

DRAFT ENVIRONMENTAL ASSESSMENT
A PROPOSAL TO ISSUE ENDANGERED SPECIES PERMITS
TO CAPTURE SELECT FLORIDA PANTHERS (Felis concolor coryi)
FOR THE ESTABLISHMENT OF A CAPTIVE POPULATION

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I. PURPOSE OF AND NEED FOR ACTION

A. **Purpose** - The purpose of the proposed activity is to immediately provide additional security against extinction of the Florida panther and to maintain genetic viability of the wild population. This action is considered essential to the long-term survival and recovery of the species.

B. **Need** - The Florida panther (*Felis concolor coryi*) represents one of this Nation's most critically endangered animals, consisting of a single population of approximately 30-50 animals. Genetic variability within this population is limited and inbreeding has been documented. Existing conditions, coupled with the application of sound population biology and genetic principles, indicate that the Florida panther could never be biologically secure under the current single population situation. Consequently, the Florida panther is threatened with both rapid and gradual extinction through catastrophic loss (e.g., disease outbreak) and continual genetic erosion, respectively.

This Environmental Assessment (Assessment) considers the biological, environmental, and socioeconomic effects of issuing endangered species permits for the removal of a minimum number of select Florida panthers from the wild for the establishment of a captive population. The Assessment also provides an analysis of various alternatives to the proposed action.

C. **Location** - The only known population center remaining for the Florida panther occurs south of Lake Okeechobee, in and around the south Florida Counties of Collier, Dade, Hendry, and Monroe (Figure 1). The periphery of the population may extend into Broward, Glades, Highlands, Lee, and Palm Beach Counties. The Big Cypress Swamp/Everglades physiographic region occupies much of this area.

D. **Background** - The Florida panther historically ranged from eastern Texas or western Louisiana eastward across Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, and parts of Tennessee and South Carolina. The Florida panther has been virtually eliminated from its entire former range. This was initially due to persecution in the form of shooting and trapping, which started with this country's early settlers. Later, habitat destruction further exacerbated the panther's decline. The only remaining population is found in the Big Cypress Swamp/Everglades region of south Florida.

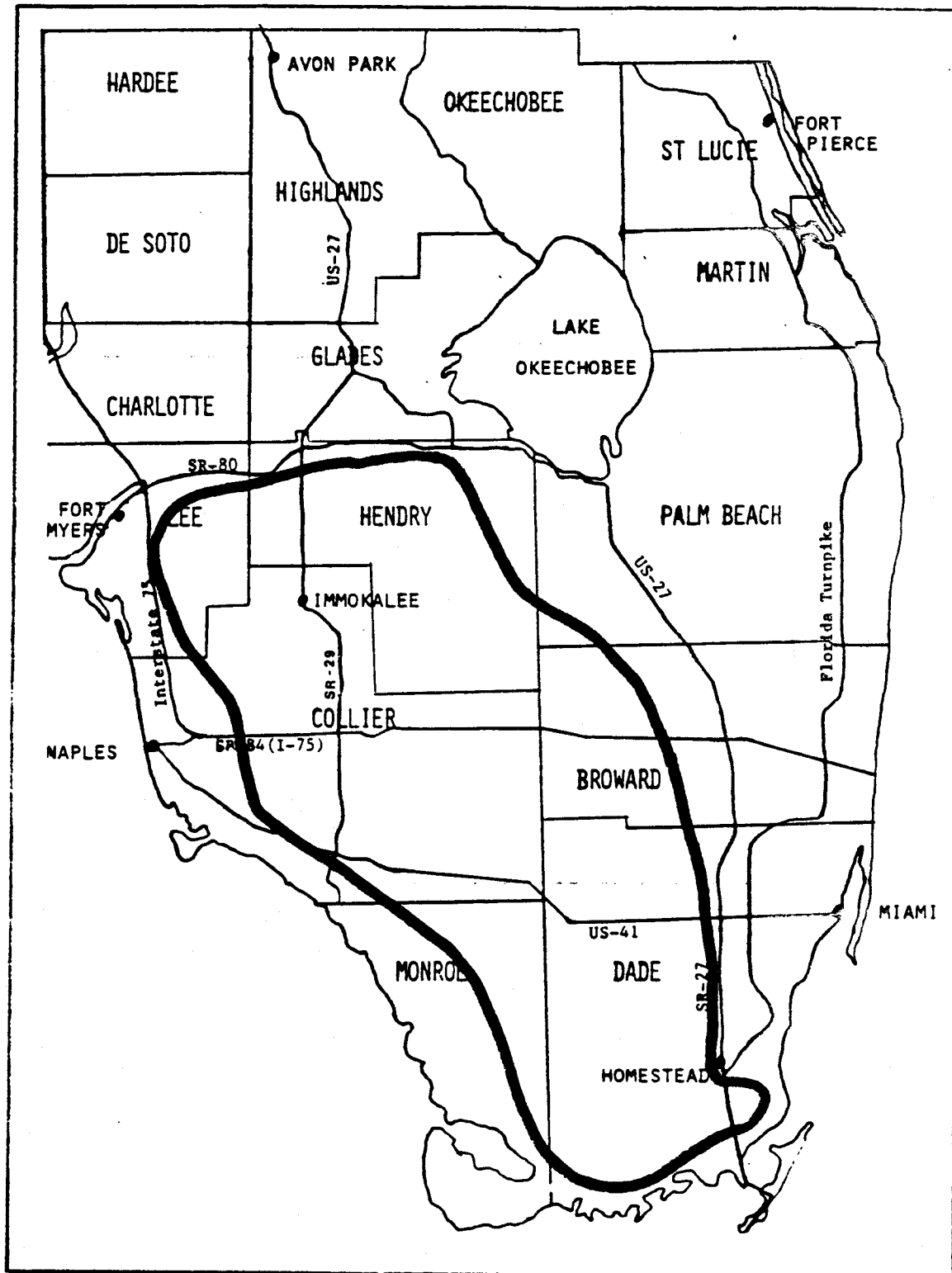


Figure 1. The only known population center for the Florida panther occurs south of Lake Okeechobee, in and around the south Florida Counties of Collier, Dade, Hendry and Monroe.

The Florida panther first received Federal protection in 1973, when classified as endangered under the provisions of the Endangered Species Act. In 1976, the U.S. Fish and Wildlife Service (Service) appointed a Recovery Team to prepare and assist in coordinating the implementation of a recovery plan. This initial plan was approved by the Service in 1981. Concurrently, the Florida Game and Fresh Water Fish Commission (Commission) initiated several important baseline studies identified as high priority needs in the recovery plan. Until preliminary data from these studies became available, practically nothing was known about the Florida panther. Now, considerable information exists concerning the panther's status, food habits and prey resources, reproduction, population size, density and distribution, health, genetics, mortality, habitat requirements, and habitat status.

The Florida Panther Interagency Committee (Committee) was formed in 1986 to provide for a coordinated, cooperative, and unified recovery program. The Committee, comprised of the U.S. Fish and Wildlife Service, National Park Service, Florida Game and Fresh Water Fish Commission, and Florida Department of Natural Resources, directed the revision of the original recovery plan. The revised plan subsequently received Service approval in 1987 (U.S. Fish and Wildlife Service 1987). Agencies comprising the Committee are assigned primary responsibility for implementation of most recovery plan tasks.

The recovery emphasis to date, has primarily focused on gathering biological data on the panther, developing information on panther needs and associated problems, and improving and preserving habitat. These extremely important actions are scheduled to continue and many will be expanded. The Committee has committed its combined authorities and resources to fully protect and enhance the existing wild population. Indeed, the recovery plan states, "the long-term goal of the Florida Panther Interagency Committee is to restore the panther to non-endangered status in the wild. . . ." However, because of the multitude of risk factors presently associated with the Florida panther, the Committee has concluded that the single population situation can never be biologically secure. Low numbers and the single population situation makes the panther extremely vulnerable to extinction through either a catastrophic event (e.g., disease outbreak) or insidious genetic deterioration (e.g., inbreeding). Information and data presented and/or developed during a Population Viability Analysis Workshop in January 1989, and a Species Survival Planning Workshop in October/November 1989, indicated that under existing conditions the present panther population is losing genetic diversity at a rate of

3-7 percent per generation and extinction would be probable in 25-40 years. Documented inbreeding conditions can only compound existing genetic and viability problems. Thus, the Committee has determined that a captive population is essential to any successful survival and recovery program for the panther. Further details on the viability analysis and species survival planning process; results, conclusions, and recommendations, can be found in the Florida Panther Viability Analysis and Species Survival Plan (Survival Plan) (Seal and Lacy 1989).

E. Scoping - Scoping for this Assessment included a Notice of Intent to prepare an Environmental Assessment on the proposed action published in the Federal Register, February 15, 1990. The Notice requested comments and information from other agencies and the public on the scope of issues to be addressed in this Environmental Assessment. Over 300 comments have been received and are summarized in Enclosure A along with the Service's response to each major issue. In addition, copies of the Notice along with the Executive Summary and Recommendations section from the Survival Plan were provided to over 300 agencies, organizations and individuals. Save the Florida Panther, Inc. held Public Forums on the issue of establishing a captive population on February 28, 1990, in Tampa, Florida, and March 1, 1990, in Ft. Lauderdale, Florida.

II. THE ALTERNATIVES

A. Alternative 1 - The "status quo" Alternative -- Under this alternative, the Committee would rely on existing and ongoing programs in an effort to buffer genetic erosion and provide security against extinction. No endangered species permits would be issued by the Service for the capture of Florida panthers to establish a captive population.

B. Alternative 2 - Translocation/Reintroduction -- Under this alternative select panthers would be translocated within the existing population in an effort to improve overall genetic conditions. Panthers from the existing population would also be translocated to candidate reintroduction sites within the species' historical range as part of population expansion programs.

C. Alternative 3 - (Preferred Alternative) Use Kittens and Select Adults For Establishing A Captive Population -- This alternative would emphasize the use of kittens for the establishment of a captive population. Select kittens from the wild population would be utilized to achieve genetic

representation to the extent possible. Select adult animals would be used to fill genetic gaps. The utilization of kittens could involve the removal of complete litters or portions of litters. This alternative would generally follow the concept and framework as presented in the Survival Plan.

D. Alternative 4 - Use Only Kittens for Establishing A Captive Population -- Under this alternative only kittens would be used for the establishment of a captive population. Select kittens from the wild population would be utilized to achieve genetic representation to the extent possible. The utilization of kittens could involve the removal of complete litters or portions of litters.

E. Alternative 5 - Use Only Older Animals for Establishing A Captive Population -- This alternative would use only older animals (adults/subadults) for the establishment of a captive population. Select older animals would be utilized to achieve complete genetic representation of the wild population.

F. Alternative 6 - Use All Panthers for Establishing A Captive Population -- Under this alternative an attempt would be made to capture all panthers from the wild and place them in captivity.

III. DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section presents a general description of the environment that could be affected by the alternatives presented. Included are discussions of the physical, biological, social, and economic components of the environment.

A. Physical and Biological Impacts - As previously indicated, the only known population center remaining for the Florida panther occurs in and around the south Florida Counties of Collier, Dade, Hendry, and Monroe (Figure 1). The Big Cypress Swamp/Everglades physiographic region occupies much of this area. Water is a principal natural resource of this Region. Because of the relatively flat limestone underlain topography, 75-90 percent of the area may be flooded during the wet season. These conditions typically last for several months and have played a major role in the relatively undeveloped status of much of the Region. Extensive sawgrass flats, prairies and marshes, forested swamps, shallow sloughs and upland hammocks and ridges characterize the Region. Public lands comprise possibly half of the known panther habitats in this Region. Detailed descriptions of the physical and biological environments of the

area, including the climate, geology, soils, mineral resources, hydrology, vegetation and wildlife are found in Craighead (1971) and Duever et. al. (1986).

B. Socioeconomic Impacts - Clean air, a subtropical climate, and diverse recreational opportunities make the south Florida area extremely desirable to tourists, retirees, and year-round residents. The extensive natural resources of the area have been widely advertised and marketed resulting in phenomenal growth, especially along the coasts. Rapid growth and lack of environmental safeguards prior to 1970 resulted in the loss or significant alteration of many thousand acres of productive wetlands and upland habitats. Canal dredging, wetlands drainage, and fire have markedly reduced viable interior wetlands in south Florida. This alteration of beneficial wetlands preceded the major growth era with unmanaged growth further affecting water quality, water storage capacity, and the diversity and abundance of wildlife in the area. The entire Region's economy is heavily dependent upon the tourist industry, which has contributed to the rapid growth of the area. Agriculture, another important industry in this Region, adds a certain amount of diversification and stability to the economy (U.S. Fish and Wildlife Service 1985).

Extensive public lands are found in the panther's habitat region. Public lands of primary importance include the Big Cypress National Preserve, Everglades National Park, Fakahatchee Strand State Preserve, Florida Panther National Wildlife Refuge, and Water Conservation Area 3A. Occupied panther range in south Florida totals approximately 2.2 million acres. Of this, approximately 1.2 million acres are in public ownership in Broward, Collier, Dade, Monroe and Palm Beach Counties. Nearly all panther range in Glades, Hendry, and Highlands Counties is privately owned (Maehr 1990). Public lands are managed for varying degrees of resource conservation and recreation. Land use in the Region's private sector is characterized by increasing urban development and an expanding, more intensively managed agribusiness.

IV. ENVIRONMENTAL CONSEQUENCES

This section discusses the impacts of the alternatives on the biological and socioeconomic components of the area.

A. Alternative 1 - No Action. Under this alternative emphasis would continue to be placed on utilizing authorities and resources available to the Committee to protect and enhance the existing wild population. Habitat enhancement and preservation along with actions to address various risks factors affecting the panther would continue to receive high priority action in order to make the population as secure as possible.

1. *Biological Impacts* -- Inbreeding within a single, small population cannot be controlled under this alternative and there is no feasible way to provide protection to existing genetic viability under these conditions. Additionally, security against extinction from man-caused or natural catastrophic events can only be provided with a significantly larger total population or from additional populations. Physical and biological limitations (habitat availability and inherent density-limiting factors) restrict opportunities for significant growth or expansion within the present population. Under the existing single population situation, the Survival Plan projects that the panther will be extinct in 25-40 years due to genetic and demographic factors. Immediate extinction due to a catastrophic event (e.g., disease outbreak) could occur at any time.

Existing predator/prey relationships within the ecosystem would be affected under the projected panther population decline scenario. This relationship would be significantly disrupted with the panther's total disappearance from the ecosystem. The ability to maintain and preserve various portions of the unique Big Cypress Swamp/Everglades ecosystem would be lessened as the panther population declined.

This alternative does not have the capabilities of providing security against extinction or genetic maintenance and is therefore rejected as a feasible course of action.

2. *Socioeconomic Impacts* -- The Survival Plan's projected extinction of the panther in the next 25 to 40-years or sooner under the no action alternative would obviously have serious impacts to the quality of the human environment in the minds of many groups and individuals. Without panthers in the south Florida Big Cypress Swamp/Everglades ecosystem, developmental pressure would be expected to increase significantly. Thus, threats to the integrity of this unique ecosystem would be expected to accelerate. The Florida Panther National Wildlife Refuge could no longer serve its intended function.

B. Alternative 2 - Translocations/Reintroductions.

1. *Biological Impacts* -- Translocating individual animals within or between populations is considered a possible tool in addressing inbreeding problems. However, its application and potential for success are unproven at the present time. Possible mortality during and after translocation would not only result in the loss of individual animals but could result in the loss of unique genetic material. Impacts from translocation actions on the social organization and population structure would be expected to exceed those resulting from removing animals for a captive population. Translocations would not provide opportunities for the same degree of genetic management or offer the same potential level of success in terms of genetic viability protection as would captive propagation.

Security against extinction can basically be provided only through a significantly larger total population or from additional populations. Successfully establishing additional wild populations via translocations could provide a level of security from extinction. However, based on the results of preliminary population reestablishment programs, a minimum of 10-20 subadult/adult animals would be needed at one time at one time for each reintroduction effort (Belden et. al. 1989). The removal of animals in these numbers for such a program and under existing wild population levels, would likely result in significant, irreversible adverse impacts on the source population (upset social organization and population dynamics) and would compromise the sustainability of the wild population. Population reestablishment programs via translocations would require a significantly larger source population than is presently available, which because of physical and biological limiting factors identified under Alternative 1, is not considered feasible. Even if significant population growth was achievable, it would be expected to take decades. The panther could easily become extinct within such a timeframe.

Translocating panthers within the wild population for genetic and demographic management purposes could possibly extend extinction timeframes associated with these factors to some degree. However, it would not provide any added security against the more rapid extinction-causing factors such as the outbreak of a deadly disease. Additionally, because of the numbers of animals deemed necessary for population reestablishment programs, translocating animals for this purpose would likely significantly accelerate the time to extinction for the

source wild population. This alternative does not provide the capabilities for achievement of the stated purpose, and is therefore, rejected as a feasible course of action.

2. *Socioeconomic Impacts* -- Translocations within the existing population for genetic management purposes could provide for at least short-term persistence of the wild population resulting in continued habitat protection efforts. The value of the panther's presence as a component of the ecosystem would be at least temporarily maintained. However, as indicated above, this alternative does not appear capable of providing for the long-term survival of the panther. Associated socioeconomic impacts of the panther's eventual disappearance from the ecosystem as described under Alternative 1 would apply equally to this alternative.

C. *Alternative 3 - Use Kittens and Select Adults (Preferred Alternative).*

Under this alternative a captive population would be incrementally established over a 3-6 year period. Up to six kittens (new-born through 12 months of age) could be used per year. The use of older animals would be limited to four the first year and one pair per year for following years. This level of removal would fall within the expected natural replacement capabilities of the wild population.

1. *Biological Impacts* -- The establishment of a captive population as proposed would, like any additional population whether captive or wild, provide security against extinction. However, in comparison to capabilities in the wild, captive propagation would provide a much greater opportunity and ability to achieve significant, rapid increases in the overall panther population. This would provide security from extinction in the shortest amount of time and would also provide resources for population expansion through reestablishment programs.

This alternative would result in the establishment of a captive population comprised of complete representation of available genetic material existing in the wild population. This would provide maximum flexibility and opportunities for preserving and improving overall genetic fitness through the application of captive propagation techniques. Under this alternative, protection of existing genetic material could be achieved in 6 years or less with minimal impacts on the wild population. Based on existing population data (present reproduction and recruitment levels, documented recycling mechanisms and mortality) the wild population appears capable of sustaining itself through the proposed removal

regime. Studies of free-ranging African lions and captive cheetahs and cougars have shown that the removal or loss of complete litters shortly after birth typically triggers a reproductive recycling mechanism in the mother. This generally results in rebreeding within 6-12 weeks and the production of a second litter. This natural recycling process has been documented on several occasions within the existing wild Florida panther population (M. Roelke, pers. comm. 1990). Removing only a portion of a litter typically would enhance the survival probabilities of remaining siblings. Kitten removal would not be expected to result in impacts to the social organization or structure of the existing wild population.

The removal of older animals to fill genetic gaps or augment the reproductive effort would be expected for the most part to consist of presently non-reproducing adults. Changes in the social organization and population structure resulting from the removal of these animals would be expected to have minimal impacts on the overall wild population and its ability to sustain itself would not be compromised. If there is evidence that the social organization and population structure are being adversely affected, removal of both kittens and adult animals will be suspended, and resumed only after careful analysis of the situation indicates that the self-sustaining capability of the wild population is not being compromised.

This alternative provides the capabilities for complete achievement of the stated purpose for the proposed program.

2. *Socioeconomic Impacts* -- Perpetuation of the wild population obviously would have impacts on the quality of human environment. Development pressure would be discouraged and habitat protection efforts would continue. Maintaining the panther as a viable component of this unique ecosystem would rank as an extremely important priority in the views of many residents across Florida and the Nation.

Any added attractiveness of the Region to recreational visitors because of the panther's presence in the ecosystem would be continued. A captive population may also result in indirect social impacts through increased educational opportunities (e.g., interpretative displays, seminars, etc.) at participating facilities. The investment for establishing a captive population would not be expected to drain funds from present and ongoing recovery efforts. Animal captures would be part of ongoing capturing and monitoring activities of the telemetry program. Participating institutions would bear the primary cost of the captive

program. It is estimated that these institutions would contribute approximately \$1,000,000 in facilities and \$500,000 per year in operating costs.

Projected long-term needs of the program may include further reproductive technology and genetic studies, and the construction of pre-release conditioning facilities for animals scheduled for release into the wild. Costs of these projects would likely be borne either by participating/contributing organizations and/or the four Interagency Committee agencies.

D. Alternative 4 - Use Kittens Only. Under this alternative up to six kittens per year would be used in obtaining available genetic representation within a 3-6 year establishment period for the captive population.

1. *Biological Impacts* - This alternative would provide security against immediate extinction. However, it would not assure the protection of all genetic material, as non-reproducing wild panthers (some of which may be important genetic founders) could not be represented in the captive population. Additionally, there would be no experienced animals (e.g., adults) in the captive population to pass along learned/taught survival skills, should this prove important in the survival capabilities of captive raised animals used in reintroduction programs.

This alternative provides the capabilities for only partial achievement of the stated purpose.

2. *Socioeconomic Impacts* - Same as Alternative C.

E. Alternative 5 - Use Older Animals Only. Under this alternative the number of adult animals removed per year would likely be between three and five. This represents the approximate number needed to achieve full genetic representation of the wild population's estimated 15-25 founder animals within the specified 3-6 year establishment period for the captive population.

1. *Biological Impacts* -- Under this alternative, complete genetic representation could be secured rapidly. However, in order to achieve complete genetic representation for the captive population 15-25 older animals would have to be taken from the present wild population. This could result in the removal of up to 50-75 percent of the present wild breeding population. Such action would result in significant,

unacceptable impacts (e.g., disrupt social organization and population dynamics) to the wild population and would compromise the wild population's ability to sustain its present level. Removing a significant portion of the population as required under this alternative could upset the ecological balance of the system favoring prey proliferation.

This alternative would result in significant population impacts completely contrary to the panther's recovery plan of preserving and enhancing the wild population and is thus rejected as a feasible course of action.

2. *Socioeconomic Impacts* -- The use of only older animals for the captive breeding program may be more distasteful to the public, as it may be perceived as more harmful to the overall wild panther population. Additionally, if the social organization and population structure of the wild population disintegrates, then the potential exists for developmental pressure to intensify in habitats vacated by panthers.

F. *Alternative 6- Utilize All Panthers.* It is expected that the majority of the animals in the wild population could be captured within a 2 year period.

1. *Biological Impacts* -- Under this alternative, genetic diversity can be maintained (e.g., the remaining founders would be protected), and a level of security against extinction provided. However, this alternative is totally unacceptable because it completely counters the primary goal of the species' recovery plan, which is to preserve and enhance the wild population.

2. *Socioeconomic Impacts* -- The removal of all panthers from the wild would have serious impacts on the quality of the human environment. Protection of existing habitat would be virtually impossible. The Florida Everglades/Big Cypress Region could be viewed as no longer representing a complete ecosystem.

V. FOR FURTHER INFORMATION CONTACT:

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* Copies available through the Fish and Wildlife Reference Service, 5430 Grosvenor Lane, Suite 110, Bethesda, MD 20814, 1(800)582-3421.

ENCLOSURE A

This section attempts to answer specific questions and alleviate major concerns raised in regards to the Fish and Wildlife Service's announced intentions to prepare an Environmental Assessment on the proposed establishment of a captive Florida panther population. It also provides insight into the decision-making process regarding the proposed action. In addition, three public meetings to provide further information on the proposed program are scheduled during the public comment period.

I. INTRODUCTION

The Service received comments from over 300 organizations and individuals on its intent to prepare an Environmental Assessment on the proposed issuance of endangered species permits for the establishment of a captive Florida panther (*Felis concolor coryi*) population. Seventeen conservation-oriented organizations provided comments. Remaining comments were from the general public. Over 30 elementary students provided comments and over 60 were from University of Florida students. Geographically, approximately 75 percent of the comments were from the Gainesville, Florida, area. The level of response from that particular area was likely a direct result of letters appearing in two local newspapers appealing to the public to write and voice their views. Comments from the Miami/Palm Beach and Tampa/St. Petersburg areas, representing the next largest areas of response, accounted for less than 10 percent each.

II. GENERAL VIEWS

Many excellent comments and recommendations were received. A significant number of the comments reflected many of the same feelings and concerns expressed by the Florida Panther Interagency Committee (Committee) and agency personnel who have been directly involved over the past year in the evaluation of the situation and the development of the basic concept and plan being proposed. Similar thought processes and rationales were clearly evident from both the public and the agencies overseeing the recovery of the Florida panther.

A majority of the comments received expressed concern over the proposal. Some were totally opposed to any consideration being given to a captive program regardless of the panther's situation. Some felt that a captive program was not needed to recover the panther. Others felt that a captive program may have its place, under specific circumstances. Still others felt that a captive program would in fact be necessary to ensure the long-term survival of the panther.

Despite the relative uniformity of concerns expressed, many of the comments received were based on misconceptions regarding the proposed captive program. This was reflected in comments such as:

COMMENT: All or most remaining panthers would be removed from the wild to establish the captive population.

RESPONSE: As planned, a captive population representative of existing genetic material from the wild population would be incrementally established over a 3-6 year period. Emphasis would be placed on using kittens (new-born through 12 months) in establishing a captive population, although very restricted use of older animals may be necessary to achieve complete genetic representation or fill a specific need within the captive population. The use of older animals would not exceed four individuals the first year and one pair per year for future years. Research has shown that through natural recycling processes females typically will replace removed or lost kittens very soon (e.g., in free-ranging African lions and captive cheetahs and cougars) and older animals are quickly replaced through natural reproduction and recruitment. The proposed removal regime falls within the expected natural replacement capabilities of the existing wild population. Under these conditions, the wild population undergoes minimal impacts.

COMMENT: If the habitat cannot support the present population, how will it be able to support the additional captive produced panthers? The reintroduction of captive produced panthers into the existing population may cause problems.

RESPONSE: Data indicate that the present wild population appears to have been relatively stable over the past few years. This suggests that at the present time habitat conditions are capable of supporting the present population. Reintroductions within the panther's historic range will play a critical role in the overall recovery program. However, except for the

possible application and occasional use of individual animals' for genetic enrichment or to address a specific demographic need, reintroductions are not planned within the existing population.

COMMENT: If panthers are removed from the wild population, the incentive for habitat preservation will be lost. Habitat will be lost during the panthers absence.

RESPONSE: This situation might be true if all or most of the panthers were to be removed from the wild population. However, as previously indicated the wild population is not expected to be affected in terms of the number of animals in the population or habitats utilized. The preservation of existing habitats will continue to receive high priority emphasis as stressed in the recovery plan.

COMMENT: The Species Survival Plan (Survival Plan) does not adequately address the primary threats to the panther like habitat loss/contamination, highway mortality/injury, hunting, off-road vehicle and other human related impacts, nor does it provide solutions to overcome these problems.

RESPONSE: It was not the intent nor purpose of the Survival Plan to address these issues. The Survival Plan was developed specifically to provide the guidance and direction for establishing and managing a captive population and detailing its role as one component of the overall recovery program. The approved Florida Panther Recovery Plan is the document that addresses the issues of threats and actions to overcome them and provides overall guidance for the total recovery program.

III. ADDRESS OTHER HIGH PRIORITY TASKS FIRST

A large percentage of those that commented felt that emphasis should be put into other programs to recover the species rather than initiate a captive breeding program. Many of these comments, as represented below, appeared to be based on a feeling or assumption that a program to establish a captive population; "represents a last ditch effort," "means the wild population is being written off," "means that no emphasis/less emphasis would be placed on maintaining and enhancing the wild population," "represents a sell-out to developers and the hunting lobby," "has an ultimate goal of eventual removal of the entire wild population." As previously indicated, the establishment of a captive population represents only one phase of a very active and comprehensive recovery program. A captive population would compliment

many recovery actions and programs presently underway or scheduled for future initiation. It should be understood that no single action or effort can lead to panther recovery. Any successful recovery program must include the simultaneous accomplishment of many interrelated actions and efforts.

IV. MAJOR ISSUES

A. General Information/Data

COMMENT: Additional efforts are needed to determine if panthers exist outside the Everglades/Big Cypress area.

RESPONSE: Comprehensive surveys have been underway for the last 14 years by the Florida Game and Fresh Water Fish Commission in an effort to locate additional panther populations. A similar 3-year effort is presently underway in Arkansas. The discovery of an additional panther population(s) would be invaluable to the recovery program.

The work in Florida has been hampered to some extent because of a lack of permitted access into some of the larger, more promising-looking areas. Efforts to gain access are continuing. Verified panther sign has been documented at a number of Florida sites outside the known population area over the past several years. Many of these sites are within or near the St. Johns River basin extending from northeastern Okeechobee County northward to southeastern Putnam County. However, to date sign has been scattered and not consistently found within any specific area. Emphasis on surveys and efforts to locate a possible population center are scheduled to continue.

COMMENT: Available data do not indicate a dwindling wild population. If recruitment is occurring, a captive breeding program is unnecessary and inexplicable.

RESPONSE: There is no question that range-wide panther populations have undergone significant declines from historic levels. There are no reliable figures for the south Florida population prior to the initiation of intensive population studies in the early 1980's. The significant loss of habitat in that area over the past 25-50 years would tend to support a position of a much reduced population. Existing information suggests that the population has likely stabilized over the past 5-10 years.

This is supported by recent mortality and reproduction data, which indicate that natural reproduction and recruitment is replacing or exceeding current losses within the population. During the period January 1987 - January 1990 (3 years), 14 panthers, 6 months of age or older, are known to have either been lost to various mortality causes (12) or been permanently removed from the wild because of severe injury or poor health. With an estimated average wild population of 40 (range of 30-50), over this period of time, such a loss would represent approximately 35 percent of the population. However, there have been no detected changes in apparent population levels during this same period.

Although reproduction and recruitment is occurring, and the wild population appears relatively stable, the present population is by no means secure. As indicated, a single, small population is extremely vulnerable to extinction from any variety of risk factors. Additionally, the ability of the current population to sustain itself through existing reproduction and recruitment supports the basis for the conclusion that the incremental removal of a small percentage of the population over a 3-6 year period would have minimal effects on the wild population. Biologically, it is clearly more appropriate to remove animals for the establishment of a captive population when the wild population can replace them through recruitment than to do so under a declining situation, which would result in significantly greater impacts to the wild population.

COMMENT: There is insufficient evidence to prove genetic erosion and inbreeding problems exist.

RESPONSE: Inbreeding within the population has been documented (e.g., panther No. 16 bred his mother, panther No. 12 bred his daughter). Several indicators suggest inbreeding and genetic loss has surfaced within the population. These include cryptorchidism (one testicle not properly descended), extremely high abnormal sperm counts with a predominance of primary defects, "kinked-tail" and "cowlick" traits, and the occurrence of a congenital heart defect. The Population Viability Analysis Workshop specifically addressed the present and future genetic integrity of this subspecies and concluded that extinction would be probable in 2-3 decades due to genetic erosion.

COMMENT: What are the expected consequences of the captive breeding program on genetic drift?

RESPONSE: Genetic drift occurs when a significant shift in or loss of genetic variants occurs from one generation to the next. This situation is more prevalent when inbreeding occurs. A captive population will enhance opportunities for selective propagation, which would minimize genetic drift by rapidly increasing the size of the captive population.

B. Habitat/Threats

COMMENT: By far the greatest number of comments received focused on the issues of habitat and associated threats. Many reflected the belief or opinion that adequate habitat preservation, accompanied with actions to eliminate or reduce existing human-related threats would in itself lead to recovery. In summary, many comments reflected a feeling that programs to secure, restore, and improve the quantity and quality of panther habitat should be expanded.

Specific recommended actions included:

- *designate Critical Habitat
- *use wildlife corridors
- *improve relations with private landowners and provide incentives to promote panther and habitat protection
- *devote more attention to land exchanges like the Arizona arrangement
- *all efforts to provide natural habitat should be totally exhausted before any thought of capture is put into action
- *habitat restoration plan needed & partially implemented prior to taking major portion of animals
- *emphasize habitat improvement & genetic enrichment prior to removal of no more than 10 percent of the known population
- *cumulative impact assessment needed
- *eliminate all grazing from panther habitat
- *address oil & gas problems
- *address habitat contamination
- *enhance/augment prey resources
- *regulate/eliminate human access to panther habitat
- *focus on road problems/close roads/divert problem roadways/re-evaluate current road system/redesign roads in panther habitat
- *install more/better crossings/fencing

- *reduce/enforce speed limits/use speed bumps
- *ban ORV's/eliminate ecologically destructive public uses in habitat
- *regulate/eliminate hunting in panther habitat/of panther food
- *remove hunting camps/other high impact inholdings within panther habitat
- *improve law enforcement

RESPONSE: The importance of habitat preservation and actions to prove the quantity and quality of panther habitat is equally shared by the Service, as well as the other agencies directly involved in the recovery program. It is fully recognized that the long-term survival of the panther is clearly dependent on the availability of adequate habitat. Indeed, the recovery plan states that, "If the habitat of the panther is not protected and managed, the panther will not survive." Within the last 2 years, actions have been taken which will ensure the preservation of almost 300,000 additional acres of panther habitat. This will result in public ownership of over 1.5 million acres of panther habitat in south Florida. Aggressive land acquisition will continue to be emphasized. However, land acquisition is extremely costly and can take many years to complete. In order to expand the preservation effort, a program is now under consideration that will focus on working directly with private landowners to preserve habitats. This innovative program utilizes all available techniques and options to obtain landowner participation and commitments for habitat preservation. Specific options for consideration will include cooperative agreements, leases, conservation easements, etc. Landowner incentives and compensations will be essential to achieve success.

Obviously, the quality of the habitat is equally important. Many actions designed to address risk factors and improve the overall habitat quality for panthers have already been taken. Examples include: (1) expanding the management of habitat on public lands to improve prey resources, (2) prohibiting the taking of deer south of Alligator Alley, (3) closing Fakahatchee Strand south of Alligator Alley to deer and hog hunting, (4) prohibiting the hunting of hogs in Collier County east of Miller Boulevard south of Alligator Alley, (5) attempting to reduce road mortalities by establishing reduced nighttime speed zones for problem highways (Commission alone has issued over 2,000 citations since 1985), (6) issuing jeopardy Biological Opinions on 3 projects affecting the panther, (7) taking action to provide for 36 wildlife crossing and associated fencing to exclude

panther access to traffic corridors along Alligator Alley (I-75) and providing for the realignment of approximately 24 miles of SR-29 to improve conditions for crossing panthers, and (8) reducing human disturbance by taking action to better regulate hunting and off-road vehicle activities in the Big Cypress National Preserve (Preserve).

Numerous actions have been taken to protect the panther within the Preserve. Some of these actions include: closing 11-mile road to hunters, increasing minimum antler size for legal deer from 1 inch to 5 inches, prohibiting off-road vehicle use within Loop and Deep Lake Units and permitting only on designated trails/areas within other Units, prohibiting the use of ATC's (all terrain cycles) for hunting, reducing the total number of hunting days, reducing the number of available deer/hog hunting permits, the elimination of deer/hog dogs in specific areas, and establishing mandatory hunter check in/out regulations. Habitat conditions for panthers will continue to be closely monitored and evaluated. Aggressive actions will continue to be taken to ensure that habitat conditions are not limiting factors in panther use on public lands.

C. Survival Plan/Captive Population

COMMENT: Many questioned the need for a captive population and/or expressed concern over potential impacts of panther removal to the wild population.

RESPONSE: The Service's position and rationale on the need for a captive population were detailed in Section IV.A in the Environmental Assessment. All proposed actions would be conducted through the oversight of the Committee and consistent with the approved Florida Panther Recovery Plan. The Florida Panther Viability Analysis and Species Survival Plan would provide the overall guidance and direction for the establishment and management of a captive population. All decisions and actions regarding the number, age, sex, and specific panthers to be used in the establishment of a captive population would be based on the best biological information and data available at that time. Included would be such factors as: the status and results of previous removal actions; the age, sex, lineage, reproductive history, current status and past history of each particular animal in question; specific needs of the captive population; present status of the wild population, and expected impacts of the proposed action on the wild population. Again, based on the rationale presented earlier, minimal impacts to the wild population are anticipated under the proposed action. Removing complete litters immediately after

birth would be expected to stimulate natural recycling mechanisms in the affected females resulting in the production of a second litter. Removing only a portion of a litter typically enhances the survival probabilities of remaining siblings. However, negative impacts are a possibility with any intervention action. Potential impacts associated with the proposed program would include females not recycling and/or not producing a second litter that year, or potential abandonment of remaining kittens where partial litters were removed. In either case, the female would be expected to reproduce no later than the following year, resulting in the potential loss of a particular female's productivity for a single year. Since females successfully-raising young reproduce only once every 2 years, the net loss would actually represent only half a production cycle under the worst case scenario. There is also a remote possibility that should abandonment occur and be detected quickly, the remaining kittens could be removed.

Kitten removal would not be expected to result in impacts to the social organization or structure of the existing wild population. A potential disadvantage is second litters could be produced during times of the year that might result in lower kitten survival rates. However, since successful wild births in the panther have been documented over a rather broad time period (early March through July) the likelihood of significant problems are considered remote. The removal of older animals, as may be necessary to fill genetic gaps or a specific captive need, would for the most part consist of presently non-reproducing adults.

COMMENT: Many expressed concerns over the holding facilities, expertise, care, and management in captivity.

RESPONSE: The Service through its permitting system would ensure that animals involved in a captive population would be provided appropriate facilities and care. Only American Association of Zoological Parks and Aquariums approved institutions would be permitted as cooperators in the program. Four facilities; Jacksonville Zoo, Lowry Park Zoo, Miami Metrozoo, and White Oak Plantation, are being considered under the initial proposal. A comprehensive, detailed protocol on the maintenance and management of a captive population is contained in the Survival Plan. This section addresses health and disease pre-evaluation and screening procedures for cooperating institutions, field evaluation and sampling regime at capture, quarantine guidelines, captive health care and maintenance, facilities, and long-term management strategies based on roles for individual panthers. Based on the response of 7 Florida panthers and over 13 wild Texas cougars that have been/are being held in captivity for

various reasons and over various lengths of time, the Service fully believes that the facilities, technology, and expertise called for in the proposed plan are such that the health and safety of involved panthers would not be unnecessarily compromised in any way. The Service fully recognizes that many of the elements of the plan are unproven in terms of their specific application to the Florida panther. However, they are based on sound biological principles and proven procedures (e.g., the red wolf captive breeding and population reestablishment program).

COMMENT: Concern was expressed for whether or not panthers would adjust to a captive environment.

RESPONSE: Kittens would be expected to adjust more readily to captivity than older animals. Given the expertise and technology available on captive felid husbandry, survivorship of all classes of animals brought into captivity would be expected to be excellent. A question still exists in how soon older animals would adjust to captivity and produce offspring. The general consensus of the expertise involved in the development of the Survival Plan was that older animals would be expected to initiate reproduction within one to three years after captivity.

D. Reintroduction/Population Reestablishment

COMMENT: Most of the comments under this topic centered around around whether panthers can be successfully reintroduced, whether captive animals can survive in the wild, and whether sufficient habitats exist for reintroduction.

RESPONSE: One of the most critical aspects of recovery will involve the reestablishment of additional populations in the wild. The primary goals of the recovery program as stated in the recovery plan are, "to secure and enhance the existing population and to successfully reestablish additional populations elsewhere within the panther's historical range." The Service believes that many potential population reestablishment sites still exist within the historic range of the panther. A range-wide survey for such sites is to be initiated this year.

Selective breeding in captivity would be utilized to maximize genetic preservation and diversity. Initial reproduction would be utilized to develop the captive population to a desired composition and maintenance level. After this has been achieved, select animals from the captive population would be available for use in reintroduction

programs. Animals selected for involvement in these programs would be maintained in husbandry programs specifically designed to facilitate successful reintroductions. Pre-release facilities and conditioning programs with minimal human contact would be provided. Candidate animals would not be released into the wild until they had demonstrated the ability to successfully take and subsist on native prey resources within native habitat-type facilities.

Population reintroduction experiments utilizing surrogate western cougars were initiated in 1988 and will continue until techniques that can be successfully applied to the Florida panther are developed. Presently, two techniques are being evaluated; translocation (moving adult/subadult wild animals from one occupied location to an experimental reestablishment area) and reintroductions involving captive-raised and pre-release conditioned animals. State of the art reproductive technology studies and investigations in the form of artificial insemination and in vitro fertilization/embryo transplants also are underway. The application of these technologies in the Florida panther would greatly expand available options for successful re-establishment programs. Genetic studies also are underway that will provide invaluable kinship information.

The role of learned or taught survival skills for kittens is not understood at this time. Should these skills be significantly important in the wild, then a potential disadvantage of the proposed action is that animals with proven wild survival skills would make up only a small percentage of the captive population. Thus, the availability of animals to pass these skills along to captive-raised animals scheduled for reintroduction programs would be limited.