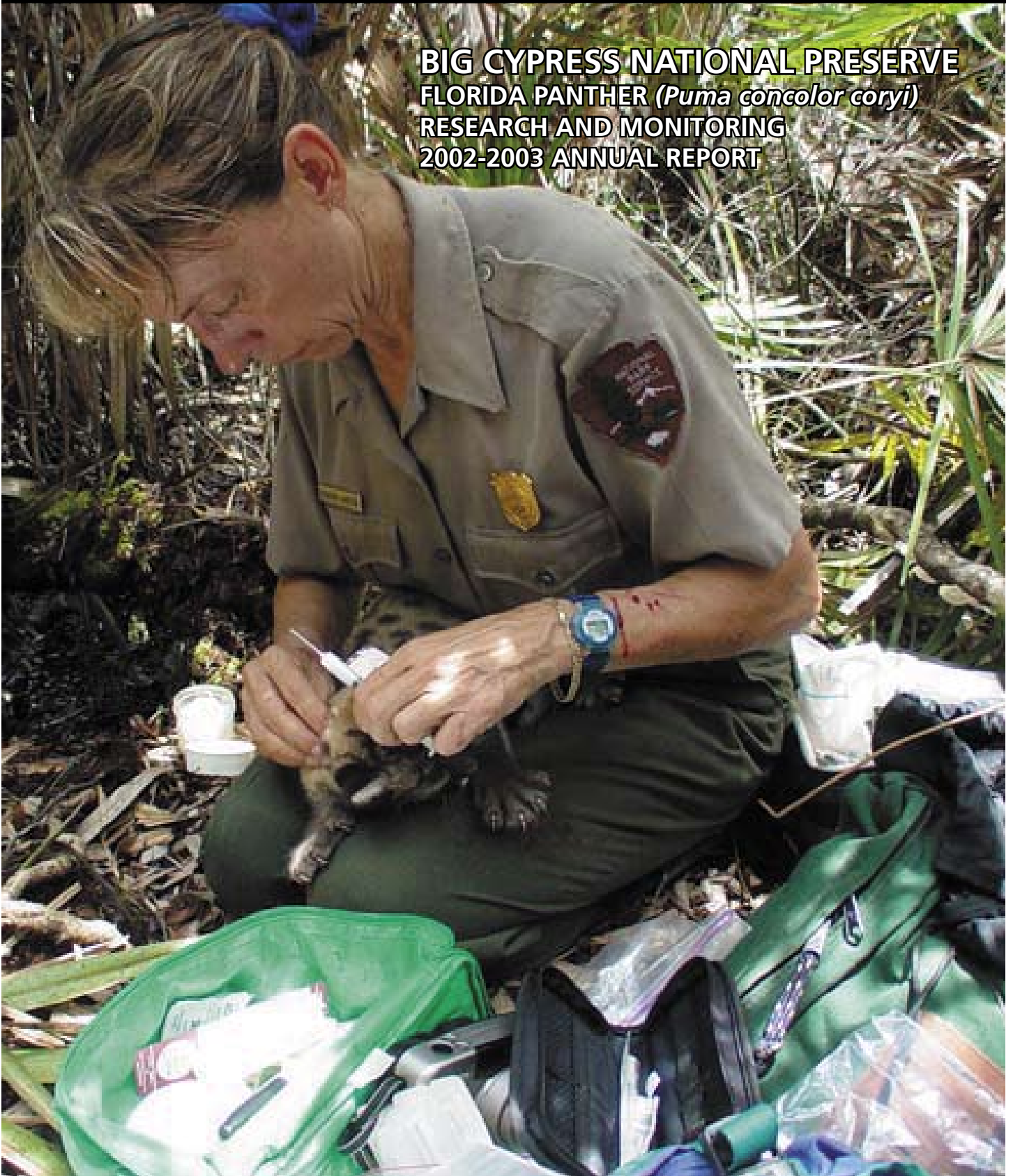


National Park Service  
U.S. Department of the Interior



Big Cypress National Preserve  
Ochopee, FL

**BIG CYPRESS NATIONAL PRESERVE  
FLORIDA PANTHER (*Puma concolor coryi*)  
RESEARCH AND MONITORING  
2002-2003 ANNUAL REPORT**



**A Review of the Status of Florida Panthers  
(*Puma concolor coryi*)**

**in Big Cypress National Preserve  
1981 – 2003**

**and a**

**Summary of the 2003 Panther Capture Season**

submitted to the U. S. Fish and Wildlife Service

in fulfillment of Endangered Species Permit #TE051015-0

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Prepared by

Deborah Jansen, Project Leader  
National Park Service

Steve Schulze, Monitoring and Mapping Specialist  
National Park Service

Rocky McBride, Houndsman  
Livestock Protection Company

Emmett Blankenship, Wildlife Veterinarian

## **Introduction**

This report is a compilation of information obtained between 1981 and 2003 on Florida panthers (*Puma concolor coryi*) in Big Cypress National Preserve south of Interstate 75 (SBICY), the current study area for panther research and monitoring conducted by the National Park Service (NPS). Annual survey efforts, initiated in 1978, revealed that only a few panthers inhabited the study area. When FWC began a panther monitoring program using radio-telemetry in 1981, their capture efforts focused where panther sign was most abundant, i.e., the Fakahatchee Strand Preserve State Park (FAKA), the Bear Island and Corn Dance Units of Big Cypress, and private lands. In the first 8 years of capture work, only 2 males were caught in SBICY and 1 female was treed but left unhandled because of her poor condition.

The National Park Service commenced survey and capture work in SBICY in 1988 to ascertain why there was an apparent scarcity of panthers there. A cooperative effort between NPS and FWC provided an increasing sample of collared panthers with which to assess their status in SBICY. Today, with the panther population's expansion in SBICY, National Park Service' involvement in panther research has also increased. Currently all panther-related work, including planning, funding, capturing, and monitoring in SBICY is conducted by NPS under an Endangered Species Permit from FWS and a Special Purpose Permit from FWC.

## **Study Area**

The study area, SBICY, represents 74% (217,409 ha) of Big Cypress, a 295,142-ha unit of NPS, situated in south Florida in Collier, Monroe, and Dade Counties. The enabling legislation of Big Cypress allowed for continued recreational and commercial uses, such as hunting, off-road vehicle operation, and oil extraction. Big Cypress was also designated a state wildlife management area for recreational hunting, and, as such, has been divided into "units" to allow flexibility in management and regulatory decision-making (Figure 1). These units are used in this document to identify specific areas. The area has further been divided into "blocks" to quantify panther survey and capture efforts (Figure 1 in Appendix A).

Big Cypress encompasses almost half of a unique water-dependent ecosystem called Big Cypress Swamp. Unlike the Everglades, it is still a relatively pristine wetland system. Nearly 80 percent of the rain normally falls during the 6-month wet season of May through October and averages 135 cm per year (Schneider et al. 1996).

The most recent classification of the vegetation of Big Cypress has been done by Welch et al (1999) to provide consistency with the mapping of other public lands in the south Florida region. The most significant change is that some areas formerly classified as marsh, such as the Stairsteps Unit, are now defined as prairie. The consolidation of Welch's 89 habitat types into 7 general categories results in the following breakdown for SBICY: cypress 50%; prairie 16%; marsh 13%; pineland 13%; mixed

hardwood swamp 4%; hardwood hammock 3%; and mangrove 1%. “Disturbed” habitat, including exotic plants and areas of human influence such as roads, accounted for less than 810 ha in SBICY.

Only 285 km of roads are found in SBICY. Two paved roads, Interstate-75 (formerly Alligator Alley) and Highway 41, run east-west through the northern and southern portions respectively from State Road 29 (S R 29) to Conservation Area 3A. Four unpaved roads, Birdon, Wagonwheel, Turner River, and Loop, account for 97 kms. State Road 29 is a paved road that borders Big Cypress on the west. The southern boundary joins Everglades National Park and the eastern boundary is partially separated from Water Conservation Area 3A by a levee (L-28).

A deer and hog hunting season runs from September through December. The 5-year (1996-2001) average for hunter pressure is 15,435 man-days, with a mean harvest of 253 deer (bucks only) and 75 hogs. These represent a sample of the actual harvest (Adams and Bozzo 2002).

The operation of off-road vehicles (ORV) has created a trail system that has increased in recent times. Duever et al. (1986) mapped 250 km of ORV trails from 1953 maps and over 1,100 km from 1973 maps. Welch et al (1999) delineated over 46,774 km of trails or trail remnants within Big Cypress that were visible on aerial photos. Janis and Clark (2002) determined that panthers showed some avoidance of these trails during periods of increased vehicle activity. The obvious aesthetic concerns and the probable impacts on soils, vegetation, and wildlife prompted the development of an ORV management plan that restricts ORV travel to designated trails (National Park Service 2000).

## **Methods**

### **Capture and Monitoring**

Over the past 23 years, the capture and radio-collaring of panthers by FWC has evolved into a safe and efficient operation. The NPS team has benefited from this expertise and has utilized similar capture techniques.

The daytime resting sites of the monitored panthers were determined 3 times per week using telemetry from a fixed-wing aircraft. The methodology used by SBICY to determine each location diverged somewhat from the EVER and FWC monitoring protocol. Big Cypress staff determined the general location of each panther at 150 m above the ground, but then made several passes at 60 m to further define it. Flights conducted by other agencies did not descend below 150 m. Low-level passes have been necessary, however, in SBICY to obtain accurate locations and habitat use because of the complexity and intermingling of vegetative types. Universal Transverse Mercator (UTM) coordinates of each location were then determined using a geo-referenced coverage of the study area.

### **Data Analysis**

The dataset used in this report consists of all telemetry locations of radio-collared panthers that had been

located in SBICY between 1981 and June 30, 2003. The locations on radio-collared panthers prior to 1988 and outside the study area were obtained by FWC and EVER staff. On days when more than 1 location per panther was obtained, only 1 location was used. The locations generated by FWC in 1984 and 1985 were not available.

**Home range**, i.e., the area where a panther restricts the majority of its movements, was determined for panthers that had more than 5% of their locations in SBICY, had more than 50 datapoints, and were considered to be adults. Females were considered to be adults at 18 months or older and males at 24 months or older, based on known ages when panthers in SBICY first bred. **Residents** were defined as adults that had continuous use of the area for greater than 6 months. **Dispersers** inhabited SBICY for less than 6 months. **Immigrants** dispersed from some other locality, and they may or may not have established residency within the study area. **Emigrants** were panthers that were born in SBICY but dispersed completely outside the study area.

Maps were generated using the ArcView 3.2 Animal Movement program extension (Hooge and Eichenlaub 1997). Home ranges are shown as minimum convex polygons with a 5% outlier removal. The home range maps delineate the locations obtained during dispersal and those comprising MCP home range when the panthers were adults. The home ranges of #16 and 23 were determined using only their locations in SBICY due to computer limitations in handling their large datasets.

## Results

Since 1981, a total of 37 radio-collared panthers have been documented in SBICY. Two males, #201 and #203, were removed from the population as kittens in 1992 and captive-reared as part of the captive breeding program. They were released into SBICY in 1997 in an effort to provide a breeding male for the population. Since neither survived in the wild, they are not included in this report.

Table 2 shows the 35 radio-collared panthers that inhabited SBICY since monitoring began, the extent of their use of SBICY, where they originated, and their status. Fourteen panthers were excluded from home range analysis for the following reasons: Five panthers, #s 2, 6, 9, 37, and 54 inhabited SBICY for less than 5% of their locations (Figures 2 to 5). Two panthers, #1 and 120, had fewer than 50 locations (Figures 6 and 7). Seven dispersing juvenile males, #s 33, 44, 76, 90, 92, 108, and 119 had not established home ranges (Figures 8 to 14).

## 2003 Capture Season

Six panthers, 5 females and 1 male, were captured and handled by the NPS capture team in 2003. Three were recollared, 1 had a failed collar replaced, and 2 panthers had not been handled previously (Table 1). Capture and biomedical data was submitted to FWC post-capture. Biomedical results on these 6 panthers

are contained in the annual report submitted by FWC. Appendix A, *Big Cypress National Preserve 2003 Florida Panther Capture Season Report*, summarizes this past year's survey and capture efforts by NPS.

## **Background on the Radio-collared Panthers in the SBICY Study Area**

This section provides background information on each panther that has inhabited SBICY with emphasis on the panthers that were captured this year by the NPS team.

### **FP #1**

This male was first captured in FAKA on February 10, 1981, at an estimated 10 years of age. His home range encompassed both FAKA and Big Cypress, with 70% in SBICY (Figure 7). He was killed by a vehicle on I-75 on December 14, 1983.

### **FP #2**

This male was first captured in FAKA on February 20, 1981, at an estimated 10 years of age. His home range was in FAKA, although he was located on a few occasions in the Deep Lake Unit of SBICY (Figure 2). He died on November 29, 1984 of intraspecific aggression.

### **FP #6**

This male was first captured in the Corn Dance Unit of SBICY on February 27, 1982, at an estimated 6 to 8 years of age. For the next 6 weeks, he was located within a small area in Mullet Slough. Concern over these small movements warranted a ground check of his status. His remains were retrieved on April 16, 1982. He likely had died soon after the capture, but the lack of movement was not detected due to the habitat similarity, lack of distinguishable landmarks, and multiple observers. Based on his small movements post-capture, his death may have been capture-related. No locations were available on this panther.

### **FP #7**

This male was first captured in the Corn Dance Unit of SBICY on March 2, 1982 at an estimated 6 to 7 years of age. His home range included SBICY (52%) and Water Conservation Area 3A and encompassed 671 km<sup>2</sup> while there (Figure 15). Contact was lost with him due to collar failure until he was recaptured in FAKA on January 26, 1985. Data on his use of FAKA were not available. He was killed by a vehicle on State Road 29 on October 26, 1985.

### **FP #9**

This female was first captured on January 26, 1985 in FAKA at an estimated 3 to 4 years of age. Her area of use was FAKA, but on 2 flights she was located in the Deep Lake Unit of SBICY (Figure 3). She was last recollared in 1994 at an estimated 13 years of age.

### **FP #16**

This male was first captured in EVER on January 12, 1987 at an estimated 12-14 months of age. He crossed Shark River Slough and entered SBICY for the first time on March 27, 1990. He ranged between SBICY and EVER but spent the majority of his time in SBICY until 1995 when 2 female cougars from Texas were released into EVER. After that, he never returned to SBICY. While in SBICY (31% of all locations), he inhabited 747 km<sup>2</sup> but did not sire any offspring there. He died of unknown causes east of EVER in January of 2000 at the age of 14 years.

### **FP #23**

This female was first captured in EVER on March 18, 1987 at the estimated age of 5 to 6 months. She was abandoned at 6 months of age as a result of capture activities and was raised in captivity for 13 months, released back into the wild for 5 months, fared poorly, and was placed in captivity for another 4 months. Her second return to EVER was on February 22, 1989. On March 6 of the following year, she crossed Shark River Slough and entered SBICY on March 9, 1990. This 75-km dispersal movement from EVER to her home range center in SBICY is the largest recorded for a female Florida panther. Her home range while in SBICY encompassed 982 km<sup>2</sup> (Figure 17). She denned 5 times between 1990 and 1995, 3 of which failed. Her 2 kittens were removed from her 1992 den for captive breeding. One female (#55) was collared from her only successful den. FP #23 died of unknown causes in November of 2001 at the estimated age of 15 years.

### **FP #33**

This male was captured on March 5, 1989 in the Stairsteps Unit of SBICY at the estimated age of 1.5 to 2 years. He inhabited SBICY until July when he moved north, crossed I-75, and resided in northern Big Cypress and private lands (Figure 8). He died on November 25, 1989 of rabies. The origin of this panther is unknown, however, his age and movements indicate that he was a dispersing juvenile.

### **FP #37**

This male was first captured on January 30, 1990 in FAKA, at an estimated age of 3 to 4 years. He was located in the Deep Lake Unit of SBICY on several flights (Figure 4). He was killed by a vehicle on S. R. 29 on November 29, 1990.

### **FP #38**

This female was first captured on February 8, 1990 in the Corn Dance Unit of SBICY at the estimated age of 4.5 years. Her home range encompassed SBICY (56%) and Water Conservation Area 3A and consisted of 119 km<sup>2</sup> (Figure 18). She associated with male panthers on almost a monthly basis but never denned, and, as a result, was removed from the wild on May 18, 1993 for medical evaluation. Surgery revealed that her reproductive tract was normal. She was returned to her home range on May 28

and continued her monthly associations with male panthers. She died on June 22, 1995 of pleuritis, the etiology of which was unknown.

#### **FP #42**

This male was born in EVER in April of 1989 and first captured on March 6, 1990 at 1 year of age. He crossed Shark River Slough and first entered SBICY on July 23, 1991 where he remained. His home range encompassed 404 km<sup>2</sup> (Figure 19). After living south of Hwy 41 for 5 months, he crossed the road and bred with females #23 and 38. He sired 3 females during his life; 1 died during dispersal, 1 (#55) has been a breeder in SBICY, and the status of the third is unknown. He died of unknown causes on June 22, 1995 at the age of 6 years.

#### **FP #44**

This male was born in the Addition Lands north of I-75 in November of 1990. He was first captured as a 6-month-old on April 30, 1991. During dispersal he made extensive movements into the city of Naples, FAKA, Shark River Slough and finally into SBICY (Figure 9). Resident male #42 killed him there on July 6, 1993.

#### **FP #54**

This male was born in the Addition Lands north of I-75 in March of 1992. He was first captured February 10, 1993 at 1 year of age. His home range encompassed the Florida Panther National Wildlife Refuge (FPNWR) and FAKA, with only 6 locations in SBICY (Figure 5). His collared failed prematurely, therefore, his status is unknown.

#### **FP #55**

This female is the only known offspring of FP #23 to survive in the wild. She was born on December 12, 1992 in the Corn Dance Unit of SBICY and first captured on January 25, 1994 at 2 years of age. She dispersed at 14 months of age and established a 490-km<sup>2</sup> home range in the Turner River Unit of SBICY (Figure 20). She was first bred at 19 months of age and has denned 7 times of which 2 dens have failed. i.e., the kittens died prior to leaving the den. Of the 10 kittens she produced, 2 have been collared of which one is still living. The status of 4 is unknown.

The NPS capture team recollared #55 on April 4, 2003 at the age of 10 years. She was in excellent physical condition, weighing 36 kg (80 lbs.), more than on any previous handling. The possible presence of chronic hepatic insufficiency (K.G. Charlton, FWC veterinarian) during #55's previous handling in 2000 were not apparent this year. Her alkaline phosphatase and gamma glutamine transferase were within range, although her albumin was still slightly low. FP #55 continues to associate with adult males although her last den was over a year ago.



## **FP #60**

This male was first captured in Big Cypress on March 6, 1996 at an estimated 6 months of age. He established his home range in the FPNWR and FAKA with only brief excursions into SBICY. Since December of 2002, however, he has remained in SBICY, inhabiting a 169-km<sup>2</sup> home range (Figure 21). While in SBICY he has associated both with a resident breeding male and resident females and has possibly sired the most recent kittens of female #93.

## **FP #70**

This female was born on May 7, 1997 in the Turner River Unit of SBICY. She and her sibling were the first offspring of TX 107, one of the 2 Texas cougars released into SBICY in 1995. FP #70 was first captured on February 25, 1998 at the age of 10 months and dispersed at the age of 16 months to the western Turner River Unit where she established a 377-km<sup>2</sup> home range (Figure 22). Her first litter, sired by FP #79, was born June 14, 1999. Two females and 1 male were marked at the den, radio-collared while still with her, and were raised to dispersal. FP#70's collar malfunctioned on January 24, 2000.

She was recollared on March 10, 2003 by the NPS capture team. She weighed 44 kg (97 lbs.) and was in good health. During subsequent tracking, it was found that she was raising 2 kittens, estimated at 6 months of age.

## **FP #71**

This female, the sibling of FP #70, was born on May 7, 1997 in the Turner River Unit of SBICY. She was first captured on March 5, 1998 at the age of 10 months, left her mother at the age of 16 months, and dispersed to the Addition Lands south of I-75. She established a 300-km<sup>2</sup> home range that borders I-75 (Figure 23). Her first litter, sired by #79, was born June 18, 1999. Two males and 2 females were marked at the den. Two were subsequently radio-collared; one likely died early based on observations of the family, and the status of the fourth is unknown. FP#71's collar malfunctioned on July 10, 2000 and no efforts have been made to recapture her since then.

## **FP #76**

This male was first captured on January 13, 1999 on the FPNWR at an estimated 22 months of age. He was one of 3 males that have been documented to be bilaterally cryptorchid. On March 31, 1999, he crossed I-75 south into SBICY. His dispersal movements centered in FAKA and SBICY (58% of locations) (Figure 10), until his death on November 13, 1999 from intraspecific aggression.

## **FP #79**

This male was born to one of the introduced Texas cougars (#101) on the Seminole Indian Reservation in September of 1995. He was first captured on March 3, 1999 at 3.5 years of age in the Turner River

Unit of SBICY, over 25 km from his birth site. He has been the dominant breeder in SBICY since then, and has inhabited a 1,304-km<sup>2</sup> home range (Figure 24). He has sired the kittens of at least 11 of 16 (69%) of the known dens documented in SBICY since 1997.

### **FP #86**

This female was born in SBICY to FP #71 on June 18, 1999. She was first captured on February 21, 2000 at 8 months of age. She dispersed at 12 months and established a 141-km<sup>2</sup> home range in the Corn Dance Unit (Figure 25). When handled on February 27, 2001, it was noted that she had a healed left distal tibial fracture. During the April 1, 2003 workup, a bony calcification of the left proximal metatarsal was noted. Employees of an oil extraction company within the home range of #86 have reported on several occasions that they have observed a panther that limps. These sightings coincide with her location during monitoring flights within the same timeframe. FP #86 was assessed to be in very good physical condition during the 2003 workup, however, she weighed only 29 kg (64 lbs) at the age of 3.5 years. A grade II out of VI protosystolic heart murmur was noted. It is possible that her metatarsal injury may contribute to the fact that she hasn't shown any indications of denning behavior in spite of having been with a male panther on several occasions.

### **FP #87**

This female was born in SBICY to #55 on April 19, 1999. She was first captured on February 28, 2000 at 10 months of age. She dispersed at 11 months and established a 190-km<sup>2</sup> home range that encompassed the Turner River and Corn Dance Units (Figure 26). Her first litter, 2 males and 1 female, was born on January 27, 2001. One male (FP #108) was collared on November 3, 2001 at the same time #87's failing collar was changed. At least 1 other kitten was also treed. The current status of the 2 uncollared offspring is unknown. FP #87's second litter, 1 male and 2 females, was born on March 11, 2003.

On June 27, 2003, the remains of #87 were recovered. She had likely been dead for several days, but the mortality mode in the collar was not functioning during the previous 2 telemetry flights. Canine punctures in the cranium indicated that intraspecific aggression was the cause of death. No sign of her kittens was found, and it is unlikely that they would have survived at the age of 2.5 months.

### **FP #88**

This female was born in SBICY to #70 on June 14, 1999. She was first captured on March 2, 2000 at 9 months of age. She dispersed at 13 months, crossed south of Hwy. 41, and established a 494-km<sup>2</sup> home range in the Loop and Corn Dance Units of SBICY (Figure 27). On May 7, 2001, she gave birth to 4 kittens, 2 males and 2 females. This was the first documented den of a Florida panther in Big Cypress south of Hwy. 41. Sign of 2 female kittens traveling with her was documented on March 19, 2002 (Jansen and McBride, pers. comm.).

On August 19, 2002, the collar of #88 began emitting an erratic signal, which continued through October 23 after which no signal was heard. No attempts were made to change the failing collar due to concerns about water levels. The NPS capture team subsequently hunted for her for 18 days during the 2003 capture season, but were unable to locate her.

### **FP #89**

This male was first captured on March 2, 2000 in the Turner River Unit of SBICY at an estimated 2.5 years of age. His parentage and origin are unknown. He inhabited a 189-km<sup>2</sup> home range in the Deep Lake and Turner River Units of SBICY with 2 locations in the FAKA (Figure 28). He was killed on November 10, 2000 by #79, the SBICY territorial male who was with female #55.

### **FP #90**

This male, a sibling of #86, was born in SBICY to #71 on June 18, 1999. He was first captured on March 8, 2000 at 9 months of age. He dispersed at 12 months and left SBICY. He traveled northeast to the Addition Lands, Seminole Indian Reservation, and Rotenburger and Holeyland WMAs (Figure 11). He was killed by a vehicle on S.R. 27 on April 26, 2001 during his dispersal movements.

### **FP #91**

This female was born in SBICY to FP #70 on June 14, 1999. She was first captured on March 17, 2000 at 9 months of age. The tranquilizer dart tip imbedded in her knee and she was removed from the wild to determine whether the foreign object would be life-threatening. She was transported to Lowry Park Zoo where veterinary staff concurred that the needle was solidly imbedded in the patella with no impact to surrounding tissues or ligaments. She was returned to Big Cypress that night and successfully reunited with her family group the next morning. When recaptured for routine collaring on March 21, 2001, no evidence of arthritis, osteomyelitis or other inflammation was found.

FP #91 dispersed at 13 months and made extensive movements both north and south of I-75, settling into a 495-km<sup>2</sup> home range in the Corn Dance Unit (Figure 29). She was recollared by the NPS capture team on March 18, 2003. Although no physical abnormalities were noted, she was a small animal with thin musculing, weighing 30 kg (66 lbs.) which is 3 kg (7 lbs) less than she had 2 years prior. The affected knee joint palpated normally and exhibited full range of motion. This now 4-year-old female has been documented with a collared male (#104) on only 2 occasions (February and April 2003) and has not yet denned.

### **FP #92**

This male was born in SBICY to FP #70 on June 14, 1999. He was first captured on April 6, 2000 at 10 months of age. He dispersed from SBICY at 13 months and traveled west to the fringe of urban Naples,

then north into Lee County (Figure 12). He was monitored up until all air traffic ceased due to the terrorist attack on September 11, 2001. When monitoring flights resumed on September 21, his collar was in mortality. His remains were retrieved but the cause of death could not be determined.

### **FP #93**

This female was born in SBICY to Tx #107 on February 22, 1999. She was first captured on April 10, 2000 at 14 months of age. She did not reunite with her mother post-capture, but was seen on May 1 with an uncollared panther, likely one of her 2 siblings. She remained in SBICY, establishing a 197-km<sup>2</sup> home range in the Turner River Unit (Figure 30).

FP #93's malfunctioning collar was replaced on February 28, 2002. Her progesterone levels at that time indicated she was pregnant. She gave birth to her first litter on April 6, 2002, consisting of 3 females and 1 male. She was observed from the monitoring plane with 3 kittens on October 11, 2002 and the tracks of these 3 offspring, 2 females and 1 male, were observed with hers on March 31, 2003. Her male offspring, K115, was captured on April 2, 2003. The status of the 2 females is unknown.

### **FP #102**

This female was born in SBICY to #55 on February 8, 1998. She was first captured on February 20, 2001 at 3 years of age. With her were at least 2 kittens, one of which (FP #103) was captured a month later at an estimated 10 months of age. She has inhabited a 174-km<sup>2</sup> home range in the Turner River Unit (Figure 31). FP #102 denned again on June 25, 2001 and 2 males were marked 3 weeks later. Neither has been collared. FP #102 next denned on July 4, 2002, only a year after her previous den. One male and 1 female were marked at this den. It is not known if her 2001 kittens died or dispersed before 12 months of age. Tracks of the 2 offspring from her 2002 den were documented along with hers on April 11, 2003.

### **FP #103**

This female is the offspring of #102. She was first captured on March 13, 2001 at an estimated 10 months of age. She was with #102 for the next 3 days and through April, except for several days when #102 associated with #79, the territorial male. FP #102 was apparently in estrous because she was bred at this time. When #103 dispersed at an estimated 11 months of age, she moved east and has established a 234-km<sup>2</sup> home range in the Corn Dance Unit (Figure 32). She has been documented with a male on 3 occasions, but has not denned.

### **FP #104**

This male was first captured on April 2, 2001 at the estimated age of 6 to 7 months. His parentage is unknown, however, it is suspected that he might be the offspring of FP #70 because he was captured

within her home range. He sustained a capture-related mid-shaft fracture of the right radius and ulna and was removed from the wild. He was treated and housed at the Lowry Park Zoo facilities for 8 weeks and then, on June 4, 2001, was taken to White Oak Conservation Center for further rehabilitation. He was released back into SBICY on November 28, 2001.

FP #104 ranged widely post-release, traveling west to FAKA, southeast into the Loop and Stairsteps Units, and north under I-75 into the Addition Lands and the Indian Reservations, and finally settling back into a 474-km<sup>2</sup> home range in the Corn Dance Unit of SBICY (Figure 33). Since turning 2 years of age, he has been documented with 2 adult females on 5 occasions. To date, neither has denned.

### **FP #108**

This male was first captured at 11 months of age on November 3, 2001 at the same time his mother's (#87) failing collar was changed. He dispersed at 13 months and inhabited the Corn Dance Unit (Figure 13) until his death on November 17, 2002 from unknown causes.

No cause of death was evident when the carcass of this 2-year-old male was retrieved by NPS personnel. The carcass was intact with no signs that vultures had yet found it. No signs of a struggle or fight, i.e., hair in the claws, bites, punctures, lacerations, were found. No vegetation in the vicinity was flattened. The carcass was immediately transported to Oasis Visitor Center where FWC personnel examined it and concurred that the cause of death was not apparent.

This male was necropsied the following day by Dr. Scott Terrell, DVM, Wildlife Diagnostics. According to the necropsy report, the tissues were severely autolyzed, preventing diagnosis of a disease agent. Some focal areas of hemorrhage in the neck region were observed, however, no skin punctures were associated with them. It was "conjectured" that these might have been caused by canine teeth, however, no puncture wounds or evidence of bony damage in the cervical spine area were found. Another possibility posed by the DVM was there may have been traumatic injury to the trachea, however, a crushing injury to the trachea could not be observed due to the poor state of the carcass.

In spite of the lack of classic signs, i.e., puncture wounds, crushed bones, hair in claws, this male was reported to USFWS as having died of intraspecific aggression. Cougars, however, experience fatal trauma in ways other than fighting with other cougars (Ross et al 1995). In addition, a disease agent may have been the cause of death but was masked by the poor condition of the carcass. It is recommended, therefore, that the cause of death of panther #108 be revised and placed in the "unknown" category in order to avoid misrepresentation of causes of panther mortality.

### **FP #119**

This male was born on April 12, 2002 to female #93. The NPS capture team collared him at 12 months

of age on April 2, 2003 in the Turner River Unit. He weighed 35 kg (76 lbs) and was in excellent physical condition. He did not reunite with his mother, and remained within a 1.6-km radius of the capture site for about 2 weeks. He then left his natal range and inhabited the Deep Lake and Turner River Units (Figure 14).

### **FP #120**

This female was first collared by the NPS capture team on April 8, 2003 in the Turner River Unit of SBICY, and estimated to be 3 years old. Her parentage is unknown. She weighed 37 kg (82 lbs) and was in excellent physical condition. Her known area of use centers in the southwestern Turner River Unit and is bisected by Hwy. 41 (Figure 7).

### **Tx #103**

This female was captured in Texas, and, after a quarantine period, released into the Stairsteps Unit of SBICY on May 4, 1995, as part of the Genetic Restoration Program. After some initial wanderings, she established a 421-km<sup>2</sup> home range in the Loop and Stairsteps Units. Unlike FP #120, she never crossed Hwy 41 (Figure 34). At the time of her release, the only known male inhabiting SBICY, #16, was in EVER where 2 other Texas females were also released. FP #16 never returned to SBICY. Apparently, no other males entered TX #103's home range for 4 years until #79 was with her in May of 1999. He bred her, but she died of complications from that pregnancy just prior to giving birth to 4 full-term male fetuses.

### **Tx #107**

This female was captured in Texas, and, after a quarantine period, released into the Corn Dance Unit of SBICY on May 4, 1995, as part of the Genetic Restoration Program. She established a 460-km<sup>2</sup> home range in the Turner River and Corn Dance Units (Figure 35). Her success in raising offspring who, in turn, have survived and raised young, has been a pivotal point in increasing the panther population in SBICY. Her first litter consisted of 2 females, # 70 and #71. Even as inexperienced mothers, they each successfully reared 3 offspring to dispersal age. TX #107's second litter consisted of 1 male and 2 females, only one of which, #93, was subsequently collared. She too has successfully reared 3 of her 4 kittens in her first litter. Had not the collars on #s 70, 71, and Tx 107 malfunctioned, the extent to which TX #107 has contributed to the population would be better understood.

In keeping with the Genetic Restoration Plan protocol to limit the number of offspring per introduced female, a contraceptive device was implanted into Tx107 on April 19, 2000. She died on January 18, 2001 from pneumonia, the cause of which was unknown.

## **Summary**

The report is a both compilation of what is known about the radio-collared panthers that have inhabited Big Cypress National Preserve south of I-75 since 1981 and a status report on the panthers monitored by the National Park Service in Big Cypress between July 1, 2002 and June 30, 2003.

At the onset of the reporting period, the Park Service was monitoring 10 panthers, 8 females and 2 males. Within the year, 2 panthers died; male #108 of unknown causes and female #87 from intraspecific aggression. The 3 kittens marked at her den likely also perished. Contact was lost with female #88 due premature collar failure. One male, #104, was returned to the study area after 8 months rehabilitating from a fractured leg. A 7-year-old male, #60, took up residence in the study area. During the NPS capture season, 2 new panthers, male #119 and female #120 were radio-collared and the failed collar on female #70 was replaced. At the end of the reporting period, therefore, 12 panthers, 8 females and 4 males, were being monitored.

Of the 8 females, 6 were of breeding age. Three were raising kittens: #93 raised 3 kittens and #102 and #70 each were raising 2 kittens. Three females, #s 55, 86, and 91, had associated with males but did not den during the reporting period. The overlapping home ranges of the females are shown in Figure 36. The 3 adult males, #s 60, 79, and 108, have overlapping home ranges (Figure 37), and, thus far, have tolerated each other's presence.

This past year's work has provided a better understanding of the value of Big Cypress National Preserve to panther recovery. What once was considered poor panther habitat will likely become the foundation for the population's survival in the future.

## **Acknowledgments**

Over the course of the past 22 years of panther research, many individuals from many agencies have been involved in the administrative and field aspects of panther recovery. They have all contributed to this document. The hardest workers have perhaps been the Sluggos, Tuffys, and Rosies, i.e., the cat hounds, and their trainers, the McBrides of Livestock Protection Company. Without their skills, our sample of panthers would be much smaller and we'd know much less about panthers in south Florida.

Special thanks to FWC for providing a second houndsman for 3 days of capture work and to USFWS for providing Dennis Giardina as a tree climber this past capture season. Bob Thomas, NPS wildlife technician, conducted the majority of the fixed-wing flights and assisted on captures this past year.

Funding has been provided by the public either through the Florida Panther Trust Fund that supports FWC efforts or through public contributions to the IRS and ultimately to support the panther research done in Big Cypress National Preserve and Everglades National Park.

**Table 1. Florida panthers captured and radio-collared in SBICY in 2003.**

ID#	Capture Date	Gender	Age (yrs)	Type	Capture Location	
					Easting	Northing
70	March 10,2003	F	6	replace failed collar	474818	2873755
91	March 18, 2003	F	3.5	recollar	505702	2871263
86	April 1, 2003	F	3.5	recollar	508204	2876983
119	April 2, 2003	M	1	new	480381	2883260
55	April 4, 2003	F	10	recollar	481904	2880545
120	April 8, 2003	F	~ 3	new	472199	2864447



**Table 2. Panther Status and Extent of Use of SBICY between 1981 and 2003.**

ID #	Gender	Locations in SBICY	% in SBICY	Origin	Category	Current Status
1	M	16	48%	unknown	resident	dead
2	M	3	1%	unknown	nonresident	dead
6	M	na	na	unknown	nonresident	dead
7	M	91	50%	unknown	resident	dead
9	F	2	1%	unknown	nonresident	dead
16	M	893	31%	immigrant	resident	dead
23	F	2054	81%	immigrant	resident	dead
33	M	198	39%	immigrant	disperser	dead
37	M	4	3%	immigrant	nonresident	dead
38	F	860	75%	unknown	resident	dead
42	M	637	98%	immigrant	resident	dead
44	M	81	25%	immigrant	disperser	dead
54	M	6	1%	immigrant	nonresident	dead
55	F	1407	100%	SBICY	resident	alive
60	M	84	8%	immigrant	resident	alive
70	F	299	100%	SBICY	resident	alive
71	F	342	100%	SBICY	resident	unknown
76	M	65	58%	immigrant	disperser	dead
79	M	617	100%	immigrant	resident	alive
86	F	472	98%	SBICY	resident	alive
87	F	478	100%	SBICY	resident	dead
88	F	366	99%	SBICY	resident	alive
89	M	90	98%	unknown	resident	dead
90	M	91	58%	SBICY	emigrant	dead
91	F	424	90%	SBICY	resident	alive
92	M	71	36%	SBICY	emigrant	dead
93	F	469	100%	SBICY	resident	alive
102	F	336	100%	SBICY	resident	alive
103	F	332	99%	SBICY	resident	alive
104	M	120	52%	SBICY	resident	alive
108	M	154	99%	SBICY	disperser	dead
119	M	37	97%	SBICY	disperser	unknown
120	F	34	100%	SBICY	resident	alive
T103	F	649	98%	introduced	resident	dead
T107	F	794	100%	introduced	resident	dead

## Literature Cited

Adams, R. B. and J. A. Bozzo. 2002. Big Cypress National Preserve Deer and Hog Annual Report. Florida Fish and Wildlife Conservation Commission. 55 pp.

Duever, M.J., J.E. Carlson, J.F. Meeder, L.C. Duever, L.H. Gunderson, L.A. Riopelle, T.R. Alexander, R.L. Meyers, and D.P. Spangler. 1986. *The Big Cypress National Preserve*, National Audubon Society, New York, New York, 444 pp.

Hooge, P. N. and B. Eichenlaub. 1997. Animal movement extension to Arcview. Ver. 1.1. Alaska Biological Science Center, U.S. Geological Survey, Anchorage, AK.

Janis M.W. and J.D. Clark. 2002. Responses of Florida panthers to recreational deer and hog hunting. *Journal of Wildlife Management* 66:839-848.

National Park Service. 2000. Final recreational off-road vehicle management plan. Supplemental Environmental Impact Statement. USNPS, Big Cypress National Preserve. Ochopee, Florida 603 pp.

Ross, P.I., M. G. Jalkotzy, and P. Daoust. 1995. Fatal trauma sustained by cougars, *Felis concolor*, while attacking prey in southern Alberta. *The Canadian Field-Naturalist* 109: 261-263.

Schneider, W. J., D. P. Weeks, and D. L. Sharrow. 1996. Water resources management plan – Big Cypress National Preserve. USDI-Natl. Park Serv. 178 pp.

Welch, R., M. Madden, and R. F. Doren. 1999. "Mapping the Everglades." *Photogrammetric Engineering and Remote Sensing* 65(2):166-170.

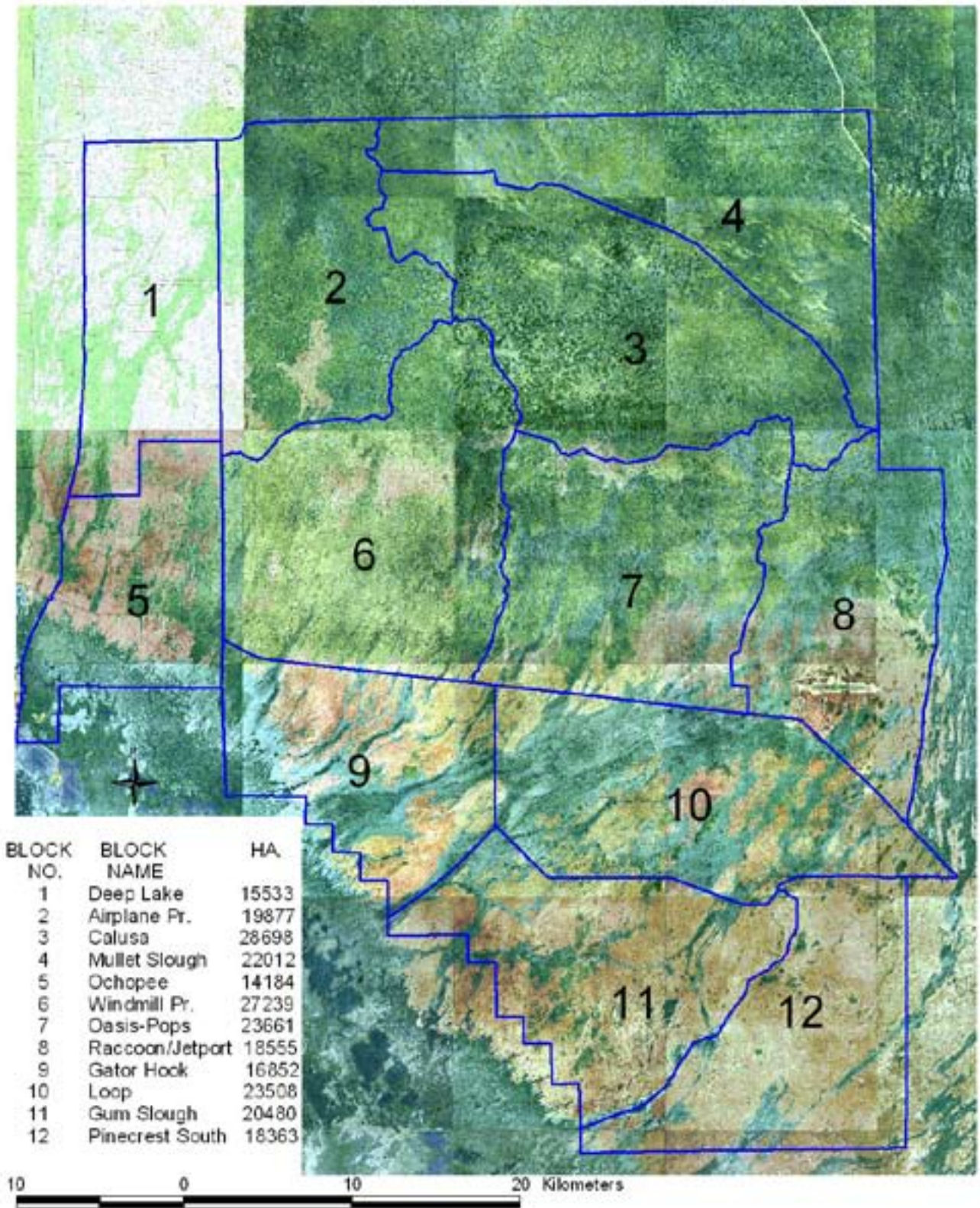


Figure 1. Panther Survey Blocks in the NPS Study Area.

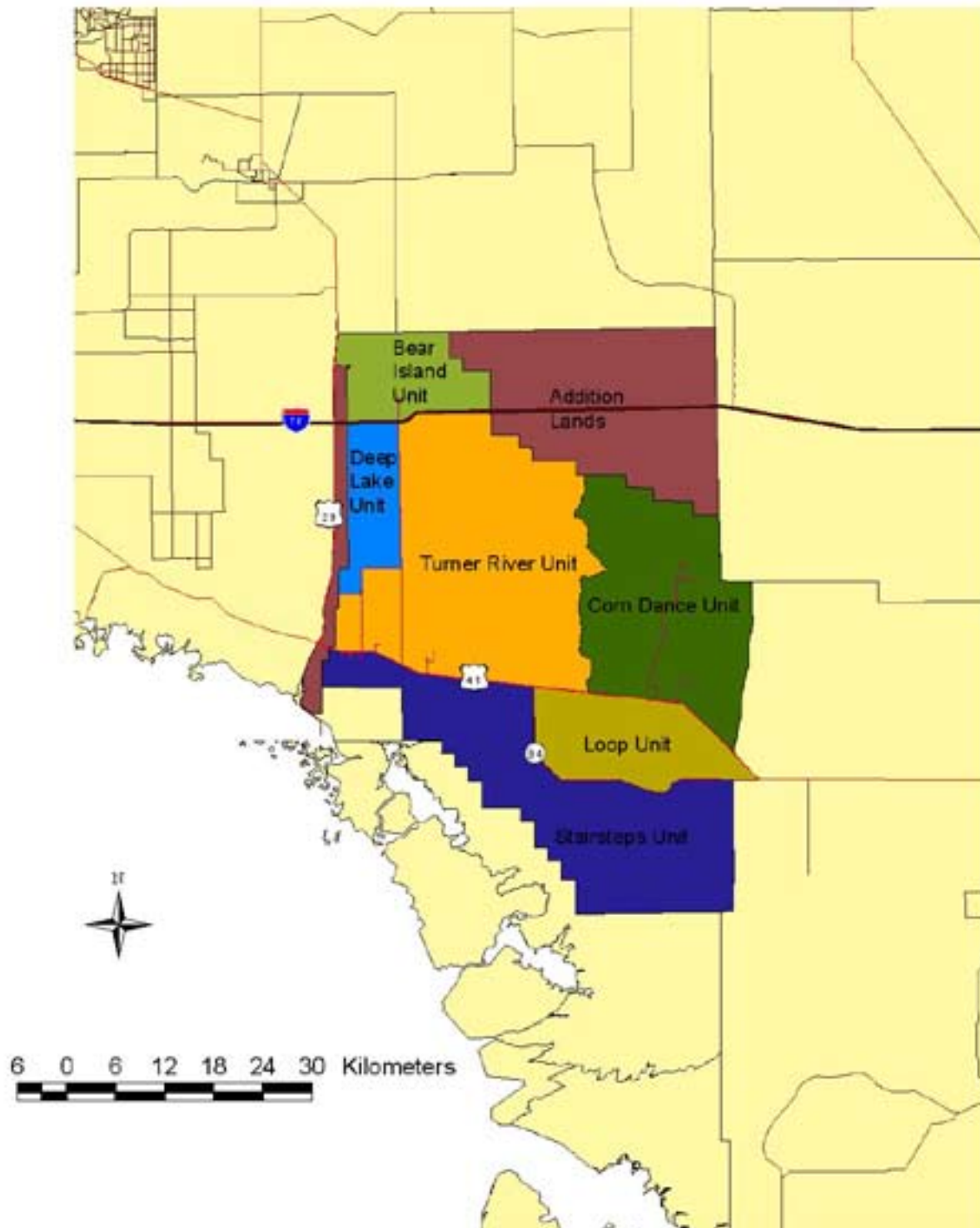


Figure 1. Management Units.

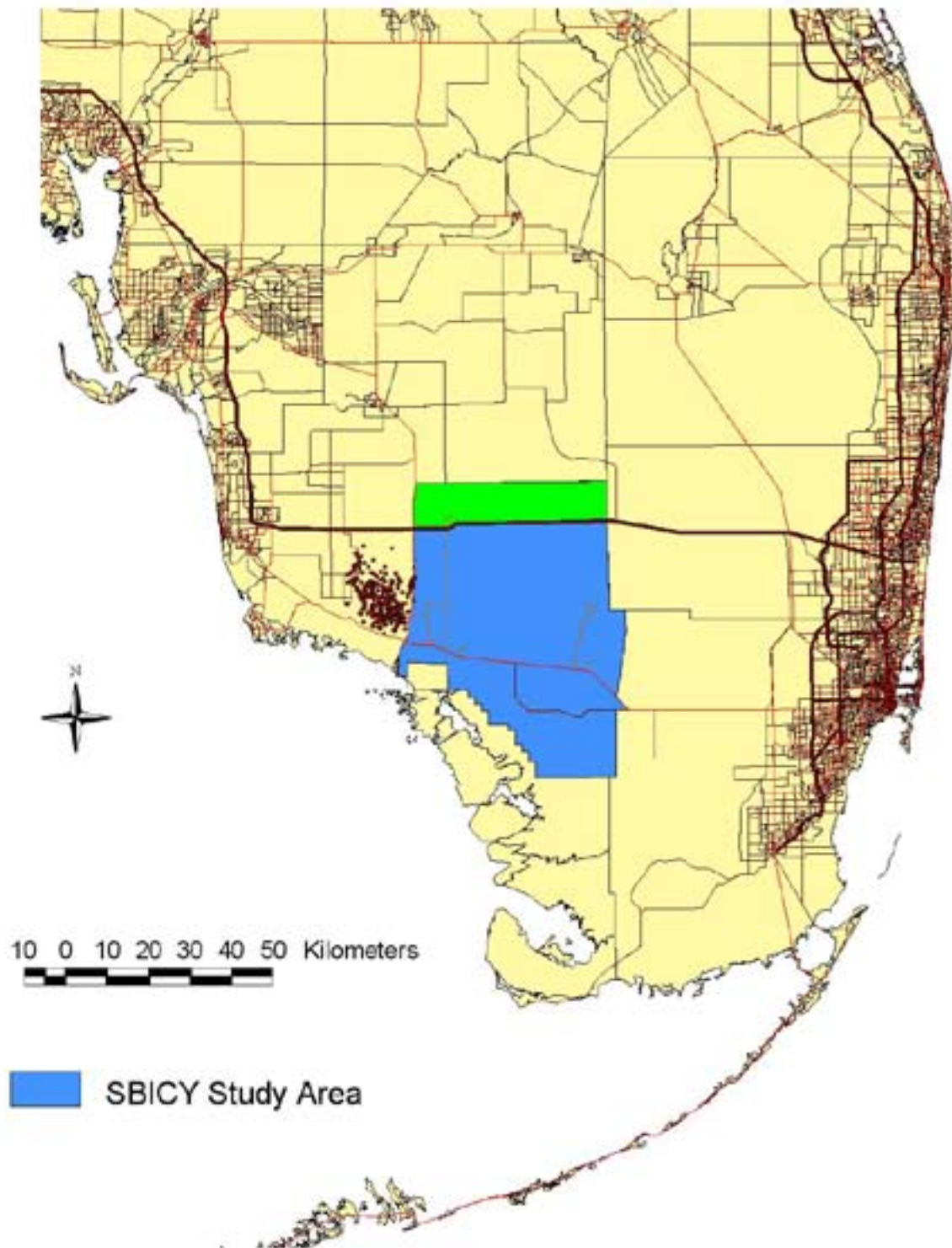


Figure 2. Area of use by male Florida panther #02.

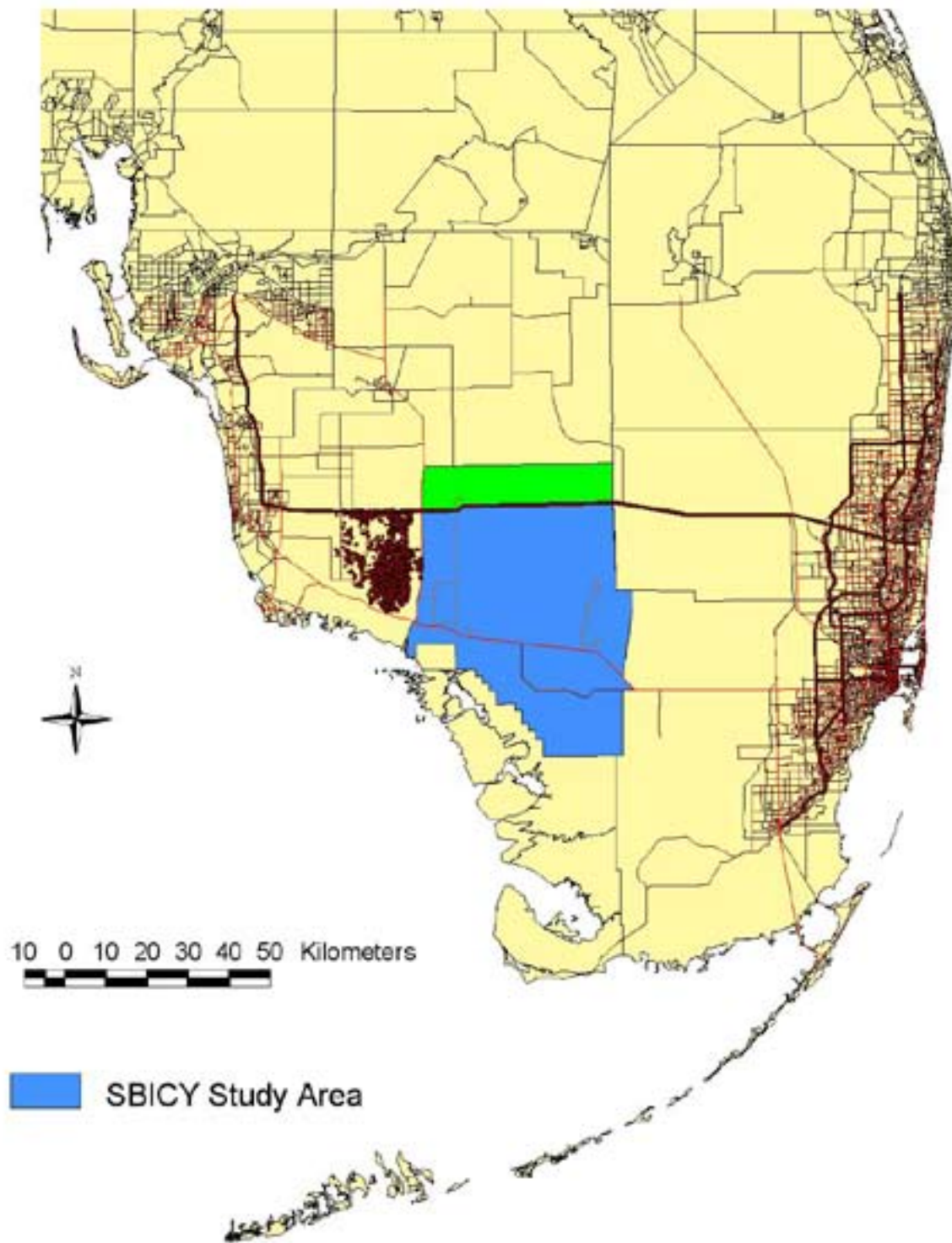


Figure 3. Area of use by female Florida panther #09.

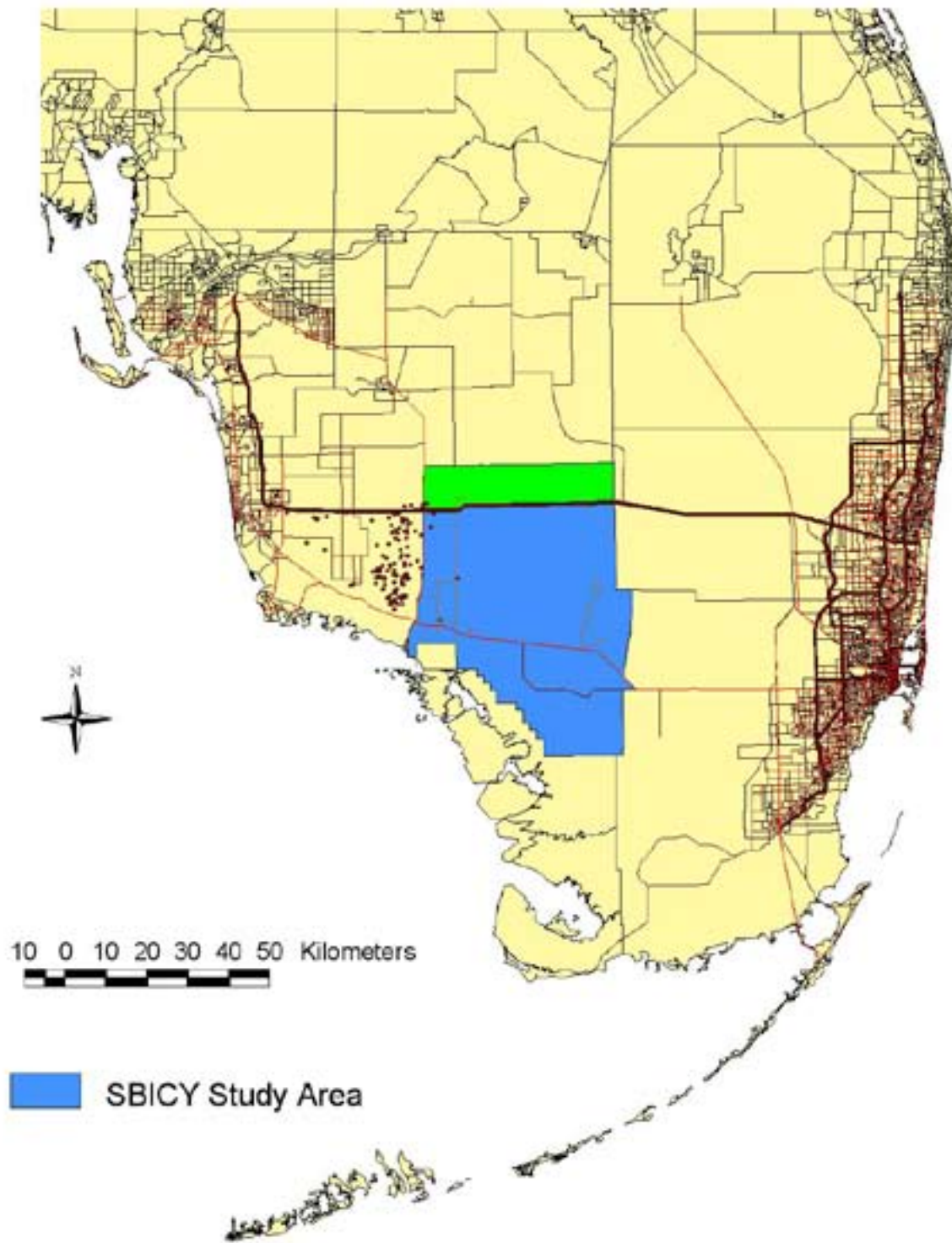


Figure 4. Area of use by male Florida panther #37.

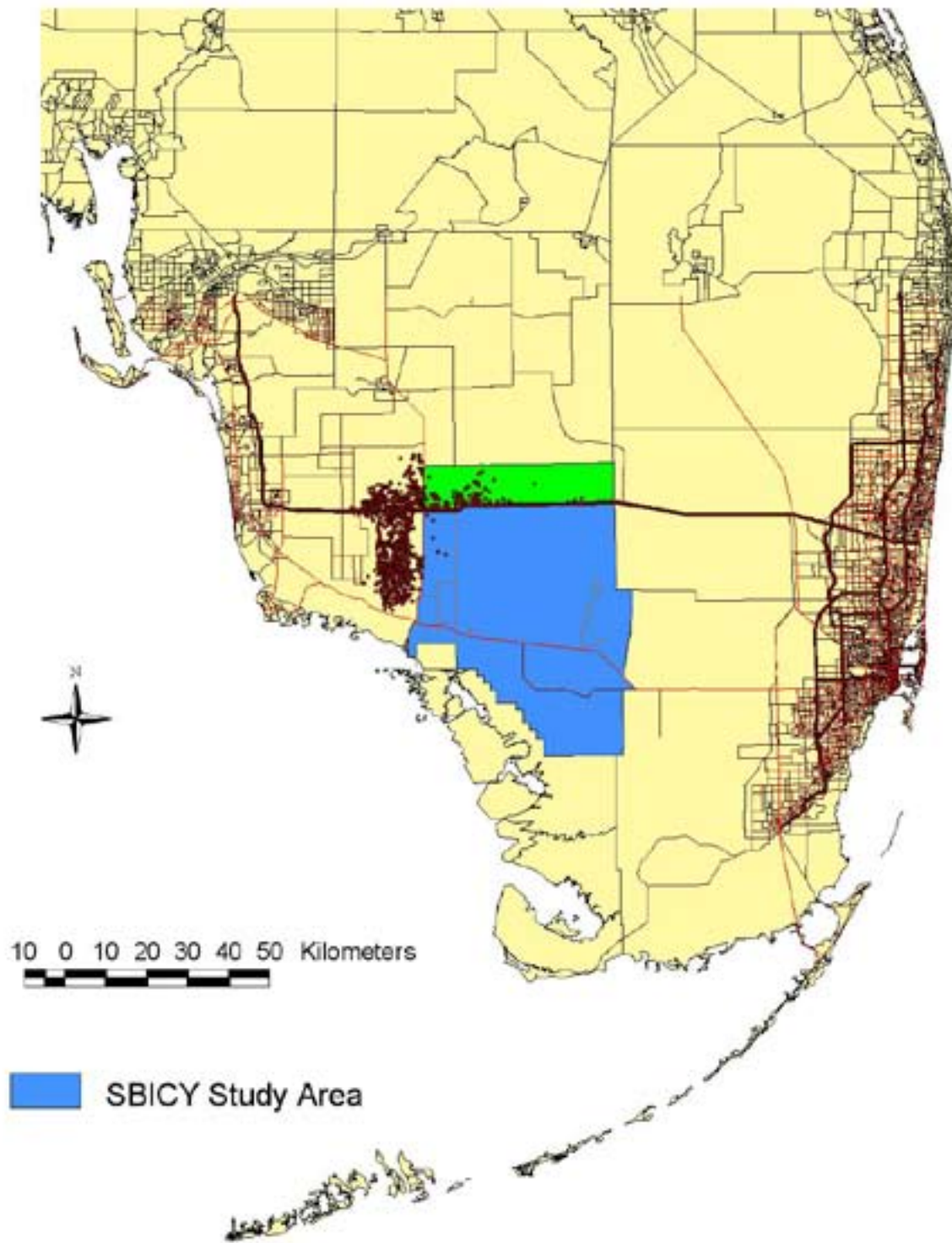


Figure 5. Area of use by male Florida panther #54.



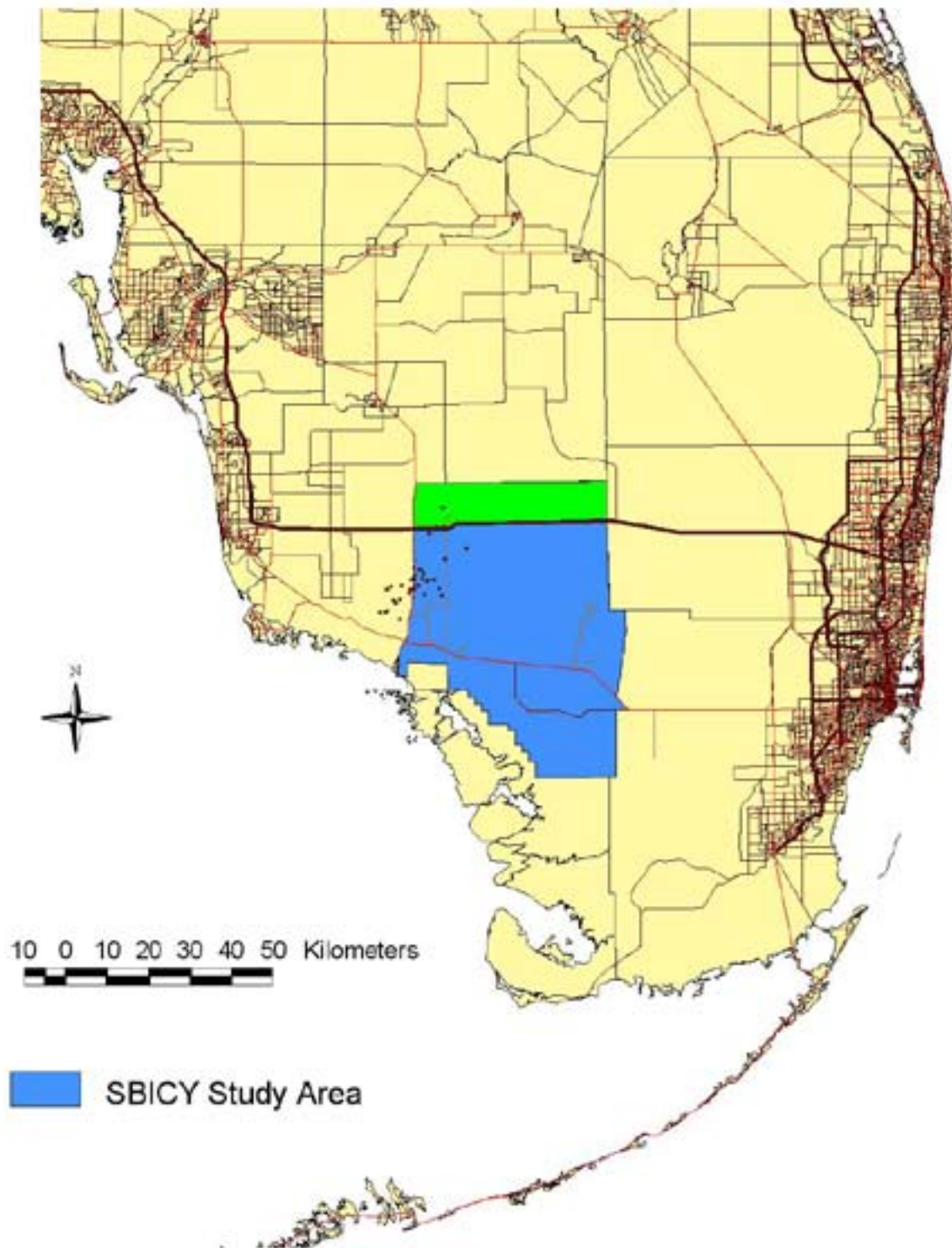


Figure 6. Area of use by male Florida panther #01.

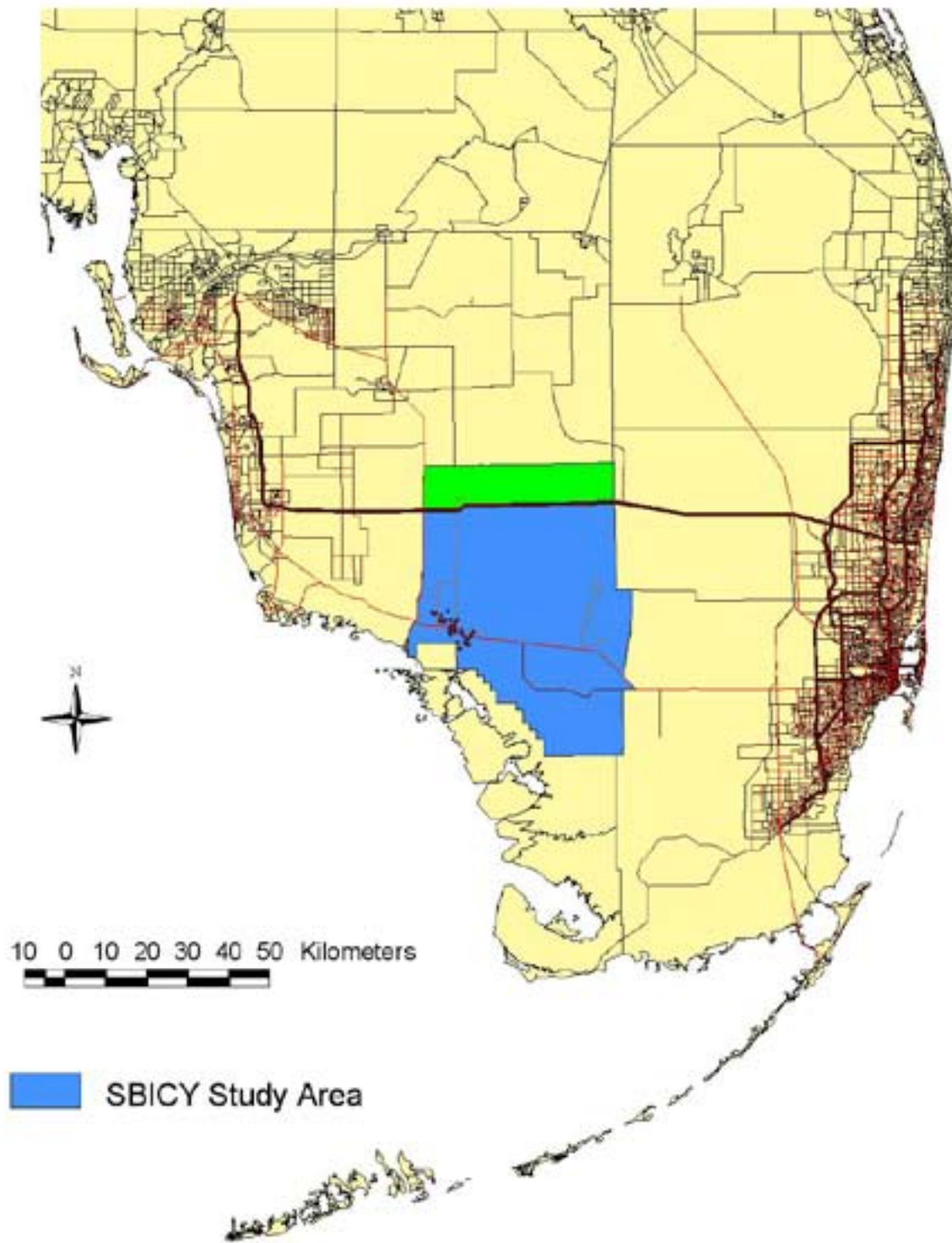


Figure 7. Area of use by female Florida panther #120.

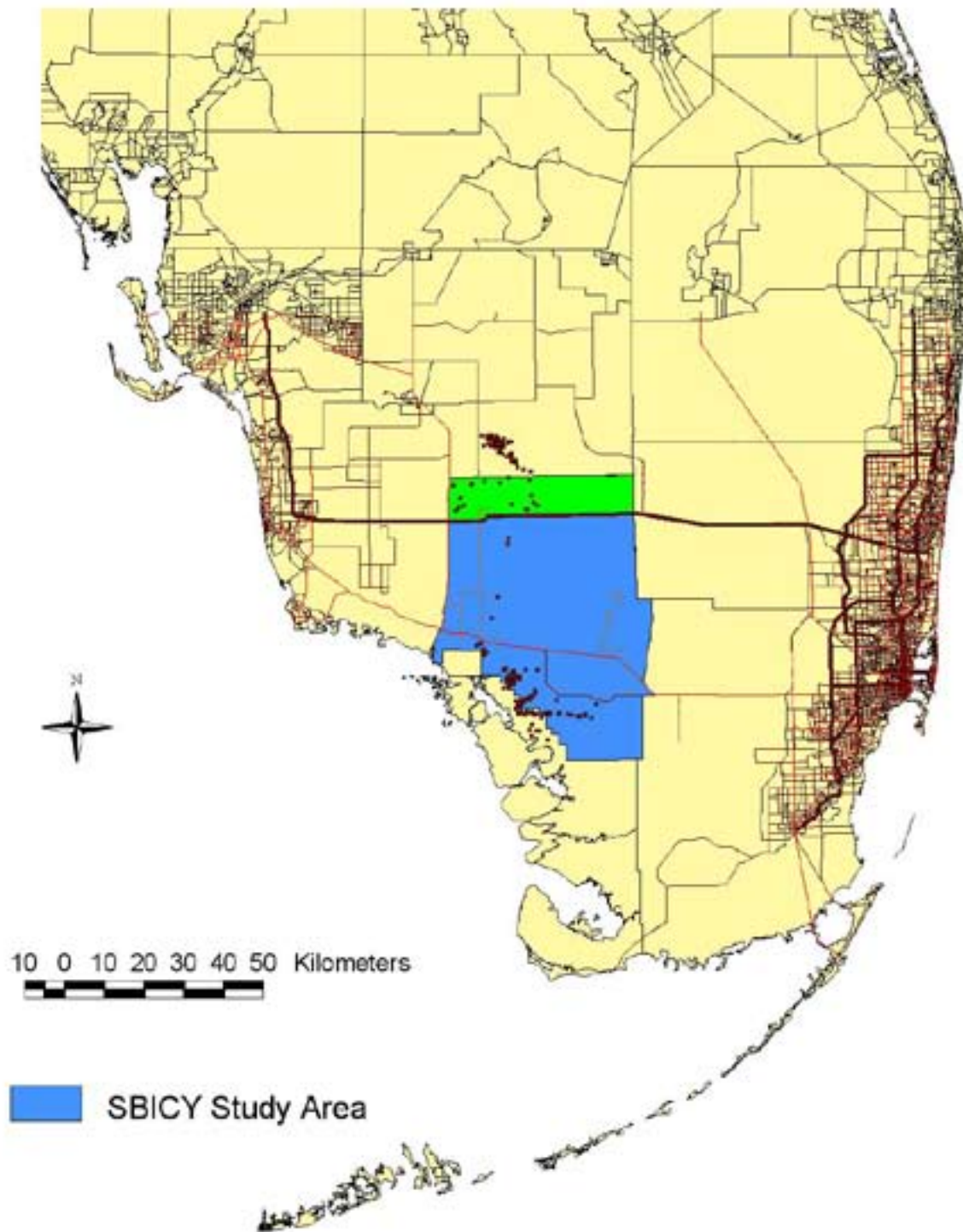


Figure 8. Area of use by male Florida panther #33.

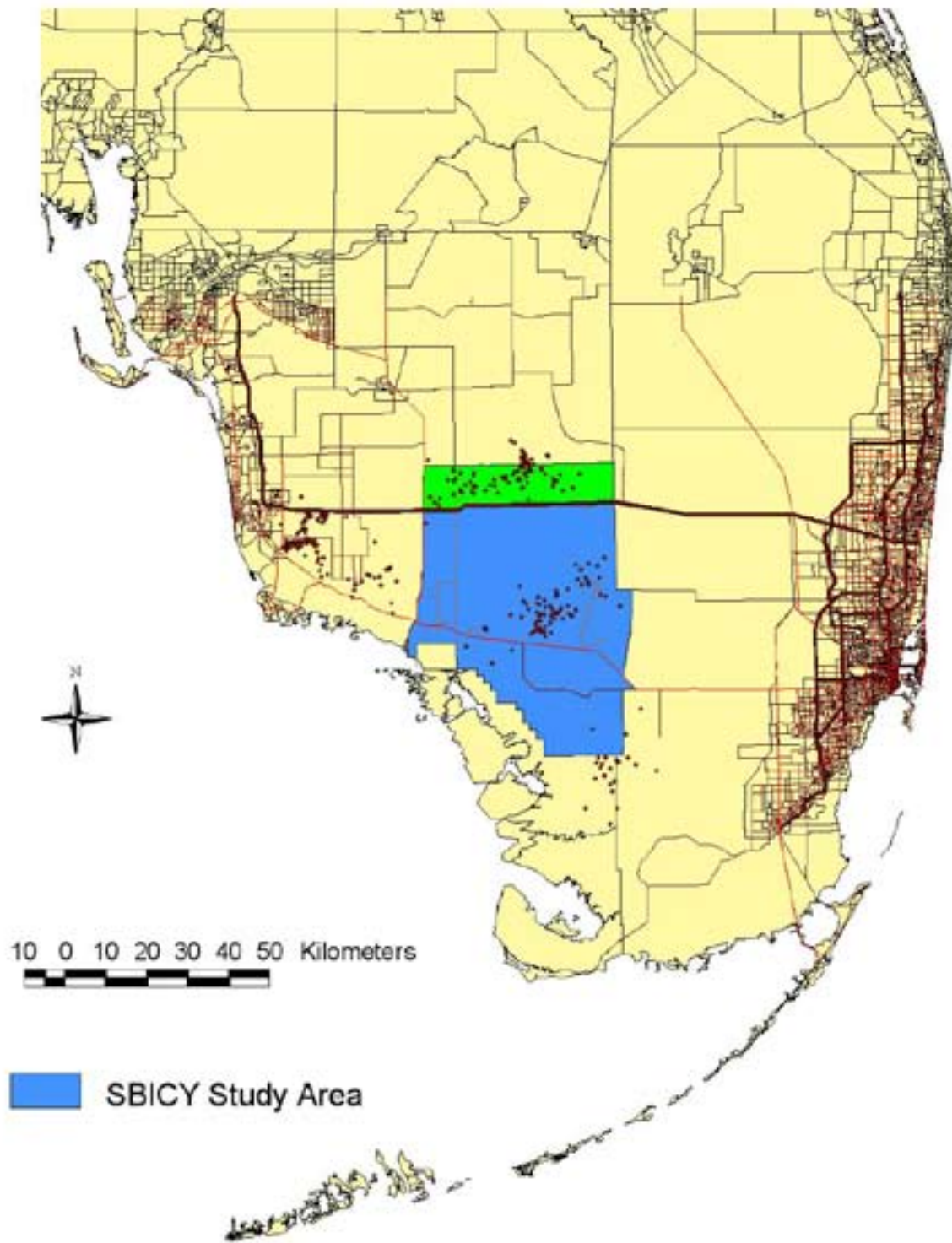


Figure 9. Area of use by male Florida panther #44.

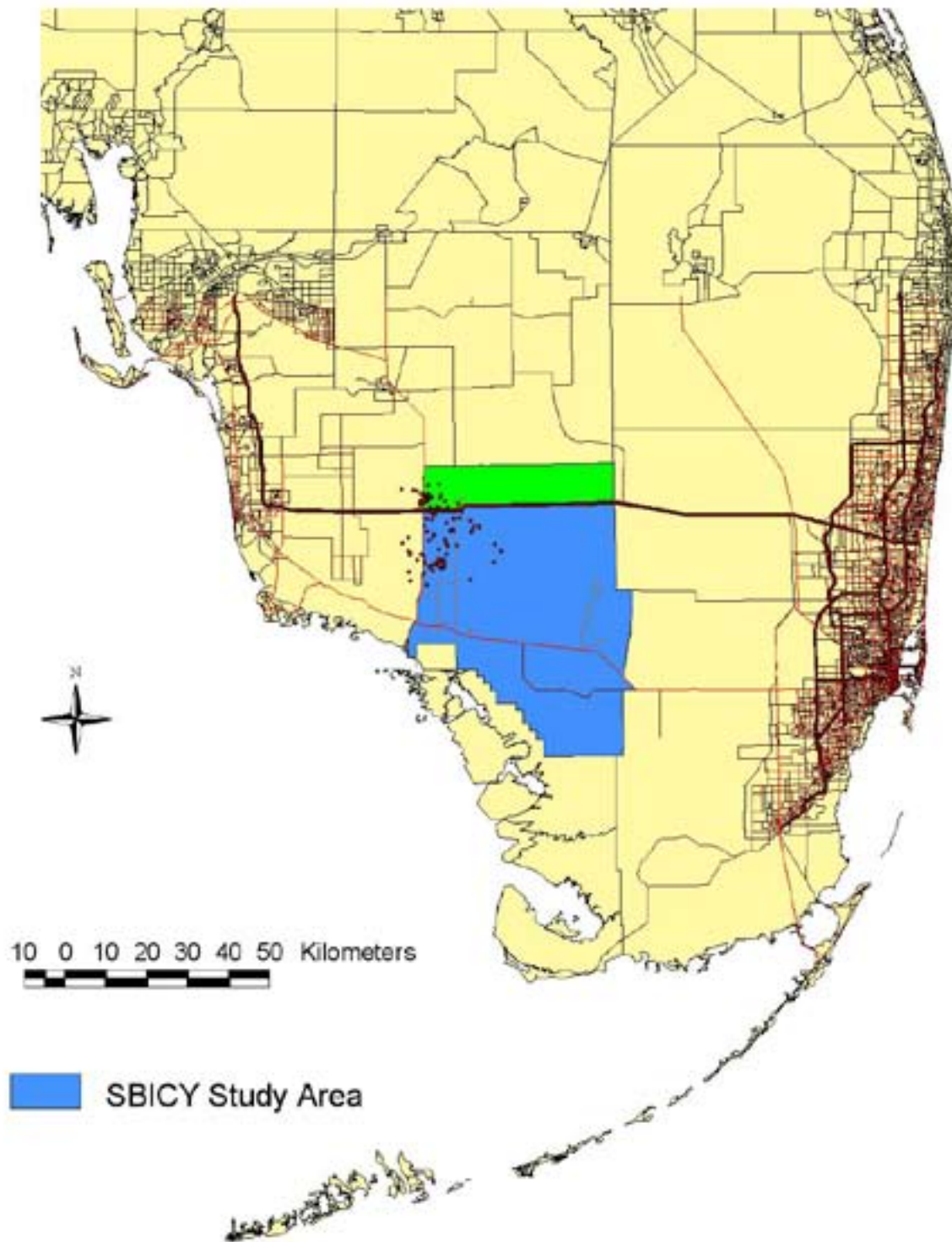


Figure 10. Area of use by male Florida panther #76.

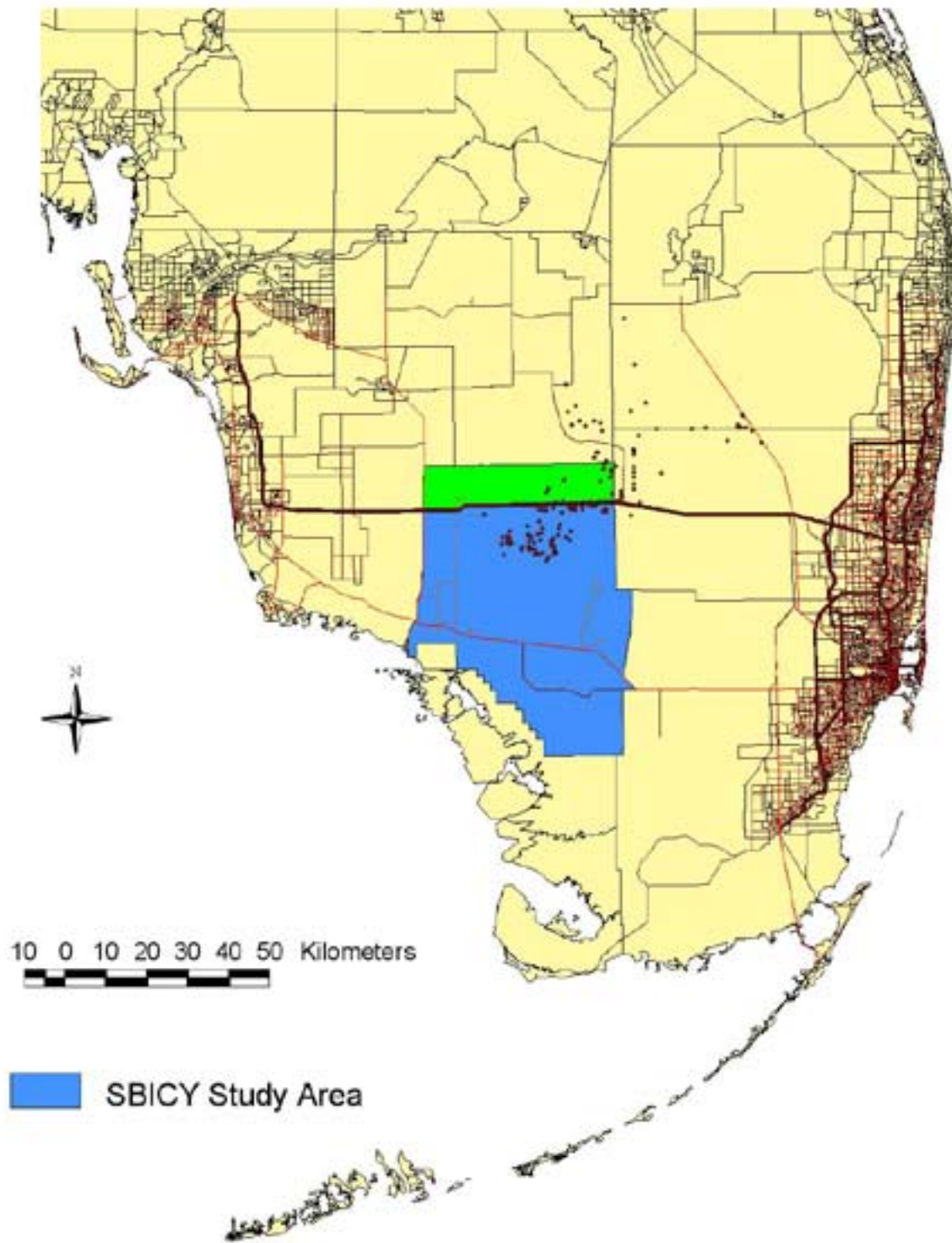


Figure 11. Area of use by male Florida panther #90.

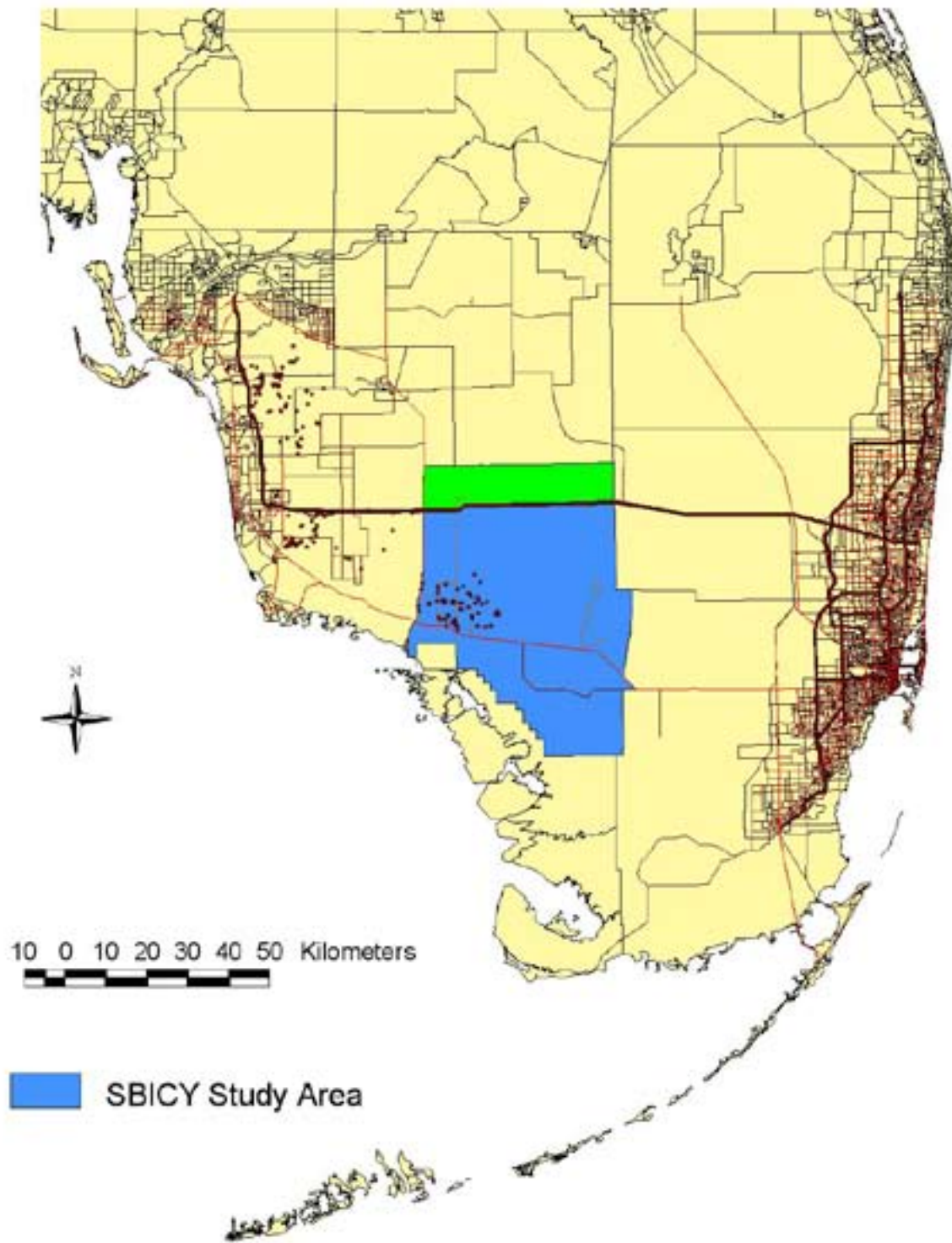


Figure 12. Area of use by male Florida panther #92.

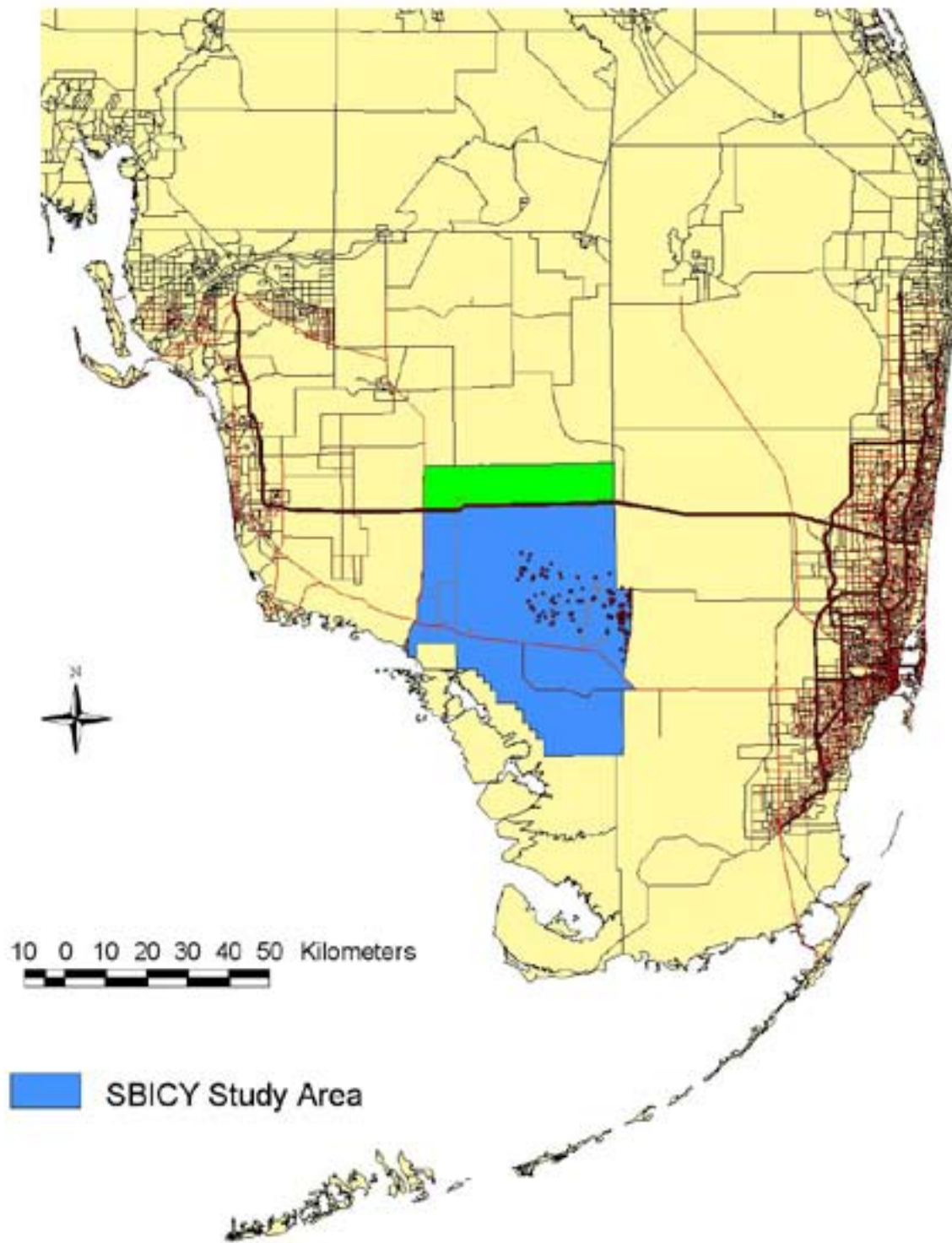


Figure 13. Area of use by male Florida panther #108.



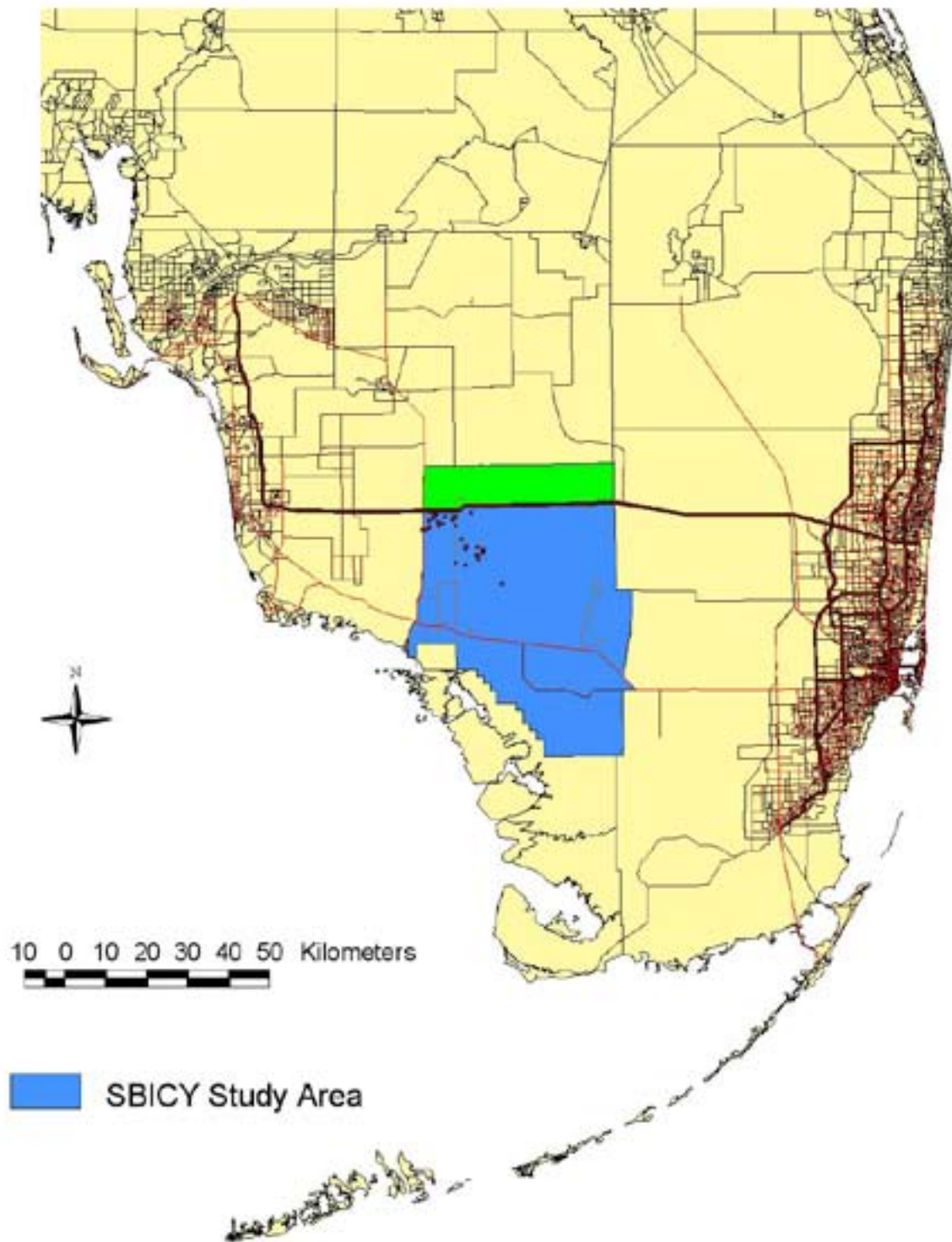


Figure 14. Area of use by male Florida panther #119.

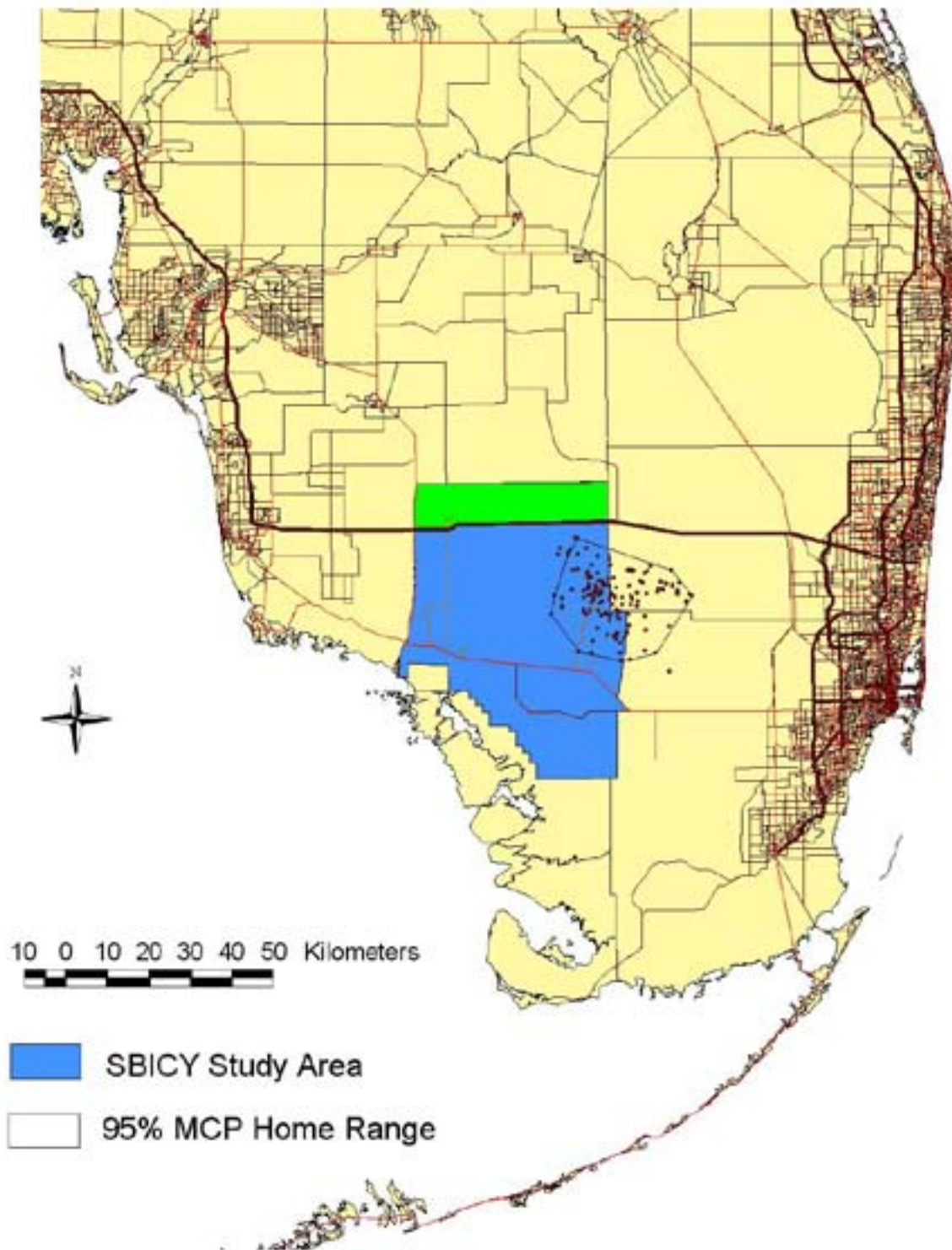


Figure 15. Area of use by male Florida panther #07.

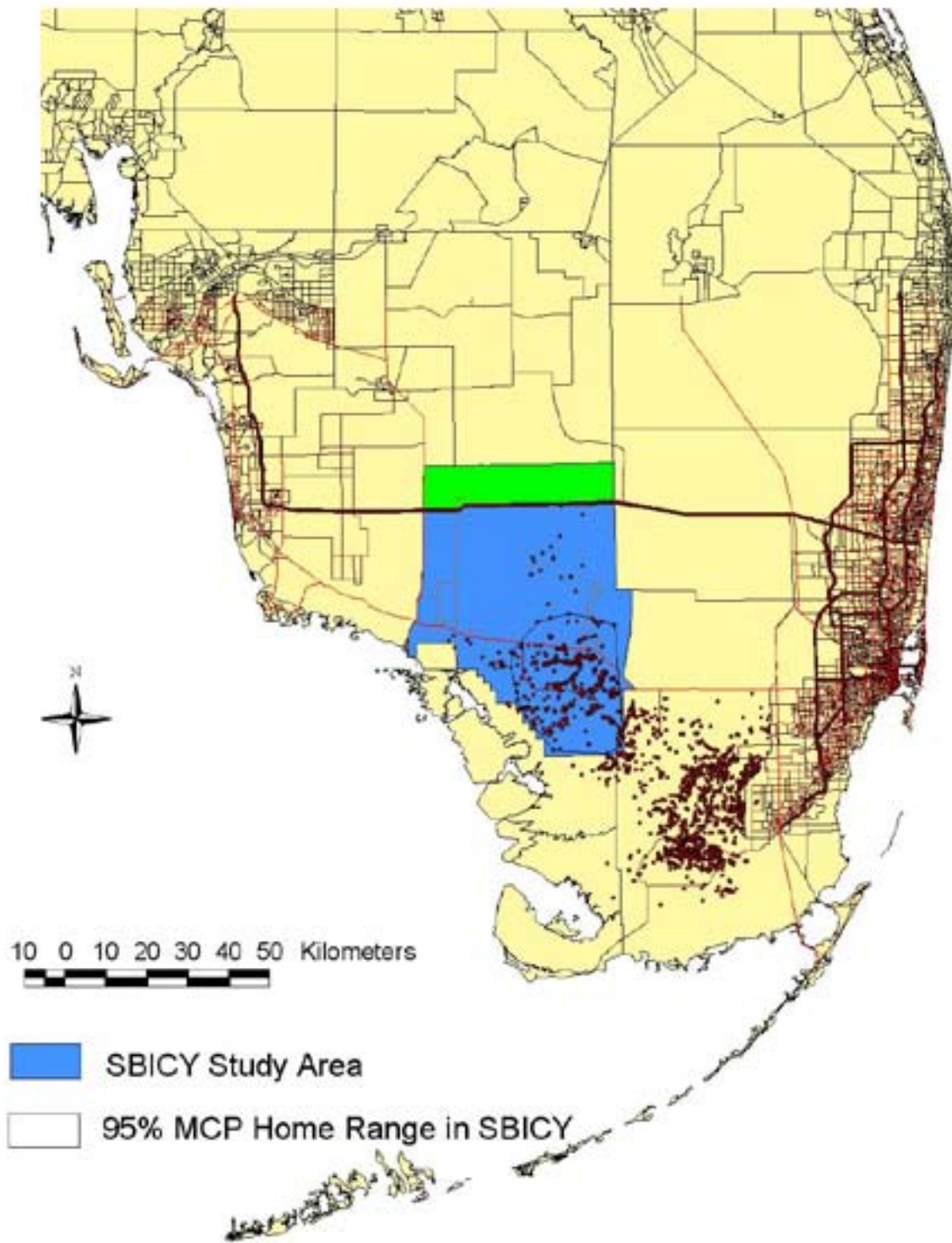


Figure 16. Area of use by male Florida panther #16.

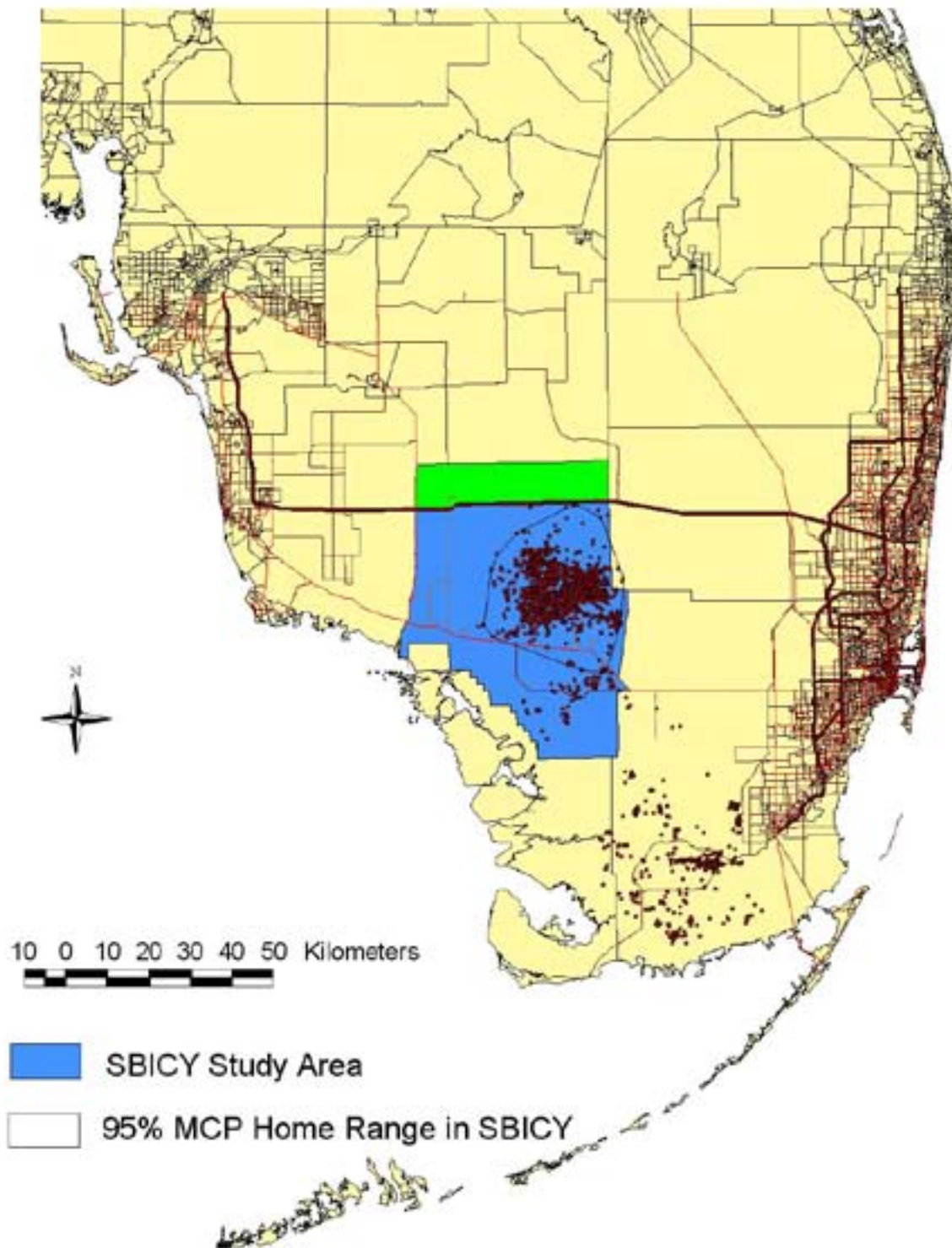


Figure 17. Area of use by female Florida panther #23.

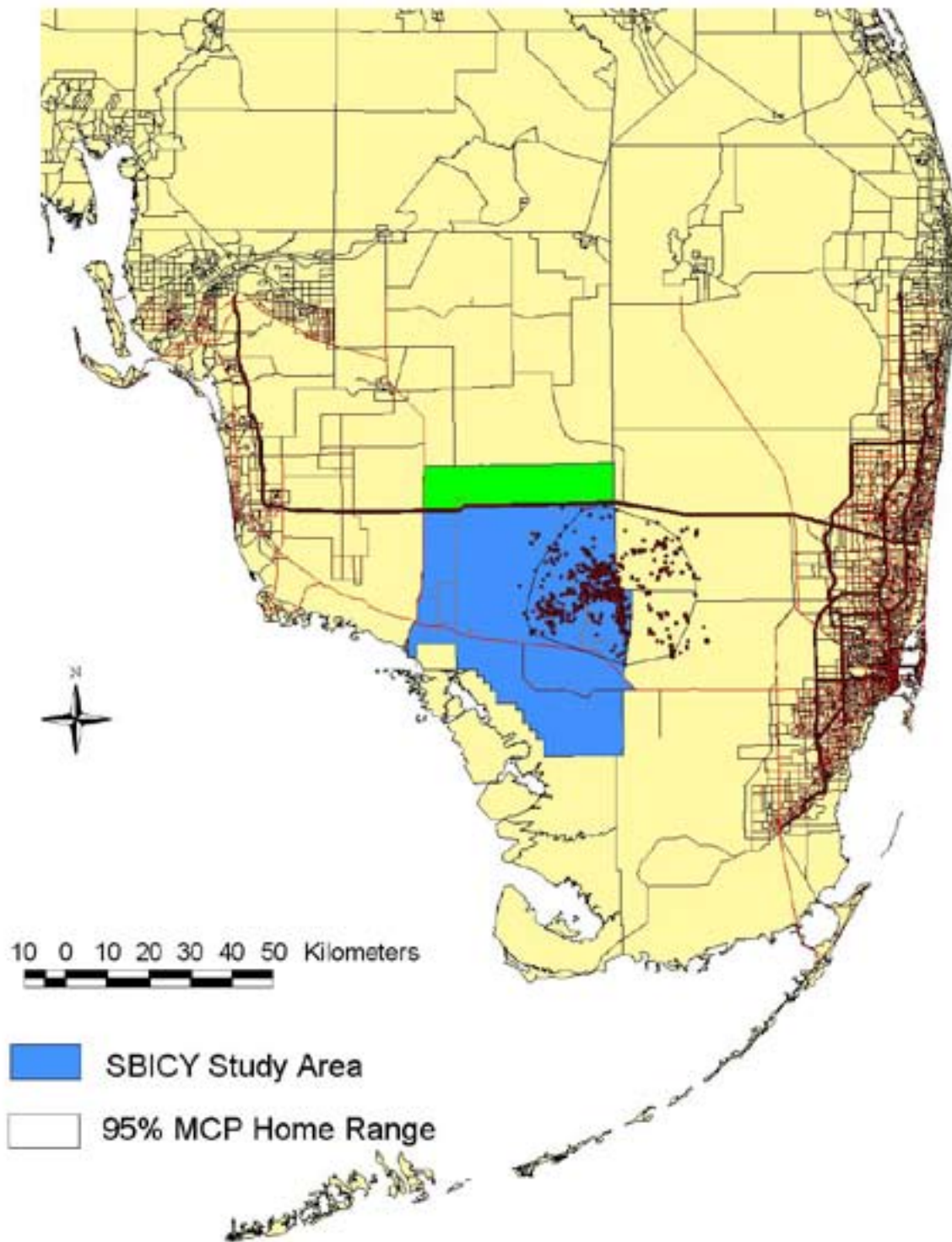


Figure 18. Area of use by female Florida panther #38.

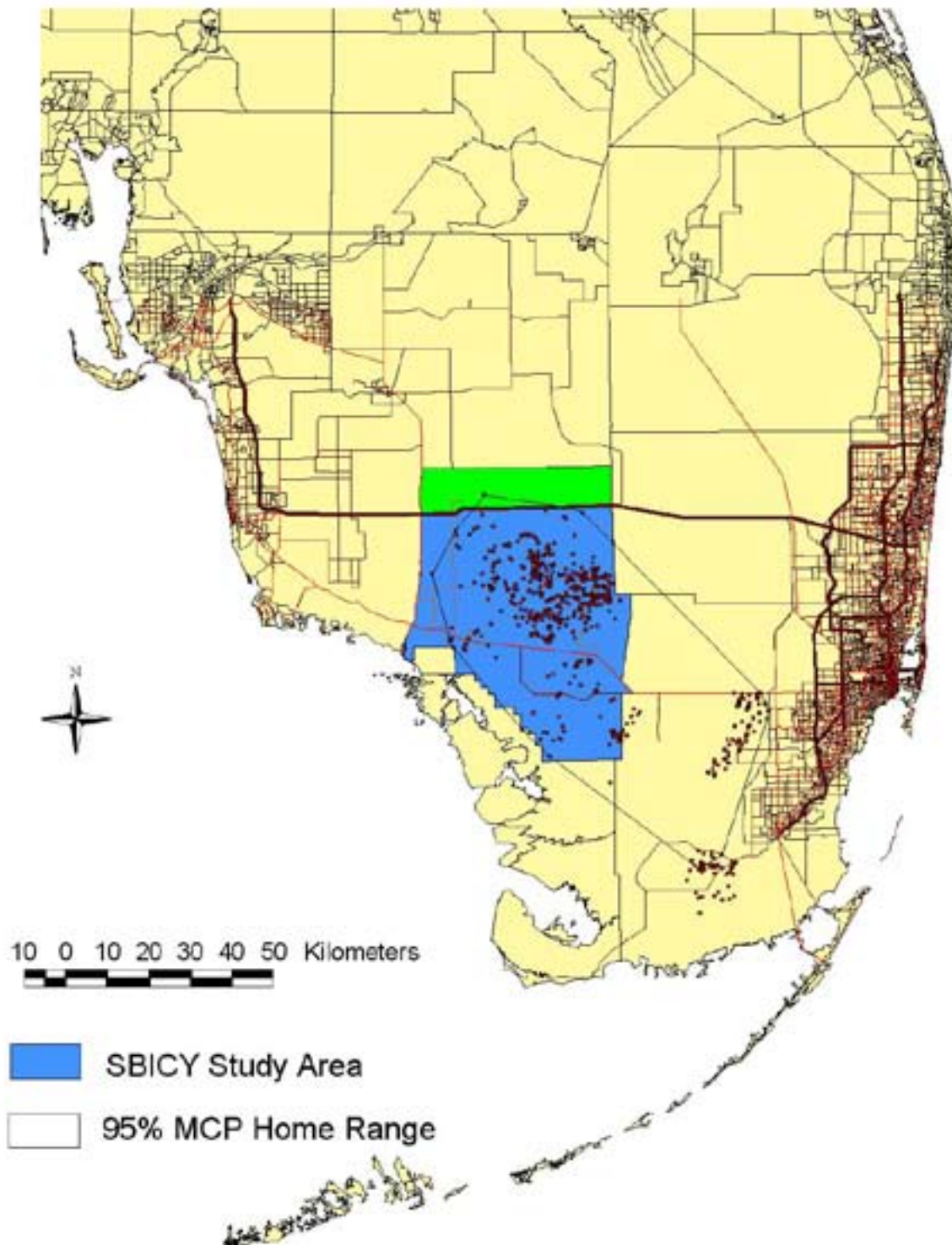


Figure 19. Area of use by male Florida panther #42.

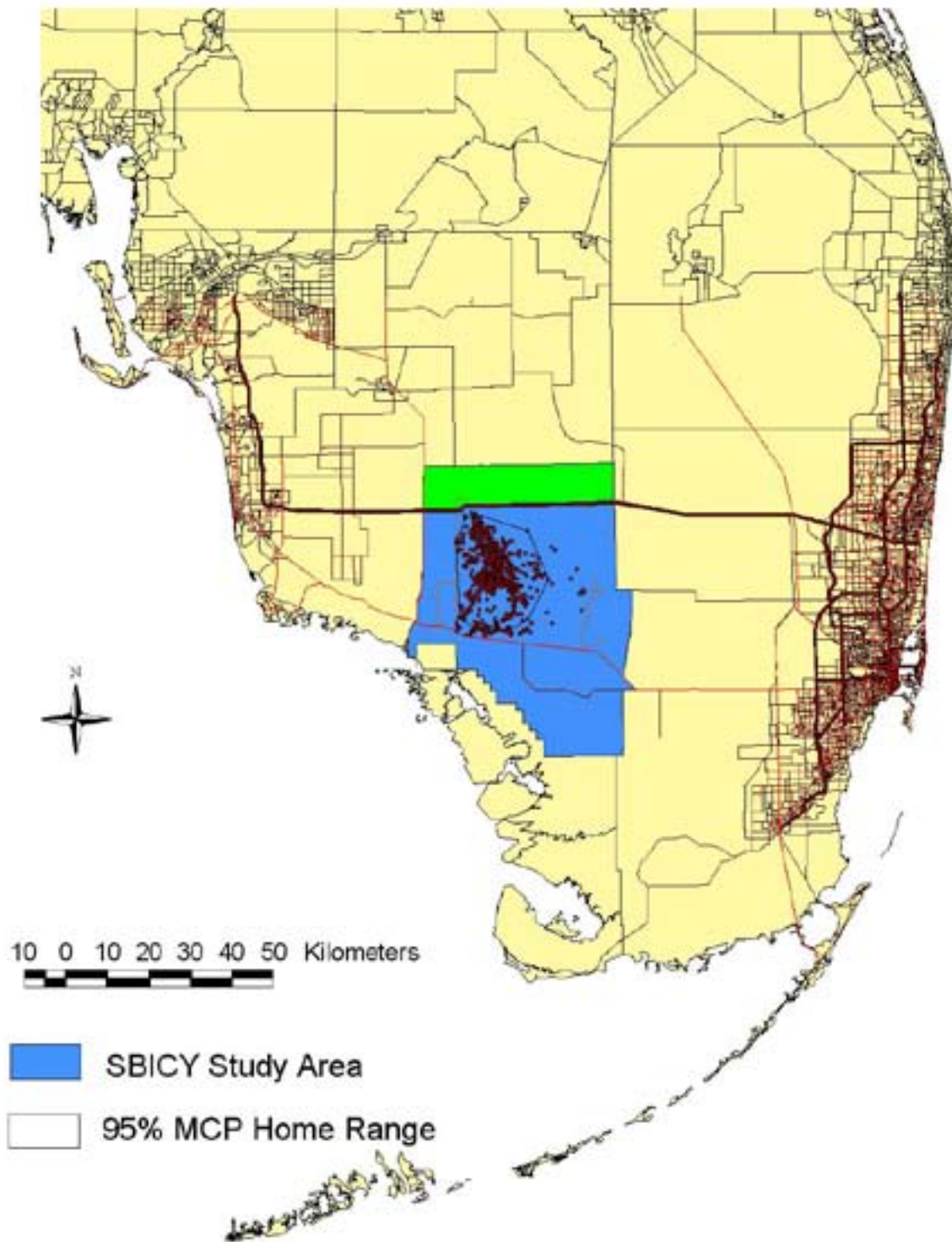


Figure 20. Area of use by female Florida panther #55.

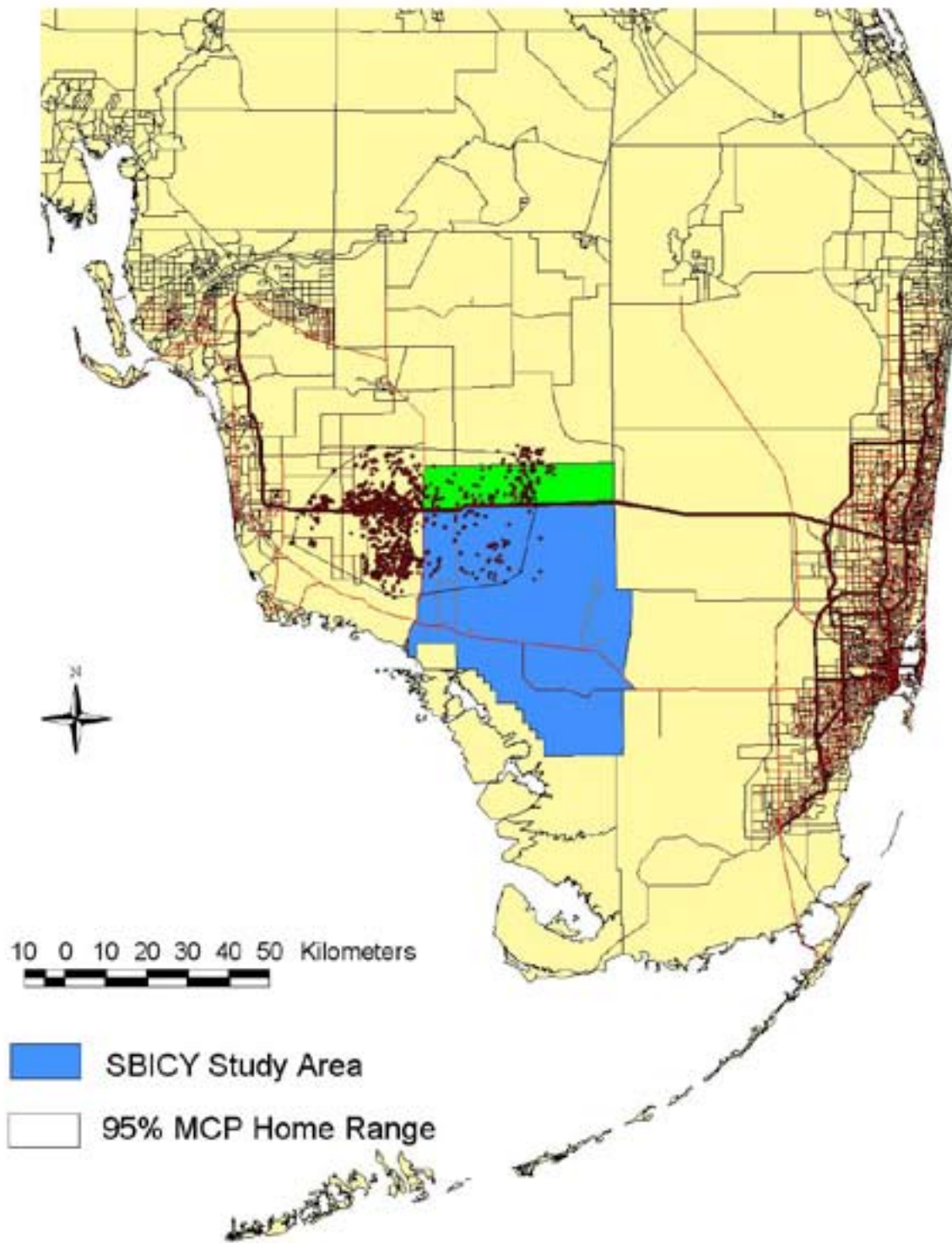


Figure 21. Area of use by male Florida panther #60.



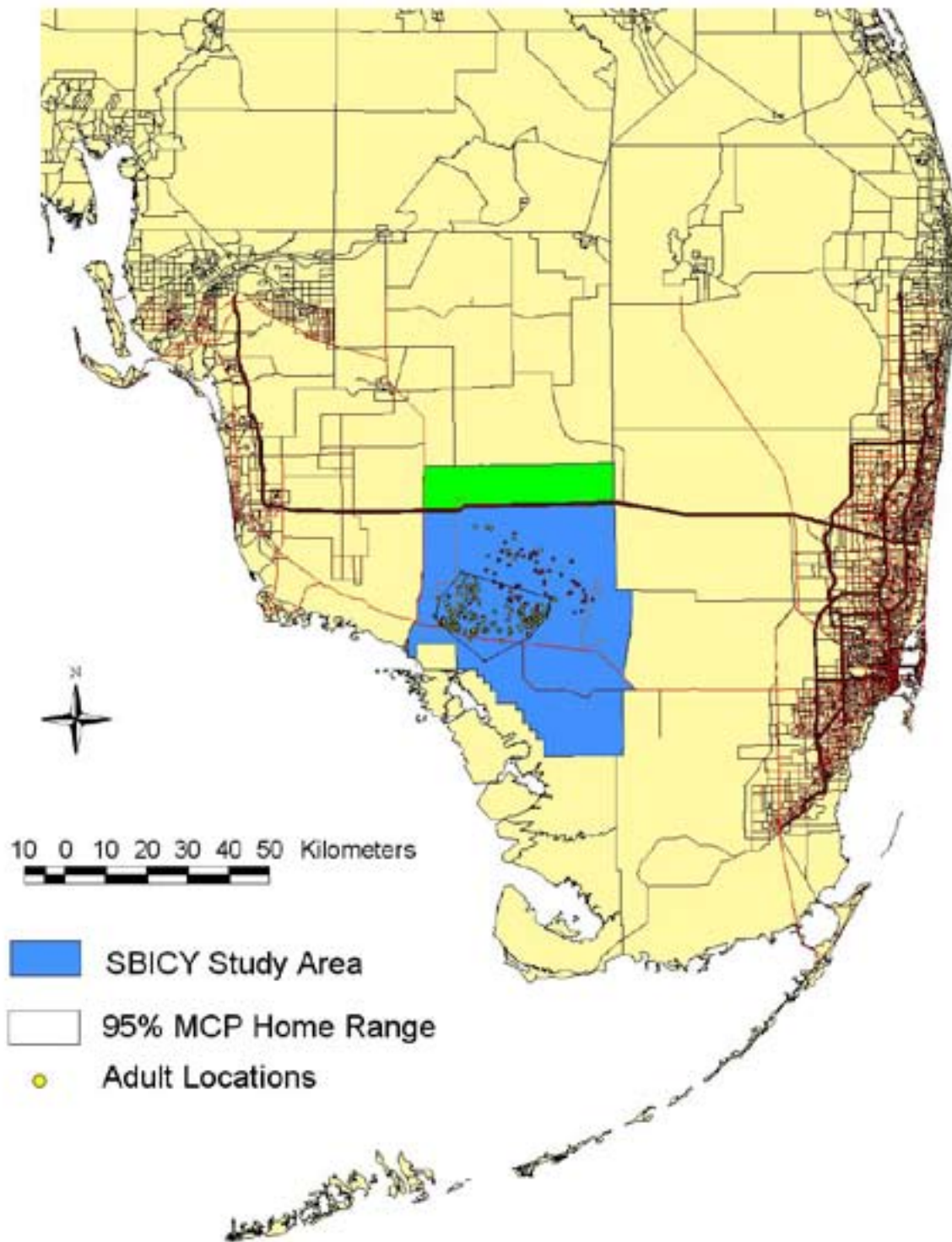


Figure 22. Area of use by female Florida panther #70.

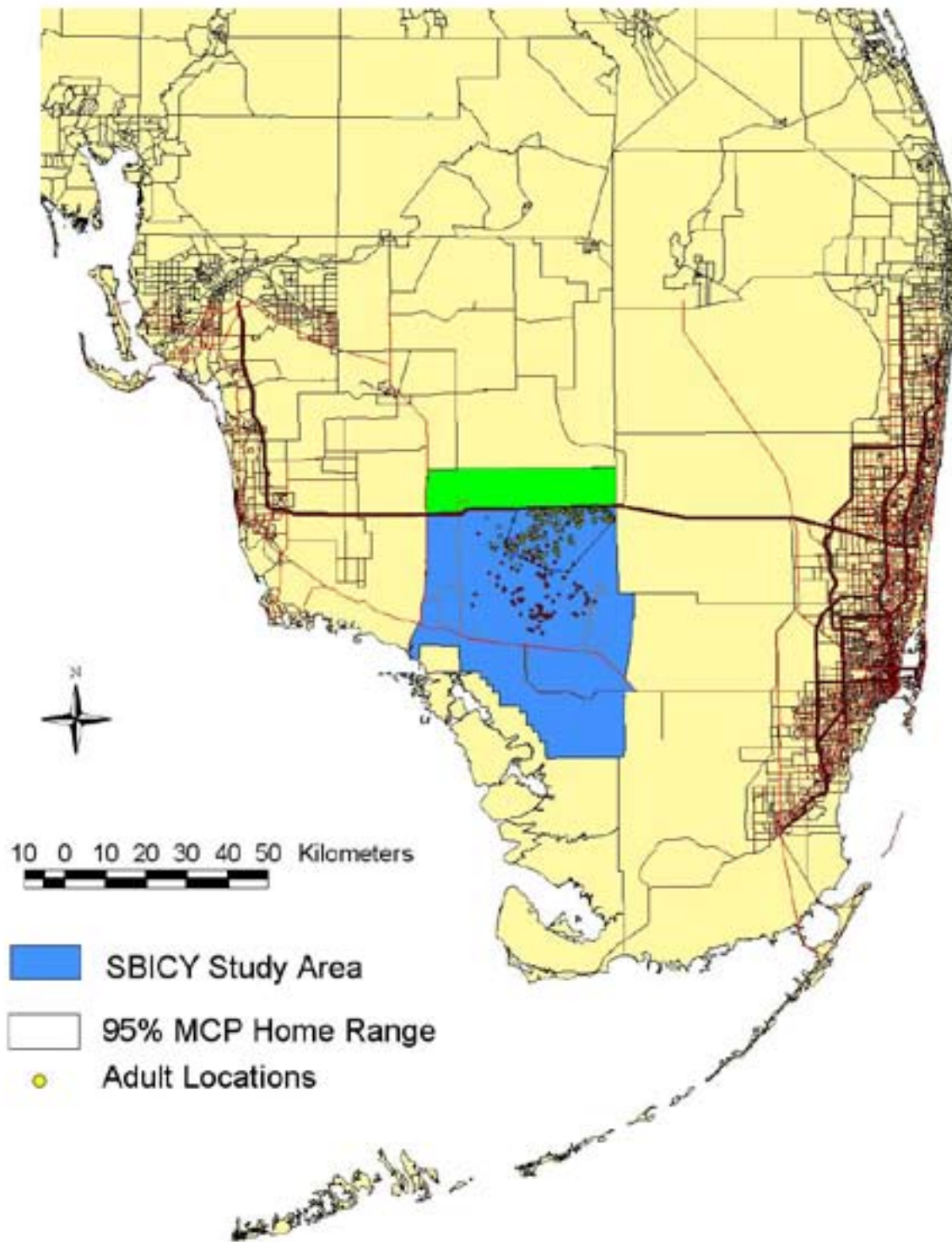


Figure 23. Area of use by female Florida panther #71.

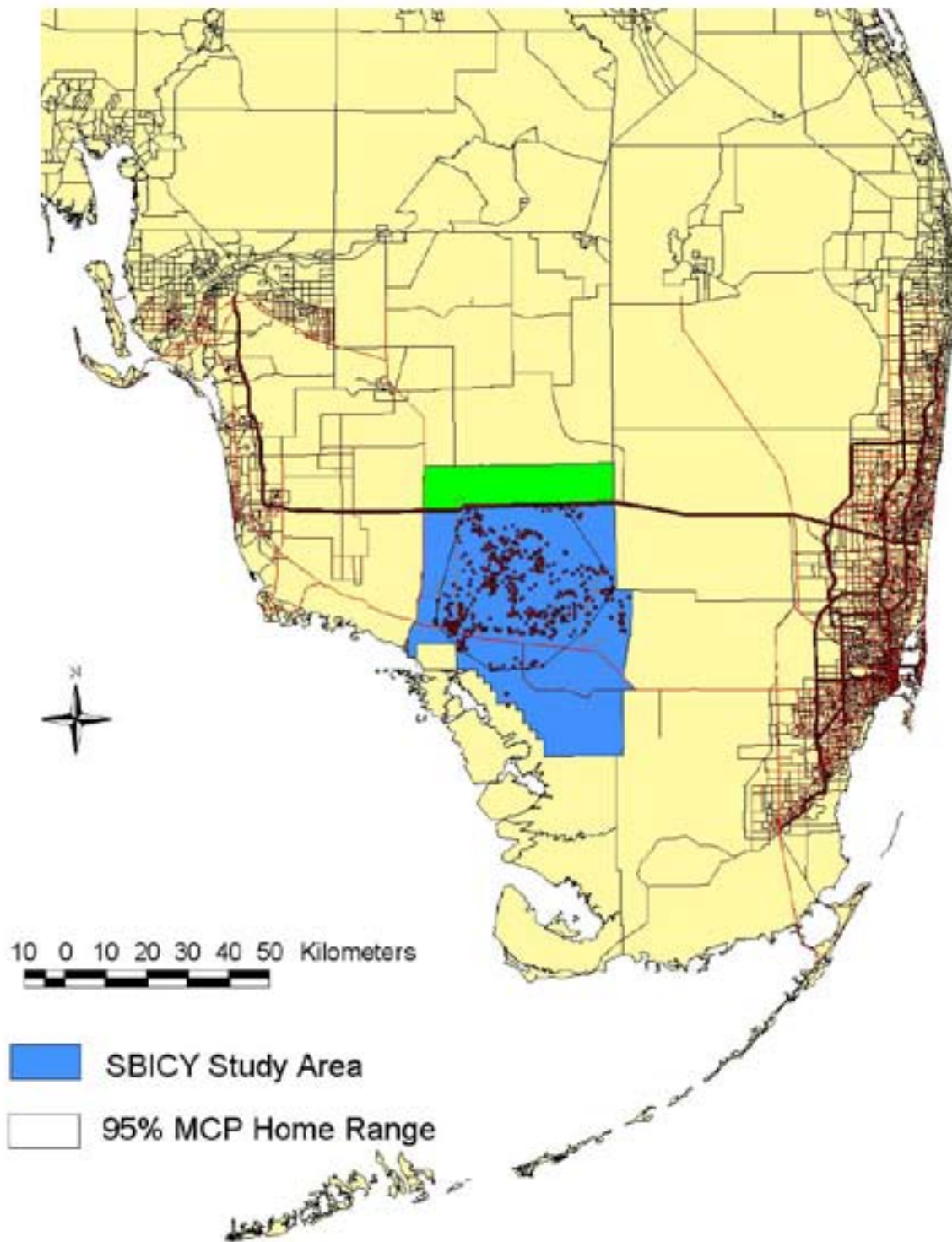


Figure 24. Area of use by male Florida panther #79.

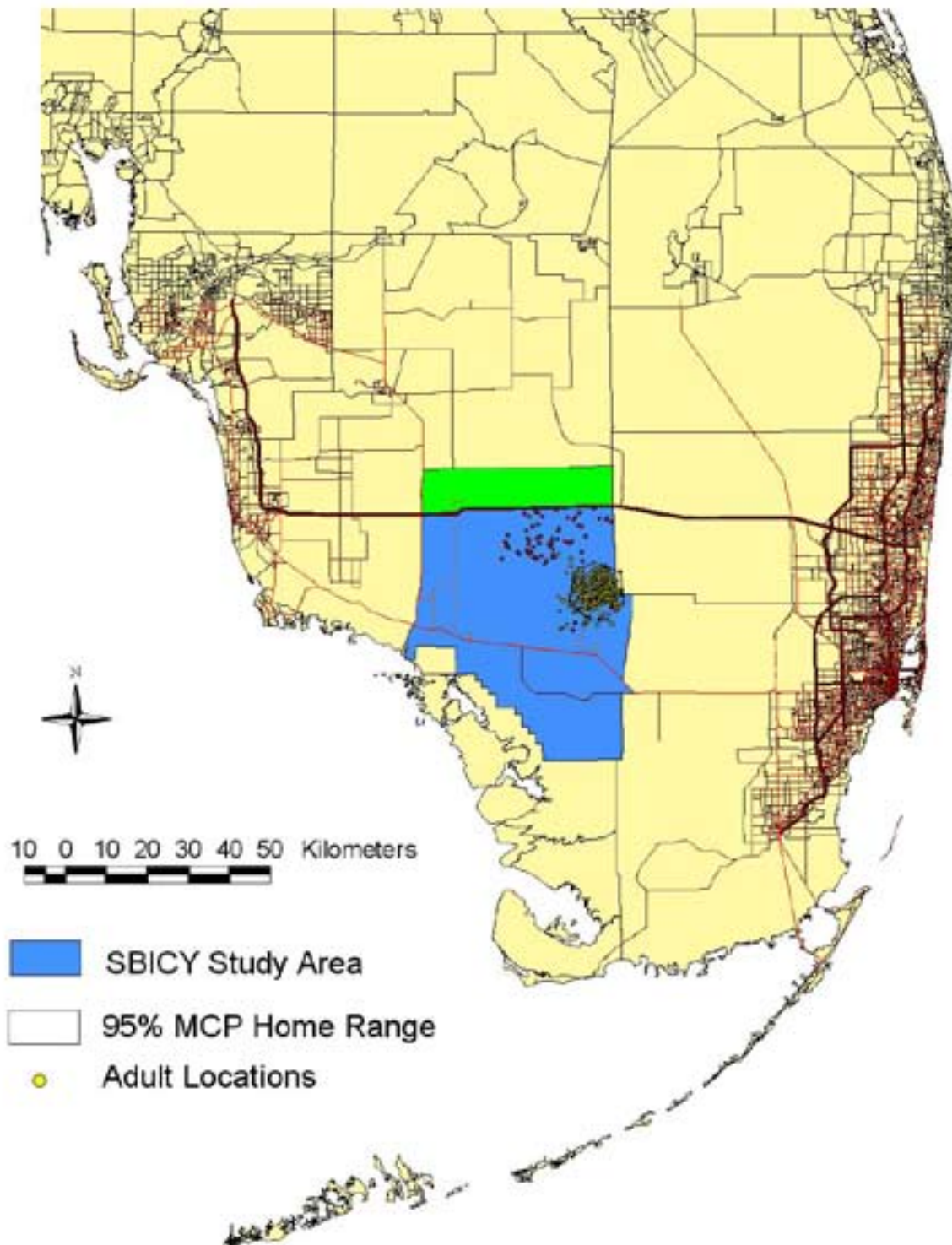


Figure 25. Area of use by female Florida panther #86.

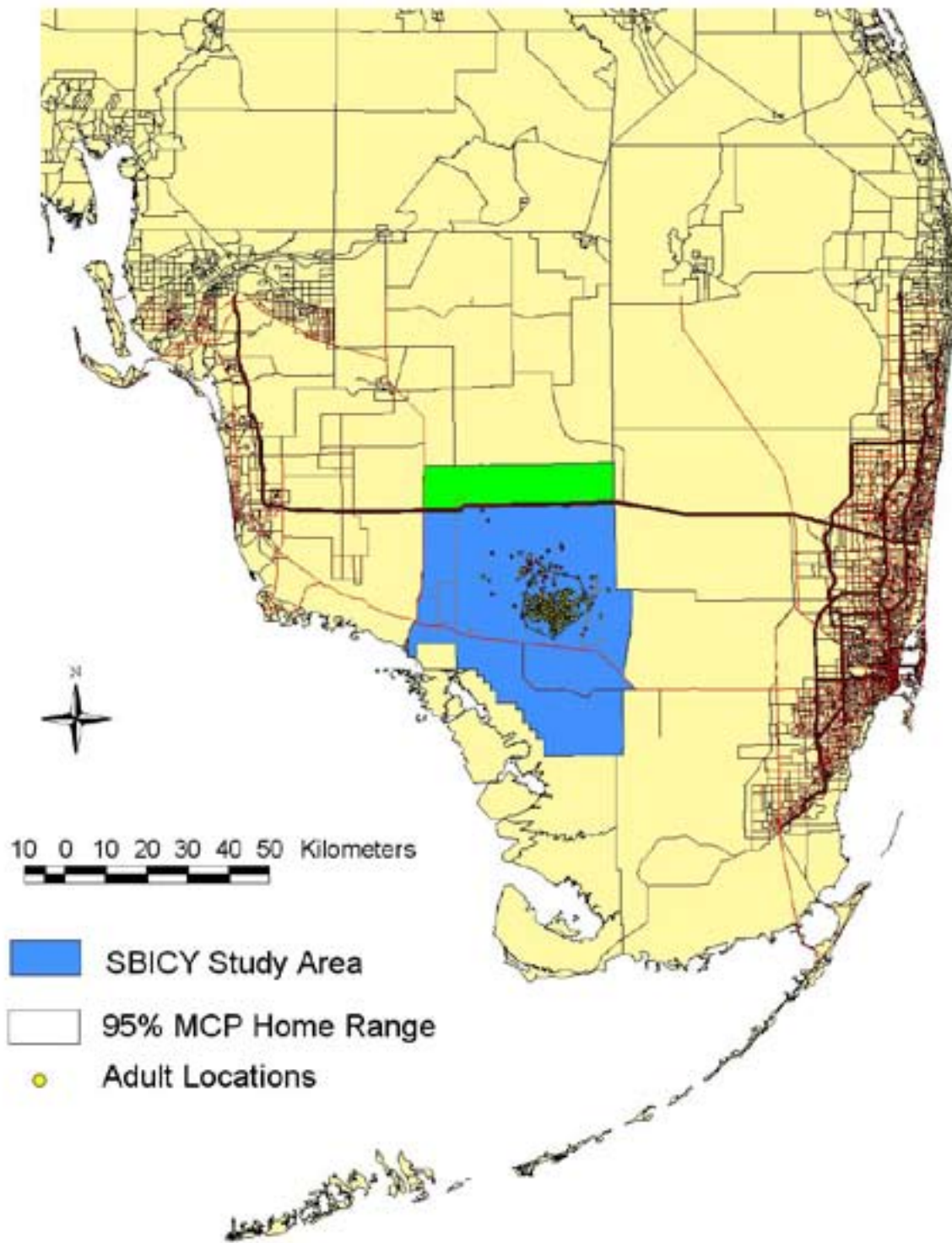


Figure 26. Area of use by female Florida panther #87.

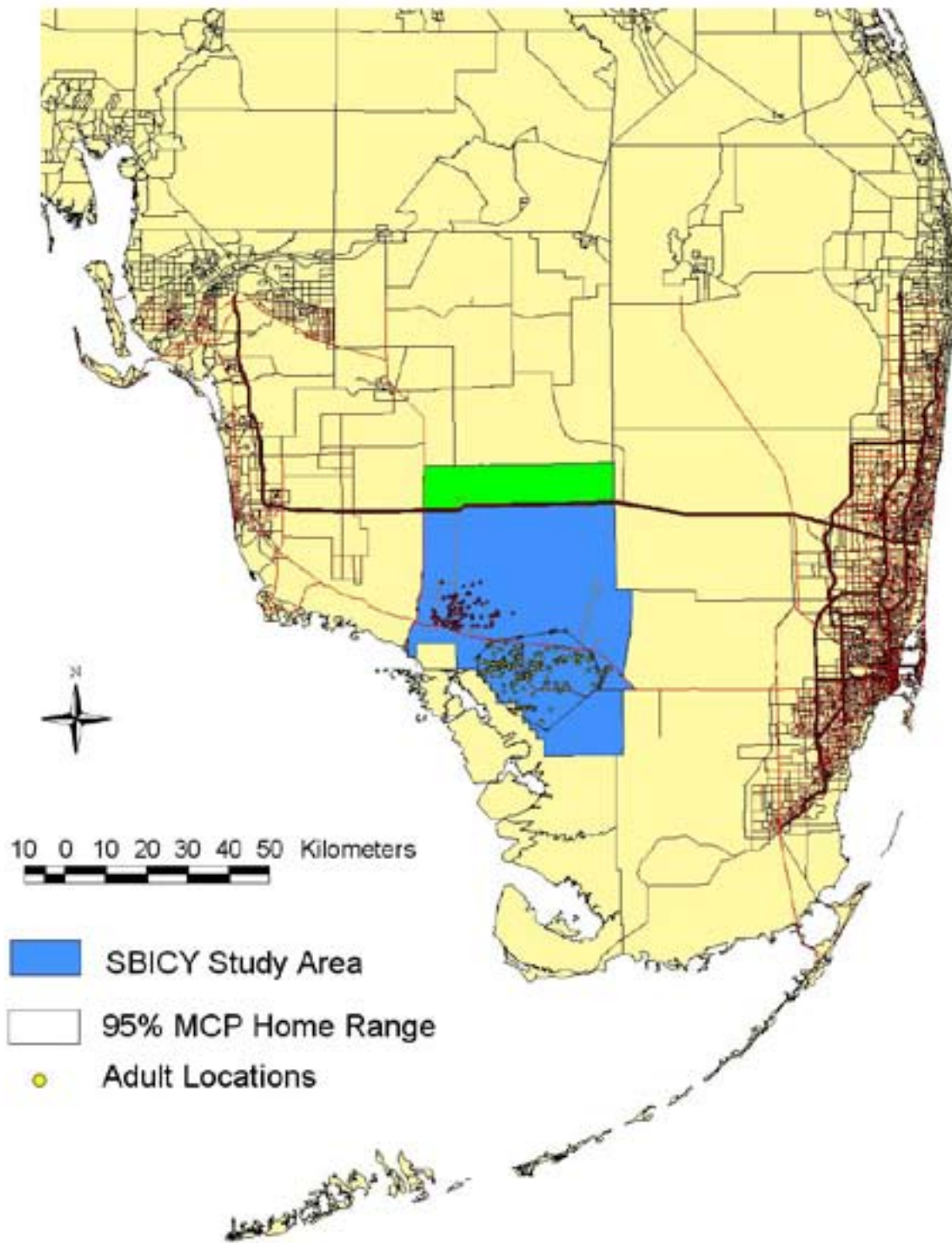


Figure 27. Area of use by female Florida panther #88.

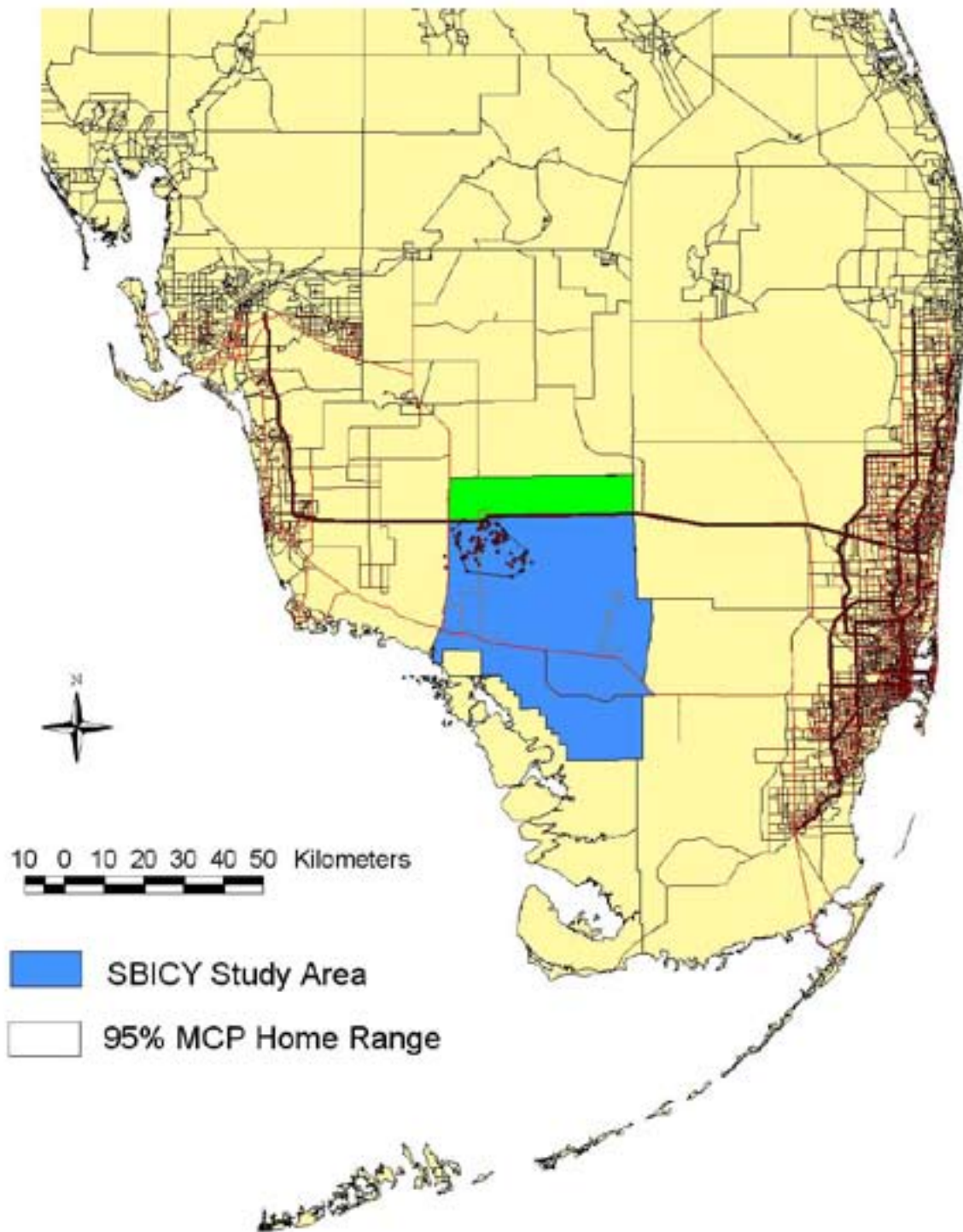


Figure 28. Area of use by male Florida panther #89.

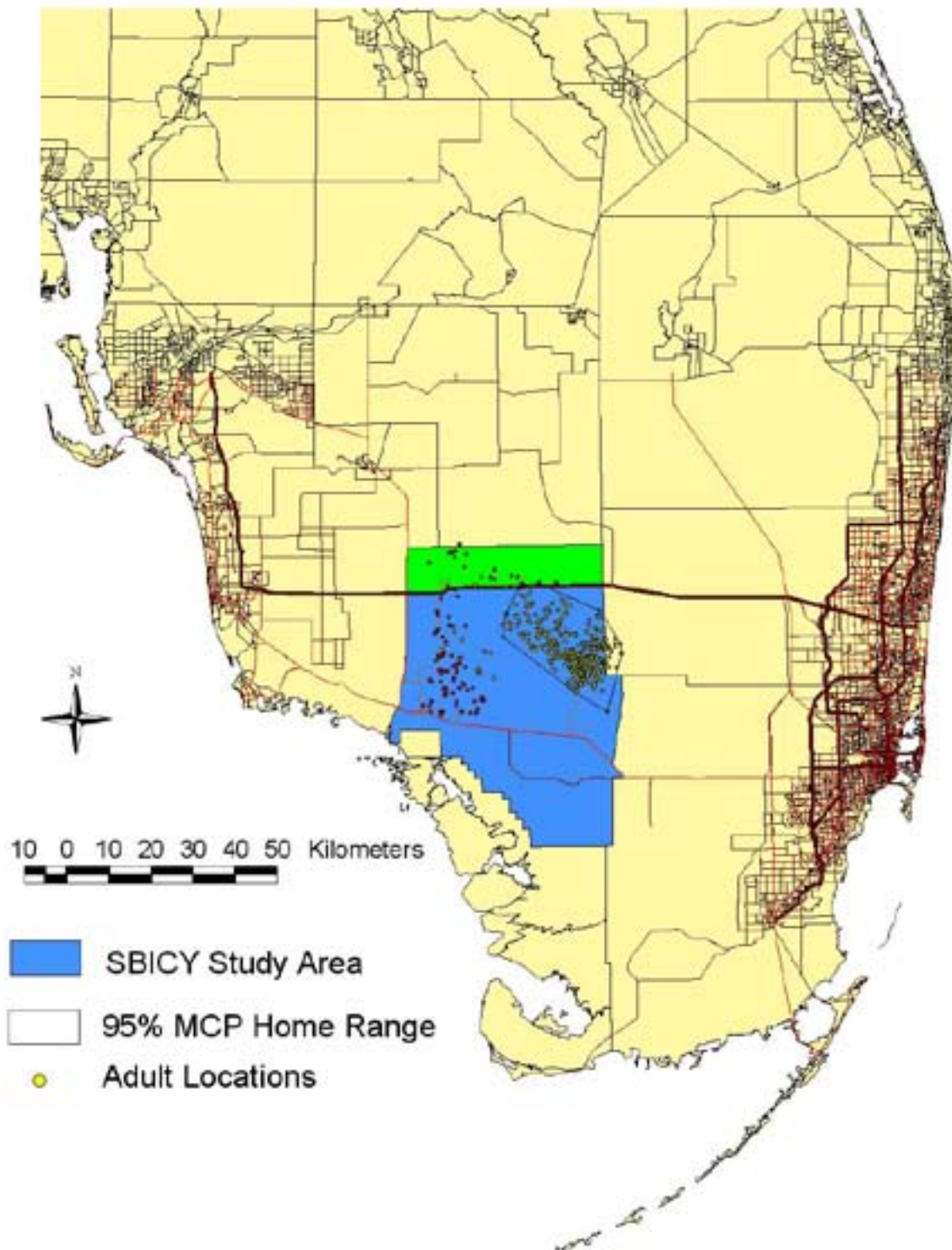


Figure 29. Area of use by female Florida panther #91.



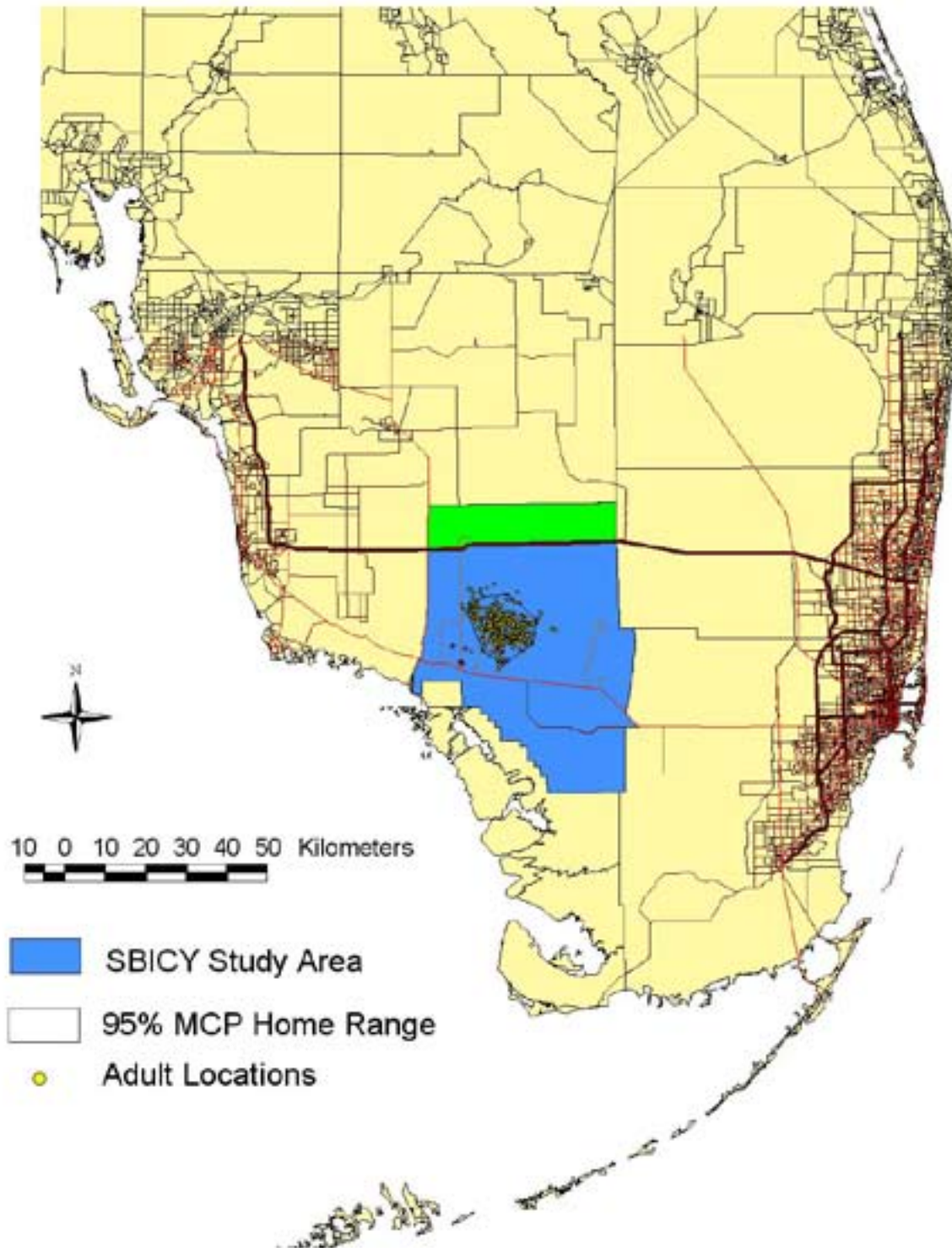


Figure 30. Area of use by female Florida panther #93.

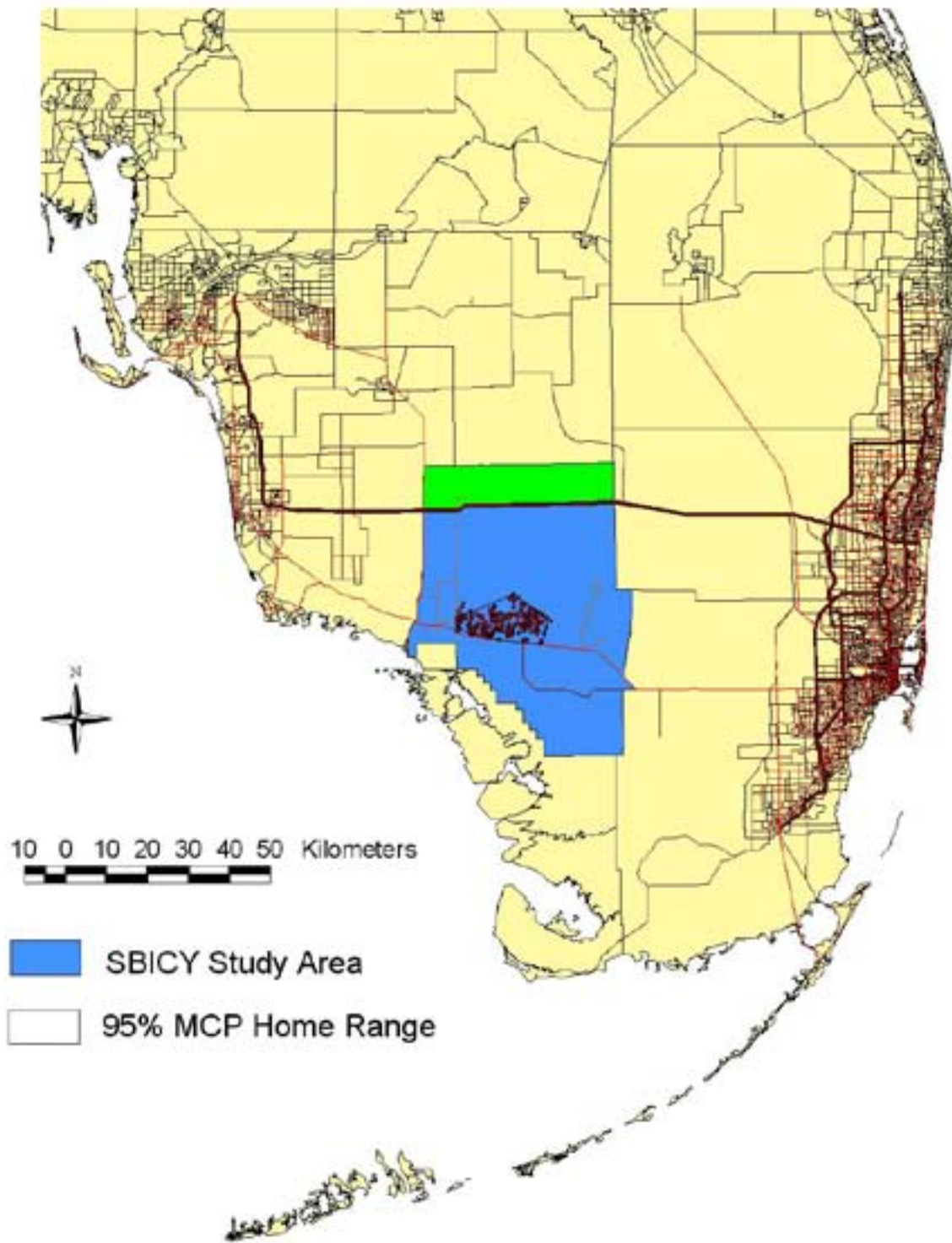


Figure 31. Area of use by female Florida panther #102.

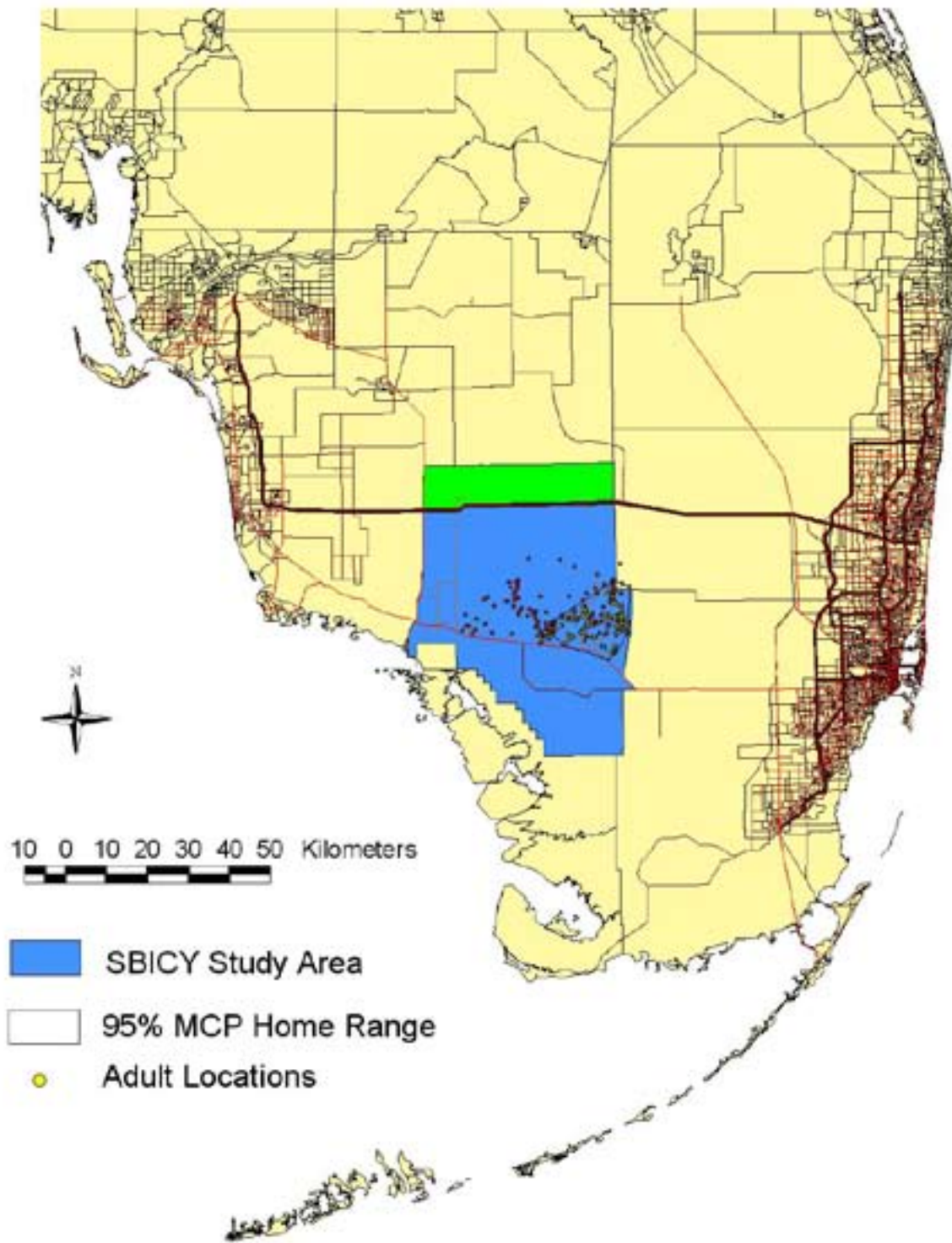


Figure 32. Area of use by female Florida panther #103.

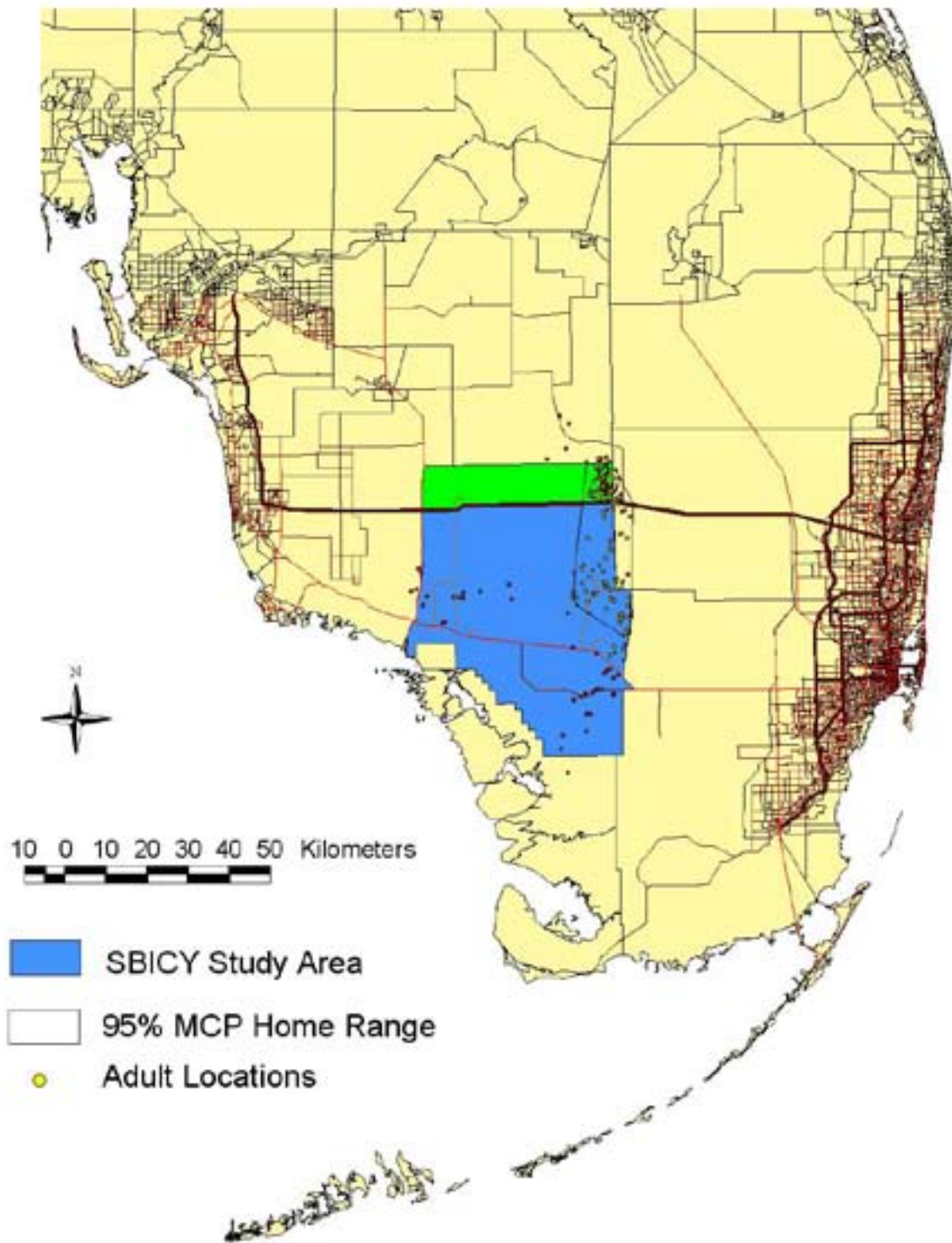


Figure 33. Area of use by male Florida panther #104.

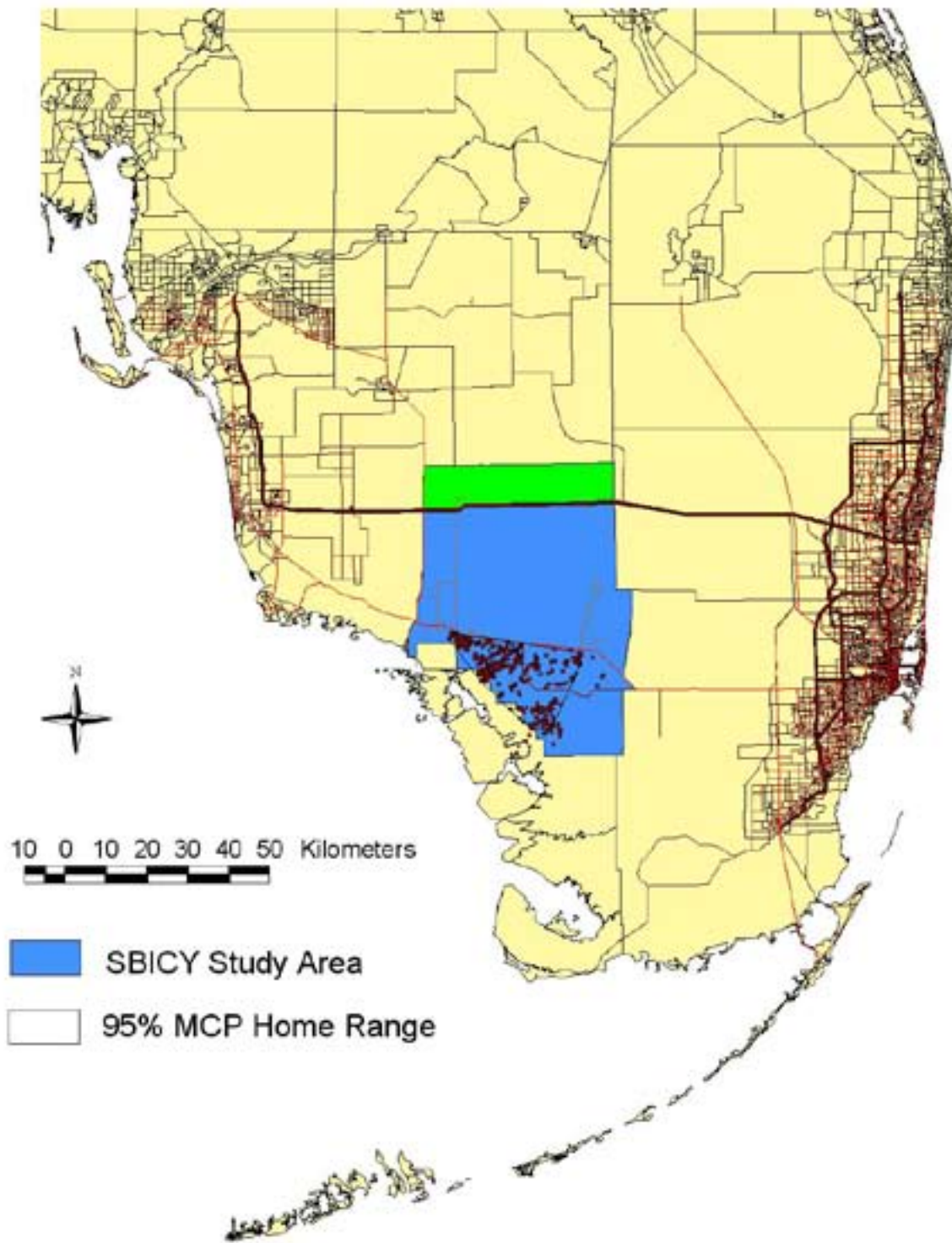


Figure 34. Area of use by female Texas cougar #TX103.

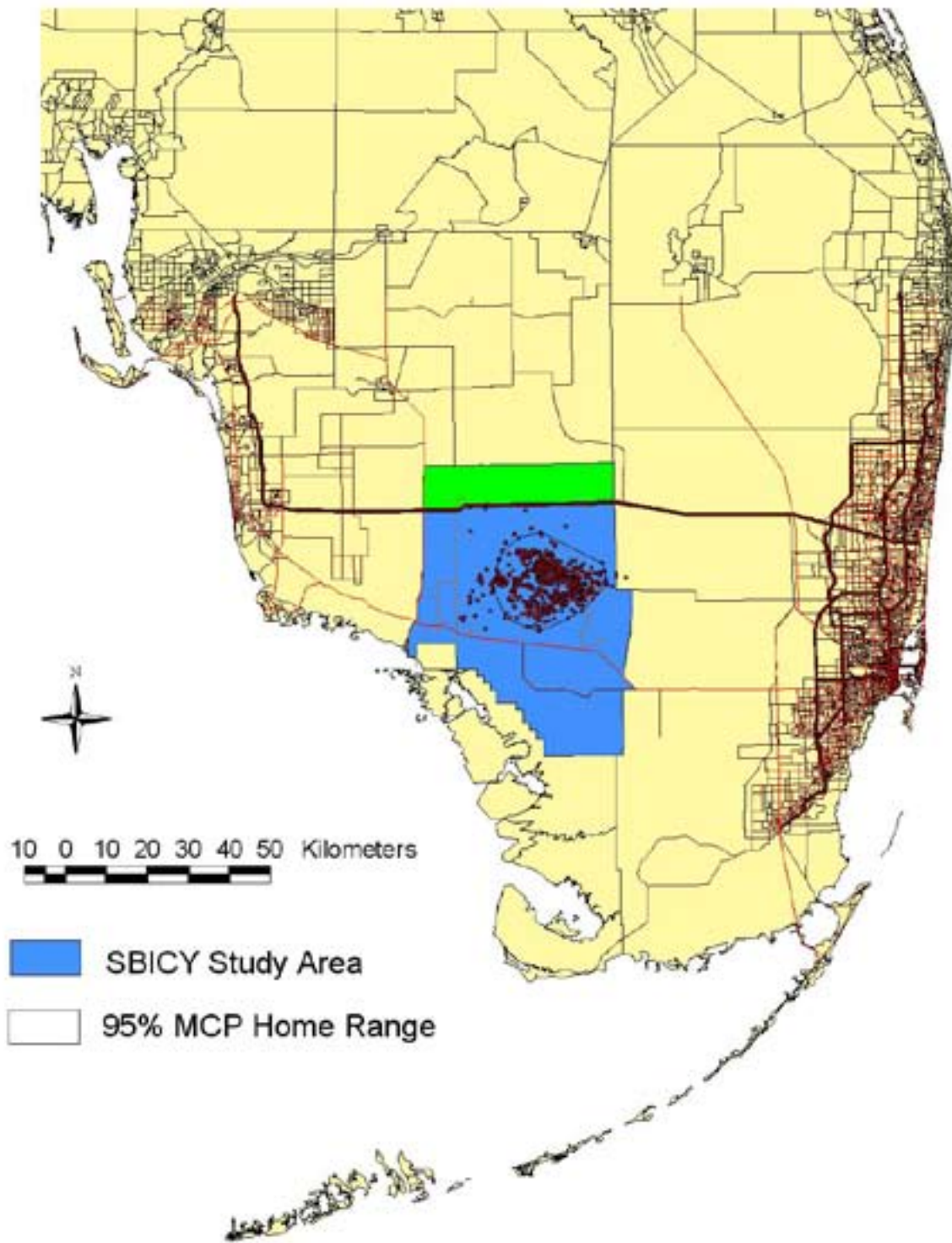


Figure 35. Area of use by female Texas cougar #TX107.

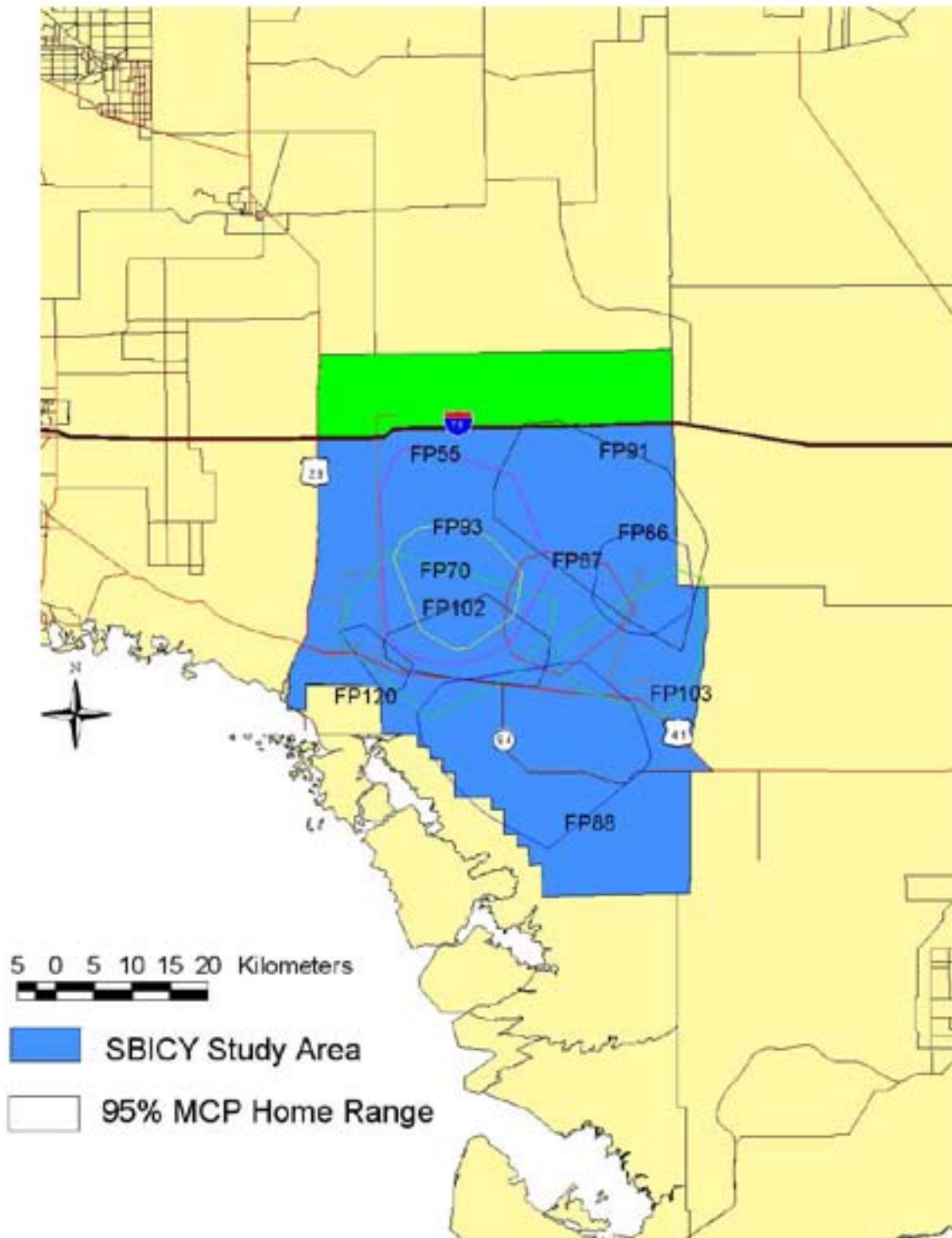


Figure 36. Home Ranges of adult female Florida panthers alive in SBICY in 2003.

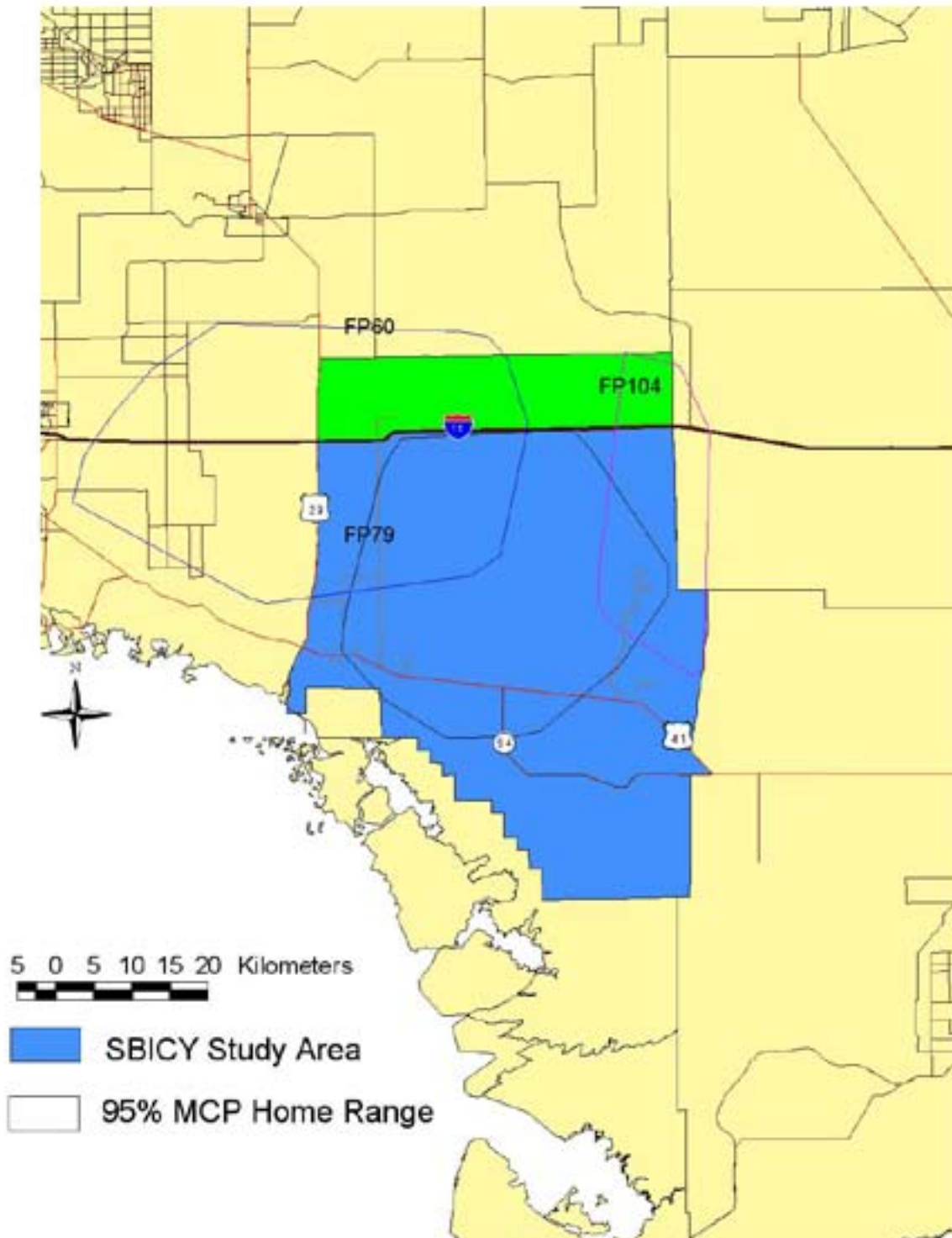


Figure 37. Home Ranges of male Florida panthers alive in SBICY in 2003.