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SOUTHEASTERN COOPERATIVE WILDLIFE DISEASE STUDY



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January 4, 2006

Mr. John Stanton
U.S. Fish and Wildlife Service
Migratory Bird Field Office
P.O. Box 2440
Manteo, North Carolina 27954

Dear Mr. Stanton:

Enclosed is our report on the deer-population health evaluation that we conducted on Pocosin Lakes National Wildlife Refuge, Washington/Terrell/Hyde Counties, North Carolina, on August 8-12, 2005. The health evaluation involved examination of five adult deer (3 females and 2 males) collected at random from the population. The data are arranged in a series of tables (parasitologic, serologic/microbiologic, and pathologic information) accompanied by interpretive comments. Our assessment of current population health status is summarized briefly below and is compared with prior evaluations.

Herd health on Pocosin Lakes NWR appears to be reasonably good based on relatively low numbers of abomasal parasites and other endoparasites, as well as nutritional indices. Abomasal parasite counts are slightly less than they were in 1992 and 1998. Body weights and kidney fat indices have increased moderately since the previous assessments. Assessments of physical condition are unchanged but this evaluation may be less sensitive than other more objective parameters.

There is little or no herd immunity to hemorrhagic disease (HD) viruses and thus the population is fully susceptible to future epizootics. However, HD epizootics in the coastal plain are largely unpredictable and are generally associated with low mortality. Furthermore, there are no management options to address this vectorborne disease among wild deer populations.

Based on our findings the population can be maintained near its present density without unreasonable risk of declines to herd health. I hope this information will be valuable to the management of this deer population. Additional information on many of the parasites

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and diseases mentioned in the report can be obtained from our Field Manual of Wildlife Diseases or from our website at www.scwds.org. If you have any questions about the report, please do not hesitate to contact me.

Best regards,

Sincerely,

Kevin Keel, DVM, PhD, DACVP
Assistant Research Scientist

Enclosures

CC: ✓ Mr. Howard Phillips
Ms. Wendy Stanton
Mr. David Cobb
Mr. Scott Osborne
Mr. Evin Stanford
Mr. Sam Hamilton
Mr. Michael Piccirilli
Ms. E. J. Williams

Table 1. Arthropod, helminth, and protozoan parasites of five white-tailed deer (*Odocoileus virginianus*) collected from Pocosin Lakes National Wildlife Refuge, Washington, Terrell, and Hyde Counties, North Carolina, on August 8-12, 2005.

						<u>Arthropods</u>					
Animal Number	1	2	3	4	5	Animal Number	1	2	3	4	5
Age (years)	6.5	5.5	5.5	3.5	2.5	Lice	Moder.	Light	Light	-	-
Sex	F	F	F	M	M	Louse Flies	-	-	-	-	-
Weight (pounds)	98	120	125	140	92	Ticks	Light	Light	Light	Moder.	Light
Physical Condition	Fair	Fair	Fair	Good	Fair	Chiggers	-	-	-	-	-
Kidney Fat Index	20.8	16.7	34.1	102.7	18.2	Ear Mites	-	-	-	-	-
Packed Cell Volume	39	34	47	43	49	Nasal Bots	Moder.	Moder.	Light	Moder.	-
Serum Protein	7.5	7.4	7.1	6.6	6.5						

		Number of Parasites Per Deer					Range	Prevalence	Average
<u>Location in Host</u>	<u>Helminths</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>			
Subcutaneous									
Brain	<i>Parelaphostrongylus tenuis</i>	-	-	-	-	1	0-1	20%	0.2
Circulatory									
Lungs	<i>Dictyocaulus viviparus</i>	2	-	-	-	-	0-2	20%	0.4
	Protostrongylid larvae	-	-	+	+	+	-	60%	-
Abdominal Cavity	<i>Setaria yehi</i>	-	-	1	-	-	0-1	20%	0.2
Liver									
Esophagus	<i>Gongylonema pulchrum</i>	18	38	12	18	10	10-38	100%	19.2
Rumen									
Abomasum	<i>Mazamastrongylus purnsglovei</i>	292	952	120	980	326	120-980	100%	534.0
	<i>Ostertagia mossi</i>	208	168	-	-	54	0-208	60%	86.0
APC = 676	<i>Trichostrongylus axkivali</i>	-	-	-	-	280	0-280	20%	56.0

							Range	Prevalence	Average
	<u>Protozoans</u>								
Blood	<i>Theileria cervi</i>	-	-	+	+	+	-	60%	-

Table 2. Results of serologic tests and microbiologic/histologic assays for selected diseases in five white-tailed deer (*Odocoileus virginianus*) collected from Pocosin Lakes National Wildlife Refuge, Washington, Terrell, and Hyde Counties, North Carolina, on August 8-12, 2005.

Disease	Deer Number				
	1	2	3	4	5
<u>Serologic Tests</u>					
Leptospirosis					
(serotype <i>bratislava</i>)	Neg	Neg	Neg	Neg	Neg
(serotype <i>pomona</i>)	Neg	Neg	Neg	Neg	Neg
(serotype <i>hardjo</i>)	Neg	Neg	Neg	Neg	Neg
(serotype <i>grippityphosa</i>)	Neg	Neg	Neg	Neg	Neg
(serotype <i>icterohemorrhagiae</i>)	Neg	Neg	Neg	Neg	Neg
(serotype <i>canicola</i>)	Neg	Neg	Neg	Neg	Neg
Brucellosis	Neg	Neg	Neg	Neg	Neg
Infectious bovine rhinotracheitis (IBR)	Neg	Neg	Neg	Neg	Neg
Bovine virus diarrhea (BVD)	Neg	Neg	Neg	Neg	Neg
Parainfluenza ₃ (PI ₃)	Neg	Neg	Neg	Neg	Neg
Epizootic hemorrhagic disease (EHD)	Neg	Neg	Neg	Neg	Neg
Bluetongue (BT)	Neg	Neg	Neg	Neg	Neg
<u>Microbiologic/Histologic Assays</u>					
Bovine tuberculosis ¹	Neg	Neg	Neg	Neg	Neg
Chronic wasting disease ²	Neg	Neg	Neg	Neg	Neg

¹ Gross and microscopic examination of retropharyngeal lymph nodes.

² Microscopic examination for lesions (H&E) and immunohistochemistry.

Table 3. Lesions and pathologic conditions in five white-tailed deer collected from Pocosin Lakes National Wildlife Refuge, Washington, Terrell, and Hyde Counties, North Carolina, on August 8-12, 2005.

Lesion/Condition	Deer Number				
	1	2	3	4	5
Pleuritis and/or pleural hyperplasia	1	-	-	-	-
Multifocal pneumonia	1	-	1	1	1
Multifocal, interstitial pulmonary fibrosis	-	1	-	-	-
Focal dermatitis	-	-	-	-	3

*Key: - = lesion or condition not present; 1 = minor tissue damage or mild pathologic change; 2 = moderate tissue damage or moderate pathologic change; 3 = extensive tissue damage or marked pathologic change.

INTERPRETIVE COMMENTS: White-tailed deer collected from Pocosin Lakes National Wildlife Refuge, Washington, Terrell, and Hyde Counties, North Carolina, on August 8-12, 2005.

Meningeal worms (*Parelaphostrongylus tenuis*) were present at a low level in one deer, but were not associated with inflammation of the cranial meninges (meningitis). Large lungworms (*Dictyocaulus viviparus*) were present at low numbers in one deer. Protostrongylid larvae, consistent with meningeal worms or muscleworms (*P. andersoni*) were present in three animals and were associated with mild interstitial pneumonia (clinically insignificant). Abomasal parasites (*Mazamastrongylus odocoilei*, *Ostertagia mossi*, *Trichostrongylus axei*) occurred at a moderately low level (APC = 676) indicating that the herd is near nutritional carrying capacity. Gullet worms (*Gongylonema pulcrum*) were present at moderate numbers in all deer, but are not considered important to herd health at the levels encountered. Blood protozoans (*Theileria cervi*) were present in three of the animals but are not considered significant to population health. Ticks, lice and nasal bots were present but at levels below those typical of many deer herds in the Southeast. A single deer had significant perirectal dermatitis due to deeply burrowing ticks, but this is probably an isolated incident not reflective of a significant herd problem. Ear mite infestations were not apparent in any of the animals.

Physical condition ratings, kidney fat indices, and body weights were generally fair with one individual rated as “good”; hematologic values of all deer were near the median values of healthy deer. Serologic tests for antibodies to selected infectious diseases were uniformly negative indicating minimal activity by these diseases within the population; the apparent absence of any herd immunity to EHD and BT viruses indicates the population has high susceptibility to future hemorrhagic disease (HD) activity. Deer populations along the southeastern Atlantic coast typically have very infrequent HD epizootics with low mortality.

An overview is as follows: (1) based on APC data and nutritional indices the herd is probably within the nutritional carrying capacity; (2) the levels of important pathogenic parasites are not at levels sufficient to be of immediate concern; (3) selected viral and bacterial diseases have not had high levels of activity on the area; (4) the overall health status of the herd presently is such that disease-related mortality is probably not occurring to a significant extent at the present time. Our assessment is that continuation of the current herd density will probably not result in any density-dependent decline in the health of the population.