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Official Newsletter of  
the Florida Panther  
Interagency Committee

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# Coryi

★ ★ BULLETIN ★ ★

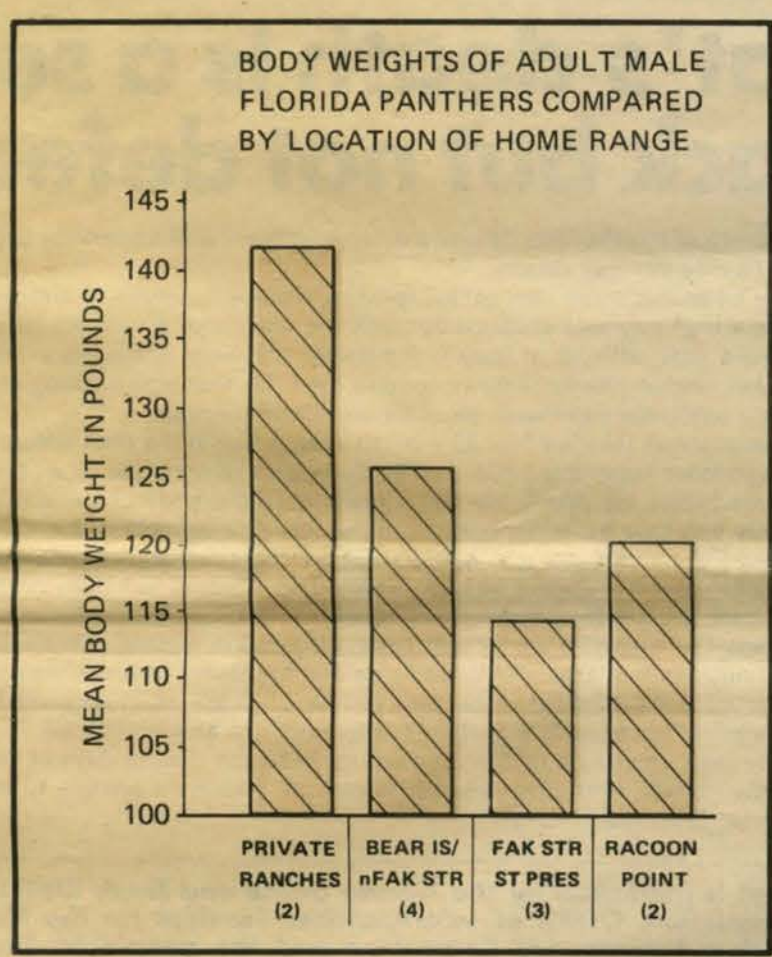
The male Florida panther at White Oak Plantation has yet to mate with the female Texas cougars at his disposal, but scientists are hoping cool winter weather will activate his mating drive soon.

If mating does not take place soon, officials plan to borrow a hybridized panther from the Tallahassee Junior Museum to provide male competition and an example for the Florida panther.

Once the cats mate, their offspring will be released into the wild as part of the experimental reintroduction of panthers in suitable areas of Florida.

Volume 1, Number 3 December 1987

## Panthers' health varies with locations



Although various panther subspecies have been the subject of considerable attention and study, most of it focuses on the economic importance of the animals as predators of domestic livestock and as game animals. Few studies have yielded information concerning the health of the cats—such as in our research of the Florida panther.

Since the summer of 1983, the Game and Fresh Water Fish Commission, with assistance of wildlife veterinarians from the University of Florida College of Veterinary Medicine, has conducted medical research with emphasis on the medical management, physical ex-

amination, biological sampling and reproductive evaluation of wild Florida panthers. Prior to this time, little information was available with regard to Florida panthers' physiology, nutritional requirements, reproduction, genetics or exposure to diseases.

Among the most notable findings so far are the differences in body weight, physical condition and blood characteristics among panthers living in different locations. Specifically, panthers, especially females, in the Fakahatchee Strand State Preserve and the eastern Big Cypress National

(continued on page 3)

### No. 13

## Large male cat falls prey to big truck on State Road 29

—By Henry Cabbage, GFC—

A traffic accident on State Road 29 near Sunniland claimed the life of Panther No. 13—the first known panther road-kill this year.

Reports indicate the cat collided with a tractor-trailer at approximately 8 p.m. Dec. 14. Minutes later a motorist, identified as Paul Dupree of Immokalee recovered the animal's

body and summoned the Game and Fresh Water Fish Commission.

Panther No. 13, a large male, probably between six and eight years old, had been tracked by biologists since Feb. 27, 1986, when Commission panther researchers fitted him

(continued on page 7)

## Kitten separated from its mother is captured at park

—By Jim Howard, NPS—

Panther No. 23, the 11-month-old female that became separated from its mother twice after being captured and collared in Everglades National Park last spring, was transferred to Gilman Paper Company's White Oak Plantation Aug. 20.

This animal has settled into a pen built especially for it by the Gilman staff. Meanwhile, its sister (No. 22) continues to roam with its mother (No. 15) in the Long Pine Key area.

Oron Bass, panther research project leader for the National Park Service, said these two animals roam westward as far as Mahogany Hammock, across Flamingo Road. Evidence of several kills—mainly white-tailed deer—have been found

in this range.

Bass said that No. 23 will be raised to maturity at White Oak and probably will be returned to its birthplace—Everglades National Park—after six to 12 months.

Tracking data on three other panthers gathered by Bass' team indicates:

No. 14 roams the eastern portion of the Long Pine Key area and has cycled several times since March but has not mated. Bass said she's leaving plenty of signs in her search for a male but so far has not been bred. He said she is not celibate—just unlucky. She is getting plenty to eat, however.

(continued on page 6)



Panther No. 23.

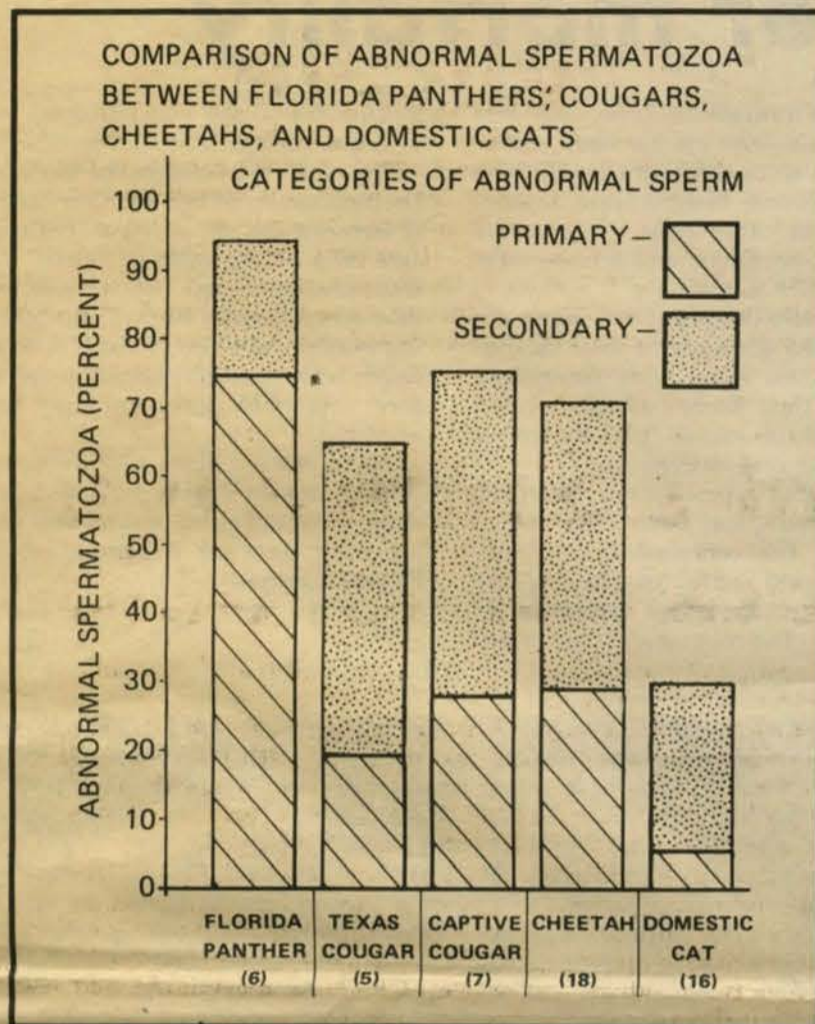






## Panthers' health

continued from page 1



Preserve were underweight and generally in poorer condition than panthers residing on lands to the north. This probably is due to the poor nutrition of those cats, which is a consequence of a low food base and the negative state of the preserve.

In addition, the poor health of the animals may account for the apparent low rate of reproduction in the preserve. This finding needs more attention.

Feline panleukopenia, a highly contagious and potentially extremely dangerous disease for panthers, showed up in 85 percent of the panthers tested.

Also calicivirus, a respiratory disorder, occurred in half the panthers tested.

Among the parasites that affect panthers are seven species of ticks, and in some cases, scientists have found as many as 100 ticks on a single panther. Although each tick ingests a small amount of blood, a large number of ticks on a single animal can result in a considerable loss of blood over time. The same may be true of hookworms. Other parasites common in Florida panthers include tapeworms and intestinal flukes.

Research concerning panther reproduction indicates that the occurrence of abnormal semen is extremely high in Florida panthers. In fact, semen analysis of four wild panthers indicated that 94 percent of the

spermatozoa were abnormal. In contrast, the figure was 60-70 percent for wild Texas cougars—a related subspecies.

Three male Florida panthers, including two adults and one sub-adult, were captured this year. But unfortunately, the weather at the time was too warm to allow researchers to take semen samples for freeze storage from the animals safely. This was particularly unfortunate because the animals were the healthiest and most well fed panthers ever captured in south Florida, and semen samples from them might have revealed whether abnormal sperm is linked to nutrition or genetics.

On the other hand, analysis has revealed a high percentage of abnormal sperm in the cats that scientists have been able to evaluate. The most common type of defect involved the "head" of the sperm and in all probability renders it incapable of fertilizing an egg. Even so, panthers are reproducing despite a low percentage of normal spermatozoa. One cat, Panther No. 12 has only one testicle and has sired at least three litters of kittens.

The phenomenon of having only one testicle may be linked to inbreeding and is a trait passed on by the females. We have observed this trait in three of seven male panthers examined since 1984.

## Coryi capsules —

### Seminole chief found not guilty

—By Ken McLaughlin, GFC—

A LaBelle jury's October decision to acquit James Billie ended a four-year effort to prosecute him on charges stemming from the killing of a panther on the Seminole Indian Reservation in Hendry County. After hearing four days of testimony and argument, the jury deliberated approximately two hours before returning a verdict finding Billie not guilty of charges that his actions violated state laws protecting the endangered Florida panther.

The Billie case began in early December 1983, when Florida Game and Fresh Water Fish Commission officers, responding to an anonymous tip, seized a recently killed panther's hide and skull from Billie's hunting compound on the Seminole Reservation. Thereafter, Billie was charged with violations of both the federal Endangered Species Act and state laws protecting the Florida panther.

Shortly following the state court verdict, Assistant United States Attorney James C. Kilbourne announced that the federal government would no longer pursue its criminal charges arising from the incident. Billie's earlier federal trial in West Palm Beach ended in a mistrial resulting from a deadlocked jury.

Billie, Chief of the Seminole Tribe of Florida, did not testify at either trial, although he never denied killing the panther during a nighttime hunting expedition with friends. However, his lawyers contested the identity of the animal as an endangered Florida panther *Felis concolor coryi*, and much of the testimony at both trials involved this disputed issue.

Although disappointed with the eventual outcome, officials were pleased that the case resulted in decisions by both state and federal courts that endangered species protections afforded the Florida panther apply to the on-reservation activities of Seminole Indians.

### Park service plans more captures

—By Jim Howard, NPS—

Everglades National Park Supt. Mike Finley plans to launch another search for panthers in the park next spring, according to panther research project leader Oron Bass.

Researchers believe there are at least two more panthers living in the eastern portion of the park in addition to the six that already have been collared. One of the six was moved to White Oak Plantation in northern Florida in late August.

Bass said he hopes at least one of the two known uncollared panthers is a mature male who might, on his own, mate with Panther No. 14, a nearby female.

### Two cats using Corkscrew Swamp

At least two adult Florida panthers have been documented as using the National Audubon Society's Corkscrew Swamp Sanctuary in Collier County on a regular basis. Several years of casual observations, as well as recent field searches by Game and Fresh Water Fish Commission and sanctuary staff have revealed the presence of at least one male and one female panther.

In April of 1986, a systematic track survey of the sanctuary was implemented by GFC Division of Wildlife biologists. A system of maintained and unimproved trails provides access to most parts of the sanctuary. All panther sign documented, including six sets of tracks, six scats, six scrapes and one possible deer kill, were found using these roads and trails—suggesting the panthers tend to use them as travelways.

Perhaps the most significant habitat characteristic of Corkscrew Swamp is its nearly complete encirclement by housing developments, vegetable crop land, improved pasture and other human developments. Sporadic use of the survey area indicates it is not the core of any panther home range. Rather it appears to be an area of occasional use. Large tracts to the south, west and northeast may be primary use areas because suitable amounts of good habitat exist on these private lands, and most of the panther sign was found on the periphery of the sanctuary.

The continued monitoring of panther populations and their habitat will provide data for interpreting trends of those populations. This information will be used to develop management strategies for maintaining these populations.

(continued on page 6)



## News

# Scientists monitor deer mortality

White-tailed deer are a major prey species of Florida panthers and are also highly prized game species, particularly on public lands such as the Big Cypress National Preserve. In order to better manage the deer resource on these public lands as well as in other areas known to be occupied by panthers, information is needed on the rates and causes of deer mortality, especially of does.

The Bear Island unit of the Big Cypress National Preserve supports the highest density deer herd in the preserve and a minimum of five panthers have been documented in Bear Island within the past year.

Two capture methods were used to obtain deer from the unit. Using air-

boats and tranquilizer darts, four does were captured. A helicopter and netgun were used for capturing an additional 13 does and three bucks with much less time and effort expended than was the case using airboats. This technique should enable our research staff to capture the necessary number of does to portray accurately the causes of death acting upon this segment of the deer herd. Additionally, a good sample size of marked bucks can be acquired which will provide insight into the proportions of male deer harvested in Bear Island.

Radio-instrumented deer were monitored three times weekly in conjunction with panther flights, mainly

to detect mortalities. Locations were recorded at least once a week, either from the air or through triangulation on the ground. Habitat type, associations with other deer, presence of fawns or yearlings, and activity were noted when possible.

The radio-instrumented deer are distributed throughout Bear Island. Four habitat types were recognized within the home ranges: open marsh, shrub marsh, pine flatwoods and hardwood hammocks.

Successful reproduction and rearing of young has been observed in three of the captured does. More ground and aerial monitoring are needed to document presence of young for the other does. One radio-

instrumented doe was killed by one of the radio-instrumented panthers.

The next, and perhaps the most important, aspect of this mortality is the determination of survival patterns and recruitment rates of fawns. All radio-instrumented does will be monitored closely during the fawning season; captured fawns will be affixed with mortality-sensing break-away collars to document their survival rates.

All of these efforts will allow informed management of white-tailed deer, a hunted game species and major prey item of the endangered Florida panther.

## Panthers' current range is a mystery to science

Although scientists have, since 1976, gathered a great deal of data concerning the panther population in the Big Cypress National Preserve and Everglades region, the precise range of the animals still is a mystery. Between July 1986 and June 1987, the Game and Fresh Water Fish Commission conducted surveys to gather some of the missing information.

The study focuses on areas in central and north Florida with adequate habitat conditions and prey animals to support panthers. Of particular interest is the vicinity of Christmas, Fla. since scientists have been able to confirm reports of at least two panthers in that general area.

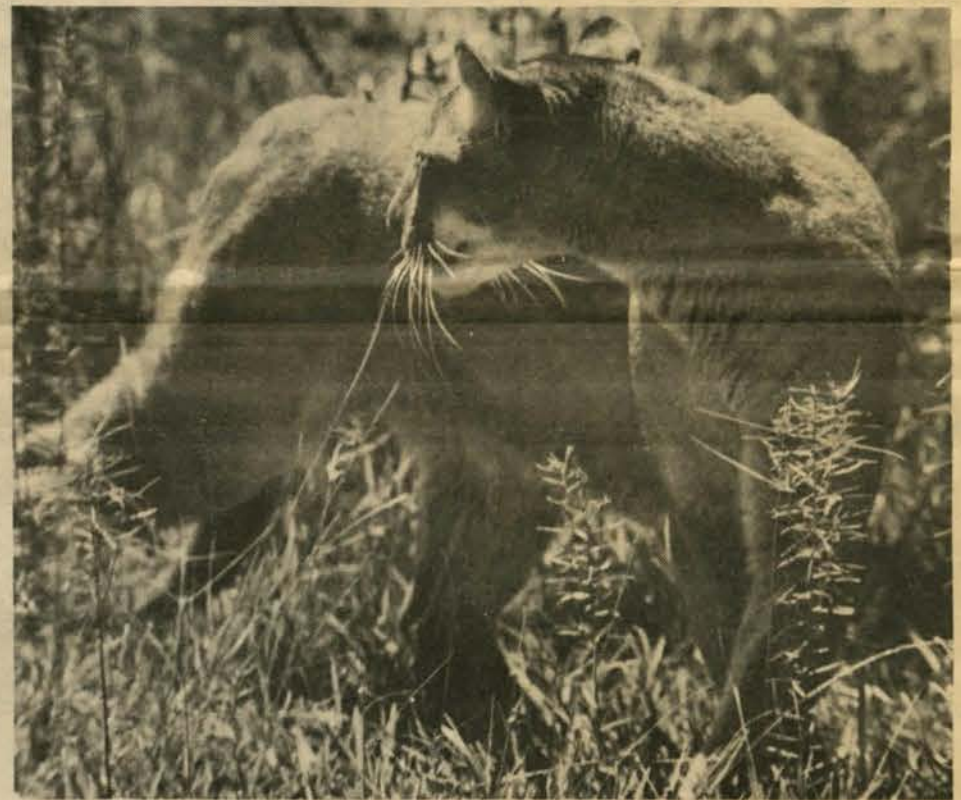
However, findings still are inconclusive as to whether the animals are transients from the south Florida population or are captive animals that have escaped into the wild or are resident Florida panthers.

Statewide, the Commission has

received 2,731 reports of panther sightings since 1976. Of those, 427 were credible enough to warrant investigation, and 88 yielded conclusive evidence of a panther. None of the confirmed reports are from areas other than south Florida except those which occurred between Flagler and Brevard counties.

Reports of panther sightings have increased steadily, but researchers have found that the number of reported sightings tends to reflect the growing human population and increased human awareness of the animals' plight rather than actual panther density or activity.

Plans are to concentrate future phases of the study in the Tosahatchee State Reserve and Bull Creek Wildlife Management Area and along the St. Johns and Kissimmee River drainages south to Indian River and Okeechobee counties.



*Florida panther in the wild.*

## U.S. Fish and Wildlife Service provides key support

—By Dennis Jordan, FWS—

Even though the U.S. Fish and Wildlife Service is negotiating with landowners to acquire panther habitat for the establishment of the Florida Panther National Wildlife Refuge, other key actions already are taking place. Once land is acquired, the service will be better prepared to move forward with its "on-the-ground" recovery activities.

Back in the spring, the service selected Steve Gard to serve as refuge manager for the project. At the time of his selection, Gard was

assistant refuge manager at Merritt Island National Wildlife Refuge at Titusville.

Because of medical reasons, Gard was able to function in this new position only a few months. He was, however, able to spend time in the Naples area "breaking ground" and making preparations for situating the refuge office there and handling other matters associated with the establishment of any new refuge. He was successful also in initiating contacts and establishing a key level of

cooperation and coordination with Game and Fresh Water Fish Commission biologists involved in panther study activities. Through this initial cooperative relationship Gard was able to provide key helicopter support needed by the state as part of ongoing study efforts.

The service recently announced Gard's replacement is Todd Logan who left his position as assistant refuge manager at Mississippi Sandhill Crane NWR, Jackson County, Miss. to assume his new duties in

October. In addition to resuming activities necessary for a functioning refuge, Logan will be involved in the land acquisition effort. Plans call for a total of 40,000 acres in an area west of S.R. 29 and north of S.R. 84, in Collier County to be acquired for the refuge. Negotiations revolve around 15,000 acres to be acquired through a purchase arrangement and the remaining acreage through a land exchange. At this time no one is in a position to predict just when the area actually will be acquired.



# Scientists search for panther habitat away from south Florida for reintroduction plan

Panther habitat evaluation surveys conducted by Game and Fresh Water Fish Commission wildlife biologists have revealed that two areas of north Florida may be suitable for panther reintroduction feasibility studies.

The Apalachicola National Forest and surrounding area and the Okefenokee National Wildlife Refuge/Osceola National Forest and surrounding area are considered the best candidate sites for the studies.

Officials hope successfully reintroducing Florida panthers into areas of currently unoccupied habitat will help reduce the risk of extinction for the subspecies. The first and most important task in the re-establishment of Florida panthers in unoccupied areas of the state was to determine if suitable habitat in fact still exists outside of south Florida.

The best way to determine if an area is suitable for panthers is to introduce the animals into it and monitor their behavioral response to that area. Because of the endangered status of Florida panthers, these preliminary introductions must be evaluated using a non-endangered subspecies as a surrogate. The objective of the habitat evaluation surveys was to develop an initial priority list of candidate study areas for further evaluation, including the experimental release of surrogate animals.

To obtain surrogate animals, captive breeding facilities were built at Gilman Paper Company's White Oak Plantation near Yulee. The male panther which was held in captivity at the GFC Wildlife Research Laboratory in Gainesville since being hit by a car in November 1984 on Hwy. 41 near Ochopee, was moved to these facilities. Three female mountain lions were brought in from Texas for use as surrogates in the captive breeding program. After being held in quarantine at the Wildlife Research Lab, the female cats also were moved to White Oak Plantation.

An old female Florida panther was captured in the Fakahatchee Strand and brought to the research lab for quarantine. After reproductive evaluations by the University of Florida College of Veterinary Medicine, she will be moved to the captive breeding facilities at White Oak Plantation for a later phase of the captive breeding project.

Scientists believe initial panther reintroduction feasibility studies must be carried out in north Florida well away from known panther populations.

Of the 11 sites evaluated, the top four (Apalachicola National Forest and surrounding area, Okefenokee National Wildlife Refuge/Osceola National Forest and surrounding area, the Kissimmee River Valley/St.

Johns River headwaters and surrounding area, and the Big Bend Coast) are by far the largest. Of these top four, the Kissimmee River Valley/St. Johns River area is the largest and probably supports the highest prey density, but it also has the highest human population density surrounding it and the highest human population growth rate.

The other three areas have moderately abundant prey densities, sparse human population densities surrounding them, and the least human population growth rates. Both the Apalachicola and Osceola/Okefenokee areas have the

fewest private landowners. This characteristic would greatly simplify coordination of the experimental reintroduction of panthers in those areas.

The Osceola/Okefenokee area is considered the first priority candidate site due to its closer proximity to the panther captive breeding facilities at White Oak Plantation in Nassau County and GFC Wildlife Research Lab in Alachua County.

Once other state and federal agencies have been contacted and landowner approval has been obtained, field searches will be conducted in the areas to determine if panthers

already exist there and the areas will be surveyed for parasites and infectious diseases potentially harmful to panthers.

Public attitudes toward panther reintroduction must be determined in order to design and focus information and education programs on the desirability of re-establishing Florida panther populations in these unoccupied areas of their historical range.

If the results of these investigations are positive, the feasibility study can then proceed with the experimental release of surrogate animals to determine their response and survival within the candidate sites.

## White-tailed deer herds draw intense study

Since white-tailed deer are an important part of the diet of Florida panthers, Game and Fresh Water Fish Commission researchers are studying south Florida deer herds. They are especially interested in gaining a clearer understanding of deer herd health, numbers of deer in each herd, distribution, age and sex ratios of the deer, reproduction and other factors.

One of the most important questions to be answered is whether sport hunting in the area reduces to a critical level the amount of food available to the cats. Also, scientists hope to find ways to enhance the number of deer in the area.

For the past three years scientists have surveyed deer numbers and distribution in the Bear Island and Eastern Monument units of the Big Cypress National Preserve, and they have studied the herd in the Fakahatchee Strand State Preserve for one year.

Findings so far indicate an increase in the Eastern Monument herd—probably due to the relatively dry springs of 1985 and 1986. However, since the March of 1987 was abnormally wet, researchers expect to detect a lower survival rate among this year's fawns.

Bear Island demonstrates the importance of good quality habitat for supporting deer and ultimately panthers. Both animals are healthier, more robust and reproductively successful in the Bear Island Unit than in other areas. Meanwhile, data concerning panthers recently captured on private lands north of the Bear Island Unit, further illustrate the relationship between good habitat and predator/prey populations.

The importance of now being able to study populations of animals preyed upon by panthers on a variety of lands is that we now are able to compare our findings from different areas and better understand the in-

fluence that different habitats and land management strategies

ultimately have on the well being of resident panthers.



White-tailed deer are panther's favorite prey.

## Panther plan gets revision

—By Dennis Jordan, FWS—

The approval of the Revised Florida Panther Recovery Plan by the Florida Panther Interagency Committee at its June 22 meeting represents the culmination of an intensive effort initiated over a year ago. In May 1986, the U.S. Fish and Wildlife Service, National Park Service, Florida Game and Fresh Water Fish Commission and the Florida Department of National Resources entered into a memorandum of agreement establishing the Florida Panther In-

teragency Committee. The long-term goal of the committee is to undertake a coordinated, cooperative effort to restore the Florida panther to nonendangered status in the wild.

One of the first tasks of the committee has been to update and revise the original Florida Panther Recovery Plan, which was approved by the Fish and Wildlife Service in 1981. This revision was undertaken in

(continued on page 7)



## Federal authorities are tracking down reports of Florida panther sightings in Arkansas and other states

—By Dennis Jordan, FWS—

Currently the only verified self-sustaining population of the Florida panther is in south Florida. It is not uncommon, however, for reports of panther sightings to surface from other parts of Florida, as well as from other southeastern states. Historically, the Florida panther, which is one of 30 recognized subspecies of panthers, ranged from eastern Texas eastward through Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida and parts of Tennessee and South Carolina.

Frequent sighting reports continue to take place in western Arkansas. Because of this, the U.S. Fish and Wildlife Service is cooperating with

the State of Arkansas and the U.S. Forest Service to launch a field study to attempt to confirm the existence of panthers in that area.

The Arkansas Game and Fish Commission has, over the past several years, received numerous sighting reports, as well as other reports of panther evidence, and maintains a clearinghouse for processing such reports. Many of these reports were followed up by visits from Arkansas Game and Fish Commission personnel. It is, however, extremely difficult to substantiate the presence of panthers in Arkansas. The most recent authenticated records of panther kills in Arkansas were from Montgomery

County in 1949, Ashley County in 1969, and Logan County in 1975. Also, in bordering Caddo Parish, La. another individual was killed in 1965. The question remains whether these kills, which have been scattered over four decades and many millions of acres, actually represent remnant native populations or merely individuals that may have escaped from captivity.

Hopefully, this study will help answer some of these questions. Plans are to use the services of Roy McBride from Alpine, Tex. to oversee the study. He is also actively involved in the south Florida project and considered by many to be the best

“cat tracker” anywhere. The study will be concentrated in areas considered most likely to possess resident cats or possess habitat considered sufficient to sustain a population. A substantial portion of the effort probably will be concentrated on National Forest lands within the Ouachita and Ozark mountains of western Arkansas.

Primary emphasis of the study will be geared toward determining if Florida panthers still occur outside south Florida and especially in Arkansas. Information also will be gathered to determine the suitability of such areas as potential Florida panther reintroduction sites.

## Park officials manage ecosystem

—By Bob Baker, NPS—

The Everglades National Park's healthy, reproducing panther population reflects the park's success in 40 years of efforts to protect habitat and preserve the balance and function of the entire ecosystem.

The National Park Service policy of ecosystem management is based on the philosophy that the health of the ecosystem should not be compromised to favor a single species that might benefit from selective management. However, that philosophy does not amount to a “hands off” attitude.

Before taking on management strategies, managers should have comprehensive scientific data concerning panthers, their prey base and habitat requirements. The second year of panther and deer research is underway at Everglades National Park. Data on the health of these animals, their movements, their numbers and the interaction between predators and prey in a protected environment have so far not been available to scientists.

Initial analysis indicates the six panthers collared in the park (two females, each with two kittens) are in good health. These adult females are reproducing and raising their offspring until the young are ready to establish their own territories.

Both male and female kittens, which became independent during this study year, have lived almost exclusively outside the park. Researchers have tracked these animals crossing major highways and roaming near developed areas frequently.

Everglades National Park's responsibility to maintain natural diversity applies to vegetation as well as wildlife. There is a recognized problem with *Schinus* (Brazilian pepper)

invading native plant communities. *Schinus* has become established on hundreds of acres in the Hole-in-the-Donut (former agricultural area). The park service is striving to eliminate exotic (non-native) species and restore native plants. The more natural the habitat, the greater the benefit to native wildlife including panthers.

Park officials have joined the Exotic Pest Plant Council—an organization of agencies trying to protect native plant communities. The council is advising the public on the unsuitability of exotic plants for landscaping, and it lobbies for ordinances to prohibit the use of such plants. Researchers, meanwhile, are seeking a natural control mechanism for these species.

For nearly three decades, the Na-

tional Park Service has supported fire management programs that include prescribed burns to restore native plant communities and simulate natural mosaic patterns which occur when lightning causes natural burns.

Since 1984, Everglades National Park's resource management specialists have burned 118,000 acres in an attempt to restore the environmental contributions of nature's fires to the park. This process im-

proves deer browse and panther habitat.

Also, since motor vehicles are the panthers' worst enemies, park management has studied ways to reduce the likelihood that a panther might be struck on a park road. Soon, officials will reduce speed limits in some areas; close some roads at night; and promote caution through the use of signs, brochures and stepped-up law enforcement.

### Capsules continued from page 3

#### GFC studies panther nutrition

Preliminary studies of panther diets in Florida indicate the cats subsist primarily on white-tailed deer, wild hogs, and small mammals. This is consistent with studies of western mountain lions where large hoofed mammals such as mule deer usually are the most important food and a variety of small prey also is eaten.

Since low nutrition has been suggested as a factor in the less than optimum condition of some Florida panthers, an understanding of their caloric needs in south Florida will be helpful in determining their nutritional status. Calculating the caloric and nutrient value of the important food items such as white-tailed deer, hogs, raccoons and armadillos, and using existing metabolic data for cougars, a variety of simulated diets can be modeled. This will be useful in understanding minimum kill rates in areas characterized by differing ratios of these prey species.

A total of 34 scats and 11 kills have been found during field searches conducted in areas occupied by radio-collared panthers and during panther capture activities between 1985 and 1987. Preliminary analyses have identified 18 scats with hog hair, six with deer, one with armadillo, two with raccoon, one with rabbit and six awaiting identification. Kills included five deer and six hogs.

### Kitten continued from page 1

Bass said a 10-point buck was taken down by this animal in late August.

No. 16, male offspring of 14, is about two years of age and has been tracked northeast of the park to a tract near the Chekika Recreation Area. His diet in this range consists mainly of raccoons and other small animals.

No. 21, female offspring of 14, has been tracked from the eastern boundary of Everglades National Park to a site near Homestead Air Force Base, which means she is crossing busy U.S. 1 in her search for food.



# Human population crowds panthers, changes habitat

Florida panthers occupy one of the largest remaining connected tracts of wildlife habitat in the eastern United States. Public and private lands covering parts of Collier, Dade, Broward, Palm Beach, Lee, Hendry and Glades counties make up a connected system of wild lands totalling more than 5 million acres.

However, continued expansion of the urbanized east coast, increasing growth on the west coast and the spread of agricultural development in the interior has placed unprecedented pressures on this system. Human population growth in Collier County alone is expected to increase 46 percent by 1995 and averages 28 percent for the six-county region. Further, Broward and Palm Beach counties will lead the state in numbers of new residents during this period.

With increasing human numbers in the region, public lands will experience comparable use pressures. Possible conflicts among public use demands, maintenance of quality outdoor experiences for users, maintenance of biological integrity of these areas, and the biological needs of the Florida panther have created a complicated management dilemma.

Given the high priority for recovery of the Florida panther, natural history information, including movements, social organization and habitat use, is essential for developing plans to prevent the extinction of this endangered subspecies. Information of this kind will be useful in evaluating the effects of significant changes in land use patterns and will serve as a basis for evaluating the success of reintroductions of panthers in currently unoccupied areas.

Detailed natural history data over a wide and diversified area are essential to determine the ability of the panther to adapt to changing and highly altered environments. These data will be valuable tools in efforts to identify and evaluate panther habitat and the factors that affect its quality for purposes of habitat protection.

Further, the identification of essential components of panther habitat such as day use sites, den cover, travel pathways, and foraging grounds will be helpful in improving conditions on occupied lands and on potential release sites.

Wildlife biologists initiated a simulation model last year for panthers in south Florida. A simulation model is a mathematical abstraction of the demography of a population. Given enough information, such a model can be useful in predicting

population responses to planned or potential management actions in panther-inhabited areas.

GFC panther capture activities in southwest Florida during 1987 resulted in the recapture of two adult females and instrumentation of four new cats, including a juvenile female kitten, an adult female and two adult males. One of the males captured (Panther No. 20) weighed 148 pounds. This is the largest Florida panther on record.

Monitoring of the instrumented panthers revealed detailed information about the cats' movement patterns and the sizes of their home ranges.

During field searches for possible kills made by radio-collared panthers, other information concerning behavior was collected. In particular, 37 sites representing panther day beds were found and described. These areas usually occurred in dense vegetation providing considerable vertical as well as horizontal cover. The bed itself usually consisted of a one-and-a-half by one-meter patch raked bare of litter, and they often contained shed panther hairs and occasionally live ticks probably removed during grooming. These heavily shaded locations probably are advantageous for regulating body temperature as well as for security.

Observations of activity patterns indicated activity peaks generally revolve around dawn and dusk with minimal activity occurring during daylight, especially around noon. The consistently lowest activity rates were recorded between one hour after sunrise and two hours before sunset. A small activity peak occurred in mid-afternoon. Activities were invariably high between sunset and four hours after sunset. From this time until one hour after sunrise, activity rates were highly variable and may be related to hunting success—an early retirement may reflect a successful kill. It should be pointed out that causes for the patterns observed are unknown but they may be response to temperature and/or prey behavior.

A preliminary population model was developed and has been useful in demonstrating the importance of litter size, mortality, and recruitment parameters in the equation. Continued refinement of the model is necessary to produce a useful tool for panther management. At least one important additional consideration is an area component that would reflect land use trends in south Florida.



Florida panther

## No. 13 continued from page 1

with a radio collar. At the time, the 126-pound animal ruled a territory of approximately 300 square-miles in southern Hendry County.

Scientists conducted a necropsy on the animal, but the results may take weeks to evaluate.

The only other known panther death to take place during 1987 was a 2-year-old male, which apparently died in a territorial dispute with a larger panther in the northern Fakahatchee Strand on Jan. 23. However, a large male, Panther No. 20, was injured when struck by a vehicle on Collier County Road 858 on June 17. The Commission's panther recovery team rushed that animal to the Miami Metrozoo for treatment before returning him to the wild.

The main cause of death for Florida panthers in south Florida since 1978 has been traffic accidents. Of 21 known panther deaths to take place

since 1978, 11 were caused by motor vehicles; three were killed by other panthers; one died of a reaction to a tranquilizing drug administered by scientists; five died from gunshot wounds and one died from unknown causes.

Officials are considering a plan to reduce traffic hazards for panthers. The plan is to be proposed to the Florida Panther Interagency Committee—a coalition of state and federal agencies involved in panther recovery efforts.

The Florida panther, known to scientists as *Felis concolor coryi*, is one of the most endangered species in the world. The tawny brown cats are a subspecies of cougar that once ranged throughout Florida and other states east of the Mississippi River. Currently, Florida panthers occur only in Florida, and only a few dozen of the animals survive.

## Panther Plan continued from page 5

order to use and incorporate new data and information which have become available since the development of the original plan. Much of the new information is a direct result of ongoing studies by the Game and Fresh Water Fish Commission and the National Park Service. The revised plan also incorporates key comments and information received from the public and conservation organizations over the past several months.

The plan will serve as a blueprint for action by the four agencies which have pledged full involvement and cooperation in the effort to save the panther. It also will provide other

groups and individuals concerned about the plight of the panther opportunities to assist in the recovery effort. Specific actions deemed necessary in order to move toward the recovery objective of three viable, self-sustaining populations within the historic range are detailed in the plan's narrative section. The plan's implementation schedule provides information about each specific recovery task identified in the plan and includes projected costs, duration and responsibilities. Detailed actions to implement the recovery plan will be presented in participation schedules being developed by each agency.



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