

## APPENDIX E – Health

### Possible Disease or Pests among Deer Population

#### **Anthrax**

Anthrax is caused by bacteria found in soil. Infection is normally contracted through cuts, open sores, scratches, inhaling spores or eating under-cooked meat. It can be a skin, lung, or gastrointestinal infection, treatable by antibiotics. A severe lung infection can be fatal. The risk of human infection in the outdoors is extremely unlikely. Vector borne transmission from cervids (hoofed mammal) and bovids (hoofed hallow horned mammals) to humans.

#### Symptoms

- Skin infection begins as a small, raised bump that might itch-similar to an insect or spider bite.
- Within one to two days, the bump develops into a fluid-filled blister about 1 cm (0.4 in.) to 3 cm (1.2 in.) in diameter. Within seven to 10 days, the blister usually has a black center of dying tissue (Escher) surrounded by redness and swelling. The blister is usually painless.
- Additional blisters may develop.
- Swollen lymph nodes close to the area of the blister.
- Fever.
- Headache.

#### **Bovine tuberculosis (TB)**

Bovine TB is a contagious and communicable disease caused by a bacterium (*Mycobacterium bovis*). It affects cattle, bison, deer, elk, and goats. Bovine TB is caused by a different bacterium than human TB (*Mycobacterium tuberculosis*), and although highly unlikely, it can affect humans. Disease transmission usually requires frequent and extended exposure to respiratory secretions and coughing, and/or contact with infected urine, manure and saliva. Vector borne transmission from livestock to wildlife.

#### Symptoms:

- weight loss
- lung involvement with coughing
- painful breathing
- enlarged lymph nodes

#### **Chronic Wasting Disease (CWD)**

CWD is a fatal disease of the central nervous system found in mule deer, white-tailed deer, elk and moose in North. CWD can be transmitted between individuals of the same species. Involves nasal-oral pathways, urine or faeces and possible environmental contamination. CWD and related diseases (e.g. bovine spongiform encephalopathy in cattle and Creutzfeldt-Jakob disease in humans) tend to be species specific. Vector borne transmission from ungulate to ungulate.

#### Symptoms:

- abnormal Behavior by deer separating itself from the herd or ignoring humans
- excessive thirst
- emaciation(muscular tremors)
- excessive drooling

### **Escherichia coli (E. coli)**

*E. coli* is a bacterium that is commonly found in the lower intestine of warm blooded animals. *E. coli* has been found in hunter harvested white-tailed deer faeces and in venison from white-tailed deer and black-tailed deer. Infection through physical contact with faeces is usually only a concern where there are extremely high concentrations of deer faeces, such as at feeding stations. Vector borne transmission from deer to humans.

Symptoms:

- stomach cramps
- diarrhea (usually bloody)
- vomiting
- low-grade fever

### **Haemorrhagic diseases of deer**

These diseases are caused by epizootic haemorrhagic disease virus (EHDV) or blue tongue virus (BTV). Mule deer are more affected by these diseases than white-tailed deer. EHDV and BTV are extremely unlikely to affect humans. Vector borne transmission from deer to humans.

Symptoms

- excessive bleeding

### **Johne's disease**

Johne's disease is a chronic, contagious bacterial disease that affects the small intestine of ruminants such as cattle, sheep, goats, elk, deer, mountain goats, bighorn sheep, antelope and bison. Infected animals shed large numbers of the bacteria (*Mycobacterium par tuberculosis*) in their faeces, leading to contamination of feed and water sources. The most common method of infection is the ingestion of bacteria via manure-contaminated udders, milk, water or feed. Vector borne transmission from livestock to wildlife.

Symptoms:

- diarrhoea
- major weight loss

### **Parasites**

Transmission of parasites from deer to deer is generally a natural phenomenon with little consequence to the animal, but when conditions change, deer numbers increase beyond acceptable levels and suitable habitat becomes over utilized, the effect of parasite transmission and disease can be significant. Vector borne transmission from wildlife to wildlife.

Symptoms:

- poor coat(except during moulting periods)
- diarrhoea
- swelling and lumps from healing bone fractures
- unusual secretion from mouth, nose, or anus
- deformed antlers

### **Tick Borne Diseases**

Tick borne diseases are transmitted when a tick that is infected with bacteria bites a human. Three closely interrelated elements must be present in order for tick borne diseases to be transmitted: the bacteria, the ticks that can transmit them, and alternate hosts such as mice and

deer that provide food for the ticks in their various life stages. Abundance and distribution of ticks are correlated with deer densities.

Symptoms:

- flu-like symptoms
- fever
- numbness
- rash
- confusion
- weakness
- pain and swelling in joints
- palpitations
- shortness of breath
- nausea and vomiting

### **Rocky Mountain Spotted Fever (RMSF)**

RMSF is a severe tick-borne disease caused by *Rickettsia rickettsii*. The American dog tick (*Dermacentor variabilis*) in the east and the Rocky Mountain wood tick (*D. andersoni*) in the west are the principal vectors for bacterial transmission. Hosts for the adult ticks are carnivores, deer and domestic animals, especially dogs. Vector borne transmission from ticks carried by deer to humans.

Symptoms:

- fever
- abundant rashes on the back, wrists, or ankles
- nausea and Vomiting
- sensitivity to light (photophobia)

### **Ehrlichiosis**

Human ehrlichiosis has been recognized as an emerging tick-borne infectious disease since 1986. There are three forms of ehrlichiosis: human monocytic ehrlichiosis (HME); human granulocytic ehrlichiosis (HGE); and one other undefined human ehrlichiosis. The lone star tick (*Amblyomma americanum*), the blacklegged tick (*Ixodes scapularis*), and the western blacklegged tick (*Ixodes pacificus*) are known vectors of ehrlichiosis. As ehrlichiosis is not a national notifiable disease in Canada, the incidence is largely unknown. In the USA, the highest incidence rates of HME have been reported from southern and south central regions, and the highest incidence rates of HGE from north eastern and upper mid-western areas. Although most cases of ehrlichiosis are mild, complications can occur in about 10% to 20% of patients. The case fatality ratios can be as high as 5% for HME and 10% for HGE. Vector borne transmission from ticks via deer to humans.

Symptoms:

- high fever tiredness
- major muscle aches
- severe headache
- rashes

### **Lice**

Black-tailed deer infected by lice exhibit severe hair loss, skin inflammation. This loss of hair is asymmetric and perceived first as a change in coat colour. Recently a new species of exotic Eurasian louse (*Damalinea Cervicola*) has been introduced to mule deer. There is concern that

this new disease may impact deer, particularly during fawn winter survival. Deer infected with exotic lice tend to develop severe skin irritation, leading to excessive grooming by the animal and eventual patchy hair loss of body condition. In addition, they tend to develop a hypersensitivity (severe allergic) reactions to lice. Louse infestations are seasonal with the most prevalence during winter and early spring. Exotic louse does not affect humans or domestic livestock. Vector borne transmission from deer to deer.

Symptoms:

- hair loss
- change in coat colour to yellow

### **Lyme disease**

Deer ticks are responsible for transmitting the bacteria to humans in the north-eastern and north-central United States, and on the Pacific Coast, the bacteria are transmitted to humans by the western black-legged tick. Deer are the primary host for the adult deer tick and are key to the reproductive success of the tick, however, reducing the incidence of Lyme disease is a complex issue, and cannot likely be achieved by a simple reduction in the deer population. Although dogs and cats can contract Lyme disease, there is no evidence that they can transmit the infection directly to humans. Pets however, can carry infected ticks into the home or yard. Fatalities from Lyme disease are rare. However, undiagnosed Lyme disease may develop into chronic disease that may be difficult to treat. The transmission of Lyme disease through over abundant deer populations is a serious concern in north-eastern parts of the USA, but only of low to moderate concern in BC. White-tailed deer do not appear to suffer from the clinical signs of infection from the bacteria that causes Lyme disease. Vector borne transmission from ticks via deer to humans.

Symptoms

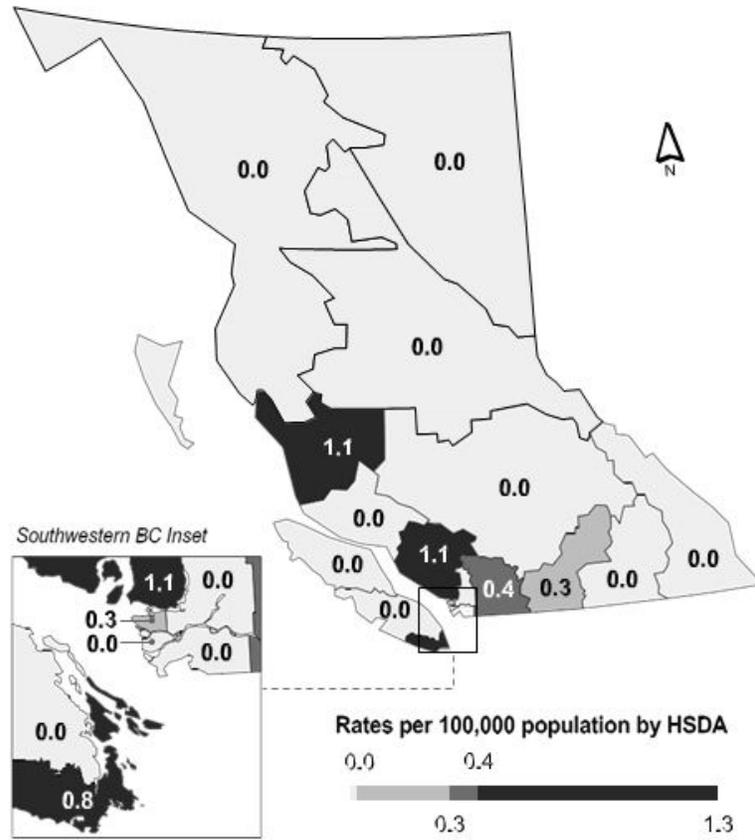
- fatigue
- chills
- fever
- headache
- muscle and joint pain
- swollen lymph nodes

If untreated, the second stage of the disease can last up to several months and include

- central and peripheral nervous system disorders
- multiple skin rashes
- arthritis and arthritic symptoms
- heart palpitations
- extreme fatigue and general weakness

### **Human Cases of Disease or Pests among Deer Population (BC Centre for Disease Control Annual Report 2009)**

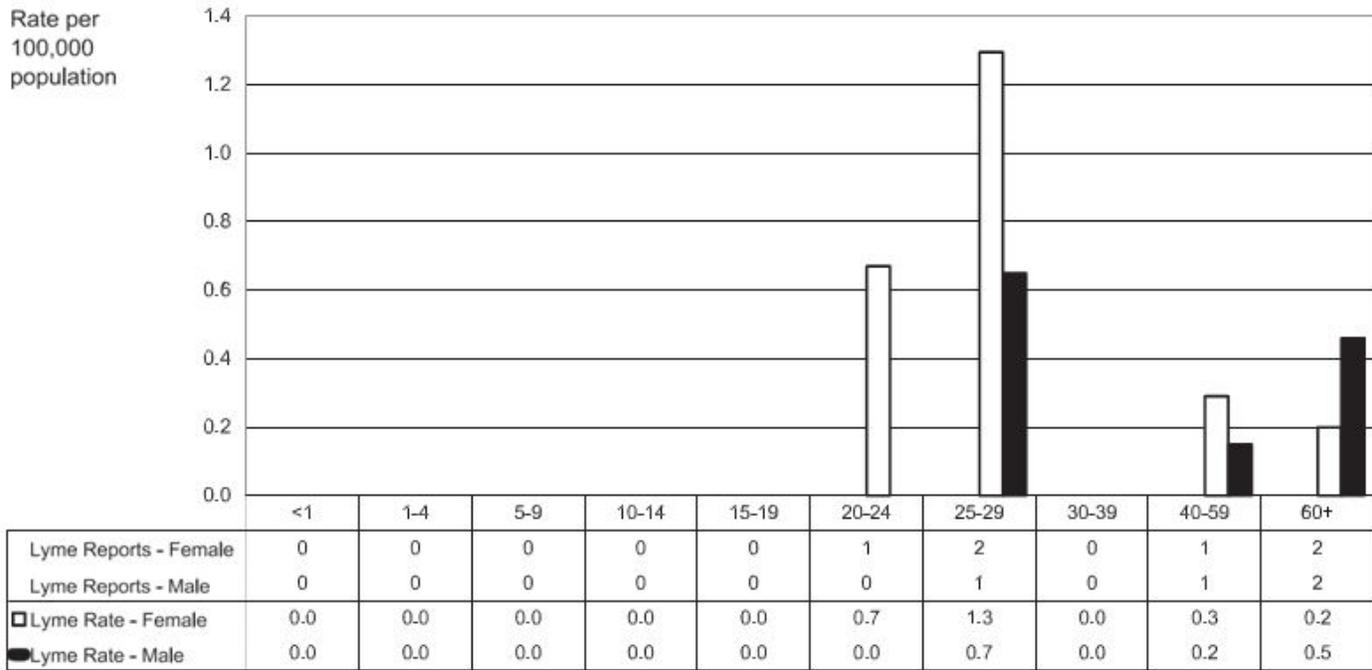
34.2 Lyme Disease Rates by Health Service Delivery Area, 2009



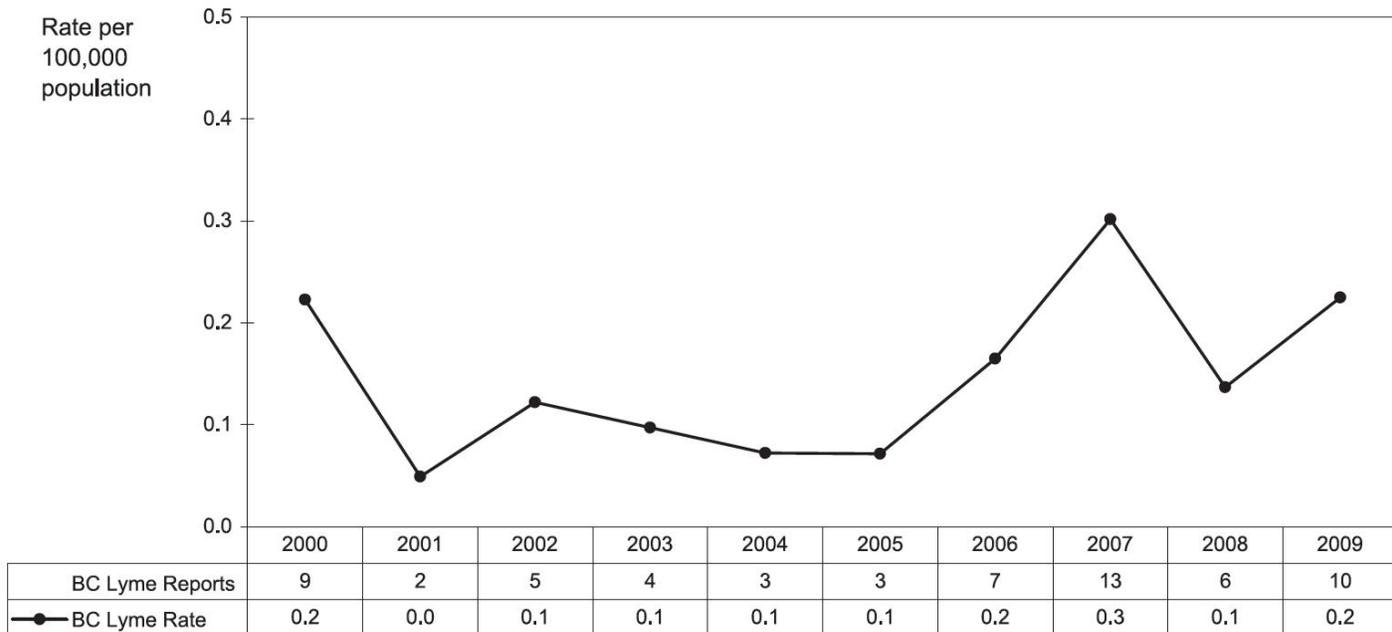
Lyme Disease Rates on Vancouver Island per 100,000 people			
South	Central	North	Vancouver Island Total
0.8	0	0	0.4

Health Services Delivery Area	Lyme Disease Cases	Rate
East Kootenay	0	0
Kootenay Boundary	0	0
Okanagan	1	0.3
Thompson Cariboo Shuswap	0	0
Fraser East	1	0.4
Fraser North	0	0
Fraser South	0	0
Richmond	0	0
Vancouver	2	0.3
North Shore/Coast Garibaldi	3	1.1
South Vancouver Island	3	0.8
Central Vancouver Island	0	0
North Vancouver Island	0	0
Northwest	0	0
Northern Interior	0	0
Northeast	0	0

Lyme Disease Cases in British Columbia By Age and Gender



BC Lyme Disease Report by Year



Note: Lyme Disease became nationally notifiable in 2009

### Deer in Poor Health (Schwantje, 2009, pp.1-2)

Signs that indicate poor health include:

- loss of fear to humans
- weakness and presence near homes, on porches, in outbuildings
- extremely thin body condition
- poor hair coats- small areas of hair loss to completely bald
- digestive tract upsets- diarrhoea, seen as green soft to liquid feces
- death with no apparent warning, especially after a period of supplemental feeding

It is evident that poor health is associated with harsh winters, seasonal nutritional issues, and high deer density. Deer that live in low elevation coastal environments are born later in the year over an extended period of time. Fawns are usually born as winter approaches and must maintain their weight and invest energy in growing muscle and bone. This is a physically gruelling period as the weather gets colder, wetter, and windier with little shrub-like plants to provide a high quantity and quality of nutrition. In turn, these deer resort to eating crops on farmlands, gardens, and golf courses that provide improper nutrition and unstable digestion. These crops such as grains, apple, grass and other rich feeds can start diarrhoea, severe constipation, weight loss, and other metabolic changes that can end in emaciation and death. As deer grow weaker and more physically stressed they do not have the energy to move around and in a high density population, the number of parasites on each animal are more likely to spread. Many deer die from hypothermia (low body temperature), hypoglycaemia (low blood sugar), or exhaustion.

### Pound Statistics on Deer in Saanich

#### Pound Statistics - Deer

2010

Date	Deceased	Injured	Problem	Dispatched	Gone on Arrival	Total
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March	0	0	0	0	0	0
April	0	0	0	0	0	0
May	0	0	0	0	0	0
June	0	0	0	0	0	0
July	0	0	0	0	0	0
August	27	2	0	0	6	35
September	25	7	0	5	1	38
October	33	6	1	4	2	46
November	30	5	0	2	3	40
December	23	0	0	1	3	27
<b>Totals</b>						
	138	20	1	12	15	186

