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Big Cypress National Preserve
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BIG CYPRESS NATIONAL PRESERVE
FLORIDA PANTHER (*Puma concolor coryi*) RESEARCH AND MONITORING 2006 - 2007 ANNUAL REPORT

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Photo Courtesy of Ralph Arwood

FLORIDA PANTHER (*Puma concolor coryi*) RESEARCH AND MONITORING IN BIG CYPRESS NATIONAL PRESERVE

2006-2007 ANNUAL REPORT

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Florida Panther 153; photo by Ralph Arwood

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Abstract The goals of this project are to provide demographic, biomedical, and genetic information on Florida panthers (Puma concolor coryi) in the 217,409-ha study area in Big Cypress National Preserve with which to guide management actions, assess responses to natural events and human-caused impacts, and enhance panther recovery. The reporting period is 1 July 2006 to 30 June 2007. During 22 hunting days between 7 February and 2 March, we captured and handled 8 adult panthers. Four were previously uncollared and 4 had their collars replaced. Two other females, slated for collar replacement, were not handled because they were pregnant. We verified the presence of a minimum of 3 uncollared adult males and 9 uncollared adult females in the study area. We monitored 12 adult panthers during the year, 3 of which were lost from the sample at the end of the reporting period due to premature collar failure. One unmarked male panther was killed on SR29 on the western boundary of the study area. Six of the 8 monitored females denned 7 times, producing 19 kittens, 10 males and 9 females, all of which we marked with transponders and from which we obtained biomedical samples. By the end of the calendar year, we confirmed that the kittens from 3 of these dens did not survive. The average home range of the 8 resident females was 187 km^2 and that of the 4 resident males was 783 km^2. As a result of several cases of panthers getting caught on SR29 between the fencing at underpasses, we recommend the expansion of the fencing at existing underpasses on SR. 29 and construction of additional underpasses at key crossing sites. The ultimate goal is to have sufficient underpasses and continuous fencing from Hwy. 41 to County Hwy. 858 to enable wildlife to safely cross the most heavily traveled road between the public lands in south Florida.

Report Background

This is the fifth annual report on National Park Service (NPS) panther work in Big Cypress National Preserve (Big Cypress). It covers capture and monitoring efforts between 1 July 2006 and 30 June 2007 in the study area (SBICY), which consists of all lands (217,410 ha) within the Preserve boundary south of Interstate 75 (I-75). The Florida Fish and Wildlife Conservation Commission (FWC) monitors panthers in the remaining 75,340 ha of Big Cypress north of I-75. The SBICY study area also includes lands used by our monitored panthers that are not in the FWC or EVER study areas. Examples of these areas are the Miccosukee tribal lands south of I-75 and east of the L-28 canal and Everglades National Park (EVER) north and west of Shark Valley Slough.

Information on all the panthers known to inhabit SBICY between 1981 and 2003 can be found in the 2003 Big Cypress Annual Report (Jansen et al 2003). The 2004, 2005 and 2006 annual reports covered capture and monitoring work in SBICY between 1 July to 30 June of those years in keeping with the fiscal year reporting requirements of FWC (Jansen et al. 2004, Jansen et al. 2005, Jansen et al. 2006).

Statement of Purpose

The overall purpose of this ongoing project is to monitor the status of the panther population in Big Cypress, to provide information to management so their decisions will support and enhance panther recovery, and to determine the panthers' behavioral and/or demographic responses to natural events, management actions, and human impacts in south Florida.

Project Goals

The proposal to renew the Federal permit to capture and handle Florida panthers included the following goals:

Goal 1. To provide the necessary information to make sound management decisions, evaluate the effects of restoration projects and management strategies, and meet the recommendations and stipulations of the Environmental Impact Assessments and Biological Opinions related to the management of Big Cypress.

Goal 2. To assess the potential of the habitat in Big Cypress to support panthers.

Goal 3. To assess the potential of the expanding population of panthers in Big Cypress to link with the subpopulation of panthers in Everglades National Park and to provide baseline information on panther use in areas that may be affected by the Comprehensive Everglades Restoration Plan (CERP).

Goal 4. Continue to provide the samples necessary to assess of the impacts of the Genetic Restoration Project on the panthers in Big Cypress south of Interstate-75.

Goal 5. Monitor the prevalence of feline leukemia through testing of all panthers handled.

Goal 6. Determine the nighttime movements and habitat use of panthers through GPS technology.

Goal 7. Identify crossing and mortality sites with which to recommend highway enhancements that resolve panther-vehicle collisions.

Goal 8. Provide timely response to panther-human interactions that occur within Big Cypress through monitoring of radio-collared panthers and, when warranted, through marking of panthers involved in these interactions.

Study Area

The study area, SBICY, represents 74% (217,409 ha) of Big Cypress, a 295,142-ha unit of the National Park Service (NPS), situated in south Florida in Collier, Monroe, and Miami-Dade Counties. The enabling legislation of Big Cypress allows for recreational and commercial uses, such as hunting, off-road vehicle operation, and oil extraction. Most of Big Cypress is also designated a state wildlife management area for recreational hunting, and, as such, has been divided into 6 "units" to allow flexibility in management and regulatory decision-making (Figure 1). 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% 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 vegetative types described by Welch et al (1999) have been consolidated into 7 general categories. Using these, the study area consists of 50% cypress, 16% prairie, 13% marsh, 13% pineland, 4% mixed hardwood swamp, 3% hardwood hammock, and 1% mangroves (Figure 2). Disturbed habitat, including exotic plants and areas of human influence such as roads, is found in 0.4% of SBICY.

Only 285 km of roads exist in SBICY. Two paved roads, I-75 (formerly Alligator Alley) and Highway 41 (Hwy. 41), run east-west through the northern and southern portions respectively from State Road 29 (S R 29) to Conservation Area 3A. Four unpaved county roads, Birdon (C R 841), Wagonwheel (C R 837), Turner River (C R 839), and Loop (C R 94) (now partially under

NPS jurisdiction), cover 97 kms. State Road 29 is a paved road that borders Big Cypress on the west. The southern boundary of Big Cypress joins Everglades National Park (EVER) and the eastern boundary is partially separated from Water Conservation Area 3A by a levee (L-28) (Figure 1). The northern boundary adjoins tribal and private lands, some of which have been converted into agricultural production.

A deer and hog hunting season takes place from September through December. The 5-year (2002-2006) average for hunter pressure was 13,189 man-days, with a mean harvest of 183 deer (bucks only) and 19 hogs (FWC 2002-2006 weekly harvest reports). The agencies also monitor population trends through aerial surveys, track counts, and spotlight counts since deer and hogs are the main prey species of the Florida panther.

Off-road vehicles (ORVs) are the only practical way to access the interior of Big Cypress for recreational purposes. The extent of ORV trails has increased since first quantified from 1953 maps (Duever et al. 1986). They 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 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. Aesthetic concerns and the probable impacts on soils, vegetation, and wildlife have prompted the development of an ORV management plan that restricts ORV travel to designated trails (National Park Service 2000). This designated trail system is still in the development and construction phase.

Methods

Study Area Sampling

We used the 6 designated "game management units" of Big Cypress, i.e., Bear Island, Deep Lake, Turner River, Corn Dance, Loop, and Stairsteps, to partition Big Cypress for descriptive purposes. We called the area added to Big Cypress in 1988 Addlands North and Addlands South (Figure 1). We incorporated the 1-mile strip of acquired land along SR 29 into the existing management units for the purpose of this report. Because the Turner River, Corn Dance, and Stairsteps Units are so large, we further divided SBICY into 12 survey "blocks", based on roads and recognizable geographic features, to aid in quantifying our survey and capture efforts (Figure 3). The size of the blocks ranges from 14,184 ha to 28,698 ha and average 20,747 ha. Although our objective is to randomly sample all areas for the presence of panthers, targeted goals identified annually may take precedent.

2007 Capture Season Plans

In the SBICY 2007 Capture Season Plan presented at the 19 October 2006 Panther Capture Season Planning meeting in Naples, Florida, we identified 7 panthers, #s 93, 102, 103, 124, 138, 145, and 147 whose collars needed replacement. Because FP147 had dispersed from the study area, FWC agreed to recollar him. We planned to target blocks 3, 4, 9, 10, and 11 where no females were monitored at that time.

We had 4 Generation III GPS collars (Telonics, Inc.), programmed to obtain 5 evening-to-morning locations to complement the existing dataset of daytime locations and to determine habitat use when panthers are active in night. For other panthers, we had MK9 models (Telonics, Inc.) with VHF capability and programmed to duty-cycle in order to extend their life in the field.

Survey and Capture Protocols

The detection of panthers occurred throughout the year by hunting and survey work conducted by Rancher's Supply, using the protocol they developed to determine the presence of uncollared panthers (McBride et al. in review). We conducted our capture work following the protocols outlined in Endangered Species Permit TE146761-0 from USFWS and the Special Purpose Permit #WX02384c from the FWC. Drug protocols and panther handling modifications were updated as new information became available. Biomedical procedures were similar to those outlined in Cunningham (2004) and Land et al (2004). For consistency in our capture effort analysis, we defined a hunt day as one having suitable environmental conditions and the availability of all team members to conduct a capture.

Population Monitoring

We located each panther with a functioning collar 3 times a week between 0900-1200 hrs, using telemetry from a fixed-wing aircraft. Our methodology differed to some extent from the EVER and FWC monitoring protocol. We determined the general location of each panther at 150 m above the ground, and then made 1 or more passes at 60 m to further define the location. Flights conducted by other panther monitoring agencies do not descend below 150 m (Darrell Land and Sonny Bass, pers. comm.) We found, however, that low-level passes were necessary in most instances to confirm habitat use due to the complexity and intermingling of vegetative types in SBICY.

We recorded the date, time, Universal Transverse Mercator (UTM) coordinates, habitat type, and unique situations, such as 2 panthers in the same location or panther sightings. We mapped the general location by air, and in the office used a Geographic Information System

with aerial photos geo-referenced in North American datum 83 to obtain accurate UTMs. We shared with FWC, on a flight-by-flight basis, the locations of several males that used both the FWC and SBICY study areas. The combined dataset on these individuals was incorporated into this report. We also incorporated location data from FWC and EVER to generate a map showing SBICY locations in relation to the entire monitored population.

We determined the home ranges of resident radio-collared panthers located in SBICY between 1 July 2006 and 30 June 2007 by 2 methods:
1) as minimum convex polygons (MCP) (Mohr 1947) with a 5% harmonic mean outlier removal for the entire time the individual was monitored via telemetry as an adult, and
2) as fixed kernels (Worton 1989), using the least squares cross validation (LSCV) "smoothing parameter" (Seaman and Powell 1996) to show the home range during the reporting period.
We determined the area of use for FP147 as a dependent kitten, as a disperser, and as a resident south of Naples. We generated home range maps using the ArcView 3.2 Spatial Analyst (Environmental Systems Research Institute, Inc.).

Reproduction

Inspection of Florida panther dens by FWC began in April 1992 and by Big Cypress in April 1995. When an adult female panther was found in the same location for more than 3 consecutive flights, we conducted a ground check to further delineate the site and install a remote monitoring device (Land et al 1998) if denning was suspected. We determined the female's routine of den attendance by 24-hour remote monitoring, waiting for an opportunity when she is away and we were able to reach the site and locate the kittens in daylight. We processed the kittens following the protocol established by FWC (Cunningham, M. 2002). Appendix II in Florida Fish and Wildlife Conservation Commission (2007) lists all panther kittens handled at dens from 7 April 1992 through 30 June 2007 and Appendix III lists all known dens of radio-collared female panthers from June 1985 to 30 June 2007.

Mortality

If a panther's collar emitted a mortality signal, we notified FWC that we were in the process of confirming whether or not the panther was dead. On rare occasions, a panther may remain motionless for 2 hours, the time it takes to activate the mortality mode on the collar. Following the protocol established by FWC (Land 1999), a law enforcement officer either accompanied or joined us to inspect the site for sign of human involvement in the death. We submitted the carcass to FWC immediately and, within 24 hours, submitted the standardized form "*Panther Mortality Investigations and Carcass Retrieval*" to FWC and USFWS.

If Big Cypress personnel received a report that a panther had been injured or killed on a road in SBICY, we notified FWC and responded to the site to secure the evidence and obtain detailed information. We submitted the carcass to FWC. Some aspects of necropsy results are incorporated into this report. Appendix IV in Florida Fish and Wildlife Conservation Commission (2007) lists known panther injuries and mortalities from 2 February 1972 to 30 June 2007.

Reporting

We used the reporting period of 1 July 2006 to 30 June 2007 to correspond with FWC reports that coincide with their fiscal year. The compiled telemetry flight dataset was submitted to FWC at the end of the reporting period. We submitted all data obtained on panther dens and mortality as well as biomedical samples from kittens and adults to FWC and designated labs within 24 hours of collection.

Definitions

We defined **Home range** as the area where a panther restricts the majority of its movements. We determined home range for those panthers that had more than 5% of their locations in SBICY, had more than 50 locations during the reporting period, and were considered to be adults. Those not meeting these criteria had **areas of use**. We chose 2 years as the average age to classify female panthers as **adults**, based on a sample of 7 known age females in SBICY who had their first litter at an average of 23 months. We also chose 2 years as the average age to classify male panthers as adults, although some may be still dispersing or have not had a breeding opportunity until older, whereas others, i.e. FP79, have successfully bred at 15 months (Warren Johnson, pers. comm.) We defined **Residents** as adults that had more than 50 locations per year (approximately one-third of all flight locations) in SBICY. We described **Dispersers** as those panthers that made large random movements and typically inhabited SBICY for less than 6 months before they either left or settled into a home range. **Immigrants** dispersed into SBICY from some other locality. **Emigrants** were panthers born in SBICY but dispersed completely outside the study area.

Results

Survey and Capture Efforts

We hunted for 22 days between 7 February and 2 March 2007 in 8 of the 12 survey blocks. We captured and collared 4 new panthers, i.e., FP150 and FP151 in block 2; FP152 in block 9 and FP153 in block 1 (Table 1). We recollared FP102 in block 7, FP124 in block 12, FP138 in block 6, and FP145 in block 2. We treed both FP93 and FP103 who were slated for recollaring, however, each appeared to be pregnant, so we didn't dart them. They each denned soon after, confirming our assessment. We accidentally treed 1 panther, FP133, which did not need to be handled. Figure 4 shows our capture effort per block for the past 5 years.

Capture Season Summary:

22 total hunt days
4 newly collared panthers (FP150, FP151, FP152, and FP153)
0 failed collar replacement
4 working collar replacement (FP102, FP124, FP138, and FP145)
2 treed but not collared due to possible pregnancy (FP93 and FP103)
1 treed but not needing recollaring (FP133)
3 juveniles treed/not handled (FP150's juvenile female; FP153's 2 of 3 juveniles)

Documentation of Uncollared Panthers

Between I-75 and Hwy. 41, the presence of 3 uncollared adult males, 7 uncollared adult female panthers and 5 dependent juveniles was documented during the reporting year, either during the hunting season or by Rancher's Supply during their survey efforts. South of Hwy. 41, the presence of 2 uncollared adult females, 1 with 3 dependent young, was documented (Figure 5). The second adult female could have been FP88 whose collar failed in 2002. These are minimal counts because several blocks had little or no survey or hunting effort.

Synopsis of our findings during the capture month and other verified reports (shown in parentheses):

Block 1: Hunted 2 days. On 19 February, treed FP153 (new panther) and documented 3 kittens at ~10 months of age with her. Treed and recollared FP145 on 25 February.

Block 2: Hunted 6 days. On 8 February, treed and collared FP150 (new panther) and treed her female juvenile at ~ 1 year of age. On February 10, treed and collared FP151 (new panther). Found sign in Baxter Island of an uncollared female on 25 February and 1 March. (On 8 August 2006, 4 NPS staff documented an uncollared adult panther while conducting a deer survey by helicopter in this block.)

Block 3: No hunting in this area. (On 3 May 2007, Roy McBride documented an uncollared female in this block.)

Block 4: No hunting in this area. (On 30 January 2007, Roy McBride documented an uncollared adult male and on 1 May 2007 he documented an uncollared adult female in this block.)
Block 5: Hunted 4 days. No sign of uncollared panthers. (On 3 August 2006, Rowdy McBride treed and photographed an uncollared male in this block. Roy McBride documented an uncollared female in this block in September 2006 and again in April and May of 2007.)
Block 6: Hunted 3 days. We documented sign of an uncollared female and kitten on Duncam Tram on 9 February. (On 23 May 2007, Roy McBride documented a juvenile female with FP102.)
Block 7: Hunted 2 days. We documented sign of an uncollared male and female in this area.
Block 8: Hunted 1 day. Found male sign but it could have been FP127. (On 2 May 2007, Roy McBride documented sign of an uncollared female in this block.)
Block 9: Hunted 3 days. Documented sign of an uncollared male and female, but could have been FP152 and FP88 with a failed collar.
Block 10: No hunting in this area. (On 7 December 2006, a private landowner verified through video the presence of an uncollared female with 3 juveniles about 6 months of age. On 29 April 2007, he again verified 2 panthers through video.)
Block 11: No hunting in this area.
Block 12: Hunted 1 day in this area when we recollared FP124 on 17 February.

Synopsis on Monitored Panthers

We monitored 12 resident adult panthers between 1 July 2006 and 30 June 2007. Figure 6 shows the geographical distribution of this year's SBICY panthers in relation to the entire monitored population, and consists of 31% of all agency monitoring efforts. Locations within Big Cypress boundaries represent 38% of the monitoring efforts, whereas 11% were obtained in EVER, and 52% occur outside the National Park units. Figures 7 and 8 show the home range overlaps among the 4 resident males and 8 resident females inhabiting SBICY. FP147 was not included because he dispersed from SBICY in July of 2006.

Synopsis of monitored panthers' background, home range, reproductive activity, and status as of 30 June 2007:

FP93

This female was born to Tx107 on 22 February 1999 in the Turner River Unit. She was first captured on 10 April 2000 at 14 months of age. She did not reunite with her mother post-capture, but was seen on 1 May with an uncollared panther, likely one of her 2 siblings.

When FP93's malfunctioning collar was replaced on 28 February 2002, her progesterone levels indicated she was pregnant. She gave birth to her first litter on 6 April 2002, consisting of 3 females and 1 male. She was observed from the monitoring plane with 3 kittens on 11October 2002 and the tracks of 3 offspring, 2 females and 1 male, were observed with hers on 31 March 2003. Her male offspring, K115, was captured on 2 April 2003. The status of the 2 females is unknown. FP93 next denned on 16 July 2003. On 5 August, 3 kittens, 2 males and 1 female were marked. One of these males, K153, was killed on C R 951 in Naples on 29 August 2005. FP93's collar malfunctioned on 30 August 2003, and she was not caught again until 11 February 2006. She was in good condition and weighed 35 kg.

FP93 denned in late June in the Turner River Unit and on 1 July 2006, we handled 3 female kittens at 18 days of age. Based on FP93's associations with radio-collared male panthers, it is likely that these kittens did not survive to 6 months. We treed her on 11February and because she appeared to be pregnant we did not handle her. She did initiate denning later that month and we marked 3 kittens on 8 March 2007. In keeping with the protocol of not handling female panthers with dependent kittens less than 12 month of age, we were not able to change her collar. Her home range during this reporting period was 255 km^2 (Figure 9).

FP102

This female was born to FP55 on 8 February 1998 in the Turner River Unit. She was first captured on 20 February 2001 at 3 years of age. At least 2 kittens were with her, one of which, FP103, was captured a month later at an estimated 10 months of age. FP102 denned again on 25 June 2001 and 2 males were marked 3 weeks later. FP102 next denned on 5 July 2002, only a year after her previous den. One male and 1 female were marked at this den and their tracks were documented with hers on 11 April 2003. FP102 was recollared on 24 March 2004. She weighed 39 kg and was in late term pregnancy. She apparently lost the fetuses but was bred a month later and gave birth on 22 July 2004. We marked 3 kittens, 2 females and 1 male, at her den on 4 August. She denned again 2 years later, in June 2006, and we marked 2 male kittens on 12 July. On 15 February 2007 we recollared her. This collar failed in late June. Her home range during this reporting period was 250 km^2 (Figure 10).

FP103

This female, an offspring of FP102, was first captured in the Turner River Unit on 13 March 2001 at an estimated 10 months of age. She was with FP102 through April, except for several days when FP102 was in the company of FP79, the territorial male. When FP103 dispersed at an estimated 11 months of age, she moved east into the Corn Dance Unit. Her collar failed prematurely on 23 December 2003, however, we recollared her on 27 February 2004. She weighed 32 kg, was in very good condition, and was not pregnant. FP103 initiated denning in March of 2007 and 3 kittens were marked at her den on 4 April. At 7 years of age, this was FP103's first den. The fact that the territorial male, FP104, was sterile may have been the reason for her not getting pregnant. When he died in March of 2006, another male filled this vacancy. FP103's home range during the reporting period was 360 km^2 (Figure 11).

FP124

On 13 February 2004, we captured and collared female FP124 and her 2 juvenile males, FP125 and FP126 in the Loop Unit. FP124 weighed 32 kg and was estimated to be 3 to 4 years old. FP126 was removed from Big Cypress on 28 May 2004 and died from intraspecific conflict on 1 January 2005. FP125 dispersed naturally in July 2004 and his collar was found on a road in Miami-Dade County 2 months later on 27 September. FP124 next denned in the Stairsteps Unit and, on 29 September 2004, we marked 1 male kitten. It survived to only 3 to 4 weeks of age. FP124 denned again in February 2005 in the Stairsteps Unit. On 10 February, we marked 3 kittens, 2 males and 1 female. Subsequent sightings up to 26 December 26 2005 indicated that she successfully raised 2 of the 3 offspring to 11 months of age. She was seen with 1 juvenile during the 19 April 2006 routine monitoring flight. This year she was recollared on 17 February 17 and two 9-day-old male kittens were found and marked at the site. Her home range during the reporting period was 243 km^2 (Figure 12).

FP127

We captured male FP127 in the Turner River Unit on 16 February 2004. He was in good condition, weighed 45 kg, did not have a transponder, and was estimated to be 2 years of age. He tested negative for feline leukemia. He initially inhabited the Turner River Unit, but then moved to the eastern side of Big Cypress where he has used both private lands and the Addlands North and South. On 29 March 2005 we recollared him. He was in excellent physical condition and weighed 55 kg. With the death of FP104 in March of 2006, FP127 shifted his home range to the south. His collar failed in late June. His home range during the reporting period was 825 km^2 (Figure 13).

FP133

The FWC capture team caught this male panther, estimated at 4 to 5 years-of-age, on 18 November 2004 in the Bear Island Unit. His 539-km^2 home range during the reporting period encompasses the Bear Island, Deep Lake, and Turner River Units of Big Cypress, with 71% of the locations in SBICY (Figure 14).

FP138

We captured adult male FP138 on 31 January 2005 in the Turner River Unit. He was in very good condition, weighing 61 kg and estimated at 4 years of age. He bore obvious signs of intraspecific aggression, i.e., a deep nasal scar and a portion of the right ear missing, and had a comparatively heavy tick infestation. He tested negative for feline leukemia. He was recollared on 27 February 2007, was in excellent condition, weighing 63 kg, and again tested negative for feline leukemia. His 1175 km^2-home range during the reporting period encompassed the Turner River and Corn Dance Units south of I-75 and the Addlands, Seminole Indian Reservation, and private lands north of I-75, of which 74% have been in SBICY (Figure 15).

FP145

The female was captured on 16 February 2006 in the Deep Lake Unit. She was in good condition, weighed 29 kg, and was estimated at 1.5 to 2 years of age. She had not been handled as a kitten at a den, so her lineage was unknown. On 23 June 2006, we marked 3 female kittens at her den. This was the first panther den documented in the Deep Lake Unit. We recollared her on 25 February 2007. She was in excellent condition, weighing 32 kg. She denned in April of 2006, indicating that the kittens from her June 2006 den did not survive. We marked 3 kittens on 26 April 2007. FP145's collar failed in mid-June. Her home range during the reporting period was 93 km^2 (Figure 16).

FP147

This male panther, K184, is the offspring of FP129. He was radio-collared at 11 months on 3 March 2006 in SBICY. He was in good condition and weighed 27 kg. After his mother died on 22 March, FP147 dispersed west through Big Cypress, FAKA, Picayune Strand State Forest, and ranged in Belle Meade and south of Naples in Rookery Bay adjacent private lands. He was recollared by FWC on 6 March 2007, however, the collar failed prematurely. Figure 17 shows his dispersal movements through SBICY and his locations during the reporting period.

FP150

On 8 February 2007, we collared FP150 in the Turner River Unit. Her transponder confirmed that she was the offspring of FP93, born in July of 2003. She had a juvenile female with her, estimated at 1 year of age, which we didn't handle. FP150 weighed 32 kg and was in average condition. Her home range during the 5 months we monitored her in reporting period was 149 km^2 (Figure 18).

FP151

On 10 February 2007 we collared FP151 in the Turner River Unit. Her transponder confirmed that she was the offspring of FP93, born in April of 2002. She weighed 41 kg and was in excellent condition. In April of 2007 she denned, and on 21 April we marked 3 kittens. They evidently did not survive because in August of 2007 she denned again. FP151's home range during the 5 months we monitored her in the reporting period was 54 km^2 (Figure 19).

FP152

On 17 February 2007 we collared FP152 in the Stairsteps Unit. He did not have a transponder and so was estimated to be between 4 and 5 years of age. He was assessed to be in good condition and weighed 61 kg. FP152's home range during the 5 months we monitored him in the reporting period was 592 km^2 (Figure 20).

FP153

On 19 February 2007, we collared FP153 in the Deep Lake Unit. She did not have a transponder, so was estimated to be 6 years of age. We also treed 2 kittens estimated at 10-11 months of age and the houndsman saw a third kitten. None of these were handled. FP153's home range during the 5 months we monitored her in the reporting period was 88 km^2 (Figure 21).

The average home range (95% MCP) of the 4 resident males was 783 km^2 and the average home range of the 8 resident females 187 km^2.

Reproduction

Six of the 8 monitored adult females denned 7 times during the reporting period. The other 2 were raising young. At the 7 dens, we marked 19 kittens, 9 females and 10 males. As of the end of the calendar year, we have documented that 3 of these dens have failed and that 10 of the 19 kittens (53%) marked did not survive.

- FP93: On 1 July 2006, we marked 3 female kittens at 18 days of age in the Turner River Unit. Based on her movements and interactions with male panthers, it is likely that these kittens did not survive.

- FP102: On 12 July 2006, we marked 2 male kittens at 18 days of age in the Turner River Unit. Based on her movements, it is probable that at least one of the kittens survived.

- FP124: On 17 Feb 2007, we marked 2 male kittens at 9 days of age in the Stairsteps Unit. Observations confirmed that she had at least 1 of the juveniles with her during the reporting period.

- FP93: On 8 March 2007, we marked 3 kittens, 2 males and 1 female, at 16 days of age. Observations confirmed that the 3 juveniles were with her during the reporting period.

- FP103: On 4 April 2007, we marked 3 kittens, 2 females and 1 male, at 24 days of age. FP103 died in August 2007, so these kittens, at 5 months of age, would not have survived on their own.

- FP151: On 21 April 2007, we marked 3 kittens, 2 females and 1 male, at 16 days of age. Since FP151 initiated denning again in August, this litter did not survive.

- FP145: On 26 April 2007, we marked 3 kittens, 2 males and 1 female, at 16 days of age. Based on FP145's movements, it is probable that at least 1 of the kittens survived.

Mortality

One mortality was documented in the study area during the reporting period. On 11 June 2007, an unmarked male panther, estimated at 2 years of age, was killed on SR29 at a wildlife crossing 4 miles north of Hwy. 41.

Recommendations

1) State Road 29 is a heavily traveled north-south road that bisects large public land areas in south Florida. Since 1979, 27 panther deaths have been verified on this road between Hwy. 41 and County Road 858. Unlike I-75, the construction of sections versus continuous fencing adjacent to wildlife underpasses was implemented on SR 29 on an experimental basis as a cost-cutting measure and to continue to provide access to adjacent canals for subsistence and recreational fishing.

   Panthers and other wildlife, however, continue to be struck by vehicles along portions that are not fenced. In addition, there have been several instances in which a panther (and other wildlife) have gotten trapped on the road between the fencing. Since it has been proven on I-75 that adequate underpasses and continuous fencing can prevent panther mortality, it is recommended that a SR 29 Panther Protection Plan be developed and submitted to FDOT and, as funds become available, that this road be secured against further panther road mortality.

2) We recommend continuation of the level of capture effort in the Big Cypress study area in order to achieve a sample of 20 radio-collared panthers distributed through the sampling blocks.

Acknowledgments from the project leader

The Big Cypress capture team consisted of a diverse group of experts in their fields who worked together to accomplish this year's intensive and successful capture effort. Two NPS veterinarians, Dr. Margaret Wild and Dr. Jenny Powers, improved the biomedical aspect of our work through their skills and insight. The years of clinical experience from Dr. John Lanier and Dr. Erik Madison further complemented the biomedical work. Annette Johnson's medical knowledge and biomedical equipment preparation provided the needed oversight as vets came and went.

In his first year on the team, John Kellam's dedication and adrenaline assured that gear and vehicles would always be ready to go. Dennis Giardina's many years of tree-climbing and work on panther capture teams provided additional cohesiveness. Ralph Arwood always saw what needed to be done and did it, as well as documenting our work. With his images, the public can see the beauty of this species and the intricacies of capture work. None of us would have seen a panther, however, if it weren't for Rocky McBride and his hounds. He could catch panthers without us but not visa versa.

Steve Schulze prepared all the maps and determined all the home range data in this report. And a second thank you to Annette Johnson and John Kellam who located the collared panthers from a plane many, many hours this year. They and the skilled pilots from Speed Aviation kept tabs on the cats' wanderings.

Once again, the success of our work is due to Big Cypress staff support of the wildlife program, especially the unwavering support of Ron Clark, Pedro Ramos, and Karen Gustin. This project was funded by the National Park Service at Big Cypress and by special funding from the NPS Southeast Regional Office.

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Table 1. Florida panthers captured and radio-collared in SBICY in 2007.

FP#	K#	Capture Date	Gender	Age	Type	Capture Location	
						Easting	Northing
150	K152	Feb. 08, 2007	F	3.5 yrs	resident	477722	2875399
151	K113	Feb. 10, 2007	F	4 yrs, 10 mo.	resident	477305	2880374
152	-	Feb. 16, 2007	M	~4-5 yrs	resident	485076	2854622
153	-	Feb. 19, 2007	F	~6 yrs	resident	472231	2883970

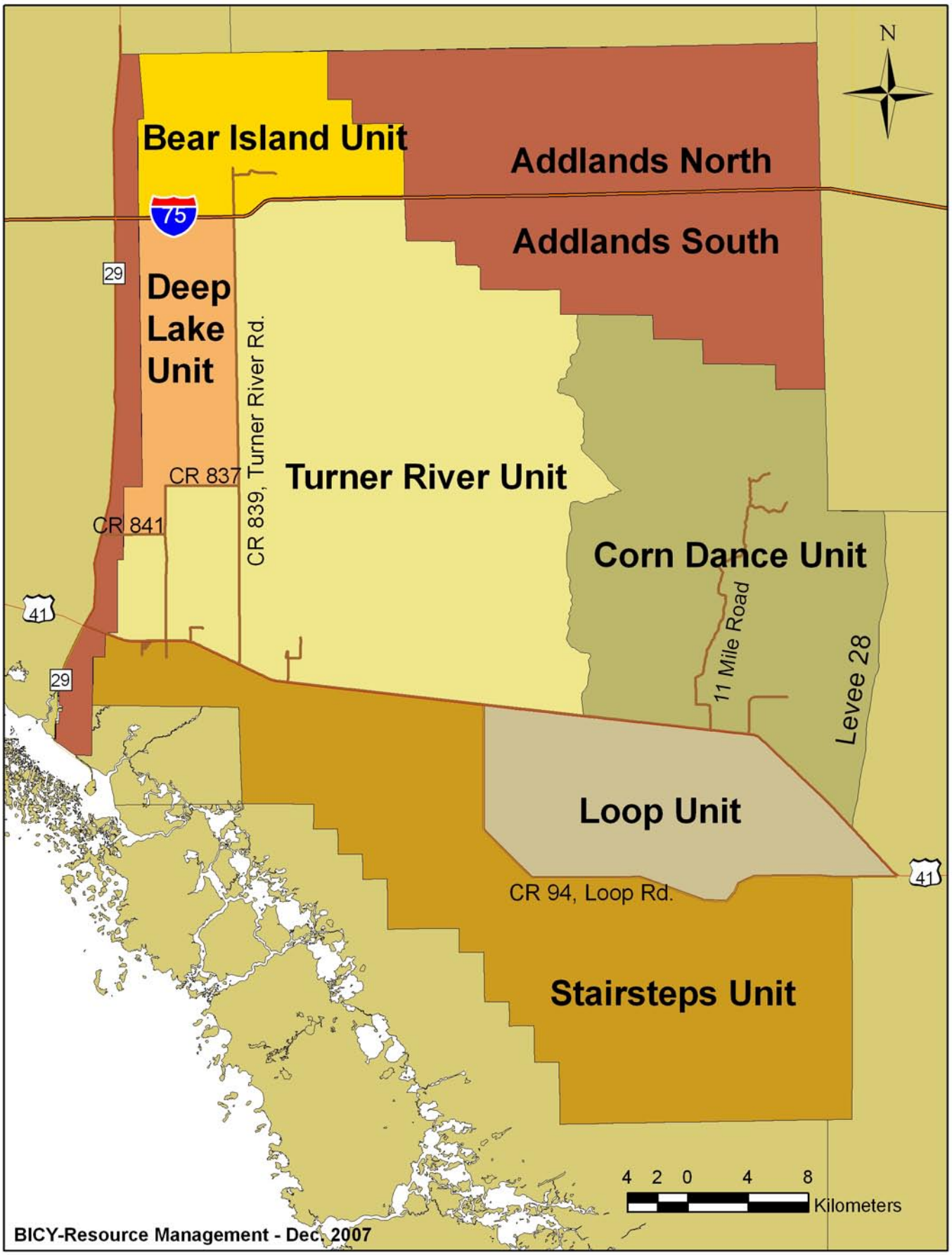

Figure 1. Management units and roads in Big Cypress National Preserve.

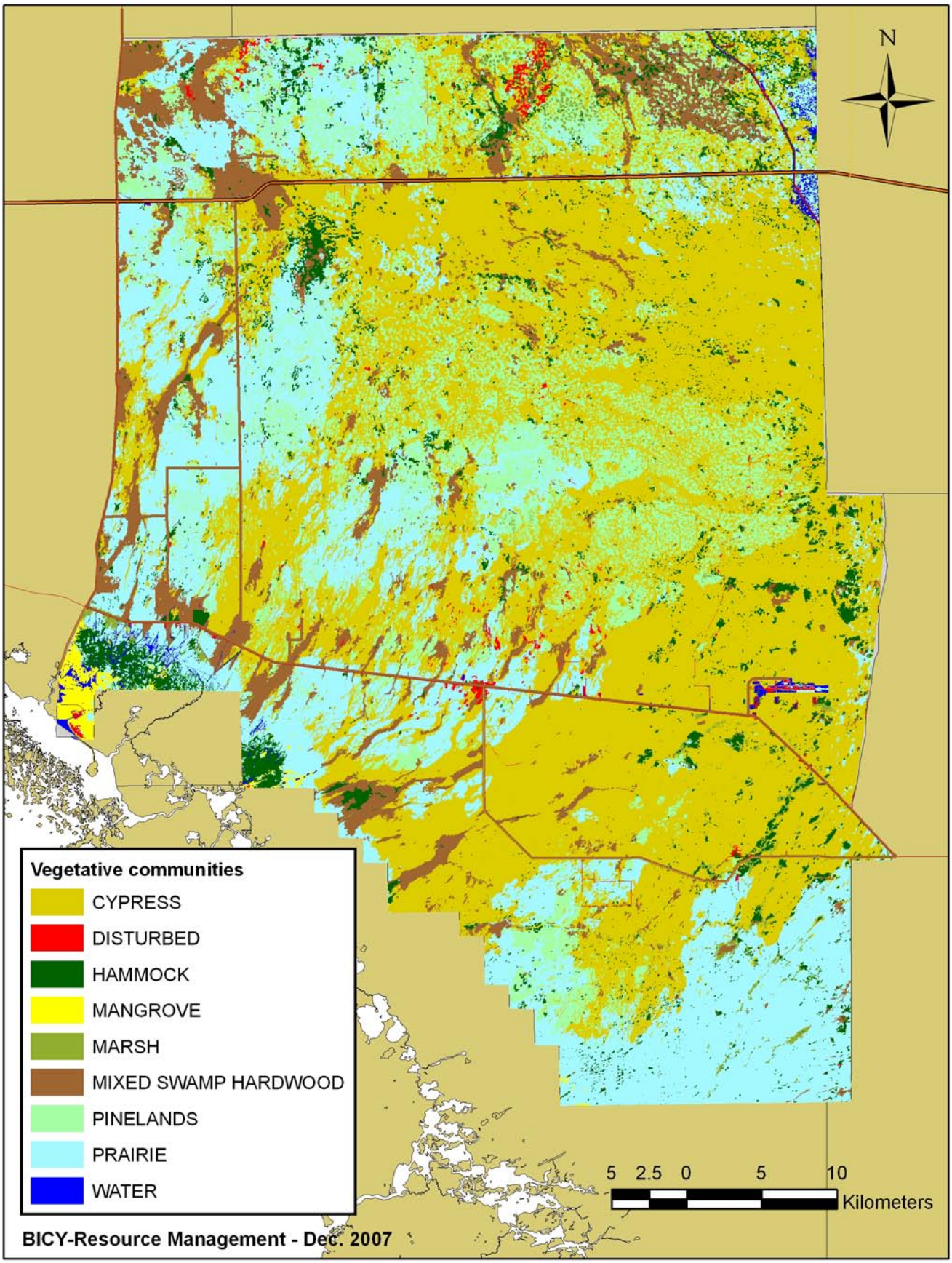

Figure 2. Vegetative communities in Big Cypress National Preserve.

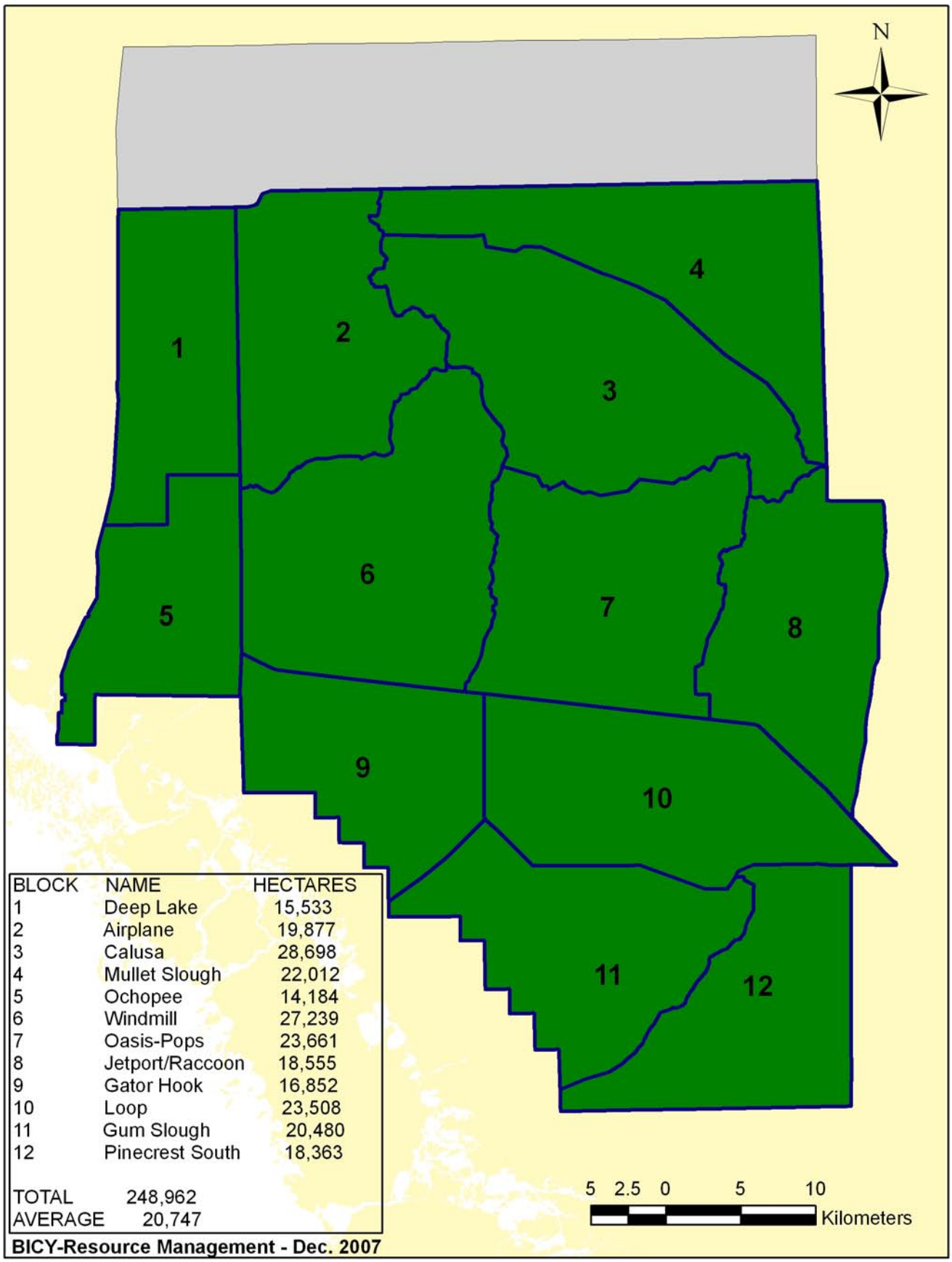

Figure 3. Panther survey blocks in SBICY.

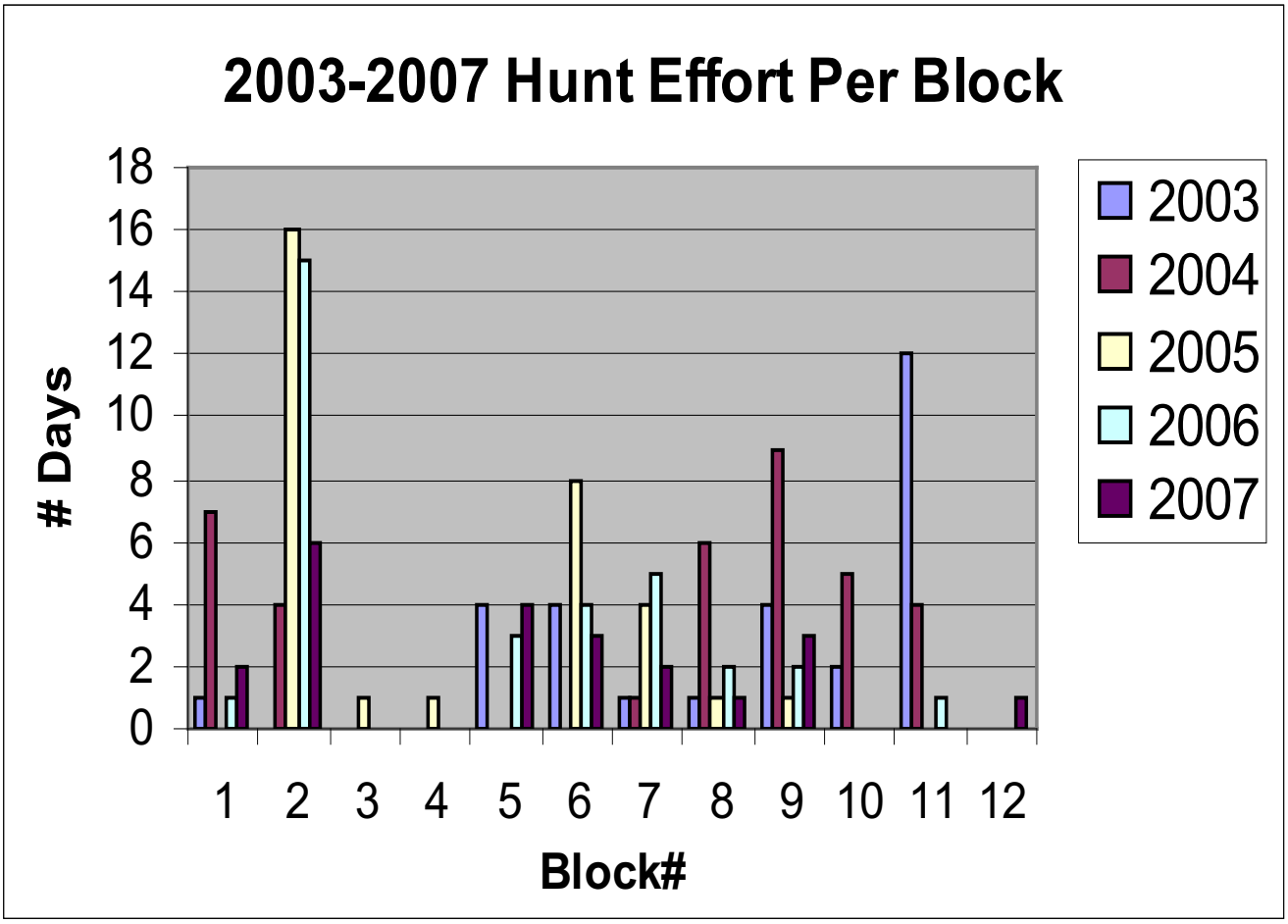

Figure 4. Hunt effort per block from 2003 through 2007.

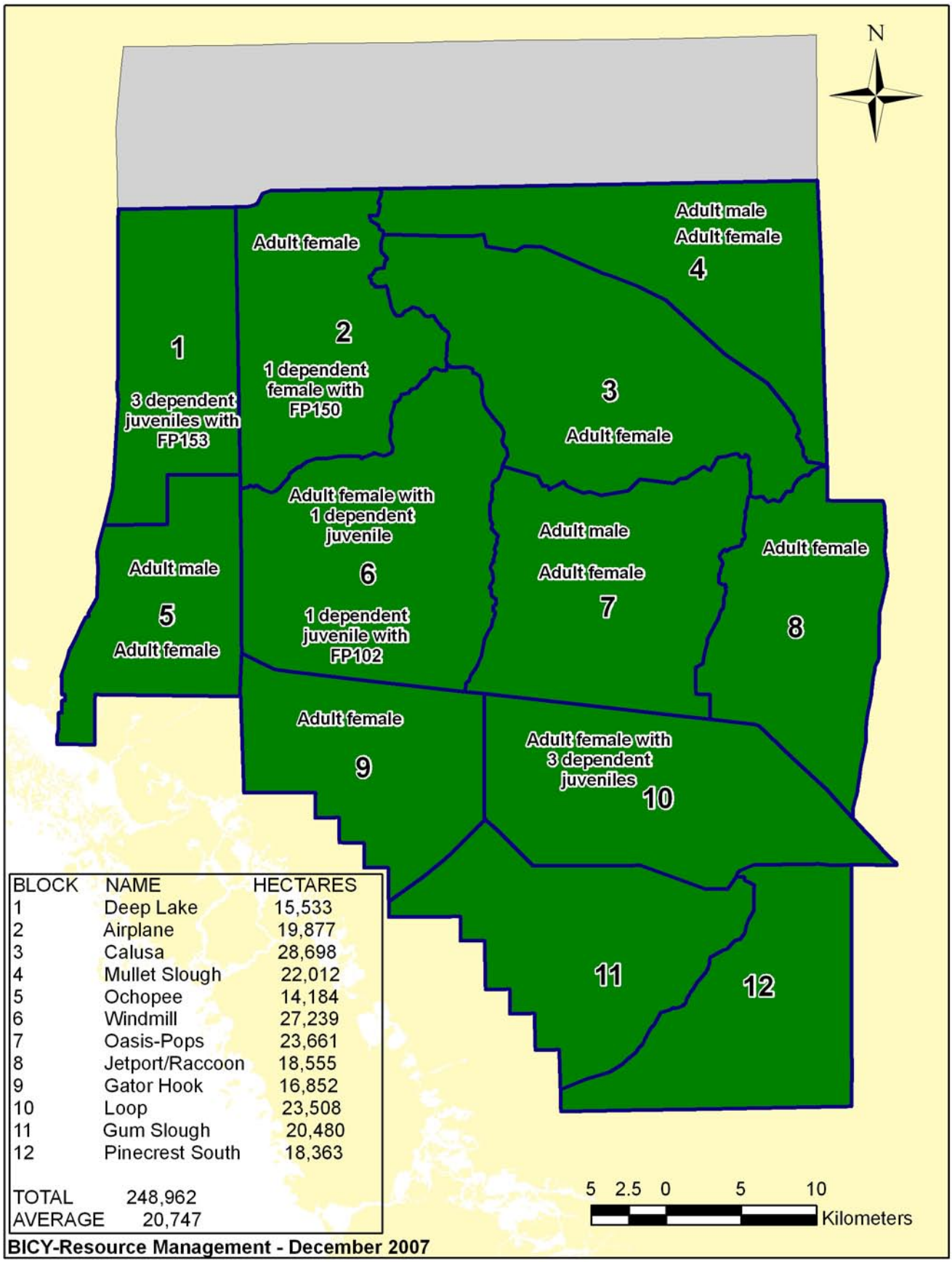

Figure 5. Documented presence of uncollared panthers in SBICY from July 2006-June 2007.

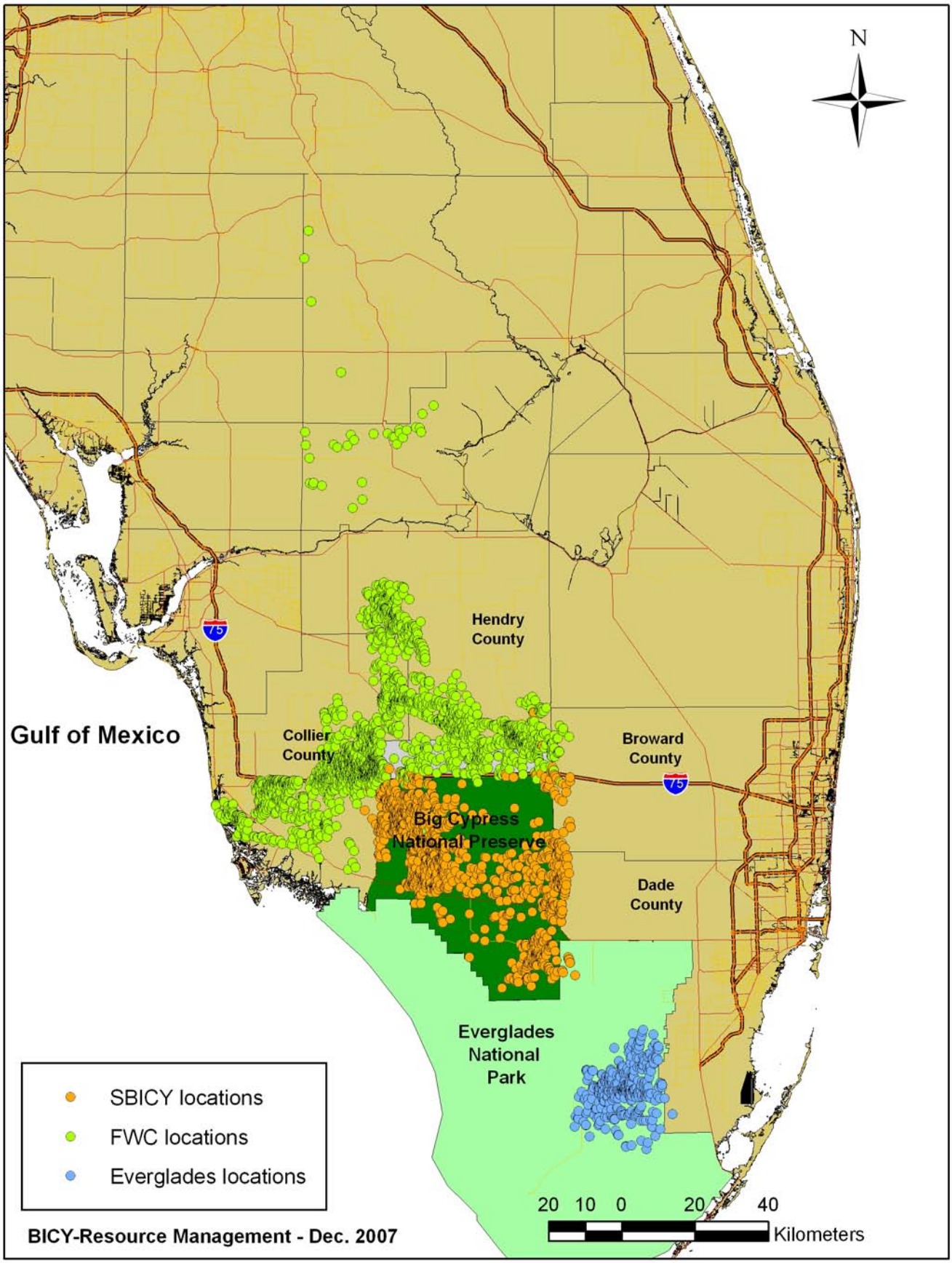

Figure 6. Geographical distribution of all Florida panther telemetry locations from July 2006-June 2007.

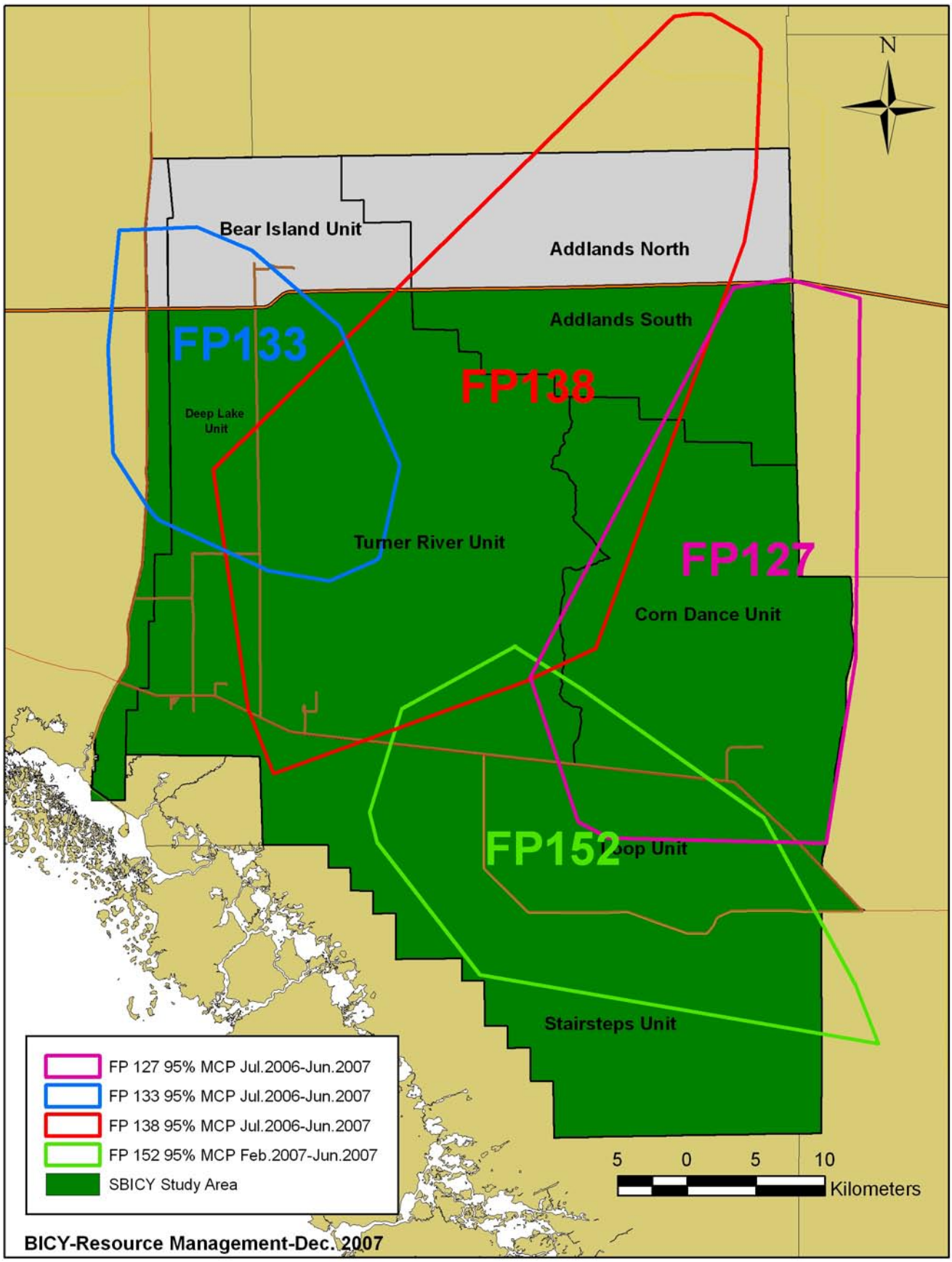

Figure 7. Home ranges of adult male Florida panthers monitored in SBICY from July 2006-June 2007.

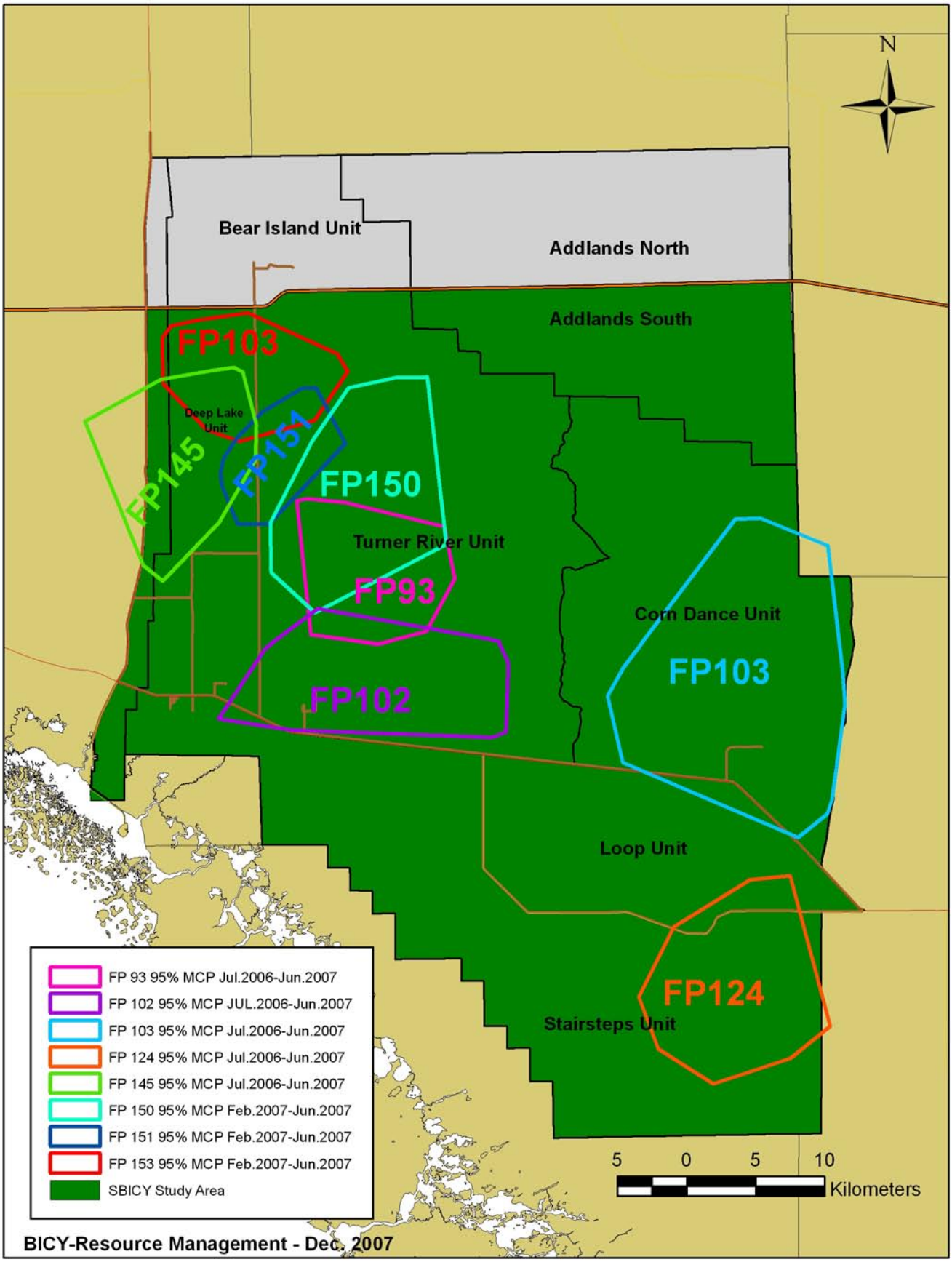

Figure 8. Home ranges of adult female Florida panthers monitored in SBICY from July 2006-June 2007.

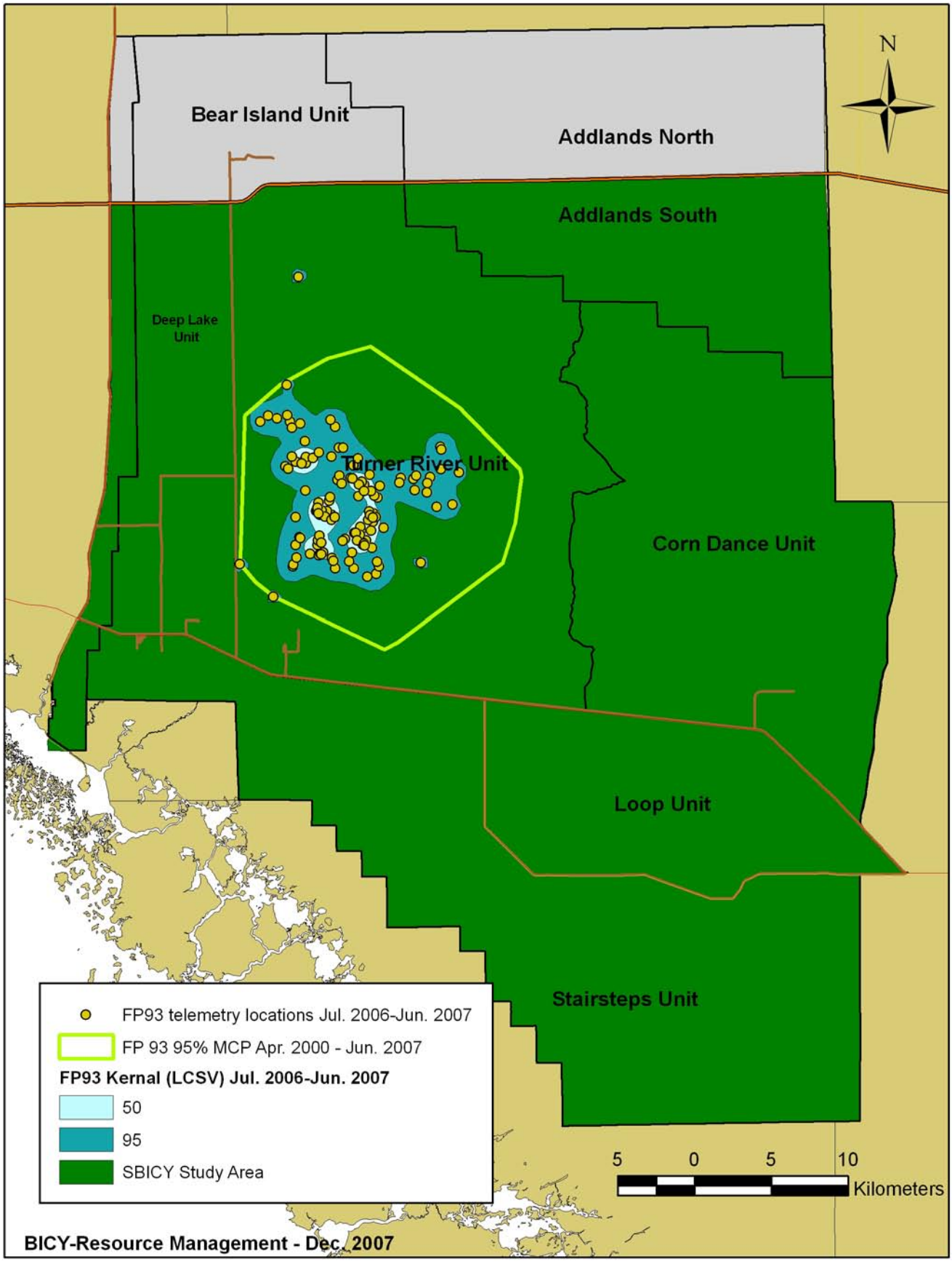

Figure 9. Home range of female Florida panther #93.

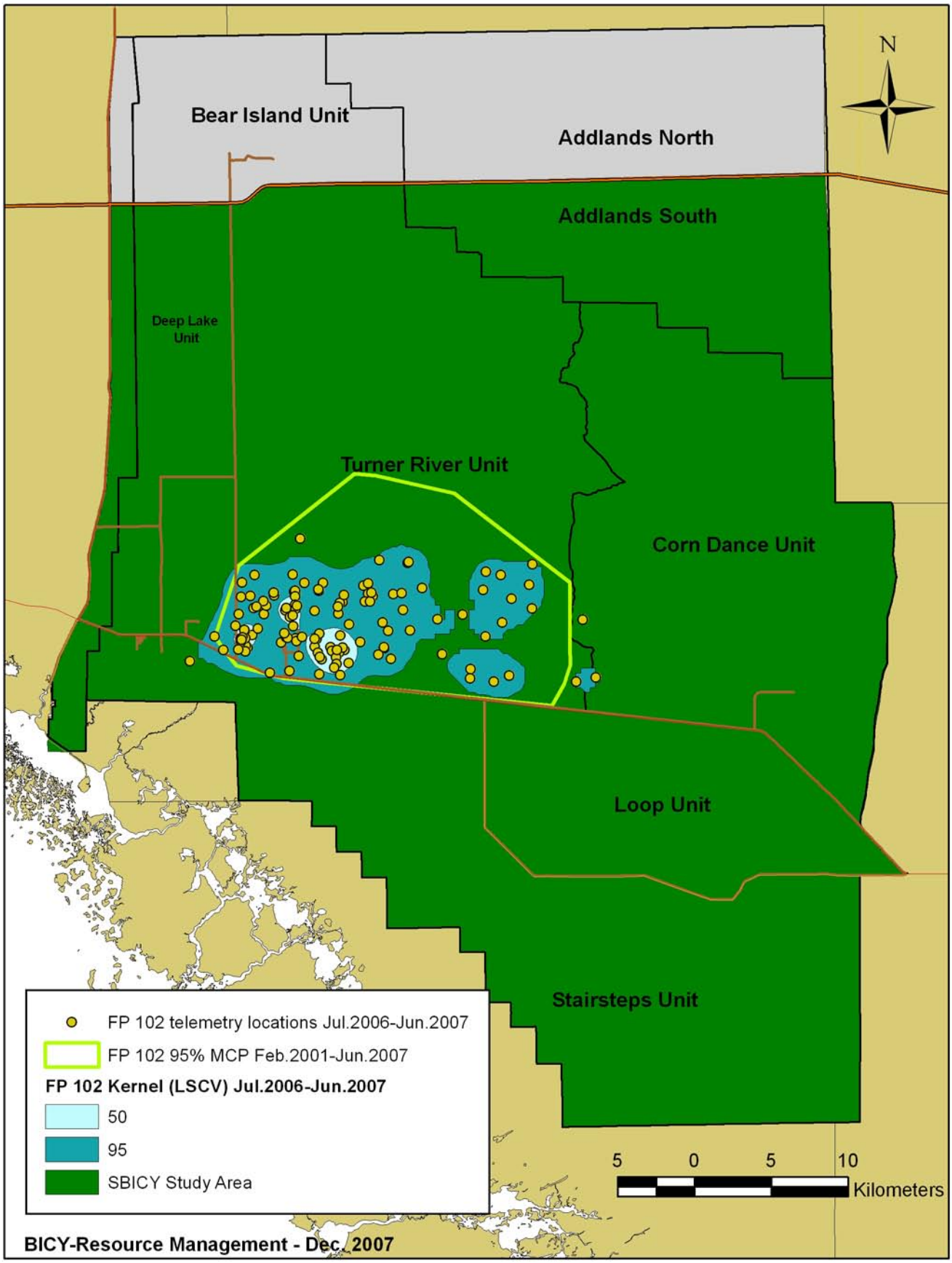

Figure 10. Home range of female Florida panther #102.

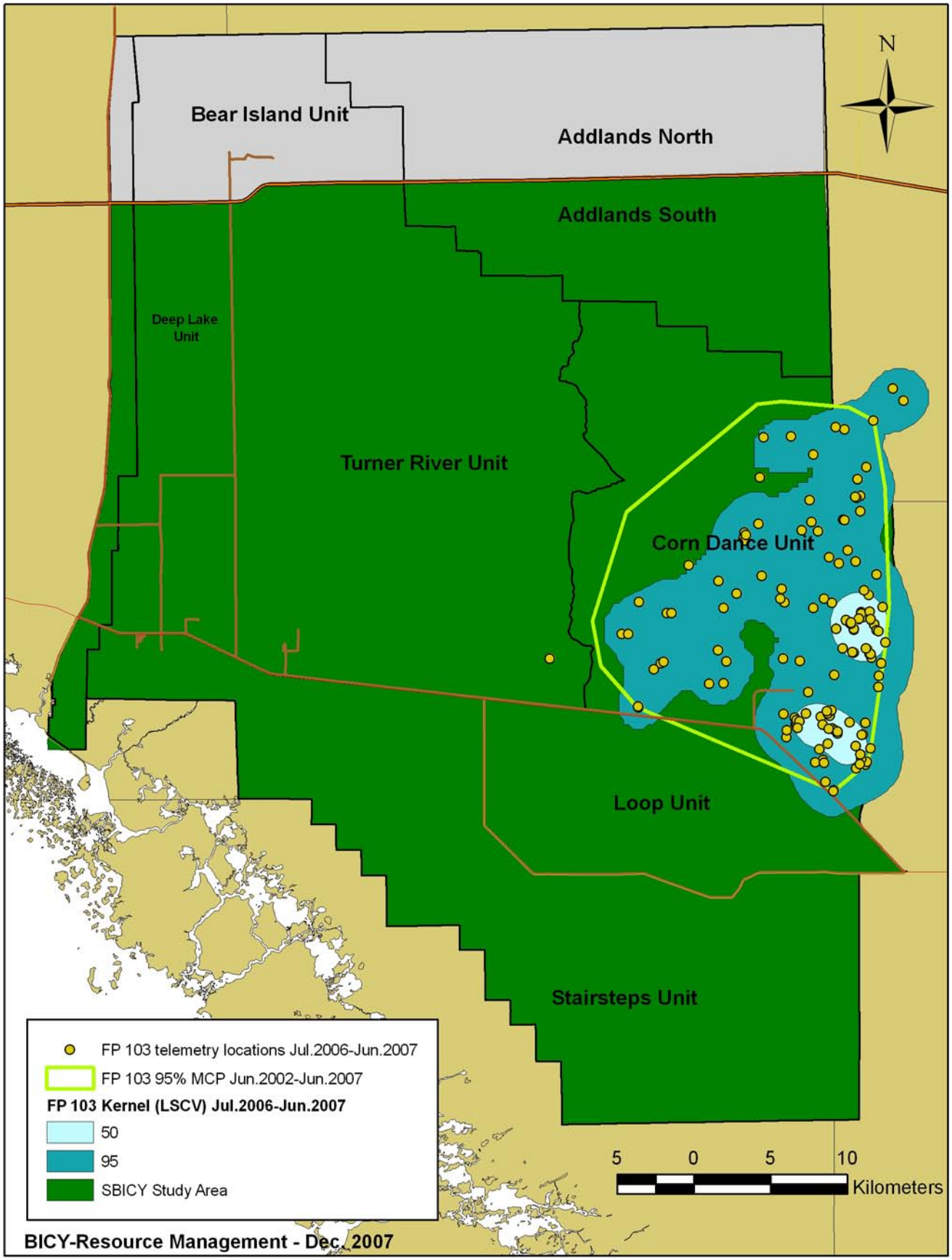

Figure 11. Home range of female Florida panther #103.

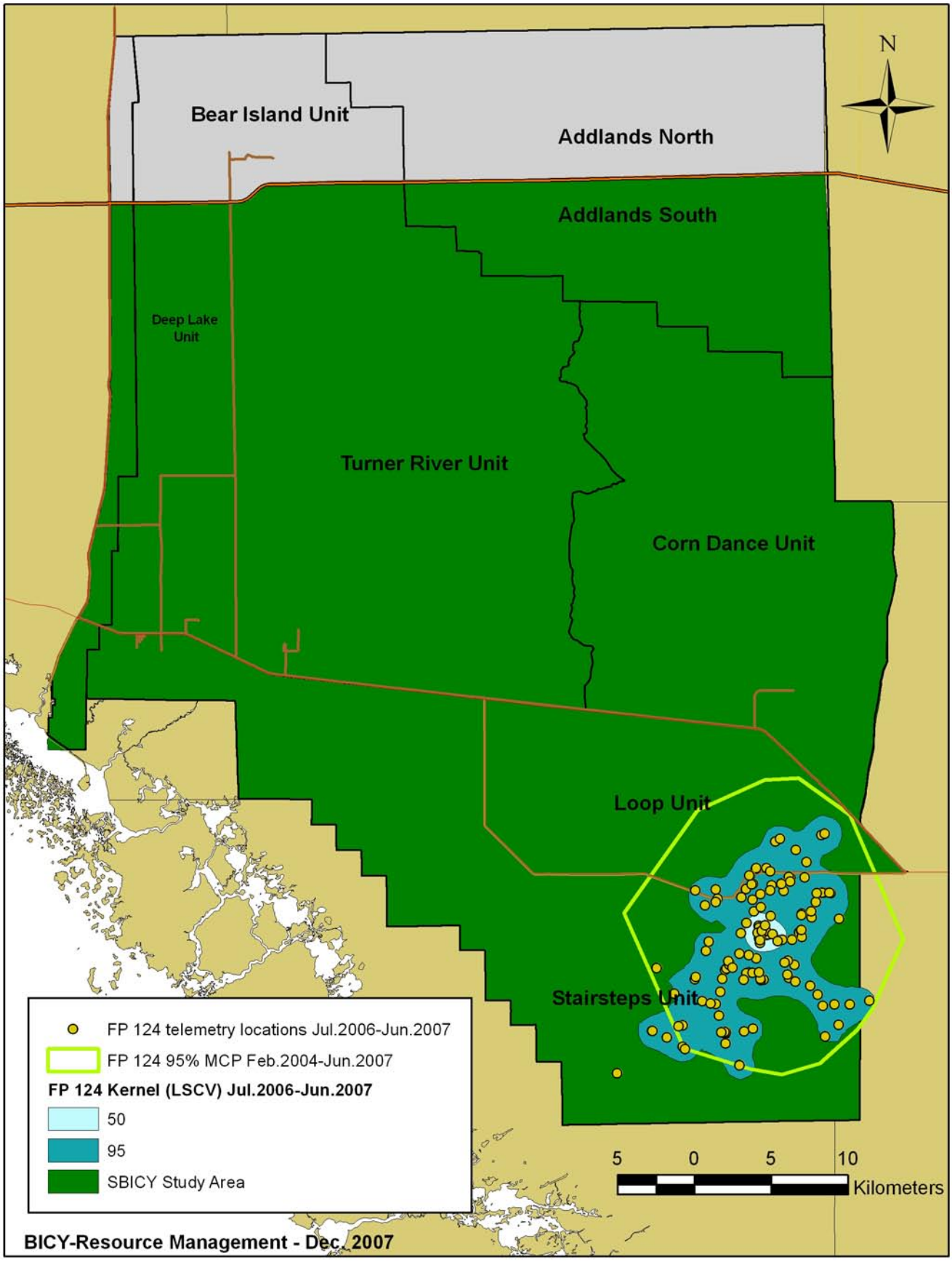

Figure 12. Home range of female Florida panther #124.

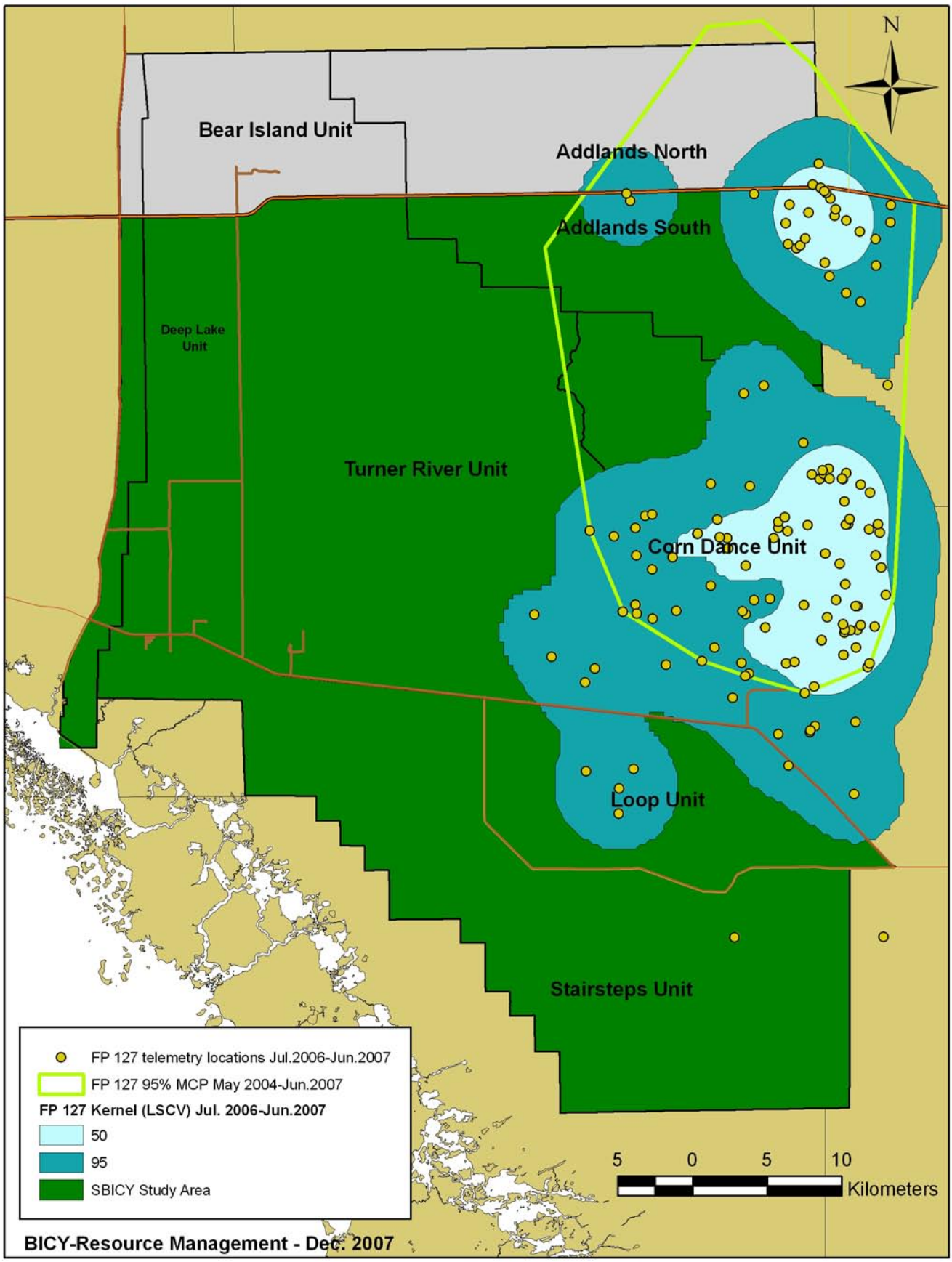

Figure 13. Home range of male Florida panther #127.

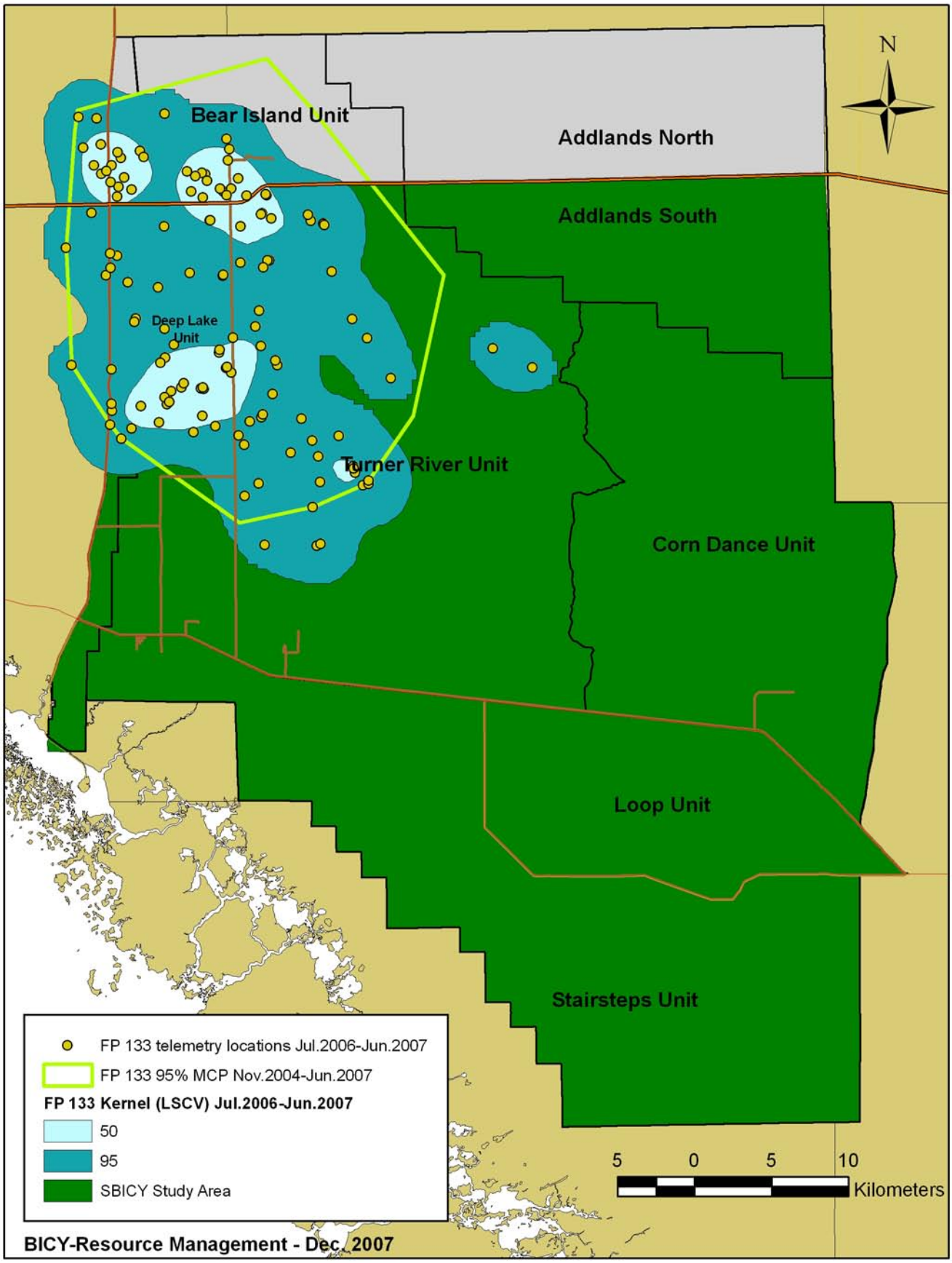

Figure 14. Home range of male Florida panther #133.

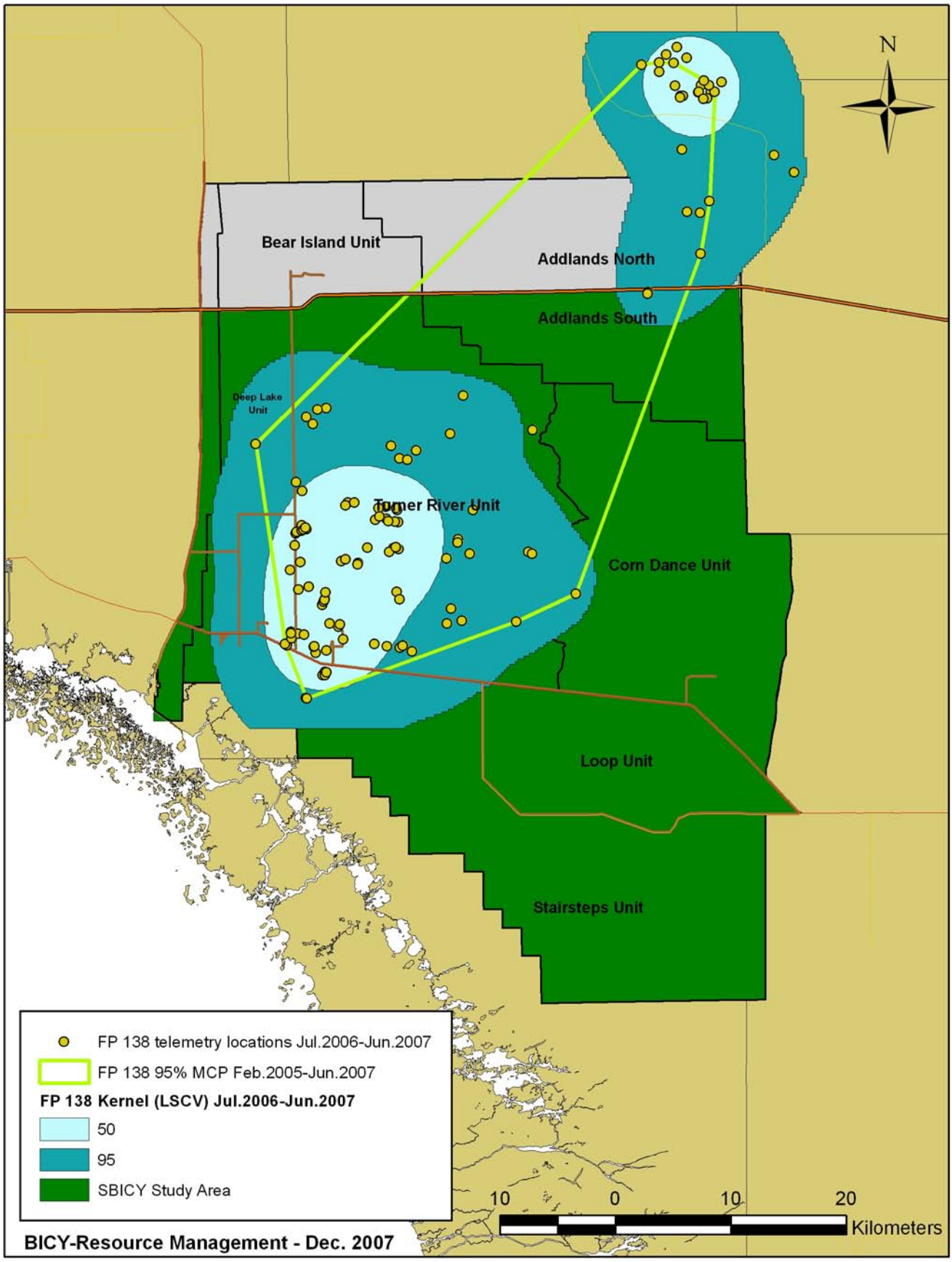

Figure 15. Home range of male Florida panther #138.

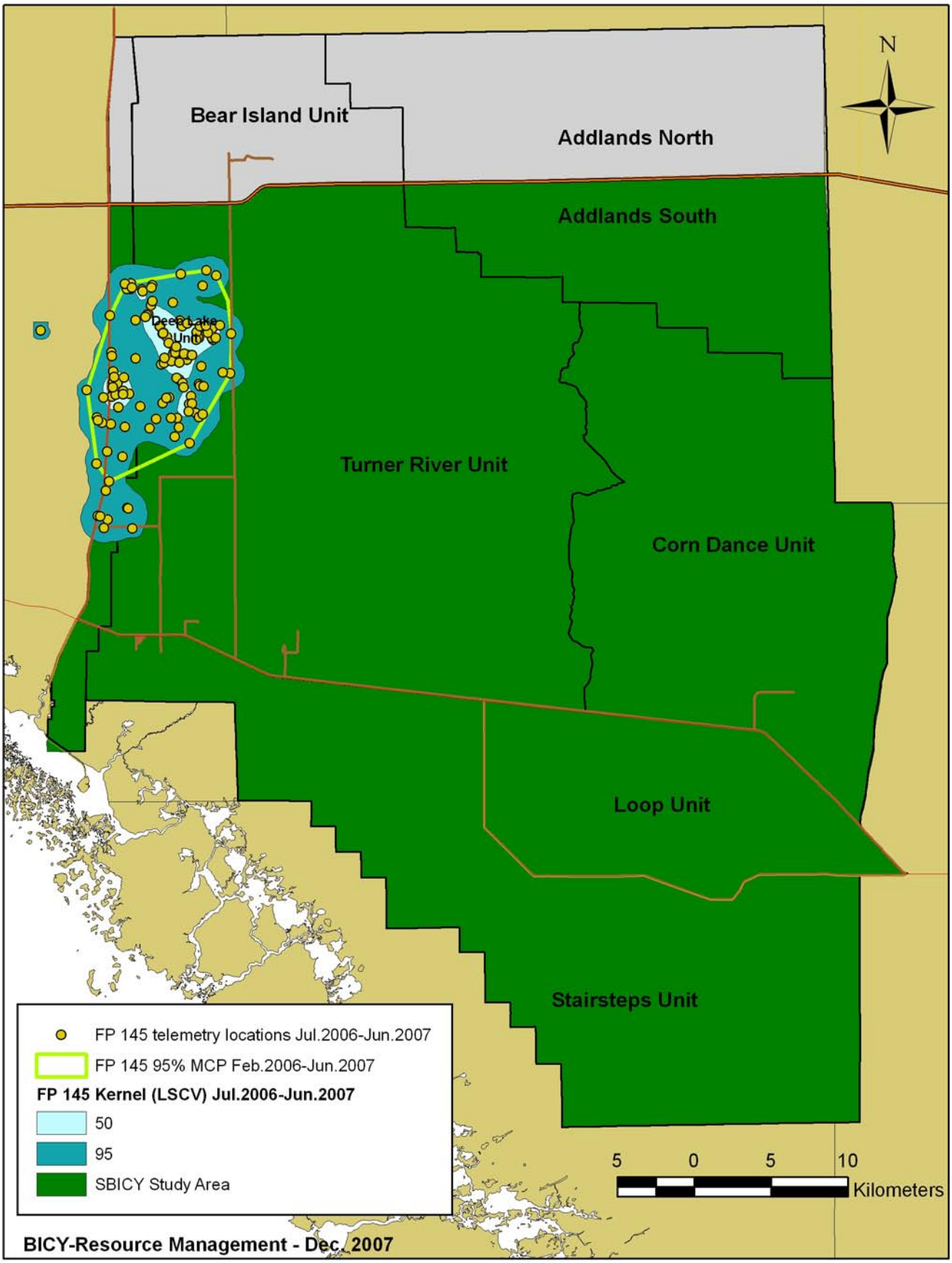

Figure 16. Home range of female Florida panther #145.

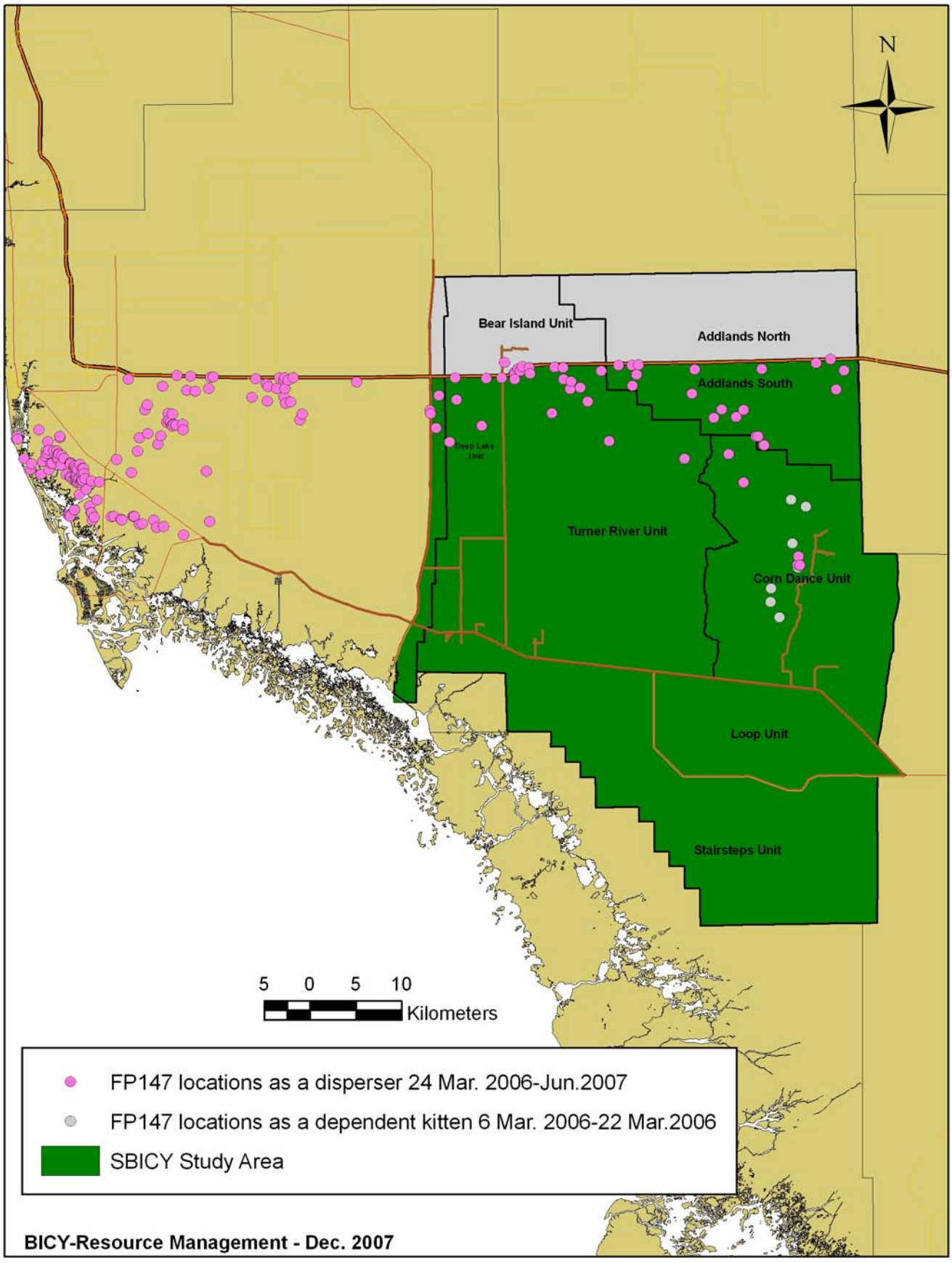

Figure 17. Area of use by male Florida panther #147 as a dependent kitten, a disperser, and as a resident near Naples.

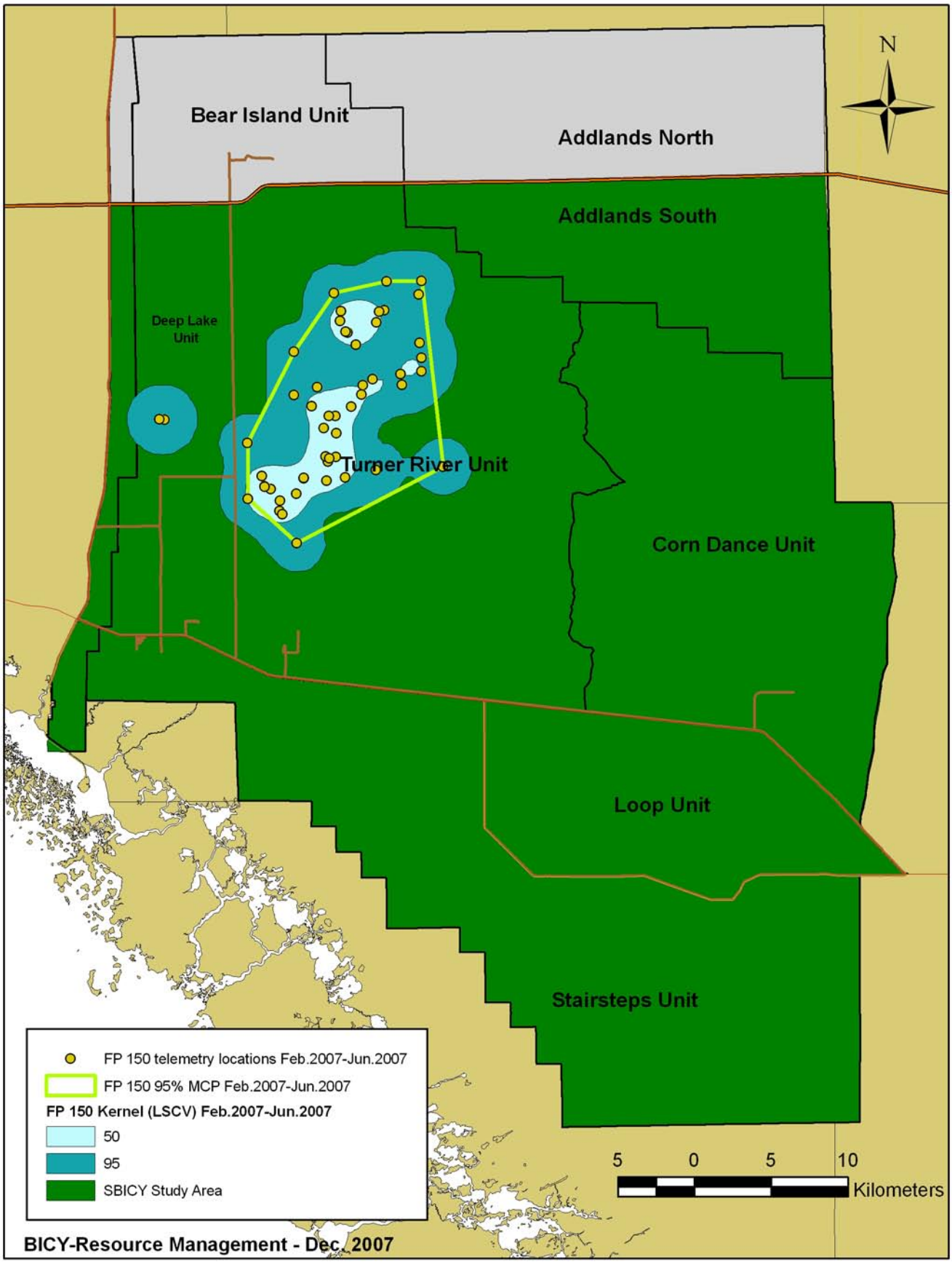

Figure 18. Home range of female Florida panther #150.

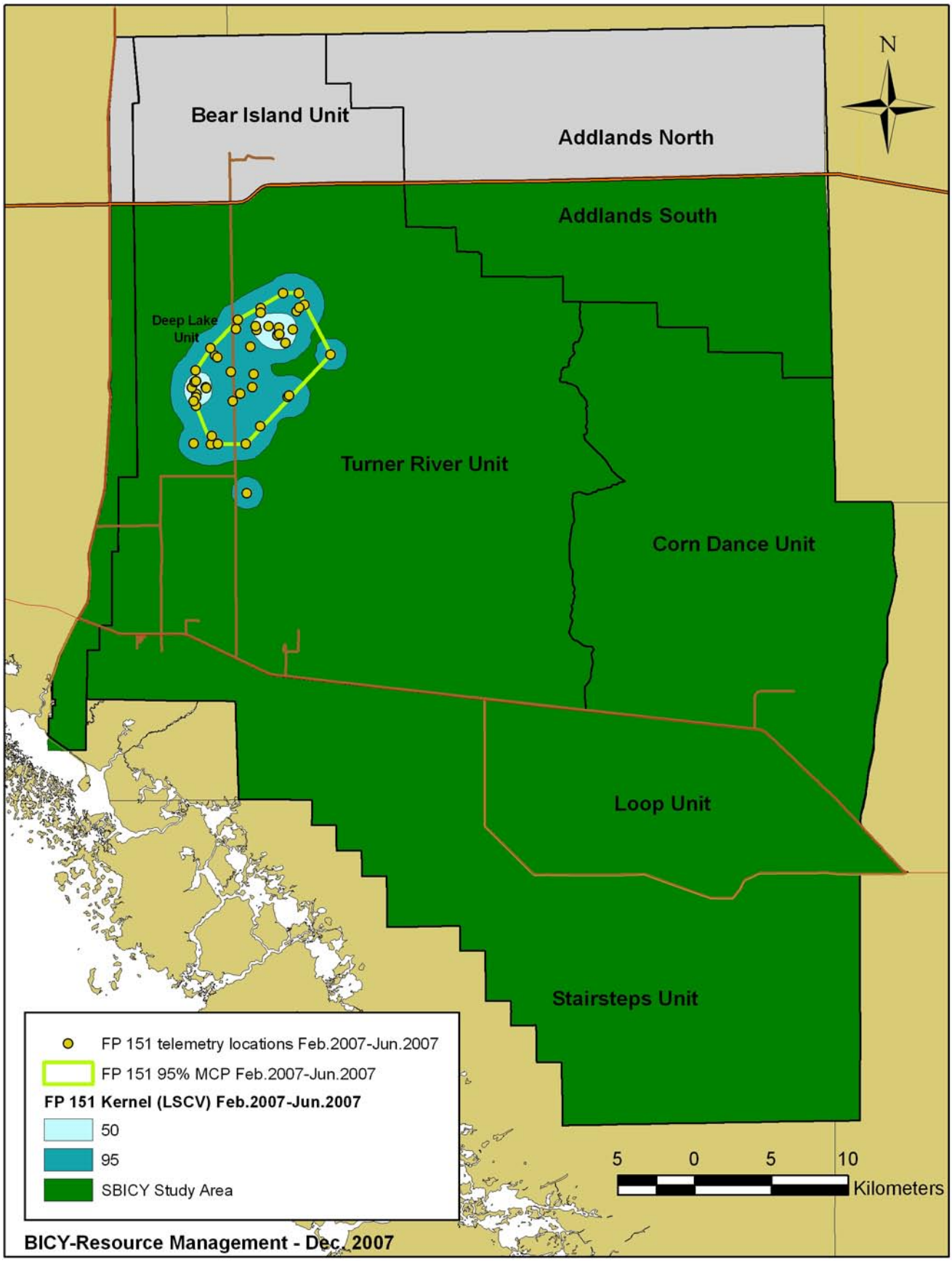

Figure 19. Home range of female Florida panther #151.

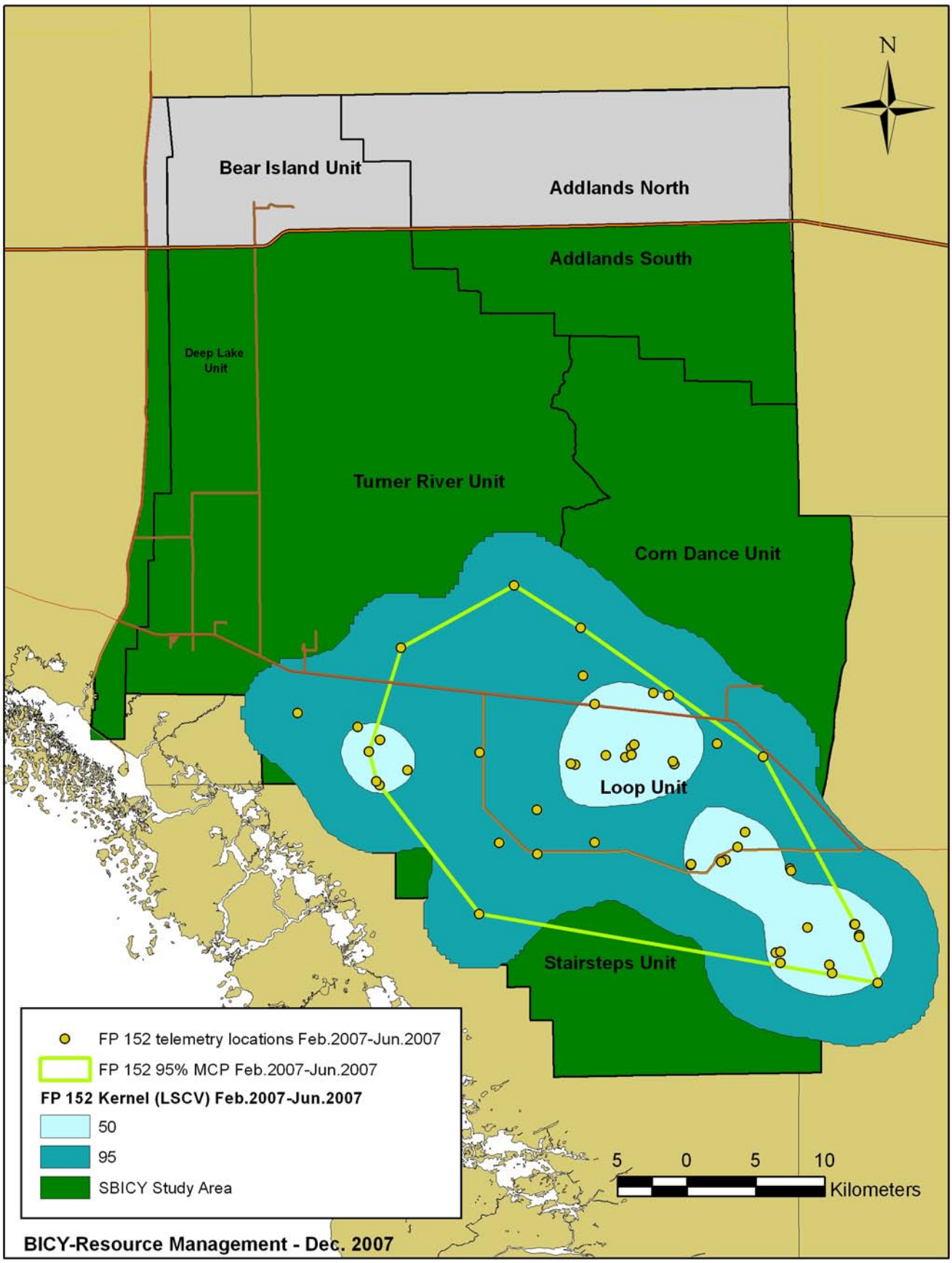

Figure 20. Home range of male Florida panther #152.

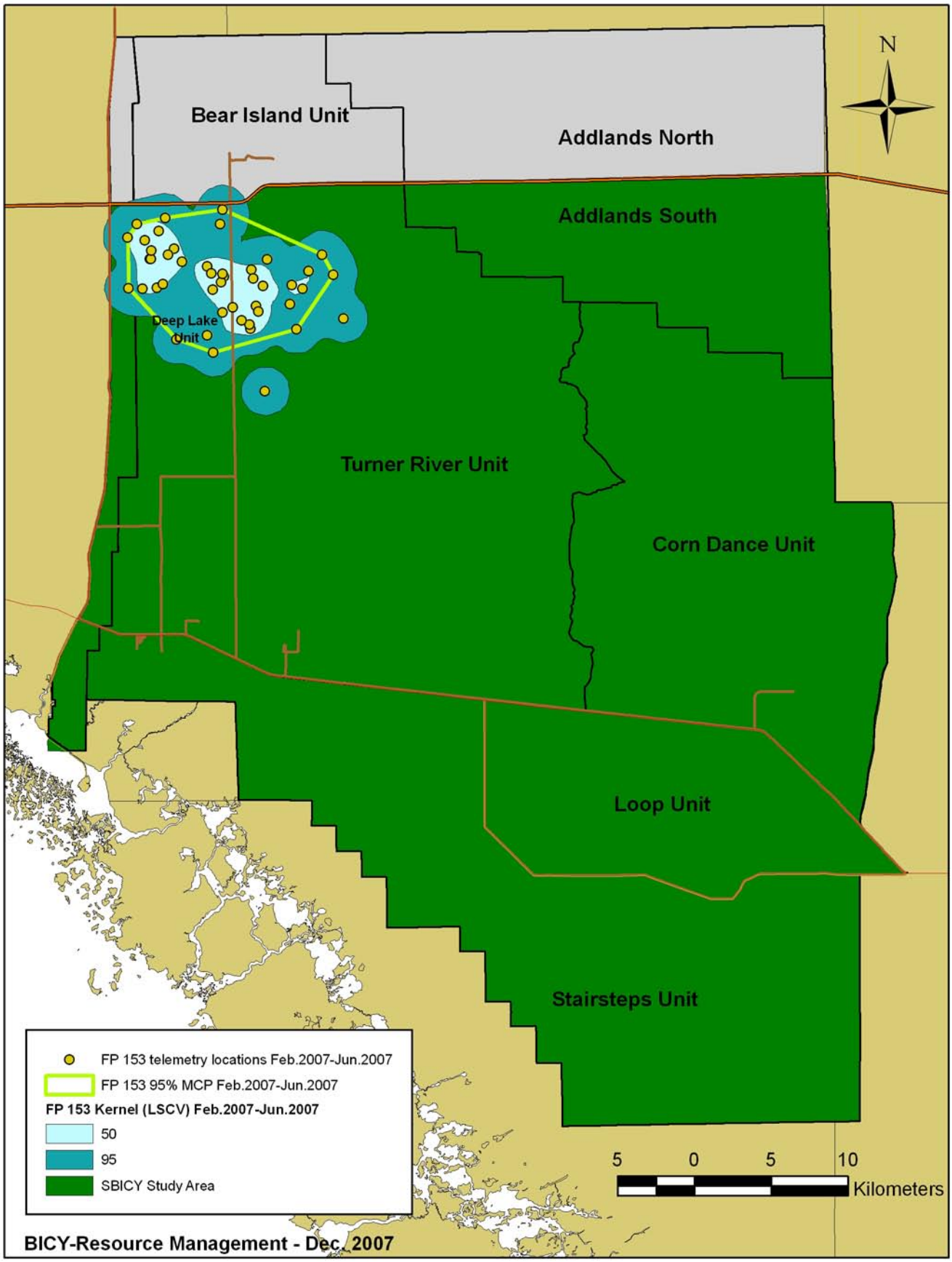

Figure 21. Home range of female Florida panther #153.