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ABSTRACT--Eighteen individual Florida panthers (Felis concolor coryi) were captured 26 times and 15 were immobilized for the purposes of radio-collaring and collection of biomedical information and/or for removal from the wild for rehabilitation. One hundred and twenty-eight field days resulted in radio-collaring 6 new panthers. Two panthers were hit by cars and survived, one of which was rehabilitated and released to the wild, the other is still receiving treatment in captivity. One additional panther was successfully released back into the Everglades National Park after 11 months in captivity. Five panthers have died since July 1, 1988; human activity is responsible for the majority of all documented panther deaths (road killed 54%, illegally killed 14%). Florida panthers were exposed to feline panleukopenia virus (FPV) (65%) and feline calicivirus (FCV) (43%); the prevalence of FPV was significantly higher in the Fakahatchee Strand/Big Cypress Swamp ecosystem than in the Everglades National Park ($p < 0.05$). However, there was no significant difference in prevalence of FCV by location ($p > 0.05$). Antibodies to 2 new potentially pathogenic viral agents were identified this year -- feline immunodeficiency virus and corona virus. The significance of these viruses in free-ranging panthers is yet to be determined. Preliminary data from the panther/cougar population genetics study reveal that F. concolor has abundant genetic diversity (minimum of 11 polymorphic loci), but F. c. coryi has fewer polymorphic loci than other wild subspecies examined. The results of the genetic study coupled with an increase in abnormal male reproductive traits (>90% abnormal spermatozoa and 47% cryptorchidism) raise serious concern for the reproductive potential and genetic health of this subspecies.

The endangered Florida panther (Felis concolor coryi), declared the state mammal of Florida in 1982, is estimated to number less than 50 individuals (Hines et al. 1987) and currently is protected under both state and federal endangered

species statutes. This remnant population of the subspecies that once occupied the entire southeastern United States is now isolated in the remote cypress swamps and hardwood hammocks of southern Florida, primarily in the Big Cypress Swamp and Everglades ecosystems (Belden 1986). Human population growth in southern Florida with the concomitant loss of suitable panther habitat is the major threat to the continued survival of this rare mammal. A detailed review of the life history and status of the panther is presented in the United States Fish and Wildlife Service recovery plan (USFWS 1987).

Given the critically small population size of this subspecies and the probable decreased genetic diversity, vitality, and lowered disease resistance that often accompanies inbreeding in mammals (O'Brien et al. 1985), the Florida panther is vulnerable to local population catastrophes that could lead to extinction in the wild such as occurred with the black-footed ferret (Mustela nigripes) in Wyoming (Williams et al. 1988). Very little published information exists concerning the basic physiology, reproduction, or disease agents of the Florida panther with the exception of one paper on parasites by Forrester et al. (1985).

In 1978 preliminary research on the diseases and parasites of wild panthers was initiated, and in 1983 this was expanded and intensified to include a study of the medical management, health, and reproductive and genetic status of free-ranging Florida panthers. This collaborative effort between the College of Veterinary Medicine at the University of Florida and the Florida Game and Fresh Water Fish Commission supported a 3-year veterinary residency position in wildlife

medicine from 1983 to 1986 (funded by the GFC). The continuation of the biomedical research since July 1, 1986 has been made possible by the funding of a full time wildlife veterinarian position with the Florida Game and Fresh Water Fish Commission.

This document serves as the Annual Performance Report for both E-1-13 II-E-6 (7506) and the contract "Studies on Certain Health and Reproductive Parameters of the Florida Panther", D.J. Forrester, principal investigator. This contract, covering July 1, 1988 through June 30, 1989 was between the Florida Game and Fresh Water Fish Commission and the Department of Infectious Diseases, College of Veterinary Medicine, University of Florida, Gainesville, Fl.

I wish to acknowledge the effort and support willingly given to this project by my assistants this past year: Stephen H. Parker, my veterinary assistant for the entire field season; Bob Sargent, wildlife graduate who cared for the captive Florida panthers; and veterinary students John Christof and Dena Anderson who assisted in the preparation of field capture supplies, care of captive panthers and various other projects at the Wildlife Research Laboratory in Gainesville.

METHODS AND MATERIALS

Field Capture Season

The main 1988-1989 Florida panther capture season spanned 4 1/2 months, January 1 through May 12, 1989 and entailed a total of 78 days in southwestern Florida and 50 days in the Everglades National Park (ENP). From January 1-20,

January 27-February 4, and May 1-9, 1989 the Florida Game and Fresh Water Fish Commission (GFC) team hunted in the Fakahatchee Strand region, including land in the northern Fakahatchee Strand in and around the proposed USF&WS National Panther Refuge east of SR 29 and north of SR 84, currently owned by Collier Enterprises. This included land referred to as "Fred Barfield's lease", Vernon Roberts land, the Fakahatchee Conservation Club, Catherine and Airplane Islands, and the Ford "Test-Track". From January 23-26 and February 6-March 7, 1989 the GFC team hunted private lands owned by Collier in Gum Swamp and the Noble Ranch lease, plus the Seminole Indian Reservation.

Concurrently, starting January 23, the Big Cypress National Preserve (BCNP) also started conducting panther research. They hunted the land south of SR 84 dividing their time between the Corn Dance, Jetport, Monument, Deep Lake, Loop, and Stair Steps units. They spent approximately 60 days in these areas and overlapped to some degree the Everglades National Park's panther project which ran from March 12-April 30. During any period of concurrent panther hunting, the veterinary medical team stayed in a central location and maintained radio and telephone communication lines with both projects in order to respond to a call for action should one team or the other capture a panther.

Reproductive physiologist Dr. JoGayle Howard from the National Zoological Park participated in the capture of #17 male on January 26 for the purpose of collecting and freezing spermatozoa. In addition she was on hand to process and freeze semen from a male panther that died of trauma following a car accident while she was in Florida.

Field Capture Technique

The primary objective of veterinary involvement on the capture team was to ensure safe handling and proper medical management of panthers during capture efforts. The decision to immobilize a given panther following treeing by dogs was made only after carefully assessing the health status, physical condition, and level of stress experienced by that individual coupled with an evaluation of the ambient temperature, humidity, and other physical conditions that might affect the panther.

A compressed air Vario^R dart rifle (Telinject USA, Inc.) was utilized to immobilize panthers. Lightweight, atraumatic plastic darts were used to deliver ketamine hydrochloride (Ketamine^R 5-10 mg/kg) or Telazol^R (4-6 mg/kg) as the initial immobilizing agent.

Tranquilized panthers were removed from the trees by hand, lowered by a rope, or allowed to fall into a catch-net and cushioned "crash bag". Once a panther was on the ground, vital signs and depth of anesthesia were evaluated. Intravenous (IV) administrations of diazepam (Valium^R 0.06- 0.12mg/kg), Medazolan (Versed^R 1-5 mg/panther), and additional Ketamine and/or xylazine hydrochloride (Rompum^R 0.25- 0.5 mg/kg) were used as needed to maintain an appropriate level of anesthesia to complete the procedure. An intravenous catheter was installed in the cephalic or saphenous vein and fluids were administered continuously.

After stabilization, each panther was given a thorough physical examination which included an evaluation of physical condition (muscling, fat, and hair coat) and reproductive status. Additionally, each animal was weighed, measured (body

and tail length, neck and chest girth, foot pads, and teeth), tattooed, and radio-collared. Dental and foot impressions also were taken when possible. Biological samples were taken and included blood, feces, urine, hair, skin biopsies (for genetic analysis), ectoparasites, and swabs from pharynx, rectum, and vagina. Additionally, all adult males were electro-ejaculated to collect spermatozoa for seminal analysis. Semen was preserved by freezing for future artificial breeding attempts.

Following immobilization, collaring, and collection of biological data and samples, panthers were placed in a nylon mesh tent and held until fully recovered. For further details of the methods used in the capture and immobilization of panthers and the procurement of biological samples, please refer to Roelke et al. (1985).

Clinical Pathology Analysis

Four different clinical laboratories were utilized this year depending on the proximity to our field location. These included Diagnostic Services Inc. in Naples, FL; James Archer Smith Hospital laboratory, in Homestead, FL; Consulab in Miami, FL; and the Veterinary Medical Teaching Hospital laboratory (VMTH) in Gainesville, FL. In many cases duplicate samples were shipped to one of 2 labs to validate the results that were being obtained from the human hospital laboratories. In these cases the VMTH was used as the veterinary standard.

Sero-survey of Infectious disease agents

Serum samples from panthers were submitted to Dr. Fred Scott of the Feline Health Center at Cornell University in Ithaca, New York to be tested for

antibodies against 6 feline infectious disease agents: feline panleukopenia (FPL), feline calicivirus (FCV), feline rhinotracheitis virus (FVR), feline infectious peritonitis (FIP), feline leukemia virus (FeLV), and Toxoplasma gondii. Dr. Margaret Barr of Cornell University screened for feline immunodeficiency virus (FIV). Dr. Jim Everman of Washington State University assayed for FIP/corona virus. Dr. Nicoletti of the College of Veterinary Medicine in Gainesville screened the panther sera for antibodies to Brucella spp., and Dr. Gene Pirtle of the National Animal Disease Laboratory, U.S. Department of Agriculture in Ames, Iowa tested them for pseudorabies virus antibodies.

Fifty blood samples have been collected from 17 male and 15 female wild panthers since 1978. These samples were collected from panthers either live-captured and immobilized for radio-instrumenting purposes (N = 24), road-killed (N = 7), illegally killed (N = 2), killed during immobilization (N = 1), or killed by interspecific aggression (N = 1). Some individuals were sampled as live animals and again at necropsy. Thirteen bled as live-captured animals were subsequently resampled; 12 as live re-captures (N=15), 2 of which were later sampled as road-kills, and 1 as a victim of aggression/cannibalism.

Genetic Analysis

Blood and tissue samples for genetic analysis were obtained from every Florida panther immobilized this year. The blood samples were processed and frozen for later analysis while the skin biopsies for fibroblast tissue culture were shipped by overnight air service to the National Cancer Institute.

Blood and tissue samples were collected from several western subspecies of wild cougar for inclusion in the Florida panther/cougar population genetics research. Included were 10 SW Colorado Mt. Lions (F. c. *hippolestes*), 13 SW Oregon Cougars (F. c. *oregonensis/californica*), 5 NE Oregon Cougar (F. c. *missoulensis*), 4 California Cougars (F. c. *californica*), 12 Arizona Mt. Lions (F. c. *browni/azteca/kaibab-ensis*), 2 Utah Mt. Lions (F. c. *kaibabensis*), and 22 west Texas panthers (F. c. *stanleyana*).

Additionally, samples from 21 cougars held in various zoological institutions and in private ownership have been collected for genetic evaluation. Eight of the captives are alleged to have descended from wild Florida panthers captured in the 1940's in the Devil's Garden area east of Immokolee, Florida.

The genetic analysis was initiated in August, 1986 at the Laboratory of Viral Carcinogenetics of the National Cancer Institute in Frederick, Maryland. Isozyme extracts of red blood cells, leukocytes, and plasma were subjected to electrophoresis using starch or acrylamide gels. Histochemical and protein stains were used to identify enzymes of approximately 46-50 different loci. Polymorphic loci (genes) were identified as variants of electrophoretic mobility.

Post Mortem Analysis

Five dead Florida panther specimens were examined this year. When decomposition was not advanced, they were subjected to a complete post mortem examination, including gross and microscopic examination of tissues, serology, bacteriology, parasitology, and radiography. When the carcass was very fresh, attempts were made to collect and preserve living spermatozoa and skin. Hides

and skeletal remains were deposited in the Florida Museum of Natural History (FMNH). Dr. Maples of the FMNH, a forensic pathologist, was consulted when the cause of death was not obvious or if we suspected some illegal activity.

RESULTS AND DISCUSSION

MEDICAL MANAGEMENT OF WILD FLORIDA PANTHERS

Field Capture of Free-Living Panthers

During 1988-89, 18 panthers were captured 26 times (Table 1). Fifteen of these captures culminated in successful field immobilizations. These resulted in the radio-collaring of 6 new panthers: 1 sub-adult male in the Ft. Myers/Corkscrew Swamp region (#28M originally hit by a car and rehabilitated), 2 juvenile offspring (#29M & #30M) of 2 radio-collared females (#11 & #19 respectively) in the Bear Island Unit of the BCNP, 2 adult females (#31F & #32F) west of SR 29 on Florida Panther National Wildlife Refuge), both of which were pregnant, and 1 young adult male in the Stair Steeps Unit of the BCNP (#33M).

As of 30 June 1988, 18 Florida panthers were involved in this study. Three animals were being held in captivity and 15 radio-instrumented, free-ranging panthers were being monitored; 10 in southwestern Florida and 5 in the Everglades National Park. During the past year, 3 wild (#20M, #24M, #25M) and 1 captive (#08F) radio-collared panthers died, 1 was removed from the wild due to injuries (#21), 1 has been lost to the study (#22F- either dead or radio failure), and 1 who was in captivity was returned to the wild (#23F). Therefore, with the addition of the 6 new panthers captured and radio-collared as of June 30, 1989

we currently have 19 panthers in the study, 2 in captivity, 13 in southwestern Florida, and 4 in the Everglades National Park.

Rescue, Rehabilitation, and Release of Injured Wild Panthers

Four panthers were rescued from the wild this past year. Rehabilitation was attempted on all, and thus far 2 have been returned to the wild. Florida panther #23F was most recently captured and removed from the wild June 22, 1988 after becoming stranded on an island in Shark River Slough in the ENP due to high water (see Roelke 1988 for full history). She was held in captivity until the following spring (February 23, 1989) and released when the capture team was working and could have responded to an emergency rescue if necessary. Prior to her return to the ENP, while at White Oak Plantation, she was fed whole dead deer which she "processed" like a wild panther; plucking hair, removal of the viscera from the carcass, and covering the body after she had eaten. Since her release she has spent the majority of her time in the mangroves and along the prairie/mangrove edges in the ENP. When treed 8 weeks after her release, she appeared to be in good physical condition and apparently is surviving primarily on a diet of raccoon (O. Bass, pers. comm.)

Florida panther #28M was struck by a vehicle in late November, 1988 near the Ft. Myers Intl. Airport and suffered a severely fractured scapula and head trauma. He was transported to the Veterinary Medical College in Gainesville for treatment. His fractures healed rapidly due to his young age (est. 18 mos.). He was released back to the wild on March 15, 1989 and to date appears to be behaving and traveling normally.

Two additional panthers were rescued this year after being hit by cars. One is still under medical treatment, and the other died from severe trauma. The first, #21F, was struck by a car on Palm Drive east of Florida City on July 23, 1988. Initially evacuated to the Metro Miami Zoo for treatment and stabilization, she was transported by air to the College of Veterinary Medicine at Gainesville for surgical repair of a fractured femur. Her internal fixation plate was removed June 7, 1989 and it is expected that she will be able to move to White Oak Plantation by late summer to start rehabilitation of muscle mass and bone strength. She could potentially be returned to the wild by early winter.

One additional young adult male, not collared, was struck by a vehicle on January 25, 1989 on SR 850 north of Corkscrew Swamp Sanctuary NW of Immokalee and incurred severe chest trauma with pneumothorax. After initial stabilization and treatment for shock, he was transported via helicopter to Gainesville to the Veterinary College for treatment. After an initial encouraging response he went into acute respiratory and cardiac collapse and died of a "shock lung" approximately 12 hrs after his initial capture.

Necropsy Findings of Dead Panthers

Four radio-collared panthers died during the past year; 3 were attributable to diseased states (1 probably congenital, 1 a septicemic sequela to fight wounds) and the fourth was undeterminable (nothing but hair and bones were collected).

Panther #20M was struck by a vehicle pavement early in the summer of 1987. He suffered abrasions and sloughing of skin over his carpus and forearm. While in captivity undergoing treatment, a pronounced cardiac murmur was diagnosed.

Cardiologists performed ultrasound and an EKG and felt that the murmur was probably due to a valvular or septal defect, congenital in origin, and that it could limit his life span. Once released, this panther apparently lived a normal life and is believed to have sired a litter (D. Maehr, GFC, pers. comm.). One year after his return to the wild he died.

At necropsy, pathologists found a 1 cm defect in the wall between the two atria of #20M's heart. Although the heart did not have an abnormal shape, changes in his lungs were supportive of a vascular flow problem, and it is felt that the heart defect contributed to his death. Additionally, he had severely damaged his canines on the concrete while in captivity, and that may have contributed to a poorer ability to catch and/or kill prey and could have contributed to the pronounced weight loss noted from his release to his death (138 lbs. down to 105 lbs.)

Panther #08F was estimated to be 13-15 years old at her death on August 20, 1989. She had been removed from the wild on April 13, 1987 due to poor health in hopes that in captivity she could contribute to the captive breeding effort (see Roelke 1987 for complete history). Her physical condition had improved markedly while she was in captivity, and her death occurred suddenly following only 4 days of inappetence and depression.

At necropsy, the pathologists determined that she died of a multi-systemic failure with renal (kidney) and hepatic (liver) involvement the most pronounced. However, they also discovered that she had a markedly enlarged thyroid gland. Initially, it was thought that it could have been a goiter (iodine deficiency),

however, the histopathology determined that she had an adenomatous hyperplasia of the thyroid glands. This condition has only recently (early 1970s) been documented in the domestic cat and has been suggested to be related to commercial cat foods. Obviously, this wild panther has a dramatically different diet than most domestic cats, and an investigation of her condition might shed light on the syndrome.

By utilizing serum banked from this female 6 weeks prior to death, we were able to confirm that at her thyroid hormone levels were at least double the established normal levels for the domestic cat. Further, control samples submitted at the same time revealed that her thyroid hormone level was also at least twice as high as "normal" wild Florida panthers. By expanding the study to include serum banked since the first time she was handled in 1984, plus samples from every other wild panther sampled, we have determined that her thyroid function was abnormal the day she was removed from the wild and was not a consequence of her stay in captivity (Table 2). The significance of these findings as it relates to her poor physical condition in the wild as well as her lack of reproductive performance during the 4 years we monitored her is yet to be determined.

Physical Condition and Body Weights of Wild Florida Panthers

After handling a number of live-captured panthers and a few well-preserved dead ones over the past 4 years, it became apparent there was a discrepancy in the physical condition between sexes and between animals of the same sex collected in different locations. A detailed analysis of this phenomenon led to the

conclusion that panthers occupying land north of Alligator Alley are heavier, in better physical condition, and have more normal hematological values than those panthers occupying the southern Fakahatchee strand (Roelke et al., 1985).

For the past 3 capture seasons we have concentrated our capture efforts on the private lands north of SR 84 (Alligator Alley) and in the Everglades National Park. Tables 3, 4, 5, and 6 summarize the capture data and compared body weight, physical condition, reproductive traits, and select hematology values between various capture locations (FY 88/89, all males, all females, and subadults, respectively).

Of the various areas where the GFC has captured panthers since 1981, the private ranches east of Immokalee, owned by ALICO Inc. and Collier Enterprise, Inc., continue to yield the largest and healthiest Florida panthers. Males in these areas weigh > 140 lbs. and the females weighed 85 and 100 lbs. with packed cell volumes (red cells) of > 45%. Bear Island and the northern Fakahatchee strand support panthers in moderate-to-good condition with body weights ranging from 120-135 lbs. for males and 90-100 lbs. for females and PCV's ranging from 34-45%. ENP panthers are faring better than those in the FSSP. The 2 adult ENP females weigh 71-85 lbs. with PCV's of 33-36% while the FSSP females weigh only 66-77 lbs. and have PCV's of 25-34%.

In addition to the ALICO and Collier properties mentioned above, the land just north of the Bear Island Unit (BCNP) and east of Sunniland appears to be another area very favorable for panthers. Florida panther #11 is currently raising her second litter there since 1986. Female #19 (#11's 1986 offspring)

has been living in this area since she was approximately 2 months old. Her body weight at different ages was compared to other sub-adult panthers (Table 6). Her weight at 18 mos. was greater than any of the 3 ENP females by 10-20 lbs., even though 2 of them were a year older. In the fall of 1988, D. Maehr documented 4 kittens at approximately 4 months of age indicating that she conceived at 19 months of age. Further, 1 of her collared offspring (#30M) dispersed when he was only 13 months of age. When #19 was recaptured late this spring at 36 months of age, she was 3 weeks pregnant with her second litter. This 17 month pregnancy interval is quite short for cougars and the increased body weight and good health observed in this female may be responsible for the early sexual maturation documented in this cat.

The most plausible explanation for the discrepancy in health between panthers living in different localities continues to be their plane of nutrition determined by the abundance of the available prey base (Roelke 1986).

Hematology and Serum Chemistry

The complete blood count (CBC) provides information about the two major cell types in the circulatory system, the red cells (erythrocytes) and the white cells (leukocytes). An analysis of the red cells, or hemogram, can detect the presence or absence of anemia by evaluation of the total number of erythrocytes, the hemoglobin level, the packed cell volume (expressed as the percentage of cellular elements in whole blood) and the size and shape of the individual erythrocytes. The packed cell volume (PCV) can be used by itself as an indicator of anemia,

however, hemoglobin, total erythrocyte count, and the PCV are interrelated and generally will all elevate or decline together.

An analysis of the white cells, or leucogram, supplies information relevant to cases of systemic inflammation, stress, infection, certain parasitic diseases or immune suppression. This is accomplished by considering both the total number of leukocytes as well as the distribution and type of cells present.

Tables 7 to 21 display the hematology results and Tables 22 to 36 contain serum chemistry results for all panthers captured this season. The tables also include blood values from previous years for those animals. In many cases there are multiple test results for the same date. This is because either the samples were taken at different times during the anesthetic procedure and the effects of time and drugs were being evaluated, or duplicate samples were sent to different laboratories to validate the results. A detailed analysis of these data will be included in the final report.

INFECTIOUS AND PARASITIC DISEASE RESEARCH-FLORIDA PANTHER

Sero-epidemiology Research

Seventy-six serum samples obtained from 41 wild Florida panthers collected between 1978 and 1989 were screened serologically for 8 infectious disease agents known to be important to felidae and/or reported previously as endemic to other wildlife species in Florida. A summary of the disease agents, serologic test methods, source and type of antigens used, number of samples tested, positive antibody thresholds, and references for the detailed test procedure is presented in Tables 37 and 38. Tables 39 and 40 summarize all the serologic data.

A. Feline Panleukopenia Virus

One of the most potentially significant documented infectious disease agents to which the panthers are exposed is feline panleukopenia (Table 39). Antibodies to this virus, or a closely related parvovirus, were detected in the serum from 27 (65%) of 41 different panthers. There had been no previous reports of the occurrence of this virus in free-ranging cougar populations.

Feline panleukopenia virus (FPL), a parvovirus, also known as feline distemper, is a highly contagious, devastating viral disease primarily involving domestic cats causing mortality chiefly in immunologically naive adults and young kittens. All members of the family Felidae are considered susceptible and definitive diagnoses have been made in several species of non-domestic felids. Of notable importance is the occurrence of the disease in captive cougars and wild bobcats (Felis rufus) in Florida (Bittle 1981; Wallach and Boever 1983; Wassmer 1982). Other susceptible wild carnivores which occupy the same habitat as the Florida panther and could serve as reservoir hosts for parvovirus are the raccoon, feral cat, otter, and mink (Roelke et al. 1985).

Infection usually occurs by ingestion or inhalation of virus in feces, vomitus, or urine from infected individuals. The virus is extremely hardy and can survive for more than 1 year at room temperature. Therefore, in addition to direct contact with a shedding individual, habitat contamination could be a very plausible "reservoir" source of the virus.

To date no panther deaths have been attributed to panleukopenia virus. This does not diminish the potential importance of this virus to the panther

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population. Until recently the majority of the animals we have sampled were "post exposure", antibody positive, surviving adults. The group of panthers we are most concerned about are the sero-negative animals, particularly the kittens and juveniles. Many factors, including the immune status, innate genetic resilience to disease, nutritional status, and other concurrent infections, act in concert within the individual to influence the outcome of an exposure to FPL. For a detailed discussion of this disease entity, refer to Roelke et al. (1985).

With the accumulation of serology data, it has become apparent that panthers in the Fakahatchee Strand and Big Cypress Swamp (FS/BCS) physiographic area are exposed to FPL to a greater degree than panthers in the Everglades National Park (ENP). To date, 21 of 26 (81%) panthers that inhabit the FS/BCS have tested seropositive for FPL compared to only 3 of 7 (43%) panthers from the ENP (see Roelke 1988 for statistical details and environmental epidemiology hypotheses).

B. Feline Calicivirus

Florida panthers are exposed to another potentially pathogenic feline virus, feline calicivirus (FCV). This is primarily an upper respiratory virus and is usually quite mild. However, certain strains can cause severe oral lesions, pneumonia, and death. Eighteen (44%) of 41 panthers had antibodies to this virus (Table 39). Recovered animals can harbor and shed the virus for considerable time, however, unlike FPL it does not survive outside the animal host and must rely on close physical contact with saliva and aerosolized respiratory fluids for transmission to occur.

There was no significant difference in the prevalence of FCV between the major geographic areas or the age or sex of the panthers. This diffuse presence of the virus throughout the panther population without regard to age and sex supports the same route of transmission that occurs in domestic cats from mother to offspring and not from the environment. The significance of this virus to Florida panthers is unknown at this time.

C. Pseudorabies Virus

Pseudorabies (PRV) is an infectious, viral disease that infects the central nervous system of many mammals (Trainer 1981) and has been demonstrated to cause mortality in 100% of experimentally infected domestic cats (Horpath and Papp 1967). All naturally infected cats showing clinical signs invariably die, usually before any immune response can be detected (Pedersen 1986). Therefore, the fact that all the panthers were sero-negative could indicate that those individuals had never encountered the virus and not that the virus was absent in their environment (Table 39)(see Roelke 1988 for detailed discussion of this disease entity).

INFECTIOUS DISEASE RESEARCH-SMALL CARNIVORE

The bobcat is susceptible to the same disease agents as the Florida panther, and, because it is much more abundant than the panther, it can serve as a very useful "sentinel" to indicate the presence and prevalence of certain infectious diseases and possibly detect the entry of a new one. However, no bobcat samples were obtained this year, so no comment can be made about current trends within

that population as it may relate to the panther (see Roelke 1988 for a discussion of our findings to date).

REPRODUCTION AND GENETICS RESEARCH

Male Reproduction

Four male panthers greater than 18 months of age were captured this past field season. All were electro-ejaculated in order to obtain semen for evaluation. Preliminary results indicate that all the males were similar to those previously examined and exhibit an exceedingly high proportion of abnormal sperm forms (>90%), with the major defect involving the acrosome or head of the spermatozoa.

In addition to the seminal defects the Florida panther exhibits, the males also suffer from a high rate of cryptorchidism where one testicle does not descend properly into the scrotum. Thus far, 8 of 19 (47%) males examined since 1984 have expressed this trait. In 2 necropsied specimens (#04 & #20), the retained testicle was located just outside of the abdominal cavity, within the inguinal canal. Retained testicles are generally atrophied and sterile, as both of these were, due to the high body temperature. In the domestic cat this trait is known to be genetically controlled, recessive, and passed on by the female. The fact that this trait is apparently so prevalent is highly suggestive of an inbred population.

More males must be examined to determine if the observed prevalence of the cryptorchid trait is typical of the population. If this trait and the high

abnormal sperm count are occurring in the population at the observed rate, the implications to the panther population may be great. In the cheetah, the high percentage of abnormal sperm is related to a high degree of monomorphism in the genetic makeup of that species (O'Brien et al. 1983). This apparent inbreeding in the cheetah is associated with increased neonatal mortality and an increased susceptibility to diseases (O'Brien et al. 1985).

Given the very small effective breeding population of the Florida panther, every opportunity should be made to retain as much genetic material as possible. One way to augment this is to bank (freeze) gametes and embryos for future artificial breeding research. This year we were able to freeze semen from 2 of the free-ranging males, #33, a sub-adult (est. 2-2.5 yrs), and VMTH 65185, a 3-4 year old male (testicles collected at necropsy). An attempt was made to collect and freeze sperm for #17M, but he was essentially sterile and the quality of the few sperm that were present was so poor that the sperm would not have survived freezing.

Unfortunately, it seems that many of the males do not survive until their re-collaring date, and valuable genetic and reproductive material is lost with each dead panther. The mean survival time post radio-collaring is 22.9 months, and our current re-capture interval is 24 months. Of the last 10 adult males instrumented, 6 have died prior to their re-collaring date and before any semen could be archived. We should move to a 12-month recapture interval for all new males in order to adequately bank their sperm should they not survive the "normal" re-collar interval.

Population Genetics Study

The remnant population of Florida panthers existing in the remote cypress swamps of south Florida are vulnerable to catastrophes such as disease or hurricanes that could drive the subspecies to extinction. But even if they survive at their current population level, they are apt to become compromised due to a loss of genetic diversity and heterozygosity. In order to retain at least 99% of the initial genetic diversity over 100 generations, it has been estimated for a finite population of large carnivores that there must be at least 300 individual animals maintained (Thomas Fosse, pers. comm.). Therefore, with even the most optimal breeding strategy for the 30-50 living Florida panthers, the potential for loss of genetic diversity over a relatively short time is great.

There are numerous morphologic indicators that suggest that the Florida panther has already experienced a fair degree of inbreeding and concomitant genetic loss. These include the peculiar "kinked-tail" and cowlick traits so prevalent in the Big Cypress Swamp population (Belden and Wilkins, manuscript in preparation); the extremely high abnormal sperm count with the predominance of primary defects (Roelke et al. 1986); the genetically controlled cryptorchid trait displayed in 9 of 19 males; and the finding of a congenital heart defect in one male (this may be a genetic trait).

Before informed management decisions can be made with regard to maintenance of existing heterozygosity or perhaps the introduction of new genetic material from another cougar population, a data base must be established. We need to

determine the current genetic status of F. c. coryi and compare it to other free-ranging, presumably heterogenic populations.

This study was initiated in the fall of 1986, and thus far blood samples from 82 different individual cougars and panthers have been subjected to the rigors of isozyme electrophoretic techniques. Most of the laboratory work is completed for 41 of 50 different loci. Those that are incomplete are either unresolved suspect polymorphic loci or ones where the established feline protocol would not work for the puma and now must be adapted and rerun.

The species, F. concolor, appears to have abundant biochemical genetic variation compared to the other great cats. A minimum of 11 polymorphic loci, or 26.8%, have been detected to date. This is high for the cat family and is rivaling the domestic cat for diversity. If the unfinished complement of 50 loci (Dr. O'Briens' standard profile at NCI) are all monomorphic, the cougar would still have 22% of its loci polymorphic. By comparison, the published values for lions (Panthera leo) are 12% (Newman et al. 1985) to 14%-15.2% (O'Brien et al. 1987); cheetah (Acinonyx jubatus), 0.0%; tiger (Panthera tigris), 10%; leopard (Panthera pardus), 8%; and ocelot (Leopardus pardalis), 20.8% (Newman et al. 1985).

If each wild subspecies of cougar is examined separately, the percent polymorphism is considerably lower than for the species as a whole. Of those populations represented by 6 or more individuals, the Florida panther exhibits the fewest polymorphic loci with 7.5% followed by Texas cougars with 10% and Arizona cougars with 17%. The captive zoo population has the highest percentage

of polymorphic loci of all the groups at 22.5% (hybrid subspecies soup!). Heterozygosity levels follow a similar pattern with Florida cats the lowest at 0.019 and Arizona cats the highest at 0.069 (see Roelke 1988 for more complete information).

FLORIDA PANTHER LONGEVITY AND MORTALITY

Radio-Collaring of Panthers

The radio-instrumenting of wild Florida panthers started in 1981. Since that time considerable attention has been given to the safety and relative merits of the radio-collaring project in the popular press. It is hoped that the following data will help address many of the questions regarding panther mortality and alleged problems associated with collaring.

A total of 34 individual panthers have been captured and collared in the past seven years; 19 of these are still alive today (Table 41). These panthers have been captured and immobilized a total of 69 times, one of which resulted in death (1.4% loss per capture). Every measure of caution is taken with each immobilization, and, as a result, our safety record is the highest in the country. The argument that many of the panthers die associated with the capture event can be refuted by examining how long they survive following their most recent anesthesia. Regardless of the cause of death, they have lived an average of 12.4 months post collaring.

The question of whether or not the collar, in some subtle way, is responsible for mortality can be examined. Thirty-two of the panthers (#23 and Big Guy

excluded) have accumulated 715 months of collar life and 63 captures, an average of 22.3 months per panther from the initial capture and 1.97 captures per cat. If we split this into two samples, those that have died and those that have not, we see that they are virtually identical. The dead panthers (including two seriously injured by cars) lived an average of 21.7 months and experienced 2.06 captures each, and those still living have averaged 22.0 months with 1.8 captures. Without an equal number of panthers "invisibly" marked that could be "magically" monitored and followed through out life, we will never be able to completely rule out any subtle effect the collar may have, but we have no evidence to suggest that it does.

Panther Mortality

Since 1972 a total of 30 panthers have died and another 4 survived serious injuries only because they received medical attention. The fate of one additional uncollared panther after being struck by a vehicle could not be determined. The causes of mortality and injury for all 35 panthers, radio-collared ($n = 16$) and uncollared ($n = 19$), are listed in Tables 41 and 42, respectively, the summary by cause of death in Table 43 and the yearly death toll is given in Table 44.

Panther deaths/injuries can be divided into 5 main categories and are listed in Table 44: road killed/injured (54.3%), illegally killed (14.3%), intraspecific aggression with or without associated septicemia (11.4%), unknown (12.4%), and other (8.4%). By far the most important causes of panther mortality responsible for 68.6% of the documented deaths are those caused by human beings. These are primarily road kills and injuries, and illegal shootings.

A comparison of the causes of death between the uncollared (U-CP) and radio-collared (R-CP) panthers reveals a strikingly different pattern. Human related deaths are responsible for virtually all of the U-CP deaths (94.7%) compared to only 43.8% of the R-CPs. Since the causes of death between the two groups are so different, with the majority of the R-CP deaths not related to human activity, it should not be inferred that the collar is responsible. Rather, the collar gives us the ability to detect the cat's location in situations where their carcasses would otherwise go completely undetected. Obviously panthers that die on the highway or even those taken illegally are much easier to document and retrieve than those succumbing to the rigors of life in the swamp.

The phrase "documented mortality" needs to be stressed. These are the deaths for which we have tangible evidence and the picture we have today may not necessarily represent the true situation for the population. For just as the collars have given us an understanding as to the impact of road kills on the population that we could not glean by examining the uncollared cats alone (i.e. 37.5% for R-CP verses 68.4% for U-CP), so might the inclusion of juvenile panthers in our sample change our perspectives further.

In most mammal species examined, both in captivity and in the wild, major mortality occurs in the first 6 months of life and most of that before 1 month of age. We know very little about this sector of the panther population for we have captured only 4 animals less than 1 year of age, and all of these were at least 6 months old at the time. Without documenting (visualizing and/or handling) the number of kittens born to a given female and comparing this to the number

surviving to at least 6 months of age, we have no way of knowing what the true mortality picture is. Several disease agents have been identified that can effect the survival of young panthers (parvovirus, calicivirus, and hookworms), but without specific knowledge of the mortality sustained by this age group we can only speculate as to their significance.

CONCLUSIONS

The Florida Panther Biomedical Investigation study is on schedule for all jobs except as noted below. The capture of previously radio-collared and new panthers was successfully accomplished and the total number of field immobilizations continues at a level far above that of previous years. There is a tremendous amount of data being gathered with regard to basic physiology, disease exposure, hematology and serum chemistries, reproduction, and genetics, most of which is yet to be analyzed.

As habitat loss throughout Florida continues to threaten all wildlife species, especially the already beleaguered panther, wildlife biologists and administrators will be forced to manage the remaining individuals in ways quite different from the classic wildlife management style. In otherwise abundant wildlife species, the population as a whole is managed, not the individual. However, if we hope rescue the Florida panther from extinction some rather intensive management strategies aimed at the individual will be necessary. From the biomedical stand point the immediate management measures must include:

- 1) enhancement of the probability of survival of all panthers by protecting them from identified pathogens (i.e. feline panleukopenia feline

calicivirus, rabies, virus and hookworms) via the use of vaccines and anthelmintics;

- 2) treatment of medical problems aimed at the long term survival of the individual (i.e. fractures, abscesses, and other medical problems);
- 3) preservation of the maximum amount of genetic diversity possible, which should include collecting and freezing gametes from every individual handled for use in future artificial breeding efforts and as insurance against the catastrophic or demographic loss of the wild population.

In light of recent advances in feline reproductive technology, we will soon be able to take advantage of the options artificial breeding techniques can offer to our captive breeding efforts. Therefore, it is imperative that we save an ample supply of sperm from our wild stock before any more males die. I strongly recommend that we consider changing the first re-collaring interval to 12 months on all newly captured males so that semen (and genetic material) can be banked.

The major obstacle to meeting the goals and deadlines as originally outlined for this project is that the magnitude and breadth of the panther biomedical project continues to expand. As originally conceived, we would catch and handle 5 panthers per year during a 2 month capture season leaving ample time for related disease and parasite work in Gainesville, the population genetics work at the National Cancer Institute, and the reproductive work. However, the field component of this project has more than doubled in the past 3 years, both in the number of cats actually handled and in the number of days spent in the field.

In addition, there have been several emergency situations involving injured and rescued panthers that have consumed much time. Providing the necessary

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- Becker, H. N., R. C. Belden, T. Breault, M. J. Burridge, W. B. Frankengerger, P. Nicoletti. 1978. Brucellosis in feral swine in Florida. J. Am. Vet. Med. Assoc.. 173:(9)1181-1182.
- Becker, N. H., G. Pirtle, R. C. Belden, W. B. Frankengerger, B. P. All, H. L. Rubin, and E. P. Gibbs. Preliminary observations on the presence of pseudorabies antibodies in domestic and feral swine in Florida. Manuscript in preparation.
- Belden, Robert C., and Lovett E. Williams, Jr. 1976. Survival status of the Florida panther. Pages 79-98 in P. C. H. Pritchard, ed. Proc. Florida Panther Conference. Florida Audubon Society and Florida Game and Fresh Water Fish Commission. 121pp.
- Belden, R. C. 1978. Florida panther investigation- a progress report. Pages 123-133 in R. R. Odum and L. Landers, eds. Proc. Rare and Endangered Wildlife Symposium. Georgia Department of Natural Resources Technical Bulletin. WL4. Athens, Georgia. 184pp.
- Belden, R. C. 1986. Florida panther recovery plan implementation- a 1983 progress report. Pages 159-172 in S. D. Miller and D. D. Evertt, eds. Cats of the World: Biology, Conservation and Management. Proc. 2nd International Cat Symposium. Caesare Kleberg Wildlife Research Institute. Kingsville, Texas. 501 pp.
- Belden, R. C., W. B. Frankengerger, and D. H. Austin. A Simulated Harvest Study of Feral Hogs in Florida. Manuscript in preparation.

Annual Performance Report
Florida Panther Biomedical Investigation

- Bittle, J. L. 1981. Feline panleukopenia. Pages 97-101 in J. W. Davis, L. H. Karstad, and D. O. Trainer, eds. Infectious diseases of wild mammals. (2nd ed.) Iowa State University Press, Ames. 421.
- Bouillant, A. and R. P. Hanson. 1965. Epizootiology of Mink Enteritis: III. Carrier State in Mink. Can. J. Comp. Med. Vet. Sci. 29(7):183-189.
- Burridge, M. J., W. J. Bigler, D. J. Forrester, and J. M. Hennemann. 1983. Serologic survey for Toxoplasma gondii in wild animals in Florida. J. Am. Vet. Med. Assoc. 175:964-967.
- Currier, M. J. P., and K. R. Russell. 1982. Hematology and blood chemistry of the mountain lion (Felis concolor). J. Wildl. Dis. 18:99-104.
- Forrester, D. J., J. A. Conti, and R. C. Belden. 1985. Parasites of the Florida panther (Felis concolor coryi). Proc. Helminthol. Soc. Wash. 52:95-97.
- Greiner, E. C., M. E. Roelke, C. T. Atkinson, J. P. Dubey, and S. D. Wright. In press. Sarcocystis sp. in muscles of free-ranging Florida panthers and cougars (Felis concolor). J. Wildl. Dis.
- Hawkey, C. M. 1975. Comparative mammalian hematology: cellular components and blood coagulation of captive wild animals. W. Heinemann Medical Books, London. 310 pp.
- Hines, T. C., R. C. Belden, and M. E. Roelke. 1987. An overview of panther research and recovery program. Pages 140-147 in R. R. Odom, K. A. Riddleberger, and J. C. Ozier, eds. Proc. of the 3rd Symposium on Southeastern Nongame Wildlife. Georgia Department of Natural Resources, Atlanta, Georgia. 253pp.

- Horpath Z. and L. Papp. 1967. Clinical manifestations of Aujeszky's disease in the cat. *Acta Vet Hung*, 17:49-54.
- Howard, J. G., M. Bush, L. G. Simmons, and D. E. Wildt. 1984. Comparative evaluation of ejaculate characteristics in nondomestic felids with emphasis on sperm morphology. Pages 168-170 in M. Silverman, ed. *Proc. Am. Assoc. Zoo Vet. Atlanta, Georgia*. 200pp.
- Jacobson, R. H. A KELA test for toxoplasmosis. Manuscript in preparation.
- Mia A. S., D. E. Kahn, M. M. Tierney, and J. E. Post. 1981. A microenzyme linked immunosorbant assay test for detection of FeLV in cats. *Comp. for Immunology, Microbiology, and Infectious disease*. 4(1):111-117.
- Miller A. M., M. E. Roelke, K. L. Goodrowe, J. G. Howard, and D. E. Wildt. Oocyte recovery, maturation, and fertilisation in vitro in the puma (Felis concolor). In press.
- Nettles, V. F., and G. A. Erickson. 1984. Pseudorabies in wild swine. *Proc. United States Animal Health Assoc*. 88:505-506.
- Nowack, R. M., and R. T. McBride. 1976. Status Survey of the Florida Panther. Pages 114-115 in P. C. H. Pritchard, ed. *Proc. of the Florida Panther Conference*. Published by the Florida Audubon Society of Florida Game and Fresh Water Fish Commission. 121pp.
- O'Brien, S. J., M. E. Roelke, L. Marker, A. Newman, C. A. Winkler, D. Meltzer, L. Colby, J. F. Evermann, M. Bush, and D. E. Wildt. 1985. Genetic basis for species vulnerability in the cheetah. *Science* 227:1, 428-1, 434.

- O'Brien, S. J., D. E. Wildt, D. Goldman, C. R. Merrill, and M. Bush. 1983. The cheetah is depauperate in genetic variation. *Science* 221:459-462.
- O'Brien, S. J., J. S. Martenson, C. Packer, L. Herbst, V. de Vos, P. Joslin, J. Ott-Joslin, D. E. Wildt, and M. Bush. 1987. Biochemical genetic Variation in geographic isolates of African and Asiatic lions. *National Geographic Research* 3(1):114-124.
- Pedersen, N. C. 1986. Pseudorabies. Manuscript in preparation.
- Platt, K. B., D. L. Graham, and R. A. Faaborg. 1983. Pseudorabies: experimental studies in raccoons with different virus strains. *J. Wildl. Dis.* 19:297-301.
- Pirtle, G., M. E. Roelke, and J. R. Brady. 1986. Antibodies against pseudorabies virus in the serum of a Florida black bear cub. *J. Am. Vet. Med. Assoc.* 189(9):1164.
- Pollock, R. V. H. 1984a. The parvoviruses. Part I. Feline panleukopenia virus and mink enteritis virus. *Cont. Ed. Art.* 4, 6:227-241.
- Pollock, R. V. H. 1984b. The parvoviruses. Part II. Canine parvovirus. *Cont. Ed. Art.* 6, 6:653-664.
- Roelke, M. E., E. R. Jacobson, G. V. Kollias, and D. J. Forrester, 1985. Medical management and biomedical findings on the Florida panther (Felis concolor coryi). Annual Performance Report 1984/85. Florida Game and Fresh Water Fish Commission. 113pp.

- Roelke, M. E., E. R. Jacobson, G. V. Kollfas, and D. J. Forrester, 1986. Medical management and biomedical findings on the Florida panther (Felis concolor coryi). Annual Performance Report 1985/86. Florida Game and Fresh Water Fish Commission. 65pp.
- Roelke, M. E. 1987. Florida Panther Biomedical Investigation: health and reproduction. Annual performance report 1986/87. Florida Game and Fresh Water Fish Commission. E-1-11 7506, 39 pp.
- Roelke, M. E. 1988. Florida Panther Biomedical Investigation: health and reproduction. Annual performance report 1987/88. Florida Game and Fresh Water Fish Commission. E-1-12 7506, 47 pp.
- Scott F. W., C. K. Cziza, and J. H. Gillespie. 1970. Feline Viruses. V. Serum-neutralization test for feline panleukopenia. The Cornell Veterinarian, LX(2):183-191 pp.
- Tozzini, F., A. Poli, and G. Della Croce. 1982. Experimental infection of European wild swine (Sus scruva) with pseudorabies virus. J. Wildl. Dis. 18:425-428.
- Trainer, D. O. 1981. Pseudorabies. Pages 102-107 in J. W. Davis, L. H. Karstad, and D. O. Trainer, eds. Infectious diseases of wild mammals, 2ND ed. The Iowa State University Press, Ames, Iowa. 421pp.
- US Department of Agriculture: Standard Agglutination Test Procedures for the Diagnosis of Brucellosis (Manual 65D, p 2-5) and Supplemental Test Procedures for the Diagnosis of Brucellosis (Manual 65E, pp 7-9; 13-15). Ames, Iowa, National Animal Disease Laboratory.

- Wallach, J. D., and W. J. Boever. 1983. Diseases of exotic animals. Medical and surgical management. W.B. Saunders Co., Philadelphia. 1159 pp.
- Wassmer, D. A. 1982. Demography, movements, activity, habitat utilization and marking behavior of a bobcat (Lynx rufus) population in south-central Florida. M.S. Thesis. U. of So. Fla., Tampa.
- Wildt, D. E., M. Bush, J. G. Howard, S. J. O'Brien, D. Meltzer, A. Van Dyk, H. Ebedes, and D. J. Brand. 1983. Unique seminal quality in the South African cheetah and a comparative evaluation in the domestic cat. Biol. Reprod. 29:1,019-1,025.
- Williams, E. S., E. T. Thorne, M. J. G. Appel, and D. W. Belitsy. 1988. Canine distemper in black-footed ferrets (Mustel nigripes) from Wyoming. J. Wildl. Dis. 24(3):385-398.

Table 1. Florida Panthers Captured, Immobilized, or Examined in 1988-89.

ID #	SEX	CAPTURE DATE	EST AGE AT CAPTURE	EVENT/LOCATION/COMMENT
<u>PRIVATE LANDS- NORTH: BETWEEN LAKE PLACID AND PALMDALE (GLADES & HIGHLANDS CO)</u>				
# 24	M	08-22-88	3-4 yr	Carcass remains collected consisted of hair and bones; died of unknown causes (probable date of death 8/13-16/88).
<u>PRIVATE LANDS- NORTHWEST: FORT MYERS AND NORTH OF CORKSCREW SWAMP SANCTUARY</u>				
# 28	M	11-29-88	18-24 mo	Hit by car near Ft. Myers International Airport, fractured scapula and head trauma. Transported to Gainesville Veterinary College for treatment (see captive section below).
		03-15-89	22-28 mo	Released to the wild in Corkscrew Swamp Sanctuary.
VMTH 65185	M	01-25-89	3-4 yr	Hit by car young adult male on SR 850 north of Corkscrew Swamp Sanctuary NW of Immokalee. Cat suffered severe chest trauma with a pneumothorax. Air lifted (via helicopter) to Gainesville Veterinary College for treatment. Cat died of a "shock lung" approximately 12 hrs after initial capture.
<u>NORTHERN FAKAHATCHEE STRAND & BEAR ISLAND UNIT OF BCNP & ADJACENT PRIVATE LANDS</u>				
# 11	F	01-27-89	7-8 yr	Treed with collared kitten #29; attempting to locate additional uncollared kittens, none found.
# 12	M	01-15-89	7-8 yr	Recaptured and changed collar. Captured on future USF&WS panther refuge land west of SR 29. Collar had been damaged by what looks like a canine puncture through the radio package (possibly by the male that #12 was thought to have killed last summer - #25 M). Cat was distinctly in poorer condition than on previous captures with a rough hair coat and a peculiar disseminated skin disease of undetermined etiology.
		05-05-89		Treed; race started in the northern end of the Fakahatchee Strand SP hoping it was an uncollared female, trailed cat across SR 84 and captured several miles north of mm 20.

Table 1. (continued)

Capture Summary FY 88/89 p.2

ID #	SEX	CAPTURE DATE	EST AGE AT CAPTURE	EVENT/LOCATION/COMMENT
<u>NORTHERN FAKAHATCHEE STRAND & BEAR ISLAND (continued)</u>				
# 17	M	01-26-89	10-12 yr	Captured and immobilized to change radio-collar. Captured on Collier property leased by the Noble ranch north of SR 84, mm 38. Ejaculated to collect semen for cyropreservation but sperm concentration and quality was too poor to attempt to freeze. Male was in excellent physical condition the heaviest male to date at 154 lbs (but did have a full stomach).
		02-08-89		Treed; hunting for uncollared female.
		02-09-89		Treed; hunting for uncollared female.
		02- -89		Treed; hunting for uncollared female.
		02-23-89		Treed; hunting for uncollared female.
# 18	F	01-23-89	10-12 yr	Captured and immobilized for change radio-collar. Captured on Collier property in Gum Swamp area north of SR 858 and east of SR 29 in Hendry Co. Female was apparently in estrus, she had been with #17 M the previous night and had fresh puncture wounds and lacerations in flank.
# 19	F	05-03-89	36 mo	Treed; did not capture, tree to high.
		05-04-89		Immobilized; Changed radio-collar, captured on Barfield lease of Collier Enterprise Inc. west of SR 29, west of Pistol Pond. Palpated vesicles in uterus, estimated fetuses to be 3 weeks old, was with #12M at that time (offspring of #11 F & #12 M).
# 20	M	08-24-88	4-5 yr	Carcass retrieved 8-24-88 (dead $\leq$ 24 hr), cause of death suspect heart failure related to an atrial septal defect in heart, also had lost considerable weight since released from zoo 12 months prior (138 lbs down to 105 lbs).
# 25	M	08-26-88	3-4 yr	Carcass was retrieved 8/26/88, died 8/24-25/88 of septicemia from puncture wounds in paralumbar fossa, abscess extended into peritoneal and pleural cavities.

Table 1. (continued)

Capture Summary FY 88/89 p.3

ID #	SEX	CAPTURE DATE	EST AGE AT CAPTURE	EVENT/LOCATION/COMMENT
<u>NORTHERN FAKAHATCHEE STRAND & BEAR ISLAND (continued)</u>				
# 26	M	02- -89	5-7 yr	Treed on Noble ranch; trying to capture uncollared female in area.
# 29	M	01-03-89	6 mo	Captured, immobilized and radio-collared in NE Bear Island, BCNP, with mother #11 F. Track data suggest that other siblings exist (sire suspected to be #20 M or possibly #25M).
		05-01-89	11 mo	Recaptured to change radio-collar, still with mother, no evidence of any other siblings.
# 30	M	01-06-89	9 mo	Captured, immobilized and radio-collared in NE Bear Island, BCNP, with mother #19 F. D. Maehr documented 4 kittens in litter at approx. 4 mos. of age (sire suspected to be #13 M).
		05-02-89	13 mo	Recaptured to change radio-collar, no longer with mother, no evidence of any other siblings in area. Captured to west of Catherine Island road surrounded by many large agricultural fields.
# 31	F	01-12-89	8-10 yr	Captured, immobilized and radio-collared on Vernon Roberts lease of Collier lands west of SR 29. Female approx. 55-75 days pregnant. Denning behavior via radio-telemetry consistent with the birth of kittens.
		03-5->15-89		Treed (unintentional); she was in close proximity to #30M
		05-02-89		
# 32	F	02-03-89	2-2.5 yr	Captured, immobilized and radio-collared. Female approx. 60-80 days pregnant. Denning behavior via radio-telemetry consistent with the birth of kittens.
		03-05-89		

Table 1. (continued)

Capture Summary FY 88/89 p.4

ID #	SEX	CAPTURE DATE	EST AGE AT CAPTURE	EVENT/LOCATION/COMMENT
<u>FAKAHATCHEE STRAND STATE PRESERVE</u>				
# 09	F	10-31-88	6-7 yr	Captured and immobilized to change radio-collar. It was hoped that kittens born to this female in June of 1987 would still be with her at this time for capture, however we were unsuccessful in locating and capturing any surviving sub-adults.
<u>STAIR STEEPS UNIT OF BIG CYPRESS NATIONAL PRESERVE</u>				
# 33	M	03-05-89	2-2.5 yr	Captured, immobilized and radio-collared.
<u>EVERGLADES NATIONAL PARK</u>				
# 14	F	03-20->24-89	7-8 yr	Suspect denning behavior based on radio-telemetry data (0. Bass), she was with #16M 12-20->22-88.
# 16	M	04-07-89	3-4 yr	Treed; hunting for uncollared panther.
# 21	F	07-23-88	30-36 mo (2.5-3 yr)	"Hit-by-car" SE Homestead, fractured femur, evacuated to Gainesville, FL. Veterinary School for internal plate fixation- see captivity section below.
# 22	F	03-13-89 03-20-89	2-3 yr	Treed but not immobilized, looked to be in good physical (offspring of #15 F, sib of #23 F). Radio-collar signal malfunctioned and/or disappeared while cat was on the eastern boundary line of the ENP. Neither cat nor sign of her was found during the following 5 weeks despite intensive field searching. The possibility exists that cat was killed and the collar destroyed.
# 23	F	06-22-88	21-22 mo	Immobilized; Removed from the wild, stranded on island in Shark River Slough for 13 days after water "came-up" and she was in very poor physical condition. Evacuated to Gainesville for treatment. See captivity section below.

Table 1. (continued)

Capture Summary FY 88/89 p.5

ID #	SEX	CAPTURE DATE	EST AGE AT CAPTURE	EVENT/LOCATION/COMMENT
<u>EVERGLADES NATIONAL PARK (cont.)</u>				
# 23 cont.		02-23-89		Released into the wild near the Research Station in Hole-in-the-Donut. She was in excellent physical condition and in estrus at the time of her release.
		04-22-89	31-32 mo	Treed to examine condition after 8 weeks in the wild. She has apparently been living on raccoons in the mangrove edge and looks in very good condition.
<u>CAPTIVITY: WHITE OAK PLANTATION & WILDLIFE RESEARCH LABORATORY AT GAINESVILLE</u>				
Big Guy M		07-24-88	7-8 yr	Immobilized; Collected blood for transfusion for injured Florida panther #21 F
# 08	F	08-20-88	13-15 yr	Died suddenly after 4 days of inappetence; cause of death kidney, liver and hyperthyroid disease.
# 21	F	07-23-88	30-36 mo	"Hit-by-car" SE Homestead, fractured femur, Evacuated to Gainesville, Fl. Veterinary School for treatment (offspring of #14 F, sib of #16 M).
		07-24-88	(2.5-3 yr)	
		07-25-88		Immobilized; surgical repair of left femur with cerclage wire and indwelling stainless steel plate
		07-29-88		Moved from VMTH to GFC research lab
		08-03-88		Immobilized; treat decubital ulcer on L hip
		08-19-88		Immobilized; treat decubital ulcer on hip
		10-21-88		Immobilized; transported to VMTH for radiographs to evaluate bone healing.
		12-29-88		Immobilized; transported to VMTH for radiographs to evaluate bone healing. There were still open fracture lines at this time.
		05-23-89		Immobilized; draw blood for pre-surgical evaluation.
		06-07-89		Immobilized; transported to VMTH. for radiographs to evaluate bone healing. Surgical removal of indwelling plate. Will be rechecked in 6 weeks at which time we will consider transferring her to White Oak Plantation.

Table 1. (continued)

Capture Summary FY 88/89 p.6

ID #	SEX	CAPTURE DATE	EST AGE AT CAPTURE	EVENT/LOCATION/COMMENT
<u>CAPTIVITY: (continued)</u>				
# 21 cont.		06-12-89		Surgical incision dehissed. Immobilized to resuture and install drains.
		06-14-89		Cat has worked distal portion of incision open again. Immobilized, used stainless steel sutures to close the wound to make it harder for the cat to remove.
# 23	F	06-22-88	21-22 mo	Immobilized; Removed from the wild, stranded on island in Shark River Slough for 13 days after water "came-up" and in very poor physical condition. Evacuated to Gainesville for treatment.
		10-21-88		Immobilized, transported to VMTH for radiographs of forelimbs (carpal deviation).
		11-05-88	26-27 mo	Immobilized; transported to White Oak Plantation. She was having her first documented estrus cycle at that time (vaginal smears agree with serum estrogen level and behavior).
		02-06-89		Immobilized to draw blood for FIP screen.
		02-22-89		Transported from White Oak Plantation to Everglades National Park.
		02-23-89	29-30 mo	Released into the wild near the Research Station in Hole-in-the-Donut. She was in excellent physical condition and in estrus at the time of her release.
# 28	M	11-30-88	18-24 mo	Hit by car near Ft. Myers International Airport, fractured scapula and head trauma. Transported to Gainesville Veterinary College for treatment.
		12-05-88		Moved from VMTH to GFC Research Lab.
		12-30-88		Immobilized, transported to VMTH for radiographs to evaluate bone healing.
		03-11-89		Immobilized for semen collection and evaluation.
		03-13-89		Immobilized and transported to VMTH for radiographs to evaluate healing of scapula prior to release to the wild.
		03-14-89		Immobilization for transport.
		03-15-89		Release to the wild on Corkscrew Swamp Sanctuary.

Table 2. Thyroid hormone levels in Florida panthers
(Triiodothyronine = T_3 , Thyroxine = T_4).

Animal #	Date Sample Drawn	T_3	T_4
#02	01-29-83	1.78	70.39
#04	01-29-83	1.95	28.46
#07	01-26-85	3.16	137.53
#08	03-25-84	3.36	140.61
	02-21-85	2.61	116.81
	01-13-86	2.66	165.22
	04-13-87	5.67	201.36
	05-18-87	6.45	197.13
	06-09-87	6.94	246.46
	08-18-87	6.57	264.09
	09-02-87	5.31	141.86
	06-01-88	7.42	311.98
#10	01-15-86	1.84	100.39
#11	01-17-88	1.99	185.5
#12	01-31-88	2.71	115.80
	01-15-89	1.17	65.37
#13	02-27-86	2.29	131.64
#14	12-07-86	1.82	122.78
#15	12-13-86	2.45	169.55
#16	02-02-88	3.76	101.79
#17	01-20-87	2.36	90.97
#18	01-22-87	2.06	105.29
	01-13-89	1.52	99.24
#19	11-09-87	3.11	174.63
#20	03-10-87	1.82	255.62
#24	01-30-88	2.66	189.05
#25	02-16-88	2.92	104.12

Table 2. (continued).

Animal #	Date Sample Drawn	T ₃	T ₄
#27	04-11-88	2.34	87.63
#29	01-03-89	5.05	163.59
#30	01-06-89	3.90	128.13
#31	01-12-89	3.23	110.23
#32	02-03-89	1.66	76.71
#33	03-05-89	2.34	81.46

Table 3. Body Weights, Physical Condition, Reproductive Status and Select Hematology Values for Adult Panthers Grouped by Capture Location Handled in 1988/89.

ID#	SEX/ AGE	LOCATION ^o \	DATE	WEIGHT	CONDITION*	PCV/HGB**	REPRO ^e
17	M-A	COLLIER/GS	01-20-87	142	I	45.1/14.8	?/2/?
	"	NOBLE	01-26-89	154	I	36.5/11.8	-/2/N
18	F-A	COLLIER/GS	01-22-87	100	I	48.1/12.7	0/N
	"	COLLIER/GS	01/23/89	85	I	41.2/13.8	0/N
20	M	ALICO	03-10-87	148	I	48.7/17.2	?/1/?
	"	SCOFIELD	06-17-87 ^A	134	II	43.9/14.8	+/1/?
	"	PRICE/BI	08-24-88 ^B	105	III	42.2/15.4	+/1/Y
28	M-SA	FT MYERS	11-29-88	93	I	33.8/11.1	?/1/?
65185	M-A	CORKSCREW	01-25-89	110	II		+/1/?
12	M-A	BI/FCC/FSSP	01-28-86	122		41.0/14.3	+/1/Y
	"	"	01-31-88	124	II	34.8/12.0	+/1/Y
	"	"	01-15-89	120	II-	40.3/12.7	+/1/Y
19	F-SA	PRICE	11-09-87	70	II	34.2/11.2	0\N
	"-A	FCC/BI/PRICE	11-09-87	75-80	II	37.4/12.3	1+/Y
25	M-A	FCC/NFS	02-16-88	121	I	39.7/13.6	?/2/?
	"	"	08-26-88		I		?/2/?
29	M-J	BI/BCNP	01-03-89	44		43.7/13.5	?/1/-
	"	"	05-01-89	76		38.8/12.7	?/1/-
30	M-J	BI/BCNP	01-06-89	55		32.8/12.0	?/1/-
	"	FCC/FPR+	05-02-89	75		35.1/11.6	?/1/-
31	F-A	FCC/FPR+	01-12-89	70		38.5/12.6	?/Y

Table 3. (continued).

ID#	SEX/ AGE	LOCATION ^a	DATE	WEIGHT	CONDITION*	PCV/HGB**	REPRO ^c
32	F-A	FCC/FPR+	02-03-89	79		36.8/10.7	?/Y
33	M-SA	SS/BCNP	03-05-89	92		32.7/10.5	+/2/?
21	F-SA	ENP	07-23-88 ^a	62	II	26.0 ^d /--	0\N

^aALICO, Inc. - NE of Immokalee; BI/BCNP - Bear Island Unit of Big Cypress National Preserve; Collier Enterprise, Inc., Noble, Price, & Scofield - SE of Immokalee; ENP - Everglades National Park; FCC - Fakahatchee Conservation Club; FPR- Florida panther refuge, proposed; FSSP - Fakahatchee Strand State Preserve; SS/BCNP- Stair Steep Unit of BCNP.

*Physical Condition Index: I=Excellent, II=Moderate, III=Poor, IV=Very poor
 **PCV - Packed cell volume. Normals for wild cougars 44.9-48.8, Currier 1982.
 **HGB - Hemoglobin, oxygen carrying component in red blood cells

^cREPRO - Reproductive status; Females- number of cubs documented within past 12 months/pregnant by palpation Y=yes, N=no; Males- results of semen evaluation (+ = fertile, - = sterile, ? = unknown) / number of testicles /documented reproduction (Y = known sire, S = suspect sire, ? = unknown).

^aHit-by Car; ^bFresh carcass; ^cBloated carcass; ^dPossibly diluted with IV fluids.

Table 4. Body Weights of Male Florida Panthers 1978-89.

Location	ID#	Date	Age	Body Weight ^A	Physical Condition ^B	HGB ^C
Fisheatting Creek	#24	30Jan88	3-4 yr	126	I	14.5
	G83-22	01Mar83 ^D	24-30 mo	117	II	ND
Ft. Myers & Corkscrew Swamp	#28	29NOV88	18-24 mo	93	I	11.1
		15MAR89	21-27 mo	90	II+	13.2
	V65185	25Jan89	3-4 yr	110	II	
Private Ranches East of Immokalee	#17	20Jan87	8-10 yr	142	I	14.8
		26JAN89	10-12 yr	154	I	11.8
	#20	10Mar87	3-4 yr	148	I+	17.2
		17Jun87 ^D	3.5-4.5 yr	134	I	14.8
		24Aug88 ^E	4.5-5.5 yr	105 ^H	III ^H	15.4
Northern Fakahatchee Strand, Bear Island Unit of BCNP and Adjacent Private Ranches	#01	14Dec83 ^D	13-15 yr	124	II	ND
	#04	22Jan84	9-10 yr	132	I	16.0
		18Apr85 ^D	10-11 yr	130	I	ND
	#12	28Jan86	4-5 yr	122	I	14.3
		31Jan88	6-7 yr	124	II	12.0
		15JaAN89	7-8 yr	120	II-	12.7
	#13	27Feb86	4-6 yr	126	I	17.0
		16Dec87 ^D	6-8 yr		I	ND
	G80-15	07Feb80	18-30 mo	111	I	ND
	#25	16Feb88	3-4 yr	121	I	13.6
		24Aug88	3.5-4.5 yr		I	ND
	#26	01Mar88 ^F	4-5 yr	125	I	15.1
	#29	03JAN89	6 mo	44		13.5
		01MAY89	11.5 mo	76		12.7
	#30	06JAN89	9-10 mo	55		12.0
		02MAY89	13-14 mo	75		11.6
Fakahatchee Strand State Preserve and Adjacent Southern Golden Gate Estates	#01	10Feb81	10-12 yr	120	II	ND
	#02	20Feb81	10-12 yr	108	II	ND
		26Jan82	11-13 yr	107	II	ND
		29Jan83	12-14 yr	117	II	14.5
		30Jan84	13-15 yr	80 ^I	IV	14.5
	#04	27Jan82	7-8 yr	113	I	nd
		29Jan83	8-9 yr	106	II	9.7
	#07	26Jan85	9-10 yr	120	I	14.5
		28Oct85 ^D	10-11 yr	122	I	14.5
	#10	13Jan86	5-7 mo	34	III	11.3
		02May86	9-11 mo	55	II	12.9

Table 4. (continued)

Location	ID#	Date	Age	Body Weight ^A	Physical Condition ^B	HGB ^C
Big Cypress	#06	27Feb82	6-7 yr	122	II	ND
National	#07	02Mar82	6-7 yr	122	II	ND
Preserve		27Mar83	7-8 yr	114	II	ND
South of	G78-65	08Mar78 ^C	18-30 mo	97		ND
SR 84	#33	05MAR89	24-30 mo	92	II	10.5
	G84-25	02Nov84 ^D	3-5 yr	115 ^E	II	8.3
Everglades	#16	12Jan87	16-22 mo	84	II ⁺	13.1
National Park		02Feb88	28-34 mo	86	III	12.0

^APounds (lbs.); ^BPhysical condition score: I-Excellent, II-Good, III-Poor, IV-Grave; ^CHemoglobin (gms/100ml); ^DHit by car; ^EDied-congenital anomaly; ^FDied-intraspecific aggression; ^GIllegally killed; ^H10+% dehydrated; ^IEstimated wt.

Table 5. Body Weights of Female Florida Panthers 1980-89.

Location	ID#	Date	Age	Body Weight ^A	Phys Cond ^B	HGB ^C	Repro ^D
Private Ranches							
East of Immokalee	#18	22Jan87	8-10 yr	100	I	12.7	None Doc
		23JAN89	10-12 yr	85	I	13.8	None Doc
Northern	#05	23Feb82	7-8 yr	99 ^I	I	ND	PG80+ days
Fakahatchee	G8004	23Dec79 ^E	18-30 mo	68		ND	Unknown
Strand, Bear Island (BCNP) & Adjacent Ranches	#11	21Jan86	5-6 yr	92 ^J	I-	10.4	None Doc
		07Jan88	7-9 yr	91	II	12.0	2-3 CBS/20m
	#19	09Feb87	9 mo	49	II	12.5	Immature
		09Nov87	18 mo	70	II	10.9	Immature
		04MAY89	36 mo	75-80	II	12.3	1+?CBS/13m
		"	"				PG24days
	#31	12Jan89	8-10 yr	70	II	12.6	PG
	#32	03FEB89	24-30 mo	79	II	10.7	PG
Fakahatchee	#03	22Jan82	8-9 yr	68	III	ND	None Doc
Strand State		17Jan83 ^F	9-10 yr	70	III	ND	SUSP PG ¹
Preserve and Adjacent	#08	25Mar84	8-10 yr	72	II	13.9	None Doc
		21Feb85	9-11 yr	70	III	11.2	SUSP PG ²
Southern		13Jan86	10-12 yr	72	III	9.1	None Doc
Golden Gate Estates	#09	13Apr86	11-13 yr	66	IV ⁺	12.0	None Doc
		26Jan85	3-4 yr	77	II	11.8	None Doc
		08Jan87	5-6 yr	76	II	13.9	PG45 days
		31Oct88	7-9 yr	80 ^K	II	12.5	SUSP PG ¹
	G8119	19Apr81 ^E	24-36 mo	85 ^I	I	ND	PG80+ days
	PC059	13Nov86 ^E	7-9 yr	70 ^L	II	ND	SUSP PG ²
Eastern Big Cypress National Preserve (BCNP)							
	NRoad	10Mar84	8-10 yr	60 ^L	IV	ND	None Doc
Everglades National Park							
#14		07Dec86	4-5 yr	71	II	13.7	2CBS/16m
		11Apr88	5-6 yr	85	II	12.7	None Doc
#15		13Dec86	4-5 yr	72	II	12.9	2CBS/3-5
		07Apr87	4-5 yr	74 ^L	II	11.0	2CBS/7-9
		13Jun87	4-5 yr	76	II	10.3	2CBS/9-11
		10Jun88 ^G	5-6 yr	75	II	ND	SUSP PG ¹²
#21		16Mar87	14-18 mo	56	II	12.3	Immature
		23Jul88 ^E	30-34 mo	62	II	7.8	None Doc
#22		18Mar87	6-8 mo	33	II	15.7	Immature
		07Apr87	7-9 mo	36	II-	11.8	Immature
		15Jun87	9-11 mo	43	II	9.8	Immature
		24Mar88	16-18 mo	60	II	9.8	None Doc
#23		18Mar87	6-8 mo	31	II	13.4	Immature
#27		11Apr88	24-36 mo	50	II	10.9	None Doc
Corbett WMA	G84-20	20Oct84 ^H	2-3 yr	80	II	ND	None Doc

Table 5. (continued)

^APounds (lbs.); ^BPhysical condition score: I-Excellent, II-Good, III-Poor, IV-Grave; ^CHemoglobin (gms/100ml); ^DReproduction: CBS-number of cubs/age in months, None Doc-no evidence of offspring documented in vicinity, PG-Pregnant no. days, SUSP PG - pregnant suspected based on ¹denning behavior or ²milk/serous fluid in mammary glands but no cubs ever documented; ^EHit by car; ^FCapture mortality; ^GDead-aggression; ^HIllegally killed; ^ILate pregnancy; ^JFull stomach, est 6-8 lbs. ^KRecently eaten, serum lipemic; ^LWeight estimated

Table 6. Body Weights of Sub-adult^A Florida Panthers at Varying Ages.

Location	ID#	Date	Age	Body Weight lbs.
<u>FEMALES</u>				
Northern	#19 F	02-09-87	9 mo	49
Fakahatchee	"	11-09-87	18 mo	70
Strand, Bear	"	05-03-89	36 mo	75-80
Isl. & Prices'	G80-4 F	12-23-79	18-30 mo	68
	#32 F	02-03-89	24-30 mo	79
Everglades	#21 F	03-16-87	14-18 mo	56
National	"	07-23-88	30-34 mo	62
Park	#22 F	03-18-87	6-8 mo	33
	"	04-07-87	7-9 mo	36
	"	06-15-87	9-11 mo	43
	"	03-24-88	16-18 mo	60
	#23 F	03-18-87	6-8 mo	31
	"	06-22-88	18-20 mo	44
	"	11-05-88	2-2.5 yr	68.5
	#27 F	04-11-88	24-36 mo	50
<u>MALES</u>				
Northern	#29 M	01-03-89	6 mo	44
Fakahatchee	"	05-01-89	11.5 mo	76
Strand, Bear	#30 M	01-06-89	9-10 mo	55
Isl. & Prices'	"	05-02-89	13-14 mo	75
Fakahatchee Strand	#10 M	01-13-86	5-6 mo	34
State Preserve	"	05-02-86	9-10 mo	55
Everglades	#16 M	01-12-87	14-18 mo	84
National	"	02-02-88	26-30 mo	86
Park				
Other	#28 MC	11-29-88	18-24 mo	74
Areas	#33 MD	03-05-89	26 mo	92

^ASub-adult = $\leq$ 36 months; ^BIn captivity released to ENP in good condition; ^CFt. Myers/Corkscrew area; ^DStair Steps Unit of BCNP

LEGEND
HEMATOLOGY TABLES

N/D = Not Determined

- MAJOR POPULATIONS: I- Southwestern Florida, Big Cypress Swamp & Fakahatchee Strand and surrounding ecosystem including privately owned land; II- Southeastern Florida, Everglades National Park; III Central Florida; IV- not part of a discrete documented population of panthers.

LOCALITY OF RANGE: BI - Bear Island Unit of Big Cypress National Preserve; CORBETT - Corbett Management Area; CORK - Coirkscrew Swamp and Ft. Myers area; ENP - Everglades National Park; FEC - Fish Eattng Creek; FS- Fakahatchee Strand both north and south of SR 84; MO - Southwestern Monument Unit, Big Cypress National Preserve; N. Florida- 10 months old captive cougar released near Capps, Fl. south of Tallahassee 2 months before death on highway by car; N.FS - Northern Fakahatchee Strand; PR - Private ranches east of Immokalee; RP - Raccoon Point, Eastern Big Cypress National Preserve; S.FS - Southern Fakahatchee Strand (Fakahatchee Strand State Preserve).

OTHER: Cap - captivity; GFC - Florida Game and Fresh Water Fish Commission, Wildlife Research Laboratory, Gainesville, Fl.; MMZ - Miami Metro Zoo, Miami, Fl.; WOP - White Oak Plantation, Yulee, Fl.

- SAMPLE: Blood samples drawn at the "running time" indicated.
Time zero (0:00) starts when cat receives initial anesthetic agent

•• EVENT:

Initial: initial blood sample, drawn as soon as cat is stable, IV catheter im-plantd, generally less than 100 cc of IV fluids given.

PRE-E: blood drawn immediately prior to starting electro-ejaculation protocol (males). Skin biopsy surgical procedure preformed on lateral thigh, 6 x 6mm plugs removed and wounds sutured. Also, cat has received 5-700 cc of lactated ringers.

PE or Post ejac: Post Ejaculation, number in front indicates time (minutes) following series III of ejaculation protocol. By end the panther has usually received 1 liter lactated ringers IV and 2 liters SQ.

Post Cap: sample drawn at end of capture procedure

- + Laboratory: CONL = Consulab, Miami; DSI = Diagnostic Services Inc., Naples; IALS = Inter-American Laboratory Service, Miami; JASH = James Archer Smith Hospital Laboratory, Homestead; VMTH = Veterinary Medical Teaching Hospital, Gainesville.

- Anesthetic used: D = Diazepam (Valium[®]); H = Halothane; K = Ketamine hydrochloride; T = Telazol; V = Versed; X = Xylazine hydrochloride (Rompun[®]); Iso = Isoflourane

*Packed cell volume is a calculated value, spun values will be footnoted

- RBC morphology: A = anisocytosis; B = burr cells; C = crenation; E = echinocytosis; H = hypochromasia; H_J = Howell-Jolly body; M = microcytosis; Ma = Macrocytosis; Mf = microfilaria; N = normal; N_r = NRBC/nucleat blood cells; Pl = polychromasia; Po = poikilocytosis; R = Rouleaux.

TABLE 7. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #09 Female

Date	01-26-85	01-08-87	01-08-87	01-14-87 ^a	01-21-87	01-25-87
Age	3-5 yr					
Location#	FSSP					
Sample ^a	A = 0:	A	B			
Event ^a	Initial					
Laboratory ^r	DSI	DSI	DSI	IALS	IALS	DSI
Anesthetic Agent ^o	K	K	KDH	K	K	K
CONSTITUENT						
Erythrocyte 10 ⁶ /mm ³	6.32	7.12	6.03	7.45	6.32	5.24
Leucocytes 10 ³ /mm ³	10.7	12.8	13.1	22.1	18.1	13.2
Hemoglobin g/100ml	11.8	13.9	11.9	11.4	9.5	10.3
Packed cell volume %*	30.6	32.5	27.1	36.3 ^b	31.1	33.2
Mean cell volume u ³	48.4	45.6	44.9	49.0	50	44.3
Mean cell hemoglobin uug	18.6	19.5	19.7	15.2	15	19.6
Mean cell Hb conc. %	38.6	42.7	43.8	31.3	30.5	44.4
RDW	11.7	N/D	11.5	N/D	N/D	N/D
Reticulocytes % (P/A)	N/D	N/D	N/D	0.8	N/D	2.0
RBC morphology**	N	N	N	N	P1	N
Platelets 10 ³ /mm ³	299	N/D	735	N/D	N/D	N/D
Plasma protein g/dl	N/D	7.7	7.7	7.9	6.0	8.3
Fibrinogen mg/dl	N/D	N/D	N/D	N/D	N/D	N/D
Icterus index units	N/D	N/D	N/D	N/D	N/D	N/D
DIFFERENTIAL - (Leukocyte count)						
Bands %	3	6	1	0	0	3
Neutrophils %	80	72	74	87	78	64
Lymphocytes %	16	17	23	10	15	32
Monocytes %	1	5	1	2	3	1
Eosinophils %	0	0	1	1	4	0
Basophils %	0	0	0	0	0	0

Table 7. (continued).

#09F p.2

Date	01-31-87	02-05-87	02-05-87	02-05-87	10-31-88	10-31-88
Age						
Location#						
Sample ^a					A	B
Event ^{aa}						
Laboratory [*]	DSI	IALS	DSI	CONL	VMTH	VMTH
Anesthetic Agent ^o	K	K	K	K		
CONSTITUENT						
Erythrocyte 10 ⁶ /mm ³	5.28	7.74	6.46	7.49	7.65	7.09
Leucocytes 10 ³ /mm ³	7.7	10.9	10.0	13.7	15.8	15.6
Hemoglobin g/100ml	10.7	12.1	11.3	11.9	12.5	10.7
Packed cell volume %*	24.1	36.9	30.0	34.2	37.0 ^c	33.7 ^a
Mean cell volume u ³	45.6	48.0	46.4	45.6	48.4	47.5
Mean cell hemoglobin uug	19.0	15.5	17.5	15.9	16.3	15.1
Mean cell Hb conc. %	41.7	32.6	37.6	34.8	33.8	31.8
RDW	N/D	N/D	11.1	N/D	18.6	18.5
Reticulocytes % (P/A)	2.2	N/D	1.5	1.1	5.5	N/D
RBC morphology**	N	P1 H ₁	N	N	N	N
Platelets 10 ³ /mm ³	N/D	N/D	394	N/D	N/D	N/D
Plasma protein g/dl	8.9	N/D	N/D	N/D	8.6	8.2
Fibrinogen mg/dl	N/D	N/D	N/D	N/D	200	100
Icterus index units	N/D	N/D	N/D	N/D	<5 ^d	N/D
DIFFERENTIAL						
(Leukocyte count)						
Bands %	2	0	1	2	1	0
Neutrophils %	37	68	62	43	76	75
Lymphocytes %	60	26	33	52	11	10
Monocytes %	1	5	4	3	<1	2
Eosinophils %	0	1	0	0	10	12
Basophils %	0	0	0	0	2	1

TABLE 7. (continued)

#09F p.3

Date	10-31-88	10-31-88
Age		6-7 yr
Location [#]		
Sample ^a	A	B
Event ^{a*}		
Laboratory [†]	DSI	DSI
Anesthetic Agent ^e		
CONSTITUENT		
Erythrocyte $10^6/\text{mm}^3$	7.28	6.33
Leucocytes $10^3/\text{mm}^3$	15.7	13.4
Hemoglobin g/100ml	12.5	11.9
Packed cell volume % [*]	34.7	30.1
Mean cell volume μ^3	47.7	47.6
Mean cell hemoglobin μg	17.2	18.9
Mean cell Hb conc. %	36.0	39.7
RDW	20.5	N/D
Reticulocytes % (P/A)	1.2	N/D
RBC morphology ^{**}	AMPo	AMPo
Platelets $10^3/\text{mm}^3$	382	210
Plasma protein g/dl	N/D	N/D
Fibrinogen mg/dl	N/D	N/D
Icterus index units	N/D	N/D
DIFFERENTIAL (Leukocyte count)		
Bands %	8	0
Neutrophils %	78	78
Lymphocytes %	14	29
Monocytes %	0	0
Eosinophils %	0	0
Basophils %	0	1

^a5-6% dehydrated^bSpun PCV = 38%^cSpun PCV = 35.5%^dSlight lipemia^eSpun PCV = 33.0%

TABLE 8. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: # 12 M

Date	01-28-86			01-31-88		
Age	4-5 yr			6-7 yr		
Location#	BI/BCNP			FSSP		
Sample ^a	A = 0:29	B = 2:14	C = 3:11	A = 0:30	B = 1:31	C = 2:02
Event ^{aa}	Initial	Post ejac	90m PE	Initial	Post ejac	30m PE
Laboratory ^r	DSI	DSI	DSI	DSI	DSI	DSI
Anesthetic Agent ^o	K	KX	KX	KT	KT	KT
CONSTITUENT						
Erythrocyte 10 ⁶ /mm ³	8.26	6.02	6.02	7.71	8.56	8.13
Leucocytes 10 ³ /mm ³	12.0	21.3	18.2	11.1	12.4	18.7
Hemoglobin g/100ml	14.3	11.4	11.6	12.0	13.1	12.7
Packed cell volume %*	41.0	28.8	28.6	34.8	38.7	36.7
Mean cell volume u ³	49.6	47.9	47.4	45.1	45.2	45.2
Mean cell hemoglobin uug	17.3	18.9	19.2	15.6	15.3	15.6
Mean cell Hb conc. %	34.9	39.5	40.5	34.5	33.9	34.6
RDW	13.6	11.2	11.7	20.7	21.1	33.1
Reticulocytes % (P/A)	1.7	ND	ND	0.6%	N/D	N/D
RBC morphology**	N	N	N	APoMa	APoMa	APoMa
Platelets 10 ³ /mm ³	810	479	114	533	528	530
Plasma protein g/dl	ND	ND	ND	N/D	N/D	N/D
Fibrinogen mg/dl	ND	ND	ND	N/D	N/D	N/D
Icterus index units	ND	ND	ND	N/D	N/D	N/D
DIFFERENTIAL (Leukocyte count)						
Bands %	2	2	5	2	1	4
Neutrophils %	64	90	75	77	80	87
Lymphocytes %	24	6	16	20	18	8
Monocytes %	8	2	4	0	0	0
Eosinophils %	2	0	1	0	0	0
Basophils %	0	0	0	1	1	1

Table 8. (continued)

#12 M p.2

Date	01-15-89	01-15-89	01-15-89	01-15-89
Age	7-8 yr	7-8 yr	7-8 yr	7-8 yr
Location#				
Sample ^a	A	B	A	B
Event ^a				
Laboratory ^a	VMTH	VMTH	DSI	DSI
Anesthetic ^a				
CONSTITUENT				
Erythrocyte 10 ⁶ /mm ³	8.92	8.64	8.50	8.14
Leucocytes 10 ³ /mm ³	9.4	18.7	9.1	18.3
Hemoglobin g/100ml	12.7	12.2	13.1	12.7
Packed cell volume %	40.3 ^a	38.6	39.4	37.5
Mean cell volume u ³	45.2	44.7	46.3	46.1
Mean cell hemoglobin uug	14.2	14.1	15.4	15.6
Mean cell Hb conc. %	31.5	31.6	33.3	33.8
RDW	17.5	17.3	20.4	20.3
Reticulocytes % (P/A)	1.3	N/D	0.4	N/D
RBC morphology**	N	N	AMPo	AMPo
Platelets 10 ³ /mm	N/D	N/D	504	528
Plasma protein g/dl	8.2	8.5	N/D	N/D
Fibrinogen mg/dl	300	300	N/D	N/D
Icterus index units	<5	<5	N/D	N/D
DIFFERENTIAL				
(Leukocyte count)				
Bands %	0	0	9	10
Neutrophils %	68	87	58	72
Lymphocytes %	11	7	28	13
Monocytes %	10	4	0	5
Eosinophils %	7	2	4	N/D
Basophils %	4	0	1	N/D

^a Spun PCV = 38.5

TABLE 9. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #17 Male

Date	01-20-87	01-20-87	01-26-89	01-26-89	01-26-89	01-26-89
Age	8-10 yr	8-10 yr	10-12 yr	10-12 yr	10-12 yr	10-12 yr
Location#						
Sample ^a	A = 0:26	B = 1:22	A =	B = 1:18	C = 1:37	D =
Event ^a			Initial	Pre EE	Post EE	60m PEE
Laboratory ^a	DSI	DSI	VMTH	VMTH	VMTH	VMTH
Anesthetic Agent ^a	K	K				

CONSTITUENT

Erythrocyte $10^6/\text{mm}^3$	9.01	8.73	7.66	7.07	8.79	9.14
Leucocytes $10^3/\text{mm}^3$	14.8	19.6	10.1	10.7	12.4	10.5
Hemoglobin g/100ml	14.8	13.8	11.8	10.7	13.7	13.4
Packed cell volume %	45.1	44.0	36.5 ^a	33.3 ^b	42.0 ^c	45.0 ^d
Mean cell volume μ^3	50.0	50.3	47.6	47.1	47.8	47.1
Mean cell hemoglobin μug	N/D	N/D	15.4	15.1	15.6	14.0
Mean cell Hb conc. %	N/D	N/D	32.4	32.2	32.6	29.8
RDW	N/D	N/D	17.6	16.7	17.6	16.7
Reticulocytes % (P/A)	0.7	N/D	1.5	N/D	N/D	N/D
RBC morphology**	Po	Po	N	N	N	N
Platelets $10^3/\text{mm}^3$	537	523	N/D	N/D	N/D	N/D
Plasma protein g/dl	N/D	N/D	8.3	7.9	8.9	8.5
Fibrinogen mg/dl	N/D	N/D	100	300	300	200
Icterus index units	N/D	N/D	<5	<5	<5	<5

DIFFERENTIAL

(Leukocyte count)

Bands %	2	4	0	0	0	0
Neutrophils %	70	7	68	81	80	83
Lymphocytes %	22	15	20	10	8	10
Monocytes %	5	3	4	4	4	4
Eosinophils %	1	2	8	4	8	2
Basophils %	0	0	0	1	0	1

Table 9. (continued)

#17 M p.2

Date	01-26-89	01-26-89	01-26-89	01-26-89
Age	10-12 yr	10-12 yr	10-12 yr	10-12 yr
Location#				
Sample ^a	A = 0:	B = 1:	C =	D =
Event ^{a*}	Initial	Pre EE	Post ejac	60m P EE
Laboratory [*]	DSI	DSI	DSI	DSI
Anesthetic ^c				

CONSTITUENT

Erythrocyte $10^6/\text{mm}^3$	7.36	6.59	8.27	9.32
Leucocytes $10^3/\text{mm}^3$	9.1	10.0	10.0	12.7
Hemoglobin g/100ml	12.0	10.7	14.0	15.4
Packed cell volume %*	35.0	31.2	39.7	44.6
Mean cell volume μ^3	47.6	47.3	48.0	47.9
Mean cell hemoglobin μg	16.3	16.2	16.9	16.5
Mean cell Hb conc. %	34.3	34.3	35.3	34.5
RDW	20.1	19.9	20.3	20.6
Reticulocytes % (P/A)	0.2	N/D	N/D	N/D
RBC morphology**	AMPo	AMPo	AMPo	MPo
Platelets $10^3/\text{mm}^3$	407	384	478	302
Plasma protein g/dl	N/D	N/D	N/D	N/D
Fibrinogen mg/dl	N/D	N/D	N/D	N/D
Icterus index units	N/D	N/D	N/D	N/D

DIFFERENTIAL

(Leukocyte count)

Bands %	14	5	3	3
Neutrophils %	54	65	70	66
Lymphocytes %	32	30	24	29
Monocytes %	0	0	2	1
Eosinophils %	0	0	1	1
Basophils %	0	0	0	0

^aSpun PCV = 35.5^bSpun PCV = 33.8^cSpun PCV = 41.7^dSpun PCV = 41.7

TABLE 10. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: # 18^A Female

Date	01-22-87	01-22-87	01-23-89	01-23-89	01-23-89	01-23-89
Age	8-10 yr.	8-10 yr.	10-12 yr	10-12 yr	10-12 yr	10-12 yr
Location#						
Sample ^a	A = 0:10	B = 1:04	A = 0:16	B = 1:55	A = 0:16	B = 1:55
Event ^{aa}						
Laboratory [*]	DSI	DSI	VMTH	VMTH	DSI	DSI
Anesthetic Agent ^a	K	K				
CONSTITUENT						
Erythrocyte 10 ⁶ /mm ³	9.64	8.74	8.78	8.11	8.60	7.72
Leucocytes 10 ³ /mm ³	13.3	22.3	15.6	16.3	13.4	15.9
Hemoglobin g/100ml	12.7	11.8	13.8	12.5	15.3	12.9
Packed cell volume % [*]	48.1	43.8	41.2 ^c	38.3 ^d	41.0	36.7
Mean cell volume u ³	49.9	50.1	46.9	47.2	47.7	47.5
Mean cell hemoglobin uug	N/D	N/D	15.7	15.4	17.8	16.7
Mean cell Hb conc. %	N/D	N/D	33.5	32.7	37.3	35.2
RDW	B	N/D	16.4	16.4	18.7	19.3
Reticulocytes % (P/A)	1.3	N/D	0.16	N/D	0.6	N/D
RBC morphology ^{**}	A M Po	A M Po	N	N	AMPo	AMPo
Platelets 10 ³ /mm ³	867	874	N/D	N/D	375	365
Plasma protein g/dl	N/D	N/D	8.7	7.9	N/D	N/D
Fibrinogen mg/dl	N/D	N/D	200	100	N/D	N/D
Icterus index units	N/D	N/D	<5	<5	N/D	N/D
DIFFERENTIAL (Leukocyte count)						
Bands %	1	2	0	0	5	4
Neutrophils %	76	90	90	90	78	90
Lymphocytes %	22	6	4	4	17	5
Monocytes %	1	0	2	5	0	1
Eosinophils %	0	0	2	1	0	0
Basophils %	0	2	2	0	0	0

^ACollier Enterprize, Inc. ("Jumbette")^B1 NRBC/100 WBC^CSpun PCV = 40.2^DSpun PCV = 36.6

TABLE 11. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: # 19 Female

Date	02-09-87	02-09-87	11-09-87 ^A	11-09-87 ^A	11-09-87
Age	9 mo.	9 mo.	18 mo	18 mo	18 mo
Location#	BI/BCNP	BI/BCNP	PR/PRICE	PR/PRICE	PR/PRICE
Sample ^a	A = 0:12	B = 1:06	A = 0:20	B = 1:12	A = 0:20
Event ^{aa}	Initial	Post cap	Initial	Post cap	Initial
Laboratory [*]	DSI	DSI	DSI	DSI	VMTH
Anesthetic Agent ^o	K	K	K	K	K
CONSTITUENT					
Erythrocyte 10 ⁶ /mm ³	6.11	5.65	7.31	6.59	7.81
Leucocytes 10 ³ /mm ³	13.0	15.8	16.9	17.3	13.0
Hemoglobin g/100ml	12.5	11.3	11.2	10.5	10.9
Packed cell volume %*	27.1	25.3	34.2	29.9	34.9 ^b
Mean cell volume u ³	44.4	44.7	46.8	45.3	44.7
Mean cell hemoglobin uug	20.4	20.0	15.3	15.9	14.0
Mean cell Hb conc. %	46.0	44.8	32.7	35.2	31.2
RDW	11.2	11.7	22.0	21.8	19.7
Reticulocytes % (P/A)	0.8	N/D	2.3	N/D	N/D
RBC morphology**	Po	M Po	APoMPI	APoMPI	2N+PoPLE ^c
Platelets 10 ³ /mm ³	244	195	269	11 ^d	N ^e
Plasma protein g/dl	N/D	N/D	N/D	N/D	8.8
Fibrinogen mg/dl	N/D	N/D	N/D	N/D	300
Icterus index units	N/D	N/D	N/D	N/D	<5
DIFFERENTIAL (Leukocyte count)					
Bands %	5	4	1	8	0
Neutrophils %	60	67	54	63	56
Lymphocytes %	28	28	38 +2 ^f	27	32
Monocytes %	2	0	2	1	6
Eosinophils %	5	1	3	1	4
Basophils %	0	0	0	0	2

Table 11. (continued)

#19 F p.2

Date	05-04-89	05-04-89	05-04-89	05-04-89	05-04-89	05-04-89
Age	36 mo	36 mo	36 mo	36 mo	36 mo	36 mo
Location#						
Sample ^a	A = 0:	B = 1:	A = 0:	B = 1:	A = 0:	B = 1:
Event ^{aa}	Initial	Post cap	Initial	Post cap	Initial	Post cap
Laboratory ^b	VMTH	VMTH	DSI ⁱ	DSI ⁱ	DSI ^j	DSI ^j
Anesthetic ^c	K	K	K	K	K	K

CONSTITUENT

Erythrocyte 10 ⁶ /mm ³	8.43	8.43	7.89	6.91	7.08	6.77
Leucocytes 10 ³ /mm ³	11.9	9.3	9.7	11.5	9.2	13.2
Hemoglobin g/100ml	12.3	12.2	11.8	10.5	12.2	11.5
Packed cell volume % ^a	37.4 ^c	37.6 ^a	35.6	30.9	33.8	31.9
Mean cell volume u ³	44.4	44.6	45.1	44.7	47.7	47.0
Mean cell hemoglobin uug	14.6	14.5	15.0	15.2	17.2	17.0
Mean cell Hb conc. %	32.9	32.4	33.2	34.0	36.1	36.1
RDW	17.5	17.5	20.7	32.7	N/D	N/D
Reticulocytes % (P/A)	13	N/D	0.6	N/D	N/D	N/D
RBC morphology ^{aa}	N	N	AMPo	AMPo	AMPo	AMPo
Platelets 10 ³ /mm ³	N/D	N/D	445	194	546	50
Plasma protein g/dl	8.2	7.9	N/D	N/D	N/D	N/D
Fibrinogen mg/dl	200	200	N/D	N/D	N/D	N/D
Icterus index units	5-10	5	N/D	N/D	N/D	N/D

DIFFERENTIAL

(Leukocyte count)

Bands %	0	0	4	14	9	6
Neutrophils %	69	71	61	59	57	67
Lymphocytes %	20	11	24	24	32	22
Monocytes %	5	7	5	1	1	2
Eosinophils %	5	11	2	1	1	3
Basophils %	1	0	1	0	0	0

^aPerformed on coulter S*^bSpun PCV = 33.5^cRare Howell Jolly Bodies^dPlatelet estimate low^e2+ clumped^fAtypical lymphocytes^gSpun PCV = 37.0^hSpun PCV = 35.5ⁱCBC run on Stkar^jCBC run on S-plus

TABLE 12. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #21 Female

Date	03-16-87	03-16-87	01-03-89 ^B	01-03-89	01-03-89	01-03-89
Age	14-16 mo	14-16 mo	2.5 yr	2.5 yr	2.5 yr	2.5 yr
Location#			CAP/GFC	CAP/GFC	CAP/GFC	CAP/GFC
Sample ^a	A = 0:03	A = 0:03	A-1	A-2	B-1	B-2
Event ^{aa}						
Laboratory ^a	CONL	VMTH	DSI	DSI	DSI	DSI
Anesthetic Agent ^a	K	K				
CONSTITUENT						
Erythrocyte 10 ⁶ /mm ³	6.32	7.84	6.20	6.27	5.79	5.79
Leucocytes 10 ³ /mm ³	11.7	15.1	6.0	5.5	4.8	5.6
Hemoglobin g/100ml	10.9	12.3	10.2	10.4	9.5	9.5
Packed cell volume %	31.8	37.1 ^A	37.7	37.7	35.3	35.0
Mean cell volume u ³	50.3	47.0	60.8	60.2	60.9	60.5
Mean cell hemoglobin uug	17.3	15.68	16.5	16.6	16.4	16.4
Mean cell Hb conc. %	34.3	33.0	27.1	27.6	26.9	27.1
RDW	N/D	N/D	17.0	16.9	18.3	17.7
Reticulocytes % (P/A)	N/D	3.6/1.6	0.2	0.2	0.1	0.0
RBC morphology ^{aa}	A M Pl Po	N	A MPo	AMPo	AMPo	AMPo
Platelets 10 ³ /mm ³	HIGH	N	361	341	357	341
Plasma protein g/dl	N/D	7.9	N/D	N/D	N/D	N/D
Fibrinogen mg/dl	N/D	200	N/D	N/D	N/D	N/D
Icterus index units	N/D	<5	N/D	N/D	N/D	N/D
DIFFERENTIAL (Leukocyte count)						
Bands %	3	0	5	4	4	2
Neutrophils %	61	69	41	34	38	28
Lymphocytes %	32	19	47	59	55	65
Monocytes %	3	3	0	0	0	2
Eosinophils %	1	9	6	3	2	3
Basophils %	0	0	1	0	1	0

Table 12. (continued)

#21 F p.2

Date	01-03-89	01-03-89	01-03-89	01-03-89	05-23-89	05-23-89
Age	2.5 yr	2.5 yr	2.5 yr	2.5 yr	3 yr	3yr
Location#	CAP/GFC	CAP/GFC	CAP/GFC	CAP/GFC	CAP/GFC	CAP/GFC
Sample ^a	C-1	C-2	D-1	D-2	A = 0:24	B = 1:15
Event ^{aa}						
Laboratory ⁺	DSI	DSI	DSI	DSI	VMTH	VMTH
Anesthetic ^o					T	T

CONSTITUENT

Erythrocyte $10^6/\text{mm}^3$	6.51	6.79	5.65	5.68	5.47	6.23
Leucocytes $10^3/\text{mm}^3$	6.9	6.8	5.4	5.5	5.3	5.7
Hemoglobin g/100ml	10.7	11.2	9.2	9.2	9.1	10.5
Packed cell volume %	38.8	40.2	34.2	34.8	25.4 ^c	29.7 ^d
Mean cell volume μ^3	59.6	59.1	60.5	61.3	46.4	47.6
Mean cell hemoglobin μg	16.5	16.5	16.3	16.3	16.6	16.9
Mean cell Hb conc. %	27.7	27.9	26.9	26.5	35.9	35.4
RDW	N/D	N/D	N/D	N/D	15.4	15.3
Reticulocytes % (P/A)	0.1	0.1	0.0	0.1	3.6/0.2	N/D
RBC morphology**	AMPo	AMPo	AMPo	AMPo	N	N
Platelets $10^3/\text{mm}^3$	362	290	267	440	N/D	N/D
Plasma protein g/dl	N/D	N/D	N/D	N/D	7.8	7.9
Fibrinogen mg/dl	N/D	N/D	N/D	N/D	300	300
Icterus index units	N/D	N/D	N/D	N/D	10	5

DIFFERENTIAL

(Leukocyte count)

Bands %	2	6	13	3	0	0
Neutrophils %	36	38	32	28	48	48
Lymphocytes %	53	53	46	63	25	25
Monocytes %	3	1	3	3	18	16
Eosinophils %	6	1	6	3	8	11
Basophils %	0	0	0	0	1	0

Table 12. (continued)

#21 F p.3

Date	06-07-89	06-07-89	06-12-89	06-12-89
Age	3 yr	3 yr	3 yr	3 yr
Location#	CAP/GFC	CAP/GFC	CAP/GFC	CAP/GFC
Sample ^a	A = 0:16	B = 4:25	A = 0:18	B = 1:40
Event ^{b,c}	Initial	Post surg	Initial	Post cap
Laboratory ^d	VMTH	VMTH	VMTH	VMTH
Anesthetic ^e	T	T & Iso	T	T

CONSTITUENT

Erythrocyte $10^6/\text{mm}^3$	6.74	4.66	4.74	4.70
Leucocytes $10^3/\text{mm}^3$	6.5	4.2	7.6	6.6
Hemoglobin g/100ml	11.0	7.5	7.7	7.6
Packed cell volume % ^a	31.9 ^e	21.8 ^f	22.6 ^g	22.0 ^h
Mean cell volume μ^3	47.4	46.8	47.6	46.9
Mean cell hemoglobin μug	16.3	16.1	16.2	16.2
Mean cell Hb conc. %	34.4	34.4	34.1	34.5
RDW	15.6	15.2	14.5	15.3
Reticulocytes % (P/A)	1.8/rare	N/D	N/D	N/D
RBC morphology ^{**}	N	N	N	N
Platelets $10^3/\text{mm}^3$	N/D	N/D	N/D	high
Plasma protein g/dl	8.4	6.3	7.6	7.2
Fibrinogen mg/dl	200	200	400	500
Icterus index units	<5	<5	<5	<5

DIFFERENTIAL

(Leukocyte count)

Bands %	0	0	0	0
Neutrophils %	59	62	68	64
Lymphocytes %	21	23	20	20
Monocytes %	9	6	6	8
Eosinophils %	8	8	5	7
Basophils %	3	1	1	1

^aSpun PCV=33.8%^b01-03-89 values were testing laboratory consistency, like letters are actually the same identical sample (A-1 = A-2), As and Bs run on one type of machine, Cs and Ds on another (Stkar = A&B, S-Plus = C&D).^cSpun PCV = 23.5^dSpun PCV = 29.0^eSpun PCV = 32.0^fSpun PCV = 21.0^gSpun PCV = 21.8^hSpun PCV = 20.0

TABLE 13. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #23 Female

Date	03-18-87	03-18-87	03-28-87 ^c	04-09-87	04-09-87	06-01-87 ^s
Age	6-7 mo	6-7 mo	6-7 mo	7-8 mo	7-8 mo	8-9 mo
Location#	ENP	ENP	ENP ^{x1}	ENP ^{x2}	ENP ^{x2}	ENP ^{x3}
Sample ^a	A	A	A	A	A	A = 0:25
Event ^{aa}	Initial	Initial	Initial	Initial	Initial	Initial
Laboratory ^a	CONL	VMTH	JASH	JASH	VMTH	VMTH
Anesthetic Agent ^a	K	K	K	K	K	K
CONSTITUENT						
Erythrocyte 10 ⁶ /mm ³	6.86	8.53	8.5	5.85	6.21	5.19
Leucocytes 10 ³ /mm ³	11.3	11.2	10.8	14.8	14.3 ^d	5.7
Hemoglobin g/100ml	12.6	13.4	13.4	9.6	10.2	8
Packed cell volume %*	36.2	41.0 ^a	41.8	28.4	29.8 ^e	24.6 ^b
Mean cell volume u ³	52.8	48	49.2	48.6	48	47.4
Mean cell hemoglobin uug	18.4	N/D	15.8	16.4	N/D	15.4
Mean cell Hb conc. %	34.9	33	32	33.8	34	32.5
RDW	N/D	N/D	22	23.8	N/D	19
Reticulocytes % (P/A)	1.1	2.0/.4	0.4	6.7	7.66/3.3	.4/.6
RBC morphology**	N	C Po Hj	N	N	N	2+C Hj
Platelets 10 ³ /mm ³	N/D	ADQ ^b	374	596	ADQ ^c	ADQ
Plasma protein g/dl	6.9	8.2	6.1	7.8	8.6	6.6
Fibrinogen mg/dl	N/D	300	N/D	N/D	300	100
Icterus index units	N/D	<5	N/D	N/D	HEM1+	HEM1+
DIFFERENTIAL (Leukocyte count)						
Bands %	4	0	0	0	0	0
Neutrophils %	39	75	35	73	72	63
Lymphocytes %	56	22	60	26	22	32
Monocytes %	0	3	4	1	5	5
Eosinophils %	1	0	1	0	1	0
Basophils %	0	0	0	0	0	0

TABLE 13. (continued).

#23 F p.2

Date	06-01-87	06-01-87	06-01-87	06-16-87	06-16-87	06-22-87
Age	8-9 mo	8-9 mo	8-9 mo	8-9 mo	8-9 mo	9-10 mo
Location#	ENP ^{x3}	ENP ^{x3}	ENP ^{x3}	ENP ^{x4}	ENP ^{x4}	ENP ^{x5}
Sample ^a	A = 0:25	B = 4:11	B = 4:11	A	A	A
Event ^a	Initial	Post cap	Post cap	Initial	Initial	Initial
Laboratory ^a	JASH	VMTH	JASH	JASH	VMTH	JASH
Anesthetic Agent ^a	K	K	K	K	K	K

CONSTITUENT

Erythrocyte $10^6/\text{mm}^3$	4.94	6.57	6.29	6.9	6.98 ^a	8.83
Leucocytes $10^3/\text{mm}^3$	5.8	8.3	7.9	9.1	9.4	10.7
Hemoglobin g/100ml	7.9	10.2	10.1	13.0	12.7 ^a	15.0
Packed cell volume %	23.2	30.8 ¹	29.4	38	34.5	45.2
Mean cell volume μ^3	47.0	46.9	46.8	51.9	49.4 ^a	51.2
Mean cell hemoglobin μg	16.0	15.5	16.1	18.8	18.2 ^a	17.0
Mean cell Hb conc. %	34.0	33.1	34.3	36.3	36.8 ^a	33.2
RDW	21.3	18.7	21.1	N/D	21.4	N/D
Reticulocytes % (P/A)	N/D	N/D	N/D	1.5	5.0/1.3	1.6
RBC morphology**	N	C Po	N	N	N2+C	Nr ^k
Platelets $10^3/\text{mm}^3$	510	ADQ ^j	306	N/D	N	N/D
Plasma protein g/dl	N/D	7.3	N/D	7.7	9.7	8.0
Fibrinogen mg/dl	N/D	100	N/D	N/D	200	N/D
Icterus index units	N/D	HEM 1+	N/D	N/D	n	N/D

DIFFERENTIAL

(Leukocyte count)

Bands %	1	0	0	0	0	0
Neutrophils %	63	60	70	60	54	72
Lymphocytes %	36	35	29	37	43	26
Monocytes %	0	3	1	1	2	2
Eosinophils %	0	2	0	2	0	0
Basophils %	0	0	0	0	1	0

TABLE 13. (continued).

#23 F p.3

Date	06-22-87	08-03-87	02-07-88	05-12-88	05-12-88	05-12-88
Age	9-10 mo	11-12 mo	17-18 mo	20-21 mo	20-21 mo	20-21 mo
Location#	ENP ^{x5}	ENP ^{x6}	ENP ^{x7}	ENP ^{x8}	ENP ^{x8}	ENP ^{x8}
Sample ^a	A	A	A	A = 0:24	B = 1:06	A = 0:24
Event ^{a,b}	Initial	Initial	Initial	Initial	Post cap	Initial
Laboratory ^c	JASH	JASH	VMTH	VMTH	VMTH	JASH
Anesthetic Agent ^c	K	K				

CONSTITUENT

Erythrocyte $10^6/\text{mm}^3$	9.2	8.34	7.10	7.89	6.74
Leucocytes $10^3/\text{mm}^3$	11.2	12.4	8.5	9.1	8.2
Hemoglobin g/100ml	14.5	14.1	11.5	12.9	11.8
Packed cell volume %	45.31	41.8	33.8 ^o	37.8 ^p	35.2
Mean cell volume μ^3	49.2	50.1	47.6	47.9	52.2
Mean cell hemoglobin μg	15.8	16.9	16.2	16.3	17.5
Mean cell Hb conc. %	32.0	33.7	34.0	34.1	33.5
RDW	19.5	N/D	16.0	15.7	N/D
Reticulocytes % (P/A)	2.8/1.8	3.5	1.2/0.8	N/D	N/D
RBC morphology**	1+C H _j ^m	Po M	2+C	2+C	N
Platelets $10^3/\text{mm}^3$	N	N/D	ADQ ^{+o}	ADQ ^{+o}	N/D
Plasma protein g/dl	9.0	N/D	7.3	7.4	N/D
Fibrinogen mg/dl	200	N/D	<100	200	N/D
Icterus index units	HEM 2+	N/D	<5	<5	N/D

DIFFERENTIAL

(Leukocyte count)

Bands %	0	3	0	0	0
Neutrophils %	54	76	50	70	61
Lymphocytes %	45	20	39	25	34
Monocytes %	1	1	6	4	5
Eosinophils %	0	0	2	0	3
Basophils %	0	0	3	1	0

TABLE 13. (continued)

#23 F p.4

Date	05-12-88	06-22-88	06-22-88	11-05-88	11-05-88	02-06-89
Age	20-21 mo	21-22 mo	21-22 mo	26-27 mo	26-27 mo	29-30 mo
Location#	ENP ^{x8}	ENP ^{x9}	ENP ^{x9}	CAP/GFC ^{x10}	CAP/GFC ^{x10}	CAP/WOP ^{x11}
Sample ^a	B = 1:06	A = 0:08	B = 1:06	A = 0:23	B = 1:16	A = 0:
Event ^a	Post cap	Initial	Post cap	Initial	Post cap	Initial
Laboratory ^r	JASH	VMTH	VMTH	VMTH	VMTH	VMTH
Anesthetic ^c		K				
CONSTITUENT						
Erythrocyte 10 ⁶ /mm ³	7.58	6.96	5.30	7.29	8.09	8.48
Leucocytes 10 ³ /mm ³	8.6	7.3	10.2	8.80	9.60	8.90
Hemoglobin g/100ml	13.0	11.5	8.7	11.9	13.5	13.8
Packed cell volume % ^a	39.0	36.5 ^x	26.8 ^s	36.4 ^u	41.0 ^v	40.9 ^w
Mean cell volume u ³	51.5	52.4	50.5	49.9	50.9	48.2
Mean cell hemoglobin uug	17.2	16.5	16.4	16.3	16.7	16.3
Mean cell Hb conc. %	33.3	31.5	32.5	32.7	32.9	33.8
RDW	N/D	17.4	16.2	15.8	15.5	17.2
Reticulocytes % (P/A)	N/D	N/D	N/D	N/D	N/D	N/D
RBC morphology ^{**}	N	A 3+C Pl Hj	Pl Hj	Po	N	N
Platelets 10 ³ /mm ³	N/D	T	N	N	N	N
Plasma protein g/dl	N/D	7.5	7.0	8.0	8.2	8.3
Fibrinogen mg/dl	N/D	400	400	300	200	100
Icterus index units	N/D	<5	<5	<5	<5	<5
DIFFERENTIAL						
Bands %	0	0	0	0	0	0
Neutrophils %	62	65	78	74	62	71
Lymphocytes %	30	24	11	23	35	23
Monocytes %	5	7	9	1	2	4
Eosinophils %	0	3	2	2	1	2
Basophils %	0	1	0	0	0	0

^aSpun PCV=36.8%; ^b1+ clumped; ^c9-10% dehydrated, extremely cachexic; ^d13.85 corrected for NRBC; ^eSpun PCV=28.5%; ^fmoderate increase; ^g5-6% dehydrated, anorectic for 6 days; ^hSpun PCV=23.5%; ⁱSpun PCV=30.8%; ^jmoderately clumped; ^k1 NRBC/100 WBC; ^lSpun PCV=44.0%; ^mocc keratocyte; ⁿsample grossly hemolyzed; ^oSpun PCV = 32.5; ^pSpun PCV = 36.8; ^qmod-marked clumped; ^rSpun PCV = 34; ^sSpun PCV = 25; ^tPlatelets clumped with a small number of large platelets; ^uSpun PCV = 34.4; ^vSpun PCV = 39.5; ^wSpun PCV = 40.2.

^{x1}Removed from wild, orphaned from mother for 10 days, 9-10% dehydrated, cachexic; ^{x2}Returned to wild, reunited with family after 12 days in captivity, good physical condition; ^{x3}Removed from wild, separated from mother for 6 days, anorectic, 5-6% dehydrated; ^{x4}Returned to wild, attempt to reunite with family, 16 days in captivity; ^{x5}Removed from wild, failed attempt to reunite with family, 6 days anorectic, slight dehydration; ^{x6}Post quarantine, moving to White Oak Plantation; ^{x7}Radiograph injured leg; ^{x8}Return to Everglades National Park, released to the wild on 05-14-88; ^{x9}Removed from wild, stranded on island in Shark River Slough for 13 days, very thin, poor physical condition, 5% dehydrated; ^{x10}Moved from Gainesville to White Oak Plantation; ^{x11}Returning to wild-ENP.

TABLE 14. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #28 Male

Date	11-29-88	12-30-88	12-30-88	03-11-89	03-11-89	03-11-89
Age	16-22 mo	17-23 mo	17-23 mo	20-26 mo	20-26 mo	20-26 mo
Location#	CAP/VMTH	CAP/GFC	CAP/GFC	CAP/GFC	CAP/GFC	CAP/GFC
Sample ^a	A = 0:	A = 0:	B = 1:	A = 0:	B = 1:	C =
Event ^{aa}	HBC	Recheck	Post cap	Initial	Post ejac	60m P EE
Laboratory [*]	VMTH	VMTH	VMTH	VMTH	VMTH	VMTH
Anesthetic Agent ^o						
CONSTITUENT						
Erythrocyte $10^6/\text{mm}^3$	8.06	7.79	6.85	8.16	8.69	6.92
Leucocytes $10^3/\text{mm}^3$	16.8	17.9	10.3	10.4	11.9	9.4
Hemoglobin g/100ml	11.1	11.4	9.4	13.2	13.8	10.8
Packed cell volume % [*]	33.8 ^A	34.5 ^B	30.1 ^C	37.7 ^D	39.6 ^E	30.5 ^F
Mean cell volume μ^3	41.9	44.0	44.0	44.5	44.0	43.4
Mean cell hemoglobin uug	13.8	15.0	14.0	16.2	15.9	N/D
Mean cell Hb conc. %	32.9	33.0	31.0	35.2	36.3	36.0
RDW	20.4	20.1	19.2	N/D	N/D	N/D
Reticulocytes % (P/A)	N/D	3.4/1.4	N/D	N/D	N/D	N/D
RBC morphology ^{**}	N	Po	N	Po	N	N
Platelets $10^3/\text{mm}^3$	643	N/D	N/D	high	N	N
Plasma protein g/dl	7.5	8.1	7.0	8.0	8.0	7.4
Fibrinogen mg/dl	300	100	100	200	200	100
Icterus index units	<5	<5	<5	5	5	5
DIFFERENTIAL (Leukocyte count)						
Bands %	0	0	0	0	0	0
Neutrophils %	93	81	80	68	69	76
Lymphocytes %	3	10	12	22	22	16
Monocytes %	4	2	4	5	7	4
Eosinophils %	0	7	4	5	2	4
Basophils %	0	0	0	0	0	0

^ASpun PCV = 32.1^BSpun PCV = 35.0^CSpun PCV = 30.1^DSpun PCV = 37.5^ESpun PCV = 38.0^FSpun PCV = 30.0

TABLE 15. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #29 Male

Date	01-03-89	01-03-89	05-01-89	05-01-89	05-01-89	05-01-89
Age	6 mos	6 mos	11 mos	11 mos	11 mos	11 mos
Location#						
Sample ^a	A = 0:	A = 0:	A = 0:	B = 1:	A = 0:	B = 1:
Event ^{aa}	Initial	Initial	Initial	Post cap	A = 0:	Post cap
Laboratory ⁺	VMTH	DSI	DSI ^A	DSI ^A	DSI ^B	DSI ^B
Anesthetic Agent ^e	K	K	K	K	K	K
CONSTITUENT						
Erythrocyte 10 ⁶ /mm ³	9.09	8.59	7.90	7.51	6.84	6.19
Leucocytes 10 ³ /mm ³	7.5	10.5	10.3	9.2	9.3	9.7
Hemoglobin g/100ml	13.5	13.8	11.9	11.3	13.0	12.0
Packed cell volume % [*]	43.7	41.1	36.2	34.0	33.2	29.2
Mean cell volume u ³	48.0	47.8	45.8	45.3	48.5	47.3
Mean cell hemoglobin uug	15.0	16.1	15.1	15.0	19.1	19.4
Mean cell Hb conc. %	31.0	33.6	32.9	33.2	39.4	41.1
RDW	18.6	20.2	20.2	31.7	N/D	N/D
Reticulocytes % (P/A)	14.0	1.1	0.5	N/D	N/D	N/D
RBC morphology ^{**}	N	AMPo	AMPo	M Po	AMPo	M Po
Platelets 10 ³ /mm ³	N/D	599	422	174	326	97
Plasma protein g/dl	7.5	N/D	N/D	N/D	N/D	N/D
Fibrinogen mg/dl	100	N/D	N/D	N/D	N/D	N/D
Icterus index units	<5	N/D	N/D	N/D	N/D	N/D
DIFFERENTIAL						
(Leukocyte count)						
Bands %	0	2	1	2	3	2
Neutrophils %	67	68	51	50	50	53
Lymphocytes %	23	27	45	43	44	37
Monocytes %	2	1	0	2	3	3
Eosinophils %	6	0	1	2	0	3
Basophils %	2	1	0	0	0	0

Table 15. (continued)

#29 M p.2

Date	05-01-89	05-01-89
Age	11 mo	11 mo
Location#		
Sample ^a	A = 0:	B = 1:
Event ^a	Initial	Post cap
Laboratory ^a	VMTH	VMTH
Anesthetic ^a	K	K
CONSTITUENT		
Erythrocyte $10^6/\text{mm}^3$	8.59	8.08
Leucocytes $10^3/\text{mm}^3$	6.7	7.3
Hemoglobin g/100ml	12.7	11.8
Packed cell volume % ^a	38.8 ^c	36.0 ^d
Mean cell volume μ^3	45.2	44.5
Mean cell hemoglobin μug	14.8	14.6
Mean cell Hb conc. %	32.7	32.8
RDW	17.2	16.8
Reticulocytes % (P/A)	0.45	N/D
RBC morphology ^{**}	N	N
Platelets $10^3/\text{mm}^3$	N/D	N/D
Plasma protein g/dl	7.5	7.0
Fibrinogen mg/dl	200	200
Icterus index units	<5	<5
DIFFERENTIAL (Leukocyte count)		
Bands %	0	0
Neutrophils %	63	59
Lymphocytes %	30	30
Monocytes %	6	6
Eosinophils %	1	5
Basophils %	0	0

^aCBC ran on Stkar^bCBC ran on S-plus^cSpun PCV = 40.0^dSpun PCV = 36.1

TABLE 16. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #30 MALE

Date	01-07-89	01-07-89	01-07-89	01-07-89	05-02-89	05-02-89
Age	9 mos	9 mos	9 mos	9 mos	13 mo	13 mo
Location#						
Sample ^a	A = 0:	B = 1:	A = 0:	B = 1:	A = 0:	B = 1:
Event ^{aa}	Initial	Post cap	Initial	Post cap	Initial	Post cap
Laboratory ^a	DSI	DSI	VMTH	VMTH	VMTH	VMTH
Anesthetic Agent ^a	K	K	K	K	K	K
CONSTITUENT						
Erythrocyte $10^6/\text{mm}^3$	7.51	7.90	7.21	7.29	7.77	8.41
Leucocytes $10^3/\text{mm}^3$	14.0	16.6	11.8	14.0	9.9	8.0
Hemoglobin g/100ml	11.4	12.6	12.0	13.0	11.6	12.5
Packed cell volume %	36.7	38.9	32.8 ^a	33.9 ^b	35.1 ^c	37.8 ^d
Mean cell volume μ^3	48.9	49.2	47.3	48.5	45.2	44.9
Mean cell hemoglobin μg	15.2	15.9	16.6	N/D	14.9	14.9
Mean cell Hb c6nc. %	31.0	32.4	36.6	N/D	33.0	33.1
RDW	19.6	20.1	N/D	N/D	18.3	18.5
Reticulocytes % (P/A)	0.3	N/D	31	N/D	14.0	N/D
RBC morphology ^{aa}	AMPo	AMPo	N	N	N	N
Platelets $10^3/\text{mm}^3$	433	138	N/D	N/D	475	496
Plasma protein g/dl	N/D	N/D	6.8	7.3	7.4	7.8
Fibrinogen mg/dl	N/D	N/D	300	300	200	300
Icterus index units	N/D	N/D	<5	<5	<5	<5
DIFFERENTIAL (Leukocyte count)						
Bands %	13	13	0	0	0	0
Neutrophils %	19	23	73	74	74	83
Lymphocytes %	60	61	24	18	18	10
Monocytes %	1	0	2	3	3	3
Eosinophils %	2	3	1	5	5	3
Basophils %	0	0	0	0	0	1

Table 16. (continued)

#30 M p.2

Date	05-02-89	05-02-89	05-02-89	05-02-89
Age	13 mo	13 mo	13 mo	13 mo
Location#				
Sample ^a	A = 0:	B = 1:	A = 0:	B = 1:
Event ^{aa}	Initial	Post cap	Initial	Post cap
Laboratory ^b	DSI ^E	DSI ^E	DSI ^F	DSI ^F
Anesthetic ^c	K	K	K	K
CONSTITUENT				
Erythrocyte 10 ⁶ /mm ³	7.29	7.48	6.13	6.45
Leucocytes 10 ³ /mm ³	9.5	10.5	9.1	10.4
Hemoglobin g/100ml	11.2	11.8	12.2	12.9
Packed cell volume % ^a	33.5	34.3	29.3	30.5
Mean cell volume u ³	45.9	45.9	47.8	47.3
Mean cell hemoglobin uug	15.4	15.8	20.0	20.0
Mean cell Hb conc. %	33.5	34.4	41.8	42.4
RDW	20.8	22.6	N/D	N/D
Reticulocytes % (P/A)	2.3	N/D	N/D	N/D
RBC morphology ^{aa}	AMPo	AMPo	AMPo	AMPo
Platelets 10 ³ /mm ³	441	412	218	425
Plasma protein g/dl	N/D	N/D	N/D	N/D
Fibrinogen mg/dl	N/D	N/D	N/D	N/D
Icterus index units N/D	N/D	N/D	N/D	N/D
DIFFERENTIAL				
(Leukocyte count)				
Bands %	4	4	1	7
Neutrophils %	60	57	58	54
Lymphocytes %	35	36	38	36
Monocytes %	0	2	1	2
Eosinophils %	1	1	2	1
Basophils %	0	0	0	0

^aSpun PCV = 33.0^bSpun PCV = 34.5^cSpun PCV = 34.9^dSpun PCV = 37.0^ECBC run on Stkar^FCBC run on S-Plus

TABLE 17. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #31 FEMALE

Date	01-12-89	01-12-89
Age		
Location#		
Sample ^a	A = 0:	B = 1:
Event ^{a,a}	Initial	Post cap
Laboratory ^r	DSI	DSI
Anesthetic Agent ^e		
CONSTITUENT		
Erythrocyte $10^6/\text{mm}^3$	7.95	8.14
Leucocytes $10^3/\text{mm}^3$	9.2	12.6
Hemoglobin g/100ml	12.6	12.8
Packed cell volume %	38.5	38.9
Mean cell volume μ^3	48.4	47.8
Mean cell hemoglobin uug	15.8	15.7
Mean cell Hb conc. %	32.7	32.9
RDW	20.2	20.1
Reticulocytes % (P/A)	0.7	N/D
RBC morphology**	AMPo	AMPo
Platelets $10^3/\text{mm}^3$	542	529
Plasma protein g/dl	N/D	N/D
Fibrinogen mg/dl	N/D	N/D
Icterus index units	N/D	N/D
DIFFERENTIAL (Leukocyte count)		
Bands %	4	4
Neutrophils %	60	74
Lymphocytes %	35	20
Monocytes %	1	1
Eosinophils %	0	1
Basophils %	0	0

TABLE 18. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #32 FEMALE

Date	02-03-89	02-03-89	02-03-89	02-03-89
Age				
Location#				
Sample ^a	A = 0:	B = 1:	A = 0:	B = 1:
Event ^a				
Laboratory ^a	VMTH	VMTH	DSI	DSI
Anesthetic Agent ^a				
CONSTITUENT				
Erythrocyte 10 ⁶ /mm ³	7.2	6.37	7.07	5.95
Leucocytes 10 ³ /mm ³	6.6	9.0	8.0	8.9
Hemoglobin g/100m	N/D	10.7	11.4	9.9
Packed cell volume % ^a	36.8 ^A	30.2 ^B	33.5	28.1
Mean cell volume u ³	48.0	48.0	47.4	47.2
Mean cell hemoglobin ug	15.4	16.8	16.1	16.6
Mean cell Hb conc. %	32.3	35.4	34.0	35.3
RDW	N/D	N/D	17.7	18.2
Reticulocytes % (P/A)	5.0	N/D	2.0	N/D
RBC morphology**	N	N	AMPo	MPo
Platelets 10 ³ /mm ³	N/D	N/D	437	399
Plasma protein g/dl	7.8	7.0	N/D	N/D
Fibrinogen mg/dl	200	200	N/D	N/D
Icterus index units	<5	<5	N/D	N/D
DIFFERENTIAL				
(Leukocyte count)				
Bands %	0	0	4	2
Neutrophils %	60	70	50	63
Lymphocytes %	32	19	43	33
Monocytes %	2	3	2	1
Eosinophils %	5	6	1	0
Basophils %	1	2	0	1

^ASpun PCV = 36.0^BSpun PCV = 30.0

TABLE 19. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #33 MALE

Date	03-05-89	03-05-89	03-05-89	03-05-89	03-05-89	03-05-89
Age						
Location#						
Sample ^a	A = 0:	B = 1:	C =	D =	A = 0:	B = 1:
Event ^{aa}	Initial	Pre EE	Post ejac	60m P EE	Initial	Pre EE
Laboratory ⁺	VMTH	VMTH	VMTH	VMTH	DSI	DSI
Anesthetic Agent ^c						
CONSTITUENT						
Erythrocyte $10^6/\text{mm}^3$	7.07	6.73	7.67	7.40	7.09	6.69
Leucocytes $10^3/\text{mm}^3$	6.4	5.3	6.8	5.9	6.5	5.3
Hemoglobin g/100ml	11.2	10.6	12.2	11.5	11.0	10.5
Packed cell volume % [*]	35.7 ^A	33.0 ^B	38.5 ^C	36.5 ^D	35.5	32.7
Mean cell volume μ^3	50.5	49.1	50.2	49.3	50.1	48.9
Mean cell hemoglobin μg	15.8	15.8	15.9	15.5	15.5	15.7
Mean cell Hb conc. %	31.4	32.1	31.7	31.5	31.0	32.1
RDW	N/D	N/D	N/D	N/D	18.8	18.6
Reticulocytes % (P/A)	0.16	N/D	N/D	N/D	0.4	N/D
RBC morphology ^{**}	N	N	N	N	Po	AMPo
Platelets $10^3/\text{mm}^3$	N/D	N/D	N/D	N/D	422	330
Plasma protein g/dl	6.6	6.5	7.2	6.9	N/D	N/D
Fibrinogen mg/dl	200	150	200	300	N/D	N/D
Icterus index units	5	N/D	N/D	<5	N/D	N/D
DIFFERENTIAL (Leukocyte count)						
Bands %	0	0	0	0	15	3
Neutrophils %	60	60	68	75	22	36
Lymphocytes %	29	25	16	13	57	58
Monocytes %	7	9	9	6	3	0
Eosinophils %	4	6	7	6	1	0
Basophils %	0	0	0	0	0	0

Table 19. (continued)

Date	03-05-89	03-05-89
Age		
Location#		
Sample ^a	C =	D =
Event ^{aa}	Post ejac	60m P EE
Laboratory ⁺	DSI	DSI
Anesthetic ^c		
CONSTITUENT		
Erythrocyte $10^6/\text{mm}^3$	7.87	7.25
Leucocytes $10^3/\text{mm}^3$	8.5	6.7
Hemoglobin g/100ml	12.9	11.4
Packed cell volume % [*]	38.6	35.5
Mean cell volume μ^3	49.1	48.9
Mean cell hemoglobin μug	16.4	15.7
Mean cell Hb conc. %	33.4	32.2
RDW	18.8	18.8
Reticulocytes % (P/A)	N/D	N/D
RBC morphology ^{**}	Po	Po
Platelets $10^3/\text{mm}^3$	388	435
Plasma protein g/dl	N/D	N/D
Fibrinogen mg/dl	N/D	N/D
Icterus index units	N/D	N/D
DIFFERENTIAL		
(Leukocyte count)		
Bands %	10	11
Neutrophils %	39	39
Lymphocytes %	44	43
Monocytes %	3	3
Eosinophils %	4	3
Basophils %	0	0

^aSpun PCV = 35.2^bSpun PCV = 32.5^cSpun PCV = 36.5^dSpun PCV = 35.9

TABLE 20. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: "BIG GUY" Male*

Date	11-02-84	11-05-84	11-09-84	11-20-84	12-10-84	01-04-85
Age	3-5 yr	3-5 yr	3-5 yr	3-5 yr	3-5 yr	3-5 yr
Location#	CAP/VMTH*	CAP/VMTH	CAP/VMTH	CAP/VMTH	CAP/VMTH	CAP/GFC
Sample ^a						
Event ^{a,a}						
Laboratory [†]	VMTH	VMTH	VMTH	VMTH	VMTH	VMTH
Anesthetic Agent ^o						
CONSTITUENT						
Erythrocyte $10^6/\text{mm}^3$	4.26	3.8	5.2	4.7	6.32	7.9
Leucocytes $10^3/\text{mm}^3$	16.4	18.3	16.7	12.6	9.0	6.6
Hemoglobin g/100ml	8.3	6.0	7.6	7.2	10.6	12.5
Packed cell volume %	19.4 ^A	18.0	23.0	22.0	30.0 ^B	35.0
Mean cell volume μ^3	46.0	48.0	45.0	48.0	47.0	45.0
Mean cell hemoglobin μug	N/D	N/D	N/D	N/D	N/D	N/D
Mean cell Hb conc. %	34.6	34.0	35.0	33.0	33.0	36.0
RDW	N/D	N/D	N/D	N/D	N/D	N/D
Reticulocytes % (P/A)	N/D	N/D	N/D	0.5/1.0	0.4/2.5	N/D
RBC morphology**	A	A Po	A Pl	A Po Pl	A	N
Platelets $10^3/\text{mm}^3$	N/D	N/D	N/D	N/D	N/D	N/D
Plasma protein g/dl	6.2	7.1	7.1	7.8	7.4	7.8
Fibrinogen mg/dl	200	600	500	400	200	400
Icterus index units	N/D	N/D	N/D	N/D	N/D	N/D
DIFFERENTIAL (Leukocyte count)						
Bands %	1	0	2	0	0	0
Neutrophils %	96	87.5	90	89.5	87	78.5
Lymphocytes %	1	10	6	8	8	11.5
Monocytes %	3	1	3	2	6	8
Eosinophils %	0	0	0	0.5	0	2
Basophils %	0	1.5	1	0	0	0

Table 20. (continued)

"Big Guy" M p.2

Date	02-25-85	04-18-85	04-29-86	04-29-86	04-29-86	04-29-86
Age	3-5 yr	3-5 yr	4-6 yr	4-6 yr	4-6 yr	4-6 yr
Location#	CAP/GFC	CAP/GFC	CAP/WOP	CAP/WOP	CAP/WOP	CAP/WOP
Sample ^a			I = 0:	II = 1:	III =	IV =
Event ^a	Initial	Initial	Initial	Pre EE	Post EE	?M Post EE
Laboratory ^a	VMTH	VMTH	VMTH	VMTH	VMTH	VMTH
Anesthetic ^a			K	K	K	K

CONSTITUENT

Erythrocyte $10^6/\text{mm}^3$	7.54	8.7	9.84	8.47	9.37	8.26
Leucocytes $10^3/\text{mm}^3$	4.6	6.6	6.0	5.5	5.5	6.3
Hemoglobin g/100ml	11.5	13.8	15.8	13.5	15.2	13.3
Packed cell volume %*	33.0 ^c	41.5 ^d	47.5 ^e	40.3 ^f	44.5 ^g	38.5 ^h
Mean cell volume μ^3	45.0	48.0	46.0	47.0	48.0	47.0
Mean cell hemoglobin μug	N/D	N/D	N/D	N/D	N/D	N/D
Mean cell Hb conc. %	35.0	33.0	32.0	33.0	34.0	34.0
RDW	N/D	N/D	N/D	N/D	N/D	N/D
Reticulocytes % (P/A)	N/D	N/D	N/D	N/D	N/D	N/D
RBC morphology**	A Po	N	N	N	A	N
Platelets $10^3/\text{mm}^3$	N/D	N/D	N	N	N	N
Plasma protein g/dl	6.9	8.4	8.8	7.8	7.9	7.5
Fibrinogen mg/dl	100	300	200	200	100	200
Icterus index units	N/D	N/D	<5	<5	<5	<5

DIFFERENTIAL

(Leukocyte count)

Bands %	0	0	0	0	0	0
Neutrophils %	64	79	65	71	75	76
Lymphocytes %	28	19	34	20	19	20
Monocytes %	5	2	1	7	6	4
Eosinophils %	3	0	0	2	0	0
Basophils %	0	0	0	0	0	0

Table 20. (continued)

Date	04-29-86	06-03-86	06-03-86	08-06-86	08-06-86	07-23-88 ^o
Age	4-6 yr	4.5-6.5 y	4.5-6.5 y	4.5-6.5 y	4.5-6.5 y	6.5-8.5 y
Location#	CAP/WOP	CAP/WOP	CAP/WOP	CAP/WOP	CAP/WOP	CAP/WOP
Sample ^a	V	A = 0:	B = 1:	A = 0:	B = 1:	A = 0:
Event ^a		Initial	Post cap	Initial	Post cap	Initial
Laboratory ^a	VMTH	VMTH	VMTH	VMTH	VMTH	VMTH
Anesthetic ^a	K			K	K	

CONSTITUENT

Erythrocyte 10 ⁶ /mm ³	7.6	8.7	8.58	9.1	9.1	7.46
Leucocytes 10 ³ /mm ³	6.2	6.1	5.3	6.5	6.5	12.2
Hemoglobin g/100ml	12.4	14.3	13.8	15.2	15.0	12.0
Packed cell volume % ^a	35.0 ⁱ	43.0 ^j	41.3 ^k	46.5 ^l	41.6 ^m	35.4 ⁿ
Mean cell volume u ³	46.0	47.0	46.0	50.0	47.0	47.4
Mean cell hemoglobin uug	N/D	N/D	N/D	N/D	N/D	16.1
Mean cell Hb conc. %	34.0	33.0	33.0	34.6	35.6	33.9
RDW	N/D	N/D	N/D	N/D	N/D	16.9
Reticulocytes % (P/A)	N/D	N/D	N/D	N/D	N/D	N/D
RBC morphology ^a	N	N	A	Po	Po	N
Platelets 10 ³ /mm ³	N	N	N	N	N	Clumped
Plasma protein g/dl	7.3	8.5	7.3	9.6	9.7	8.2
Fibrinogen mg/dl	300	200	200	200	200	200
Icterus index units	<5	<5	<5	<5	<5	<5

DIFFERENTIAL

(Leukocyte count)

Bands %	0	1	1	0	0	0
Neutrophils %	77	62	51	62	77	81
Lymphocytes %	13	22	31	29	7	9
Monocytes %	7	8	9	6	11	6
Eosinophils %	3	6	8	3	3	4
Basophils %	0	1	0	0	2	0

*"Big Guy" hit-by-car in Ochopee, Fl. on Highway 41, fractured both femurs which were plated.

^aSpun PCV = 24.0; ^bSpun PCV = 32.8; ^cSpun PCV = 31.5; ^dSpun PCV = 42.2; ^eSpun PCV = 48.8; ^fSpun PCV = 40.9; ^gSpun PCV = 44.8; ^hSpun PCV = 38.8; ⁱSpun PCV = 36.0; ^jSpun PCV = 40.5; ^kSpun PCV = 39.5; ^lSpun PCV = 41.5; ^mSpun PCV = 43.0; ⁿSpun PCV = 35.0.

^oTransported to the VMTH from WOP awake in a crate, immobilized at the VMTH after a 2 hour car trip to donate blood for Florida panther #21 F (hit-by-car).

TABLE 21. CELLULAR CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #VMTH-65185* Male

Date	01-25-89	01-25-89
Age	3-4 yr	3-4 yr
Location#		
Sample ^a	A = 0:	B = 1:
Event ^{aa}	Initial	
Laboratory ^a	VMTH	VMTH
Anesthetic Agent ^a	K	
CONSTITUENT		
Erythrocyte $10^6/\text{mm}^3$	8.15	7.6
Leucocytes $10^3/\text{mm}^3$	14.4	22.6
Hemoglobin g/100ml	12.3	11.4
Packed cell volume %*	37.5 ^A	35.7 ^B
Mean cell volume μ^3	46.0	46.6
Mean cell hemoglobin μug	15.1	14.9
Mean cell Hb conc. %	32.8	31.9
RDW	N/D	N/D
Reticulocytes % (P/A)	N/D	N/D
RBC morphology**	N/D	N
Platelets $10^3/\text{mm}^3$	N	N
Plasma protein g/dl	5.8	5.6
Fibrinogen mg/dl	300	200
Icterus index units	5	5
DIFFERENTIAL		
(Leukocyte count)		
Bands %	0	1
Neutrophils %	86	93
Lymphocytes %	7	2
Monocytes %	4	2
Eosinophils %	2	1
Basophils %	1	1

*Hit-by-car on SR 850 NW of Immokalee, NE of Corkscrew Swamp Sanctuary

^ASpun PCV = 37.0

^BSpun PCV = 35.9

LEGEND
SEROLOGY TABLES

N/D = Not Determined

- MAJOR POPULATIONS: I- Southwestern Florida, Big Cypress Swamp & Fakahatchee Strand and surrounding ecosystem including privately owned land; II- Southeastern Florida, Everglades National Park; III Central Florida; IV- not part of a discrete documented population of panthers.

LOCALITY OF RANGE: BI - Bear Island Unit of Big Cypress National Preserve; CORBETT - Corbett Management Area; CORK - Corkscrew Swamp and Ft. Myers area; ENP - Everglades National Park; FEC - Fish Eating Creek; FS- Fakahatchee Strand both north and south of SR 84; MO - Southwestern Monument Unit, Big Cypress National Preserve; N. Florida- 10 months old captive cougar released near Capps, Fl. south of Tallahassee 2 months before death on highway by car; N.FS - Northern Fakahatchee Strand; PR - Private ranches east of Immokalee; RP - Raccoon Point, Eastern Big Cypress National Preserve; S.FS - Southern Fakahatchee Strand (Fakahatchee Strand State Preserve).

OTHER: CAP - captivity; GFC - Florida Game and Fresh Water Fish Commission, Wildlife Research Laboratory, Gainesville, Fl.; MMZ - Miami Metro Zoo, Miami, Fl.; WOP - White Oak Plantation, Yulee, Fl.

- SAMPLE: Blood samples drawn at the "running time" indicated.
Time zero (0:00) starts when cat receives initial anesthetic agent

•• EVENT:

Initial: initial blood sample, drawn as soon as cat is stable, IV catheter im-plant, generally less than 100 cc of IV fluids given.

PRE-E: blood drawn immediately prior to starting electro-ejaculation protocol (males). Skin biopsy surgical procedure performed on lateral thigh, 6 x 6mm plugs removed and wounds sutured. Also, cat has received 5-700 cc of lactated ringers.

PE or Post ejac: Post Ejaculation, number in front indicates time (minutes) following series III of ejaculation protocol. By end the panther has usually received 1 liter lactated ringers IV and 2 liters SQ.

Post Cap: sample drawn at end of capture procedure

- + Laboratory: CONL = Consulab, Miami; DSI = Diagnostic Services Inc., Naples; IALS = Inter-American Laboratory Service, Miami; JASH = James Archer Smith Hospital Laboratory, Homestead; VMTH = Veterinary Medical Teaching Hospital, Gainesville.

- Anesthetic used: D = Diazepam (Valium[®]); H = Halothane; K = Ketamine hydrochloride; T = Telazol; V = Versed; X = Xylazine hydrochloride (Rompun[®]); Iso - Isoflurane.

Table 22. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #09 Female

Date	01-26-85	01-08-87**	01-14-87	01-20-87	01-25-87	01-31-87
Age	3-4 yr	5-6 yr	5-6 yr	5-6 yr	5-6 yr	5-6 yr
Location#	FSSP	FSSP	Captive	Captive	Captive	Captive
Sample ^a	A	A	A	A	A	A
Event ^{aa}						
Laboratory+	DSI	DSI	IALS	CONL	DSI	DSI
Anesthetic ^c	K	K	K	K	K	K
Total Protein	7.2	7.7	7.9	6.0	8.3	8.9
Globulin	3.6	4.3	5.4	3.5	4.4	4.7
Albumin	3.6	3.4	2.5	2.5	3.9	4.2
A/G Ratio	1.0	0.8	0.5	.7	0.9	0.9
LDH	855	120	67	133.0	146	49
CPK	7430	255	592	113.4	210	228
SGPT	115	30	40	30.5	61	61
SGOT	215	32	84	28.1	59	43
Alk. Phos.	42	7	8.0	3.0	8	7
Na	150	149	149	148.0	150	151
K	4.2	4.5	4.1	4.9	5.2	5.1
Cl	116	116	113	115.0	116	117
Ca	9.5	9.1	10.0	9.8	9.9	10.4
Phos.	4.9	3.9	5.9	5.6	4.5	3.8
Glucose	386	(?)	110	90.2	72	100
Cholesterol	132	119	179	267.1	226	216
Bilirubin	0.1	0.1	0.4	0.8	0.0	0.1
Creatinine	1.7	2.2	1.8	1.4	1.6	1.9
BUN	51	26	32	53.0	41	28
BUN/Crea. Ratio	30	11.8	17.8	37.9	25.6	14.7
GGT	3	4	22	.8	1	1
Serum Iron	34 ^a	46	N/D	N/D	82	55
Anion Gap	N/D	N/D	14.7	16.4	N/D	N/D
CO ₂ Total	15.9	15.0	21.0	17.0	19.1	16.6
Triglycerides	11	16	N/D	N /D	79	20
Uric Acid	0.8	0.4	N/D	N/D	0.3	0.0

Table 22. (continued).

Date	02-05-87	02-05-87	10-31-88	10-31-88
Age	5-6 yr	5-6 yr	7-8 yr	7-8 yr
Location#	CAP/MMZ	CAP/MMZ	FSSP	FSSP
Sample ^a	A = 0:	A = 0:	A = 0:	B = 1:
Event ^{aa}			Initial	Post cap
Laboratory+	DSI	CONL	DSI	DSI
Anesthetic@	K	K		
Total Protein	8.2	8.1	8.0	8.0
Globulin	4.2	3.9	4.4	4.6
Albumin	4.0	4.2	3.6	3.4
A/G Ratio	1.0	1.1	0.8	0.7
LDH	80	34	120	438
CPK	493	N/D	270	702
SGPT	53	57	33	36
SGOT	68	69	38	48
Alk. Phos.	10	10	17	15
Na	150	155	151	151
K	5.0	5.0	4.7	4.5
Cl	112	117	117	115
Ca	10.4	10.8 ^b	9.2	9.2
Phos.	5.1	5.4	4.6	3.2
Glucose	95	101	102	87
Cholesterol	178	195	107	108
Bilirubin	0.1	0.1	0.2	0.2
Creatinine	1.6	1.6	1.9	1.8
BUN	40	44	70	64
BUN/Crea. Ratio	25.0	27.5	36.8	35.6
GGT	1	N/D	3	3
Serum Iron	48	64	64	80
Anion Gap		16.0	N/D	N/D
CO ₂ Total	22	22	N/D	N/D
Triglycerides	42	46	501	112
Uric Acid	0.4	0.2	0.4	0.4

**Captured- Discovered an infected, broken foot from gun shot wound. Evacuated to Miami Metro Zoo for surgery and follow-up treatment. Returned to the wild on 2/9/87.

^aserum iron value 45.7 determined at Dr. Harvey's lab, UF, Gainesville, FL.

^bionized calcium = 4.4

Table 23. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: # 12 Male^A

Date	01-29-86	01-31-88	01-31-88	01-31-88	01-31-88
Age	4-5 yr	6-7 yr	6-7 yr	6-7 yr	6-7 yr
Location#	BI/BCNP	FSSP	FSSP	FSSP	FSSP
Sample ^a	A = 0:40	A = 0:30	A = 0:30	B = 1:15	C = 2:20
Event ^{aa}	Initial	Initial	Initial	Post ejac	60m PE
Laboratory ⁺	DSI	DSI	CONL	CONL	CONL
Anesthetic [@]	K	KT	KT	KT	KT
Total Protein	8.7	8.0	8.0	8.1	7.7
Globulin	4.8	4.4	4.5	3.9	3.7
Albumin	3.9	3.6	3.5	4.2	4.0
A/G Ratio	0.8	0.8	0.8	1.1	1.1
LDH	369	126	196	246	287
CPK	655	254	229	N/D	1640
SGPT	101	54	20	29	28
SGOT	153	45	42	62	76
Alk. Phos.	12	6	6	30	25
Na	153	154	154	157	154
K	4.6	4.6	4.5	4.5	4.0
Cl	116	122	119	118	117
Ca	10.3	9.5	10.0	11.1	10.5
Phos.	5.0	5.0	5.3	5.8	4.3
Glucose	222	198	179	139	137
Cholesterol	158	127	128	199	185
Bilirubin	0.1	0	0.2	0.2	0.2
Creatinine	2.5	2.3	2.2	1.7	1.7
BUN	19	13	17	48	46
BUN/Crea. Ratio	8	5.7	8.0	28	27
GGT	2	1	N/D	N/D	N/D
Serum Iron	71	39	46	79	92
Anion Gap	N/D	N/D	21	23	19
CO ₂ Total	15	16	14	16	18
Triglycerides	11	16	6	23	14
Uric Acid	1.0	0.4	0.5	0.3	0.4
Ionized Calcium	N/D	N/D	4.1	4.5	4.4

Table 23. (continued)

Date	01-15-89	01-15-89
Age	7-8 yr	7-8 yr
Location#	I-N.FS	I-N.FS
Sample ^a	A = 0:	B = 1:
Event ^{aa}	Initial	Post cap
Laboratory+	DSI	DSI
Anesthetic ^c		

Total Protein	7.6	8.1
Globulin	4.1	4.5
Albumin	3.5	3.6
A/G Ratio	0.9	0.8
LDH	208	131
CPK	351	661
SGPT	45	57
SGOT	63	87
Alk. Phos.	6	6
Na	153	153
K	4.2	4.1
Cl	118	120
Ca	9.3	9.6
Phos.	4.1	3.6
Glucose	217	202
Cholesterol	140	150
Bilirubin	0.2	0.2
Creatinine	2.9	2.7
BUN	28	27
BUN/Crea. Ratio	9.7	10.0
GGT	0	1
Serum Iron	56	43
Anion Gap	N/D	N/D
CO ₂ Total	11	16
Triglycerides	23	10
Uric Acid	0.4	0.2

"The Bear Island Male"

Table 24. SERUM CONSTITUENTS OF BLOOD IN WILD FLORIDA PANTHERS: #17^A Male

Date	01-20-87	01-26-89	01-26-89	01-26-89	01-26-89
Age	8-10 yr	10-12 yr	10-12 yr	10-12 yr	10-12 yr
Location#	COL. ENT.	Nobles	Nobles	Nobles	Nobles
Sample ^a	A = 0:26	A = 0:	B = 1:	C =	D =
Event ^{aa}	Initial	Initial			
Laboratory+	DSI	DSI	DSI	DSI	DSI
Anesthetic@	K				
Total Protein	7.6	7.8	7.1	8.3	7.8
Globulin	4.0	4.0	3.4	4.1	3.8
Albumin	3.6	3.8	3.7	4.2	4.0
A/G Ratio	0.9	1.0	1.1	1.0	1.1
LDH	161	83	94	233	323
CPK	323	328	332	649	1,233
SGPT	44	53	54	60	58
SGOT	35	42	41	54	66
Alk. Phos.	10	9	9	8	10
Na	154	151	152	153	152
K	4.5	4.0	3.8	4.8	4.0
Cl	113	114	116	115	115
Ca	10.0	9.8	9.7	9.9	9.7
Phos.	5.6	5.1	5.3	6.4	5.3
Glucose	181	146	110	78	151
Cholesterol	157	203	196	222	203
Bilirubin	0.1	0.2	0.2	0.2	0.2
Creatinine	1.8	1.7	1.8	1.8	1.9
BUN	36	57	57	56	54
BUN/Crea. Ratio	20.0	33.5	31.7	31.1	28.4
GGT	2	2	1	2	1
Serum Iron	45	85	79	81	71
Anion Gap	N/D	N/D	N/D	N/D	N/D
CO ₂ Total	15	19	18	18	16
Triglycerides	33	61	41	49	62
Uric Acid	0.4	0.4	0.4	0.3	0.4
Testosterone	N/D	105	N/D	N/D	N/D

^A"Jumbo"

Table 25. SERUM CONSTITUENTS OF BLOOD IN WILD FLORIDA PANTHERS: #18^A Male

Date	01-22-87	01-23-89	01-23-89
Age	8-10 yr	10-12 yr	10-12 yr
Location#	Col Ent	Col Ent	Col Ent
Sample ^a	A = 0:10	A = 0:16	B = 1:55
Event ^{aa}	Initial	Initial	Post cap
Laboratory+	DSI	DSI	DSI
Anesthetic ^c	K		
Total Protein	7.3	8.2	7.6
Globulin	4.0	4.3	4.3
Albumin	3.3	3.9	3.3
A/G Ratio	0.8	0.9	0.7
LDH	143	177	326
CPK	276	3,136	3,535
SGPT	42	35	40
SGOT	35	74	102
Alk. Phos.	12	8	16
Na	152	145	147
K	4.6	4.1	3.6
Cl	112	103	108
Ca	9.9	9.8	9.5
Phos.	6.3	4.0	2.8
Glucose	240	237	115
Cholesterol	84	152	137
Bilirubin	0.1	0.96	0.2
Creatinine	3.5	3.1	2.8
BUN	26	66	66
BUN/Crea. Ratio	7.4	21.3	23.0
GGT	0	0	0
Serum Iron	64	271	136
Anion Gap	N/D	N/D	N/D
CO ₂ Total	12	20	20
Triglycerides	53	74	50
Uric Acid	1.8	1.0	0.5

^a"Jumbette"

Table 26. Serum Constituents of Blood in Wild Florida Panthers: # 19 Female^A

Date	02-09-87	11-09-87	05-04-89	05-04-89
Age	9 mo	18 mo	36 mo	36 mo
Location#	BI	PR/PRICE	I-N.FS	I-N.FS
Sample ^a	A = 0:12	A = 0:20	A = 0:	B = 1:
Event ^{aa}	Initial	Initial	Initial	Post cap
Laboratory+	DSI	DSI	DSI	DSI
Anesthetic ^c	K	K		
Total Protein	6.6	7.8	8.0	7.3
Globulin	3.0	3.7	3.7	3.3
Albumin	3.6	4.1	4.3	4.0
A/G Ratio	1.2	1.1	1.2	1.2
LDH	167	332	136	156
CPK	271	485	789	1,898
SGPT	58	141	52	50
SGOT	55	90	63	77
Alk. Phos.	137	14	9	11
Na	152	N/D	149	149
K	4.8	N/D	4.7	3.7
Cl	112	N/D	112	116
Ca	10.2	9.8	10.2	9.8
Phos.	6.9	5.8	5.0	4.4
Glucose	177	146	119	118
Cholesterol	156	122	152	143
Bilirubin	0.1	0	0.2	0.1
Creatinine	1.1	1.9	1.8	1.8
BUN	46	56	45	41
BUN/Crea. Ratio	41.8	29.5	25.0	22.8
GGT	1	1.0	3	2
Serum Iron	146	128	42	35
Anion Gap	N/D	N/D	N/D	N/D
CO ₂ Total	17	N/D	17	16
Triglycerides	178	95	19	14
Uric Acid	0.5	1.4	0.1	0.1

^A"The Price Kitten"

Table 27. Serum Constituents of Blood in Wild Florida Panthers: #21F.

Date	03-16-87	12-29-88	05-23-89	06-07-89	06-07-89
Age	14-18 mo	25-29 mo	30-34 mo	30-34 mo	30-34 mo
Location#	ENP	CAP/GFC	CAP/GFC	CAP/GFC	CAP/GFC
Sample ^a	A = 0:03	A = 0:	A = 0:24	A = 0:16	B = 4:25
Event ^{aa}	Initial	Initial	Initial	Initial	Post surg
Laboratory+	CONL	VMTH	VMTH	VMTH	VMTH
Anesthetic [@]	K	K	T	T	T+Iso
Total Protein	6.8	6.9	8.0	8.3	5.9
Globulin	3.3	4.4	4.2	4.3	3.0
Albumin	3.5	2.5	3.8	4.0	2.9
A/G Ratio	1.1	0.6	0.9	0.9	1.0
LDH	99	N/D	N/D	N/D	N/D
CPK	N/D	148	134	169	481
SGPT	47	43	24	24	19
SGOT	39	9	18	17	19
Alk. Phos.	28	2	16	16	16
Na	151	158	149	149	147
K	4.3	4.3	4.2	4.1	5.7
Cl	121	119	116	118	122
Ca	9.8	10.1	9.3	10.0	8.9
Phos.	4.4	4.4	4.3	4.4	5.5
Glucose	118	109	108	125	142
Cholesterol	103	110	123	129	91
Bilirubin	0.1	0.1	0.1	0.2	0.1
Creatinine	2.0	1.7	2.0	1.9	1.7
BUN	26	13	19	20	18
BUN/Crea. Ratio	13.0	7.6	9.5	10.5	10.6
GGT	N/D	N/D	N/D	N/D	N/D
Serum Iron	8	N/D	96	84	67
Anion Gap	14.0	21	19	19	11
CO ₂ Total	16	22	14	12	14
Triglycerides	1.0	26	N/D	N/D	N/D
Uric Acid	0.3	N/D	N/D	N/D	N/D

Table 28. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #23 Female*

Date	03-18-87	03-28-87	04-09-87	06-01-87	06-16-87	06-22-87
Age	6-7 mo	6-7 mo ^a	7-8 mo ^b	8-9 mo ^c	8-9 mo ^d	9-10 mo ^e
Location#	ENP	ENP ^{x1}	ENP ^{x2}	ENP ^{x3}	ENP ^{x4}	ENP ^{x5}
Sample #	A	A	A	A = 0:25	A	A
Event ^{aa}						
Laboratory+	CONL	JASH	JASH	JASH	JASH	JASH
Anesthetic@	K	K	K	K	K	K
Total Protein	6.9	6.1	7.8	6.0	7.7	8.0
Globulin	2.7	2.4	3.5	2.5	2.2	3.8
Albumin	4.2	3.7	4.3	3.5	5.5	4.2
A/G Ratio	1.6	1.5	1.2	1.4	2.5	1.1
LDH	650	158	163	51	206	185
CPK	N/D	629	2334	260	338	357
SGPT	64	28	77	29	120	77
SGOT	72	25	106	24	100	50
Alk. Phos.	227	94	27	63	40	106
Na	152	161	158	150	147	147
K 4.8	4.5	5.1	4.4	4.1	5.0	
Cl	117	114	113	115	109	110
Ca	11.0	11.0	10.6	9.9	11.2	11.2
Phos.	7.2	9.5	7.5	5.6	6.4	8.4
Glucose	374	277	99	135	127	242
Cholesterol	238	142	148	122	207	164
Bilirubin	0.1	0.1	0.0	0.2	0.2	0.0
Creatinine	1.7	1.9	0.9	1.6	0.9	2.3
BUN	24	34	77	33	55	25
BUN/Crea. Ratio	14.1	17.9	85.6	20.6	61.1	10.9
GGT	N/D	N/D	N/D	N/D	N/D	N/D
Serum Iron	76	95	N/D	55	52	95
Anion Gap	22.0	N/D	N/D	N/D	N/D	N/D
CO ₂ Total	13	7	18	17	18	7
Triglycerides	16	N/D	N/D	N/D	N/D	N/D
Uric Acid	1.2	0.2	0.4	0.0	0.0	0.3
Ionized Calcium	N/D	N/D	N/D	N/D	N/D	N/D

Table 28. (continued).

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Date	08-03-87	02-02-88	05-12-88	06-22-88	06-22-88
Age	11-12 mo ^f	17-18 mo ^f	20-21 mo ^f	21-22 mo ^g	21-22 mo ^g
Location#	ENP ^{x6}	ENP ^{x7}	ENP ^{x8}	ENP ^{x9}	ENP ^{x9}
Sample ^a	A			A = 0:18	B = 1:28
Event ^{aa}					
Laboratory+	JASH			CONL	CONL
Anesthetic@	K		K	K	K
Total Protein	8.1			7.5	6.7
Globulin	3.7			3.3	3.0
Albumin	4.4			4.2	3.7
A/G Ratio	1.2			1.3	1.2
LDH	112			298	425
CPK	573			226	889
SGPT	64			71	66
SGOT	59			57	70
Alk. Phos.	43			31	24
Na	161			162	150
K 3.7			4.9	4.8	
Cl	115			122	118
Ca	10.9			11.2	9.9
Phos.	5.7			5.5	4.0
Glucose	109			178	183
Cholesterol	163			102	89
Bilirubin	0.2			0.2	0.2
Creatinine	1.5			2.0	1.8
BUN	45			24	21
BUN/Crea. Ratio	30.0			12	12
GGT	N/D			N/D	N/D
Serum Iron	N/D			59	57
Anion Gap	N/D			0	17.0
CO ₂ Total	20			12	15
Triglycerides	N/D			21	10
Uric Acid	-0.1			0.6	0.2
Ionized Calcium	N/D	N/D	N/D	4.8	4.5

Table 28. (continued)

Date	02-07-89
Age	2 yr
Location#	CAP/WOP
Sample ^a	A = 0:
Event ^a	Initial
Laboratory+	VMTH
Anesthetic@	K

Total Protein	7.9
Globulin	5.2
Albumin	2.7
A/G Ratio	0.5
LDH	96
CPK	N/D
SGPT	59
SGOT	51
Alk. Phos.	13
Na	159
K 4.0	
Cl	110
Ca	10.5
Phos.	4.6
Glucose	126
Cholesterol	223
Bilirubin	0.1
Creatinine	1.7
BUN	24
BUN/Crea. Ratio	14
GGT	N/D
Serum Iron	86
Anion Gap	34
CO ₂ Total	15
Triglycerides	19
Uric Acid	0.6

*"Annie"; ^a9-10% dehydrated, cachectic; ^bhealthy; ^canorectic, 5-6% dehydrated; ^dhealthy; ^e6 days anorectic; ^fin captivity, healthy; ^g5% dehydrated, cachectic.

^{x1}Removed from wild, orphaned from mother for 10 days, 9-10% dehydrated, cachectic; ^{x2}Returned to wild, reunited with family after 12 days in captivity, good physical condition; ^{x3}Removed from wild, separated from mother for 6 days, anorectic, 5-6% dehydrated; ^{x4}Returned to wild, attempt to reunite with family, 16 days in captivity; ^{x5}Removed from wild, failed attempt to reunite with family, 6 days anorectic, slight dehydration; ^{x6}Quarantine, moving to White Oak Plantation; ^{x7}Radiograph injured leg; ^{x8}Return to Everglades National Park, released to the wild on 05-14-88; ^{x9}Removed from wild, stranded on island in Shark River Slough for 13 days, thin, poor physical condition, 5% dehydrated.

Table 29. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #28 MALE

Date	11-29-88	12-30-88	3-11-89
Age	16-22 mo	17-21 mo	20-24 mo
Location#	CAP/VMTH	CAP/GFC	CAP/GFC
Sample ^a	A = 0:	A = 0:	A = 0:
Event ^{aa}	HBC	Initial	Initial
Laboratory+	VMTH	VMTH	VMTH
Anesthetic ^c	K	K	
Total Protein	N/D	7.9	7.4
Globulin	N/D	5.0	4.8
Albumin	N/D	2.9	2.6
A/G Ratio	N/D	0.6	0.5
LDH	N/D	N/D	258
CPK	N/D	902	404
SGPT	N/D	47	50
SGOT	N/D	29	44
Alk. Phos.	N/D	12	29
Na	154	150	155
K	3.9	4.5	4.2
Cl	125	113	110
Ca	10.0	11.3	10.5
Phos.	N/D	5.2	5.5
Glucose	N/D	109.2	138
Cholesterol	N/D	214	247
Bilirubin	N/D	0.7	0.1
Creatinine	0.7	1.7	1.6
BUN	16	13	24
BUN/Crea. Ratio	N/D	7.6	15
GGT	N/D	N/D	N/D
Serum Iron	N/D	N/D	49
Anion Gap	N/D	23.0	32.0
CO ₂ Total	N/D	19.0	13.0
Triglycerides	N/D	31	23
Uric Acid	N/D	N/D	0.4

Table 30. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #29 MALE

Date	01-03-89	05-01-89	05-01-89
Age	6 mos	11 mo	11 mo
Location#	I-BI/PR	I-BI/PR	I-BI/PR
Sample ^a	A = 0:	A = 0:	B = 1:
Event ^{aa}	Initial	Initial	Post cap
Laboratory+	DSI	DSI	DSI
Anesthetic@	K	K	K
Total Protein	7.1	6.9	6.4
Globulin	3.0	2.8	2.6
Albumin	4.1	4.1	3.8
A/G Ratio	1.4	1.5	1.5
LDH	222	172	149
CPK	437	413	668
SGPT	40	46	42
SGOT	41	44	45
Alk. Phos.	130	82	74
Na	152	147	150
K	5.3	4.7	4.1
Cl	119	111	114
Ca	10.9	10.7	10.4
Phos.	6.7	7.5	6.4
Glucos	145	126	103
Cholesterol	177	173	161
Bilirubin	0.5	0.2	0.1
Creatinine	1.4	1.3	1.3
BUN	25	62	57
BUN/Crea. Ratio	17.9	47.7	43.8
GGT	0	2	2
Serum Iron	106	101	72
Anion Gap	N/D	N/D	N/D
CO ₂ Tota	9	17	19
Triglycerides	45	87	34
Uric Acid	0.6	0.4	0.3
Testosterone			

Table 31. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #30 MALE

Date	01-07-89	01-07-89	05-02-89	05-02-89
Age	9 mo	9 mo	11 mo	11 mo
Location#	I-BI/PR	I-BI/PR	I-N.FS	I-N.FS
Sample*	A = 0:	B = 1:	A = 0:	B = 1:
Event**	Initial	Post cap	Initial	Post cap
Laboratory+	DSI	DSI	DSI	DSI
Anesthetic@				
Total Protein	6.1	6.6	7.0	7.4
Globulin	2.7	2.8	2.8	2.9
Albumin	3.4	3.8	4.2	4.5
A/G Ratio	1.3	1.4	1.5	1.6
LDH	214	288	159	284
CPK	429	682	400	1,520
SGPT	59	64	31	34
SGOT	72	82	38	55
Alk. Phos.	112	124	49	51
Na	153	155	151	153
K	4.6	3.8	4.3	4.2
Cl	117	119	113	113
Ca	9.2	9.2	9.9	10.6
Phos	7.1	5.9	6.4	5.9
Glucose	113	113	128	117
Cholesterol	141	140	134	144
Bilirubin	0.7	0.7	0.7	0.7
Creatinine	1.5	1.5	1.6	1.6
BUN	48	45	30	28
BUN/Crea. Ratio	32.0	30.0	18.8	17.5
GGT	4	3	1	<1
Serum Iron	80	110	60	86
Anion Gap	N/D	N/D	N/D	N/D
CO ₂ Total	18	19	21	23
Triglycerides	93	86	118	128
Uric Acid	0.7	0.5	0.2	0.1
Testosterone	N/D	N/D	N/D	N/D

Table 32. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: # 31 FEMALE

Date	01-12-89	01-12-89
Age		
Location#	I-N.FS	I-N.FS
Sample ^a	A = 0:	B = 1:
Event ^{aa}	Initial	Post cap
Laboratory+	DSI	DSI
Anesthetic [@]		
Total Protein	7.3	7.9
Globulin	3.4	3.7
Albumin	3.9	4.2
A/G Ratio	1.1	1.1
LDH	196	292
CPK	1,002	1,769
SGPT	40	49
SGOT	52	80
Alk. Phos.	7	7
Na	151	142
K	5.1	4.2
Cl	116	109
Ca	9.4	9.7
Phos.	5.8	3.3
Glucose	137	118
Cholesterol	169	180
Bilirubin	0.2	0.3
Creatinine	2.2	2.1
BUN	35	32
BUN/Crea. Ratio	15.9	15.2
GGT	1	0
Serum Iron	83	157
Anion Gap	N/D	N/D
CO ₂ Total	10	17
Triglycerides	12	15
Uric Acid	0.7	0.8

Table 33. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #32 FEMALE

Date	02-03-89	02-03-89
Age		
Location#	I-N.FS	I-N.FS
Sample ^a	A = 0:	B = 1:
Event ^a	Initial	Post cap
Laboratory+	DSI	DSI
Anesthetic ^a		
Total Protein	7.4	6.5
Globulin	3.3	2.9
Albumin	4.1	3.6
A/G Ratio	1.2	1.2
LDH	126	105
CPK	504	611
SGPT	24	22
SGOT	32	30
Alk. Phos.	15	13
Na	150	150
K	4.2	3.7
Cl	115	118
Ca	10.1	9.3
Phos.	5.3	3.2
Glucose	163	115
Cholesterol	177	155
Bilirubin	0.2	0.1
Creatinine	2.4	2.2
BUN	29	28
BUN/Crea. Ratio	12.1	12.7
GGT	2	1
Serum Iron	100	110
Anion Gap	N/D	N/D
CO ₂ Total	16	17
Triglycerides	17	9
Uric Acid	0.4	0.2

Table 34. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #33 MALE

Date	03-05-89	03-05-89	03-05-89	03-05-89
Age	22-26 mo	22-26 mo	22+26 mo	22-26 mo
Location#	I-SS	I-SS	I-SS	I-SS
Sample ^a	A = 0:	B = 1:	C =	D =
Event ^{aa}	Initial	Pre EE	Post ejac	60m P EE
Laboratory+	DSI	DSI	DSI	DSI
Anesthetic@	K			
Total Protein	6.3	6.2	6.6	6.4
Globulin	2.9	2.8	2.9	2.8
Albumin	3.4	3.4	3.7	3.6
A/G Ratio	1.2	1.2	1.3	1.3
LD	266	186	254	236
CPK	670	1,017	1,650	1,847
SGPT	67	68	83	81
SGOT	56	64	93	95
Alk. Phos.	68	68	56	49
Na	153	152	153	153
K	4.3	4.2	4.4	4.2
Cl	119	119	119	119
Ca	9.6	9.8	10.1	10.2
Phos.	5.6	5.6	5.7	5.8
Glucose	106	114	124	117
Cholesterol	101	98	107	105
Bilirubin	0.2	0.2	0.2	0.1
Creatinine	2.3	2.3	2.4	2.3
BUN	25	24	23	23
BUN/Crea. Ratio	10.9	10.4	9.6	10.0
GGT	3	2	3	1
Serum Iron	69	65	72	59
Anion Gap	N/D	N/D	N/D	N/D
CO ₂ Total	15	17	14	15
Triglycerides	7	8	15	9
Uric Acid	0.2	0.2	0.3	0.3
Testosterone	<10			

Table 35. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: "BIG GUY" Male*

Date	11-02-84	11-05-84	11-09-84	11-20-84	12-20-84	01-04-85
Age	3-5 yr	3-5 yr	3-5 yr	3-5 yr	3-5 yr	3-5 yr
Location#	CAP/VMTH*	CAP/VMTH	CAP/VMTH	CAP/VMTH	CAP/VMTH	CAP/GFC
Sample*						
Event**						
Laboratory†	VMTH	VMTH	VMTH	VMTH	VMTH	VMTH
Anesthetic@						
Total Protein	5.4	5.6	5.9	6.5	6.7	7.1
Globulin	2.9	3.3	3.6	4.1	3.8	3.8
Albumin	2.5	2.3	2.3	2.4	2.9	3.3
A/G Ratio	N/D	N/D	N/D	N/D	N/D	N/D
LDH	N/D	N/D	N/D	N/D	N/D	N/D
CPK	N/D	N/D	N/D	N/D	N/D	N/D
SGPT	115	97	N/D	29	159	39
SGOT	187	182	39	15	28	29
Alk. Phos.	9	3	7	37	13	4
Na	N/D	N/D	N/D	N/D	N/D	N/D
K	N/D	N/D	N/D	N/D	N/D	N/D
Cl	N/D	N/D	N/D	N/D	N/D	N/D
Ca	9.2	9.3	9.2	9.4	10.7	11.3
Phos.	3.4	4.3	4.5	4.2	4.9	5.6
Glucose	316	216	179	125	113	110
Cholesterol	130	146	N/D	123	156	174
Bilirubin	N/D	N/D	N/D	N/D	N/D	N/D
Creatinine	1.5	1.0	1.3	1.1	1.2	1.3
BUN	28	39	27	33	33	29
BUN/Crea. Ratio	N/D	N/D	N/D	N/D	N/D	N/D
GGT	N/D	N/D	N/D	N/D	N/D	N/D
Serum Iron	N/D	N/D	N/D	N/D	N/D	N/D
Anion Gap	N/D	N/D	N/D	N/D	N/D	N/D
CO ₂ Total	N/D	N/D	N/D	N/D	N/D	N/D
Triglycerides	N/D	N/D	N/D	N/D	N/D	N/D
Uric Acid	N/D	N/D	N/D	N/D	N/D	N/D
Testosterone	N/D	N/D	N/D	N/D	N/D	N/D

Table 35. (continued)

"Big Guy" M p.2

Date	02-25-85	04-18-85	04-29-86	06-03-86	07-23-88 ^A
Age	3-5 yr	3-5 yr	4-6 yr	4-6 yr	6-8 yr
Location#	CAP/GFC	CAP/GFC	CAP/WOP	CAP/WOP	CAP/WOP
Sample ^a			I = 0:		A = 0:
Event ^{aa}	Initial	Initial	Initial		Initial
Laboratory [*]	VMTH	VMTH	VMTH	VMTH	VMTH
Anesthetic ^c			K		
Total Protein	6.2	7.6	7.9	8.0	7.6
Globulin	3.2	2.8	3.4	3.6	5.2
Albumin	3.0	4.8	4.5	4.4	2.4
A/G Ratio	N/D	N/D	1.3	1.2	0.4
LDH	N/D	N/D	N/D	N/D	166
CPK	N/D	N/D	N/D	N/D	N/D
SGPT [*]	49	56	39	42	85
SGOT	43	81	21	19	93
Alk. Phos.	5	6	6	3	10
Na	N/D	N/D	155	154	153
K	N/D	N/D	4.7	4.3	3.6
Cl	N/D	N/D	117	114	113
Ca	11.0	11.1	11.4	12.1	10.0
Phos	6.2	5.4	4.4	4.9	3.0
Glucose	170	194	96	99	214
Cholesterol	146	142	140	118	209
Bilirubin	N/D	N/D	0.2	0.1	0.1
Creatinine	2.0	2.2	2.2	2.2	1.6
BUN	21	23	24	31	23
BUN/Crea. Ratio	N/D	N/D	10.9	14.1	14.0
GGT	N/D	N/D	N/D	N/D	N/D
Serum Iron	N/D	N/D	N/D	N/D	65.0
Anion Gap	N/D	N/D	23	23	26
CO ₂ Total	N/D	N/D	22	21	14
Triglycerides	N/D	N/D	N/D	N/D	14
Uric Acid	N/D	N/D	N/D	N/D	0.4
Testosterone	N/D	N/D	N/D	N/D	N/D

Table 36. SERUM CONSTITUENTS OF BLOOD FROM WILD FLORIDA PANTHER: #VMTH 65185 M

Date	01-26-89	01-26-89
Age	3-4 yr	3-4 yr
Location#	I-Cork	I-Cork
Sample ^a	A = 0:	B = 1:
Event ^{aa}	HBC	
Laboratory+	VMTH	VMTH
Anesthetic@	K+D	
Total Protein	5.3	5.1
Globulin	3.2	3.0
Albumin	2.1	2.1
A/G Ratio	0.7	0.7
LDH	N/D	N/D
CPK	N/D	N/D
SGPT	507	728
SGOT	855	905
Alk. Phos.	29	39
Na	154	157
K	4.2	3.6
Cl	114	112
Ca	8.8	8.3
Phos.	5.7	8.1
Glucose	209	210
Cholesterol	103	98
Bilirubin	0.4	0.2
Creatinine	2.7	3.4
BUN	16	26
BUN/Crea. Ratio	5.9	7.6
GGT	N/D	N/D
Serum Iron	N/D	N/D
Anion Gap	23	29
CO ₂ Total	22	20
Triglycerides	22	46
Uric Acid	N/D	N/D
Testosterone		

Table 37. Serologic Tests and Antigens used to Determine Antibody Titers Against Nine Pathogenic Agents in Free-ranging Florida Panthers.

Agent (antigen)	No. of Samples	Test	Positive Threshold	Reference
VIRUSES				
Feline calicivirus (FP 255)	76	plaque reduction	> 1:4	CFHL-Scott ^A
Feline infectious peritonitis (corona virus)	76	KELA ^B	≥ 1:9	Barlough et al., 1983
" " "	56	IFA	≥ 1:25	Everman ^F
Feline leukemia virus	76	ELISA ^C		Mia et al., 1981
Feline immunodeficiency virus (FIV)	64	IFA, ELISA, & western blot		Barr et al., 1989
Feline panleukopenia virus (FPL-LV)	76	serum neutralization	≥ 1:50	Scott et al., 1970
Feline rhinotracheitis virus (FVR-Goldstein)	75	plaque reduction	≥ 1:2	CFHL-Scott ^A
Pseudorabies	26	Latex agglutination ^D	> 1:4	Pirtle, 1988
BACTERIA				
<u>Brucella</u> spp. (<u>Brucella abortus</u>)	26	plate agglutination ^E	≥ 1:25	USDA
PROTOZOA				
<u>Toxoplasma gondii</u>	76	KELA	≥ 1:48	Jacobson et al., 1988

^ACFHL: Feline Health Laboratory, Cornell University, Dr. Fred Scott

^BKELA: kinetics enzyme-linked immunosorbant assay; results are considered to be "IFA-equivalent" titers.

^CELISA: enzyme-linked immunosorbant assay; kits utilized were VIRACHEK-FelV^R by Symbiotics and LEUK-ASSAY F*II^R by Pitman-Moore.

^DLatex kit from Viral Antigens, INC., Memphis, Tenn.

^EDr. P. Nicolletes' brucellosis lab, UF, College of Veterinary Medicine.

^FTested at Washington Animal Disease Diagnostic Laboratory, Dr. Jim Everman.

Table 38. Summary of serologic tests for antibodies to selected pathogens in individual wild Florida panthers, 1978-89.

Agent	Prevalence			Reciprocal titer	
	No. exam.	No. pos.	%	Minimum	Maximum
VIRUSES					
Feline calicivirus	41	18 ^A	44	<2	>256
Feline infectious peritonitis (coronavirus)	41 ^E	0	0	<9	
Feline leukemia virus	41	0	0	0	
Feline panleukopenia virus (parvovirus)	41	27 ^B	65	<5	>10,000
Feline rhinotracheitis virus (herpesvirus)	41	0	0	<2-<8 ^D	
Pseudorabies virus	25	0	0	0	
PROTOZOA					
<u>Toxoplasma gondii</u>	41 ^C	4	9	<48	308
BACTERIA					
<u>Brucella</u> spp.	25		0 0	<25	

^ATwo animals sero-converted after 12 and 22 months, negative to positive, and each was included once in the tally as a positive animal. Also, postmortem hemolysis could interfere with detecting a low positive titer in three animals, actual results: two with <1:8 and one with <1:20.

^BOne animal sero-converted after 12 months, negative to positive, and was included once in the tally as a positive animal.

^CData on five of these serum samples were presented in two earlier papers (four in Forrester et al., 1985 and one in Burridge et al., 1979). All of these samples tested negative by KELA in this current study, however one was reported by Forrester to be positive by indirect hemagglutination test (1:256).

^DHemolyzed sera from necropsied animals resulted in higher negative thresholds than non-hemolyzed sera.

^ESamples analysed at Cornell State Diagnostic lab.

Table 39. Seroprevalence of Selected Disease Agents in Free-living Florida Panthers, 1978-89.

ID#	SEX	LOCATION ^a	DATE	AGE CLASS ^c	TESTS ^a								
					FPL	FCV	TOX	FVR	FELV	FIP	FIV	BRUC	PRV
# 01	M	I-S.FS	12-16-83 ^b	6	>5,000	12	-	<4	-	-	ND	ND	-
# 02	M	I-S.FS	01-29-83	6	>4,000	<2	-	<4	-	-	ND	-	ND
		I-S.FS	12-06-84 ^b	6	100	<4	-	<5	-	-	ND	ND	ND
# 03	F	I-S.FS	01-17-83 ^b	6	2,250	<4	- ^d	<4	-	-	ND	ND	ND
# 04	M	I-FS	01-29-83	6	<5	<2	-	<4	-	-	ND	-	ND
		I-N.FS	01-22-84	6	>5,000	2	-	<4	-	-	ND	-	ND
		I-N.FS	04-18-85 ^c	6	50	<20	-	<10	-	-	ND	ND	ND
# 07	M	I-RP	03-27-83	5	1,000	<2	49	<4	-	-	ND	-	ND
		I-S.FS	01-26-85	6	1,000	>256	188	<5	-	-	ND	ND	-
		I-S.FS	10-28-85 ^d	6	500 ^e	80 ^e	-	<10 ^e	-	-	ND	ND	-
# 08	F	I-S.FS	03-25-84	5	>5,000	48	-	<4	-	-	-	-	ND
		I-S.FS	02-21-85	6	10,000	16	-	<5	-	-	-	ND	-
		I-S.FS	01-13-86	6	>10,000 ^f	64 ^f	39	<2 ^f	-	-	+	ND	ND
		I-S.FS	04-13-87	6	5,000 ^f	96 ^f	9	12 ^f	-	-	ND	ND	ND
		CAP/GFC	06-09-87	6	1,000 ^f	>256 ^f	-	96 ^f	-	-	ND	ND	ND
		CAP/GFC	08-18-87	6	ND	ND	ND	ND	ND	ND	+	ND	ND
		CAP/WOP	06-01-88	6	>10,000 ^f	24 ^f	50	16 ^f	-	-	+	ND	ND
		CAP/WOP	08-20-88 ^g	6	10,000 ^f	16 ^f	ND	48 ^f	* ^h	-	+	ND	ND
# 09	F	I-S.FS	01-26-85	4	10,000	10	308	<5	-	-	ND	-	-
		I-S.FS	01-08-87	5	1,000 ^f	24 ^f	79	6 ^f	-	-	-	ND	ND
		CAP/MMZ	02-05-87	5	10,000 ^f	192 ^f	150	96 ^f	-	-	-	ND	ND
		I-S.FS	10-31-88	5	>10,000 ^f	48 ^f	47	6 ^f	-	-	-	ND	ND
# 10	M	I-S.FS	01-15-86	1	100	4	-	<2	-	-	ND	-	-
		I-S.FS	05-02-86	2	100 ^f	3 ^f	-	<2 ^f	-	-	-	ND	-
ND													
# 11	F	I-BI	01-21-86	5	500	2	-	<2	-	-	-	ND	ND
		I-PR	01-07-88	5	500 ^f	24 ^f	15	6 ^f	-	-	-	-	-
# 12	M	I-BI/FS	01-28-86	5	500	<2	-	<2	-	-	-	ND	ND
		"	01-31-88	5	100 ^f	6 ^f	26	<2 ^f	-	-	-	-	-
		"	01-15-89	6	500 ^f	6 ^f	21	3 ^f	-	-	-	ND	ND
# 13	M	I-BI/PR	02-27-86	5	>10,000	8	-	<2	-	-	-	-	-
		"	12-16-87 ^g	5	>10,000 ^f	<6 ^f	13	<6	-	-	-	ND	ND
# 14	F	II-ENP	12-07-86	5	50	>256	9/27	<2	-	-	+	-	-
		II-ENP	04-11-88	5	500 ^f	80 ^f	7	3 ^f	-	-	+	ND	ND

Table 39. (continued)

Seroprevalence p.2

ID# / SEX	LOCATION ^a	DATE	TESTS ^a		FPL	FCV	TOX	FVR	FELV	FIP	FIV	BRUC	PRV
			AGE	CLASS ^b									
# 15	F	II-ENP	12-13-86	5	100	<2	6	<2	-	-	ND	-	-
	"	"	04-07-87	5	100 ^c	>256 ^d	-	2 ^e	-	-	-	ND	ND
	"	"	06-16-87	5	ND	ND	ND	ND	ND	ND	-	ND	ND
	"	"	06-11-88 ^g	5	<50	ND	<10	ND	*1	-	-	ND	ND
# 16	F	II-ENP	01-12-87	2	<10	48	6	<2	-	-	+	-	-
	"	II-ENP	02-02-88	4	<10	240	12	<2	-	-	+	ND	ND
# 17	M	I-PR	01-20-87	6	500	32	24	2	-	-	-	-	-
	"	"	01-26-89	6	1000 ^c	8 ^e	50	<2 ^e	-	-	-	ND	ND
# 18	F	I-PR	01-22-87	6	500	16	9	<2	-	-	+	-	-
	"	"	01-23-89	6	10,000 ^c	4 ^e	40	<2 ^e	-	-	+	ND	ND
# 19	F	I-BI	02-09-87	2	10,000	8	17	<2	-	-	-	-	-
	"	"	11-09-87	3	5,000 ^c	<2 ^e	73	<2 ^e	-	-	-	ND	-
	ND	I-PR	05-04-89	4	5,000 ^c	4 ^e	66	12 ^e	-	-	-	ND	ND
	"	"	"	"	"	"	"	"	"	"	"	"	"
# 20	M	I-PR	03-10-87	4	100	6	15	<2	-	-	-	-	-
	"	CAP/MMZ	07-06-87	4	ND	ND	37	ND	ND	ND	-	ND	ND
	"	I-BI	08-24-88 ^g	4	>10,000 ^c	ND	10 ^e	<24 ^e	*1	-	-	ND	ND
# 21	F	II-ENP	03-16-87	2	<10	2	15	<2	-	-	+	-	ND
	"	"	07-23-88	4	<10	<2	<10	<2	-	-	-	ND	ND
	"	CAP/GFC	10-19-88	4	ND	ND	ND	ND	ND	ND	+	ND	ND
	"	"	01-28-89	4	ND	ND	ND	ND	ND	ND	-	ND	ND
	"	"	02-24-89	4	ND	ND	ND	ND	ND	ND	-	ND	ND
	"	"	05-23-89	4	>10,000 ^c	24 ^e	<10	16 ^e	-	-	-	ND	ND
	"	"	"	"	"	"	"	"	"	"	"	"	"
# 22	F	II-ENP	03-18-87	2	<10	<2	4	<2	-	-	-	ND	ND
	"	"	04-09-87	2	ND	ND	ND	ND	ND	ND	ND	-	-
	"	"	03-24-88	3	<10	32	5	<2	-	-	-	ND	ND
# 23	F	II-ENP	03-18-87	2	<10	<2	3	<2	-	-	ND	ND	ND
	"	"	04-09-87	2	ND	ND	ND	ND	ND	ND	ND	-	-
	"	"	06-01-87	2	<10	2	3	<2	-	-	-	ND	ND
# 24	M	III-FEC	01-30-88	4	<10	48	23	<2	-	-	-	-	-
# 25	M	I-N.FS	02-16-88	4	500	3	8	<2	-	-	+	ND	ND
	"	"	08-26-88 ^g	4	ND	ND	ND	ND	ND	ND	+	ND	ND
# 26	M	I-PR	03-10-88	5	500	16	8	<2	-	-	-	-	-
# 27	M	II-ENP	04-11-88	4	100	16	10	<2	-	-	-	-	-

Table 39. (continued)

Seroprevalence p.3

ID# / SEX	LOCATION ^a	DATE	TESTS ^a		FPL	FCV	TOX	FVR	FELV	FIP	FTV	BRUC	PRV
			AGE	CLASS ^b									
# 28 M	I-CORK	11-29-88	2	<10	<2	ND	<2	ND	ND	ND	ND	ND	ND
	CAP/GFC	12-30-88	2	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
	"	03-02-89	3	10,000 ^c	<2 ^d	<10	<2 ^d	-	-	-	ND	ND	ND
# 29 M	I-BI/PR	01-03-89	1	<10	<2	47	<2	-	-	-	-	ND	ND
	"	05-01-89	2	50 ^e	2 ^d	58	<2 ^d	-	-	-	-	ND	ND
# 30 M	I-BI/PR	01-06-89	2	<10	<2	28	<2	-	-	-	-	ND	ND
	I-N.FS	05-02-89	2	<10 ^f	8 ^d	21	<2 ^d	-	-	-	-	ND	ND
# 31 F	I-N.FS	01-12-89	6	5,000	<2	<10	<2	-	-	-	-	ND	ND
# 32 F	I-N.FS	02-03-89	4	<10	<2	<10	<2	-	-	-	-	ND	ND
# 33 M	I-SS	03-05-89	4	<10	<2	<10	<2	-	-	-	-	ND	ND
Big Guy	I-MO	11-02-84	4	<20	40	-	5	-	-	-	-	-	-
	CAP/WOP	06-13-87	5	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
	"	06-02-88	5	5,000 ^c	12 ^d	<10	8 ^d	-	-	-	-	ND	ND
G78-65 M	I-RP	03-17-78 ^g	3	5,000	<8	- ^h	<4	-	-	-	ND	-	-
G80-15 M	I-N.FS/BI	02-11-80 ^g	4	500	48	- ^h	<8	-	-	-	ND	ND	ND
G81-19 F	I-S.FS	04-19-81 ^g	4	<5	<8	- ^h	<8	-	-	-	ND	ND	ND
G83-22 M	III-FEC	03-17-83 ^g	4	2,250	64	-	<8	-	-	-	ND	ND	-
G84-20 F	IV-CORBET	11-01-84 ^g	4	1,000	<4	-	<5	-	-	-	ND	ND	ND
G84-26 F	I-FS	11-12-84 ^g	6	1,000	<4	-	<5	-	-	-	ND	ND	ND
G88-TED M	N.FLORIDA	03-10-88 ^g	2	<50	<3	-	<3	-	-	-	ND	-	ND
V-65185 M	I-CORK	01-25-89	4	<10	<2	<10	<2	-	-	-	-	ND	ND
PCO 59 F	I-S.FS	11-14-86 ^g	6	100	<24	<10	<12	* ⁱ	-	-	-	ND	ND

LEGEND: SEROPREVALENCE TABLE

*SEROLOGICAL TESTS:

BRUC - brucellosis, plate agglutination test screens serum for antibodies against bacteria *Brucella* spp.; FCV - feline calicivirus, SN antibody > 1:4 considered positive; FELV - feline leukemia virus, ELISA test detects presence of virus; FIP - feline infectious peritonitis - ELISA test determines antibody to coronaviruses; FPL - feline panleukopenia virus, serum neutralizing antibody titer, test detects and cross reacts with all parvoviruses. Titers $\geq$ 1:50 are considered positive; FVR - feline viral rhinotracheitis, SN antibody titer $\geq$ 1:2 considered positive; TOX - toxoplasmosis, caused by protozoan *Toxoplasma gondii*. KELA titer > 1:48 considered positive; PRV - pseudorabies virus, latex agglutination > 1:4 considered positive.

*LOCATION OF PANTHER-

MAJOR POPULATIONS: I- Southwestern Florida, Big Cypress Swamp & Fakahatchee Strand and surrounding ecosystem including privately owned land; II- Southeastern Florida, Everglades National Park; III Central Florida; IV- not part of a discrete documented population of panthers.

LOCALITY OF RANGE: BI - Bear Island Unit of Big Cypress National Preserve; CORBETT - Corbett Management Area; CORK - Corkscrew Swamp Sanctuary and Ft. Myers area; ENP - Everglades National Park; FEC - Fish Eating Creek; FS- Fakahatchee Strand both north and south of SR 84; MO - Southwestern Monument Unit, Big Cypress National Preserve; N. Florida- 10 months old captive cougar released near Capps, Fl. south of Tallahassee 2 months before death on highway by car; N.FS - Northern Fakahatchee Strand; PR - Private ranches east of Immokalee; RP - Raccoon Point, Eastern Big Cypress National Preserve; S.FS - Southern Fakahatchee Strand (Fakahatchee Strand State Preserve); SS -Stair Steps Unit of Big Cypress National Preserve.

OTHER: Cap - captivity; GFC - Florida Game and Fresh Water Fish Commission, Wildlife Research Laboratory, Gainesville, Fl.; MMZ - Miami Metro Zoo, Miami, Fl.; WOP - White Oak Plantation, Yulee, Fl.

*AGE CLASS: 1 - kitten (0-6 months); 2 - juvenile (7-18 months); 3 - subadult (19-24 months); 4 - young adult (2-4 years); 5 - mature adult (5-8 years); 6 - older adult (> 8 years).

*Blood collected postmortem

*Very autolysed carcass (3-4 days P.M.).

*Reported by Forrester, 1985, sera tested at CDC <1:256 considered negative: '1:256, '1:132, also G80-4 $\leq$ 1:32

*Minimal blood collected from eviscerated carcass.

*Carcass was 12+ hours postmortem when collected.

*Equivocal positive reaction on ELIZA

*Certain test results on this date may be influenced by vaccinations received on the previous immobilization date. Panthers were vaccinated with killed virus vaccine (Fort Dodge: FEL-O-VAX) for FPL, FCV, and FVR.

TABLE 40. Feline Infectious Peritonitis titer results^A for Florida panthers and other wild and captive cougars.

Population	ID#/Name	Sex	Date Sample Drawn	Date Sample Tested	Result ^B
FLORIDA PANTHERS					
	#08	F	02-21-85	03-02-89	<25
			09-02-87	02-10-89	<25
			06-01-88	02-10-89	<25
	#09	F	02-05-87	04-19-89	<5
			10-31-88	06-08-89	<5
	#10	M	01-15-86	03-02-89	<25
	#11	F	01-21-86	03-02-89	<25
			01-07-88	02-10-89	25
			01-07-88	06-08-89	5
	#12	M	01-28-86	03-02-89	<25
			01-15-89	06-08-89	<5
	#13	M	12-16-87	04-19-89	<5
	#14	F	12-07-86	02-10-89	<25
			12-07-86	02-10-89	25
			12-07-86	06-08-89	25
			04-11-88	04-19-89	<5
	#15	F	12-13-86	02-10-89	<25
			12-13-86	02-10-89	25
			12-13-86	06-08-89	<5
			06-16-87	04-19-89	<5
	#16	M	01-12-87	02-10-89	125
			01-12-87	06-08-89	25
			02-02-88	04-19-89	<5
	#17	M	01-20-87	04-19-89	<5
			01-26-89	06-08-89	<5
	#18	F	01-22-87	02-10-89	<25
			01-23-89	06-08-89	<5
	#19	F	02-09-87	04-19-89	<5
			11-09-87	02-10-89	<25
			11-09-87	06-08-89	5
			05-04-89	06-08-89	<5
	#20	M	07-27-87	04-19-89	<5

Table 40. (continued)

FIP p. 2

Population	ID#/Name	Sex	Date Sample Drawn	Date Sample Tested	Result ^b
FLORIDA (cont.)					
	#21	F	03-02-89	03-02-89	<25
			12-09-88	02-10-89	<25
			02-24-89	03-02-89	<25
	#22	F	03-18-87	03-02-89	<25
			04-07-87	02-10-89	<25
	#23	F	05-12-88	02-02-89	<25
			10-21-88	02-10-89	<25
			10-21-88	03-02-89	<25
	#24	M	01-30-88	04-19-89	<5
	#25	M	02-16-88	04-19-89	<5
	#26	M	03-01-88	04-19-89	<5
	#27	F	04-11-88	04-19-89	<5
	#28	M	12-30-88	02-02-89	<25
			02-24-89	03-02-89	<25
	#29	M	01-03-89	06-08-89	<5
			05-01-89	06-08-89	<5
	#30	M	01-06-89	06-08-89	25
			05-02-89	06-08-89	25
	#31	F	01-12-89	06-08-89	<5
	#32	F	02-03-89	06-08-89	5
	#33	M	03-05-89	06-08-89	5
	Big Guy	M	11-20-84	03-02-89	<25
			06-02-88	02-10-89	<25
	VMTH 65185	M	01-26-89	06-08-89	25
TEXAS COUGARS					
	#01	F	06-14-86	02-10-89	<25
			06-14-86	02-10-89	<25
	#02	F	06-14-86	02-10-89	25
			05-31-88	02-10-89	<25

Table 40. (continued)

FIP p. 3

Population	ID#/Name	Sex	Date Sample Drawn	Date Sample Tested	Result ^B
TEXAS (cont.)					
	#03	M	06-21-86	02-10-89	<25
	#04	M	06-22-86	02-10-89	<25
	#05	M	06-22-86	02-10-89	<25
	#06	M	06-22-86	02-10-89	125
	#07	F	06-23-86	02-10-89	<25
	#08	F	06-23-86	02-10-89	25
			06-01-88	02-10-89	<25
	#09	F	06-23-86	02-10-89	125
	#10	F	06-23-86	02-10-89	<25
	#13	F	06-01-88	02-02-89	<25
	#14	F	06-01-88	02-02-89	<25
			06-01-88	02-02-89	<25
	#15	F	06-01-88	02-02-89	<25
	#16	M	06-02-88	02-02-89	<25
	#17	M	01-25-88	02-02-89	25
			10-26-88	02-10-89	<25
			02-24-89	03-02-89	25
	#18	M	06-02-88	02-02-89	25
	#19	F	01-24-89	02-02-89	25
			02-24-89	03-02-89	<25
	#20	M	01-26-89	02-02-89	125
	#21	M	01-28-89	02-02-89	25
			02-24-89	03-02-89	<25
	#22	F	03-20-89	03-25-89	3,125
	#23	M	03-20-89	03-25-89	3,125

Table 40. (continued)

FIP p. 4

Population	ID#/Name	Sex	Date Sample Drawn	Date Sample Tested	Result ^B
ARIZONA MT. LIONS					
	#03		01-20-87	06-08-89	<5
	#07		10-10-86	06-08-89	<5
	#08		12-12-86	06-08-89	<5
	#14		12-30-86	06-08-89	<5
CALIFORNIA COUGARS					
	#02		07-21-86	02-10-89	25
	#04		06-13-86	02-10-89	<25
	#05		06-25-86	02-10-89	25
COLORADO MT. LIONS					
	#05	M	04-20-88	02-10-89	<25
	#07	F	04-25-87	02-10-89	<25
	#20	M	04-25-88	02-10-89	<25
	#21	F	05-21-87	02-10-89	<25
	#22	M	04-23-88	02-10-89	<25
	#40	M	04-22-88	02-10-89	<25
	#46	M	04-27-88	02-10-89	<25
	#52	M	04-19-88	02-10-89	<25
	#55	M	04-26-88	02-10-89	<25
OREGON COUGARS					
	#03		03-13-86	02-10-89	<25
	#04		04-16-86	06-08-89	5
	#06		05-16-86	06-08-89	25
	#07		- -86	06-08-89	<5
	#08		01-19-87	02-10-89	25
	#30		03-11-87	02-10-89	<25
UTAH COUGARS					
	#29		03-15-87	02-10-89	25
	#34		03-01-87	02-10-89	<25
CAPTIVE COUGARS					
	"Tom"	M	05-31-88	02-10-89	<25
			11-05-88	02-02-89	25
	"Ocho"	M	01-18-89	04-19-89	<25

^ATested at Washington Animal Disease Diagnostic Laboratory;^B>1:25 = positive for corona virus, test cross reacts with all corona viruses.

Table 41. Longevity of Collared Panthers - As of June 30, 1989

ID#	Sex	Capture Date		Field ^a Captures	Months Collared		Dead or Injured Panthers		
		Initial	Latest		Total	Recent ^b	Date	Age	Cause/Location ^c
#01	M	02-10-81	—	1	34	34	12-14-83	12-14 y	Road-killed SR 84 mm 18, Cco
#02	M	02-20-81	01-29-83	3	44	21	10-27-84	13 y	Intrasp aggression FSSP, Cco
#03	F	01-23-82	01-17-83	2	12	0	01-17-83	9-10 y	Capture related ^e FSSP, Cco
#04	M	01-27-82	01-22-84	3	39	15	04-18-85	10 y	Road-killed SR 84 mm 17, Cco
#05	F	02-23-82	—	1	21	21	11-18-83	8-9 y	Unknown- Bnz & Hr ^f Fak Conc C, Cco
#06	M	02-27-82	—	1	2	2	04-16-82	6-7 y	Unknown- Bnz & Hr RP/BCNP, Cco
#07	M	03-02-82	01-26-85	3	43	9	10-28-85	9-10 y	Road-killed SR 29 2mS SR84
#08	F	03-25-84	04-13-87	3	37	RFW ^g	08-20-88	12-14 y	Kidney, liver, & thyroid disease captivity - WOP
#09	F	01-26-85	10-31-88	3	66	8	* Alive *		
#10	M	01-15-86	05-05-86	2	12	8	01-27-87	17-19 mo	Intrasp aggression Fak Conc C, Cco
#11	F	01-21-86	01-07-88	2	41	18	* Alive *		
#12	M	01-28-86	01-15-89	3	41	5	* Alive *		
#13	M	02-27-86	—	1	22	22	12-16-87	6-8 y	Road-killed SR 29 SunL, Cco
#14	F	12-06-86	04-11-88	2	30	14	* Alive *		
#15	F	12-13-86	06-16-87	3	18	12	06-10-88	5-7 y	Intrasp aggression & infection/ENP
#16	M	01-12-87	02-02-88	2	29	17	* Alive *		
#17	M	01-20-87	01-26-89	2	29	5	* Alive *		
#18	F	01-22-87	01-23-89	2	29	5	* Alive *		
#19	F	02-09-87	05-04-89	3	29	2	* Alive *		

Table 41. (continued)

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ID#	Sex	Capture Date		Field ^A Captures	Months Collared		Dead or Injured Panthers		
		Initial	Latest		Total	Recent ^B	Date	Age	Cause/Location
#20	M	03-10-87	06-17-87	2	3	RFW ^{#2}	06-17-87	3-4 y	Hit-by-car SR 858 5mE SR 29
	"		08-02-87	2	16	13	08-24-88	4-5 y	Pos. heart related (atrial defect) BI/BCNP, Cco
#21	F	03-16-87	07-23-88	2	18	RFW ^{#3}	* Alive *	2.5-3 y	Hit-by-car Palm Dr., SE Homestead, Dco
#22	F	03-18-87	03-24-88	4	24	12	03-20-89	30-31 mo	Radio-signal missing- no sign of cat in ENP
#23	F	03-18-87	06-22-88 02-23-89	5 5	15 ^I 19 ^I	RFW ^{#4} 4	06-22-88 * Alive *	21-22 mo	Stranded on island
#24	M	01-30-88	—	1	8	8	08-12/16-88	3-4 y	Unknown- Bnz & Hr Lykes Bros, Cco
#25	M	02-16-88	—	1	7	7	08-25-88	3-4 y	Intrasp aggression and septicemia Fak Conc C, Cco
#26	M	03-01-88	—	1	16	16	* Alive *		
#27	F	04-11-88	—	1	15	15	* Alive *		
#28	M	11-29-88	—	1	0	RFW ^{#5}	11-29-88	18-24 mo	Hit-by-car, Ft. Myers airport, Lco
	"		03-15-89 ^{#5}	1	4	4	* Alive *		
#29	M	01-03-89	05-01-89	2	6	2	* Alive *		
#30	M	01-06-89	—	2	6	2	* Alive *		
#31	F	01-12-89	—	1	6	6	* Alive *		
#32	F	02-03-89	—	1	5	5	* Alive *		
#33	M	03-05-89	—	1	4	4	* Alive *		
Big Guy	M	11-02-84	—	1	0	RFW ^{#6}	11-02-84	3-5 yr	Hit-by-car, SR 41 Ochopee, Fl., Cco. Perman- ently in captiv- ity at WOP

Table 41. (continued)

^AField captures = total number of times panther was captured and immobilized in the wild (field).

^BRecent = months lived since most recent capture.

^CLocation: County-Collier (Cco), Dade (Dco), Glades (Gco), Lee (Lco); ENP-Everglades Nat. Park; Fak Conc C-Fakahatchee Conservation Club; FSSP-Fakahatchee Strand State Preserve; BI/BCNP & RP/BCNP - Bear Island and Raccoon Point in Big Cypress Nat. Preserve; SunL- Sunniland; WOP- White Oak Plantation.

^DRadio collar malfunctioned 6 months after collaring.

^EVery old female in poor physical condition, anesthetic possibly entered the blood stream.

^FBnz & Hr - skeleton was reduced to bones and hair.

^GLived for a total of 53 months, 16 months in captivity.

^HRFW = Removed from wild:

¹poor physical condition and no reproduction for 3 years.

²hit-by-car, removed for 6 weeks to treat injuries then returned to the wild.

³hit-by-car, removed to fix fractured femur, still in captivity.

⁴stranded on island surrounded by water in Shark River Slough, ENP.

⁵uncollared panther, hit-by-car, rehabilitated and released.

⁶uncollared panther, hit-by-car, rehabilitated, in captivity.

^I#23 was in captivity from 6-22-87 until 5-14-88 (11 months) then returned to the wild and was removed 1 month later. She was then held in captivity for 8 more months before released on 02-22-89.

Table 42. Documented Panther Injury & Mortality: Uncollared Panthers 1978-1989

ID#	Sex	Date	Est. Age ^a	Cause of Death/Injury	Location/Comment/Source ^b
UF 9789	M	02-13-72	2-3 yr	Road injured/shot	S. of Moore Haven, Glades Co. ^{1,2,7}
"Sunniland"	F	10-07-72	Adult	Road-killed	S. of Sunniland, Collier Co. No specimen- may not be valid report ¹
G78-65	M	03-08-78	2-3 yr	Illegally-killed	Levee 28, Dade Co. ^{1,4,7}
'80-4 F		12-23-79	1.5-2.5 yr	Road-killed	SR 29, 200 yds. N. of SR 84, Collier Co. ^{1,4,7}
'80-15	M	02-07-80	1.5-2.5 yr	Road-killed	Sunniland, 1 mile N. on SR 29, Collier Co. ^{1,4,7}
'81-19	F	04-19-81	2-3 yr	Road-killed	SR29, 9.5 m. So of SR 84, 1.6 m. S. of Road Prison, Collier Co., Pregnant 2-3 mos.- 4 fetuses ^{1,4,7}
G83-22	M	03-18-83	2-3 yr	Road-killed	SR 27 near Palmdale, Glades Co. ^{1,4,7}
'Canal Pt."	F	05-22-83	Adult	Illegally-killed	L-8 canal near Canal Point, Fl., Martin Co. ^{1,7}
'83-75	M	12-01-83	3-6 yr	Illegally-killed	Seminole Indian Reservation, shot by Chief James Billy, Hendry Co. ^{1,7}
G84-20	F	10-30-84	2-3 yr	Illegally-killed	Corbett Wildlife Management Area, Palm Beach Co. ^{1,7}
'84-25	M	11-02-84	3-5 yr	Road-injured	SR 41, 2 m. E. of Ochoppee, Fl., fractured both femurs, * Alive * in captivity, "Big Guy" ¹
G84-26	F	11-18-84	8-10 yr	Road-killed	SR 84, mm 16, Collier Co. ^{1,7}
'85-BNZ	F	01-10-85	18-24 mo	Road-killed	SR 84, mm 16, Collier Co. ^{1,7}
'85-CS	F	03-23-85	2-3 yr	Illegally-killed	Collier Seminole State Park, N. of SR 41, ~20 m. E. of Naples, Fl., shot through neck and skinned, long bones removed (butchered) ^{1,7}
'Naples"	F	05-12-85	unknown	Road-injured	SR 951, 2 m. N of SR 41, struck by car, not killed - did not find body, saw tracks ¹
PCO 59	F	11-14-86	7-9 yr	Road-killed	SR 84, mm 16, Collier Co. ^{1,7}

Table 42. (continued)

ID#	Sex	Date	Est. Age ^a	Cause of Death/Injury	Location/Comment/Source ^b
UF 24042	M	12-19-87	8-10 ¹ yr	Unknown	Skeleton found by hunter in Crane Swamp, Framton Wildlife Management Area, 6 m. S. of Edgewater, Fl., Volusia Co. ^{1,7}
G88-16	M	03-01-88	10 mos.	Road-killed	CAPTIVE born/Released by Ted Turner in Jan. 1988 along with sibling. Killed near Capps, Fl. S. of Tallahassee ¹
FP #28	M	11-29-88	18-24 mo	Road-injured	Near Ft. Myers Int. Airport, was rehabilitated and is now radio-collared and free ranging ⁴
VMTH 65185	M	01-26-89	3-4 yr	Road-killed	SR 850, NW of Immakolee, Fl. ¹

^aEstimated age is based on growth plate closure, tooth wear, and "subjective" field impressions.

^bSource of information:

- 1) Belden, Robert C., and Lovett E. Williams, Jr. Survival Status of the Florida Panther. In: Proceedings of the Florida Panther Conference, March 17-18, 1976, Orlando, Florida. Pub. by the Florida Audubon Society of Florida Game and Fresh Water Fish Commission.
- 2) Nowack, Ronald M., and Roy McBride. Status Survey of the Florida Panther. Reprinted from World Wildlife Fund Yearbook, 1973-74. In: Proceedings of the Florida Panther Conference, March 17-18, 1976, Orlando, Florida. Published by the Florida Audubon Society of Florida Game and Fresh Water Fish Commission, p. 118.
- 3) Belden, Robert C. Field capture records, radio-telemetry data, and personal communication- for 1981-83. Florida Game and Fresh Water Fish Commission. Gainesville, Fl.
- 4) Forrester, Donald J. Necropsy examination records for 1978-83. Department Infectious Disease, College of Veterinary Medicine, University of Florida, Gainesville, Fl.
- 5) Roelke, Melody E., Elliott R. Jacobson, and George V. Kollias. Veterinary medical records for field seasons 1983/84, 1984/85, and 1985/86. Department of Special Clinical Sciences, College of Veterinary Medicine, University of Florida, Gainesville, Fl.
- 6) Roboski, John and Walt McCown. Field capture records, radio-telemetry data, and personal communication- 1984 & 1985. Florida Game and Fresh Water Fish Commission. Naples, Fl.
- 7) Wilkins, Laurie. Specimens held at Museum collection. Mammal Range Florida State Museum, University of Florida, Gainesville, Fl.
- 8) Roelke, Melody E. Veterinary medical records for field seasons 1986-1989. Florida Game and Fresh Water Fish Commission. Gainesville, Fl.

Table 43. Causes of Documented Panther Mortality/Injury: Radio-collared Verses Uncollared Panthers, 1972-1989

Category of Death	Collared No. (Percent)		Uncollared No. (Percent)		Total No. (Percent)	
Road killed/Injured	6 ^A	(37.5)	13 ^B	(68.4)	19	(54.3)
Illegally killed	0	0	5	(26.3)	5	(14.3)
Intraspecific Aggression ^C	4	(25.0)	0	0	4	(11.4)
Unknown cause ^D	3	(18.8)	1	(5.3)	4	(11.4)
Other:						
Congenital Heart Defect	1	(6.3)	0	0	1	(2.8)
Kidney Disease ^E	1	(6.3)	0	0	1	(2.8)
Capture mortality	1	(6.3)	0	0	1	(2.8)
TOTAL	16		19		35	

^ATwo panthers were injured by vehicles: #21 F is still in captivity healing from a fractured femur; #20 M recovered from injuries and was released, later died, probably related to congenital atrial septal defect.

^BThree panthers were hit by cars and survived: G84-25 M ("Big Guy") in captivity, recovered from two fractured femurs; a female ("Naples") survived at least the first day, found tracts, never found body. Fl. panther #28 was rehabilitated, radio-collared, and released.

^CThis also includes those panthers that died of septicemia &/or toxemia as a result of bite and puncture wounds.

^DSkeletal remains were recovered on these animals, no obvious cause of death.

^EKidney and liver disease were the primary causes of death for panther #08 F, however, her thyroid, and reproductive systems were failing as well.

Table 44. Causes of Florida Panther Mortality or Injury by Year, 1972-1989

Fiscal Year ^a	Road Kill ^b	Illegal Kill	Aggression ^c	Unknown	Other ^d	Total
1972/73	2 (0/2) ^e	0	0	0	0	2 (0/2)
1973/-/77	0	0	0	0	0	0
1977/78	0	1 (0/1)	0	0	0	1 (0/1)
1978/79	0	0	0	0	0	0
1979/80	2 (0/2)	0	0	0	0	2 (0/2)
1980/81 ^f	1 (0/1)	0	0	0	0	1 (0/1)
1981/82	0	0	0	1 (1/0)	0	1 (1/0)
1982/83	1 (0/1)	1 (0/1)	0	0	1 (1/0)	3 (1/2)
1983/84	1 (1/0)	1 (0/1)	0	1 (1/0)	0	3 (2/1)
1984/85	5 (1/4 ^g)	2 (0/2)	1 (1/0)	0	0	8 (2/6)
1985/86	1 (1/0)	0	0	0	0	1 (1/0)
1986/87	2 (1 ^h /1)	0	1 (1/0)	0	0	3 (2/1)
1987/88 ⁱ	1 (1/0)	0	1 (1/0)	1 (0/1)	0	3 (2/1)
1988/89	3 (1 ^h /2 ^j)	0	1 (1/0)	1 (1/0)	2 (2 ^k /0)	7 (5/2)
TOTAL	19 (6/13)	5 (0/5)	4 (4/0)	4 (3/1)	3 (3/0)	35 (16/19)

^aFiscal year: July 1- June 30, centered around the winter.

^bThis category includes 5 panthers that were injured by vehicles, but did not die.

^cAggression- intraspecific, includes deaths due to septicemia &/or toxemia subsequent to fight wounds as well as deaths from combat and cannibalism.

^dOther: Capture mortality (1), kidney disease (1), and heart anomaly^f (1).

^eRadio-collared/Uncollared panthers in parenthesis, collaring project started Jan. 1981.

^f#20 M was road injured, repaired and released to the wild, he later died of a heart defect (presumptive diagnosis) in FY 88/89, therefore he was scored twice.

^gCaptive born cat released to wild and road-killed not included in this table.