

Wildlife Crossings of Florida I-75

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The Florida Department of Transportation is constructing I-75 across the SR-84 (Alligator Alley) alignment in south Florida. This alignment crosses approximately 40 mi of habitat of the only known population of the endangered Florida panther. Panther movement and behavior are being monitored by radio tracking. Radio-collared panthers have been crossing the alignment, providing information on locations of crossings and habitat type being used. This information was used to develop measures to provide safe crossings of I-75 for the panther. Measures taken include creation of 23 wildlife crossings, which are 100 ft long and 8 ft high, and the extension of 13 existing bridges to provide 40 ft of land along the drainage canals under the bridges. The spacing of the crossings is roughly 1 mi apart. Fencing to cause animals to use the crossings will be 10 ft high with outriggers and three strands of barbed wire, except at crossings, where fencing will be 12 ft high with outriggers and barbed wire. Although the crossings and fencing are not completely finished, panthers and other animals are currently passing through these structures, indicating that the constructed crossings are being used.

The Florida Department of Transportation is presently constructing I-75 across south Florida. This Interstate highway is using the SR-84 (Alligator Alley) alignment in Collier and Broward counties. The limits of the Interstate project are from east of County Road 951 in Collier County to west of US-27 at Andytown in Broward County, a distance of 76.3 mi (Figure 1). This alignment severs the unique ecological areas of the Fakahatchee Strand, Big Cypress National Preserve, and the Everglades water conservation areas. Therefore, the primary concerns with the project are of an ecological nature.

Project development was initiated in the early 1980s. In October 1982, a list of potential threatened and endangered species on the project was requested from the U.S. Fish and Wildlife Service (USFWS). The USFWS reply contained six endangered species, among which was the Florida panther.

The main factors in the plight of the Florida panther are low population numbers with associated depressed genetic viability, increased human presence, diseases and parasites, and reduced prey base (1). The number one cause of death is highway mortality. The two major highways of concern are SR-84 (I-75) and SR-29 (Figure 1) in the area of the Fakahatchee Strand and the Big Cypress National Preserve. Eight panthers had been killed in a 13-year period on these two highways. The only known population of Florida panthers is in the area of Collier County where I-75 is planned (Figure 2). The remaining panther population is in remote areas with a population estimate of 20 to 50 animals (2).

During the studies for the environmental documents for the I-75 project, the possibility that the highway might jeopardize the endangered Florida panther was a principal consideration.

The Interstate highway would run 40 mi across the center of the remaining habitat for the only known population of Florida panther. The panthers would need to cross the highway in order to provide food during periods of deteriorating habitat during wet seasons, to permit dispersals of young panthers, and to maintain the genetic viability of the population. Therefore, measures to provide safe crossing of I-75 for the panthers were evaluated.

Fortunately, the Florida Game and Fresh Water Fish Commission (FGFWFC) in cooperation with the U.S. Fish and Wildlife Service had ongoing studies of panther behavior and movement in the area. The Florida Department of Transportation joined in these ongoing studies to design a highway facility that would minimize impacts to the endangered panthers. The information obtained served as a basis for exploring concepts for protecting the panthers.

Although there has been a great deal of interest in highway-related animal mortality, few studies have examined causes or methods for reducing highway kills (3). Several possible methods of reducing highway kills were evaluated. Laterally diffusing reflectors similar to those used for deer were being tried on SR-29 and SR-84 on an experimental basis. Because it was not possible to document their effectiveness, the use of this method on the Interstate was eliminated. An increased road shoulder width for better driver and panther visibility was considered as a factor in reducing highway kills. This method was used on SR-29. However, a panther was killed on SR-29 after the shoulders were widened, so this approach was not felt to be effective. Lower speed limits are reducing panther kills both on SR-84 and SR-29 in several key locations. However, a 45-mph speed limit on approximately 40 mi of I-75 was not considered enforceable. Fencing the facility would only isolate the animals on either side of the facility. Therefore, the most viable concept seemed to be the use of wildlife crossings. Such structures had been used successfully for a variety of animals in several areas (4-7).

Wildlife crossings are presently being constructed on the I-75 project. Studies conducted to determine the number and location of the crossings, the crossing and fence design, and the effectiveness of the crossings for wildlife movement across the alignment are discussed.

METHODOLOGY

As part of the studies of the behavior and movement of the panther population identified in Collier County, the FGFWFC is capturing and placing radio collars on panthers. The panthers are tracked and treed using dogs, then immobilized by drugs. Radio transmitters are placed around the panthers' necks for subsequent tracking. The animals are tracked from fixed-wing aircraft with directional antennas, as described by

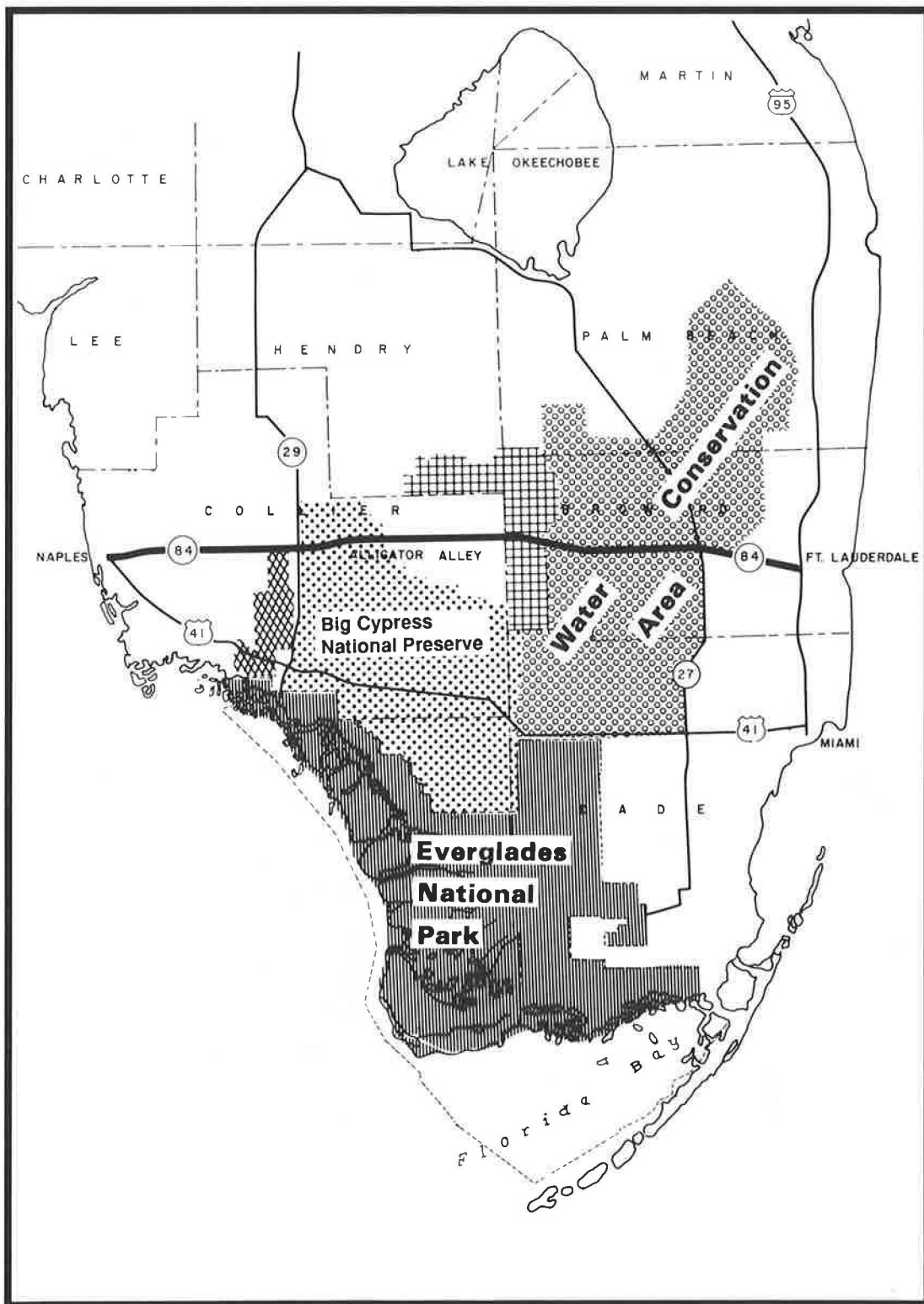


FIGURE 1 Project and public lands location map.

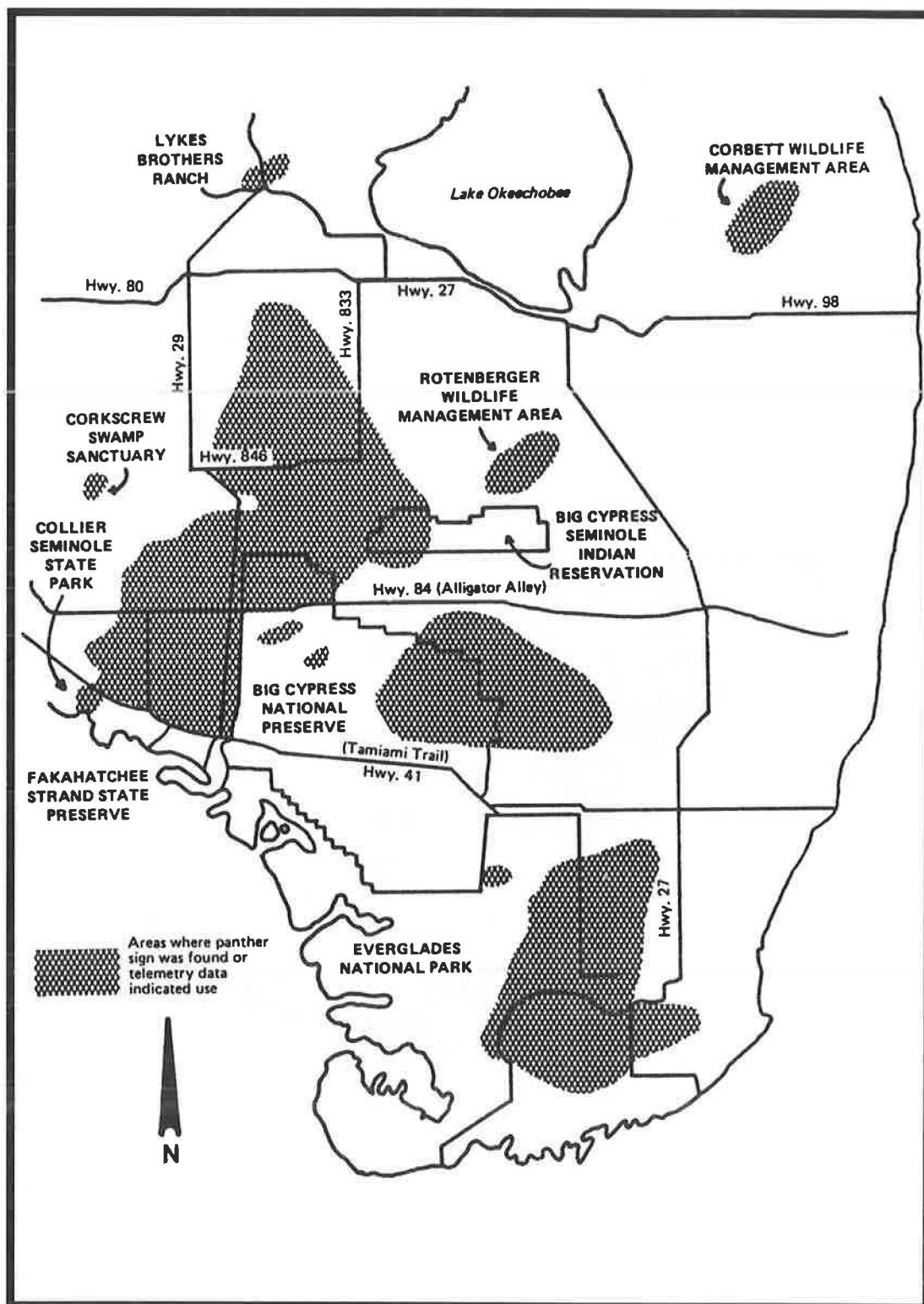


FIGURE 2 Known range of the Florida panther.

Mech (8). Latitude and longitude are noted using universal transverse Mercator coordinates. Radio tracking information for 18 panthers has been used in the analysis of measures needed along I-75.

The transverse Mercator coordinates obtained from the radio tracking studies were converted to state plane coordinates, which are used by the Photogrammetry Office of the Florida Department of Transportation. The remote sensing section of this office developed land use and vegetation maps of the area using the Florida land use, cover, and forms classification system. Panther coordinates were superimposed on the land use and vegetation maps to identify the habitats being used by the panthers. Seasonal patterns of movement were mapped to depict movements during wet, dry, mating, and kitten-rearing seasons. Patterns and locations of movement across the highway were identified from this information.

Panther crossing design was based on literature review of successful animal crossings in other locations (3–5). The design was intended to minimize the tunnel effect of the appearance of the crossings. The idea was to present as continuous a corridor of habitat as possible with an open view of the habitat that the panther would be entering after crossing under the bridges.

Fencing height and design were determined by consulting experts with experience in captive animal facilities and panther behavior through the forum of the Florida Panther Interagency Committee (FPIC), an interagency committee of experts charged with the recovery of the Florida panther. The committee served as a forum for expert inputs on many factors related to I-75.

At present, the wildlife crossings are being randomly monitored by ground survey of footprints of panthers as described by Belden (9). The footprints of other animals using the crossings are also being identified. Installation of movement-activated photographic devices (Trailmaster 1500 Game Counters, Trailmaster, P.O. Box 3497, Shawnee, Kansas) is planned on completion of the crossings.

RESULTS

Definite corridors of movement were readily identified from the radio tracking data. The shaded area shown in Figure 3 is a composite of the panther movements for five radio-collared panthers. On a macroscopic scale, it shows the areas of movement across I-75 and SR-29 for the five collared panthers.

Analysis of the locations indicated that the panthers move over large areas and stay in given areas varying lengths of time (10). For movement, the panthers use heavily vegetated areas such as mixed swamp forest, hardwood hammocks, slash pine-saw palmetto woodlands, and oak-pine woodlands. They often bed in saw palmetto thickets. Nighttime telemetry indicates panthers often leave dense cover and move out into open areas such as wet prairies, freshwater marsh, or agricultural land, presumably to follow the movement and feeding habits of prey (1).

The locations where the panthers were crossing SR-84 (I-75) were consistent with the other movement data. The panthers were using heavily vegetated corridors. Several of the crossing locations were higher ground than the surrounding areas. These were old logging tram roads, oil exploration roads, and an old railroad alignment. The points of crossing

were locations where these features approached the road alignment. Another indicator that some of these locations were correct was the fact that panthers were consistently being killed by vehicles at these locations.

The vegetative mapping was then used to identify type of habitat along the remainder of the corridor in the range of the panther. From this information, it was possible to determine other probable crossing locations for areas not covered by the radio tracking studies. Several of these have since been further substantiated by the location of panther tracks in these areas.

It was felt that a number of crossings would be needed along the approximately 40-mi stretch of the known panther range. A distance between crossings of approximately 1 mi was used so that the panther and other animals would not have to travel far in finding a crossing. A combination of wildlife crossing structures and extensions of existing bridges to provide dry land crossings was determined to be the most cost-effective approach. The final design calls for 23 animal crossings and 13 bridge extensions.

The length and height of the bridges was determined by looking at various length-to-height relationships to come up with a design that did not present a tunnel appearance. Another factor was the desire to have a clear view of the habitat on the other side of the facility to present the appearance of a continuum of habitat across the facility. A length of 100 ft with a height of 8 ft was determined to be the most cost-effective design. Existing bridges will also be extended to provide 40 ft of land along the canals under the bridges (Figure 4).

In order to ensure that the panthers use the crossings rather than cross the road at the location where they approach it, fencing of suitable design was necessary. The fencing specifications call for a 10-ft-high fence with outriggers with three strands of barbed wire, except at the crossings where the fence is to be 12 ft high with outrigger and barbed wire.

Because radio-collared panthers were crossing the alignment in the Fakahatchee Strand area (Figure 1), construction of crossings in this area was begun first so that use of the crossings could be studied. The disturbed nature of the area around and under the crossings has made track identification possible. By track identification, several species of animals (Florida panther, bobcat, racoon, opossum, and armadillo) have been documented as using the constructed animal crossings. The Florida panther has gone under two of the animal crossings a few times even though the construction and fencing were not completed. The panthers move across the area at night when there are no construction activities. These are areas where radio telemetry data indicated that panthers historically crossed the corridor. Future monitoring will further document the extensiveness of use of the crossings by animals.

CONCLUSIONS

Knowledge about the movements and behavior of the Florida panther in the project area enabled definitive development of measures to minimize impacts to this endangered species. The radiotelemetry data and behavioral information obtained on this species were critical to the decision-making process about measures to minimize impacts. State-of-the-art computer graphics that displayed land use, vegetation type, and the panther movements provided the information necessary

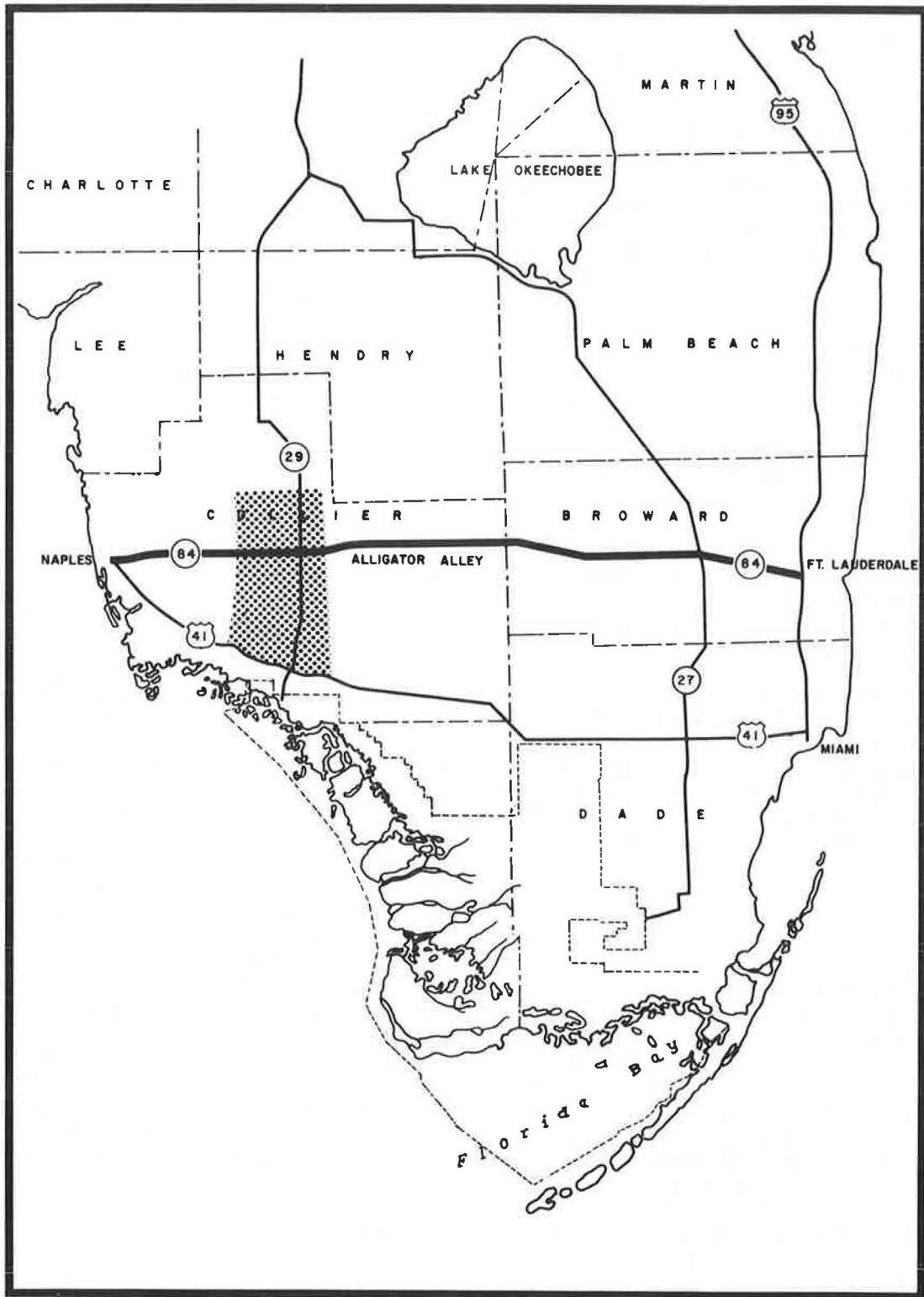


FIGURE 3 Range of radio-collared panthers.

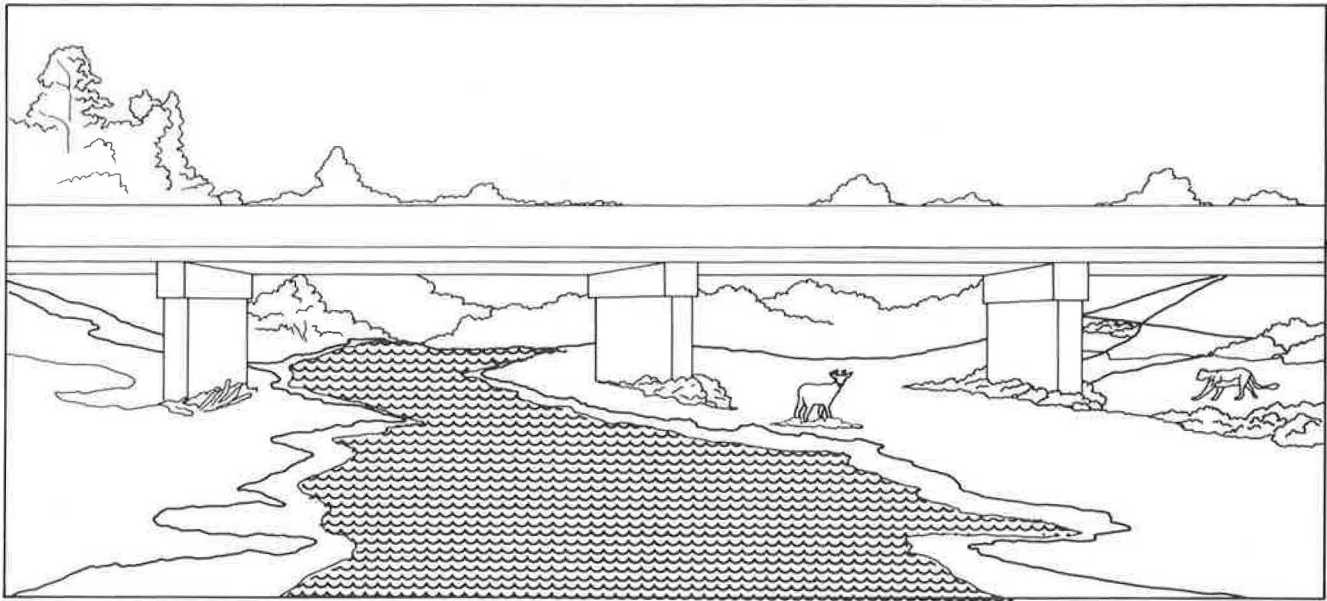


FIGURE 4 Design of animal crossings and bridge extensions.

to define the locations at which the panthers were crossing the highway. These techniques could be applied to many other species.

Use of animal crossing structures to provide safe passage for wildlife is proving successful. All wildlife in the project area benefit from having these safe corridors across what could have been a barrier to north-south movement in these environmentally important areas. Fencing will help ensure that wildlife does not cross the highway in areas other than the wildlife crossings.

With rapid development taking place in Florida, fragmentation of wildlife habitat has reduced the usable habitat for a number of species with large ranges. Maintaining corridors between these remnant populations is critical to the survival of these animals.

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