

Deer Herd Health

2939
GFC Deer Collection

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Project Title: Wildlife Disease and Parasite Research

Study Title: Disease and Parasites

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Abstract--Examinations of specimens of sick, diseased, and normal mammals and birds were conducted. No large scale epizootics occurred, but a number of individual cases were investigated in scattered localities. Work continued on a comprehensive book on parasites and diseases of wildlife in Florida. A 2-year study of the health and reproductive status of white-tailed deer in the Big Cypress National Preserve was completed. Two distinct deer herds were examined and found to be different as far as physical condition and parasites and diseases were concerned, but reproduction in general was similar in both. A total of 152 deer was examined during the study.

In order to properly maintain and manage Florida's wildlife resources it is necessary to understand the role that diseases and parasites play and to maintain continuous surveillance on disease outbreaks. To achieve this end, wildlife disease research was continued with the following objectives: (1) Examine moribund, dead, and normal specimens of wildlife in order to monitor the disease situation in various species of wildlife in Florida and to assess the impact and importance of disease occurrences. (2) Prepare a comprehensive book in which the known (published and unpublished) information on diseases and parasites of wildlife in Florida is summarized. (3) Evaluate the health and reproductive status of white-tailed deer in Big Cypress National Preserve.

METHODS

Specimens of dead and dying animals and various samples from wild animals were processed according to standard laboratory procedures in order to determine the cause of death or to obtain certain information on various

parasites and diseases. These procedures included pathological, microbiological, toxicological, and parasitological analyses.

Information on various species of wildlife were collected from published reports, unpublished records and from other sources and compiled into chapters organized from a host standpoint. Rough drafts of chapters were prepared and circulated to various people for their critical comments and suggestions for improvement. Revisions were then prepared where necessary.

Reproductive and health/disease information was obtained from 152 white-tailed deer from Big Cypress National Preserve and nearby Fakahatchee Strand. Of these, 110 were collected over a 2-year period and complete necropsies performed to determine weights, measurements, and condition indices as well as to evaluate lesions, parasitism and APC's. Serological tests were conducted to detect antibodies to a number of viral and bacterial disease agents. Limited information was obtained from another 42 deer (hunter-kills, road-kills, etc.) and tests conducted where possible to obtain some of the types of information indicated above.

RESULTS

During the course of the year, 111 specimens representing 10 species of wildlife were examined for parasites and disease conditions or cause of death. These included black bears (30), raccoons (64), white-tailed deer (4), grey fox (1), grey squirrel (91), wild turkeys (3), great blue heron (1), cardinal (1), sandhill crane (1), and ring-billed gulls (5). Reports on these examinations were given to appropriate personnel in writing and/or by telephone.

Eight chapters for the wildlife disease and parasite book were revised, some extensively with newly discovered information being added. These included chapters on white-tailed deer, wild hogs, squirrels, round-tailed muskrats, rabbits, raccoons, black bears, foxes and coyotes. In addition, a new chapter was prepared on Florida panthers and bobcats. This comprised 40 manuscript pages and included 61 references, 11 tables, 2 figures and 2 line drawings and dealt with trauma, toxicosis and environmental contamination, rabies, parvovirus and other viral infections, bacterial diseases, protozoans, helminths, and arthropods. In all, 41 parasites and infectious disease agents in bobcats and 40 in Florida panthers were discussed. This chapter was difficult to prepare since much of the information was not published and was not easily obtained. A second chapter on manatees was outlined and partially written. In addition, the outline for the entire book was revised and was extended to 33 chapters.

The results of the 2-year health and disease study of white-tailed deer in the Big Cypress National Preserve are presented in the attached document (Appendix A) and serve as a final report for this aspect of a comprehensive study of white-tailed deer in certain areas of south Florida. Data on parasites, diseases, reproductive status and physical condition were collected on 152 deer.

DISCUSSION AND CONCLUSIONS

The activities planned for this segment have been accomplished. This work will continue and is proceeding according to schedule.

Continued examination of sick and diseased wildlife has proved valuable as a system for monitoring the health of various species of wildlife in Florida. No serious or large-scale epizootics occurred during the past year and disease problems identified were fairly routine. Because of public concern over certain parasites of raccoons such as Baylisascaris which are of public health significance, a number of raccoons were examined. None was found infected and at this point it appears that this parasite may be absent from Florida populations of raccoons.

Progress on the parasite/disease book continued. New sources of data were located in the medical and necropsy files of the College of Veterinary Medicine and in the arthropod collections of the Bureau of Plant Industry in Gainesville. Permission was obtained to use this information and it is providing a wealth of new data which will increase the scope and value of the book.

It was concluded that deer in the Bear Island Unit of Big Cypress National Preserve were heavier, larger and in better physical condition than deer from Raccoon Point. A number of other comparisons were made of the two herds and they were found to differ in many aspects. APC's were higher in deer at Raccoon Point indicating that this herd was at the upper level of the range for carrying capacity. There was a highly synchronized breeding season with peak conception rates occurring in late July and early August.

Appendix A. "Health/Disease Study of White-tailed Deer in the Big Cypress"
(July 1, 1984 through June 30, 1986)

Health/Disease Study of White-tailed Deer

in the Big Cypress

(July 1, 1984 through June 30, 1986)

Abstract -- Reproductive and health/disease information was collected from 152 white-tailed deer (Odocoileus virginianus) from the Big Cypress National Preserve and Fakahatchee Strand. Of these 53 were collected from the Bear Island Unit and 57 from the Raccoon Point Area of the Monument Unit by Game Commission biologists. In addition, limited information was obtained from another 42 deer (37 hunter-kills, 3 road-kills, 1 illegal kill and 1 injured deer). These latter deer came from Fakahatchee Strand (18 deer), Stairsteps Unit (10), Bear Island Unit (7), Monument Unit (4) and Loop Road Unit (3). The collected deer were evaluated via examinations for external and internal parasites, lesions, serologic tests for selected infectious disease agents and determination of physical condition (weights, measurements, fat indices, etc.) and reproductive status.

Deer from Bear Island were heavier, larger and in better general physical condition than deer from Raccoon Point. They also had lower APC's and were less parasitized by lungworms, liver flukes, rumen flukes, tapeworm cysticerci, lice and chiggers. On the other hand deer from Bear Island had higher prevalences of bluetongue virus, EHD virus, and several parasites. The data indicated that deer from Raccoon Point were at the upper level of carry capacity, whereas the deer at Bear Island were below carrying capacity. There was a highly synchronized breeding season in BCNP with the peak conception rate taking place in late July and early August. A limited number of does conceived during their first year of life. Overall there was almost no difference in the reproductive rates of deer at Bear Island compared with those at Raccoon Point.

Limited data from deer in the northern Fakahatchee Strand indicated that these deer were at carrying capacity although APC's were at the upper end of this category. Deer in the Stairsteps Unit were also at carrying capacity according to APC's and were entirely free of antibodies to bluetongue and EHD viruses as opposed to findings in other areas of BCNP and Fakahatchee Strand where both viruses are prevalent.

Results of stomach and scat analyses have shown that the Florida panther (Felis concolor coryi) relies fairly heavily on white-tailed deer as a food item (Belden, 1984). Because of this fact, concern has been expressed over the health status of the herds of white-tailed deer which occur in areas containing panthers.

The objective of the present study was to obtain information on the diseases and parasites and general physical and reproductive condition of deer in two areas of the Big Cypress National Preserve (BCNP), i.e. the Bear Island Unit and the Raccoon Point Area of the Monument Unit. In addition, a secondary goal was to obtain similar data (where possible) from other Units within BCNP and nearby localities such as the Fakahatchee Strand. The data were to be collected in such a way as to be directly comparable to similar information obtained from deer in other areas of Florida and the southeast by the Southeastern Cooperative Wildlife Disease Study.

METHODS

During the past two years reproductive and health/disease information was obtained from 152 white-tailed deer from BCNP and nearby localities. One hundred and ten deer were collected from two main areas by personnel of the Florida Game and Fresh Water Fish Commission, i.e. 53 from Bear Island and 57 from Raccoon Point. These collections took place during eight time periods at different seasons of the year (Table 1). Limited data were obtained from another 42 deer (37 hunter-kills, 3 road-kills, 1 illegal kill and 1 injured deer). These latter animals were from the Fakahatchee Strand (18 deer), Stairsteps Unit (10), Bear Island (7), Monument Unit (4), and Loop Road Unit (3) (Table 2).

For the deer collected by Game Commission personnel blood samples were obtained by cardiac puncture soon after death and carcasses were kept on ice until examined at necropsy, usually within 10 hours. After weights and measurements were taken, necropsies were performed as outlined by Nettles (1981). The methods of Stockle et al. (1978) were followed to assess physical

condition. Using this method the amounts of fat on the tail, heart, pericardium and kidneys were estimated on a four-point scale and an overall physical condition value was determined. Values ranged from poor (P) to fair (F) to good (G) to excellent (E) with plus and minus values being utilized. Ages were determined by analysis of tooth development and wear by Game Commission personnel. Abomasal parasite counts (APC's) were determined as outlined by Eve and Kellogg (1977). Serum samples were tested for antibodies to a number of infectious disease agents in several laboratories at the College of Veterinary Medicine (UF), at the Animal Disease Diagnostic Laboratory in Kissimmee, Florida and at the National Animal Disease Laboratory in Ames, Iowa.

The 42 deer obtained as hunter-kills, road-kills, etc. were also processed as outlined above, but in a less complete manner due to the condition of the carcasses or because only certain organs or samples were received.

RESULTS AND DISCUSSION

Physical Condition

The physical characteristics of 53 deer from Bear Island and 57 from Raccoon Point are presented in Tables 3 and 4. In general, deer from Bear Island weighed more than those from Raccoon Point. Indeed, animals in the 2-year-old age class (where the sample size was the largest) at Bear Island averaged 21.9 lbs. more than those from Raccoon Point (Table 5). Data on total lengths (TL) showed a similar trend with 2-year-olds from Bear Island averaging 10.4 cm. longer in TL than those from Raccoon Point (Table 6). When subjective condition values were converted from letter grades to numbers (i.e. P=1, P+=2, F-=3, F=4, F+=5, etc.) and the means calculated for each area it was found that Bear Island deer graded out at 5.1 (G) whereas Raccoon Point deer were

4.2 (F+). Two-year-olds graded as 5.3 (G) and 4.0 (F+) at Bear Island and Raccoon Point respectively.

Reproductive Status

Eighty-two female white-tailed deer were taken from the Bear Island Unit and Raccoon Point Area of the BCNP between August 1984 and June 1986 (Tables 7 and 8). Five of the 40 deer collected at Bear Island were less than or equal to 1 year of age when collected. Another three, although older than 1 year when collected would have been 7-8 months old at the end of the breeding season, thereby leaving 33 females which were old enough for us to assess their reproductive activity. Similarly, eight of the 42 does from Raccoon Point were 1 year old or older when collected and another two would have been 6 months old during the breeding season, leaving 32 does of reproductive age for assessment. An additional eight adult does were collected from the Fakahatchee Conservation Club area and limited information on these animals is given in Table 9. Further analysis of the FCC deer data will not be included in the following discussion.

Twenty-five gravid does were examined, 11 from Bear Island and 14 from Raccoon Point. By back dating from the age of the fetus, the approximate conception date of all does was calculated (Table 10). The timing of conception was tightly synchronized and did not appear to vary either between years or location. Twenty-four of the 25 pregnancies were conceived within the 2-month period starting July 8, and 64% of these occurred within the 30 days following July 22. This tight synchrony of breeding activity would tend to refute the widely held opinion that "fawns are dropped year round" in the Big Cypress region.

When the number of fetuses per pregnant doe was examined there was a striking difference between the two areas. A total of five sets of twins was

found, all in the Bear Island does and none in the Raccoon Point sample (Table 11). What was most peculiar however, was that all twin fetuses were less than 52 days old, and twins accounted for 83% of all BI pregnancies less than 52 days of age. Even though the sample sizes are fairly small (six pregnancies < 52 days; five > 52 days) these data suggest that early selective death occurred to one of the fetuses.

In addition to the pregnancy evaluation, previous reproductive activity can also be assessed by examination of the mammary gland for the presence of milk indicating active suckling, or glandular and nipple development without milk, indicating lactation had occurred previously. Also, field observations can be utilized to determine if does had fawns with them when they were collected. By using such data an additional 18 reproductively active females from Bear Island and 14 from Raccoon Point were identified. Also, two Bear Island and six Raccoon Point does were both pregnant and lactating, thereby allowing us to gain information about two different reproductive seasons from the same doe.

Combining all the above mentioned aspects of reproduction, the age of conception and the percentage pregnancy for each cohort age class is given in Table 12. Both herds had fawns of the year conceiving and bearing young (conception at 5-7 mo.) and both experienced a 75-100% pregnancy rate per age class. The one exception was in the 5+ age class at Bear Island which had a rate of only 33%. The major difference appeared to be in the age structure of the respective doe herds; Raccoon Point had 20% of the sampled animals in the 4 year old and older classes, whereas Bear Island had only 11.8% in these groups.

In Table 13 the reproductive data are given for each site by the month of collection. As previously discussed, the majority of conceptions occurred in

late July and early August, therefore many of the pregnancies were in extremely early stages and could not readily be detected grossly during the August collection period (40% BI, 33%RP compared with 87% later on). The overall pregnancy rate was virtually the same for both areas (73% BI and 71% RP) and the rate after excluding the August does was 87% for both sites.

The most striking difference between the two study areas was reflected in the "reproductive health" of the animals. We have already discussed the early frequency of twinning at Bear Island and its absence at Raccoon Point. Twinning is highly associated with an elevated nutritional plane; the converse is also true. There were four documented cases of reproductive failure at Raccoon Point and none at Bear Island. The cases involved does who had been pregnant and either subsequently resorbed the fetus (i.e. #04) or carried the fetus well into pregnancy and lost it late in pregnancy or in the neonatal period (i.e. #59, #62, and #128). In at least two of these four cases the does were either still lactating or had raised a fawn the previous season.

In order to obtain an accurate picture of the reproductive status of some animals, the uterus, fetus, mammary gland, other necropsy findings, and field observations must be evaluated together. For example, doe #128 from Raccoon Point was a 2-year-old who had a 10-11 month old fawn. Both were in poor physical condition when collected (P+). At necropsy it was found that the uterus of the doe had not yet completely involuted following a recent pregnancy and parturition. This in itself is unremarkable, for early March is the primary fawning period. However, when the mammary glands were examined, they revealed waxy plugs in the ends of her nipples and grey cloudy-watery milk, all of which indicated that normal lactation was not progressing and that in all probability her most recent fawn was lost in late pregnancy or as a neonate. This may have been due to the effects of poor nutrition complicated by

her conception of her first fawn at a young age (7 months) and the stress of caring for a large fawn while pregnant again.

The data on reproduction can be summarized as follows:

1. There was a highly synchronized breeding season in BCNP with peak conception occurring in late July and early August.
2. The onset of breeding activity was identical during the two years of the study, i.e. July 8.
3. A limited number of does conceived during their first year of life with the percentage at Bear Island being slightly higher than at Raccoon Point (29% vs. 13%).
4. There was virtually no difference in the reproductive rate at Bear Island and Raccoon Point. The one possible exception would be the reproductive failures documented only at Raccoon Point.

Parasitism

A number of species of parasites were recovered including ectoparasites (ticks, chiggers, lice and louse flies), rumen flukes (Paramphistomum liorchis), liver flukes (Fascioloides magna), tapeworm cysticerci (probably Taenia omissa, the adults of which are found in Florida panthers), lungworms (Dictyocaulus viviparus), abdominal worms (Setaria yehi), muscleworms (Parelaphostrongylus andersoni), a variety of gastrointestinal nematodes (Haemonchus contortus, Apteragia odocoilei, Cooperia punctata and Oesophagostomum venulosum), nasal bots (Cephenemyia sp.), coccidia (Eimeria mccordocki, Eimeria madisonensis, Eimeria odocoilei and Adelina sp.), blood trypanosomes (Trypanosoma cervi) and sarcocysts (Sarcocystis odocoileocanis). There was no evidence of infection by threadworms (Strongyloides papillosus), meningeal worms (Parelaphostrongylus tenuis) or arterial worms (Elaeophora schneideri).

Arthropods

Three species of ticks were recovered (Table 14) usually in small numbers. All three species have been reported also on Florida panthers in Collier County (Forrester et al., 1985). The most common and abundant tick was the black-legged tick (Ixodes scapularis) which occurred on 21 of the 110 deer collected from BCNP. It was also common on deer from the Fakahatchee Strand although the number of deer examined (6) was small. This tick has been found on deer in 20 other counties in Florida (Smith, 1977). This is a three-host tick. Adults are found most commonly on the head and neck of cattle, horses, deer, dogs, and hogs and larvae and nymphs are found on birds and small mammals. This tick is not important as a vector of disease agents, but may cause tick paralysis and may be a factor in young fawns by causing blood loss, local irritation and secondary infections.

Other arthropod parasites included lice (at least two species), keds (or louse flies), chiggers, and nasal bots (Cephenemyia sp.). The most common and abundant of these were the keds which occurred on 85% of the deer examined at Bear Island and 82% at Raccoon Point (Table 15). Keds and nasal bots occurred in about equal prevalences at both areas, but lice and chiggers were more prevalent on deer from Raccoon Point. Lice are often more common on debilitated animals and the higher prevalences and intensities of lice found on deer from Raccoon Point may be related to the poor condition of these animals as discussed earlier.

Helminths

Ten species of helminths were recovered from the deer in BCNP and Fakahatchee Strand. These included two trematodes, one cestode and seven nematodes.

The rumen fluke (Paramphistomum liorchis) occurred in 83% of the deer examined from Bear Island and Raccoon Point. The prevalence was higher at Raccoon Point (91%) than at Bear Island (74%). This fluke is a common parasite of white-tailed deer in the Southeast (Prestwood et al., 1970) and has been found in deer from ten counties in Florida with prevalences varying from 22 to 65% (Forrester, 1986). The flukes cause inflammation and thickening of the rumen lining, but are considered relatively harmless to deer (Foreyt, 1981).

The giant liver fluke (Fascioloides magna) was present in 62% of the deer from Bear Island and 61% of those from Raccoon Point with mean intensities of 7.0 and 8.3 respectively (Table 16). Details on these infections are found in Tables 17 and 18. Data from a limited number of deer from Stairsteps, Loop Road, Monument Unit and Fakahatchee Strand show that the fluke is present in these areas as well (Tables 19 and 20). Previous studies in Florida have indicated that this parasite is common especially in the southern part of the state (Forrester, 1986). For the most part deer tolerate fluke infections well. It is possible, however, that severe infections can pose a threat to deer when other stress factors such as inclement weather, malnutrition, and other diseases come into play.

Larval cestodes (cysticerci) were found in 6% of the deer from Bear Island and 11% of those from Raccoon Point (Table 21). These are probably Taenia omissa, the adult of which occurs in the small intestine of the Florida panther (Forrester et al., 1985). In the deer the cysticerci were found in the thoracic cavity attached to the mesentery near the sternum and in one case on the pericardium. Their effects on deer are unknown.

The filarial worm (Setaria yehi) was found in the abdominal cavities of three deer from Raccoon Point. Two deer had one worm each and one had two

worms. This nematode can cause fibrinous peritonitis, but it is usually not of much significance (Prestwood and Pursglove, 1977). It has been found in deer in all parts of Florida with an overall prevalence of 28% (Forrester, 1986).

The muscleworm, Parelaphostrongylus andersoni, was found in 38% of the deer from Bear Island and 40% of those from Raccoon Point. Data on prevalences according to season and ages of the deer are given in Tables 22 and 23. Infections appear to be lowest during August and October and in fawns less than one year of age. The adults of this worm are found in the musculature of the hindbody, whereas larval stages are found in the lungs where they can cause serious pulmonary damage (pneumonia) when deer are stressed by predators and other factors (Anderson and Prestwood, 1981). This could be an important disease factor in the deer in BCNP.

The lungworm, Dictyocaulus viviparus, was present in 32% of the deer from Bear Island and 42% of those from Raccoon Point (Table 16). Details on infections in other units of BCNP and the Fakahatchee Strand are given in Tables 17-20. Intensities found varied from 1 to 185 and were probably not at a dangerous level. Because of similarities in life cycles, this parasite is usually accompanied by other related nematodes found in the gastrointestinal tract (i.e. Haemonchus contortus). Localized bronchitis and peribronchitis was seen in deer with low numbers of worms. Adult deer seem to be able to tolerate mild infections, but fawns less than six-months-of-age are often severely affected by dictyocaulosis in association with malnutrition and concomitant gastrointestinal nematode infections (Anderson and Prestwood, 1981). This parasite is potentially a serious pathogen of deer in BCNP. However, with the low numbers seen in this study the problem doesn't seem to be very severe at this time.

Four species of gastrointestinal nematodes were identified in this study. Cooperia punctata and Oesophagostomum venulosum from the small intestine and large intestine respectively were found in a few deer. Of ten deer examined three harbored O. venulosum and one harbored Cooperia punctata in low numbers. Intestinal tracts were not examined from other deer. These parasites are not considered important pathogens of deer in BCNP.

Two species of nematodes were found commonly in the abomasums of deer from both areas, i.e. Apteragia odocoilei and Haemonchus contortus. Combined counts of these two species were used for Abomasal Parasite Counts (APC's). Values for individual deer are given in Tables 17 and 18 for deer from Bear Island and Raccoon Point. In Tables 19 and 20 additional data on APC's are given for smaller numbers of deer from other units in BCNP and from Fakahatchee Strand. Mean values for the seasonal collections made at Bear Island and at Raccoon Point are summarized in Table 24. Following the guidelines of Eve and Kellogg (1977), it could be concluded that deer from Bear Island were below carrying capacity, deer from Stairsteps were at the low end of the optimal carrying capacity level and that the deer at Raccoon Point and Fakahatchee Strand (Northern) were approaching the upper level of the optimal density category. Several young deer from Raccoon Point had numbers of Haemonchus which were dangerously high (Table 18) and which could lead to morbidity and mortality due to haemonchosis. In Table 25 several physical and physiologic values are compared for seven deer with counts of Haemonchus above 1,000. The two deer from Raccoon Point with the highest numbers of Haemonchus were anemic and had PCV and plasma protein values which were below normal. These data indicated that Haemonchus contortus is a pathogen of serious concern and could be responsible for significant morbidity and mortality of fawns and yearlings in BCNP, particularly in the Raccoon Point area. The haemonchosis/malnutrition

syndrome as described by Davidson et al. (1980) may be a disease of importance as well, especially among fawns going through their first winter and being stressed nutritionally. Another feature of interest was the fact that APC's stayed pretty much the same at Raccoon Point, but at Bear Island were lowest in August and increased during the year reaching a high point in June (Table 24). The reasons for these differences are not known, but may be related to nutritional changes or other factors.

Apteragia odocoilei, although of importance in the APC technique, is probably not of serious pathologic significance in BCNP unless it occurs in extremely high numbers.

Five species of coccidia were found in the deer from BCNP. Four of these species are intestinal coccidia. Details of infections in ten deer (six from Bear Island and four from Raccoon Point) are given in Table 26. Adelina is probably of insect origin and represents an accidental infection. Of the other three species (Eimeria mccordocki, E. madisonensis and E. odocoilei), only E. mccordocki had been studied to determine if it is pathogenic. It was found that deer in good physical condition were not harmed by the parasite, but that malnourished and stressed young deer were susceptible to the harmful effects of this parasite (Conlogue and Foreyt, 1984; Abbas and Post, 1980). Under conditions of crowding and nutritional stress this species, therefore, could have a significant impact on deer, especially fawns, at BCNP.

The fifth species of coccidia was Sarcocystis odocoileocanis which occurred in 18% of the deer examined from Bear Island, Racccon Point and Fakahatchee Strand (Table 27). Infections were more prevalent at Bear Island (23%) than at Raccoon Point (8%). This is also a parasite of dogs which serve as the definitive host. Experimental work has shown that this parasite is only mildly pathogenic to deer (Crum et al., 1981).

Feces of each deer were tested with special stains to detect Cryptosporidium infections. None was found.

The blood parasite, Trypanosoma cervi, was found in 98% of the deer that were examined via blood-culture techniques. The mode of transmission of this parasite from deer to deer is unknown, but the vector is suspected to be a horsefly. Nothing is known about the pathological significance of T. cervi to deer (Kingston, 1981).

Viral Diseases

Serologic evidence was obtained that there are five viruses circulating among deer at BCNP (Table 28). These included bluetongue virus (BTV), epizootic hemorrhagic disease virus (EHDV), bovine virus diarrhea virus (BVDV), parainfluenza virus (PI₃) and infectious bovine rhinotracheitis virus (IBRV). BTV and EHDV were the most common and occurred in 81 and 77% of the deer at Bear Island and 21 and 14% of those at Raccoon Point. Details on these infections are given in Tables 29 and 30. These two viruses were absent in deer from Stairsteps and Loop Road, but were common in the Fakahatchee deer (Table 31). In Tables 32 and 33 the prevalences of BTV and EHDV antibodies are given by age classes. Numerous attempts to isolate BT and EHD viruses from deer at BCNP at several seasons of the year were unsuccessful. No acute cases of hemorrhagic disease were seen in any of the deer examined at necropsy, but a number of deer had mild rumen lesions (atrophied papillae) suggestive of chronic disease.

The findings of a few animals with antibodies to BVD virus and IBR virus are probably of little significance. PI₃ virus was more common (21% at Bear Island and 19% at Raccoon Point). This virus is associated with a pneumonia syndrome in calves (shipping fever), but little is known about its significance to deer.

BTV and EHDV, however, are significant pathogens in white-tailed deer and are known to cause large-scale epizootics of hemorrhagic disease in deer in Florida and other parts of the southeastern U.S. (Thomas, 1981). Both viruses are vectored by midges of the genus Culicoides. Cattle are also susceptible to both viruses, although the infections usually are mild. The higher prevalence of antibodies to BTV and EHDV in deer from Bear Island than in deer from Raccoon Point may be related to the presence of range cattle at Bear Island and lack of cattle at Raccoon Point.

Bacterial Diseases

Serum samples from all 110 deer collected from Bear Island and Raccoon Point were tested for antibodies to Brucella abortus (Table 28). All samples were negative. Brucellosis is an important bacterial disease of domestic animals and wildlife (Rhinehart and Fay, 1981), but it is not a problem in white-tailed deer in BCNP.

Abscesses were found in the thoracic cavity of one deer, in the abdominal cavity of three deer, and in the mesenteric lymph nodes of nine deer. One of the nine deer also had abscessed abdominal and inguinal lymph nodes. Five of these abscesses were cultured for bacteria. Four of the five proved to be sterile abscesses and the fifth (an abdominal abscess from a 15-month-old buck from Raccoon Point) was positive from Corynebacterium pyogenes. The significance of these findings is unknown.

Ten deer from Bear Island and two from Raccoon Point were seropositive for Leptospira interrogans (Table 28). Ten of these were serotype canicola, one was pomona and one was grippotyphosa. Positive deer were more prevalent at Bear Island than at Raccoon Point. These infections are not of great concern and probably reflect exposure from other species of wildlife such as skunks, raccoons, opossums, and rodents in which infections are more common.

CONCLUSIONS

Although reproduction appeared to be fairly similar in deer from both Bear Island and Raccoon Point, there were other noteworthy differences. Deer from Bear Island were heavier, larger, and in better general physical condition than deer from Raccoon Point. They also had lower APC's and were less parasitized by lungworms, liver flukes, rumen flukes, tapeworm cysticerci, lice and chiggers. On the other hand deer from Bear Island had more ticks and infections by Sarcocystis, bluetongue virus, EHD virus and Leptospira interrogans. Infections by other disease agents such as keds, nasal bots, musclemoorms and parainfluenza virus were similar in both areas. Other comparisons of the two deer herds are given in Table 34. These data indicate that the deer at Raccoon Point were in poor condition and may have been at the upper end of carrying capacity of the habitat, whereas the deer at Bear Island were in better condition and the population was below carrying capacity.

Limited data from deer in the Fakahatchee Strand and in several other units of BCNP indicated that deer in the northern Fakahatchee and in the Stairsteps Unit of BCNP were at carrying capacity. The apparent absence of BTV and EHDV in the southern part of BCNP (Loop Road and Stairsteps) is of interest. More data are needed from these areas to better understand the health status of these deer in other Units of BCNP.

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Table 1. Numbers of white-tailed deer collected in the Big Cypress National Preserve, 1984-1986.

Date	Area		Total
	Bear Island	Raccoon Point	
August-September, 1984	6	6	12
October, 1984	5	6	11
March, 1985	5	7	12
June, 1985	6	6	12
August, 1985	7	6	13
October, 1985	8	7	15
March, 1986	10	11	21
June, 1986	6	8	14
Total	53	57	110

Table 2. Numbers of white-tailed deer obtained as hunter-kills, road-kills, illegal kills or moribund animals and examined for diseases and parasites (Fakahatchee Strand and Big Cypress National Preserve, 1984-85).

Area	Year		Total
	1984	1985	
<u>Fakahatchee Strand</u>			
Northern	7	8	15
Southern	1	1	2
Western	0	1	1
<u>Bear Island</u>	4	3	7
<u>Monument</u>	3	1	4
<u>Loop Road</u>	2	1	3
<u>Stairsteps</u>	8	2	10
All areas	25	17	42

Table 3. Physical characteristics of 53 white-tailed deer collected on the Bear Island Unit of the Big Cypress National Preserve, 1984-86.

Collection date	Deer no.	Sex	Age	Wt. (lbs.)	Condition value ^a
August-September, 1984	01	F	2.5	90	G-
	02	F	2.5	90	F
	03	F	2.5	107	G+
	06	F	4.5	82	F
	07	F	3.5	94	G-
	08	F	2.5	91	F
October, 1984	13	F	3.5	95	G
	15	F	1.5	78	F+
	16	F	14mo.	64	F
	18	M	1.5	100	F+
	21	F	1.5	96	F+
March, 1985	49	F	1	60	F-
	50	M	4	132	G+
	51	F	3	80	F+
	52	F	6	102	F+
	53	F	2	97	F
June, 1985	64	F	2.5	82	F-
	65	F	3.5	92	G
	66	F	16mo.	70	G-
	71	F	2.25	82	F-
	72	M	1.25	76	F
	73	M	16mo.	88	G
August, 1985	74	F	3.5	91	G
	75	M	5-6mo.	41	P
	76	M	4.5	95	F
	77	F	3.5	81	G
	83	F	3.5	94	G
	85	F	1.5	64	F+
	86	F	6.5	98	G
October, 1985	90	F	2.5	80	G
	91	M	7mo.	60	F-
	92	F	5.5	105	G+
	93	F	2.5	88	G
	95	M	10mo.	68	F
	100	F	5mo.	28	F-
	101	F	2.5	85	G
	102	M	1.5	120	F
March, 1986	119	M	2	95	F
	120	M	2	105	F
	121	M	3	110	F+

Table 3, continued

Collection date	Deer no.	Sex	Age	Wt. (lbs.)	Condition value ^a
March, 1986 (cont.)	122	F	10mo.	43	P
	123	F	2	103	G+
	124	F	2	87	F
	125	F	3	85	F
	126	F	5	82	F+
	127	F	8mo.	75	F+
	137	F	2	92	G+
June, 1986	141	F	2	82	F
	142	F	4-6mo.	37	F
	143	F	4	86	F+
	147	F	4.25	105	G-
	148	F	16-17mo.	87	F+
	150	M	12-13mo.	70	F

^aP=poor, F=fair, G=good, E=excellent. - (minus) and + (plus) denote intermediate values.

Table 4. Physical characteristics of 57 white-tailed deer collected on the Raccoon Point area of the Big Cypress National Preserve, 1984-86.

Collection date	Deer no.	Sex	Age	Wt. (lbs.)	Condition value ^a
August-September, 1984	04	F	4.5 75	F	
	05	F	1.5	66	F
	09	M	1.5	72	F-
	10	F	2.5	71	F-
	11	F	2.5	66	F
	12	F	5.5	78	F
October, 1984	14	F	2.5	64	F-
	17	F	5mo.	24	P
	19	F	1.5	60	F
	20	F	6mo.	50	F-
	22	F	1.5	73	F
	23	M	1.5	75	F
March, 1985	54	F	1-2mo.	20	G
	55	F	2	72	F
	56	M	1	61	F-
	57	M	2	68	F
	58	M	3	73	F
	59	F	5	85	F
	60	F	2	72	F
June, 1985	62	F	2.25	65	F
	63	F	15mo.	56	F
	67	F	3.5	85	F+
	68	M	4mo.	50	F
	69	F	5.5	80	F
	70	F	1.25	48	F-
August, 1985	78	F	2.5	67	F+
	79	M	1.5	70	P+
	80	F	5-6mo.	40	F+
	81	F	2.5	63	F
	82	F	2.5	61	F
	84	F	4.5	75	F+
October, 1985	88	F	7mo.	36	P
	89	F	3.5	75	F+
	94	M	9mo.	47	P+
	96	F	3.5	85	F
	97	F	5.5	83	G+
	98	F	2.5	83	F+
	99	F	1.5	70	G

Table 4, continued

Collection date	Deer no.	Sex	Age	Wt. (lbs.)	Condition value ^a
March, 1986	128	F	2	61	P+
	129	M	10-11mo.	50	P+
	130	M	3	138	E-
	131	M	3	115	G
	132	M	3	118	G
	133	F	5	96	G
	134	F	5	94	F+
	135	F	1	40	P+
	136	M	10mo.	58	P
	138	F	3	74	F
	139	M	2	84	G
June, 1986	140	F	4-6mo.	35	F
	144	F	4.25	71	F+
	145	F	3	56	P
	146	F	4mo.	35	F
	149	M	1.25	85	F
	151	F	4	72	G+
	152	F	2.25	69	F+
	153	F	4.25	84	F

^aP=poor, F=fair, G=good, E=excellent. - (minus) and + (plus) denote intermediate values.

Table 5. Comparison of mean body weights of male and female white-tailed deer from the Bear Island Unit and the Raccoon Point Area of the Big Cypress National Preserve, 1984-86.

Age class	<u>FEMALES</u>						Weight differen (lbs)
	<u>Bear Island</u>			<u>Raccoon Point</u>			
	Mean (lbs)	n	S.D.	Mean (lbs)	n	S.D.	
0-6mo.	32.50	2	4.50	34.00	6	9.92	1.50
6-12mo.	59.00	2	16.00	37.00	1	-	22.00
1 yr.	74.14	7	12.43	59.00	7	11.07	15.10
2 yr.	89.71	14	7.75	67.83	12	5.91	21.90
3 yr.	89.00	8	5.70	75.00	5	10.60	14.00
4 yr.	93.50	2	11.50	75.40	5	4.59	18.50
5 yr.	93.50	2	11.50	86.00	6	6.76	4.12
6 yr.	100.00	2	2.00	-	-	-	-

<u>MALES</u>							
Age class	<u>Bear Island</u>			<u>Raccoon Point</u>			Weight differen (lbs)
	Mean (lbs)	n	S.D.	Mean (lbs)	n	S.D.	
0-6mo.	41.00	1	-	50.00	1	-	9.00
6-12mo.	64.00	2	4.00	51.67	3	4.64	12.33
1 yr.	90.80	5	17.87	72.60	5	7.76	18.20
2 yr.	100.00	2	5.00	76.00	2	8.00	24.00
3 yr.	110.00	1	-	111.00	4	23.65	1.00
4 yr.	113.50	2	18.50	-	-	-	-
5 yr.	--	-	-	-	-	-	-
6 yr.	--	-	-	-	-	-	-

Table 6. Comparison of mean total lengths of male and female white-tailed deer from the Bear Island Unit and the Raccoon Point Area of the Big Cypress National Preserve, 1984-86.

<u>FEMALES</u>							
Age class	<u>Bear Island</u>			<u>Raccoon Point</u>			Total length difference (cm)
	Mean (cm)	n	S.D.	Mean (cm)	n	S.D.	
0-6mo.	108.00	2	3.00	113.00	3	2.16	5.
6-12mo.	131.50	2	11.50	116.50	1	-	15.
1 yr.	138.67	3	7.04	134.63	4	6.96	4.
2 yr.	148.06	8	3.78	137.64	7	3.88	10.
3 yr.	150.50	5	0.89	140.10	5	8.36	10.
4 yr.	148.50	2	5.50	139.75	4	7.08	8.
5 yr.	155.00	2	4.00	150.88	4	3.75	4.
6 yr.	169.00	1	-	-	-	-	-

<u>MALES</u>							
Age class	<u>Bear Island</u>			<u>Raccoon Point</u>			Total length difference (cm)
	Mean (cm)	n	S.D.	Mean (cm)	n	S.D.	
0-6mo.	115.00	1	-	125.00	1	-	-10.
6-12mo.	136.25	2	4.75	125.00	3	2.94	11.
1 yr.	147.63	4	11.34	144.50	2	0.50	3.
2 yr.	154.75	2	11.25	138.00	1	-	16.
3 yr.	159.00	1	-	158.67	3	3.52	0.
4 yr.	147.00	1	-	-	-	-	-
5 yr.	-	-	-	-	-	-	-
6 yr.	-	-	-	-	-	-	-

Table 7. Reproductive data on female white-tailed deer collected from Bear Island Unit of BCNP 1984-86.

Collection date	Deer no.	Age (yrs)	Current repro status				Previous pregnancy		
			Estrus	Preg.	Fetus		Lactating	Fawn	Uterus
					No.	Age			
Aug.-Sept. 1984	01	2.5	ND**	No	-	-	No ²¹	ND	PE
	02	2.5	ND	No	-	-	Yes	4-6mo.	PE
	03	2.5	ND	Yes	2	<37d	No	ND	CE
	06	4.5	ND	No	-	-	Yes	7mo.	PE
	07	3.5	ND	Yes	2	<37d	Yes	ND	CE
	08	2.5	ND	No	-	-	No	ND	PE
Oct. 1984	13	3.5	ND	Yes	1	53-60d	No ²¹	ND	CE
	15	1.5	ND	Yes	1	37d	No ^{8,18}	ND	CE
	16	14mo.	ND	NO	-	-	No ^{8,18}	ND	N
	21	1.5	ND	Yes	1	14wk	No	ND	CE
March, 1985	49	1.0	ND	No	-	-	No	ND	N
	51	3.0	ND	No	-	-	Yes ^{1,10}	ND	R
	52	6.0	ND	No	-	-	Yes	ND	R
	53	2.0	ND	No	-	-	Yes	ND	R
June, 1985	64	2.5	ND	No	-	-	Yes ¹¹	ND	P
	65	3.5	ND	No	-	-	No ¹⁵	ND	P
	66	16mo.	ND	No	-	-	No ²	ND	N
	71	2.25	ND	No	-	-	Yes ^{1,11}	6-7mo.	P
Aug. 1985	74	3.5	Yes	No	-	-	No ²¹	ND	P
	77	3.5	ND	No	-	-	Yes ^{1,14}	ND	P
	83	3.5	ND	Yes	2	<37d	No ²¹	ND	C
	85	1.5	Yes	No	-	-	Yes ^{1,10}	ND	P
	86	6.5	ND	Yes	2	40-52d	No ²¹	ND	C
Oct. 1985	90	2.5	ND	Yes	2	41-44d	No ²¹	4-6mo./#91	C
	92	5.5	ND	No	-	-	ND ^{1,7,19}	ND	E
	93	2.5	ND	Yes	1	11wks	No ⁷	ND	C
	100	5mo.	ND	No	-	-	No	ND	N
	101	2.5	ND	Yes	1	12-13wk	No ¹³	ND	C
March, 1986	122	10mo	ND	No	-	-	No	ND	N
	123	2.0	ND	Yes	1	200 $\pm$ d.	No ¹⁶	ND	C
	124	2.0	ND	No	-	-	Yes ¹⁷	ND	E
	125	3.0	ND	No	-	-	Yes ^{1,10,5,20}	6-12mo/#27	E
	126	5.0	ND	No	-	-	Yes ^{1,10}	ND	N
	127	8mo.	ND	No	-	-	No	(DAM #125)	N
	137	2.0	ND	No	-	-	Yes ^{1,10}	ND	E

Table 7 continued.

Collection date	Deer no.	Age (yrs)	Current repro status				Previous pregnancy		
			Estrus	Preg.	Fetus		Lactating	Fawn	Uter
					No.	Age			
June, 1986	141	2.0	ND	No	-	-	Yes	ND	
	142	4-6mo.	ND	No	-	-	No	ND	
	143	4.0	ND	No	-	-	Yes	ND	
	147	4.25	ND	No	-	-	Yes	ND	
	148	16-17mo.	ND	No	-	-	Yes	ND	

*

Uterus

N - nulliparous (virginal tract)

CP - currently parous (pregnant)

PP - previously parous (enlarged uterus, prominent uterine vessels, thickened broad ligament)

RP - recently parous (flacid uterus, involution not complete, post parturition)

**

ND - not determinable

Lactation notes -

- | | |
|---|---|
| 1 well developed mammary gland | a placenta found in rumen, parturition occurred |
| 2 minimal tissue development | within 1-2 weeks prior |
| 5 gland edematous in subcutaneous tissue | b estimate parturition occurred 2-4 weeks prior |
| 7 large nipples | c estimate parturition occurred 2 weeks prior |
| 8 small undeveloped nipples | d estimate parturition occurred 4 weeks prior |
| 10 abundant milk supply | |
| 11 moderate milk supply | |
| 13 mammary gland dry | |
| 14 small amount of thin, watery fluid | |
| 15 grey cloudy, watery milk | |
| 16 clear or honey colored, waxy/sticky silicone-like material | |
| 17 probably 1st lactation, "young"-small nipples | |
| 18 probably has never lactated | |
| 19 probably previously lactated | |
| 20 recent parturition | |
| 21 developed, involuted mammary gland with large nipples from previous lactation (1,7,19) | |

Table 8. Reproductive data on female white-tailed deer collected from Raccoon Point Area of BCNP, 1984-86.

Collection date	Deer no.	Age (yrs)	Current repro status				Previous pregnancy		
			Estrus	Preg.	Fetus		Lactating	Fawn	Uterus*
					No.	Age			
Aug.-Sept. 1984	04	4.5	ND	Yes			Yes ¹²	ND	CP-AB
	05	1.5	ND	Yes	1	<37d	No	ND	CP
	10	2.5	ND	No	-	-	Yes ³	ND	PP
	11	2.5	ND	No	-	-	Yes	ND	PP
	12	5.5	ND	Yes	1	<37d	No ^{4,6,21}	ND	CP
Oct. 1984	14	2.5	ND	Yes	1	60d	Yes ¹⁰	ND	CP
	17	5mo.	ND	No	-	-	No ^{8,18}	ND	N
	19	1.5	ND	Yes	1	8wk	No ^{8,18}	ND	CP
	20	6mo.	ND	No	-	-	No ^{8,18}	ND	N
	22	1.5	ND	Yes	1	13wk	No	ND	CP
March 1985	54	1-2mo.	ND	No	-	-	No ^{8,18}	ND	N
	55	2.0	ND	No	-	-	Yes ²¹	ND	RP
	59	5.0	ND	No	-	-	No ¹⁶	ND	RP-AB
	60	2.0	ND	Yes	1	23wk	No	ND	CP
June 1985	62	2.25	ND	No	-	-	No ²	ND	RP-AB
	63	15mo.	ND	No	-	-	No ^{8,18}	ND	N
	67	3.5	ND	No	-	-	Yes ¹¹	4mo./#68	PP
	69	5.5	ND	No	-	-	Yes ^{8,18}	ND	PP
	70	1.25	ND	No	-	-	No ^{8,18}	ND	N
Aug. 1985	78	2.5	Yes	No	-	-	No ^{2,8,18}	ND	N
	80	5-6mo.	ND	No	-	-	No ^{8,18}	ND	N
	81	2.5	Yes? ^e	No	-	-	No	ND	PP
	82	2.5	No	No	-	-	Yes ^{1,10}	ND	PP
	84	4.5	ND	Yes	1	45-52d	Yes	w Fawn	CP
Oct. 1985	88	7mo.	ND	No	-	-	No ^{8,18}	ND	N
	89	3.5	ND	Yes	1	13-14wk	No ^{2,7,19}	ND	CP
	96	3.5	ND	Yes	1	11wk	Yes ¹²	ND	CP
	97	5.5	ND	Yes	1	13wk	No ^{13,21}	5-7mo/#94	CP
	98	2.5	ND	Yes	1	10-11wk	No ^{13,21}	w Fawn	CP
	99	1.5	ND	Yes	1	7wk	No	ND	CP
March 1986	128	2.0	ND	No	-	-	No ^{6,9,15,19}	10-11mo/#129	RF-AB
	133	5.0	ND	Yes	1	22-26wk	No ^{13,21}	ND	CP
	134	5.0	ND	No	-	-	Yes ^{1,10}	ND	PP
	135	1.0	ND	No	-	-	No	ND	N
	138	3.0	ND	No	-	-	Yes ^{12,17}	ND	RP ^d

Table 8 continued.

Collection date	Deer no.	Age (yrs)	Current repro status				Previous pregnancy		
			Estrus	Preg.	Fetus		Lactating	Fawn	Ute
June 1986	140	4-6mo.	ND	No	-	-	No	ND	
	144	4.25	ND	No	-	-	Yes ^{4,12}	ND	
	145	3.0	ND	No	-	-	Yes ¹²	ND	
	146	4mo.	ND	No	-	-	No	ND	
	151	4.0	ND	No	-	-	Yes ^{3,12}	ND	
	152	2.25	ND	No	-	-	Yes ^{1,10}	ND	
	153	4.25	ND	No	-	-	Yes ¹	ND	

*

Uterus

N - nulliparous (virginal tract)

CP - currently parous (pregnant)

PP - previously parous (enlarged uterus, prominent uterine vessels, thickened broad ligament)

RP - recently parous (flacid uterus, involution not complete, post parturition)

AB - abnormal findings

**

ND - not determinable

Lactation notes -

- | | |
|--|---|
| ¹ well developed mammary gland
² minimal tissue development
³ poorly developed mammary gland
⁴ gland firm
⁶ large milk cisterns under nipples
⁷ large nipples
⁸ small undeveloped nipples
⁹ end of nipples plugged - not nursing
¹⁰ abundant milk supply
¹¹ moderate milk supply
¹² small amount of milk present
¹³ mammary gland dry
¹⁵ grey cloudy, watery milk
¹⁶ clear of honey colored, waxy/sticky silicone-like material
¹⁷ probably 1st lactation, "young"-small nipples
¹⁸ probably has never lactated | ¹⁹ probably previously lactated
²¹ developed involuted mammary gland with large nipples from previous lactation (1,7,19)
^a uterus slightly distended, possibly pregnant earlier this season
^b uterus flacid and slightly enlarged, possibly been pregnant, probably never lactated
^c uterine involution not complete, suspect fawn is dead (see lactation information)
^d uterine involution complete, possibly first lactation
^e recently ovulated |
|--|---|

Table 9. Reproductive data on eight female white-tailed deer collected by hunters on the Fakahatchee Conservation Club Area, 1984-85.

Collection date	Deer no.	Age (yr)	Pregnant?	Fetuses		Lactating?	Uterus
				No.	Age		
11/84	41	2.5	Yes	1	NA ^a	NA	CP ^b
11/84	43	2.5	Yes	1	NA	NA	CP
11/84	44	1.5	Yes	1	NA	NA	CP
1/85	39	1.5	Yes	1	NA	NA	CP
11/85	103	2.0	No	-	-	Yes	PP ^c
11/85	104	1.5	Yes	1	106 days	No	CP
11/85	105	2.5	Yes	1	106 days	No	CP
12/85	107	2.5	Yes	1	NA	NA	CP

^a NA = information not available

^b CP = currently parous

^c PP = previously parous

Table 10. Conception dates of female white-tailed deer in the BCNP, 1984-85.

Conception date	<u>Bear Island</u>		<u>Raccoon Point</u>		<u>Both</u>	
	N	%	N	%	N	%
July 8-22	2	18	2	14	4	16
July 23 - Aug. 23 ^a	7	64	9	64	16	64
Aug. 24 - Sept. 26	2	18	3	21	5	20

^a This 30 day period was chosen because of tight clustering of conception dates.

Table 11. Comparison of twining rates between white-tailed deer from Bear Island and Raccoon Point (BCNP), 1984-86.

Age of fetus (days)	Bear Island		Raccoon Point	
	No. of does pregnant	% Twins	No. of does pregnant	% Twins
≤ 52	6	83	5	0
> 52 (up to 200)	5	0	9	0

Table 12. A comparison of age of conception and reproductive activity of cohort age classes of female white-tailed deer collected from Bear Island and Raccoon Point (BCNP), 1984-1986.

Age Class (yrs)	Bear Island			Raccoon Point		
	No. PG/exam.	% Fecundity ^a	Herd age structure(%)	No. PG/exam.	% Fecundity	Herd age structure(%)
< 1	2/7	28.6	16.7	1/8	12.5	17.7
1.2-1.7	11/12	91.7	28.6	12/13	92.3	28.9
2.2-2.7	9/11	81.8	26.2	6/8	75.0	17.7
3.2-3.7	6/7	85.7	16.7	7/7	100.0	15.6
4.2-4.7	1/1	100.0	2.4	6/7	85.7	15.6
5.2-5.7	1/3	33.3	7.0	2/2	100.0	4.4
6.2-6.7	1/1	100.0	2.4	0/0	-	-

^a Evidence of conception included fetus in uterus, lactation, and/or fawn at side. All lactating does were assumed to have conceived during the preceding breeding season (July - September).

Table 13. Comparison of reproductive rates of white-tailed deer from Bear Island and Raccoon Point Point (BCNP), 1984-86.

Collection period	Bear Island		Raccoon Point	
	No. examined ^a	% Fecundity ^b	No. examined	% Fecundity
Aug.	10	40	9	33 ^c
Oct.	8	75	8	100
March	8	100	7	71 ^c
June	7	85	8	88 ^c
	33	73	32	71

^a includes all does who would have been $\geq$ 15 mo. by Sept. of the previous breeding season.

^b Fecundity determined by evaluation of pregnancy (Aug. and Oct.) and subsequent lactation (March and June); twins were not taken into account.

^c There are four cases indicative of reproductive failure due to early resorption of the fetus, late term abortion or early neonatal death.

^d Values in () were derived from omitting the August data; it was not possible to visually detect pregnancy in does in early stages.

Table 14. Prevalence of tick infestations on white-tailed deer from Bear Island, Raccoon Point and Fakahatchee Strand, 1984-86.

Area	No. deer examined	Prevalence (%)		
		<u>Ixodes</u> <u>scapularis</u>	<u>Amblyomma</u> <u>maculatum</u>	<u>Ixodes</u> <u>affinis</u>
Bear Island	53	23	4	4
Raccoon Point	57	7	5	0
Fakahatchee Strand	6	83	0	0

Table 15. Prevalence of lice, keds, chiggers and nasal bots from white-tailed deer collected from Bear Island and Raccoon Point, 1984-86.

Arthropod	Prevalence (%)		
	Bear Island (n=52)	Raccoon Point (n=57)	Both areas (n=109)
Lice	6	26	17
Keds	85	82	83
Chiggers	4	23	14
Nasal bots	42	53	48

Table 16. Prevalence and intensity of liver flukes and lungworms in white-tailed deer from Bear Island and Raccoon Point, 1984-86.

Parasite	Bear Island			Raccoon Point		
	(n=52)			(n=57)		
	Prevalence	Intensity ^a		Prevalence	Intensity	
	(%)	Mean	Range	(%)	Mean	Range
Liver flukes ^b	62	7.0	2-26	61	8.3	1-47
Lungworms ^c	32	4.5	1-12	42	17.2	1-185

^a Intensity = no. of parasites per infected deer

^b Fascioloides magna

^c Dictyocaulus viviparus

Table 17. Data on liver flukes, lungworms, and abomasal nematodes of 53 white-tailed deer collected on the Bear Island Unit of the Big Cypress National Preserve, 1984-1986.

Collection date	Deer no.	Sex	Age	No. liver flukes ^a	No. lungworms ^b	APC	
						Total ^c	No. <u>Haemonchus</u>
Aug.-Sept. 1984	01	F	2.5	2	0	113	
	02	F	2.5	5	0	50	
	03	F	2.5	11	0	920	
	06	F	4.5	3	0	300	
	07	F	3.5	5	1	150	
	08	F	2.5	9	0	10	
Oct. 1984	13	F	3.5	5	0	200	
	15	F	1.5	10	3	510	
	16	F	14mo.	0	0	400	
	18	M	1.5	0	1	540	
	21	F	1.5	2	4	160	
Mar. 1985	49	F	1	3	10	1540	
	50	M	4	10	1	240	
	51	F	3	0	3	290	
	52	F	6	3	7	1520	
	53	F	2	2	7	1370	
June 1985	64	F	2.5	0	0	320	
	65	F	3.5	11	0	220	
	66	F	16mo.	0	2	413	
	71	F	2.25	0	0	1273	
	72	M	1.25	0	0	1447	
	73	M	16mo.	2	0	2935	
Aug. 1985	74	F	3.5	2	0	310	
	75	M	5-6mo.	0	0	680	
	76	M	4.5	3	12	1873	
	77	F	3.5	2	0	213	
	83	F	3.5	3	0	307	
	85	F	1.5	6	0	420	
	86	F	6.5	3	0	0	
Oct. 1985	90	F	2.5	6	0	40	
	91	M	7mo.	0	0	933	
	92	F	5.5	2	0	160	
	93	F	2.5	23	2	350	
	95	M	10mo.	0	0	570	
	100	F	5mo.	0	0	934	
	101	F	2.5	9	0	450	
	102	M	1.5	2	7	607	

Table 17, continued.

Collection date	Deer no.	Sex	Age	No. liver flukes ^a	No. lungworms ^b	APC	
						Total ^c	No. <u>Haemonch</u>
Mar. 1986	119	M	2	0	0	147	40
	120	M	2	6	0	80	0
	121	M	3	17	0	390	0
	122	F	10mo.	0	0	1040	873
	123	F	2	0	11	700	87
	124	F	2	0	0	490	30
	125	F	3	14	0	1210	630
	126	F	5	26	0	780	60
	127	F	8mo.	0	0	745	425
	137	F	2	12	0	2130	340
June 1986	141	F	2	0	0	1000	190
	142	F	4-6mo.	0	0	354	307
	143	F	4	6	1	1146	146
	147	F	4.25	6	2	510	320
	148	F	16-17mo.	0	0	420	150
	150	M	12-13mo.	0	3	2170	1200

^a Fascioloides magna

^b Dictyocaulus viviparus

^c Haemonchus contortus and Atperagia odocoilei

Table 18. Data on liver flukes, lungworms, and abomasal nematodes of 57 white-tailed deer collected on the Raccoon Point Area of the Big Cypress National Preserve, 1984-1986.

Collection date	Deer no.	Sex	Age	No. liver flukes ^a	No. lungworms ^b	APC	
						Total ^c	No. Haemonc
Aug.-Sept. 1984	04	F	4.5	9	0	787	56
	05	F	1.5	2	0	ND ^d	--
	09	M	1.5	4	0	1960	85
	10	F	2.5	8	100	1800	78
	11	F	2.5	0	1	2160	15
	12	F	5.5	47	0	790	15
Oct. 1984	14	F	2.5	0	27	180	3
	17	F	5mo.	0	0	350	32
	19	F	1.5	4	7	793	7
	20	F	6mo.	0	0	3093	107
	22	F	1.5	6	0	1200	18
	23	M	1.5	6	7	1580	18
Mar. 1985	54	F	1-2mo.	0	0	0 ^e	
	55	F	2	1	14	2370	6
	56	M	1	4	3	1420	37
	57	M	2	2	9	607	34
	58	M	3	0	8	1010	45
	59	F	5	23	4	20	1
	60	F	2	7	3	1050	10
June 1985	62	F	2.25	0	0	420	21
	63	F	15mo.	0	0	110	2
	67	F	3.5	14	0	987	42
	68	M	4mo.	0	0	260	8
	69	F	5.5	8	0	1053	16
	70	F	1.25	4	27	2927	192
Aug. 1985	78	F	2.5	2	0	590	2
	79	M	1.5	0	3	1010	73
	80	F	5-6mo.	0	1	513	47
	81	F	2.5	10	0	270	11
	82	F	2.5	2	3	547	28
	84	F	4.5	6	1	3340	29
Oct. 1985	88	F	7mo.	0	1	5980	53
	89	F	3.5	4	0	1010	1
	94	M	9mo.	0	1	675	3
	96	F	3.5	2	1	30	
	97	F	5.5	5	0	600	
	98	F	2.5	0	0	1860	4
	99	F	1.5	0	0	1540	3

Table 18 continued.

Collection date	Deer no.	Sex	Age	No. liver flukes ^a	No. lungworms ^b	APC	
						Total ^c	No. <u>Haemonchus</u>
Mar. 1986	128	F	2	6	2	1660	700
	129	M	10-11mo.	0	0	1650	1010
	130	M	3	24	0	570	30
	131	M	3	2	0	440	0
	132	M	3	12	0	570	100
	133	F	5	2	0	250	0
	134	F	5	18	1	1287	314
	135	F	1	0	0	3353	2993
	136	M	10mo.	0	0	1030	820
	138	F	3	4	1	1310	390
	139	M	2	0	0	470	80
June 1986	140	F	4-6mo.	0	0	440	220
	144	F	4.25	4	0	780	270
	145	F	3	0	185	1627	326
	146	F	4mo.	0	0	647	520
	149	M	1.25	2	0	693	13
	151	F	4	12	3	500	10
	152	F	2.25	6	0	1480	170
	153	F	4.25	20	0	887	140

^a Fascioloides magna

^b Dictyocaulus viviparus

^c Haemonchus contortus and Apteragia odocoilei

^d ND = not done; contents of abomasum lost

^e Curdled milk in abomasum; fawn nursing.

Table 19. Data on liver flukes, lungworms, and abomasal nematodes of 15 white-tailed deer from various units within Big Cypress National Preserve, 1984-1985.

Collection date	Deer no.	Sex	Age	Wt. (lbs.)	No. liver flukes ^a	No. lungworms ^b	APC	
							Total ^c	No. <u>Haemonchus</u>
<u>Stairsteps</u>								
11/84	25 ^d	M	>1	NA ^f	8	4	560	10
	26 ^d	M	>1	NA	4	0	1580	30
	27 ^d	M	1.5	91	NE ^g	0	390	20
	33 ^d	M	1.5	NA	NE	2	600	70
	34 ^d	M	2.5	105	7	0	800	113
	35 ^d	M	2.5	NA	NE	1	80	20
	36 ^d	M	1.5	NA	0	0	460	0
							$\bar{X} = 639$	$\bar{X} = 38$
<u>Loop Road</u>								
10/84	37 ^d	M	1.5	NA	2	9	320	0
9/85	87 ^e	F	1.5	63	5	NE	767	160
<u>Monument</u>								
11/84	30 ^d	M	>1	NA	0	3	1013	233
	32 ^d	M	>1	NA	2	NE	160	70
<u>Bear Island</u>								
9/84	24 ^d	M	>1	NA	10	15	1700	510
10/84	28 ^d	M	1.5	107	11	NE	513	93
11/84	29 ^d	M	>1	80	NE	NE	790	210
10/84	31 ^d	M	1.5	79	0	1	NA	—

^a Fascioloides magna

^b Dictyocaulus viviparus

^c Haemonchus contortus and Apteragia odocoilei

^d Hunter-killed deer

^e Moribund deer; collected by GFC personnel

^f NA = not available

^g NE = not examined

Table 20. Data on liver flukes, lungworms, and abomasal nematodes of 14 white-tailed deer from the Fakahatchee Strand, 1984-1985.

Collection date	Deer no.	Sex	Age	Wt. (lbs.)	No. liver flukes ^a	No. lungworms ^b	APC	
							Total ^c	No. <u>Haemonchus</u>
<u>Northern</u>								
11/84	39 ^d	F	1.5	78	11	1	1090	70
	41 ^d	F	2.5	96	NE ^g	NE	610	40
	44 ^d	F	1.5	82	NE	NE	1413	87
	45 ^e	F	>1	98	NE	NE	873	7
							$\bar{X} = 997$	$\bar{X} = 51$
11/84	40 ^d	M	6-8mo.	66	NE	NE	700	220
11/85	103 ^d	F	2	77	NE	0	1180	627
	104 ^d	F	1.5	70	NE	0	1373	360
	105 ^d	F	2.5	85 ^h	NE	1	420	20
	108 ^d	M	2.5	NA	NE	NE	1180	7
	109 ^d	M	2.5	NA	6	NE	2180	640
	110 ^d	NA	2	NA	1	NE	650	20
							$\bar{X} = 1164$	$\bar{X} = 279$
<u>Southern</u>								
12/84	46 ^e	F	3	85	NE	0	267	47
1/85	48 ^f	M	2.5	NA	2	NE	140	0
<u>Western</u>								
2/85	47 ^e	M	1	65	NE	0	953	793

^a Fascioloides magna

^b Dictyocaulus viviparus

^c Haemonchus contortus and Apteragia odocoilei

^d Hunter-killed deer

^e Road-killed deer

^f Illegally-killed deer

^g NE = not examined

^h NA = not available

Table 21. Characteristics of infections by tapeworm larvae (cysticerci) in white-tailed deer collected on the Bear Island Unit and the Raccoon Point Area of the Big Cypress National Preserve, 1984-86.

Area	No. deer examined	No. deer infected	Prevalence (%)	Intensity ^a	
				Mean	Range
Raccoon Point	57	6	11	6.3	1-15
Bear Island	53	3	6	1.0	1
Both areas	110	9	8	4.5	1-15

^a Number of cysticerci per infected deer

Table 22. Prevalence of muscleworms (Parelaphostrongylus andersoni) in various seasons in white-tailed deer from the Bear Island and Raccoon Point Areas of the Big Cypress National Preserve, 1984-86.

Date	<u>Bear Island</u>		<u>Raccoon Point</u>		<u>Both Areas</u>	
	N	Prevalence (%)	N	Prevalence (%)	N	Prevalence (%)
Aug.-Sept. 1984	6	33	6	50	12	42
Oct. 1984	5	20	6	17	11	18
Mar. 1985	5	40	7	71	12	58
June 1985	6	67	6	83	12	75
Aug. 1985	7	14	6	17	13	15
Oct. 1985	8	13	7	14	15	7
Mar. 1986	10	60	11	36	21	48
June 1986	6	50	8	38	14	43
Total	53	38	57	40	110	39

Table 23. Prevalence of muscleworms (Parelaphostrongylus andersoni) in various age classes of white-tailed deer from the Bear Island and Raccoon Point areas of the Big Cypress National Preserve, 1984-86.

Age class (yr.)	Bear Island		Raccoon Point		Both areas	
	N	Prevalence (%)	N	Prevalence (%)	N	Prevalence (%)
Fawns (<1)	7	29	11	0	18	11
1	12	42	12	42	24	42
2	16	31	14	57	30	43
3	9	56	9	56	18	56
4	5	40	5	40	10	40
5	2	50	6	50	8	50
6	2	0	0	--	2	0
All ages	53	38	57	40	110	39

Table 24. Mean APC's for white-tailed deer from the Bear Island Unit and Raccoon Point Area of the Big Cypress National Preserve, compared by season, 1984-1986.

Year	Collection date	<u>Bear Island</u>		<u>Raccoon Point</u>	
		N	APC ^a	N	APC ^a
1984-85	Aug.-Sept. 1984	6	257	5	1499
	Oct. 1984	5	362	4	938
	March 1985	5	992	6	1080
	June 1985	6	1113	5	1095
1985-86	Aug. 1985	6	520	5	1142
	Oct. 1985	5	321	3	1008
	March 1986	8	741	9	1100
	June 1986	5	1049	6	995

^a Means include counts only for animals 1 year of age or older.

Table 25. Physical and physiologic characteristics of seven young white-tailed deer which had counts of Haemonchus contortus above 1,000.

Area	Deer no.	Age (mo.)	Wt. (lbs.)	Total no. <u>Haemonchus</u> present	Condition value ^a	PCV ^b (vol.%)	To pla prot (g/dl)
<u>Bear Island</u>	73	16	88	1,550	G	42	5
	150	12-13	70	1,200	F	38	6
<u>Raccoon Point</u>	20	6	50	1,073	F-	60 ^e	4
	70	15	48	1,927	F-	70 ^e	5
	88	7	36	5,394	P	19 ^d	2
	129	10-11	50	1,010	P+	40	5
	135	12	40	2,993	P+	22 ^d	3

^a G = good; F = fair; P = poor

^b Normal values = 39-58%

^c Normal values = 5.0 - 7.8 g/dl

^d Below normal

^e These high values may have been due to mistreatment of the blood samples before being received in the laboratory.

Table 26. Characteristics of coccidial infections in white-tailed deer collected at the Bear Island Unit and the Raccoon Point Area in Big Cypress National Preserve, 1984-86.

Area	Deer no.	Sex	Age	Collection date	Species of Coccidia
<u>Bear Island</u>	16	F	14mo.	10/84	<u>Eimeria mccordocki</u>
	50	M	4	3/85	<u>E. madisonensis</u>
	53	F	2	3/85	<u>E. madisonensis</u>
	121	M	3	3/86	<u>E. odocoilei</u>
	137	F	2	3/86	<u>E. mccorkocki</u>
	142	F	6mo.	6/86	<u>Adelina-like</u> ^a
<u>Raccoon Point</u>	20	F	6mo.	10/84	<u>E. mccordocki</u>
	56	M	1	3/85	<u>E. mccordocki</u>
	82	F	2.5	8/85	<u>Eimeria sp.</u> ^b
	134	F	5	3/86	<u>E. mccordocki</u>

^a Probably of insect origin and represents a case of spurious parasitism.

^b Oocysts not sporulated and therefore species could not be determined.

Table 27. Prevalence of cysts of Sarcocystis odocoileocanis in tongues of white-tailed deer from Big Cypress National Preserve and Fakahatchee Strand, 1984-1986.

Area	No. deer examined	No. deer positive ^a	Prevalence (%)
Raccoon Point	38	3	8
Bear Island	30	7	23
Fakahatchee	4	3	75
	—	—	—
All areas	72	13	18

^a Diagnosis by examination of histologic sections of tongue.

Table 28. Prevalence of antibodies to infectious disease agents in white-tailed deer from the Bear Island Unit and the Raccoon Point Area of the Big Cypress National Preserve, 1984-86.

Etiologic agent	Bear Island (n=53)		Raccoon Point (n=57)	
	No. pos.	Prevalence (%)	No. pos.	Prevalence (%)
<u>Viruses</u>				
Bluetongue	43	81	12	21
EHD	41	77	8	14
PI ₃	11	21	10	19
BVD	1	2	0	0
IBR	0	0	1	2
<u>Bacteria</u>				
<u>Leptospira interrogans</u>				
<u>canicola</u>	9	17	1	2
<u>pomona</u>	1	2	0	0
<u>grippytyphosa</u>	0	0	1	2
<u>Brucella abortus</u>	0	0	0	0

Table 29. Serologic results on 53 white-tailed deer collected on the Bear Island Unit of the Big Cypress National Preserve, 1984-86.

Collection date	Deer no.	Sex	Age	Bluetongue virus	EHD virus	PI ₃ virus	<u>Leptospira interrogans</u> ^a
Aug.-Sept., 1984	01	F	2.5	+	+	-	-
	02	F	2.5	+	+	-	+ ^b
	03	F	2.5	+	+	-	+ ^b
	06	F	4.5	+	+	+	-
	07	F	3.5	+	+	-	-
	08	F	2.5	+	+	+	+ ^b
Oct., 1984	13	F	3.5	+	+	+	-
	15	F	1.5	+	+	-	-
	16	F	14mo.	+	+	-	-
	18	M	1.5	+	+	-	+ ^b
	21	F	1.5	+	+	-	-
Mar., 1985	49	F	1	+	+	-	-
	50	M	4	+	+	-	-
	51	F	3	+	+	+	-
	52	F	6	+	+	+	-
	53	F	2	+	+	-	-
June, 1985	64	F	2.5	+	+	-	-
	65	F	3.5	+	+	-	-
	66	F	16mo.	+	+	-	-
	71	F	2.25	+	+	-	-
	72	M	1.25	+	+	-	-
	73	M	16mo.	+	+	-	-
Aug., 1985	74	F	3.5	+	+	+	-
	75	M	5-6mo.	-	-	-	-
	76	M	4.5	+	+	-	-
	77	F	3.5	+	+	-	-
	83	F	3.5	+	+	+	-
	85	F	1.5	+	+	+	-
	86	F	6.5	+	+	-	-
Oct., 1985	90	F	2.5	+	+	-	-
	91	M	7mo.	-	-	-	-
	92	F	5.5	+	+	-	-
	93	F	2.5	+	+	-	-
	95	M	10mo.	+	-	-	-
	100	F	5mo.	-	-	+	-
	101	F	2.5	+	+	-	-
	102	M	1.5	+	-	+	-

Table 29 continued.

Collection date	Deer no.	Sex	Age	Bluetongue virus	EHD virus	PI ₃ virus	<u>Leptospira interrogans</u> ^a
March, 1986	119	M	2	-	-	-	-
	120	M	2	+	+	-	+ ^c
	121	M	3	-	-	-	-
	122	F	10mo.	-	-	-	-
	123	F	2	+	+	-	+ ^b
	124	F	2	+	+	-	+ ^b
	125	F	3	+	+	-	-
	126 ^d	F	5	+	+	-	+ ^b
	127	F	8mo.	-	-	-	-
	137	F	2	-	-	+	+ ^b
June, 1986	141	F	2	+	+	-	-
	142	F	4-6mo.	-	-	-	-
	143	F	4	-	-	-	-
	147	F	4.25	+	+	-	+ ^b
	148	F	16-17mo.	-	-	-	-
	150	M	12-13mo.	-	-	-	-

^a All sera were tested against the following serovars: canicola, hardjo, grippotyphosa, icterohemorrhagica, and pomona.

^b Positive against canicola.

^c Positive against pomona.

^d This deer was positive for antibodies against BVD virus.

Table 30. Serologic results on 57 white-tailed deer collected on the Raccoon Point Area of the Big Cypress National Preserve, 1984-86.

Collection date	Deer no.	Sex	Age	Bluetongue virus	EHD virus	PI ₃ virus	<u>Leptospira interrogans</u> ^a
Aug.-Sept., 1984	04	F	4.5	-	-	-	-
	05	F	1.5	-	-	-	-
	09	M	1.5	-	-	-	-
	10	F	2.5	-	-	-	-
	11	F	2.5	-	-	-	-
	12	F	5.5	-	-	-	-
Oct., 1984	14	F	2.5	-	-	-	-
	17	F	5mo.	-	-	-	-
	19	F	1.5	+	+	-	-
	20	F	6mo.	-	-	-	-
	22	F	1.5	-	-	-	-
	23	M	1.5	-	-	-	-
Mar., 1985	54	F	1-2mo.	-	-	-	-
	55	F	2	+	+	-	-
	56	M	1	-	-	-	-
	57	M	2	-	-	-	-
	58	M	3	-	-	-	-
	59	F	5	+	+	-	-
June, 1985	60	F	2	-	-	-	-
	62	F	2.25	-	-	-	-
	63	F	15mo.	-	-	-	-
	67	F	3.5	-	-	-	+
	68	M	4mo.	-	-	-	-
	69	F	5.5	+	+	-	-
Aug., 1985	70	F	1.25	-	-	-	-
	78	F	2.5	-	-	-	-
	79	M	1.5	-	-	-	-
	80	F	5-6mo.	-	-	-	-
	81	F	2.5	-	-	-	-
	82	F	2.5	+	-	-	-
Oct., 1985	84	F	4.5	-	-	-	-
	88	F	7mo.	-	-	-	-
	89	F	3.5	-	-	-	-
	94	M	9mo.	-	-	-	-
	96	F	3.5	+	-	-	-
	97	F	5.5	-	-	-	-
	98	F	2.5	+	-	-	-
	99	F	1.5	-	-	-	-

Table 30 continued.

Collection date	Deer no.	Sex	Age	Bluetongue virus	EHD virus	PI ₃ virus	<u>Leptospira interrogans</u> ^c
Mar., 1986	128	F	2	-	-	-	-
	129	M	10-11mo.	-	-	-	-
	130	M	3	-	-	-	-
	131	M	3	+	+	-	-
	132	M	3	-	-	-	-
	133	F	5	-	-	-	-
	134	F	5	-	-	-	-
	135	F	1	-	-	NT ^c	-
	136	M	10mo.	-	-	-	-
	138	F	3	-	-	-	-
	139	M	2	+	+	-	-
June, 1986	140	F	4-6mo.	+	+	-	-
	144	F	4.25	+	+	-	-
	145	F	3	+	+	-	-
	146	F	4mo.	-	-	-	+ ^d
	149	M	1.25	+	-	-	-
	151	F	4	+	+	-	-
	152	F	2.25	-	-	+	-
	153 ^e	F	4.25	+	+	-	-

^a All sera were tested against the following serovars: canicola, hardjo, grippotyphosa, icterohemorrhagica, and pomona.

^b Positive against grippotyphosa.

^c NT = not tested; serum sample was toxic to tissue culture.

^d Positive against canicola.

^e This deer was positive for antibodies against IBR virus.

Table 31. Prevalence of antibodies to bluetongue and EHD viruses in hunter-killed white-tailed deer from various units within Big Cypress National Preserve and Fakahatchee Strand, 1984-85.

Area	Collection date	Deer no.	Sex	Age	Bluetongue virus	EHD virus
<u>Stairsteps</u> (n=10)	11/84	25	M	>1	-	-
	11/84	26	M	>1	-	-
	11/84	27	M	1.5	-	-
	11/84	33	M	1.5	-	-
	11/84	34	M	2.5	-	-
	11/84	35	M	2.5	-	-
	11/84	36	M	1.5	-	-
	11/84	38	M	NA ^a	-	-
	11/85	112	NA	NA	-	-
	11/85	116	M	NA	-	-
<u>Loop Road</u> (n=2)	10/84	37	M	1.5	-	-
	11/84	111	NA	NA	-	-
<u>Monument</u> (n=4)	11/84	30	M	>1	-	-
	11/84	32	M	>1	-	-
	11/84	113	NA	NA	-	-
	11/84	114	M	NA	-	-
<u>Bear Island</u> (n=6)	10/84	28	M	1.5	+	-
	11/84	29	M	>1	+	+
	10/84	31	M	1.5	-	-
	11/85	115	NA	NA	-	-
	11/85	117	NA	NA	+	+
	11/85	118	NA	NA	+	+
<u>Fakahatchee</u> (northern) (n=8)	11/84	39	F	1.5	+	+
	11/85	103	F	2	+	-
	11/85	104	F	1.5	-	-
	11/85	105	F	2.5	+	-
	11/85	107	F	2.5	+	+
	11/85	108	M	2.5	+	+
	11/85	109	M	2.5	+	+
	11/85	110	NA	2	-	-

^a NA = not available

Table 32. Prevalence of antibodies to bluetongue virus in various age classes of white-tailed deer from the Bear Island and Raccoon Point areas of the Big Cypress National Preserve, 1984-86.

Age class (yr.)	Bear Island		Raccoon Point		Both areas	
	N	Prevalence (%)	N	Prevalence (%)	N	Prevalence (%)
Fawns (<1)	7	14	11	9	18	6
1	12	92	12	17	24	54
2	16	88	14	29	30	60
3	9	89	9	33	18	61
4	5	100	5	20	10	60
5	2	100	6	33	8	50
6	2	100	0	--	2	100
All ages	53	81	57	21	110	50

Table 33. Prevalence of antibodies to EHD virus in various age classes of white-tailed deer from the Bear Island and Raccoon Point areas of the Big Cypress National Preserve, 1984-86.

Age class (yr.)	Bear Island		Raccoon Point		Both areas	
	N	Prevalence (%)	N	Prevalence (%)	N	Prevalence (%)
Fawns (<1)	7	0	11	0	18	0
1	12	83	12	17	24	50
2	16	88	14	14	30	53
3	9	89	9	11	18	50
4	5	100	5	20	10	60
5	2	100	6	33	8	50
6	2	100	0	—	2	100
All ages	53	77	57	14	110	45

Table 34. Comparisons of various features of health and diseases of white-tailed deer in Bear Island and Raccoon Point (BCNP), 1984-86.

Feature	Bear Island	Raccoon Point
1. Weights of 2 year olds	21.9 lbs. > R.P. deer	21.9 lbs. < B.I. deer
2. TL of 2 year olds	10.4 cm. > R.P. deer	10.4 cm. < B.I. deer
3. Condition value	5.1 (Good)	4.2 (Fair +)
4. Conception rates (%) (July 23-Aug. 23)	63	64
5. Twinning rates (%) (up to 52 days after conception)	83	0
6. Fecundity (%)	73	71
7. Prevalence (%) of:		
a. <u>Ixodes scapularis</u>	23	7
b. lice	6	26
c. keds	85	82
d. chiggers	4	23
e. nasal bots	42	53
8. Cysticerci		
a. prevalence (%)	6	11
b. intensity	1.0	6.3
9. Liver flukes		
a. prevalence (%)	62	61
b. intensity	7.0	8.3
10. Rumen flukes prevalence (%)	74	91
11. Lungworms		
a. prevalence(%)	32	42
b. intensity	4.5	17.2
12. Muscleworms		
Prevalence(%)	38	40
13. APC's		
a. Aug.-Sept., 1984	257	1499
b. Aug., 1985	520	1142
14. <u>Sarcocystis</u>		
Prevalence(%)	23	8
15. Prevalence (%) of		
a. Bluetongue virus	81	21
b. EHD virus	77	14
c. <u>Leptospira</u>	19	4