

FLORIDA PANTHER

(Felis concolor coryi)

RECOVERY PLAN

SECOND REVISION

U.S. Fish and Wildlife Service
Southeast Region
Atlanta, Georgia

FLORIDA PANTHER

(Felis concolor coryi)

RECOVERY PLAN*

(Original Approval: December 17, 1981)
(First Revision Approved: June 22, 1987)
(Second Revision Approved: 3/13/1995)

Second Revision Prepared by Florida Panther Recovery Team

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March 13, 1995

*It should be noted that this does not represent a complete revision of the previous recovery plan (1987 revision). Changes represented herein were undertaken solely for the purpose of incorporating and expediting the implementation of genetic restoration needs into the recovery program.

Recovery plans delineate reasonable actions which are believed to be required to recover and/or protect listed species. Plans are sometimes prepared with the assistance of recovery teams, contractors, State agencies, and others and are published by the U.S. Fish and Wildlife Service. Objectives can only be attained and funds expended contingent upon appropriations, priorities, and budgetary and other constraints affecting the parties involved. Recovery plans do not necessarily represent the views nor the official positions or approval of any individuals or agencies involved in the plan formulation, other than the U.S. Fish and Wildlife Service. They represent the official position of the U.S. Fish and Wildlife Service only after they have been signed by the Regional Director or Director as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks.

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PURPOSE

This abbreviated revision of the Florida Panther Recovery Plan has been undertaken specifically to incorporate into the present recovery program a management strategy designed to restore and maintain the historic genetic character of the Florida panther. Task 12411 (page 25) has been added to achieve this need.

The addition of genetic restoration actions are deemed necessary and appropriate because available biological data indicate that perhaps even if all major task contained in the present recovery program are successfully implemented, the continued existence of the panther would be doubtful without specific actions to restore genetic health to the panther.

To expedite the implementation of efforts to address genetic restoration needs, a complete recovery plan revisions was not undertaken at this time. Rather, the plan's previous revision (June 1987) has been amended to incorporate genetic restoration as a component of the recovery program. Text and tasks from the 1987 revision remain virtually unchanged. For this reason, various information retained herein will not necessarily represent the "most up to date" information now available, for the level of knowledge has been significantly enhanced with the implementation/completion of many tasks that were incorporated into the 1987 revision. However, in order to provide an updated status report on plan implementation, the Implementation Schedule (Part III of the plan) has been updated through June 1994.

cooperators, private landowners, and the general public to prevent the extinction of this animal. With that in mind, attempts have been made to involve all responsible parties in the recovery program. Attempts will be made to maintain a high level of coordination in order to bring about a successful implementation of the step down outline which is designed to lead to the full recovery of the Florida panther. It is imperative that all entities work together toward this common goal.

PREFACE

The original Florida Panther Recovery Team was appointed by the Fish and Wildlife Service in July 1976 for the purpose of preparing, and assisting in coordinating the implementation of, a recovery plan for the Florida panther. The first technical draft plan was submitted to the Service in September, 1978, and a subsequent agency review draft was submitted in December 1979. After further revisions, the plan was approved by the Director, Fish and Wildlife Service, on December 17, 1981.

The first revision of the plan was undertaken by the Technical Subcommittee of the Florida Panther Interagency Committee. At the time the revision was approved the Subcommittee consisted of: Dominic Dottavio and Gary Hendrix of the National Park Service, Tom Logan and Tommy Hines of the Florida Game and Fresh Water Fish Commission, Jim Stevenson and John Baust of the Florida Department of Environmental Protection (formally Florida Department of Natural Resources), and Dennis Jordan and David Wesley of the Fish and Wildlife Service. The discussion leader during Technical Subcommittee meetings dealing with the revision process was John Christian of the Fish and Wildlife Service. The initial draft of the first revision was developed by Don Palmer and John Paradiso, Jacksonville Field Office, Fish and Wildlife Service.

In addition to the Subcommittee, the following individuals assisted with the first revision: Oron Bass, Chris Belden, John Christian, Ed Conklin, Dave Maehr, Bill Robertson, Melody Roelke, and Don Wood.

The purpose of the first revision was to update the original plan by incorporating new data that had become available, and to delineate some new tasks that might be useful in panther recovery efforts. The revision was based on (1) information provided by the U.S. Fish and Wildlife Service, National Park Service, Florida Game and Fresh Water Fish Commission, Bureau of Indian Affairs, and Florida Department of Natural Resources, (2) twenty-seven key panther issues identified at a February, 1986, Everglades Panther Workshop, and (3) information provided by participants at a April, 1986, Panther Symposium, hosted by the Florida Defenders of the Environment. The first revision also incorporated an updated recovery plan format.

The recovery plan is intended to serve as a guide that delineates and schedules those actions believed necessary to restore the panther as a viable, self-sustaining element of its ecosystem. It is recognized that many of the tasks delineated in the plan may be well underway or even completed now. The inclusion of these "in-progress" tasks are to retain an awareness of their importance, and to provide support for their continuation, as may be appropriate.

The challenge of recovering the Florida panther is great. It will take a well-coordinated and cooperative effort from all Local, State and Federal entities, key

I. INTRODUCTION

Historical Distribution

At one time, *Felis concolor* ranged from British Columbia throughout the United States, Central America, and South America to Patagonia. In the United States today, substantial populations are found only in the remote regions of the western mountains.

The Florida panther (*F. c. coryi*), one of 30 subspecies presently recognized, originally ranged from eastern Texas eastward through Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida and parts of Tennessee and South Carolina (Goldman 1946). This is essentially the area mapped by Hall (1981)(Fig. 1).

Taxonomy

The Florida panther was first described as a separate geographic race of *Felis concolor* by Charles B. Cory in 1896, who assigned it *F. c. floridana*. Bangs (1899), however, noted that *F. floridana* had previously been used for a bobcat and, believing that the Florida panther was restricted to peninsular Florida and could not intergrade with any other form, assigned it full specific status as *Felis coryi*.

Nelson and Goldman (1929) revised the taxonomic classification of the *Felis concolor* group and reassigned the Florida panther subspecies status as *F. c. coryi* Bangs. This designation also incorporated *Felis arundivaga*, which had been designated by Hollister (1911) from specimens collected in Louisiana. The most recent taxonomic review of the species, as well as detailed descriptions of each subspecies, including *Felis concolor coryi* (based on 17 specimens), is by Goldman (1946).

Description

The Florida panther is a medium-sized, relatively dark subspecies with short and rather stiff pelage. It is distinguished from other subspecies by its long limbs, small feet, and rich ferruginous color (Bangs 1898), particularly in the mid-dorsal region. The skull has a relatively broad, flat frontal region with remarkably broad and highly arched or upwardly expanded nasals. Three external characters are often observed on Florida panthers which are not found in combination on other subspecies of *F. concolor* (Belden 1982) -- a right angle crook at the terminal end of the tail, a whorl of hair - a "cowlick" in the middle of the back, and irregular white flecking on the head, nape, and shoulders.

Mature male Florida panthers examined in the wild have weighed from 106 to 148 lbs., and measured nearly seven feet from nose to tip of tail. Females were considerably smaller, with a weight range of 65 to 100 lbs. and measuring about six feet from nose to tip of tail.

Figure 1. Historic range of the Florida panther (*Felis concolor coryi*) from Hall (1981).

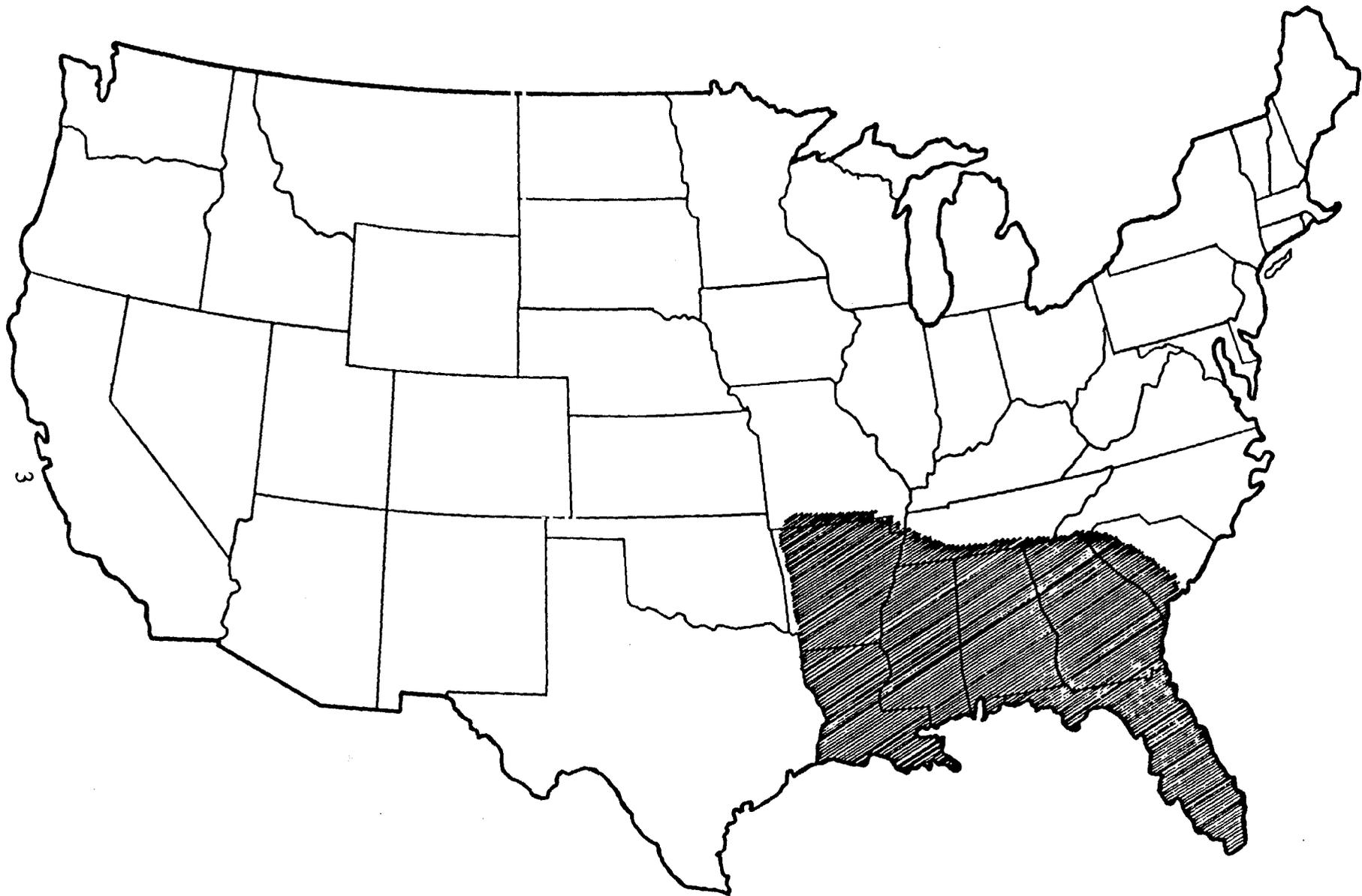


Figure 1. Historic Range of the Florida Panther

Panther tracks consist of four toe marks in a semi-circle ahead of the imprint of a three-lobed heel pad (Belden 1978b). The claws are encased in a sheath and normally do not show in a walking track. When walking the hind foot is often placed in the imprint made by the forepaw. Other less easily identifiable evidence that indicates the presence of panthers are scats, scrapes, and kills. Scrapes are made by pushing up small mounds of dirt and debris with very short backward raking motions with the hind feet. These six-inch-long scrapes usually back up against some object such as a palmetto bush, fallen log, etc., or are found along grassy roads or trails and are typically urinated or defecated upon. Scrapes are made by both sexes, perhaps more frequently during the breeding season (Belden, pers. comm. 1986).

Habitat

Felis concolor has the most extensive natural distribution of any terrestrial mammal in the western hemisphere, excepting man. It is found in montane coniferous forests, lowland tropical forests, swamps, grassland, dry brush country, or any other area with adequate cover and prey (Nowak and Paradiso 1983).

Daytime locations of radio-collared panthers in southwest Florida are highly variable but all are typically heavily vegetated. Commonly used habitat types include mixed swamp forest, hardwood hammock, slash pine-saw palmetto woodlands, and oak-pine woodlands. Most day-bed sites are located in dense, 2-3 m tall saw palmetto thickets bordered by hardwood hammock and wet prairie.

Nighttime telemetry indicates panthers often leave the dense cover used during the day for more open wet prairie, freshwater marsh, or agricultural land. These observations probably reflect movement/feeding patterns of prey species (FGC & NPS - unpublished data).

Food

Throughout the entire range of *F. concolor* in North America, deer is the most consistently important food (Nowak and Paradiso 1983). Remains of rabbit, feral hog, and deer have been found in scats from north Fakahatchee Strand, south of Sunniland, and deer, rabbit, and raccoon in scats from eastern Everglades National Park (McBride 1985). Deer was found in 46% of the scats, rabbit in 31%, cotton rat in 20%, wild hog in 15%, raccoon in 11%, armadillo in 7%, and birds in 3% (Belden 1982).

Hunting

Panthers approach their prey slowly and attack with a short, high speed rush at close range. After making a kill, panthers drag their victims to a place of concealment to feed. The forequarters of the carcass are eaten first, after which it is buried with grass and debris and often fed upon later (McBride 1985).

Large prey, such as deer, are usually killed by biting into the spinal cord on top of the neck where the neck and head join. This distinctive killing method provides an excellent way to identify their presence in an area.

Home Range and Movements

Radio-instrumentation studies indicate that Florida panthers use large areas and may stay for varying periods of time in a specific location (Belden 1982). An individual panther's tracks have been found over areas of 500 sq. km. or more during a given 30 day period (McBride 1985). Of 6 panthers studied in 1986, 2 adult males had ranges averaging 666 sq. km., 3 adult females had ranges averaging 192 sq. km., and one juvenile male had a home range of 433 sq. km. (Dave Maehr, pers. comm 1987). Home ranges of two radio-instrumented females with kittens in Everglades National Park averaged about 200 sq. km. (Bass, pers. comm. 1987). During the winter, panthers appear to move as much in the daytime as at night, but in summer they normally do not move at all in the daytime (op. cit.). Individuals on occasion move as much as 30 km. overnight, and at other times remain in the same location for a week or more. There is considerable overlap in ranges, but adult animals are rarely found together with the exception of during the breeding period, November through March (Roelke et al. 1985; Belden 1982).

The Florida panther is a capable swimmer, readily crossing canals and sloughs and ranging well out into the wetter portions of the Everglades. Even during periods of high water, it is apparently little inconvenienced. Panthers also readily use oil roads and tram roads as travel lanes, and routinely cross highways (McBride 1985).

Population Estimate

The Florida panther occurs in remote areas in south Florida with a population estimate of 20-50 animals (Forrester et al. 1985). On Federal, State and private lands in Collier and Hendry Counties, the estimate is 23 animals (Robertson et al. 1985).

Social Interactions

Florida panthers are generally solitary except during courtship and that period of time the female is raising young. Occasionally, however, adult males and females are found in close proximity to each other outside of the courtship period (Maehr pers. comm. 1986). The reason for this behavior is unknown at present.

Reproduction

The Florida panther breeding season starts in October and continues through March, with the majority of conceptions occurring from November to March (Roelke et al. 1985). However, frequent encounters between males and females have been

documented throughout the year (FGC - unpublished data). Males are at least 3 years old at sexual maturity but females may mature at under 3 years. The gestation period is assumed to be 90-95 days. Living litters documented in Florida have consisted of 1, 2, and 3 kittens (FGC unpublished data). Four full term fetuses were found in a road-killed female and 3 fetuses were detected in a female treated for foot injuries due to gunshot (FGC - unpublished data).

Health Status

Two major areas of critical concern to panther health have been identified - poor physical condition and anemia of many animals (particularly females) within the Fakahatchee Strand State Preserve and eastern Big Cypress National Preserve, and exposure to infection by several potentially pathogenetic viral, bacteriologic, and parasitic agents (Roelke et al. 1986).

One of the most significant infectious diseases which may affect Florida panthers is feline panleukopenia. Antibodies to this virus and closely related parvovirus were detected in 23 of 26 (88 percent) of the panthers examined (Roelke et al., 1986). Also known as feline distemper, this virus is a highly contagious, devastating disease known primarily in domestic cats. Given the pathogenicity of this virus and the documented species' susceptibility to it (Bittle 1981; Wallach et al. 1984), it is reasonable to assume that panthers in Florida have experienced some degree of clinical disease and mortality, especially in individuals under one year of age. Females with high titers can provide passive protection to the kittens for only a limited period of time (8 to 14 weeks), after which the kittens are susceptible. However, once an animal has survived an infection and mounted an immune response, it probably is protected for life. Panleukopenia has also been diagnosed in bobcats, and recent experimental evidence indicates that raccoons are also highly susceptible. Both species in south Florida have antibodies to the virus, indicating exposure and may function as reservoir hosts (Roelke, pers. comm. 1986).

Another pathogenic virus detected in panthers is feline calicivirus, a primarily upper respiratory virus. It usually is quite mild, but certain strains can cause severe oral lesions and even death. Thirteen of 26 panthers examined by Roelke, et al. (1985) had antibody titers to this virus. Recovered animals can harbor and shed the virus for a considerable time.

Another potential pathogen found in the Florida panther is the hookworm, *Ancylostoma pluriidentatum*. Forrester, et al. (1985) found six of seven panther carcasses examined had hookworm infection. The mean number of adult worms per panther was 254, with a range of 36 to 744. In dogs, hookworms are known to consume an estimated 1/20th of a cc of blood per day. Therefore, a panther could be losing a significant amount of blood per day at the level of worm infection noted. On a short term basis, this amount of loss could possibly be tolerated, but over an extended

period of time the loss could be debilitating. Limited research (Roelke, et al. 1985) with two captive cougar kittens (non-*coryi*) indicated that hookworms caused severe anemia, depressed serum iron, poor weight gain, and "unthrifty" condition. Had anthelmintics not been used, the kittens would probably have died. Hookworm parasitism in older panthers may contribute to chronic anemia and weight loss, especially when the animals are nutritionally compromised. Effects of parasitism can show up secondarily in nutritional deficiencies or concomitant diseases.

Roelke, et al. (1985) speculated that either panleukopenia or hookworms, acting independently or concurrently, especially when coupled with other environmental or nutritional stresses, could result in significant mortality in panthers under one year of age, and could thereby lower recruitment.

Present Status

Panther sightings, most of which are at best questionable, have been reported in Arkansas, Florida, and Louisiana (Layne and McCauley 1976; Lewis 1969, 1970, Lowery 1974, McCauley 1977, Sealander 1956, 1979, Sealander and Gipson 1973, and Yenke 1982). Other reports indicating the possible presence of the animal in other areas have been summarized by Jenkins (1971) and Nowak (1974). However, consistently conclusive recent evidence of the animal's presence is available only from the Big Cypress and Everglades Physiographic Regions of South Florida (Belden 1978; McBride 1985; Belden 1979, Florida Panther Survey, Job I-E-1 Performance Report, Florida Endangered Wildlife Project E-1-03) (Fig. 2).

Panther sign is found regularly in these areas and reproduction has been documented. In addition, periodic confirmed sightings have come from adjacent areas as far north as Glades County and as far east as Palm Beach County. Panther sign cannot, however, be predictably found in areas other than the Big Cypress and Everglades Physiographic Regions (Belden, et al. 1987).

Reasons for Decline

The decline of Florida panther numbers and distribution has been under way at least since the arrival of Europeans. The elimination process started with early settlers, who attempted to destroy panthers at every opportunity because of potential and real losses of livestock, and fear. Hunting was typically done by using dogs to pursue and tree the cat, at which time it was easily shot. Given these conditions, it is not surprising that most populations were eliminated before 1900.

Figure 2. Area where consistent documented evidence of the presence of panthers occurs.

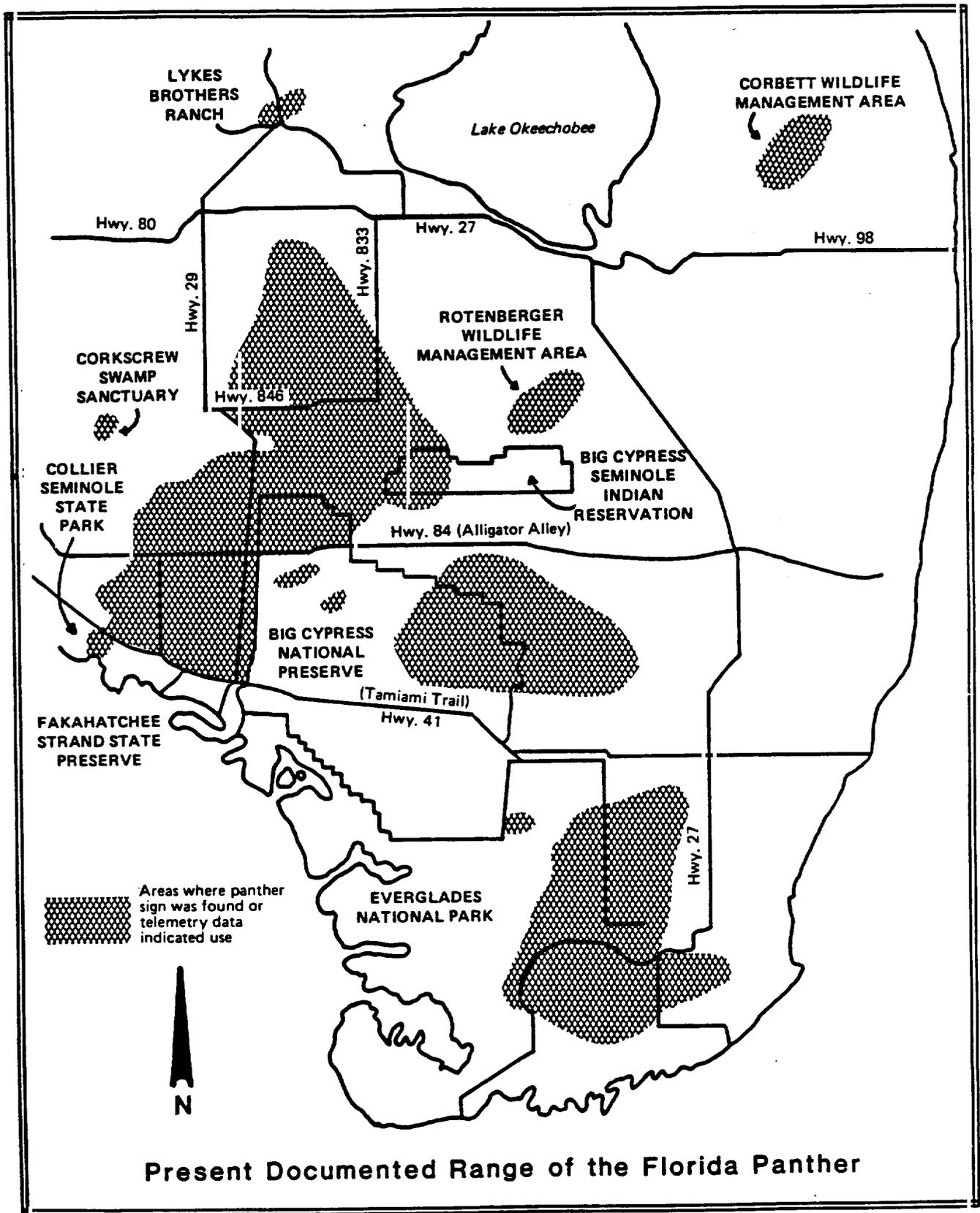


Figure 2.

The panther has only recently been protected in the southeastern States. As late as 1973, it was considered a predator in Mississippi and given no protection under State law; the species was not fully protected in Florida until 1958. A significant panther population was still present in southern Florida around the turn of the century, but enormous human population growth since has resulted in a continuous and accelerated decline.

Present Threats to the Species

Present threats (not necessarily in order of priority) to the survival of the Florida panther in south Florida include:

1. Low population numbers/depressed genetic viability. Low numbers make the species especially vulnerable to natural or man-caused catastrophes and suppressed genetic viability. Male panthers exhibit an unusually high percentage of abnormal sperm. Five males examined to date had greater than 93% abnormal sperm (Roelke 1985; Roelke pers. comm. 1986.). The significance of this as it relates to reproductive fitness is yet to be determined, but such may reflect a critical degree of inbreeding, as demonstrated in other felids (O'Brien, et al. 1985; Wildt, in press).
2. Increased human presence. Increased human populations in Florida have results in greater human use and occupation of panther habitat by residents, hunters, tourists and industry. Roads have been built through areas occupied by panthers and more are anticipated. Vehicular traffic continues to increase annually. Twelve panthers are known to have been struck by vehicles between 1980 and 1986, 10 of which were killed. As hunter use demands accelerate, the potential exists for competition between panthers and hunters for deer and hogs, and occasionally hunters illegally shoot panthers. Off-road vehicle traffic is increasing, making accessible large areas that formerly had been isolated wilderness. Increased or intensified urbanization, agriculture, water management, mineral exploitation, and industrialization in panther habitat have also resulted from human population growth.
3. Diseases and parasites. Panthers are known to be exposed to panleukopenia, feline calicivirus, and pseudorabies, and are infected with hookworms and ticks. Any or all may increase kitten mortality and/or seriously reduce the vitality of adults.
4. Reduced prey base. Panthers likely need to consume up to one deer or hog per week (pregnant females two) in order to maintain proper vigor and health (McBride 1985). There is concern that deer and hogs in several areas of south Florida may not be sufficiently abundant to meet that need. Reasons for the

decline of prey species include human alteration of the habitat, improper management of the habitat, and/or other human impacts such as water control, public use, etc. Moreover, much of south Florida has never produced high deer densities because of low habitat quality.

Accomplishments

Since the Florida panther was listed as an endangered species by both State and Federal governments, and since the initial panther recovery plan was approved in 1981, considerable recovery effort has been made.

The Florida Panther Record Clearinghouse was established in 1976 by the Florida Game and Fresh Water Fish Commission and is maintained at its Wildlife Research Laboratory, 4005 S. Main Street, Gainesville, 32601. Thousands of panther sightings have been reported and reviewed, and many field-investigated. From these efforts, it has been confirmed that panthers exist in the Fakahatchee Strand, the Corn Dance Unit in the Big Cypress National Preserve, the Everglades National Park, Corkscrew Swamp, Indian reservations, and on private lands to the north and east of Fakahatchee Strand, extending into Hendry and Glades Counties (west of Lake Okeechobee).

Panther movements have been tracked through radio-instrumentation studies by the Florida Game and Fresh Water Fish Commission and the National Park Service. The resulting data have been computer analyzed to document habitat use, daily activities, home range characteristics, social interactions, etc., and to identify areas where panthers cross roadways.

Nighttime speed limits have been reduced in some areas to provide protection to panthers crossing highways. Major highway improvement projects for State Road 29 and Interstate 75 (State Road 84) have been initiated and special protective features such as wildlife crossings, bridge extensions, fencing, and shoulder expansions were identified and determined to be construction requisites in biological opinions issued by the Fish and Wildlife Service.

A captive-breeding/reintroduction study is underway by the Florida Game and Fresh Water Fish Commission. Facilities have been constructed by Gilman Paper Company at their White Oak Plantation near Yulee, Florida, to accommodate portions of this work. Panther diseases and parasites have been, and are continuing to be, investigated. Efforts are underway to purchase and secure approximately 30,000 acres of north Fakahatchee Strand in Collier County. Other major land purchases are scheduled within the Fakahatchee Strand State Preserve, Golden Gate Estates, and lands impacted by the construction of Interstate 75.

The National Park Service is preparing a General Management Plan for the Big

Cypress National Preserve that will outline the management of all natural resources within the Preserve; the Florida panther will be a featured species. The draft plan is scheduled for release in the summer or fall of 1988.

The panther was designated the official Florida State mammal in 1982. The Florida Panther Technical Advisory Council was established pursuant to Chapter 38-172, Laws of Florida, in 1983 to advise the Florida Game and Fresh Water Fish Commission on technical issues regarding the Florida panther.

The Florida Panther Interagency Committee was established in May, 1986, to provide guidance and coordination on research and management activities. The primary agencies involved in the Committee are the Florida Department of Environmental Protection, Florida Game and Fresh Water Fish Commission, National Park Service, and U.S. Fish and Wildlife Service.

Work to save the Florida panther, and to carry out the tasks of this recovery plan, will continue to require joint cooperative efforts involving many agencies, organizations, and individuals. Currently, directly involved are the agencies represented on the Florida Panther Interagency Committee. However, many other Federal, State, and local agencies including the U.S. Army Corps of Engineers, Florida Department of Transportation, Florida Department of Public Safety, Florida Department of Environmental Regulation, South Florida Water Management District, and others, will play an important role as will numerous public and private research organizations, various local and national conservation groups, and individual landowners within the present and potential range of the panther.

II. RECOVERY

A. Objective

The recovery objective for the Florida panther is to achieve three viable, self-sustaining populations within the historic range of the animal. First priority will be to secure a viable population in south Florida. A viable population level will be determined when enough data are available to develop a panther population model. The other two populations to be established will require separate population goals. These population objectives will be based upon the size of the respective areas, prey base, competing interests for the resource base, regulatory capability and location.

B. Stepdown Outline

1. Identify, protect and enhance existing Florida panthers rangewide and protect and manage habitats.
 11. Identify existing Florida panther populations and occupied habitat.
 111. Determine population levels and habitat requirements for known inhabited areas.
 1111. National Park Service (NPS), in consultation with Florida Game and Fresh Water Fish Commission (FGC) and Fish and Wildlife Service (FWS), will conduct studies in Everglades National Park (EVER) using radio-telemetry and will consider the need for additional studies in south Florida units of the NPS.
 1112. FGC will conduct radio tracking studies in Fakahatchee Strand State Preserve (FSSP) and Big Cypress National Preserve (BCNP).
 1113. FGC will expand studies to private lands north of S.R. 84 (Alligator Alley) in cooperation with landowners.
 1114. FWS will conduct population surveys to monitor panther activity in Florida Panther National Wildlife Refuge (FPNWR).

12. Protect and manage existing panther populations.
 121. Protect panthers from vehicular traffic.
 1211. Florida Department of Transportation (FDOT) will post warning signs and reflectors, where practical, on Alligator Alley, S.R. 29, U.S. 41 (Tamiami Trail), and other roads as necessary.
 1212. FDOT will reduce nighttime speed limits where panthers may be vulnerable to vehicle collisions.
 1213. FGC will develop a plan to provide prompt emergency veterinary aid for injured panthers.
 1214. FGC will develop a protocol for handling dead panthers.
 1215. FDOT will physically alter segments of roadways determined to be hazardous to panthers.
 122. FGC will identify and evaluate significant Florida panther diseases and parasites and means of prevention or protection, as appropriate.
 123. FWS, with assistance from NPS and FGC, will develop a cumulative effects model for the south Florida ecosystem.
 124. FGC will develop a genetic profile for Florida panther.
 1241. FWS and FGC will identify biological and legal options if the genetic profile indicates low genetic diversity and subsequent detrimental effects on the population.
 12411. FPIC will develop and implement a management strategy to restore and maintain the historic genetic character of the Florida panther.
 1242. FGC will establish a Florida panther sperm bank.

125. FGC and FWS will develop a panther population model.
 126. Florida Department of Environmental Protection (DEP), FGC, FWS, and NPS will develop or revise existing comprehensive land management plans to address the needs of the panther on their respective lands within the current known range of the panther, in addition to other agency land management objectives.
 127. FGC will initiate a system for marking and maintaining records on captive cougars in the state.
13. Protect, manage and enhance habitat for prey species.
131. Expand deer studies and monitoring to improve management techniques in all areas known to be occupied by panthers.
 1311. NPS will conduct deer studies in EVER to determine optimum carrying capacity and to provide data for developing management guidance.
 1312. NPS, DEP, FGC, FWS, South Florida Water Management District (SFWMD), Collier and Dade Counties, and other local governments will evaluate habitat protection and management actions on their respective lands and initiate actions to enhance panther conditions as appropriate.
 1313. FGC will continue ongoing deer studies and initiate new studies in BCNP and FSSP similar to those studies identified in 1311.
 1314. FGC and FWS will conduct deer studies as identified in 1311 in north Fakahatchee Strand, FPNWR, and on private lands, with landowner approval.
 1315. FGC, in cooperation with NPS and DEP, will continue to evaluate the effect deer hunting has on deer herds in areas of importance to Florida panthers and recommend or implement any

needed regulatory changes.

1316. FGC will refine the Abomasal Parasite Count (APC) technique as an indicator of carrying capacity for deer in sub-tropical Florida.
 1317. FGC will offer to work with the Miccosukee and Seminole Indian Tribes (MSIT) to evaluate the deer status on Indian lands and cooperatively initiate and evaluate a variety of management techniques and strategies to enhance deer populations.
 1318. FGC and DEP will continue to test and evaluate on an interim basis the effectiveness of supplementing the prey base for panthers in the FSSP.
132. NPS, FWS, and FGC will establish a monitoring program for prey species at EVER, BCNP, FSSP, FPNWR, and selected private lands.
 133. FWS, FGC, NPS, MSIT, and DEP will evaluate the need for, and if necessary provide, increased law enforcement throughout the year.
14. Maintain and expand clearinghouse operations for obtaining and compiling panther records throughout the entire historical range of the subspecies.
 15. Monitor panther populations.
 151. NPS will monitor the population in EVER and assist FGC in BCNP.
 152. DEP will assist FGC in monitoring panthers at FSSP.
 153. FGC will offer to assist MSIT in monitoring panthers at the Reservations.
 154. FGC will offer to monitor panthers on selected private lands in cooperation with landowners.
 155. FWS will monitor panthers at FPNWR.

16. FWS will assess the potential benefits of designating critical habitat.
17. Establish Florida Panther Interagency Committee (FPIC).
 171. Establish technical subcommittee.
 172. FWS will designate a Florida Panther Coordinator.
 173. Develop Participation Schedules.
18. FWS, NPS, FGC, DEP, FDOT, and MSIT will continue to evaluate present laws and regulations regarding hunting, off-road vehicle (ORV) use, and public use in general, and to make changes necessary to insure the panther and its prey are protected.
19. Federal, State, and local agencies will implement habitat protection measures.
 191. All Federal, State, and local agencies will review their respective policies regarding land management and regulatory functions to insure actions are consistent with panther conservation.
- A. FWS, FGC, NPS, and DEP will develop a contingency plan, including implementing criteria, for the removal of all free-ranging panthers from the wild.
- B. Federal and State agencies should acquire land essential for the survival of the panther.
 - B1. FWS will establish FPNWR.
 - B2. FWS will staff and fund FPNWR.
 - B3. DEP will acquire "In-holdings" in FSSP.
 - B4. FDOT, NPS, FWS, DEP, and FGC will acquire additional lands as a result of the construction of I-75.
 - B5. Conservation and Recreational Lands (CARL) program should aggressively pursue the purchase of lands within Golden Gates Estates, south of Alligator Alley.

- B6. Secure Jet Port property.
- 2. Establish positive public opinion support for the management of Florida panther.
 - 21. Establish Public Affairs Subcommittee to inform the public about the panther and its habitat requirements.
 - 211. FGC, FWS, DEP and NPS will work with sportsmen and other recreational users to encourage cooperation to provide maximum protection for the panther.
 - 212. FGC, FWS, DEP and NPS will work with conservation groups to encourage support for the recovery efforts for the panther.
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 - 214. Federal and State holdings, such as EVER, BCNP, FSSP, and FPNWR will distribute literature about the panther, its habits, and ways the public can assist in recovery.
 - 215. All agencies will participate in the production and distribution of audio-visual aids.
 - 216. FDOT will develop a "Traveler Information Service" for radios on Alligator Alley, SR 29, Tamiami Trail, and other roads as necessary.
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 - 22. Involve private landowners in recovery of the panther.
 - 221. FWS, and FGC will develop a Comprehensive Habitat Management Plan for the panther on private lands, in cooperation with the landowners within the known distribution of the panther.
- 3. FGC will reintroduce Florida panthers into areas of suitable habitat.
 - 31. Determine where areas of suitable habitat exist.

311. Develop priority list of potential reintroduction sites.
 312. Coordinate panther reintroductions with private, State, and Federal landowners.
 313. Public attitudes toward panther re-establishment will be determined in the vicinity of potential reintroduction sites.
 314. Potential reintroduction sites will be surveyed for the presence or absence of parasites and infectious diseases potentially harmful to panthers.
 315. The presence or absence of existing panthers in potential reintroduction areas will be determined by conducting field searches.
32. Determine the feasibility of using captive-bred offspring in the re-establishment or supplementation of Florida panther populations.
321. An evaluation will be made to determine if wild-caught adult panthers can successfully produce offspring in captivity.
 3211. The primary captive-breeding facilities will be built at White Oak Plantation.
 322. Offspring obtained from the Florida panther and non-endangered panther matings will be conditioned for release into the wild.
 323. The feasibility of re-establishing panther populations with captive-raised animals will be determined.
 324. Captive-raised panthers will be used to supplement existing populations where necessary.
33. Determine the feasibility of using translocated wild panthers in the re-establishment of Florida panther populations.
331. Three wild-caught adult females and two wild-caught adult males from a non-endangered subspecies will be obtained and transferred to Florida.

332. These animals will be surgically sterilized, fitted with radio-transmitter collars, and released into suitable wild areas.
 333. These animals will be monitored daily for at least one year.
 334. At the end of the evaluation period, the translocated non-endangered subspecies will be recaptured and removed from the wild.
34. Properly conditioned Florida panthers will be introduced into the wild if determined feasible.

C. Narrative

1. Identify, protect and enhance existing Florida panthers rangewide, and protect and manage habitats.

Although there are frequent reports of Florida panthers from many areas of the species' historic range, the only confirmed surviving population is in south Florida. The survival of the Florida panther depends upon the continued existence of this population.

11. Identify existing Florida panther populations and occupied habitat.

Areas inhabited or frequented by panthers need to be precisely delineated. Present search efforts within the historic range which primarily involve state agencies should be expanded to include appropriate Federal and private entities. Techniques and materials developed and utilized in Florida will be made available to assist others.

111. Determine population levels and habitat requirements for known inhabited areas.

Although considerable research has been, and is being, conducted on this task, much remains to be learned about the life history of the panther. Continue studies already in progress, and initiate new studies on panther movements, food habits, predator-prey relationships, energetics, reproduction, mortality, etc.

1111. NPS, in consultation with FGC and FWS, will conduct studies in EVER using radio-telemetry and will consider the need for additional studies in south Florida units of NPS.

EVER has remained virtually free of human development for the last 40 years. It is essential to radio-instrument panthers there and study this population segment for comparison with data from concurrent studies in areas of different vegetative types and known to be impacted by various human activities. Studies were recently initiated in EVER (11/86) to augment the panther and deer studies presently underway in BCNP and FSSP.

1112. FGC will conduct radio tracking studies in FSSP and BCNP.

FGC has radio-tracked panthers in FSSP and BCNP since 1981. Much has been learned from these studies. It continues to be important to study this segment of the population since it appears to be in poor health with little recruitment. Results from these studies will be compared with results from Task 1111.

1113. FGC will expand studies to private lands north of Alligator Alley in cooperation with landowners.

At the present, an estimated 20-50 panthers inhabit south Florida. About one-half of these are believed to occur on private lands which are managed differently than public lands. It is important to determine panther distribution and survival on these private lands. Radio-telemetry and intensive ground surveys will be required. These studies should be similar to those outlined in 1111 and 1112 for panthers on public lands.

1114. FWS will conduct population surveys to monitor panther activity in FPNWR.

This will be one of the first priority actions for the new FPNWR in order to develop and refine management actions.

12. Protect and manage existing panther populations.

With only a small remnant population of Florida panthers known to survive in south Florida, it is essential these animals be carefully protected and managed to secure their continued existence.

121. Protect panthers from vehicular traffic.

Vehicles striking panthers has become the major known cause of panther mortality in south Florida. The endorsement of measures being developed through the FPIC to address this problem by FDOT and Florida

Department of Highway Safety and Motor Vehicles (FDHS) is essential. Active participation from these Departments will be sought by the FPIC in the development of these measures.

1211. FDOT will post warning signs and reflectors, where practical, on Alligator Alley, S.R. 29, U.S. 41, and other roads as necessary.

Some areas where panthers cross roads or have been killed by vehicles have been posted with reduced speed limits. Checks should be made to insure all such areas are prominently posted. In addition, consideration should be given to posting all roads within known panther range. FDOT should initiate studies to determine if reflectors will help reduce the incidence of highway fatalities.

1212. FDOT will reduce nighttime speed limits where panthers may be vulnerable to vehicle collisions.

If necessary, reduced nighttime speed limits on additional segments of roadways will be posted. Strict enforcement shall be shared by the Florida Highway Patrol (FHP), local law enforcement officers, FWS and FGC enforcement officers.

1213. FGC will develop a plan to provide prompt emergency veterinary aid for injured panthers.

A contingency plan will be developed to assist panthers injured by vehicular accidents. Such a plan should include methods of rapid movement, temporary and long-term holding facilities, etc. Veterinary expertise should be available on short notice.

1214. FGC will develop a protocol for handling dead panthers.

The goal will be to maximize the biological, medical, genetic, and forensic information to be

gained from each animal.

1215. FDOT will physically alter segments of roadways determined to be hazardous to panthers.

Segments of SR-29 and plans for the proposed I-75 have been modified to protect the panther. As other roadways are scheduled for repairs or realignment, similar protective measures should be incorporated into the design. This includes moving the road bed to increase the size of the shoulder and other modifications.

122. FGC will identify and evaluate significant Florida panther diseases and parasites and means of prevention or protection, as appropriate.

Hookworms are known to infest Florida panthers; panthers are also susceptible to feline distemper (panleukopenia). Both may be factors in suppressing panther recruitment. Studies should be continued on panther diseases and their significance to wild populations. These studies should include an experimental evaluation of the pathogenicity of both of these agents in surrogate hosts, such as captive cougars. Consideration should be given to improving the health of wild populations. This may involve prey base enhancement, as well as prevention or protection, including capture and immunization. All panthers caught in the wild or held in captivity should be inoculated against panleukopenia.

123. FWS, with assistance from NPS and FGC, will develop a cumulative effects model for the south Florida ecosystem.

As human population growth continues in south Florida, it will be necessary to predict its impact on panther habitat. To accomplish this, a cumulative impact model, similar to one developed for the grizzly bear in Yellowstone National Park, should be developed. This model should address the impacts of hydrology, agriculture, air pollution, human population growth, roads, recreation, etc. The FWS will utilize input from all appropriate entities in this effort.

124. FGC will develop a genetic profile for Florida panther.

Genetic variability of the Florida panther should be assessed using blood and tissue electrophoretic evaluations and other techniques. Similar analyses of other subspecies of *F. concolor* should also be conducted for comparative purposes.

1241. FWS and FGC will identify biological and legal options if the genetic profile indicates low genetic diversity and subsequent detrimental effects on the population.

12411. FPIC will develop and implement a management strategy to restore and maintain the historic genetic character of the Florida panther.

A genetic profile describing the historic character of the Florida panther will be established and a management plan designed to achieve and maintain this profile will be developed and implemented. The plan will describe scientific controls to be utilized, genetic and morphological objectives, management needs, source stock, methods, monitoring needs and etc.

1242. FGC will establish a Florida panther sperm bank.

Sperm should be collected and preserved from both wild and captive panthers and from dead animals in which the sperm is still viable.

125. FGC and FWS will develop a panther population model.

To arrive at an estimate for the minimum viable population (MVP), it will be necessary to develop a population model. Needed for such a model are data on natality, mortality, recruitment, and compensatory mechanisms. The above data may have to come, in part,

from other non-endangered subspecies of *Felis concolor*.

126. DEP, FGC, FWS and NPS will develop or revise existing comprehensive land management plans to address the needs of the panther on their respective lands within the current known range of the panther, in addition to other agency land management objectives.

These comprehensive plans will implement specific agency tasks outlined in the implementation schedule and committed to in the agencies' participation schedule (see 173). The plans will outline specific tasks to enhance habitat conditions for panthers and will address all facets of each agency's responsibilities and capabilities for management of fire, water, recreation, vegetation, etc. They will be reviewed by the FPIC. A priority list for land acquisition efforts related to the panther will also be addressed, though it may be through a separate agency process. These plans and priorities will be developed or revised using existing agency processes.

127. FGC will initiate a system for marking and maintaining records on captive cougars in the state.

It has been estimated that there are over 1,000 captive cougars in Florida (Capt. Barry Cook, pers. comm. 1986). These animals pose a potential problem to the recovery of the Florida panther due to the confusion over the true status and distribution of the native population as a result of escapes and intentional releases. Some system of marking (such as tattooing) and careful record-keeping is needed to keep track of these captive animals and to make the owners responsible for the continued up-keep of them in captivity (Belden 1982).

13. Protect, manage and enhance habitat for prey species.

The basic prey for panthers in Florida is white-tailed deer and hogs. Panthers are opportunistic feeders as evidenced by the variety of other animals found in their scats and stomachs. However, for panthers to reproduce successfully, it is highly desirable that large prey species be available.

131. Expand deer studies and monitoring and improve management techniques in all areas known to be occupied by panthers.

At present, limited deer studies have been conducted in the Corn Dance and Bear Island Units of the BCNP. Results indicate that differences do exist in physiological conditions and abundance between the two deer herds. It is essential to expand these studies and initiate new studies in other areas known to be occupied by panthers. These studies will help identify factors regulating deer populations in each of the areas. One of the first priorities for the FPNWR will be to expand this effort to include this new acquisition area.

1311. NPS will conduct deer studies in EVER to determine optimum carrying capacity and to provide data for developing management guidance.

The use of radio-telemetry will provide data on habitat use, energetics, etc. A representative sample of deer must be collected to analyze reproduction and general health status of the overall deer population.

1312. NPS, DEP, FGC, FWS, SFWMD, Collier and Dade Counties, and other local governments will evaluate habitat protection and management actions on their respective lands and initiate actions to enhance panther conditions as appropriate.

To perpetuate the natural distribution and abundance of the Florida panther and its primary prey, it will be necessary to evaluate current management actions such as fire management, exotic species eradication programs, and habitat restoration programs. These management actions and programs will be adjusted as appropriate to improve panther habitat consistent with other natural resource management guidelines. FWS and DEP should actively move forward with experimental programs designed to

increase the carrying capacities for deer on their respective lands. This effort should include, but not necessarily be limited to, manipulating present habitat conditions to encourage native vegetation preferred by deer. Consistent with overall natural resource management objectives, NPS will place management emphasis on the elimination of exotic species and restoration of disturbed lands to natural systems. The inherent diversity and productivity of natural habitats on restored lands may have a beneficial impact on deer populations and thus aid in panther recovery. Additionally, it may be determined through studies that the use of controlled fire may provide a means to better replicate natural conditions that are more suitable for the panther. FWS and DEP will carry out exotic plant control measures and burning programs as needed on their respective lands (FPNWR and FSSP) in order to improve and maintain optimum habitat conditions for panthers.

1313. FGC will continue ongoing deer studies and initiate new studies in BCNP and in FSSP similar to those studies identified in 1311.

Studies involving reproduction and general health status of deer in the Corn Dance and Bear Island Units of BCNP have involved the collection of does and information from deer taken by hunters. To complement the research identified in 1311, similar research should be conducted in FSSP and other units of BCNP. This will provide a broad data base for deer in two distinct habitats.

1314. FGC and FWS will conduct deer studies as identified in 1311 in north Fakahatchee Strand, FPNWR, and on private lands, with landowner approval.

Over one-half of all panthers may occur on private lands to the north of the public lands. There are no available data for the deer herds on

these lands. It has been reported that panthers are healthier in these areas and recruitment is occurring. It is essential to understand why, and to determine if management alternatives exist which might improve the deer situation on public lands. The panthers in FSSP are apparently underweight and their diet is comprised largely of raccoons. There appears to be little recruitment. To improve the situation, habitat modification or food plots should be initiated in the FSSP and FPNWR and the response of deer measured.

1315. FGC, in cooperation with NPS and DEP, will continue to evaluate the effect deer hunting has on deer herds in areas of importance to Florida panthers and recommend or implement any needed regulatory changes.

The issue of deer hunting on public lands has been debated for several years. Opinions are varied as to the effect hunting is having on suppressing deer. Studies will be undertaken to identify any impacts to panthers and recommendations developed to mitigate any identified impacts.

1316. FGC will refine the APC technique as an indicator of carrying capacity for deer in sub-tropical Florida.

The use of APCs has been widely accepted as one measure of the health of a deer herd. The Southeastern Wildlife Cooperative Disease Study, Athens, Georgia, has developed the standards for this technique. Specific application of the technique needs to be refined for proper use and interpretation in sub-tropical Florida.

1317. FGC will offer to work with the MSIT to evaluate the deer status on Indian lands and cooperatively initiate and evaluate a variety of management techniques and strategies to enhance deer populations.

Panthers have been documented on the two Indian Reservations in south Florida but no information is available on the status of the deer herds on either. As on private lands, this information is important for the development of suitable management programs for the panther. The same methodology developed to study deer in EVER and BCNP should be appropriate. Once the status of the deer herds is known, an active deer management program should be initiated on tribal lands to improve the habitat for deer. A prescribed burning program will set back succession and increase edge. Clearcutting, and selective thinning will also open up areas which will promote deer browse. To supplement the management programs, deer food plots may also be an effective tool to increase the number of deer.

1318. FGC and DEP will continue to test and evaluate on an interim basis the effectiveness of supplementing the prey base for panthers in the FSSP.

In March 1986, twelve radio-collared sterilized hogs were released in FSSP and the southern Golden Gate Estates to examine the feasibility of supplementing the diets of 2 adult female panthers. One hog was killed by an adult male panther on July 14, 1986. Other predators, including black bears and an alligator, killed 4 others. Three were taken by humans and 4 were lost due to radio failures or unknown causes. All hog collars failed or were collected by January 1, 1987 (Maehr, pers. comm 1987). Additional experimental releases should be attempted using deer to temporarily supplement the prey base for selected individuals that are in poor physical condition.

132. NPS, FWS, and FGC will establish a monitoring program for prey species at EVER, BCNP, FSSP, FPNWR, and selected private lands.

Following the development and implementation of management techniques identified in 131, long term monitoring must be carried out to determine their effectiveness.

133. FWS, FGC, NPS, MSIT, and DEP will evaluate the need for, and if necessary provide, increased law enforcement throughout the year.

The illegal taking of deer and hogs out of season, and taking more than the legal limit during the season, may be a serious problem. To curtail these activities, increased law enforcement may be necessary in certain areas in south Florida. This may require reassigning officers or hiring additional ones for these areas.

14. Maintain and expand clearinghouse operations for obtaining and compiling panther records throughout the entire historical range of the-subspecies.

Each year many panther sightings are reported from Florida and elsewhere within the former range of the species. A central clearinghouse has been established in Florida so that all in-state reports can be investigated and categorized. The clearinghouse concept will be expanded to include all states within the former range of panthers by the FWS with cooperation of respective states. It is necessary that all panther reports are evaluated so that no possibility of surviving populations is overlooked.

15. Monitor panther populations.

Once the extant populations of panthers are known, it will be necessary to periodically monitor the status of each population.

151. NPS will monitor the population in EVER and assist FGC in BCNP.

The NPS will monitor the population in EVER. This is probably the only population virtually free of human disturbance. NPS will assist FGC in a monitoring program at BCNP.

152. DEP will assist FGC in monitoring panthers at ESSP.

A few panthers remain at FSSP. DEP has the responsibility for management of this tract. DEP should assist FGC in the monitoring efforts.

- 153. FGC will offer to assist MSIT in monitoring panthers at the Reservations.
- 154. FGC will offer to monitor panthers on selected private lands in cooperation with landowners.

Over one-half the known panther population occurs on private lands. It is imperative that monitoring this segment of the population be initiated, especially in view of habitat loss due to the accelerated growth of citrus production and other agricultural operations in south Florida.

- 155. FWS will monitor panthers at FPNWR.
- 16. FWS will assess the potential benefits of designating critical habitat.

It should be ascertained whether a designation of critical habitat will aid in the conservation and recovery of the Florida panther.

- 17. Establish FPIC.

The FPIC was established in May 1986 to enhance the implementation of all necessary conservation efforts. The long term goal of this Committee is to restore the panther to non-endangered status in the wild by assuring coordinated implementation of the Florida panther recovery plan. The committee is comprised of the Agency persons having the authority to make decisions regarding primary actions necessary for the recovery of the panther. The agencies having this primary responsibility are FWS, NPS, FGC, and DEP. Other agencies will be requested to participate as needed.

- 171. Establish technical subcommittee.

The objectives of the Technical Subcommittee are to 1) insure technical coordination between agency actions to recover the Florida panther; 2) provide technical staff support and advice to the FPIC on any issue; 3) provide

recommendations to the FPIC on specific actions; and 4) revise the recovery plan as needed. Expertise and input from other appropriate sources will be utilized by the subcommittee in accomplishing these objectives.

172. FWS will designate a Florida Panther Coordinator.

In order to supplement and increase FWS involvement in panther issues and activities, a full-time coordinator will be designated.

173. Develop Participation Schedules.

FWS, FGC, DEP, and NPS and the other involved agencies and groups will develop individual participation schedules which outline specific commitments to implement tasks contained in the implementation schedule of the recovery plan. These participation schedules will outline what will be done and when and document available funding.

18. FWS, NPS, FGC, DEP, FDOT, and MSIT will continue to evaluate present laws and regulations regarding hunting, ORV use, and public use in general, and to make changes necessary to insure the panther and its prey are protected.

There are many State and Federal laws and regulations that protect wildlife and the natural environment on lands under State or Federal jurisdiction. Some of these laws and regulations have been changed in recent years to benefit the panther. Agencies responsible for the panther must continue to review these laws and regulations in light of new information on the panther, and modify them where necessary. FGC has taken action, in cooperation with DEP, to close hunting of deer and hogs in that portion of Fakahatchee Strand lying south of Alligator Alley effective July 1, 1987.

19. Federal, State, and local agencies will implement habitat protection measures.

If the habitat of the panther is not protected and managed, the panther probably will not survive. It is incumbent on all agencies to do whatever they can to insure that their management and regulatory programs are compatible with panther recovery efforts.

191. All Federal, State, and local agencies will review their respective policies regarding land management and regulatory functions to insure actions are consistent with panther conservation.

All agencies should review agency policies that affect lands under their jurisdiction in south Florida, and insure that those policies benefit the panther. This may require policy revisions in some cases. Regulatory agencies must also utilize their authorities to insure that the panther and its habitat receive maximum allowable protection. The comprehensive Habitat Management Plan under task 221 will provide important guidance and direction needed by agencies in accomplishing this.

- A. FWS, FGC, NPS, and DEP will develop a contingency plan, including implementing criteria, for the removal of all free-ranging panthers from the wild.

If it is determined that panthers are unable to survive in the wild, the remaining animals will be removed from the wild and placed in facilities suitable for maintaining and breeding them in captivity.

- B. Federal and State Agencies should acquire land essential for the survival of the panther.

As lands are identified as essential for the panther, they should be acquired and appropriately managed by the responsible agencies.

- B1. FWS will establish FPNWR.

FWS has initiated acquisition actions for this refuge, which will total approximately 32,000 acres in size and be located north of Alligator Alley and west of SR-29. The Service should close on this very important tract of land as soon as possible. An Environmental Assessment on the acquisition of this tract has already been prepared by FWS.

- B2. FWS will staff and fund FPNWR.

B3. DEP will acquire "in-holdings" in FSSP.

DEP has established a field office in Naples to accelerate acquisition of these important habitat areas. They are in the process of purchasing land along the perimeter of FSSP which lies south of Alligator Alley and west of SR-29. DEP will also purchase "in-holdings" within the preserve. Only when all of the private lands in the preserve are under public ownership will DEP be able to pursue an aggressive management program for the panther there. Until such time, DEP must take into consideration the impact any program will have on private landowners in the area.

B4. FDOT, NPS, FWS, DEP and FGC will acquire additional lands as a result of the construction of I-75.

As part of the I-75 Interstate Highway project, State and Federal governments will purchase lands not scheduled for access to the Highway. This extensive acquisition project will increase considerably the amount of acreage in public ownership and has been identified as essential to the recovery of the panther.

B5. CARL program should aggressively pursue the purchase of lands within Golden Gate Estates, south of Alligator Alley.

DEP's field office in Naples is presently involved in acquisition efforts for these lands which are occupied by the panther and are considered essential to its recovery.

B6. Secure Jet Port Property.

Panthers have recently been documented on this tract which is owned by Dade County. FGC and NPS currently have separate agreements with the County dealing with various activities including regulating some types of recreational use and fire management. The FPIC should evaluate the existing agreements to determine if additional features should be incorporated in order to provide for improved conditions for the panther. Furthermore, should an action or actions be contemplated in the future by Dade County which would likely significantly reduce the value

of the property as panther habitat, immediate steps must be taken by the FPIC to provide for an appropriate level of long-term security of the habitat. This could be accomplished through fee title acquisition or some other appropriate means.

2. Establish positive public opinion support for the management of Florida panther.

To actively pursue a recovery program, it is essential the public understand and support the effort. It is incumbent on every agency involved to insure its part in the recovery effort is clearly explained to the public.

21. Establish Public Affairs Subcommittee to inform the public about the panther and its habitat requirements.

The most important effort in the recovery of the panther must be directed at protecting its habitat. The public must be made aware of the uniqueness of this animal, its specific habitat requirements, and the need to preserve the integrity of the habitat through TV, radio, and newspaper and popular articles. The Public Affairs Subcommittee will consist of a representative from each agency on the FPIC.

211. FGC, FWS, DEP and NPS will work with sportsmen and other recreational users to encourage cooperation to provide maximum protection for the panther.

The hunting community can be a valuable ally in the protection and recovery of the panther. It is imperative that the agencies work with these groups to insure that the value of the panther is recognized and their active participation in panther conservation is solicited.

212. FGC, FWS, DEP, and NPS will work with conservation groups to encourage support for the recovery efforts for the panther.

Several conservation organizations have been extremely supportive of efforts to protect the panther. These organizations should be kept informed of progress made in the recovery effort. The proper distribution of the Florida panther newsletter, "Coryi," will aid in accomplishing

this.

213. FDOT, DEP, and NPS will post interpretive road signs on Alligator Alley, SR 29, Tamiami Trail, and other roads as necessary.

As tourism increases in south Florida, it is important to alert drivers about the panther. Panthers have been killed or injured on all three of these highways over the last several years. At present, interpretive road signs have been posted in certain areas warning motorists about the panther and the need to drive with caution. Similar signs may be required on other highways as well, such as US-27.

214. Federal and State holdings, such as EVER, BCNP, FSSP and FPNWR will distribute literature about the panther, its habits, and ways the public can assist in its recovery.

As tourism increases, visits to Federal and State installations will increase. It would be useful to distribute literature about the panther and the recovery efforts at these facilities. This literature should identify ways the public can help in the effort, and provide addresses where more information can be obtained, or a monetary contribution submitted.

215. All agencies will participate in the production and distribution of audio-visual aids.

To reach more of the general public with information about the panther and its needs, movies, slide, and video programs should be presented to church groups, schools, fraternal organizations, etc.

216. FDOT will develop a "Traveler Information Service" for radios on Alligator Alley, SR-29, Tamiami Trail, and other roads as necessary.

This service will alert motorists about the panther and protective traffic regulations in the areas involved.

217. FWS will develop a "popularized" recovery plan for distribution to the general public.

A technique that has not been attempted before is to prepare a "popular" version of a Recovery Plan. This document should explain how a private citizen can become involved in the recovery effort and facilitate participation in recovery through donations or by other types of support for management agencies. It will be reviewed and approved by the FPIC prior to distribution.

22. Involve private landowners in the recovery of the panther.

Over half of the known panthers survive on private lands. To recover this species, it is important that private land owners become actively involved in the recovery effort.

221. FWS and FGC will develop a Comprehensive Habitat Management Plan for the panther on private lands, in cooperation with the landowners within the known distribution of the panther.

As the human population of south Florida continues to grow and agriculture expands into previously undisturbed areas, more and more of the large private land holdings will be sold or otherwise removed from cattle ranching and converted to subdivisions, citrus or other row crops. This will compromise prime panther habitat that supports large numbers of prey species. In an attempt to provide for the panthers on these lands, FWS and FGC will work in cooperation with the principal landowners, to develop a Comprehensive Habitat Management Plan that will address development issues and habitat management programs. The Management Plan should address the management needs of the total system in order to better evaluate the impact of individual projects, identify the need to provide wildlife corridors across south Florida, maintain habitat for prey species and for panthers, and outline projects landowners can undertake to enhance the survival of both. DEP will participate for those lands that are part of, or immediately adjacent to, the Fakahatchee Strand system. It is necessary to gain private landowners' cooperation in this endeavor, otherwise private lands to the north of BCNP may become fragmented and unsuitable for

panthers. Realizing that today's economics require the landowner to use his land for economic gain, the plan will also develop a full range of economic incentives. This will cover such things as purchase of the remaining woodlands, wildlife and hunting easements, and any other viable methods of protecting panther habitat and food sources, while providing the landowner economic compensation. In order to enhance the actual application of the Habitat Management Plan, it should be integrated with all appropriate local governmental comprehensive plans.

3. FGC will reintroduce Florida panthers into areas of suitable habitat.

Areas that appear to be suitable panther habitat occur outside of south Florida and are apparently unoccupied. Successfully introducing Florida panthers into such areas would help reduce the risk of extinction for the subspecies. In order to re-establish populations suitable Florida panther stock will have to be introduced into areas where re-establishment is socially and ecologically sound.

31. Determine where areas of suitable habitat exist.

The first and most important task in the re-establishment of Florida panthers into unoccupied areas is to determine if suitable habitat still exists within the historic range, other than south Florida. The best way to determine if an area is suitable for panthers is to introduce panthers and monitor them. However, because of the endangered status of Florida panthers, these preliminary introductions need to be initiated using a non-endangered subspecies as a surrogate.

311. Develop priority list of potential reintroduction sites.

The study area for these initial re-establishment efforts will be chosen from a priority list of potentially suitable areas which will be determined using standardized evaluation criteria. The primary factors in determining the suitability of an area for a panther population are landowner cooperation, size, prey base, land use, and the human population density surrounding the area. A panther habitat evaluation criteria form will be developed and mailed to FGC biologists and others knowledgeable regarding large tracts of land potentially suitable for

panther reintroduction.

312. Coordinate panther reintroductions with private, State, and Federal landowners.

Landowner attitudes concerning the re-establishment of panthers and landowner management priorities need to be taken into consideration when choosing reintroduction sites. It is generally accepted that public ownership of panther habitat gives greater protection against future habitat loss due to human developments. Depending on the goals and policies of the managing agency, however, this benefit can be offset by emphasis on management programs that do not feature the panther. Since the U.S. Forest Service and Department of Defense own large tracts of land within the historic range of the panther, consideration will be given to utilizing such areas as potential re-establishment sites. Habitat management schemes that enhance deer density or management for increased densities of wild hog populations may not be compatible with landowner management policies. Also the landowner(s) may have reservations about the re-establishment of panthers due to concerns over personal liability, the threat of livestock depredation, and hunting privileges.

313. Public attitudes toward panther re-establishment will be determined in the vicinity of potential reintroduction sites.

Apart from an area having the necessary components of good panther habitat, people who live around the reintroduction site must be supportive of the idea of panther introduction. Public attitudes will probably be the major factor affecting success of re-establishment efforts, and these attitudes need to be examined prior to any trial releases. Once public attitudes have been determined, information and education (I&E) efforts can be directed toward cultivating public acceptance of the program. A statistician will be consulted on the design and analysis of questionnaire and interview surveys. Surveys will be conducted in the vicinity of potential panther habitat to determine public attitudes toward re-establishing panthers. Public meetings will be conducted and television programs, slide series, and popular literature will be

produced and distributed to enhance public attitudes as appropriate.

314. Potential reintroduction sites will be surveyed for the presence or absence of parasites and infectious diseases potentially harmful to panthers.

Roelke et al. (1985) have identified several major diseases and parasites that may be complicating Panther survival in south Florida. Potential reintroduction sites need to be surveyed for these diseases and parasites and appropriate actions taken where necessary to deal with them. A statistically adequate sample of small carnivores will be collected in the areas potentially suitable for panther reintroduction. Through necropsy, serology, and live-capture blood work, these animals will be tested for parasites and infectious diseases associated with panthers.

315. The presence or absence of existing panthers in potential reintroduction areas will be determined by conducting field searches.

A survey will be made in potential reintroduction areas to determine whether or not panthers already exist in the area. This will be done to avoid possible disruption of the social structure of any existing populations and to avoid Florida panther hybridizations with any released/escaped captive animals of other subspecies. A system of transects utilizing woods-roads and firelanes will be established and surveyed for the presence or absence of panther sign in areas that meet the criteria of panther habitat.

32. Determine the feasibility of using captive-bred offspring in the re-establishment or supplementation of Florida panther populations.

There are two primary methods to be considered in obtaining panther stock for reintroduction. These are the translocation of adult or subadult animals directly from the wild to the reintroduction area and the translocation of wild-caught stock into a captive situation where they would be kept as brood stock in a captive-breeding program with the properly conditioned offspring being introduced into the wild. Both of these methods need to be objectively evaluated using surrogate subspecies.

321. An evaluation will be made to determine if wild-caught adult panthers can successfully produce offspring in captivity.

In the wild to captive-breeding method of obtaining reintroduction stock, the initially captured panthers could come from any age class. Bringing adult animals into the program from the wild would provide earlier offspring if they can be successfully bred. Due to an unfortunate highway accident, a young adult male Florida panther is presently available for use in the captive breeding program. He will need to be tested for breeding performance. The most time-consuming, but more conservative approach, would be to first capture kittens in the wild and hand raise them for use as breeding stock. Data collected during radio-telemetry studies in south Florida indicate that if a female loses a litter, she will recycle and produce a second (Belden, unpublished data). By taking an entire litter of kittens for use in the captive-breeding program, the wild female should produce a second litter resulting in very little impact on the resident population. Experts familiar with captive breeding of large cats will be consulted for advice on all aspects of the captive breeding program.

3211. The primary captive-breeding facilities will be built at White Oak Plantation.

Even though the primary breeding facilities will be maintained at White Oak Plantation, consideration may be given to establishing a second program elsewhere. Not only might this provide for an enhanced level of overall safety to the captive-breeding effort, it may also allow for differences in breeding techniques and approaches to be tested and evaluated, possibly resulting in a significant saving of time. Two or three wild-caught female panthers from a non-endangered panther subspecies will be obtained and moved to the White Oak Plantation. The non-endangered female panthers will be bred to the male Florida panther already in captivity.

322. Offspring obtained from the Florida panther and non-endangered panther matings will be conditioned for release into the wild.

Offspring will be conditioned for release into the wild by placing them and their mothers in large pens where the kittens will learn to make kills and survive on their own. The necessary conditioning facilities will be built at White Oak Plantation. The captive-bred offspring will be surgically sterilized, radio-instrumented, and moved to the conditioning facilities with their mothers at approximately six months of age. The mothers will remain with the offspring while they learn to hunt and feed themselves.

323. The feasibility of re-establishing panther populations with captive-raised animals will be determined.

The conditioned captive-raised offspring will be transferred into a previously determined suitable wild area and monitored daily for at least one year. At the end of the one year evaluation period the captive raised offspring will be recaptured and removed from the wild.

324. Captive-raised panthers will be used to supplement existing populations where necessary.

If it is determined that captive-raised panthers can be successfully reintroduced into the wild, they can be used to supplement existing populations where necessary. The feasibility of these supplementations would have to be determined on a case by case basis. They would generally be in areas where sufficient resources were available to support a higher panther population, but recruitment was unable to provide the natural increase.

33. Determine the feasibility of using translocated wild panthers in the re-establishment of Florida panther populations.

The only work done to date where panthers were translocated from one area to another is that of McBride (1977), in which eight panthers were translocated from the desert mountains of the Trans-Pecos to a flat subtropical area of south Texas. Transmitter failure resulted in the almost immediate loss of three, but conclusive data were obtained from the remaining five. The

transplanted panthers adapted easily to the new terrain, even though it contrasted greatly to their previous habitat. If this technique works and surplus Florida panthers are available, it would be the easiest and most economical method of re-establishing populations.

331. Three wild-caught adult females and two wild-caught adult males from a non-endangered subspecies will be obtained and transferred to Florida.
 332. These animals will be surgically sterilized, fitted with radio-transmitter collars, and release into suitable wild areas.
 333. These animals will be monitored daily for at least one year.
 334. At the end of the evaluation period, the translocated non-endangered subspecies will be recaptured and removed from the wild.
34. Properly conditioned Florida panthers will be introduced into the wild if determine feasible.

When the best alternative is determined, the appropriate Florida panthers can be captured for translocating or use in the captive-breeding program. Properly conditioned Florida panther stock can then be introduced into suitable habitat and monitored to evaluate the success of the reintroduction.

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III. IMPLEMENTATION SCHEDULE

GENERAL CATEGORIES FOR IMPLEMENTATION SCHEDULE

Information Gathering - I or R (Research)

1. Population status
2. Habitat status
3. Habitat requirements
4. Management techniques
5. Taxonomic studies
6. Demographic studies
7. Propagation
8. Migration
9. Predation
10. Competition
11. Disease
12. Environmental contaminant
13. Reintroduction
14. Other information

Other - O

1. Information and education
2. Law enforcement
3. Regulations
4. Administration

Management - M

1. Propagation
2. Reintroduction
3. Habitat maintenance and manipulation
4. Predator and competitor control
5. Depredation control
6. Disease control
7. Other management

Acquisition - A

1. Lease
2. Easement
3. Management agreement
4. Exchange
5. Withdrawal
6. Fee title

TASK PRIORITIES

Priorities in Column 4 of the following Implementation Schedule are assigned as follows:

Priority 1 - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.

Priority 2 - An action that must be taken to prevent a significant decline in species population/habitat quality, or some other significant negative impact short of extinction.

Priority 3 - All other actions necessary to provide for full recovery of the species.

IMPLEMENTATION SCHEDULE COST INFORMATION

1. Cost estimates are for planning purposes and will be reflected through agency budget processes as new research findings or management information dictates.
2. All agencies will strive to carry out all tasks identified in the implementation schedule. However, this will be contingent upon appropriations, personnel availability and other constraints. Each agency has developed individual Participation Schedules which outline specific tasks the agency will accomplish and the time frame for accomplishment.
3. Some routine agency activities that do not lend themselves to separating out costs for Florida panther recovery such as ongoing law enforcement, coordination or other programs, may not be included in the schedule.
4. Land acquisition costs are not included in this schedule because these efforts serve multiple resource objectives.
5. Costs may rise or be modified for future years as current research programs provide management recommendations that are currently not planned. Additionally, the initiation of some tasks are contingent on the completion/results of others. Therefore, target dates for some actions may require adjustments over time.

LIST OF ABBREVIATIONS

APC	= Abomasal parasite count
BCNP	= Big Cypress National Preserve
BIA	= Bureau of Indian Affairs
CARL	= Conservation and Recreation Lands
DEP	= Florida Department of Environmental Protection
DOD	= Department of Defense
EVER	= Everglades National Park
FDHS	= Florida Department of Highway Safety and Motor Vehicles
FDOT	= Florida Department of Transportation
FGC	= Florida Game and Fresh Water Fish Commission
FHP	= Florida Highway Patrol
FPIC	= Florida Panther Interagency Committee
FPNWR	= Florida Panther National Wildlife Refuge
FS	= U.S. Forest Service
FSSP	= Fakahatchee Strand State Preserve
FWS	= U.S. Fish and Wildlife Service
GIS	= Geographic Information System
GMP	= General Management Plan for Big Cypress National Preserve
HPP	= Florida Panther Habitat Preservation Plan
I & E	= Information and Education
JZP	= Jacksonville Zoological Park
LO	= Landowners
LPZ	= Lowry Park Zoo
MM	= Miami Metrozoo
MSIT	= Miccosukee and Seminole Indian Tribes of Florida
MVP	= Minimum viable population
NPS	= National Park Service
ORV	= Off-road vehicle
SFWMD	= South Florida Water Management District
SR	= State Route
VA&SSP	= Population Viability Analysis and Species Survival Plan
WOP	= White Oak Plantation
ZOOS	= Participating breeding facilities

IMPLEMENTATION SCHEDULE

(Revised June 1994)

Florida panther (Recovery Priority #6C)

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency	Estimated Fiscal Year Costs (in thousands)					Comments/Notes
						FY-1*	FY-2	FY-3	FY-4	FY-5	
R-1 R-3	Conduct radio-telemetry studies in NPS south FL units	1111	1	Completed	NPS	-	-	-	-	-	EVER study completed in '91. BCNP study completed in '92. Monitoring underway (See Task 151).
R-1 R-3	Conduct radio tracking studies in FSSP & BCNP	1112	1	Completed	FGC	-	-	-	-	-	Initiated in '81. Most studies completed in '90. Study of panther removal impacts on wild population completed in '93. Monitoring underway (See Tasks 151 & 152).
R-1 R-3	Expand studies to private lands N of Alligator Alley	1113	1	Completed	FGC	-	-	-	-	-	Initiated in '87. Studies completed in '90. Monitoring underway (See Tasks 153 & 154).
R-1 R-3	Conduct panther surveys at FPNWR	1114	1	Continuing	FWS	-	-	-	-	-	Initiated in '89. FGC carries out radio-telemetry work (see Task 155). FWS conducts track surveys. FGC costs reflected in Task 151. FWS costs reflected in Task B.2.
M-3 O-1	Post warning signs and reflectors	1211	2	Continuing	FDOT	-	-	-	-	-	Routine. Initiated in '85.
O-3	Reduce nighttime speed limits	1212	1	Continuing	FDOT	-	-	-	-	-	Initiated in '85. FGC carries out most enforcement under routine activities.
O-4	Develop plan for emergency veterinary aid	1213	1	Continuing	FGC	-	-	-	-	-	Plan being developed. Costs reflected in Task 122.
O-2 O-4	Develop protocol for handling dead panthers	1214	3	Completed	FGC	-	-	-	-	-	Necropsy protocol developed 3/92.
M-3	Modify hazardous roadways	1215	1	Continuing	FDOT	-	-	-	-	-	No costs estimates. 36 wildlife crossings/bridge extensions have been installed under I-75 through Big Cypress Swamp in Collier County. 2 experimental design crossings were placed in SR-29 in '94. Additional crossings under consideration for planned work on US-1. Approximately 4 miles of SR-29 were modified in '86. Additional modifications underway.
R-11 M-6	Identify panther diseases	122	1	Continuing	FGC	125	125	125	125	125	Studies initiated in '84 & are continuing. Costs shown in this task cover entire medical management program.

*Costs figures represent estimated cost to carry out action, not funds actually available. FY-1 represents either the current year (FY-94) for tasks already initiated or the first year for tasks yet to be initiated.

IMPLEMENTATION SCHEDULE

(Revised June 1994)

Florida panther (Recovery Priority #6C)

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency	Estimated Fiscal Year Costs (in thousands)					Comments/Notes
						FY-1*	FY-2	FY-3	FY-4	FY-5	
I-2	Develop cumulative effects model	123	2	4 years	FWS, FGC & NPS	-	-	-	-	-	May not be needed. Recently completed habitat projects (FGC's strategic habitat conservation planning, SFWMD's citrus study, & FPIC's HPP) have provided vast information on current habitat conditions, threats, trends, and projections.
R-1	Develop genetic profile	124	1	Continuing	FGC FWS NPS	- - -	- - -	- - -	- - -	- - -	Studies initiated in '86 in collaboration with Dr. S. O'Brien. Initial examination of S. FL subpopulations completed in '90 under FPIC jointly funded study w/Dr. O'Brien. Analyses have included allozyme, mtDNA, & DNA-FP processes. Examination continues as new individuals are captured.
I-1	Identify management options if genetic profile shows problems	1241	1	Continuing	FWS FGC	- -	- -	- -	- -	- -	Results of pop. viability analysis & species survival planning process in '89 concluded that establishment & management of a captive population was essential for panther survival. Captive population establishment initiated in '91. Viability update & genetic management workshop conducted in Fall '92. FWS approved genetic restoration strategy 6/94. Actions underway to complete tasks necessary to implement genetic management strategy.
M-7	Develop & implement strategy to restore & maintain historic genetic character	12411	1	Continuing	FPIC (FGC, FWS, NPS, DEP)	249	232	260	229	235	Actions underway to develop & implement genetic restoration strategy. An Environmental Assessment is being developed to evaluate various alternatives. A Genetic Management Plan is also under development. Implementation of genetic restoration strategy targeted for early 1995.
M-1	Establish sperm bank	1242	1	Continuing	FGC FWS	8 37	8 -	8 -	8 -	8 -	Established in '88. Refinements in technologies being developed by Dr. D. Wildt under Grant Agreement with FWS. FWS costs indicated represent costs for ongoing AI/IVF work, which includes sperm bank activities.
I-1	Develop panther population model	125	2	Completed	FGC FWS	15 -	15 -	- -	- -	- -	Initial population modelling completed as part of viability analysis in '89. Additional modelling completed during viability update & genetic workshop held in Fall '92.

*Costs figures represent estimated cost to carry out action, not funds actually available. FY-1 represents either current year (FY-94) for tasks already initiated or the first year for tasks yet to be initiated.

IMPLEMENTATION SCHEDULE

(Revised June 1994)

Florida panther (Recovery Priority #6C)

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency	Estimated Fiscal Year Costs (in thousands)					Comments/Notes
						FY-1*	FY-2	FY-3	FY-4	FY-5	
M-3	Develop Comprehensive Mgmt. Plans for public lands	126	1	Continuing	FGC NPS DEP FWS	- - - -	- - - -	- - - -	- - - -	- - - -	Routine. BCNP GMP completed 1/92, BCNP Fire Mgmt. Plan completed 7/94. Plan approved 5/94. Funded under B.2. Fire Mgmt., Annual Burn, Wildlife Inventory, & Law Enforcement Plans completed. Cropland Mgmt. Plan presently in draft form.
M-7	Inventory captive cougars	127	3	Completed	FGC	-	-	-	-	-	
I-1, 2, 3	Conduct deer studies in EVER	1311	1	Continuing	NPS	69	59	34	19	-	Original study initiated '87. Completed '91'. New study for EVER & BCNP targeted for '93-96.
M-3	Evaluate & enhance habitat conditions on public lands	1312	1	Continuing	FWS NPS DEP FGC SFWMD Collier Co. Dade Co.	- 200 59 - - - -	- 200 60 - - - -	- 200 60 - - - -	- 200 60 - - - -	- 200 60 - - - -	Initiated in '89. Funded under B.2. Underway. Underway. Routine No information available. No information available. No information available.
R-1	Continue ongoing deer studies & initiate new ones in BCNP & FSSP	1313	1	Continuing	FGC NPS	- 100	- 100	- 100	- 60	- 60	FGC studies initiated '84 & completed in '90. NPS expanded studies in '89. See Task 132 for monitoring. New studies for Addition lands scheduled to begin in '94.
R-1	Conduct deer studies in N. Fakahatchee Strand, FPNWR, & on private lands	1314	1	Completed	FGC FWS	- -	- -	- -	- -	- -	Completed in '90. See Task 132 for ongoing monitoring.
I-1	Evaluate effect of deer hunting in BCNP & FSSP	1315	1	Continuing	FGC NPS DEP	- - -	- - -	- - -	- - -	- - -	Routine. Costs reflected in 1313 FSSP was closed to deer/hog hunting effective 7/1/87.
R-1	Refine APC technique	1316	2	Completed	FGC	-	-	-	-	-	
I-1	Offer to work with Indian Tribes to evaluate and enhance deer status & mgmt. techniques on Indian lands.	1317	2	Continuing	FGC MSIT	- -	- -	- -	- -	- -	Routine No information available.

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IMPLEMENTATION SCHEDULE

(Revised June 1994)

Florida panther (Recovery Priority #6C)

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency	Estimated Fiscal Year Costs (in thousands)					Comments/Notes
						FY-1*	FY-2	FY-3	FY-4	FY-5	
R-4	Test effectiveness of supplementing prey base in FSSP	1318	3	Completed	FGC DEP	- -	- -	- -	- -	- -	12 radio-instrumented wild hogs released in 3/86 & monitored. Present position is that activity is not something to pursue further at this time.
I-2	Monitor prey species at EVER, BCNP, FSSP, FPNWR, & selected private lands	132	2	Continuing	NPS FGC DEP FWS	30 - 3 -	30 - 2 -	30 - 2 -	30 - 2 -	30 - 2 -	Costs reflected in Task B.2.
O-2	Provide law enforcement	133	1	Continuing	FGC, NPS & DEP MSIT FWS	- - - 50	- - - 50	- - - 50	- - - 50	- - - 50	Routine No information available. Does not include ongoing routine law enforcement actions.
I-1	Maintain & expand clearinghouse	14	3	Completed	FGC FWS	- -	- -	- -	- -	- -	Expanded in FL in '85. Responsibilities assigned to FGC's Regional Offices. Contacts with other States were made in 1988. Some were already operating clearinghouse-type activities. Most states feel that the panther no longer exists in their state. No additional actions planned at the present time.
I-1	Monitor panthers in EVER & BCNP	151	1	Continuing	NPS FGC	60 -	60 -	60 -	65 -	65 -	Underway. See 1111 & 1112. FGC costs reflected in 154.
I-1	Monitor panthers at FSSP	152	1	Continuing	FGC DEP	- -	- -	- -	- -	- -	Underway. FGC costs reflected in 154.
I-1	Offer to monitor panthers at Indian Reservations	153	1	Continuing	FGC MSIT	- -	- -	- -	- -	- -	Underway. Costs reflected in 154. No information available.
I-1	Offer to monitor panthers on selected private lands	154	1	Continuing	FGC	250	250	250	250	250	Underway.
I-1	Monitor panthers at FPNWR	155	1	Continuing	FGC FWS	- -	- -	- -	- -	- -	Underway. FGC costs reflected in 154. FWS costs reflected in B.2.
O-4	Assess benefits of designating Critical Habitat	16	2	Continuing	FWS	-	-	-	-	-	Routine. Initial assessment in 1/87 concluded not appropriate at time. Will be reassessed as part of the HPP implementation, likely in late '94.

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IMPLEMENTATION SCHEDULE

(Revised June 1994)

Florida panther (Recovery Priority #6C)

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency	Estimated Fiscal Year Costs (in thousands)					Comments/Notes
						FY-1*	FY-2	FY-3	FY-4	FY-5	
O-4	Establish FPIC	17	1	Completed	FWS, NPS, FGC, DEP	-	-	-	-	-	Established 5/86 & continues.
O-4	Establish Technical Subcommittee	171	1	Completed	FWS, NPS & DEP FGC	- 5	- 5	- 5	- 5	- 5	Established 5/86 & continues. Costs associated with TS activities.
O-4	Designate a Florida Panther Coordinator	172	1	Completed	FWS	80	80	80	80	80	Position established 1/87 & continues. Additionally, a position for Assistant established in '93, primarily to coordinate HPP implementation.
O-4	Develop Participation Schedules	173	1	Completed	FWS, NPS & DEP FGC	- -	- -	- -	- -	- -	Each agency has completed initial Schedules; which will be periodically updated. FWS costs covered under task 171.
O-3, O-4	Evaluate public use laws & regulations	18	2	Continuing	FWS, NPS, DEP, FGC, FDOT, MSIT	- - - -	- - - -	- - - -	- - - -	- - - -	Routine Routine No information available. No information available.
O-4	Review policies on land management & regulatory functions.	191	1	Continuing	FWS, NPS, DEP, FGC, & other State & Fed. agencies	-	-	-	-	-	Routine. Authorities will be fully utilized in support of habitat preservation needs.
M-7	Develop contingency plan for removal of panthers	A	2	Continuing	FWS, NPS, DEP, & FGC	-	-	-	-	-	Establishment of captive pop. lessens need for contingency plan.
A-7	Acquire land essential for panther survival	B	1	Continuing	FWS, NPS, DEP, FGC	-	-	-	-	-	Working group established 3/91 to develop HPP. HPP approved by FPIC 1/94. Plan focuses on cooperative programs with private landowners and emphasizes "less than fee title acquisition".
A-6	Establish FPNWR	B.1	1	Completed	FWS	-	-	-	-	-	Initial 25,000 acres acquired in 6/89. Most of remainder will be acquired through land exchange. Acquisition approx. 83% complete.
O-4	Staff & fund FPNWR	B.2	1	Continuing	FWS	520	550	575	575	575	Funding & staffing initiated in Fall '86.

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IMPLEMENTATION SCHEDULE

(Revised June 1994)

Florida panther (Recovery Priority #6C)

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency	Estimated Fiscal Year Costs (in thousands)					Comments/Notes
						FY-1*	FY-2	FY-3	FY-4	FY-5	
A-6	Acquire "in-holdings" in FSSP	B.3	1	Continuing	DEP	(Cannot be pre-determined)					Ongoing. Funding contingent on legislative appropriations. Acquisition approximately 88% complete.
A-7	Acquire lands resulting from I-75 construction	B.4	1	Continuing	FDOT, NPS, FGC, DEP, FWS	(Cannot be pre-determined)					Ongoing. Acquisition of BCNP Addition (146,000 acres) is approximately 28% complete.
A-6	Acquire south Golden Gate Estates	B.5	1	Continuing	DEP	(Cannot be pre-determined)					Ongoing. Approximately 7,300 acres acquired to date (approximately 26% complete).
A-7	Secure Jet Port property	B.6	1	Continuing	NPS, FGC	-	-	-	-	-	Consideration being given to pursuing a possible swap involving the Homestead AFB runway for Jet Port property.
O-1	Work with sportsmen	211	2	Continuing	DEP FGC, FWS & NPS	-	-	-	-	-	Routine
O-1	Work with conservation groups	212	2	Continuing	DEP FWS, NPS & FGC	1	1	1	1	1	Routine
O-1	Post interpretive signs	213	3	Continuing	FDOT DEP NPS FPNWR	-	-	-	-	-	No information available. Routine Routine Informational Kiosk along SR-29
O-1	Distribute panther literature	214	2	Continuing	FSSP NPS FWS FGC	5	-	-	-	-	Routine Routine
O-1	Produce & distribute audio-visual aids	215	3	Continuing	FGC DEP, FWS & NPS	10	10	10	10	10	Routine
O-1	Develop traveler information service	216	3	Continuing	FDOT	-	-	-	-	-	No information available.

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IMPLEMENTATION SCHEDULE

(Revised June 1994)

Florida panther (Recovery Priority #6C)

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency	Estimated Fiscal Year Costs (in thousands)					Comments/Notes
						FY-1*	FY-2	FY-3	FY-4	FY-5	
O-1	Develop "popularized" recovery plan	217	3	2 years	FWS	-	-	-	-	-	On hold pending likely need for Recovery Plan revision in '95.
M-7	Develop Comprehensive Habitat Management plans for private lands	221	2	Continuing	FGC FWS	- 50	- 50	- 50	- 50	- 50	Underway. Will be accomplished through HPP. FWS funding reflects costs associated with the Ass't Florida Panther Coordinator's position.
M-2	Evaluate & prioritize potential reintroduction sites	311	2	Continuing	FWS FGC	- -	- -	- -	- -	- -	Initial identification & evaluation of candidate sites in FL completed in 1987. Preliminary identification & evaluation of candidate sites range-wide completed in 1994. FWS costs reflected under Task 172.
M-2	Coordinate plans with private, State, and Federal landowners	312	3	Continuing	FGC FWS DOD & FS	- - -	- - -	- - -	- - -	- - -	Completed for initial Phase I surrogate study (translocation) conducted in '88 & 89. Phase II (combination translocation & captive raised/conditioned) surrogate study initiated Feb. '93 (3 yr. project). FGC costs reflected in 333. FWS costs reflected in 172.
M-2	Determine public attitudes toward reintroduction.	313	3	Continuing	FWS FGC	- -	- -	- -	- -	- -	Costs reflected in 172. Costs reflected in 333. Completed for initial Phase I surrogate study. Phase II surrogate study underway (see task 312).
M-2	Survey reintroduction sites for parasites & diseases	314	3	Continuing	FGC	-	-	-	-	-	Costs reflected in 333 for FL project.
M-2	Determine existence of panthers in reintroduction areas	315	3	Continuing	FGC	-	-	-	-	-	Costs reflected in 333 for FL project. Completed for initial Phase I surrogate study.
M-2	Determine captive productivity of wild caught panthers	321	1	Continuing	ZOOS	50	50	100	150	200	Development of captive population for breeding purposes initiated in 1991. Federal participation permits have been issued to WOP, JZP, LPZ & MM. To date, 10 panther kittens have been brought into captivity for breeding purposes. Initial breeding attempts could start in late '94.
M-2	Develop captive breeding facilities	3211	1	Continuing	JZP LPZ MM WOP	10 50 30 220	- 50 30 50	- 20 -	- 20 -	- 20 -	Breeding & conditioning capabilities being developed at institutions identified under Task 321.

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IMPLEMENTATION SCHEDULE

(Revised June 1994)

Florida panther (Recovery Priority #6C)

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency	Estimated Fiscal Year Costs (in thousands)					Comments/Notes
						FY-1*	FY-2	FY-3	FY-4	FY-5	
M-2	Condition offspring for reintroduction into wild	322	3	Continuing	ZOOS	20	50	50	50	50	Actions to develop condition technology continuing utilizing surrogate cougars produced in captivity for Phase II reintroduction experiment study. 3 of 10 animals used in initial Phase II release were captive born/conditioned cougars.
M-2	Introduce captive-raised surrogates into wild	323	3	2 years	FGC	-	-	-	-	-	Costs reflected in 333 for FL project. Experimental reintroduction (Phase II) presently underway (see task 312).
M-2	Supplement existing population as needed	324	1	As needed	FGC	-	-	-	-	-	Animals from the captive population could possibly be available for this purpose by '96.
M-2	Obtain surrogate animals for translocation study	331	3	2 years	FGC	-	-	-	-	-	Costs reflected in 333 for FL project. Initial translocation experiment (Phase I) involving surrogate cougars completed 4/89. Phase II project underway.
M-2	Sterilize, radio-collar & release surrogate animals	332	3	2 years	FGC	-	-	-	-	-	Experimental translocation initiated with release of 5 Texas cougars in 6/88. After 10-months, remaining 2 cougars were removed from reintroduction area in 4/89. Additional experimental releases underway (see task 312). Costs for FL project reflected in 333.
M-2	Monitor surrogate animals	333	3	2 years	FGC	225	225	225	-	-	Phase I animals monitored from 6/15/88-4/19/89. Phase II monitoring underway (initiated Feb.'93).
M-2	Recapture & remove from the wild	334	3	2 years	FGC	-	-	-	-	-	Costs for FL project reflected in 333. Last cougar from Phase I study removed from wild 4/19/89. Phase II still underway.
M-2	Reintroduce Florida panthers into the wild	34	3	Continuing	FGC	-	-	-	-	-	Reintroduction actions will be initiated when sites have been selected and panthers for reintroduction purposes are available, not likely for 5-10 years.

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APPENDIX A

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APPENDIX B.

Summary of Comments and FPIC Response for June 1987 Revision

This revised Florida Panther Recovery Plan was drafted by the Technical Subcommittee of the Florida Panther Interagency Committee and distributed to approximately 120 individuals and organizations for review on October 31, 1986. Comments were received from 24 reviewers.

The comments ranged from very non-specific general comments basically supportive of the plan and recovery efforts, to detailed section by section review and comment.

All comments received were carefully reviewed and studied by the Technical Subcommittee and incorporated into the plan as determined appropriate.

There were numerous comments which were directed toward specific points of concern that could be handled through simple editorial changes or corrections as appropriate.

The following discussion provides a narrative summary of the major comments received and as appropriate, how they were handled. As much as possible, in order to enhance continuity, the comments have been grouped into broad major categories of discussion.

I. General

Comment: Major shortcomings of the plan in general as expressed by some reviewers were that the plan needed expanding to provide more detail, more innovative and ambitious strategies not more of the same (status quo), was too open-ended and should present the worst case scenario.

Response: Because of a general lack of available biological data and knowledge on the Florida panther, the plan has to be somewhat open-ended and lacking in detail in some respects. But this should not present a problem. The purpose of the plan is to identify to the extent possible/practical the major causative agents to the panther's endangered status and to provide for the immediate initiation of actions which are viewed as necessary to overcome these problems. As additional data are developed during the recovery process, the plan can be amended to identify additional actions needed. It is the feeling of the FPIC that this plan has identified and addressed the issues relative to the panther as known at this point in time and has developed practical, achievable recovery strategies based on available data, information, and knowledge.

Comment: Considerable comments surfaced relative to the urgency of actions needed, specific dates, time frames, and costs should be identified as well as specific agency responsibility/commitments.

Response: The inclusion of the targeted starting dates (fiscal year), task duration, costs estimates, and responsibilities for all tasks in the Implementation Schedule as presented in this final plan should address most of these concerns. It should also be pointed out that the initiation/ implementation of some tasks are contingent on the completion/results of others. Therefore, target dates will have to be somewhat flexible in some cases.

Comment: There were several comments relative to the assigned task priorities in the implementation schedule.

Response: Numerous changes have been made and the present assigned numbers should accurately reflect priority ranking as based on the guidance provided on page 51 of the plan.

II. Florida Panther Interagency Committee/Technical Subcommittee/ General Coordination

Comment: Some commentators felt that the role/function of the FPIC/TS should be better defined and membership expanded. Others made recommendations as to specific duties, responsibilities, and activities that the FPIC/TS should be involved in. These ranged from such actions as providing review, oversight and coordination relative to plans/actions on public lands, to reviewing and commenting on permit applications at the state and federal level. There were also numerous comments recommending that recovery needs/actions be coordinated with various agencies, groups and individuals.

Response: It is felt that the plan adequately addresses the general role/function of the FPIC/TS. More detailed specific information and guidance is contained in the Memorandum of Agreement dated May 28, 1986 which established the committee. Consideration

to expanding the representation on the committee has been addressed on several occasions. The present consensus is that the committee can probably more successfully function under its present make-up. However, various other agencies/individuals will be requested to attend and participate in committee/subcommittee meetings and functions as appropriate. Input from non-representative entities is considered critical to the successful functioning of the committee and will continue to be requested and utilized to support its efforts. The committee will continue to provide oversight and guidance to member agency plans and actions and will actively involve and be involved in non-member activities affecting the Florida panther. It will continue to provide guidance and direction to all panther recovery efforts. However, to be successful the importance of complete and total coordination and cooperation from the smallest landowner to the largest government agency cannot be over emphasized. Numerous changes have been made in the plan to reflect this need.

III. Research/Studies

Comment: Considerable comment was received relative to various aspects of the plan dealing with research and studies. Some reviewers felt that we could not afford to wait for the research/study data to become available, that we must act decisively now. This point was brought up several times as it relates to establishing a viable population figure. It was also recommended that we should rely more on existing data on other species/subspecies and not wait for specific data on the Florida panther.

Response: It should be pointed out that considerable data is now becoming available relative to the panther and its primary prey species, the white-tailed deer, as a result of research/study efforts initiated within the last few years. This critical data will aid in developing management and protection strategies and decisions. It along with other appropriate data already available, whether on the Florida panther or other species/subspecies will provide the foundation and guidance upon which to initiate a coordinated, intensive recovery effort. Additional information will continue to become available as ongoing efforts continue and new efforts are initiated. All available data will be fully utilized to complement, refine, adjust and improve management and protection strategies in order to ensure a state of the art recovery effort.

IV. Protection/Management

Comment: There were many comments, some rather general in nature and some fairly specific, that addressed such broad topics as panther and deer habitat issues, highway and other hazards, management and protection needs, disturbance, etc. Some of these were specific to public lands and some related to private lands only. Comments on these issues will be addressed under other headings later, as appropriate.

The major theme around which most comments were based is the fact that we are dealing with a critically endangered animal whose dwindling habitat is continually being exposed to increasing competition and demands from the human element. These demands occur in many forms, including habitat loss through land use changes, habitat and food competition and disturbance from various forms of recreation (hunting, ATV/ORV use, etc.), road hazards, etc. Commentors expressed concern that major emphasis must be placed on all fronts to reduce the human/panther competition and hazards and protect the habitat that remains.

Response: As mentioned earlier some of these concerns will be addressed in following sections. The FPIC recognizes and agrees with the position that actions must be initiated to enhance the level of protection presently being provided the panther and its habitat. The revised recovery plan calls for a coordinated effort involving all levels of government to utilize their management and regulatory authorities and capabilities to provide the maximum level of protection possible, both to the panther and its habitat. Speed limits on critical roadways will be highly regulated. Road construction and modifications in habitat areas will incorporate safety features designed to provide for an enhanced level of protection. The FPIC will continue to evaluate and develop ways to better preserve and enhance existing habitat and develop strategies to address public use conflicts.

V. Acquisition

Comment: Directly related to the above topic on habitat protection, is acquisition. Several commentors stressed the importance of an active acquisition plan emphasizing speed and consisting of specific timetables.

Response: The FPIC recognizes that habitat preservation whether it be by acquisition or some other means is the key to the long-term survival of the Florida panther. The recovery plan presents a general summary of key acquisition needs as presently identified. However, a much more comprehensive document addressing short-term habitat preservation needs has already been developed (Fakahatchee Strand: A Florida Panther Habitat Preservation Proposal). This 69 page document was developed through a cooperative effort between the FWS, NPS, and the State of Florida and recommends a "team approach" to preserving approximately 88,000 acres of panther habitat in the Fakahatchee Strand area of the Big Cypress Swamp. This area represents only a small fraction of the total area considered critical to the survival of the panther in south Florida. However, the successful preservation of this area, coupled with vast land areas already under public control, along with other important areas identified in

the recovery plan for protection, should provide the land area necessary for panther survival in south Florida. Each agency represented on the FPIC will develop a detailed acquisition plan, including target dates, which will be a part of Comprehensive Land Management Plans to be developed by each agency as referenced in the revised recovery plan. Acquisition is considered a high priority activity by the FPIC and consequently will receive special emphasis.

VI. Public Lands

Comment: Considerable comment relative to public lands was received. It basically ranged from a recommendation that the level of human-panther competition should be explored, to taking all public lands, establishing a panther preserve and eliminating all activities detrimental to panthers. Specific topics identified included the recommendation for a single management plan for public lands, supplementing the prey base, exotic vegetation control, natural systems management, recreational use, prey base management, hunter check stations, poaching, food plots, burning, salt blocks, etc.

Response: The final revised recovery plan incorporated many of the specific recommendations as presented. A major addition to the plan which will provide a means to incorporate the other appropriate recommendations is task 126. This task requires each FPIC agency to develop a Comprehensive Land Management Plan to address panther needs on their respective lands. These plans will be geared to enhancing habitat conditions for panthers and will address all facets of each agency's on-site management/ protection responsibilities and capabilities, such as fire, water, recreation, vegetation, etc. The basic theme of each plan will be that the long-term survival of the panther in south Florida will likely be dependent upon the preservation and appropriate management of lands under public control and each agency will maximize the use of their authorities and capabilities to this end. Each plan will be subject to the review of the FPIC.

VII. Private Lands

Comment: The importance of private lands was strongly emphasized by several commentors. The need for management strategies and habitat protection efforts was stressed.

Response: The importance of private lands to the panther is recognized by the FPIC and is evidenced by the fact that current data indicate that possibly up to one-half of the panthers occurring in south Florida presently occupy private lands. Because of this fact, the FPIC places high priority on the protection and management of panther habitat occurring on private lands. Special emphasis will be placed on working with these landowners and closely coordinating all recovery efforts with them. A Comprehensive Land Management Plan will be developed for private lands. The cooperation and assistance of all landowners will be vital in the implementation of recovery efforts. All governmental agencies will be requested to utilize their full regulatory authorities and capabilities to ensure that maximum protection is afforded all panther habitat areas.

VIII. Captive Breeding/Population Enhancement

Comment: These topics received a significant level of comment. They ranged from a position of wholehearted support of using surgically sterilized hybrids in the reintroduction studies to a position that data obtained from such efforts will be worthless and a waste of funds and time. There was also significant comment relative to matters dealing with reintroduction sites and efforts. Outbreeding was also mentioned, as was the importance of consulting with and involving others in this effort.

Response: As is the case with most of the other biological needs and efforts identified within the plan, there is a total void of information and data relative to reintroduction efforts involving the Florida panther. This, coupled with the fact that all activities associated with the reintroduction effort must be carried out in a manner to have minimal impacts on the critically low population in the wild, will require a cautious step-by-step strategy utilizing all information, expertise, and assistance available. This will include decisions on the use of surrogate animals, selection of reintroduction methods and sites, time frames, etc. The FPIC views this section of the plan as extremely important and its success will be critical to achieving the recovery objective as identified in the revised recovery plan. Various tasks necessary for this effort have already been initiated and an orderly progression through successful reintroduction is provided for in the implementation schedule. The matter of initiating outbreeding is considered premature at this point, but depending on population status, etc., may be pursued at some point in the future as a last resort effort.

IX. Summary

The FPIC recognizes that the Revised Florida Panther Recovery Plan will not necessarily meet the satisfaction of all entities concerned about the plight of the Florida panther. However, it is felt that the plan accurately reflects the basic problems associated with the Florida panther and presents an orderly, workable plan of action based on the present state of knowledge and information to ensure its continued existence. Sufficient checks and balances will be provided for in the implementation of the plan to ensure

that all decisions are based on the most accurate information available. It is the opinion of the FPIC that the Florida panther can be recovered. However, it will not be easy and it cannot be done within a short time frame. Successful recovery efforts will require the cooperation and assistance of many entities, ranging from landowners within and adjacent to key habitat areas to the largest governmental department.

Summary of Comments Received on the August 1994 Draft Revision

Written comments on the August 1994 Technical/Agency draft were received from five entities (Archbold Biological Station, Florida Panther Technical Advisory Council, Florida Wildlife Federation [with enclosure from Mr. Al Ford, II], National Parks and Conservation Association, and The Fund for Animals, Inc.). All commentors indicated support for the proposed genetic restoration program for the panther. Some were interested in reviewing more detailed information on the proposed program, which will be provided in the genetic management plan and the Environmental Assessment. The involved agencies were encouraged to expedite genetic restoration activities as much as possible. Other comments included the need to update the biological information contained in the recovery plan/revise the recovery plan. A number of comments expressed concern over habitat issues. Including the continued loss of panther habitat, the need for more aggressive habitat preservation and acquisition activities, the support for incentives to landowners to retain and manage panther habitat on their lands, the need to designate Critical Habitat, and the need for a cumulative environmental impact statement to address urban and agricultural impacts on panther habitat. Also mentioned was the need to continue development of artificial insemination and in vitro fertilization technology, which could be important for genetic restoration and management.

Comments received not specific to the proposed genetic restoration program will be considered during a complete recovery plan revision scheduled for 1995.