UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
ANIMAL DISEASE ERADICATION DIVISION
FEDERAL CENTER BUILDING
HYATTSVILLE, MARYLAND 20781

March 2, 1965

NATIONAL TICK SURVEY - CY 1964

PURPOSE AND NATURE OF THE TICK SURVEY

The purpose of the National Tick Survey is to systematically monitor our tick populations, not only to find exotic species which may have gained entrance, but also to develop additional information on the distribution and problem of ticks presently established here. Such information is essential when the control of any tick-borne disease is contemplated. The ticks we have not only serve as vectors of diseases presently in this country, but might well become important vectors of foreign diseases, should such diseases appear.

Most of the specimens identified during this survey were collected by State and Federal veterinarians and livestock inspectors. Ticks were collected during the course of regular work assignments such as brucellosis and tuberculosis testing, inspection of livestock at stockyards, auction markets, screwworm inspection stations, and other collection points where livestock were assembled. Veterinary practitioners also participated in the survey.

In several States the cooperation of State and Federal wildlife management personnel aided materially in the collection of ticks from numerous species of small and large game animals. Dr. Frank A. Hayes, Director of the Southeastern Cooperative Wildlife Disease Study, School of Veterinary Medicine, University of Georgia, continues to be active in encouraging wildlife biologists and game wardens to collect and submit ticks from white-tail deer and other wildlife throughout the southeastern States. The Southeastern Cooperative Wildlife Disease Study is a regional cooperative multi-State wildlife research program in which thirteen southeastern States and the School of Veterinary Medicine, University of Georgia, collaborate with the United States Fish and Wildlife Service in the study of the diseases of native wildlife.

The present National Livestock Tick Survey actually had its beginning in Florida in conjunction with their last B. microplus outbreak which occurred in 1960. Intensive inspections and surveys were made on farms and at auction markets and slaughtering plants to locate all foci of the infestation. Livestock regulatory officials were not content with determining that a tick specimen merely was or wasn't Boophilus, but instead established the policy of sending all specimens to a central location where identification was made by an experienced taxonomist. This thinking quickly paid off handsomely as an extremely important exotic tick, Rhipicephalus evertsi, was found on imported exhibition animals at an animal farm. Further efforts resulted in locating exotic ticks at a second animal farm in Florida and one in New York State. Strenuous efforts to eradicate these ticks have been successful and represent the only instances in which these ticks have been eradicated from an infested country. Had the infestation become more widespread in this country prior to detection, eradication would have been much more difficult, if not impossible.

POTENTIAL DANGERS OF EXOTIC TICKS

The threat of introducing exotic parasites and diseases is probably greater today than at any time in our history. This is true for several reasons. For one, modern, rapid transportation, with all the advantages it has brought us, has also confronted us with some new problems that our predecessors generally did not have to face. For instance, it is now possible to load animals on swift ocean-going vessels in Africa, Asia, or Europe; and within only a few days they are at one of our ports of entry. With air transportation--and more and more animals are being shipped by air each year--the time interval from departure to arrival is measured in hours, not days.

In earlier days, the long, slow voyages of the windjammers were probably the primary reason that many more exotic parasites and diseases were not introduced into the United States and other parts of the Americas. Years ago the infected animals generally died or perhaps recovered so that upon arrival they were less of a threat to our domestic livestock. Perhaps more ectoparasites were not introduced as many completed their life cycles and dropped off the host before arrival at the port of entry.

Without a doubt, the exotic ticks pose a greater potential threat to our livestock industry than any other arthropod. They are a definite threat for two reasons: The damage that they can do as blood suckers and the diseases that they are capable of transmitting. The ticks, of all the arthropods, are the most notorious vectors of livestock diseases. We, here, are very fortunate as we have few ticks capable of causing the damage that the ticks cause in Africa. Africa is teeming with many species of ticks that, if they were introduced into the United States and South and Central America, could easily decimate our livestock industry. Exotic vectors could also be introduced intentionally to cripple a livestock industry.

Eradication of many of these species would probably be impossible once they became firmly established. It is true that we have eradicated the Boophilus ticks from the United States and even though this was a very difficult and costly task, it would seem a minor accomplishment when compared to the problem of eradicating certain exotic species. The Boophilus ticks are one-host ticks and the bovine is the primary host. They spend all their parasitic life cycle, that is as the larva, nymph, and adult, on the same host. Thus, by treating the primary host enough times and at the appropriate intervals all the ticks can either be killed by the treatment or starved if they have failed to find a host.

Many of the exotic ticks, however, are three-host ticks. Although the biology varies from species to species, the larval stage is generally spent on birds or small rodents, after which it drops off and molts to the nymphal stage. The nymphal stage usually attaches to a rodent or some small wild or domestic animal, engorges, and drops to the ground to molt to the adult stage. The adult usually attacks larger wild or domestic animals. Three-host ticks are extremely difficult to eradicate since it would be next to impossible to control the immature stages on the wildlife. Also, many of the immature and mature stages can survive for long periods without a blood meal.

One of the most likely pathways for exotic ticks to enter this country is through the entry of exotic zoo and exhibition animals, many of which are shipped directly from areas of the world which are heavily infested with ticks of both potential and real danger to our livestock industries. In years past, collections of exotic ticks have been made at various inland zoos. Although certain of these are a matter of public record at one place or another, the information is not generally available at any one place and is probably rather incomplete. Inasmuch as there was not always a continuous effort to survey tick populations at all locations, tick infestations of zoo animals may well have gone unnoticed, and, due to the general environmental conditions at city zoos, did not persist. However, the keeping of exhibition animals is undergoing considerable change and the present trend seems to be to exhibit such animals in "more natural" environments. These natural environments are out of the comparative safety of the city and are in areas where more direct contact with our domestic livestock is possible. Exotic animal "farms or ranches" have been established at several locations and others are in the planning stages. This considerably increases the danger potential to our domestic livestock and makes tick surveys even more important.

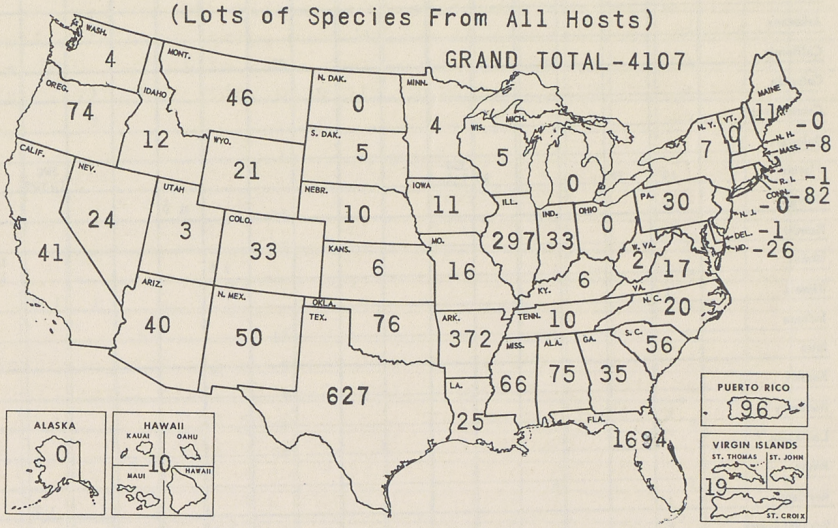
REPORT OF ALL TICKS COLLECTED
CALENDAR YEAR 1964

STATE	TOTAL	CATTLE	HORSES & MULES	DOGS	ZOO ANIMALS & MISC.	NATIVE WILDLIFE
TOTAL	4,107	2,062	1,214	408	289	134
Alabama	75	18	4	26	15	12
Alaska						
Arizona	40	28	6		4	2
Arkansas	372	333	6	9	24	
California	41	26	7	4	4	
Colorado	33	12	3	17	1	
Connecticut	82	1		73	8	
Delaware	1			1		
Florida	1,694	548	1,051	36	40	19
Georgia	35	19	2	8	5	1
Hawaii	10	7		2	1	
Idaho	12	3	2		3	4
Illinois	297	247	13	7	29	1
Indiana	33	6		7	20	
Iowa	11	6	1	4		
Kansas	6	4		2		
Kentucky	6	1	1	1	2	1
Louisiana	25	19	2	1	3	
Maine	11			9	2	
Maryland	26	6		8	11	1
Massachusetts	8	1		3	2	2
Michigan						
Minnesota	4			1	3	
Mississippi	66	36	2	6	20	2
Missouri	16	12			3	1
Montana	46	25	6	3	5	7
Nebraska	10	3	2	4		1
Nevada	24	11	2	8	2	1
New Hampshire						
New Jersey						
New Mexico	50	32	1	5	12	
New York	7			6	1	
North Carolina	20	10	1	6	3	
North Dakota						
Ohio						
Oklahoma	76	62	4	6	4	
Oregon	74	12	10	25	16	11
Pennsylvania	30		3	26	1	
Rhode Island	1				1	
South Carolina	56	27		1	3	25
South Dakota	5	1		2	2	
Tennessee	10	5		2		3
Texas	627	430	75	75	15	32
Utah	3		1		1	1
Vermont						
Virginia	17	12			3	2
Washington	4	1		1	2	
West Virginia	2	1			1	
Wisconsin	5	2		1	2	
Wyoming	21	7	5	4	4	1
Puerto Rico	96	85	4	7		
Virgin Islands	19	3		1	11	4

TICKS COLLECTED CALENDAR YEAR 1964

(Lots of Species From All Hosts)

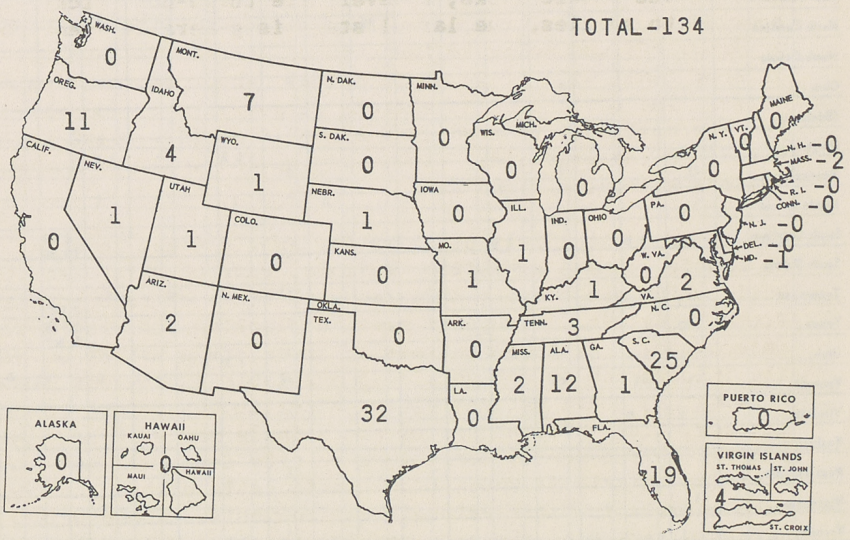
GRAND TOTAL-4107



TICKS COLLECTED CALENDAR YEAR 1964

(Lots of Species From Native Wildlife)

TOTAL-134



REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1964

HOST: Native Wildlife

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAJENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR NIGROLINEATUS	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR [illegible]	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORISPALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	
TOTAL	134	15			3	4			3		15	2		1	30	2	1	28	1	9	14	3	2	1			
Alabama	12	8D										1D									3 D						
Alaska																											
Arizona	2																1 Ra							1 D			
Arkansas																											
California																											
Colorado																											
Connecticut																											
Delaware																											
Florida	19	2D			2D	3Gd 1SNr									1WC 1D 1WY			1 R			1WC 1F 4D 1WY						
Georgia	1											1 D															
Hawaii																											
Idaho	4										2 D					1D 1B											
Illinois	1														1 PS												
Indiana																											
Iowa																											
Kansas																											
Kentucky	1																	1 R									
Louisiana																											
Maine																											
Maryland	1														1 F												
Massachusetts	2										1 D										1 D						
Michigan																											
Minnesota																											
Mississippi	2																	1 R			1 D						
Missouri	1	1 WT																									
Montana	7										7 E																
Nebraska	1										1 E																
Nevada	1										1 D																
New Hampshire																											
New Jersey																											
New Mexico																											
New York																											
North Carolina																											
North Dakota																											
Ohio																											
Oklahoma																											
Oregon	11										1 E			1 K						1B 7K 1BC							
Pennsylvania																											
Rhode Island																											
South Carolina	25	3 D			1 D										8 PO 10 RC				1 RC			2 Dm					
South Dakota																											
Tennessee	3														2 WY							1Rk					
Texas	32														1J 3K 1 BC			25 R			1 D		1Jn				
Utah	1										1 D																
Vermont																											
Virginia	2	1 D																			1 D						
Washington																											
West Virginia																											
Wisconsin																											
Wyoming	1										1 E																
Puerto Rico																											
Virgin Islands	4							3 D															1MGp				

Key to Hosts:

B	Bear	F	Fox	MG	Mongoose	RC	Raccoon
BC	Bobcat	G	Gopher	PO	Opossum	SN	Snake
D	Deer	J	Javalina	PS	Porcupine	WC	Wildcat
E	Elk	K	Coyote	R	Rabbit	WT	Wild Turkey
						WY	Wild Hog

Key to Species:

a.	Dermacentor parumapertus	n.	Ornithodoros turicata
d.	Amblyomma tuberculatum	p.	Ornithodoros puertoricensis
k.	Ixodes dentatus	r.	Amblyomma dissimile
m.	Ixodes affinis		

REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1964

HOST: Cattle

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAJENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR NIGROLINEATUS	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR VENUSTUS (E. & D. Rocky Mt. Spp.)	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORISPALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.
TOTAL	2,062	920	6		239			10	10	1	26	22	87	8	252	36	7			3	216		1	214	4	
Alabama	18	8													10											
Alaska																										
Arizona	28	4									9						1a							14		
Arkansas	333	285													26						18			4		
California	26	1									1	2		7										15		
Colorado	12										2					1								9		
Connecticut	1														1											
Delaware																										
Florida	548	110			213								3		73						147				2	
Georgia	19	3			4										12											
Hawaii	7																							7		
Idaho	3										1					1								1		
Illinois	247	176										4			43						24					
Indiana	6	1													5											
Iowa	6	3													3											
Kansas	4														2									2		
Kentucky	1														1											
Louisiana	19	12			2																4			1		
Maine																										
Maryland	6	3													3											
Massachusetts	1														1											
Michigan																										
Minnesota																										
Mississippi	36	24			5										1						5			1		
Missouri	12	7													3						1			1		
Montana	25															24								1		
Nebraska	3														3											
Nevada	11																							11		
New Hampshire																										
New Jersey																										
New Mexico	32	8									8	3				2	6a							5		
New York																										
North Carolina	10	5													4						1					
North Dakota																										
Ohio																										
Oklahoma	62	26													8						3			25		
Oregon	12										2			1		4				3				2		
Pennsylvania																										
Rhode Island																										
South Carolina	27	12			2										13											
South Dakota	1														1											
Tennessee	5	4													1											
Texas	430	217	6		13			10	8	1	2	13			34						13		1n	112		
Utah																										
Vermont																										
Virginia	12	11													1											
Washington	1																							1		
West Virginia	1														1											
Wisconsin	2														2											
Wyoming	7										1					4								2		
Puerto Rico	85												84												1	
Virgin Islands	3								2																1	

Key to Species:

a. Dermacentor parumapertus

n. Ornithodoros turicata

REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1964

HOST: Zoo Animals and Miscellaneous Hosts (human, sheep, etc.)

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAJENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR NIGROLINEATUS	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR [illegible]	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORIS-PALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	
TOTAL	289	59			20	6	1		9		7	1	3	1	96	17		2	3	12	18	1	2	12	19		
Alabama	15	3 Q													1H 1Y 8Q				1 Q		1 Q						
Alaska																											
Arizona	4																							3 Q	1 Q		
Arkansas	24	3 H 14 Q													1 Q 1 H						1 C 4 Q						
California	4																							4 C			
Colorado	1																								1 Q		
Connecticut	8														1 C 1 Q						1 C				1 C 4 Q		
Delaware																											
Florida	40	1 Y 5 Q			12Q 1H 1Y	2 IGr									1H 7Y 3Q			1 Xb			1Y 1C 4Q						
Georgia	5	2 Q													1 Y 1 Q							1 Pe					
Hawaii	1																	1 PHq									
Idaho	3															1 SH 2 GT											
Illinois	29	2Q 6H 3Y				1 IGs 1 REt						1 Q			2H 8Y 1C 2Q						1 Q				1 Q		
Indiana	20														14SH 4H 2Y												
Iowa																											
Kansas																											
Kentucky	2	1 H													1 Q												
Louisiana	3	1 Q			2 Q																						
Maine	2														1 C				1 Q								
Maryland	11	1 H 1 X				1 THf									1H 1SH 2X1Y3Q												
Massachusetts	2														1 Q						1 H						
Michigan																											
Minnesota	3														1 Q 2 H												
Mississippi	20	1 SH 10 H			1Q 1H										2H 1C 1SH						1 H				2 Q		
Missouri	3	1 Q													1 Y						1 Q						
Montana	5															2 H 3 Q											
Nebraska																											
Nevada	2															1 H								1 C			
New Hampshire																											
New Jersey																											
New Mexico	12						1 CH				7 Q														4 Q		
New York	1					1 TPg																					
North Carolina	3														1Y 1C 1X												
North Dakota																											
Ohio																											
Oklahoma	4				1 SH 1 H										1 C 1 H												
Oregon	16												1 Q		1 Q	1 SH 1 H				9C 1V 1Q 1H								
Pennsylvania	1																								1 Q		
Rhode Island	1																								1 X		
South Carolina	3														1 Y 1 H				1 H								
South Dakota	2														1 H	1 SH											
Tennessee																											
Texas	15	3 GT 1 C										1 Q			1 Y 1 H									1 GT 1 SH	2 X 1 C		
Utah	1																				1 C		2 Xn				
Vermont																								1 C			
Virginia	3														3 Q												
Washington	2															1 Q								1 Q			
West Virginia	1														1 C												
Wisconsin	2														1 H 1 Q												
Wyoming	4															1SH 1Q 2H											
Puerto Rico																											
Virgin Islands	11							6 SH 3 GT				2 SH															

Key to Hosts:

C	Domestic Cat	P	Peacock	TH	Trophy Hides
CH	Chicken	PH	Pheasant	TP	Tapir
GT	Goat	Q	Host Not Given	V	Numerous Small Animals
H	Human	RE	Reptile	X	Inanimate Object
IG	Iguana	SH	Sheep	Y	Swine

Key to Species:

b.	Haemaphysalis chordeilis	q.	Haemaphysalis wellingtoni
e.	Ixodes brunneus	r.	Amblyomma dissimile
f.	Amblyomma gemma	s.	Amblyomma cyprium
g.	Amblyomma incisum	t.	Amblyomma rotundatum
n.	Ornithodoros turicata		

REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1964

HOST: Horses and Mules

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAJENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR NIGROLINEATUS	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR [illegible]	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORISPALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.
TOTAL	1,214	27			306						13	11	232	5	263	17				2	297			36	5		
Alabama	4	2													2												
Alaska																											
Arizona	6										1					1								4			
Arkansas	6	4																			2						
California	7										2			4										1			
Colorado	3										1					1								1			
Connecticut																											
Delaware																											
Florida	1,051	10			302							1	213		204						294			25	2		
Georgia	2														2												
Hawaii																											
Idaho	2															2											
Illinois	13	2													11												
Indiana																											
Iowa	1															1*											
Kansas																											
Kentucky	1														1												
Louisiana	2	2																									
Maine																											
Maryland																											
Massachusetts																											
Michigan																											
Minnesota																											
Mississippi	2	1			1																						
Missouri																											
Montana	6															6											
Nebraska	2											1			1												
Nevada	2															1									1		
New Hampshire																											
New Jersey																											
New Mexico	1										1																
New York																											
North Carolina	1														1												
North Dakota																											
Ohio																											
Oklahoma	4	1													3												
Oregon	10										3			1		4				2							
Pennsylvania	3	1													2												
Rhode Island																											
South Carolina																											
South Dakota																											
Tennessee																											
Texas	75	4			3							9	15		36						1			5	2		
Utah	1										1																
Vermont																											
Virginia																											
Washington																											
West Virginia																											
Wisconsin																											
Wyoming	5										4					1											
Puerto Rico	4												4														
Virgin Islands																											

* Evidently shipped in, not known to be established.

REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1964

HOST: Dogs

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAJENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR NIGROLINEATUS	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR [illegible]	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORISPALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	
TOTAL	408	19			7									145	1				10	21	12	6		14	173		
Alabama	26	2												21											3		
Alaska																											
Arizona																											
Arkansas	9	6												2							1						
California	4													1										2	1		
Colorado	17																		2		2	2		4	7		
Connecticut	73													37											36		
Delaware	1																								1		
Florida	36				5									14							3				14		
Georgia	8	1												7													
Hawaii	2																								2		
Idaho																											
Illinois	7													7													
Indiana	7	1												6													
Iowa	4													4													
Kansas	2													2													
Kentucky	1													1													
Louisiana	1	1																									
Maine	9													6					2						1		
Maryland	8													4											4		
Massachusetts	3													2							1						
Michigan																											
Minnesota	1													1													
Mississippi	6	2			1									1							1				1		
Missouri																											
Montana	3													1								1h			1		
Nebraska	4													4													
Nevada	8																							1	7		
New Hampshire																											
New Jersey																											
New Mexico	5																							1	4		
New York	6													2					2						2		
North Carolina	6													5											1		
North Dakota																											
Ohio																											
Oklahoma	6				1									3										1	1		
Oregon	25													2	1					21					1		
Pennsylvania	26													2					4						20		
Rhode Island																											
South Carolina	1													1													
South Dakota	2													2													
Tennessee	2													1											1		
Texas	75	6												6							3			4	56		
Utah																											
Vermont																											
Virginia																											
Washington	1																								1		
West Virginia																											
Wisconsin	1																				1						
Wyoming	4																					3h		1			
Puerto Rico	7																								7		
Virgin Islands	1																								1		

Key to species:

h. Ixodes kingi