

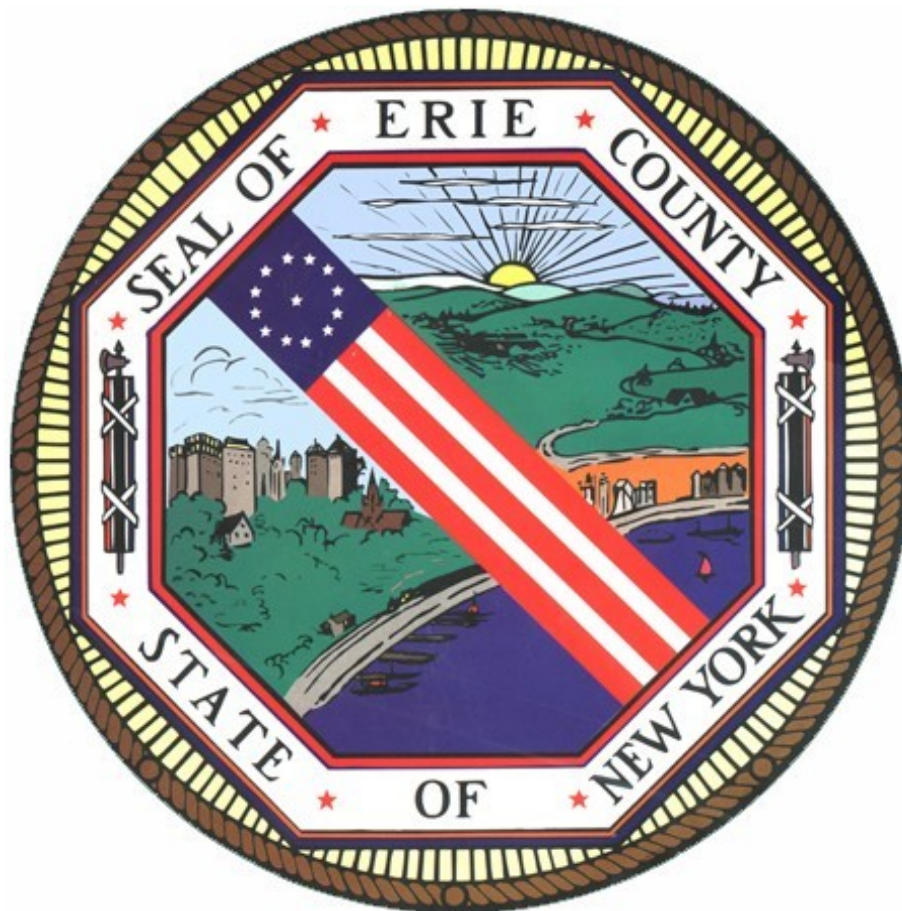
# COUNTY OF ERIE

## FOUR YEAR VECTOR SURVEILLANCE REPORT

LYME DISEASE AND OTHER TICK BORNE DISEASES 2001-2004

FINAL

MAY 2, 2005



DEPARTMENT OF HEALTH  
ENVIRONMENTAL HEALTH WELLNESS  
VECTOR & PEST CONTROL PROGRAM

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COUNTY OF ERIE  
FOUR YEAR VECTOR SURVEILLANCE REPORT  
LYME DISEASE AND OTHER TICK BORNE DISEASES 2001-2004  
DRAFT – MARCH 28, 2005

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## PURPOSE

The purpose of Tick Identification is to assist healthcare professionals (physicians, veterinarians, etc) to determine if a victim has encountered a species of tick that is a potential vector for disease, most importantly Lyme Disease. Over the past ten years in Erie County, there have been no reported human cases of Rocky Mountain Spotted Fever, 0 cases of Babesiosis, 1 case of Ehrlichiosis (1995), and 83 cases of Lyme Disease. The following table shows reported human cases of tick borne diseases in Erie County over the past ten years as reported by the Erie County Health Department, Disease Control Bureau.

Reported Communicable Diseases in Erie County											
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
Babesiosis	0	0	0	0	0	0	0	0	0	0	0
Ehrlichiosis	1	0	0	0	0	0	0	0	0	0	1
Lyme Disease (unconfirmed)	25	14	7	9	10	8	4	4	1	1	83
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	0	0	0	0
Information from Erie County Health Department – Disease Control Bureau N/A = Not Available 2004 figures are provisional											

The Vector and Pest Control Lab of the Erie County Health Department has been performing identification of ticks since May of 2001. The Vector and Pest Control Lab has received 349 (74 in 2004, 94 in 2003, 123 in 2002, and 58 in 2001) specimens for identification to date. The service is currently being provided free of charge. The cost incurred by the Erie County Health Department to provide this service was reimbursable by the NYSDOH at a rate of 36% as educational outreach.

## TICK SURVEILLANCE PERFORMED

### TARGET SPECIES

The following table describes the target species of ticks in Erie County and the Western Region of New York State.

Species	Common Name	Potential Vector of:
<i>Amblyomma americanum</i>	Lone Star Tick	Ehrlichiosis Tularemia
<i>Dermacentor variabilis</i>	American Dog Tick	Ehrlichiosis Rocky Mountain Spotted Fever - <i>Rickettsia rickettsii</i> Tularemia
<i>Ixodes cookei</i>	Woodchuck Tick	Not known
<i>Ixodes marxi</i>	Squirrel Tick	Not known
<i>Ixodes scapularis</i>	Blacklegged (Deer) Tick	Babesiosis Ehrlichiosis Lyme Disease – <i>Borrellia burgdorferi</i>
<i>Rhipicephalus sanguineus</i>	Brown Dog Tick	Ehrlichiosis

### METHODS

Provide the service of Tick Identification to local physicians, hospitals, laboratories, veterinarians or private citizens upon request. The victim of a tick might be a human, dog, cat or other animal.

Microscopic identification is performed usually within 48 hours and not more than one week. Each Tick was identified by species, common name, sex, and degree of engorgement. Identification is performed using the following as reference for adult ticks:

“Pictorial Key to the Adults of Hard Ticks, Family Ixodidae (Ixodida:Ixodoidea) East of the Mississippi River.” James E. Keirans and Taina R. Litwak. J. Med. Entomol. 26(5): 435-448 (1989)

“The Genus *Ixodes* in the United States: A Scanning Electron Microscope Study and Key to the Adults.” James E. Keirans and Carleton M. Clifford. J. Med. Entomol. Supplement 2: 1-149 (1978)

Identification of ticks in the Genus *Ixodes* that are nymphs is performed using the following reference:

“Nymphs of the Genus *Ixodes* (Acari: Ixodidae) of the United States: Taxonomy, Identification Key, Distribution, Hosts, and Medical/Veterinary Importance.” Lance A. Durden and James E. Keirans. Entomological Society of America. 1996.

RESULTS

In 2004, 74 specimens have been submitted for identification. The breakdown by species is as follows.

TICKS IDENTIFIED						
Species	Common Name	Number Identified				
		2001	2002	2003	2004	Total
<i>Amblyomma americanum</i>	Lone Star Tick	4	10	3	4	21
<i>Amblyomma maculatum</i>	Gulf Coast Tick	0	1	0	0	1
<i>Aponomma latum</i>	Snake Tick	0	0	1	0	1
<i>Dermacentor variabilis</i>	American Dog Tick	26	54	23	29	132
<i>Dermacentor albipictis</i>	Winter Tick	0	1	0	0	1
<i>Ixodes cookei</i>	Woodchuck Tick	6	14	19	8	47
<i>Ixodes marxi</i>	Squirrel Tick	4	1	0	0	5
<i>Ixodes muris</i>	None	0	0	1	0	1
<i>Ixodes scapularis</i>	Blacklegged (Deer) Tick	9	16	33	8	66
<i>Ixodes spp.</i>	<i>Ixodes</i> species*	0	1	1	0	2
<i>Rhipicephalus sanguineus</i>	Brown Dog Tick	0	5	2	1	8
Ticks Identified		49	103	83	54	289
Specimens other than Ticks Identified**		9	20	11	20	60
Total Specimens Received		58	123	94	74	349
* Tick damaged. Features missing for complete identification.						
** See Appendix for details.						

Our primary target species for Tick Identification is *Ixodes scapularis*, the vector of Lyme disease. Over the past 4 years, 22.8% of all ticks identified have been *Ixodes scapularis*. The yearly breakdown is 14.8% in 2004, 39.8% in 2003, 15.5% in 2002, and 18.4% in 2001. The increased percentage of specimens identified as *Ixodes scapularis* in 2003 may be indicative of one or both of the following factors: a greater population of the species in the area or a greater awareness of tick-borne diseases. This cannot be statistically proven due to the small sample size.



*Ixodes Scapularis*, the Blacklegged Tick or Deer Tick - Dorsal View

There were three unique cases in 2002 and 2003. Each involves a tick that is rarely observed in this area. The following photos and text briefly describe each case.

*Amblyomma maculatum*, the Gulf Coast Tick.



*Amblyomma maculatum* Dorsal View

adult female whose only travel history was listed as “Walks dogs near Reinstein Woods and at Como Park.” The tick was an intact unengorged adult male. The identification was verified by Dr. Wayne Gall, Regional Entomologist for the NYSDOH.

This event was the first recorded occurrence of the Gulf Coast Tick in Erie County. It was sent for identification by the victims father and was collected on December 12, 2002. The victim was an



*Amblyomma maculatum* Ventral View

*Aponomma latum*, the Snake Tick



*Aponomma latum* Dorsal View

The remarks on the report stated, “This is the most common tick parasite of large snakes in most of sub-Saharan Africa and in the pet trade worldwide. It frequently arrives in the USA on imported pet pythons especially from West African countries.”

This tick was collected from a Ball Python at Sheridan Animal Hospital on January 7, 2003. It could not be identified using the current reference keys. It was sent to the USDA, National Veterinary Science Laboratory and identified as a Snake Tick.



*Aponomma latum* Ventral View

*Dermacentor albipictis*, the Winter Tick



*Dermacentor albipictis* Dorsal View

tick was an intact unengorged adult male. This species of tick is known to reach the adult stage during the winter months.

This tick was sent by Arnot Odgen Medical Center. It was collected from an adult male on November 5, 2002. It was attached to his left hip. The victim was deer hunting in Schuyler County and observed other ticks on a deer. The



*Dermacentor albipictis* Ventral View

## WORKLOAD

The following table describes the numbers of specimens by victim.

Workload by Victim					
Victim	Number of Specimens				
	2001	2002	2003	2004	Total
Human	35	51	27	39	152
Dog	16	57	51	16	140
Cat	2	3	8	4	17
Other	5	12	8	15	40
Total	58	123	94	74	349

The following table describes the numbers of specimens by client type.

Workload by Client Type					
Client Type	Number of Specimens				
	2001	2002	2003	2004	Total
Hospitals/Laboratories	12	15	10	4	41
Physicians	6	15	1	8	30
Private Citizens	13	44	16	38	111
Public Health Agencies	8	7	10	5	30
Veterinarians	19	42	57	19	137
Total	58	123	94	74	349

The following table describes the number of specimens by month.

Workload by Month					
Month	Number of Specimens				
	2001	2002	2003	2004	Total
Jan	--	1	3	0	4
Feb	--	0	1	1	2
March	--	3	2	3	8
April	--	4	6	6	16
May	6	11	15	14	46
June	17	48	15	19	99
July	15	21	19	13	68
August	8	15	5	4	32
September	2	8	5	5	20
October	3	2	10	1	16
November	7	8	8	8	31
December	0	2	5	0	7
Total	58	123	94	74	275



## REGIONAL AND INTER-AGENCY ISSUES

The Vector and Pest Control Lab made its service of Tick Identification available to physicians, veterinarians and private citizen in any of the western region counties of New York State. Of the 275 specimens identified, 32 were from outside Erie County.

The following table describes the number of specimens by county of residence of the victim.

Workload by County					
County	Number of Specimens				
	2001	2002	2003	2004	Total
Chemung	2	8	2	0	12
Erie	45	111	87	70	315
Genesee	1	0	1	3	5
Livingston	1	0	0	0	1
Niagara	1	1	1	1	4
Orange	1	0	0	0	1
Schuyler	0	1	2	0	3
Seneca	1	0	0	0	1
Steuben	2	1	1	0	4
Wyoming	4	1	0	0	5
Total	58	123	94	74	351

The Vector and Pest Control Lab has worked closely with Dr. Wayne Gall, Entomologist for the Western Region Office of the NYSDOH. He has supplied technical assistance to the Vector Lab in the form of identifying insects not ticks and verification of identification for several ticks.

## APPENDIX

### PROTOCOL FOR TICK IDENTIFICATION SERVICE (INCLUDES REQUEST FORM)

**ERIE COUNTY HEALTH DEPARTMENT**  
**ENVIRONMENTAL HEALTH WELLNESS**  
**VECTOR AND PEST CONTROL PROGRAM**

462 Grider Street Room BB-122

Buffalo, NY 14215

716-898-3324

**Protocol for Tick Identification Service**

Specimen Collection, Transport and Storage

Updated: October 14, 2003

**Requisition Form:**

The proper form for requesting tick Identification is the:

- Erie County Health Department Tick Identification Request Form revised 6/03.
- When sending multiple ticks, a separate form must accompany each tick.

**Specimen Collection Information:**

In removing and submitting ticks for identification, use the following procedure:

- Carefully remove ticks by grasping them as close to the skin as possible using fine tweezers and pull gently but firmly until they let go.
- Do not squeeze ticks or handle them with your bare hands.
- Place the whole tick in a tightly sealed container. Label with the victims name and date collected.
- Package carefully in a crush-proof container and send to the above address.

**Specimen Transport Information:**

Specimens for Tick Identification in a tightly sealed container, packed in a crush-proof package can be transported to the Vector Lab by:

- US Mail to Address listed above and on the Requisition Form.  
Specimens are picked up from the mailroom at ECMC each business day.
- Hand-deliver directly to lab.  
Vector & Pest Control Program  
462 Grider Street – Room BB122  
Buffalo, NY 14215  
(716) 898-3324  
(716) 898-6163 fax
- If there is no one at the Vector Lab to accept the specimen, deliver to the Erie County Public Health Lab for storage/holding.  
Erie County Public Health Laboratory  
Clinical Center Building AA  
462 Grider Street  
Buffalo, NY 14215  
(716) 898-6105  
(716) 898-6110 fax

The Public Health Lab should call the Vector Lab to notify that a specimen is being held for Tick Id. Voicemail is acceptable. The Vector Lab will pick up the specimen by the next business day.

- Hand-deliver to one of the four district offices of the Erie County Health Department.

Buffalo District Office  
462 Grider Street-Building BB  
Buffalo, NY 14215  
(716) 691-6800  
(716) 691-6880 fax

Hamburg District Office  
17 Long Avenue  
Hamburg, NY 14075  
(716) 649-4225  
(716) 649-4223 fax

Lancaster District Office  
85 Manitou  
Lancaster, NY 14086  
(716) 683-6487  
(716) 683-5517 fax

Tonawanda District Office  
250 Cortland Avenue  
Tonawanda, NY 14223  
(716) 874-1070  
(716) 874-1076 fax

The Erie County Health Department District Offices should call the Vector Lab to notify that a specimen is being held for Tick Id. Voicemail is acceptable. Place the specimen container in a “ziploc” bag, and a brown paper bag labeled “Vector Lab.” The interoffice courier can then deliver the specimen directly to the Vector Lab.

### **Specimen Storage/Holding Information:**

- Specimens for Tick Identification must be in a tightly sealed container. This container may contain only the tick specimen with no media or it may contain alcohol as a transport media.
- The specimen container must be labeled with the victim’s/patient’s name.
- The specimen can be held at room temperature or under refrigeration whichever is more convenient.

### **Identification Performed/Results Reporting**

- Specimens received will be processed for identification the day they are received in lab.
- Identification performed within 48 hours not including weekends and holidays using the following reference. Additional references used as needed.

“Pictorial Key to the Adults of Hard Ticks, Family Ixodidae (Ixodida:Ixodoidea) East of the Mississippi River.” James E. Keirans and Taina R. Litwak. J. Med. Entomol. 26(5): 435-448 (1989)

- Results report includes species name, common name, life stage (larva, nymph or adult), degree of engorgement (1+ to 5+), and whether the head of the tick is intact.
- Results are reported by phone and by mail. Faxed reports are available upon request.
- Specimens that are not ticks will be identified using insect keys on hand in lab or referred to:  
Dr. Wayne Gall, Regional Entomologist  
NYSDOH, Western Region Office  
584 Delaware Avenue  
Buffalo, NY 14202  
Phone: 716-847-4508
- Exotic ticks that are not included in the identification keys will be referred to:  
National Veterinary Services Laboratories  
1800 Dayton Road  
Ames, IA 50010  
Phone: 515-663-7266

**ERIE COUNTY HEALTH DEPARTMENT  
ENVIRONMENTAL HEALTH WELLNESS  
VECTOR AND PEST CONTROL PROGRAM**

462 Grider Street Room BB-122  
Buffalo, NY 14215  
716-898-3324

LAB USE ONLY
SR#: _____
Date Closed: _____
Closed By: _____

**Tick Identification Request Form**

Collection Information:

In removing and submitting ticks for identification, use the following procedure:

- Carefully remove ticks by grasping them as close to the skin as possible using fine tweezers and pull gently but firmly until they let go.
- Do not squeeze ticks or handle them with your bare hands.
- Place the whole tick in a tightly sealed container labeled with the victims name and collection date.
- Package carefully in a crush-proof container and send to the above address.
- When sending multiple ticks, a separate form must accompany each specimen.

Specimen Sent By	Name:			
	Address:			
	City:	County:	State:	Zip:
	Phone:		Fax:	
Tick Information	Date tick found:	Was the tick attached when found? <input type="checkbox"/> Yes <input type="checkbox"/> No		
If tick was found on a person	Name:			Phone:
	Address:			
	City:	County:	State:	Zip:
	Sex <input type="checkbox"/> M <input type="checkbox"/> F	DOB or Age:		
If tick was found on an animal	Part of body on which it was found:			
	<input type="checkbox"/> Cat <input type="checkbox"/> Dog <input type="checkbox"/> Other (specify)		Name of Animal:	
	Owner of Animal:		Phone:	
	Address:			
30 day travel history of victim, with dates				
<b>Lab Use Only</b>				
Date rec'd:	Date of ID:	Processed by:		
Sample condition: <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor				
Identification	Species		Common name	
	<input type="checkbox"/>	<i>Amblyomma americanum</i>	Lone Star Tick	
	<input type="checkbox"/>	<i>Dermacentor variabilis</i>	American Dog Tick	
	<input type="checkbox"/>	<i>Ixodes cookie</i>	Woodchuck Tick	
	<input type="checkbox"/>	<i>Ixodes scapularis</i>	Blacklegged (Deer)Tick	
	<input type="checkbox"/>	<i>Ixodes marxi</i>	Squirrel Tick	
<input type="checkbox"/>	<i>Rhipicephalus sanguineus</i>	Brown Dog Tick		
<input type="checkbox"/>	Other:			
<input type="checkbox"/> Larva <input type="checkbox"/> Nymph <input type="checkbox"/> Adult		Sex: <input type="checkbox"/> M <input type="checkbox"/> F	Damage: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Degree of Engorgement: <input type="checkbox"/> 1+ <input type="checkbox"/> 2+ <input type="checkbox"/> 3+ <input type="checkbox"/> 4+ <input type="checkbox"/> 5+				
Comments				
Phone Report to:	Date & Time:			

## SPECIMENS OTHER THAN TICKS IDENTIFIED

Specimens Other Than Ticks Identified in 2001		
Species	Common Name	Number Identified
<i>Cimex lectularius</i>	BED BUG*	2
<i>Eristalis tenax</i>	Rat-Tailed Maggot*	1
Order: Diptera Family: Hippoboscidae	KED or LOUSE FLY**	1
---	Bird Mite*	1
---	Debris	3
---	No Tick in Container	1
<b>Total</b>		<b>9</b>
*Identified by Dr. Jacques Berlin, NYSDOH Regional Entomologist (Retired)		
**Confirmed by Dr. Jacques Berlin, NYSDOH Regional Entomologist (Retired)		

Specimens Other Than Ticks Identified in 2002		
Species	Common Name	Number Identified
<i>Anthrenus fuscus</i>	Dermeestid beetle*	2
<i>Contarinia negundifolia</i>	Boxelder Leaf Gall Midge Larvae*	1
<i>Leptoglossus occidentalis</i>	Western Conifer Seed Bug*	1
<i>Otiorynchus ovatus</i>	Strawberry Root Weevil*	1
<i>Pediculus humanus capitis</i>	Head Louse**	1
<i>Phormia regina</i>	Black Blow Fly Larvae*	1
<i>Thermobia domestica</i>	Firebrat*	1
<i>Vespa crabro</i>	European Hornet aka Giant Hornet*	1
<i>Ctenocephalides felis</i>	Cat Flea**	1
Family: Cerambycidae	Long-Horned Beetle*	1
Genus: Cimex	Nymph, probable bedbug*	1
---	Ermine Moth*	1
---	Silverfish*	1
---	Black Carpet Beetle*	1
---	Plant Material	1
---	Insect Parts Not From a Tick	1
---	Debris	3
<b>Total</b>		<b>20</b>
*Identified by Dr. Wayne Gall, NYSDOH Regional Entomologist		
**Confirmed by Dr. Wayne Gall, NYSDOH Regional Entomologist		

Specimens Other Than Ticks Identified in 2003		
Species	Common Name	Number Identified
<i>Crematogaster spp.</i>	Acrobat Ant*	1
<i>Dermestes lardarius</i>	Larder Beetle*	1
<i>Dytiscus spp.</i>	Predaceous diving beetle*	1
<i>Lipoptena cervi</i> Order: Hippobosidae)	Deer ked*	1
<i>Oryzaephilus mercator</i>	Merchant Grain Beetle**	1
Order: Coleoptera Family: Carabaeidae	Scarab Beetle*	1
Order: Hemiptera Family: Reduviidae)	Assassin Bug Nymph*	1
Phycitine moth	Possibly an Indian mealmoth*	1
---	Debris	3
<b>Total</b>		<b>11</b>
*Identified by Dr. Wayne Gall, NYSDOH Regional Entomologist		
**Confirmed by Dr. Wayne Gall, NYSDOH Regional Entomologist		

Specimens Other Than Ticks Identified in 2004		
Species	Common Name	Number Identified
<i>Cimex lectularius</i>	Bed Bug	2
<i>Lipoptena cervi</i>	Deer Ked	1
<i>Oryzaepjhilus surinmensis</i>	Sawtoothed Grain Beetle	1
<i>Pediculus humanus</i>	Head and Body Louse	1
<i>Periplaneta americana/Periplaneta australasae</i>	American/Australian Cockroach	1
<i>Ploidia interpunctell</i>	Indianmeal Moth	2
<i>Pthirus pubis</i>	Crab Louse	1
<i>Rhyzoptertha dominica</i>	Lesser Grain Robber	1
<i>Simuliul vittatum Zetterstedt</i>	Black Fly	1
<i>Tetramorium caespitum</i>	Pavement Ant	3
<i>Vespa crabro</i>	European Hornet	1
--	Pseudoscorpion	1
--	Chalcidoid Wasp (Parasitic Wasp)	1
--	Debris/No Insect Found	5
<b>Total</b>		<b>22</b>
*Identified by Dr. Wayne Gall, NYSDOH Regional Entomologist		
**Confirmed by Dr. Wayne Gall, NYSDOH Regional Entomologist		

## ACKNOWLEDGMENTS

Erie County Health Department

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Note: Photos in this document were taken using a JVC 3.3 Megapixel Digital Camera installed on the Leica GZ7 Stereo Microscope at the Vector Lab.

Technical Assistance:

New York State Department of Health

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