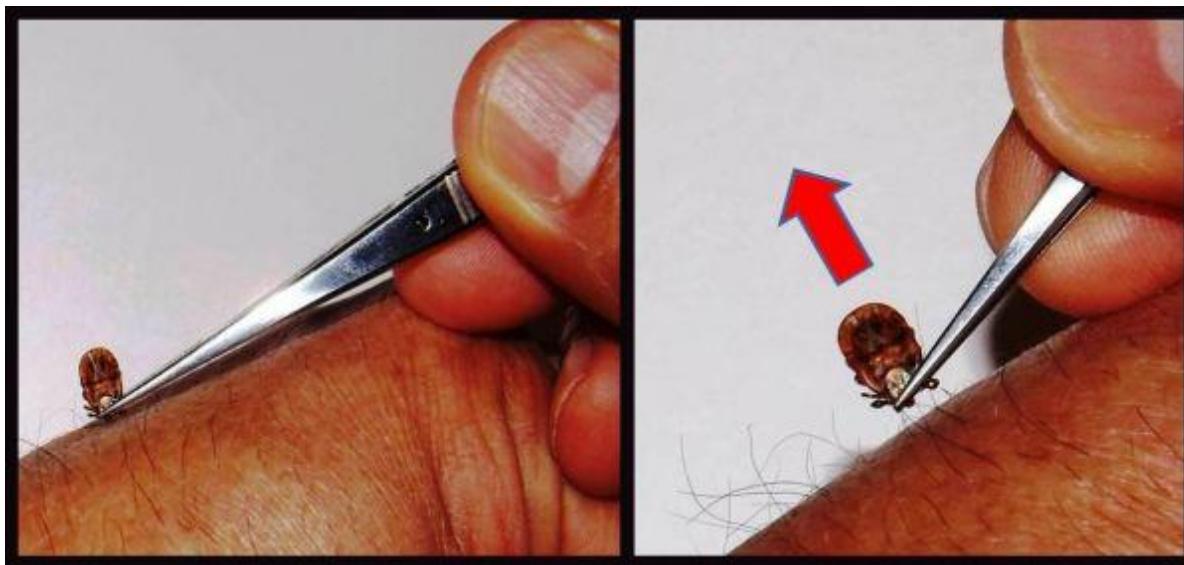
Eastern Equine Encephalitis Activity 2009-2016

- No human cases ever reported in Canada
- No EEE activity in Middlesex-London
- EEE vectors are identified and tested
- Only 5 *Culiseta melanura* identified from traps in Middlesex-London



Lyme Disease Activity

- 142 ticks were submitted to the MLHU in 2016
- 32 ticks (22%) were identified as *Ixodes scapularis* the LD vector in Ontario
- Three locally acquired probable cases of LD reported from within Middlesex-London
- Two travel related confirmed/probable cases of LD experienced by Middlesex-London residents



Lyme Disease Summary



- Active tick dragging was conducted on **45** occasions at **28** different locations
- Increased dragging in Parkhill due its proximity to risk area
- No blacklegged ticks were identified during active surveillance
- **18** ticks were submitted for LD testing (**1** positive, **15** negative, **2** results still outstanding)

Questions?





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