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THE ROLE OF CAPTIVE BREEDING IN
THE RECOVERY OF THE FLORIDA PANTHER

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The Florida panther (Felis concolor coryi) is one of thirty subspecies of Felis concolor, called among other names, cougar, mountain lion, puma, catamount and painter, that is found from British Columbia, Canada to Patagonia in South America. The Florida panther subspecies originally ranged throughout the southeast United States. The Florida panther is a medium sized, relatively dark subspecies with a short and stiff hair coat. It is distinguished from other subspecies by its long limbs, small feet and unique skull characteristics (Cory, 1896). Recently, because of inbreeding, kinked tails and cowlicks are found in most panthers.

The Florida panther has lived in the southeast for close to one million years (Eisenberg, 1985). Only fifty years after it was recognized as a unique subspecies, the panther was driven close to extinction by European settlement practices. The panther was given protected status in 1958 and listed as an endangered species in 1967. It is now one of the most endangered animals in the world. The survival of the panther now depends on a captive breeding program to preserve its genetic diversity and expand its numbers. As is most often the case, captive breeding is called on as a last resort to save a species. This paper will take a look at how we got where we are and where we need to concentrate as a conservation community if we are to help save the panther from extinction.

In 1976 research and surveys defined the population of the Florida panther as numbering between 30 - 50 animals, living only in Florida, south of Lake Okeechobee (Belden, 1978). The population has stabilized over the last few years at the same number of animals. Presently, 18-20 animals are being radio monitored as part of ongoing investigations. Estimates from telemetry data indicate that occupied panther range in south Florida totals 2.2 million acres, 55% of which is in state or federal ownership. Land acquisition programs underway will bring public land ownership to approximately 68% (Jordan, 1991). With the accelerated changes occurring in south Florida this is not enough land or enough animals to maintain a sustainable population of panthers.

The Florida Panther Recovery Plan was revised in June, 1987 with a stated objective "to achieve 3 viable self-sustaining populations within the historical range of the animal". Section 32 of the Recovery Plan directs the Fish and Wildlife Service to "determine the feasibility of using captive-bred offspring in the

re-establishment or supplementation of the Florida panther population" (U.S. Fish & Wildlife, 1987).

White Oak Conservation Center became involved in the recovery of the Florida panther when we offered our services to maintain injured panthers. After entering into a contractual arrangement with the Florida Game and Freshwater Fish Commission, facilities were built to house panthers. In June of 1986 a non-releasable male panther "Big Guy" moved into a two and a half acre facility at White Oak. He was maintained in natural enclosures and exposed to several Texas cougar (Felis concolor stanleyana) females. Unfortunately "Big Guy" suffered from another in-bred characteristics of Florida panthers that is high concentrations of abnormal sperm - over 90% - and never sired offspring (Roelke, 1989). "Big Guy" is now part of on-going research into different artificial reproductive technologies for use in producing Florida panthers.

We continued to work with injured panthers, but our role in the Recovery Plan continued as a minor one as various agencies debated the direction to take in saving the panther. As more and more data surfaced it became clear that the recovery of the panther was impossible without some kind of intervention to preserve genetic diversity and greatly increase the number of animals. Alone, genetic and demographic profiles of a dying species, predicting extinction in 25 - 40 years (Seal, 1989), were not enough to cause agencies to act. But additional persuasive data dealing with environmental, socio-economic and biological concerns, such as increasing human presence in south Florida, increased vehicle related deaths, toxic chemical poisoning, disease, poor prey base, and habitat loss finally convinced the major governmental agencies involved to recommend the establishment of a captive population of panthers.

In December 1990 a final assessment to issue permits to capture select Florida panthers for a captive population was issued by the Fish and Wildlife Service. Four zoological institutions from Florida offered their services in managing the captive population. An SSP was formed and developed a Florida Panther Captive Management and Health Protocol which was included as an enclosure with the assessment.

The stated purposes to establish a captive population were 1) to provide immediate security against the extinction of the Florida panther, 2) to maintain and preserve existing Florida panther genetic variability and viability, and 3) to provide opportunities to greatly expand the Florida panther population in the wild in terms of numbers of animals and the number of self-sustaining populations (Jordan, 1990).

This proposal was approved and permits issued to take Florida panther young and adults from the wild beginning in late January 1991. Just days before the permits went into effect the Fund for Animals, Inc. and Holly Jensen filed a law suit against the Fish and Wildlife Service to stop the capture and removal of

Florida panthers from the wild. The law suit was not a move against zoos, as some people assumed, but expressed a concern that additional data be gathered and other alternatives looked at before wild panthers were brought into captivity. It also called for the preparation of an environmental impact statement, which could have taken years to complete. Fortunately, an out-of-court settlement was reached on Feb. 6, 1991. The settlement called for the preparation of a supplement to the Final Environmental Assessment on the captive breeding proposal, that would look at other means of genetic enrichment for the panther in the wild and would discuss the implications of re-introducing captive born panthers into the wild.

Also, as part of the settlement, no adult cats could be taken and one year permits were issued for the removal of six kittens with the stipulation that they be held in conditions which would enable them to be re-released if necessary. It was further stipulated that the permits could only be issued to White Oak Plantation, not because we were not a zoo, but rather that we had the only facilities that could maintain these kittens in as wild a condition as possible in the event that it became necessary to return them to the wild.

Three male and three female kittens between 6 and 9 months of age arrived at White Oak between February and May of 1991. The panthers arrived individually and were quarantined and acclimated in special holding pens, completely isolated from human activity. The pens were planted with cover, providing hiding places for the cats and snow fence was used to prevent the cats from trying to go through the chain link and to prevent them from chewing on the wire. The cats were routinely monitored by a remote video system after their arrival at White Oak. Every effort was made to keep exposure to people to a minimum. The pens were entered only when video review showed the cats to be hiding out of sight.

The panthers settled down very quickly and were on prepared diets within 2 - 3 weeks after arrival. Coming from the wild, the kittens were stressed and heavily infected with parasites. Medical procedures, as called for in the management protocol, were performed over the first year. One kitten suffers from a serious, congenital heart defect and was moved to the Florida Game and Freshwater Fish Commissions research station in Gainesville to be close to the Veterinary School at the University of Florida for possible emergency treatment. Two unrelated pairs are now set up at White Oak in 3/4 acre pens. We are holding the third male while we await another female, then plans will be made to move that pair to another zoological facility in Florida.

After the supplement was completed in November of 1991 and captive breeding was again recommended as the only recourse to save the Florida panther from extinction, new permits were applied for. Another law suit was threatened, but was averted through an arrangement between the Fund for Animals and the Fish and Wildlife Service, that calls for the taking of only kittens

and for a third party review of the captive breeding program. The Florida Panther Technical Advisory Council, established by the government of Florida in 1983 to advise the Game Commission on the technical issues involving the Florida panther, was re-instated to perform this function.

With the issuance of six more permits for 1992, the one year permits for the kittens already in captivity lost their restrictions.

Kittens from females with the most important genetic backgrounds were targeted for removal in 1992, but so far two females have stayed on private lands, inaccessible to the capture team. One male kitten of important genetic stock was captured and brought to White Oak early in March of 1992. He is now settling in well. The remaining kittens to be removed from the wild in 1992 will be neonates and are scheduled to go to the Jacksonville Zoo and Lowry Park Zoo. These cats will remain in captivity as breeders and need not be kept in a wild state.

Parallel to our work with the Florida panther we have been working with Texas cougars in a surrogate program. An integral part of this program is to work with Texas cougars in the same way as we would with Florida panthers. For that reason wild caught cougars are being used to develop protocols for breeding, conditioning and returning panthers to the wild. Two female cougars were bred naturally and produced litters in 1991. The mothers and young were moved into a 15 acre conditioning pen and the young are now being conditioned for release. These experienced females should make excellent recipients of Florida panther embryos if IVF becomes a feasible alternative in the next few years.

The most critical part of this approach to recover the Florida panther is re-introduction. All of this work will be in vain if we cannot put animals back into the wild and have them function as an integral part of the ecosystem they evolved in. Extensive research has defined the best sites that are capable of supporting a population of panthers. A comprehensive site evaluation was undertaken in 1987. Many distinct variables that combine to constitute the suitability of any given area for panther habitation were looked at; first, biological factors such as, size of area, prey density, water, and cover, and secondly, human factors, such as, population density, road density, land ownership, livestock operations, types of human activity, and human attitudes towards predators. Areas of Florida were rated on the basis of a formula representing these factors and what field data has revealed that panthers require. The top four sites were Appalachian National Forest, Osceola National Forest / Okefenokee National Wildlife Refuge, Kissimmee Valley / St. John's River headwaters area, and the Big Bend coast (Belden, 1987).

Experimental re-introductions involving western cougars to study a wild to wild release were initiated in 1988. The Osceo-

la/Okefenokee complex was chosen as the initial release site. The release area represents a combination of public and private lands that covers 7,702 square miles (Belden et al, 1990). Five adult Texas cougars (2.3) were captured in west Texas, sterilized, then released after a 30 day quarantine period. The release site was on Gilman Paper Company land and as with this and all future releases, cooperation and support from the private sector is essential for any hope of success.

During the year of this study two animals were lost to illegal hunting and one to unknown causes. Despite these problems it was encouraging that the cougars appeared to adapt to the reintroduction site, developed patterns considered typical of cougars elsewhere and were able to find prey and cover to support their predatory lifestyle.

Public attitude was generally very supportive but the uncontrollable actions of a few desperate people indicate how difficult successfully re-introducing panthers will be. Future releases will need to address the problem of how to control or punish deliberate attempts to undermine the release process.

As we produce more kittens in our surrogate program at White Oak, we plan to work with Florida Game and Freshwater Fish Commission on the release of captive produced cougars sometime in 1993. Again the Osceola/Okefenokee complex will be tested. If all goes in the right direction we could have Florida panthers ready for release in 1995.

Conditioning young captive born animals for release will be a most difficult task. Letting wild caught females raise their young on natural prey in large areas offers, I think, the best chance for success. At this time we have two litters of Texas cougars being raised by their mothers in a 15 acre pen. Food such as deer, rabbit and quail are provided several times a week. Experience has shown that the prey species that a cat is raised on will become their preferred diet when they mature (Bogue, 1976). Our first experimental release with the Texas cougar offspring will help us to evaluate this approach. Other categories of captive cats that are potential release animals are orphans and young produced by tame mothers.

At White Oak Conservation Center we were successful in conditioning a six month old orphan female panther for re-release back to the wild. Orphan Annie came to us in August of 1987 from the Everglades. She began her conditioning on a diet of rabbits in a 3/4 acre pen, then she was moved into a 15 acre conditioning pen where she worked her way up to killing half grown deer before her release back into the Everglades in May of 1988. She survived in the wild for six months but had to be recaptured in November of 1988 after she was stranded on an island during very high water in the Everglades. She was returned to White Oak and was put back into the conditioning program. She was released again in February of 1989 and has since moved out of the Everglades into Big Cypress Reserve. Today she is one of the desig-

the designated females from which neonates will be collected this spring for the captive population.

We do not know how difficult it will be to condition, for release, the young from hand raised, tame females. Eventually, we will likely find that there will be a need to introduce offspring from tame females being used for captive propagation and artificial reproduction research. It is unlikely that these cats can be released into areas where hunting is permitted or where people have free access. Everglades National Park with its strict control of human activities will be the best release site for these cats, once the mercury problem has been addressed.

We have been working with Dr. David Wildt and his team of reproductive specialists from the National Zoo on developing criteria for successful artificial insemination of the Florida panther (Wildt, 1991). White Oak has also been sponsoring Dr. Melody Roelke to coordinate this research in Florida. The reproductive team has already achieved one successful cougar birth by artificial insemination at Octagon Wildlife Sanctuary in March. The work continues with cougars, with more trials scheduled for cats at White Oak this spring. When the necessary permits are issued by the Fish and Wildlife Service, we will be applying these techniques on captive Florida panthers.

This complex species survival strategy emerging from field investigations, population viability analysis, genetic and reproductive research will require the development of a large captive population of 130 breeding individuals by the year 2,000 and 500 by the year 2010 (Seal, 1989). These are incredible numbers and probably unattainable in the present state of resources available in the wild and in Florida's zoological community. A combination of advanced reproductive technologies and a sizeable number of captive Florida panthers and suitable surrogates will be the only way that the necessary numbers can be reached.

To provide the opportunities for intensive management that will be the basis of their recovery and survival, many facilities will be needed to hold, breed, artificially reproduce, condition and release Florida panthers. Zoos need to be extremely vigilant in providing the best situation for panthers from the wild if we are to be on equal footing with all parties involved in the recovery of the Florida panther. Institutions should prepare for the great responsibility in dealing with wild caught panthers and the emotions which they evoke in people.

The survival of the wild populations of Florida panther will only be possible by genetic transfusions from a well managed captive population. This conservation strategy will have to be practiced indefinitely and must become part of the maintenance of Florida's ecosystems. The panther in Florida will need a system of perpetual care. Providing that care is a challenge we must meet together if the panther is to survive at all.

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