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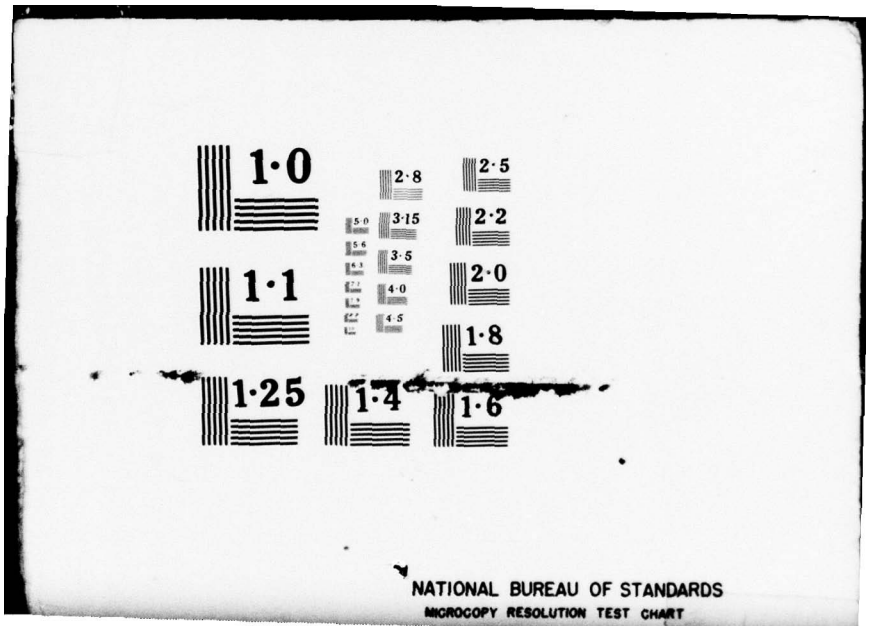
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LEVEL II

# DREDGED MATERIAL RESEARCH PROGRAM

MISCELLANEOUS PAPER D-78-1

## A SURVEY OF POTENTIAL MEDICAL AND VETERINARY DISEASES AT HABITAT DEVELOPMENT FIELD SITES

by

John W. Simmers

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P. O. Box 631, Vicksburg, Miss. 39180

July 1978

Final Report



48 p.

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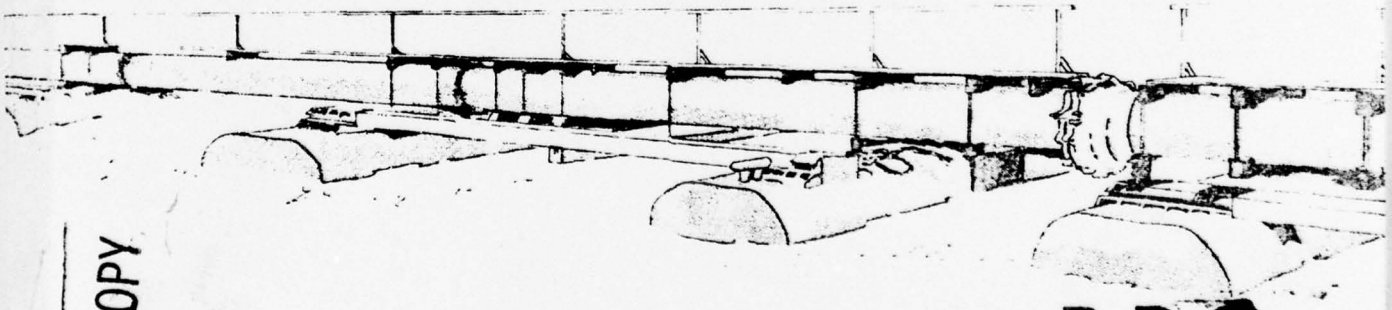



Prepared for Office, Chief of Engineers, U. S. Army
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Under DMRP Work Unit No. 2A10

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SUBJECT: Transmittal of Miscellaneous Paper D-78-1

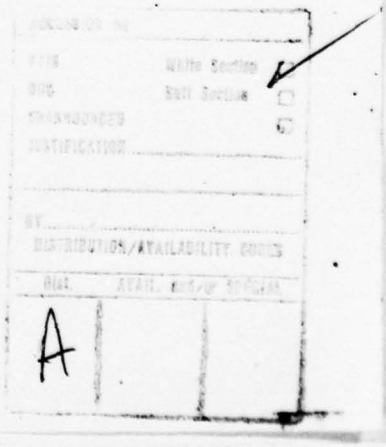
TO: All Report Recipients

1. The Miscellaneous Paper transmitted herewith represents the results of one of the research efforts (work units) of the Corps of Engineers' Dredged Material Research Program (DMRP). This study was conducted by the Habitat Development Project (HDP) of the DMRP. The HDP had as its main objectives the development of wetland and upland habitats on dredged material and the evaluation of the impact of disposal in shallow water and upland sites.

2. This report, "A Survey of Potential Medical and Veterinary Diseases at Habitat Development Field Sites" (Work Unit 2A10), addresses the concern that the establishment of natural habitats on dredged material may increase the incidence of medical or veterinary diseases at those sites. Habitat development sites in Oregon, Texas, and Virginia were evaluated, and it was found that an increase in the incidence of vector-borne, contact, or environmental diseases would not be expected as a result of habitat development activities.

3. This work unit is of importance in assessing the overall environmental impact of the habitat development disposal alternative and is one of many research efforts in the HDP with a similar objective. This and related work units will be synthesized in a report entitled "Upland and Wetland Habitat Development with Dredged Material: Ecological Considerations" (2A08).

JOHN L. CANNON
Colonel, Corps of Engineers
Commander and Director



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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

There is concern that the development of marshes and upland habitats on dredged material may increase the incidence of medical and veterinary diseases in the localities of those habitats. Faunal field inventory information and available literature were used to identify potential relationships between habitat associated animals and communicable diseases at habitat development field sites in Virginia, Texas, and Oregon. Medical and veterinary records were used to document the actual occurrence of diseases at these locations. No vector-borne, contact, or environmental diseases were identified from any of the field sites.

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## Preface

This report constitutes a literature survey of selected potential medical and veterinary diseases at three of the Dredged Material Research Program (DMRP), Habitat Development Project (HDP) field sites: Miller Sands Marsh and Upland Habitat Development Site, Columbia River, Oregon; Bolivar Peninsula Marsh and Upland Habitat Development Site, Galveston Bay, Texas; and Windmill Point Marsh Development Site, James River, Virginia.

The study was conducted as Work Unit 2A10 of the DMRP for the Office, Chief of Engineers, at the U. S. Army Engineer Waterways Experiment Station (WES), Environmental Laboratory (EL), formerly the Environmental Effects Laboratory, Vicksburg, Mississippi.

The report was written by Dr. John W. Simmers, HDP. The study was under the supervision of Dr. Hanley K. Smith, Manager, HDP, and the general supervision of Dr. John Harrison, Chief, EL.

The Directors of WES during the study were COL G. H. Hilt, CE, and COL J. L. Cannon, CE. Technical Director was Mr. F. R. Brown.

## Contents

## List of Tables

# A SURVEY OF POTENTIAL MEDICAL AND VETERINARY DISEASES AT HABITAT DEVELOPMENT FIELD SITES

## Introduction

1. The development of marsh and upland habitats from dredged material disposal sites at Bolivar Peninsula, Galveston Bay, Galveston County, Texas; Windmill Point, James River, Prince Georges County, Virginia; and Miller Sands, Columbia River, Clatsop County, Oregon, may affect the localized incidence of selected human and veterinary diseases in these areas. The effect could be an indirect impact of habitat development through the attraction and maintenance of animal populations that serve either as reservoirs or are otherwise involved in the maintenance or transmission of communicable diseases of human or veterinary importance.

2. This report represents an effort to distinguish between the possibility for a communicable disease problem related to habitat development and the probability of a problem related to this activity.

## Survey Approach

3. This survey was conducted in three phases; the first phase involved the listing of animal species (both fish and wildlife) associated with the particular habitat development sites. The second phase identified known diseases of human or veterinary importance potentially associated with each animal on the list and the role that the animal fills in the transmission of the disease. For example, a red-winged blackbird (*Agelaius phoeniceus*) can be a reservoir for the virus of western equine encephalitis. If in fact the blackbird were infected with the virus, the disease could be carried to a man or a horse or to other animals by certain species of mosquitoes (*Aedes aegypti* or various *Culex spp.*) which first bite the blackbird and then bite the man. As the reader might judge for himself, the variety of possible diseases a man exposes himself

to through association with natural animal communities is surprising and perhaps upsetting but the actual occurrences of these diseases on the local and state level do not approach the potential. The third phase served then to define, for each disease, the actual localized and statewide occurrence of the diseases listed.

Animal populations at the habitat development sites

4. The list of fauna presented in this report and used to define potential disease interactions was obtained from the Dredged Material Research Program (DMRP), Habitat Development Project (HDP) files and represents two types of information:

a. Listings from baseline field and/or literature faunal inventories for the general locations of proposed habitat development.

b. Listings of fish and wildlife species actually observed at the sites during the early phases of site development.

5. The faunal listings presented are incomplete for the locations discussed but are suggested as adequate for the purpose of defining the relationships that may cause the transmission of disease from animal to animal or animal to man.

Potential disease problems

6. The potential diseases associated with the listed fish and wildlife were identified from reports of state health organizations of Washington, Texas, and Virginia; publications of the U. S. Center for Disease Control; publications of the U. S. Agricultural Research Service; and a general literature review.

Actual disease occurrences

7. The 4-year period from 1971-1975 was studied to identify the actual incidence of the various diseases in the states and in counties adjacent to the locations of the HDP field sites. The same sources used to obtain potential disease information were used to obtain the actual disease incidence data.

## Results

Survey

8. The results of the survey are presented in Tables 1-3 according to column headings that are explained below. Tables are designed

for quick reference by site and obvious animal species. Diseases listed are those that may be influenced by habitat management practices to encourage or discourage site use by specific animals. Although these diseases may have been reported from areas near the HDP field sites, none have been reported specifically from the field sites. Finally in order to make the tabulation less confusing, literature references have been omitted and a list of useful secondary literature is given in the bibliography.

Definitions and explanations
of column headings within tables

10. The following is an explanation of the headings included in the tables:

a. Host -- An abundant animal at the site and one that might maintain a pathogen (bacteria, virus, etc.) by serving as a reservoir for that pathogen. The host animal may also transfer a pathogen to man or to animals of economic importance to man. When the host animal serves the transfer function, it is called a vector. Host animals are usually vertebrates and the most obvious animals at each field site.

b. Vector or intermediate host -- Certain diseases are directly communicated from one man or animal to another man or animal but most listed in the tables of this report require another animal to link the reservoir and the susceptible host. This other animal is either a vector or an intermediate host or both.

(1) Vector -- A micropredator (a predator that takes only a small bit of nourishment from the prey) that may transfer a pathogen from one susceptible host (reservoir) to another susceptible host. If the pathogen does not further develop or reproduce in the micropredator, then the micropredator is called a vector; if the pathogen develops or reproduces in the micropredator, the micropredator is considered an intermediate host. Usually vectors seek out prey (susceptible hosts) and may transfer pathogens to new host species and new geographical areas.

(2) Intermediate host -- As explained above, the intermediate host may be a vector. The intermediate host may also serve a passive role in disease communication. An animal serving as an intermediate host may be eaten by a susceptible host thereby transferring the pathogen to the susceptible host. A waterborne pathogen may undergo development or reproduction in an intermediate host before returning to the water to infect a

susceptible host. Intermediate hosts are most often lower invertebrates: arthropods (usually insects) and mulluscs (snails or bivalvia).

c. Disease -- May be acute or chronic and generally one of three types: vector-borne diseases, contact diseases, or environmental diseases. For information on most of these diseases, the reader is directed to the Manual of Communicable Diseases, published by the Communicable Disease Center, Atlanta, Georgia.

d. Role of host in disease -- A host animal may serve one or more roles in the communication of human or veterinary disease.

(1) Final susceptible host -- Contains the final development form of the pathogen, usually the infectious form.

(2) Host of micropredators -- An animal supporting micropredators that may serve as vectors or intermediate hosts, e.g., an animal serving as a tick host or flea host.

(3) Intermediate host -- This role is explained above and refers to a host supporting a developing or reproducing stage of a pathogen.

(4) Reservoir host -- An animal that harbors a pathogen at a chronic level and thereby makes the pathogen available to vectors, intermediate hosts, or final hosts.

e. Pathogen -- A living organism such as a virus, bacteria, protozoa, etc., capable of producing disease in a susceptible host.

f. Hosts of economic significance -- Hosts including man that are preferred by micropredatory vectors, or who may consume intermediate hosts or who are otherways susceptible to a disease. Included in this list with man are animals associated with man as domestic animals or pets.

g. Human infections per year -- The average number of infections reported for 1971-1975 from counties adjacent to the HDP field site.

h. Average for state -- The average number of human infections reported for 1971-1975 from the entire adjacent state.

i. Likelihood of occurrence -- An a through d rating of possible occurrence of each disease at each site:

(1) a Reported in county or adjacent counties every year 1971-1975.

(2) b Reported in the state during 1971-1975, but no cases in counties adjacent to HDP field site.

(3) c Reservoir, vector, and/or intermediate host species present, but no cases reported in man.

(4) d Veterinary disease predominantly of wildlife, no human cases.

j. Notes -- A series of notes is appended to each table set to clarify or elaborate on items of special importance.

Table 1

Potential Medical and Veterinary Diseases at Miller Sands

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Oncorhynchus tshawytscha Chinook salmon | None | Bacterial kidney disease | Host | Corny bacterium sp. | Salmonid fishes | 0 | 0 | d | 1 |
| | | Kidney disease or salmon furculosis | | Aeromonas salmonicida | | | | | 1 |
| | | Aeromonas disease | | Aeromonas liquefaciens | Salmonid fishes, shad | | | | 1 |
| | | Columnaris disease | | Chondrococcus sp. | Salmonid fishes | | | | 1 |
| | | Cold water disease | | Cytophagia psychrophilia, C. sp. | | | | | 1 |
| | | Tail rot, fin rot, hemorrhagic septicemia | | Vibrio sp. (not specific) | Many fishes | | | | 1 |
| | Nanophyletus salmonicola | Canid salmon poisoning | Contains intermediate host | Neorickettsia helminthoeca | Dog, carnivores | | | | 2 |
| Rattus norvegicus Norway rat | Culex tarsalis | Western equine encephalitis | Reservoir mosquito host | Virus | Domestic bird, passerine bird, man, killdeer, horse | | 2 | b | |
| | | St. Louis encephalitis | | | | | <1 | | |
| | Culex pipiens | Western equine encephalitis | | | | | 2 | | |
| | | St. Louis encephalitis | | | | | <1 | | |
| | Culiseta inornata | Western equine encephalitis | | | Domestic bird, horse, passerine bird, man, killdeer | | 2 | | |
| | Thassus petrolatus | Plague | Flea host reservoir | Yersinia pestis | Man, rodent | | 0 | c | |
| | Dimanus montanus | Plague | | | | | 0 | | |
| | Ornithodoros hermsi | Relapsing fever | Tick host reservoir | Borellia recurrens | | | <1 | | |
| | Dermacentor andersoni | Tick paralysis | Tick host | None | Man, rodent, rabbit, dog, cattle, passerine bird, deer mouse, killdeer | | <1 | | |
| | | Colorado tick fever | | Virus | | | 5 | b | |
| | | Anaplasmosis | | Anaplasma marginale | | Not reported | Not reported | c | |
| | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | | 0 | 2 | b | |
| | | Rabies | | Virus | | | 0 | d | 3 |
| | | Tularemia | | Pasteurella tularensis | | | <1 | b | |
| | | Q. fever | | Coxiella burnetii | | | <1 | b | |

(Continued)

(Sheet 1 of 6)

Table 1 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Rattus norvegicus | Dermacentor andersoni | Lymphocytic chloriomeningitis | Tick host | Virus | Man, rodent, rabbit, dog, cattle, passerine bird, deer mouse, killdeer | 0 | 0 | c | |
| Norway rat (Continued) | (Continued) | Western equine encephalitis | Reservoir tick host | | | | 2 | b | |
| Myocastor coypus | None | None | | | | | None | None | 4 |
| Nutria | | | | | | | | | |
| Peromyscus maniculatus | Dermacentor andersoni | Tick paralysis | Tick host | None | Man, Norway rat, cattle, rabbit, rodent, dog, passerine bird, killdeer | | <1 | b | |
| Deer mouse | | Colorado tick fever | | Virus | | | 5 | b | |
| | | Anaplasmosis | | Anaplasma marginale | | Not reported | Not reported | c | |
| | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | | 0 | 2 | b | |
| | | Rabies | | Virus | | | 0 | d | 3 |
| | | Tularemia | | Pasteurella tularensis | | | <1 | b | |
| | | Q. fever | | Coxiella burnetii | | | | | |
| | | Brucillosus | | Brucilla sp. | | | 0 | c | |
| | | Lymphocytic chloriomeningitis | Virus | | | | | | |
| | | Western equine encephalitis | Tick host reservoir | Virus | | | 2 | b | |
| | Ornithodoros hermsi | Relapsing fever | | Borrella hermsii | Man, Norway rat, Townsend's vole, rodent, domestic bird, passerine bird, killdeer | | <1 | | |
| | Culex tarsalis | Western equine encephalitis | Mosquito host reservoir | Virus | Man, horse, Norway rat, passerine bird, domestic bird, killdeer | | 2 | | |
| | Culex pipiens | | | | Man, Norway rat, passerine bird, domestic bird, killdeer, horse | | | | |
| | Culiseta inornata | | | | Man, horse, Norway rat, passerine bird, domestic bird, killdeer | | | | |
| Branta canadensis | None | Avian botulism | Host | Clostridium sp. | Aquatic bird | | 0 | d | 5 |
| Canada goose | Simulid fly | Leucocytozoonosis | | Leucocytozoon sp. | Aquatic bird, passerine bird | | | | 6 |
| Anas platyrhynchos | None | Avian botulism | | Clostridium sp. | Aquatic bird | | | | 5 |
| Mallard | Simulid fly | Leucocytozoonosis | | Leucocytozoon sp. | Aquatic bird, passerine bird | | | | 6 |
| | Ceratopogonid fly | | | | | | | | |

(Continued)

Table 1 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Charadrius voiciferus<br>Killdeer | Culex tarsalis | Western equine encephalitis | Mosquito host reservoir | Virus | Man, horse, rodent, passerine bird, domestic bird | 0 | 2 | b | |
| | | St. Louis encephalitis | | | | | <1 | | |
| | Culex pipiens | Western equine encephalitis | | | | | 2 | | |
| | | St. Louis encephalitis | | | | | <1 | | |
| | Culiseta inornata | Western equine encephalitis | | | | | 2 | | |
| | Dermacentor andersoni | Tick paralysis | Tick host | None | Man, Norway rat, cattle, rabbit, rodent, dog, passerine bird | | <1 | | |
| | | Colorado tick fever | | Virus | | | 5 | | |
| | | Anaplasmosis | | Anaplasma marginale | | Not reported | Not reported | c | |
| | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | | 0 | 2 | b | |
| | | Rabies | | Virus | | | 0 | d | 3 |
| | | Tularemia | | Pasteurella tularensis | | | <1 | b | |
| | | Q. fever | | Coxiella burnetii | | | | | |
| | | Brucillosus | | Brucilla sp. | | | | | |
| | | Lymphocytic chloriomeningitis | Virus | | | | 0 | c | |
| | | Western equine encephalitis | Tick host reservoir | Virus | | | 2 | b | |
| | Ornathodoros hermsi | Relapsing fever | | Borrelia hermsii | Man, Norway rat, Townsend's vole, rodent, domestic bird, passerine bird | | <1 | | |
| Corvus brachyrhynchos<br>Common crow | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Man, domestic bird, passerine bird | | ? | | |
| | | Q. fever | | Coxiella brunetii | | | <1 | | |
| | | Tularemia | | Pasteurella tularensis | | | | | |
| | | California encephalitis | | Virus | | | 0 | c | |
| | | Rickettsia disease | | Rickettsia canada | | | 0 | c | |
| | | Western equine encephalitis | Tick host, mosquito host reservoir | Virus | Man, passerine bird | | 2 | b | |
| | Culex tarsalis | | Mosquito host reservoir | | Man, horse, Norway rat, passerine bird, domestic bird, killdeer | | 2 | b | |

(Continued)

Table 1 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Corvus brachyrhynchos Common crow (Continued) | Culex pipiens | Western equine encephalitis | Mosquito host reservoir | Virus | Man, Norway rat, passerine bird, domestic bird, killdeer, horse | 0 | 2 | b | |
| | Culiseta inornata | | | | Man, horse, Norway rat, passerine bird, domestic bird, killdeer | | | | |
| | Simulid fly ? | Avian trypanosomiasis | Host | Trypanosoma sp. | Passerine bird, aquatic bird | | 0 | d | 7 |
| | | Leucocytozoonosis | | Leucocytozoon sp. | | | | | 6 |
| | Ceratopogonid fly | | | | | | | | 6 |
| | Simulid fly | | | | | | | | 6 |
| Turdus migratorius Robin | | Avian trypanosomiasis | | Trypanosoma avium | Passerine bird, domestic bird | | | | 7 |
| | | | | Trypanosoma sp. | Passerine bird ? | | | | 7 |
| | Mosquito sp. ? | Filariasis | Host ? | Microfilaria sp. | Bird ? | | | | 7 |
| | Ceratopogonid fly | Leucocytozoonosis | Host | Leucocytozoon sp. | Aquatic bird, passerine bird | | | | 6 |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Passerine bird, domestic bird, man, rabbit | | 2 | b | |
| | | Q. fever | | Coxiella burnetii | | | <1 | | |
| | | Tularemia | | Pasteurella tularensis | | | <1 | | |
| | | California encephalitis | | Virus | | | 0 | c | |
| | | Rickettsia disease | | Rickettsia canada | | | 0 | c | |
| | | Western equine encephalitis | | Virus | | | 2 | b | |
| | Ornithodoros hermsi | Relapsing fever | Tick host reservoir | Borrelia hermsii | Man, Norway rat, Townsend's vole, rodent, domestic bird, passerine bird, killdeer | | <1 | | |
| | Culex tarsalis | Western equine encephalitis | Mosquito host reservoir | Virus | Man, horse, Norway rat, passerine bird, domestic bird, killdeer | | 2 | | |



(Continued)

Table 1 (Concluded)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Turdus migratorius Robin (Continued) | Culex pipiens | Western equine encephalitis | Mosquito host reservoir | Virus | Man, Norway rat, passerine bird, domestic bird, killdeer, horse | 0 | 2 | b | |
| | Culiseta inornata | | | | Man, horse, Norway rat, passerine bird, domestic bird, killdeer | | 2 | b | |

Table 1: Notes, Miller Sands

1. These diseases are related to water temperature; water temperature should not be increased.

2. A rickettsial disease carried by a fluke in a fish.

3. An average of seven cases per year of rabies in wild animals occurs in the state.

4. There are no significant medical or veterninary diseases currently known to be related to nutria.

5. Avian botulism can be exceptionally harmful to populations of waterfowl during periods of drought.

6. Leucocytozoonosis may be fatal to immature waterfowl.

7. Undoubtedly there are many infected birds. This is a common disease, but only occasionally reported.

Table 2

Potential Medical and Veterinary Diseases at Bolivar Peninsula

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Dasypus novemcinctus<br>Armadillo | Amblyomma americanum | Tularemia | Tick host | Pasteurella tularensis | Man, cattle, swine, sheep, horse, | 1 | 12 | a | |
| | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | cat, goat, rabbit, chicken | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | | | | |
| | Triatoma protracta<br>T. rubida<br>T. gerstaeckeri<br>T. heidemanni<br>T. longipes<br>T. sanguisuga<br>T. megista<br>Rhodinus prolixus<br>Reduviius personatus<br>Melanolestes picipes<br>Panstrongylus megistus<br>Erutryus sp.<br>Ornathodoros turicata | Chagas' disease | Tick host, bug host reservoir | Schizotrypanum cruzi | Man, cotton rat, house mouse, opossum, goat, cattle, dog, cat, swine, horse, raccoon | | | | 2 |
| | None | Leprosy | Host reservoir | Mycobacterium leprae | Man | 3 | 24 | a | 3 |
| Procyon lotor<br>Raccoon | Triatoma protracta<br>T. rubida<br>T. gerstaeckeri<br>T. heidemanni<br>T. longipes<br>T. sanguisuga<br>T. megista<br>Rhodinus prolixus<br>Reduviius personatus<br>Melanolestes picipes<br>Panstrongulus megistus<br>Erutyrus sp.<br>Ornathodoros turicata | Chagas' disease | Tick host, bug host reservoir | Schizotryponum cruzi | Man, cotton rat, house mouse, opossum, goat, cattle, dog, cat, swine, horse, armadillo | 0 | c | c | 2 |
| | Amblyomma maculatum | Leptospirosis | Tick host | Leptospira pomona | Man, dog, cat, horse, | 2 | 5 | a | 4 |
| | | Rickettsia-like fever | | Rickettsia sp. | cattle, goat, sheep | 0 | 0 | c | |
| | Dermancentor variabilis | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, dog, cattle, horse, cat, swine, | 2 | 18 | a | 1 |
| | | Tularemia | | Pasteurella tularensis | house mouse, cotton rat, rabbit, passerine bird | 1 | 12 | a | |
| | | Anaplasmosis | | Anaplasma marginale | | 0 | 0 | c | |
| | | Colorado tick fever | | Virus | | | 0 | d | |
| | | Tick paralysis | | None | | | | | |
| | | St. Louis encephalitis | | Virus | | 7 | 8 | a | 5 |

(Continued)

(Sheet 1 of 25)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| *Procyon lotor* | *Ixodes scapularis* | Tularemia | Tick host | *Pasteurella tularensis* | Man, rabbit, dog, cattle | 1 | 12 | a | |
| Raccoon (Continued) | | Anaplasmosis | Tick host | *Anaplasma marginale* | ↓ | 0 | 0 | c | |
| *Mus musculus* | Tenebrionid beetles | Tapeworm infection | Definitive host and reservoir | *Hymenolepis nana* | Man | Not reported | ↓ | ↓ | |
| House mouse | *Notopsullus fasciatus* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *Xenopsylla cheopis* | | | | | | | | |
| | None | Toxoplasmosis | Reservoir, | *Toxoplasma gondii* | Man, rodent, domestic animals | 0 | ↓ | ↓ | 6 |
| | *Amblyomma americanum* | Tularemia | Tick host | *Pasteurella tularensis* | Man, rabbit, cattle, sheep, swine, | 1 | 12 | a | |
| | | Rocky Mtn. spotted fever | ↓ | *Rickettsia rickettsii* | horse, cat, goat, chicken | 2 | 18 | a | 1 |
| | | Q-fever | ↓ | *Coxiella burnetii* | ↓ | 0 | 0 | c | 10 |
| | | Tick paralysis | ↓ | None | ↓ | ↓ | ↓ | ↓ | |
| | *Dermacentor variabilis* | Tick paralysis | Tick host | None | Man, dog, cattle, | ↓ | ↓ | ↓ | |
| | | Rocky Mtn. spotted fever | ↓ | *Rickettsia rickettsii* | horse, cat, swine, cotton rat | 2 | 18 | a | 1 |
| | | St. Louis encephalitis | ↓ | Virus | ↓ | 7 | 8 | a | 5 |
| | | Tularemia | ↓ | *Pasteurella tularensis* | ↓ | 10 | ↓ | ↓ | |
| | | Anaplasmosis | ↓ | *Anaplasma marginale* | ↓ | 0 | 0 | c | |
| | | Colorado tick fever | ↓ | Virus | ↓ | ↓ | 0 | c | |
| | *Ornithodoros hacoti* | Endemic typhus (Texas strain) | Tick host reservoir | *Rickettsia* sp. | Man, cotton rat | ↓ | 20 | b | |
| | | Rickettsial pox | ↓ | *Rickettsia akari* | ↓ | ↓ | ↓ | ↓ | |
| | *Allodermanyssus sanguineus* | Rickettsial pox | Mite host reservoir | *Rickettsia akari* | Man | ↓ | ↓ | ↓ | |
| | *Triatoma protracta* | Chagas' disease | Reservoir | *Schizotrypanum cruzi* | Man, dog, cat, swine, horse, goat, opossum, raccoon, cattle, cotton rat, armadillo | ↓ | ↓ | ↓ | 7 |
| | *T. rubida* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *T. gerstaeckeri* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *T. heidemanni* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *T. longipes* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *T. sanguisuga* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *T. megista* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *Rhodnius prolixus* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *Hedyvilus pergandeum* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *Melanolestes picipes* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *Panstrongylus megistus* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *Erutyrus* sp. | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *Ornathodoros turicata* | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | *Aedes aegypti* | Western equine encephalitis | ↓ | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | ↓ | <1 | b | 5 |



(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Mus musculus House mouse (Continued) | Aedes sollicitans | Eastern equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Sigmodon hispidus Cotton rat | Amblyomma americanum | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, cattle, swine, dog, cat, sheep, | 2 | 10 | a | 1 |
| | | Q. fever | | Coxiella burnetii | horse, goat, rab- | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | bit, house mouse | 1 | 12 | a | |
| | | Tick paralysis | | None | | 0 | 0 | c | |
| | Amblyomma maculatum | Leptospirosis | Tick host | Leptospira pomona | Man, dog, cat, horse, | 2 | 5 | a | 4 |
| | | Rickettsia-like fever | | Rickettsia sp.? | cattle, sheep, raccoon, cotton rat | 0 | 0 | c | |
| | Ornithodoros talaje | Relapsing fever | | Borella neotropicus | Man, opossum, Norway rat, black rat, horse, swine, cattle | | | | 10 |
| | | Q. fever | | Coxiella burnetii | | | | | |
| | Dermacentor variabilis | Tick paralysis | | None | Man, dog, cattle, horse, cat, swine, house mouse | | | | |
| | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | | 2 | 18 | a | 1 |
| | | Colorado tick fever | | Virus | | 0 | 0 | c | |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | St. Louis encephalitis | | Virus | | 7 | 8 | a | 5 |
| | | Anaplasmosis | | Anaplasma marginale | | 0 | 0 | c | |
| | Ixodes dentatus | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, Norway rat, rabbit, chicken | 2 | 18 | a | 1 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | | |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Black rat, swamp rabbit, passerine and domestic bird | 2 | 18 | | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | Western equine encephalitis | | Virus | | 0 | <1 | b | 5 |
| | | California encephalitis | | | | 0 | 0 | c | |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Sigmodon hispidus<br>Cotton rat (Continued) | Haemaphysalis leporis-palustris (Continued) | Rickettsia disease | | Rickettsia canada | | 0 | | | |
| | Ixodes scapularis | Tularemia | Tick host | Pasteurella tularensis | Man, dog, cattle, Norway rat | 1 | 12 | a | |
| | | Anaplasmosis | | Anaplasma marginale | | 0 | 0 | c | |
| | | Relapsing fever | | Borella neotropicus | | | | | 10 |
| | | Q. fever | | Coxiella burnetii | | | 20 | b | |
| | Ornithodoros bacoti | Endemic typhus (Texas strain) | Tick host reservoir | Rickettsia sp. | Man, house mouse | | 0 | c | |
| | | Rickettsial pox | | Rickettsia akari | | | <1 | b | 5 |
| | Aedes aegypti | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | | | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Sylvilagus aquaticus<br>Swamp rabbit | Amblyomma americanum | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, cattle, dog, cat, swine, sheep, horse, goat, rabbit, house mouse | 2 | 18 | | 1 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | | |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | 0 | 0 | c | |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Black rat, cotton rat, passerine bird, domestic bird | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tularemia | Reservoir | Pasteurella tularensis | | 1 | 12 | a | |
| | | Western equine encephalitis | | Virus | | 0 | <1 | b | |
| | | California encephalitis | Tick host | | | | 0 | c | |
| | Aedes sollicitans | Eastern equine encephalitis | Reservoir | | Man, cotton rat, passerine bird, domestic bird, opossum, goat | | <1 | b | 5 |
| Capra hircus<br>Goat | Argas persicus | Avian spirochaetes | Tick host | Spirochaeta sp. | Man, duck, chicken, pigeon | -- | -- | d | |

(Continued)

(Sheet 4 of 25)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Capra hiracus | Argas persicus (Continued) | Fowl cholera | Tick host | Pasteurella avicida | Man, duck, chicken, pigeon | -- | -- | d | 6 |
| Goat (Continued) | | Fowl paralysis | | None | | -- | -- | d | 6 |
| | | Anthrax | | Bacillis anthracis | | 0 | 0 | c | 6 |
| | | Fowl relapsing fever | | Borella sp. | | | | | |
| | | Human relapsing fever | | Borella neotropicus | | | | | |
| | | Endemic typhus | | Rickettsia | | | 20 | b | |
| | | Yellow fever | | Charon cuagatus | | | 0 | c | |
| | | Tetanus | | Clostridium tetanii | | ? | 11 | a | 8 |
| | | Western equine encephalitis | | Virus | | 0 | <1 | b | 5 |
| | Amblyomma americanum | Tularemia | | Pasteurella tularensis | Man, cattle, sheep, cat, horse, swine, chicken, rabbit, armadillo, house mouse, cotton rat | 1 | 12 | a | |
| | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | | 2 | 18 | a | |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | 0 | 0 | c | |
| | Amblyomma maculatum | Leptospirosis | | Leptospira pomona | Man, dog, cat, horse, cattle, sheep, raccoon, cotton rat | 2 | 5 | a | |
| | | Rickettsia-like fever | | Rickettsia sp. | | 0 | 0 | c | |
| | Dermacentor andersoni | Tick paralysis | | None | Man, rabbit, cattle, rodent | | | | |
| | | Colorado tick fever | | Virus | | | | | |
| | | Anaplasmosis | | Anaplasma marginale | | | | | |
| | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | | 2 | 18 | a | 1 |
| | | Rabies | | Virus | | 0 | <1 | c | 9 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | Rickettsia diaportica infection | | Rickettsia diaportica | | 0 | 0 | c | 6 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Western equine encephalitis | Reservoir tick host | Virus | | | <1 | b | 5 |
| | | Brucilosis | | Brucilla sp. | | 12 | | | |
| | | Lymphocytic choriomeningitis | | | | 0 | 0 | c | |
| | Aedes sollicitans | Eastern equine encephalitis | Reservoir | Virus | Man, passerine bird, horse | | <1 | b | 5 |
| | Triatoma protracta<br>T. rubida<br>T. gerstaecheri<br>T. heidemanni<br>T. longipes<br>T. sanguisuga<br>T. megista<br>Rhodinus prolixus<br>Reduviius personatus | Chagas' disease | | Schizotrypanum cruzi | Man, cotton rat, opossum, raccoon, armadillo, cattle, swine, dog, cat, horse, house mouse | | 0 | c | 2 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Capra hiracus<br>Goat (Continued) | Melanolestes picipes<br>Panstrongylus megistus<br>Erutyrus sp.<br>Ornithodoros turicata | Chagas' disease | Reservoir | Schizotrypanum cruzi | Man, cotton rat, opossum, raccoon, armadillo, cattle, swine, dog, cat, horse, house mouse | 0 | 0 | c | |
| Anhinga anhinga<br>Anhinga | Argas persicus | Avian spirochaets | Tick host | Spirochaeta sp. | Man, goat, domestic bird, barn swallow | | | d | |
| | | Fowl cholera | | Pasteurella avicida | | | | | |
| | | Fowl paralysis | | None | | | | | |
| | | Anthrax | | Bacillus anthracis | | | | c | |
| | | Fowl relapsing fever | | Borellia sp. | | | | d | |
| | | Human relapsing fever | | Borellia neotropicus | | | | c | |
| | | Endemic typhus (Texas strain) | | Rickettsia sp. | | | 20 | b | |
| | | Plague | | Yersinia pestis | | | 10 | c | |
| | | Brucillosus | | Brucilla sp. | | <1 | 23 | b | |
| | | Yellow fever | | Charon cynatus | | 0 | 0 | c | |
| | | Tetanus | | Clostridium tetani | | ? | 11 | a | 8 |
| | | Western equine encephalitis | | Virus | | 0 | <1 | b | 9 |
| Charadrius vociferus<br>Killdeer | Amblyomma maculatum | Leptospirosis | | Leptospira pomona | Man, dog, cat, horse, cattle, sheep, goat, raccoon, cotton rat, passerine bird | 2 | 5 | a | |
| | | Rickettsia-like fever | | Rickettsia sp. | | 0 | 0 | c | |
| | Aedes aegypti | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 9 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 9 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 9 |
| | | Eastern equine encephalitis | | | | | | | 9 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 9 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 9 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 9 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Zenaida macroura | Pseudolynchia sp. | Haemoproteus infection | Host | Haemoproteus shirovi | None | 0 | 0 | d | |
| Mourning dove | Microlynchia sp. | | | | | | | | |
| | Ornathomyia sp. | | | | | | | | |
| | Other simulidae | | | | | | | | |
| | Anopheles quadrimaculatus | Avian malaria | | Plasmodium reticulatum | Passerine bird | | | | 1 |
| | An. crucians | | | | | | | | |
| | Culex pipiens | | | | | | | | |
| | C. tarsalis | | | | | | | | |
| | Aedes aegypti | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Coccyzus americanus | Amblyomma americanum | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Man, cattle, sheep, swine, horse, cat, rabbit, cotton rat, house mouse, armadillo, domestic bird, wild bird | 2 | 18 | | 1 |
| Yellow-billed cuckoo | | Tularemia | | Pasteurella tularensis | | 1 | 12 | | |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | 0 | 0 | c | |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Black rat, cotton rat, passerine bird | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | Rickettsia disease | | Rickettsia sp. | | 0 | | | |
| | | Western equine encephalitis | | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | Culex tarsalis | | Mosquito host reservoir | | | | | | |
| | C. pipiens | | | | | | | | |
| | Aedes sollicitans | | | | | | | | |
| | Aedes aegypti | | | | | | | | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Coccyrus americanus<br>Yellow-billed cuckoo<br>(Continued) | Aedes sollicitans | Eastern equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Myiarchus crinitus<br>Great crested flycatcher | Amblyomma americanum | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Man, cattle, sheep, swine, horse, cat, | 2 | 18 | | 1 |
| | | Tularemia | | Pasteurella tularensis | rabbit, cotton rat, house mouse, armadillo, domestic bird, wild bird | 1 | 12 | | |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | | | c | |
| Hirundo rustica<br>Barn swallow | Argas persicus | Avian spirochetes | | Spirochaeta sp. | Man, goat, mourning dove, domestic bird | | | d | |
| | | Fowl cholera | | Pasteurella avicida | | | | | |
| | | Fowl paralysis | | None | | | | c | |
| | | Anthrax | | Bacillus anthracis | | | | c | |
| | | Fowl relapsing fever | | Borrelia sp. | | | | d | |
| | | Human relapsing fever | | Borrelia neotropicus | | | | c | |
| | | Endemic typhus (Texas strain) | | Rickettsia sp. | | | 20 | b | |
| | | Plague | | Yersinia pestis | | 0 | 0 | c | 7 |
| | | Yellow fever | | Cuaron evagatus | | 0 | 0 | c | |
| | | Tetanus | | Clostridium tetani | | 7 | 11 | a | 5 |
| | | Western equine encephalitis | | Virus | | 0 | <1 | b | 5 |
| | Ixodes brunneus | Fowl paralysis | | None | Passerine bird | 0 | 0 | d | |
| Corvus brachyrynchos<br>Crow | Amblyomma americanum | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, cattle, sheep, horse, swine, cotton rat, opossum, armadillo, house mouse, raccoon, passerine bird | 2 | 18 | a | 1 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | Q. fever | | Coxiella brunetii | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | | 0 | c | |
| | | Western equine encephalitis | Reservoir | Virus | | | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Aedes aegypti | Western equine encephalitis | | | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Corvus brachyrynchos Crow (Continued) | Aedes sollicitans | Eastern equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Cotton rat, cat, black rat, domestic | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | bird, passerine | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | bird | 1 | 12 | a | |
| | | Western equine encephalitis | | Virus | | 0 | <1 | b | 5 |
| | | California encephalitis | | | | | 0 | c | |
| Mimus polyglottos Mockingbird | Anopheles quadrimaculatus | Avian malaria | Host | Plasmodium reticulatum | Passerine bird, mourning dove | | | d | |
| | Culex pipiens C. tarsalis | | | | | | | | |
| | Aedes aegypti | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |

(Continued)

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Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| *Mimus polyglottos* | *Amblyomma americanum* | Rocky Mtn. spotted fever | Tick host | *Rickettsia rickettsii* | Man, cattle, sheep, horse, swine, cotton rat, opossum, armadillo, house mouse, raccoon, passerine bird | 2 | 18 | a | 1 |
| Mockingbird (Continued) | | Tularemia | | *Pasteurella tularensis* | | 1 | 12 | a | |
| | | Q. fever | | *Coxiella burnetii* | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | 0 | 0 | c | |
| | *Amblyomma maculatum* | Leptospirosus | | *Leptospira pomona* | Man, passerine bird, dog, cat, cattle, horse, goat, sheep, rabbit, raccoon, cotton rat | 2 | 5 | a | |
| | | Rickettsia-like fever | | *Rickettsia* sp. | | 0 | 0 | c | |
| | *Haemaphysalis leporis-palustris* | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | Cotton rat, cat, black rat, domestic bird, passerine bird | 2 | 18 | a | 1 |
| | | Q. fever | | *Coxiella burnetii* | | 0 | | | |
| | | Tularemia | | *Pasteurella tularensis* | | 1 | 12 | a | 10 |
| | | Western equine encephalitis | Reservoir | Virus | | 0 | <1 | b | 5 |
| | | California encephalitis | | | | | 0 | c | |
| | | Rickettsia canada disease | | *Rickettsia canada* | | | | c | |
| *Toxostoma rufum* | Culicid fly | Avian malaria | Host | *Plasmodium* sp. | Passerine bird | | | d | |
| Brown thrasher | Simulid fly | Haemoproteus infection | | *Haemoproteus* sp. | | | | | |
| | Simulid fly | Leucocytozoonosis | | *Leucocytozoon* sp. | | | | | |
| | Culicid fly | Filariasis | | *Microfilaria* sp. | | | | | |
| | *Aedes aegypti* | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | *Aedes sollicitans* | Eastern equine encephalitis | | | | | | | 5 |
| | *Culex pipiens* | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | | | | 5 |
| | *Culex pipiens* *Aedes sollicitans* | St. Louis encephalitis | | | Man, house mouse, cotton rat, passerine bird, domestic bird | 7 | 8 | a | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| *Toxostoma rufum* | *Amblyomma americanum* | Rocky Mtn. spotted fever | Tick host | *Rickettsia rickettsii* | Man, cattle, dog, sheep, horse, | 2 | 18 | a | 1 |
| Brown thrasher (Continued) | | Tularemia | | *Pasteurella tularensis* | swine, cat, goat, house mouse, cotton | 1 | 12 | a | |
| | | Q. fever | | *Coxiella burnetii* | rat, armadillo, | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | raccoon, domestic bird | 0 | 0 | c | |
| | *Amblyomma maculatum* | Leptospirosis | | *Leptospira pomona* | Man, dog, cat, horse, | 2 | 5 | a | |
| | | Rickettsia-like fever | | *Rickettsia* sp. | cattle, goat, sheep, raccoon, cotton rat, passerine bird | 0 | 0 | c | |
| | *Ixodes brunneus* | Wild bird paralysis | | None | Passerine bird | 0 | 0 | d | |
| | *Ixodes dentatus* | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | Man, rabbit, Norway rat, cotton rat, | 2 | 18 | a | 1 |
| | | Tularemia | | *Pasteurella tularensis* | passerine bird | 1 | 12 | | |
| | *Haemaphysalis leporis-palustris* | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | Rabbit, cotton rat, cat, domestic bird, | 2 | 18 | | 1 |
| | | Tularemia | | *Pasteurella tularensis* | passerine bird | 1 | 12 | | |
| | | Q. fever | | *Coxiella burnetii* | | 0 | 0 | c | 10 |
| | | *Rickettsia canada* disease | | *Rickettsia canada* | | | | | |
| | | Western equine encephalitis | | Virus | | | | | |
| | | California encephalitis | | | | | | | |
| *Turdus migratorius* | Simulid fly | Leucocytozoonosis | Host | *Leucocytozoon* sp. | Passerine bird | | | | |
| Robin | ? | Trypanosomiasis | | *Trypanosoma avum* | | | | d | |
| | Simulid fly | Haemoproteus infection | | *Haemoproteus* sp. | | | | | |
| | Culicid fly | Filariasis | | *Microfilaria* sp. | | | | | |
| | *Anopheles quadrimaculatus* | Avian malaria | | *Plasmodium relictum* | Passerine bird, mourning dove | | | | |
| | *Culex pipiens* *C. tarsalis* | | | | | | | | |
| | *Aedes aegypti* | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | *Aedes sollicitans* | Eastern equine encephalitis | | | | | <1 | b | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Turdus migratorius Robin (Continued) | Culex pipiens | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | | Eastern equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Ixodes brunneus | Wild bird paralysis | Tick host | None | Passerine bird | 0 | 0 | d | |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Rabbit, cotton rat, cat, domestic bird, passerine bird | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | Rickettsia canada disease | | Rickettsia canada | | 0 | 0 | c | |
| | | Western equine encephalitis | Reservoir | Virus | | | <1 | b | 5 |
| | | California encephalitis | | | | | 0 | c | |
| Polioptila caerulea Blue-gray gnatcatcher | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | Rickettsia canada disease | | Rickettsia canada | | 0 | 0 | c | |
| | | Western equine encephalitis | Reservoir | Virus | | | <1 | b | 5 |
| | | California encephalitis | | | | | 0 | c | |
| | Aedes aegypti | Western equine encephalitis | | | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |



(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Polioptila caerulea | Culex tarsalis | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| Blue-gray gnatcatcher (Continued) | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Regulus calendula | Ixodes brunneus | Wild bird paralysis | Tick host | None | Passerine bird | 0 | 0 | d | |
| Ruby-crowned kinglet | Aedes aegypti | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Anthus spinoletta | Ixodes brunneus | Wild bird paralysis | Tick host | None | Passerine bird | 0 | 0 | d | |
| Water pipit | Aedes sollicitans | Eastern equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Lanius ludovicianus | Amblyomma americanum | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, cattle, dog, sheep, horse, | 2 | 18 | | 1 |
| Loggerhead shrike | | Tularemia | | Pasteurella tularensis | swine, cat, goat, house mouse, cotton | 1 | 12 | | |
| | | Q. fever | | Coxiella burnetii | rat, armadillo, raccoon, domestic bird, passerine bird | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | 0 | 0 | c | |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| *Lanius ludovicianus* Loggerhead shrike (Continued) | *Amblyomma maculatum* | Leptospirosis | Tick host | *Leptospira pomona* | Man, dog, cat, horse, cattle, goat, sheep, raccoon, cotton rat, passerine bird | 2 | 5 | a | |
| | | Rickettsia-like fever | | *Rickettsia* sp. | | 0 | 0 | c | |
| | *Haemaphysalis leporis-palustris* | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | Rabbit, cotton rat, cat, domestic bird, passerine bird | 2 | 18 | a | 1 |
| | | Q. fever | | *Coxiella burnetii* | | 0 | 0 | c | 10 |
| | | Tularemia | | *Pasteurella tularensis* | | 1 | 12 | a | |
| | | *Rickettsia canada* disease | | *Rickettsia canada* | | 0 | 0 | c | |
| | | Western equine encephalitis | | Virus | | | <1 | b | 5 |
| | | California encephalitis | | | | | 0 | c | |
| | *Aedes aegypti* | Western equine encephalitis | Reservoir | | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | *Aedes sollicitans* | Eastern equine encephalitis | | | | | | | 5 |
| | *Culex pipiens* | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | *Culex tarsalis* | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| *Seiurus motacilla* Louisiana waterthrush | *Amblyomma americanum* | Rocky Mtn. spotted fever | Tick host | *Rickettsia rickettsii* | Man, cattle, dog, sheep, horse, swine, cat, goat, house mouse, cotton rat, armadillo, raccoon, domestic bird, passerine bird | 2 | 18 | | 1 |
| | | Tularemia | | *Pasteurella tularensis* | | 1 | 12 | | |
| | | Q. fever | | *Coxiella burnetii* | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | | | c | |
| | *Ixodes brunneus* | Wild bird paralysis | | None | Passerine bird | | | d | |
| | *Haemaphysalis leporis-palustris* | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | Rabbit, cotton rat, cat, domestic bird, passerine bird | 2 | 18 | a | 1 |
| | | Q. fever | | *Coxiella burnetii* | | 0 | 0 | c | 10 |
| | | Tularemia | | *Pasteurella tularensis* | | 1 | 12 | a | |
| | | *Rickettsia canada* disease | | *Rickettsia canada* | | 0 | 0 | c | |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Seiurus motacilla<br>Louisiana waterthrush (Continued) | Haemaphysalis leporis-palustris (Continued) | Western equine encephalitis | Reservoir | Virus | Rabbit, cotton rat, cat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | | California encephalitis | | | | | 0 | c | |
| | Aedes aegypti | Western equine encephalitis | | | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Sturnella magna<br>Eastern meadowlark | Amblyomma americanum | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, cattle, dog, sheep, horse, swine, cat, goat, house mouse, cotton rat, armadillo, raccoon, domestic bird, passerine bird | 2 | 18 | | 1 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | | |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | 0 | 0 | c | |
| | Amblyomma maculatum | Leptospirosis | Tick host | Leptospira pomona | Man, dog, cat, horse, cattle, goat, sheep, raccoon, cotton rat, passerine bird | 2 | 5 | a | |
| | | Rickettsia-like fever | | Rickettsia sp. | | 0 | 0 | c | |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Rabbit, cotton rat, cat, domestic bird, passerine bird | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | Rickettsia canada disease | | Rickettsia canada | | 0 | 0 | c | |
| | | Western equine encephalitis | | Virus | | | <1 | b | 5 |
| | | California encephalitis | | | | | 0 | c | |
| | Culex pipiens | Avian malaria | Host | Plasmodium hexamerium | Passerine bird | | 0 | d | |
| | Aedes aegypti | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Sturnella magna<br>Eastern meadowlark (Continued) | Aedes sollicitans | Eastern equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Agelaius phoeniceus<br>Red-winged blackbird | Amblyomma americanum | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, cattle, dog, sheep, horse, | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | swine, cat, goat, | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | house mouse, cotton rat, armadillo, | 1 | 12 | a | |
| | | Tick paralysis | | None | raccoon, domestic bird, passerine bird | 0 | 0 | c | |
| | Amblyomma maculatum | Leptospirosis | Tick host | Leptospira pomona | Man, dog, cat, horse, | 2 | 5 | a | |
| | | Rickettsia-like fever | | Rickettsia sp. | cattle, goat, sheep, raccoon, cotton rat, passerine bird | 0 | 0 | c | |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Rabbit, cotton rat, cat, domestic bird, | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | passerine bird | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | Rickettsia conorii disease | | Rickettsia conorii | | 0 | 0 | c | |
| | | Western equine encephalitis | Reservoir | Virus | | | <1 | b | 5 |
| | | California encephalitis | | | | | 0 | c | |
| | Dermacentor variabilis | Tick paralysis | Tick host | None | Man, dog, cattle, | 0 | 0 | c | |
| | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | horse, cat, house mouse, cotton rat, | 2 | 18 | a | 1 |
| | | Tularemia | | Pasteurella tularensis | raccoon, opossum, rabbit | 1 | 12 | a | |
| | | Anaplasmosis | | Anaplasma marginale | | 0 | | | |
| | | Colorado tick fever | | Virus | | 0 | 0 | c | |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Agelaius phoeniceus<br>Red-winged blackbird (Continued) | Aedes aegypti | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex pipiens | Avian malaria | Host | Plasmodium relictum<br>P. cathemerium<br>P. elongatum<br>P. hexamerium<br>P. sp. | Passerine bird | 0 | 0 | d | |
| | Simulid fly | Haemoproteus infection | | Haemoproteus sp. | | | | | |
| | Simulid fly | Leucocytozoonosis | | Leucocytozoon sp. | | | | | |
| | Simulid fly | Trypanosomiasis | | Trypanosoma avium | | | | | |
| | Mosquito | Filariasis | | Microfilaria sp. | | | | | |
| Quiscalus quiscula<br>Common grackle | Amblyomma maculatum | Leptospirosis | Tick host | Leptospira pomona | Man, dog, cat, horse, cattle, goat, sheep, raccoon, cotton rat, passerine bird | 2 | 5 | a | |
| | | Rickettsia-like fever | | | | 0 | 0 | c | |
| | Ixodes brunneus | Wild bird paralysis | | None | Passerine bird | 0 | 0 | d | |
| | Ixodes dentatus | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, passerine bird, domestic bird, rabbit, Norway rat, cotton rat | 2 | 18 | a | 1 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | | |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Rabbit, cotton rat, cat, domestic bird, passerine bird | 2 | 18 | | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | California encephalitis | Reservoir | Virus | | 0 | 0 | c | |
| | | Western equine encephalitis | | | | 0 | <1 | b | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| *Quiscalus quiscula* Common grackle (Continued) | *Aedes aegypti* | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | *Aedes sollicitans* | Eastern equine encephalitis | | | | | | | 5 |
| | *Culex pipiens* | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | *Culex tarsalis* | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | *Culex pipiens* Other mosquitoes | Avian malaria | Host | *Plasmodium relictum* *P. cathemerium* *P. elongatum* *Plasmodium* sp. | Passerine bird | 0 | 0 | d | |
| | Simulid fly | Haemoproteus infection | | *Haemoproteus* sp. | | | | | |
| | Simulid fly | Leucocytozoonosis | | *Leucocytozoon* sp. | | | | | |
| | Simulid fly | Avian trypanosomiasis | | *Trypanosoma avium* | | | | | |
| | Mosquito | Filariasis | | *Microfilaria* sp. | | | | | |
| *Molothrus ater* Brown-headed cowbird | *Amblyomma maculatum* | Leptospirosis | Tick host | *Leptospira pomona* | Man, dog, horse, cattle, goat, sheep, raccoon, cotton rat, passerine bird | 2 | 5 | a | |
| | | Rickettsia-like fever | | *Rickettsia* sp. | | 0 | 0 | c | |
| | *Dermacentor variabilis* | Tick paralysis | | None | | 0 | 0 | c | |
| | | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | | 2 | 18 | a | 1 |
| | | Tularemia | | *Pasteurella tularensis* | | 1 | 12 | a | 6 |
| | | Anaplasmosis | | *Anaplasma marginale* | | 0 | 0 | c | |
| | | Colorado tick fever | | Virus | | 0 | 0 | c | |
| | | St. Louis encephalitis | Reservoir | | | 7 | 8 | a | 5 |
| | *Haemaphysalis leporis-palustris* | Rocky Mtn. spotted fever | Tick host | *Rickettsia rickettsii* | Rabbit, cotton rat, cat, domestic bird, passerine bird | 2 | 18 | a | 1 |
| | | Q. fever | | *Coxiella burnetii* | | 0 | 0 | c | 10 |
| | | Tularemia | | *Pasteurella tularensis* | | 1 | 12 | a | |
| | | California encephalitis | Reservoir | Virus | Virus | 0 | 0 | c | |
| | | Western equine encephalitis | | | | 0 | <1 | b | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Molothrus ater<br>Brown-headed cowbird (Continued) | Aedes aegypti | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex pipiens other mosquitoes | Avian malaria | | Plasmodium relictum<br>P. circumflexum<br>P. hexamerium<br>P. sp. | Passerine bird | 0 | 0 | d | |
| | Simulid fly | Haemoproteus infection | Host | Haemoproteus sp. | | | | | |
| | Simulid fly | Leucocytozoonosis | | Leucocytozoon sp. | | | | | |
| | Simulid fly | Avian trypanosomiasis | | Trypanosoma avium | | | | | |
| Guiraca caerulea<br>Blue grosbeak | Simulid fly | Avian trypanosomiasis | | Trypanosoma avium | | | | | |
| | Amblyomma americanum | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Man, cattle, dog, sheep, horse, swine, cat, cotton rat, house mouse, goat | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | Raccoon, armadillo, domestic bird, passerine bird | 0 | 0 | c | |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| Passerculus sandwichensis<br>Savannah sparrow | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Rabbit, cotton rat, cat, domestic bird, passerine bird | 2 | 18 | a | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | California encephalitis | Reservoir | Virus | | 0 | 0 | c | |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Aedes aegypti | Western equine encephalitis | | | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| *Passerculus sandwichensis* Savannah sparrow (Continued) | *Aedes sollicitans* | Eastern equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | 0 | <1 | b | 5 |
| | *Culex pipiens* | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | *Culex tarsalis* | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| *Ammodramus savannarum* Grasshopper sparrow | *Amblyomma americanum* | Rocky Mtn. spotted fever | Tick host | *Rickettsia rickettsii* | Man, cattle, swine, sheep, horse, cat, goat, rabbit, chicken | 2 | 18 | a | 1 |
| | | Q. fever | | *Coxiella burnetii* | | 0 | 0 | c | 10 |
| | | Tick paralysis | | None | | 0 | 0 | c | |
| | | Tularemia | | *Pasteurella tularensis* | | 1 | 12 | a | |
| | *Amblyomma maculatum* | Leptospirosis | | *Leptospira pomona* | Man, dog, horse, cattle, goat, sheep, raccoon, cotton rat, passerine bird | 2 | 5 | a | |
| | | Rickettsia-like fever | | *Rickettsia* sp. | | 0 | 0 | c | |
| | *Haemaphysalis leporis-palustris* | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | Rabbit, cotton rat, cat, domestic bird, passerine bird | 2 | 18 | a | 1 |
| | | Q. fever | | *Coxiella burnetii* | | 0 | 0 | c | 10 |
| | | Tularemia | | *Pasteurella tularensis* | | 1 | 12 | a | |
| | | California encephalitis | Reservoir | Virus | | 0 | 0 | c | |
| | | Western equine encephalitis | | | | | <1 | b | 5 |
| | *Aedes aegypti* | Western equine encephalitis | | | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | | | 5 |
| | *Aedes sollicitans* | Eastern equine encephalitis | | | | | | | 5 |
| | *Culex pipiens* | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | *Culex tarsalis* | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |

(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Poecetes gramineus | Dermacentor andersoni | Tick paralysis | Tick host | None | Man, rabbit, dog, | 0 | 0 | c | |
| Vesper sparrow | | Colorado tick fever | | Virus | goat, cattle, pas- | | | | |
| | | Anaplasmosis | | *Anaplasma marginale* | serine bird, cotton | | | | 6 |
| | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | rat, house rat | 2 | 18 | a | 1 |
| | | Rabies | | Virus | | 0 | <1 | c | 9 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | Rickettsia diaportica infection | | Rickettsia diaportica | | 0 | 0 | c | |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Brucillosus | | Brucilla sp. | | <1 | 23 | b | |
| | | Lymphocytic-chloriomeningitis | | Virus | | 0 | 0 | c | |
| | | Western equine encephalitis | | | | | <1 | b | 5 |
| | Aedes aegypti | Western equine encephalitis | Reservoir | | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | | | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Spizella passerinea | Amblyomma americanum | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Man, cattle, swine, | 2 | 18 | | 1 |
| Chipping sparrow | | Tularemia | | Pasteurella tularensis | sheep, horse, cat, goat, rabbit, chicken | 1 | 12 | | |
| | | Tick paralysis | | None | | 0 | 0 | c | |
| | Amblyomma maculatum | Leptospirosis | | Leptospira pomona | Man, dog, horse, cattle, goat, sheep, raccoon, cotton rat, passerine bird | 2 | 5 | a | |
| | | Rickettsia-like fever | | Rickettsia sp. | | 0 | 0 | c | |
| | Mosquito sp? | Filariasis | Host | Microfilaria sp. | Passerine bird | | | d | |
| | Ixodes brunneus | Wild bird paralysis | Tick host | None | | | | | |
| Spizella pusilla | Ixodes brunneus | | | | | | | | |
| Field sparrow | | | | | | | | | |

(Continued)

(Sheet 21 of 25)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Spizella pusilla | Ixodes dentatus | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Man, rabbit, Norway rat, passerine | 2 | 18 | a | 1 |
| Field sparrow | | Tularemia | | Pasteurella tularensis | bird, cotton rat | 1 | 12 | | |
| (Continued) | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Rabbit, cotton rat, cat, domestic bird, | 2 | 18 | | 1 |
| | | Q. fever | | Coxiella burnetii | passerine bird | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | California encephalitis | | Virus | | 0 | 0 | c | |
| | | Western equine encephalitis | Reservoir | | | | <1 | b | 5 |
| | Aedes aegypti | Western equine encephalitis | | | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | | | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Mosquito? | Filariasis | Host | Dipetalonema sp. | Passerine bird | 0 | 0 | c | |
| Melospiza georgiana | Ixodes brunneus | Wild bird paralysis | Tick host | None | | 0 | 0 | c | |
| Swamp sparrow | Ixodes dentatus | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Man, rabbit, Norway rat, passerine | 2 | 18 | a | 1 |
| | | Tularemia | | Pasteurella tularensis | bird, cotton rat | 1 | 12 | | |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Rabbit, cotton rat, cat, domestic bird, | 2 | 18 | | 1 |
| | | Q. fever | | Coxiella burnetii | passerine bird | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | California encephalitis | | Virus | | 0 | 0 | c | |
| | | Western equine encephalitis | | | | 0 | <1 | b | 5 |



(Continued)

Table 2 (Continued)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Melospiza georgiana | Ixodes scapularis | Tularemia | Tick host | Pasteurella tularensis | Man, dog, cattle, Norway rat, raccoon, opossum, rabbit, cotton rat, skink | 1 | 12 | a | |
| Swamp sparrow (Continued) | | Anaplasmosis | | Anaplasma marginale | | 0 | 0 | c | 6 |
| | Aedes aegypti | Western equine encephalitis | Reservoir | Virus | Man, horse, house mouse, cotton rat, domestic bird, passerine bird | | <1 | b | 5 |
| | Aedes sollicitans | Eastern equine encephalitis | | | | | | | 5 |
| | Culex pipiens | Western equine encephalitis | | | | | | | 5 |
| | | Eastern equine encephalitis | | | | | | | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| | Culex tarsalis | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| | | St. Louis encephalitis | | | | 7 | 8 | a | 5 |
| Melospiza melodia | Ixodes dentatus | Rocky Mtn. spotted fever | Tick host | Rickettsia rickettsii | Man, rabbit, Norway rat, passerine bird, cotton rat | 2 | 18 | | 1 |
| Song sparrow | | Tularemia | | Pasteurella tularensis | | 1 | 12 | | |
| | Haemaphysalis leporis-palustris | Rocky Mtn. spotted fever | | Rickettsia rickettsii | Rabbit, cotton rat, cat, domestic bird, passerine bird | 2 | 18 | | 1 |
| | | Q. fever | | Coxiella burnetii | | 0 | 0 | c | 10 |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | a | |
| | | California encephalitis | | Virus | | 0 | 0 | c | |
| | | Western equine encephalitis | | | | 0 | <1 | b | 5 |
| Eumeces sp. | Ixodes scapularis | Tularemia | | Pasteurella tularensis | Man, dog, cattle, Norway rat, raccoon, opossum, rabbit, cotton rat, skink | 1 | 12 | a | |
| Skink | | Anaplasmosis | | Anaplasma marginale | | 0 | 0 | c | 6 |
| Terrapene ornata | Ornithodoros turicata | Recurrent fever | | Borella recurrens B. turricata | Man, horse, swine, cattle, rabbit | | | | |
| Ornate box tortoise | | Rocky Mtn. spotted fever | | Rickettsia rickettsii | | 2 | 18 | a | 1 |
| | | Leptospirosis | | Leptospira pomona | | 2 | 5 | | |
| | | Tularemia | | Pasteurella tularensis | | 1 | 12 | | |
| | | Rabies | | Virus | | 0 | <1 | c | 9 |

(Continued)

Table 2 (Concluded)

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Hosts of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| *Mugil cephalus* Striped mullet | None | Salmonelosis | Reservoir | *Salmonella typhimurium* | Man | ? | 1042 | a | 11 |
| *Trachinotus carolinus* Pompano | None | ↓ | ↓ | ↓ | ↓ | ? | 1042 | a | 11 |
| *Brevortia patronus* Gulf menhaden | None | Coccidrosis | Host | *Eimeria brevoortia* | Menhaden | 0 | 0 | d | |
| *Callenectes sapidus* Blue crab | None | Food poisoning | Reservoir | *Vibrio parahaemolyticus* | Man | ? | ↓ | c | 11 |
| *Penaeus aztecus* Brown shrimp | None | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 11 |
| *Penaeus setiferus* White shrimp | None | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 11 |

Table 2: Notes, Bolivar Peninsula

1. Nearby Brazoria County, Texas, has been the only recent site of tick surveillance.

2. Chagas' disease or American trypanosomiasis is a potential threat. All the vectors and reservoir hosts are present, but human cases are rare in the U. S.

3. Leprosy incidence has dropped from 34 in 1972 to 17 in 1975. Involvement of armadillo is not well defined at this time.

4. A high proportion of reported cases occurred in counties adjacent to the HDP field site.

5. Thirty-three St. Louis encephalitis cases were reported in Harris County in 1975. Only Jefferson County, Texas, participated in the 1976 surveillance program. Harrison and Jefferson Counties are near the Bolivar Peninsula.

6. This disease is usually not reported by health organizations.

7. Plague has not been reported in the 1971-1975 period, but was reported in the 1900-1970 period.

8. No reports by county are available.

9. A total of 330 veterinary ravies cases have been reported per year statewide.

10. A. fever has not been reported from this area, but vectors are present.

11. Local food poisoning reports and salmonellosis reports are not available. Packaging and transport of food moves contaminated material out of the immediate area of contamination.

Table 3

Potential Medical and Veterinary Diseases at Windmill Point

| Host | Vector or Intermediate Host | Disease | Role of Host in Disease | Pathogen | Roots of Economic Significance | Human Infections per Year | Average for State | Likelihood of Occurrence | Notes |
|---|---|---|---|---|---|---|---|---|---|
| *Charadrius vociferus* Killdeer | *Culex pipiens* | Western equine encephalitis | Reservoir | Virus | Man, horse, domestic bird, passerine | 0 | 0 | c | |
| | | Eastern equine encephalitis | | | bird, rodent | | <1 | b | 1 |
| | | St. Louis encephalitis | | | | | <1 | b | 1 |
| *Agelaius phoeniceus* Red-winged blackbird | *Dermacentor variabilis* | Rocky Mtn. spotted fever | Tick host | *Rickettsia rickettsii* | Man, dog, rabbit, rodent, passerine | <1 | 77 | b | 2 |
| | | Tularemia | | *Pasteurella tularensis* | bird | 0 | 0 | c | |
| | | Anaplasmosis | | *Anaplasma marginale* | | | | | 3 |
| | | Colorado tick fever | | *Coxiella burnetii* | | | | | |
| | | Tick paralysis | | None | | Not reported | Not reported | b | 4 |
| | *Haemaphysalis leporis-palustris* | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | Man, rabbit, rodent, passerine bird | <1 | 77 | b | |
| | | Tularemia | | *Pasteurella tularensis* | | 0 | 0 | c | |
| | *Amblyomma maculatum* | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | Man, rabbit, dog, rodent, passerine bird | <1 | 77 | b | |
| | *Culex pipiens* | Western equine encephalitis | Reservoir | Virus | Man, horse, domestic bird, passerine | 0 | 0 | c | |
| | | Eastern equine encephalitis | | | bird, rodent | | <1 | b | 1 |
| | | St. Louis encephalitis | | | | | <1 | b | 1 |
| | | Avian malaria | Host | *Plasmodium relictulatum*<br>*P. cathemerium*<br>*P. elongatum*<br>*P. hexamerium* | Passerine bird | | 0 | i | |
| *Porzana carolina* Sora | *Amblyomma americanum* | Rocky Mtn. spotted fever | Tick host | *Rickettsia rickettsii* | Man, rabbit, rodent, passerine bird | <1 | 77 | b | |
| | | Tularemia | | *Pasteurella tularensis* | | 0 | 0 | c | |
| | | Tick paralysis | | None | | Not reported | Not reported | c | |
| *Ondatra zibethica* Muskrat | *Ixodes dentatus* | Rocky Mtn. spotted fever | | *Rickettsia rickettsii* | Man, rodent, passerine bird, rabbit | <1 | 77 | b | |
| | | Tularemia | | *Pasteurella tularensis* | | 0 | 0 | c | |

(Sheet 1 of 2)

Table 3: Notes, Windmill Point

1. Dermacentor variabilis has been implicated as vector of Rocky Mountain spotted fever in Virginia.

2. The year 1975 was the first time arthropod-borne encephalitis was reported in Virginia. In 1975 there were two cases of eastern equine encephalitis and one St. Louis strain. In 1976 there were three cases of St. Louis encephalitis in and around Richmond. This may represent an emerging zoonosis. The dense populations of passerine birds may require management.

3. Colorodo tick fever was previously isolated on the east coast at Long Island, New York.

4. Dermacentor variabilis was confirmed as the cause of tick paralysis in Virginia in 1948.

5. Rocky Mountain spotted fever transmission by Ixodes denatatus was confirmed in Prince George County, Virginia, in 1952.

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