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SIGN SURVEYS FOR FLORIDA PANTHERS ON PERIPHERAL AREAS OF THEIR KNOWN RANGE

JAYDE C. ROOF AND DAVID S. MAEHR
Florida Game and Fresh Water Fish Commission,
566 Commercial Blvd., Naples, Florida 33942

Abstract.—Surveys for Florida panther (*Felis concolor coryi*) sign were conducted between April 1984 and March 1987 at Fisheating Creek, Glades County, and Corkscrew Swamp, Collier County. Sign was encountered regularly at Fisheating Creek and sporadically at Corkscrew Swamp. A search method involving weekly surveys from an all-terrain cycle was preferred over pick-up truck surveys.

The Florida panther's (*Felis concolor coryi*) original range extended from eastern Texas and the lower Mississippi valley east through the southeastern states including Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, and parts of Tennessee and South Carolina (Goldman 1946). At present the only documented population is in southern Florida with total numbers estimated between 20 and 50 (U. S. Fish and Wildlife Service 1987). Scattered sign of individuals have been found along the St. Johns River drainage north to Volusia County (W. Frankenberger, pers. comm.) and Highlands County (Layne and Wasser 1988), but the dynamics and distribution of these and other peripherally occurring individuals are unknown.

The need to document demographics of panthers in these areas is essential to the management for this endangered subspecies. To better understand the distribution and ecology of panthers in Florida, we present the results of two panther surveys conducted in peripheral areas.

STUDY AREAS

The Fisheating Creek study area is located in Glades County in southwestern Florida (Fig. 1). Most of the county including Fisheating Creek is presently used as unimproved rangelands and has a human population of about 6,000 (Marth and Marth 1983). The 8,000 ha study area is composed of live oak (*Quercus virginianus*) hammocks, slash pine (*Pinus elliottii*) flatwoods, cypress (*Taxodium distichum*) strands, scattered freshwater ponds

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and sloughs. It is used primarily for cattle, and through 1985 also was a refuge leased by the Florida Game and Fresh Water Fish Commission (GFC) for wildlife research on Wild Turkey (*Meleagris gallopavo*), feral hog (*Sus scrofa*) and other species. National Audubon Society's Corkscrew Swamp Sanctuary covers approximately 4,450 ha in extreme northwest Collier County (Fig. 1). Collier County supports a variety of land uses from wilderness reserves to agricultural and urban and has a human population of about 86,000 (Marth and Marth 1983). Plant communities found on Corkscrew Swamp include virgin cypress swamp, sawgrass (*Cladium jamaicense*) prairie, tropical-oak hammock, slash pine flatwoods, and mixed swamp. Perhaps the most significant habitat characteristic of Corkscrew Swamp is its nearly complete encirclement by housing developments, crop lands, improved pasture and other human developments.

Methods

Methods used to find and identify tracks were similar to methods used by Van Dyke et al. (1986) and Belden (1978). We also included scats, scrapes and kills as indicators of panther presence. Scrapes consist of a pile of leaves or other debris mounded by both hind feet and apparently serve as olfactory communication among individual panthers (Hornocker 1969). Occasionally scats are present in these mounds but more often only urine is deposited. Although many authors attribute scrapes only to males, our observations support those of Musgrave (1926) and Hornocker (1969), who observed both sexes engaging in this behavior. Females seem particularly prone to making scrapes during estrous. Kills were located by following drag marks across survey routes or by observing feeding behavior of vultures.

On Fisheating Creek, unimproved roads and trails were driven an average of once per week in a pick-up truck and checked for sign between 20 April 1984 and 17 May 1985. Also, five locations on wildlife trails were cleared and checked for sign. These tracking surfaces measured approximately 1 x 2 m and were raked after each inspection.

A slightly different approach to finding sign was used on Corkscrew Swamp. A course of roads and trails approximately 30 km in length were established as a survey route. Once a week from 4 April 1986 through 25 March 1987 an all-terrain cycle was used to travel the survey route at approximately 3 km/hr.

Results and Discussion

On Fisheating Creek between 20 April 1984 and 17 May 1985, 67 days (160 man-hours) were spent surveying 126 km of roads and trails. Sign found included two kills, six scats, seven scrapes, and eleven sets of tracks (Fig. 1).

All scats collected on Fisheating Creek contained hog hair. On 20 April 1984 a freshly killed pig approximately 3.6 kg was found. The carcass was extensively utilized leaving only the snout forward of the eyes and a neat pile of intestines nearby. On 10 August 1984 an approximately 23 kg male hog was found with only the internal organs and ribs consumed. Neither hog was covered as is the typical fashion of the species (Shaw 1979).

On Corkscrew Swamp between 4 April 1986 and 25 March 1987, 38 days (306 man-hours) were spent surveying 918 km of roads and trails within the sanctuary boundaries. Actual survey distance was influenced

by water level and ranged from 12 to 30 km. From mid-June through mid-September high water significantly reduced the survey area.

One possible deer kill, six scats, six scrapes and six sets of tracks were found. No distinct pattern of use was apparent. Scats collected contained hair from white-tailed deer (*Odocoileus virginianus*) (n=3), hog (n=2) and raccoon (*Procyon lotor*) (n=1). The bleached bones of an adult female deer were found, however the age of the kill precluded certain identification of the predator.

Track sizes indicated at least one male panther used the Fisheating Creek area. Sign was found an average of every 21 days or one observation of sign per 6.2 man-hours. No sign was found in 1985, but only three field searches were conducted from January through March. On six occasions sign was found on an abandoned bulldozer road. The road passed through densely vegetated slash pine and saw palmetto (*Serenoa repens*) woodlands. Due to the frequency of use, this appeared to be a preferred travel route.

The abundance and distribution of sign found in Fisheating Creek suggests occupancy by a resident adult male. It is possible that his home range overlaps that of at least one female as is the pattern among radio

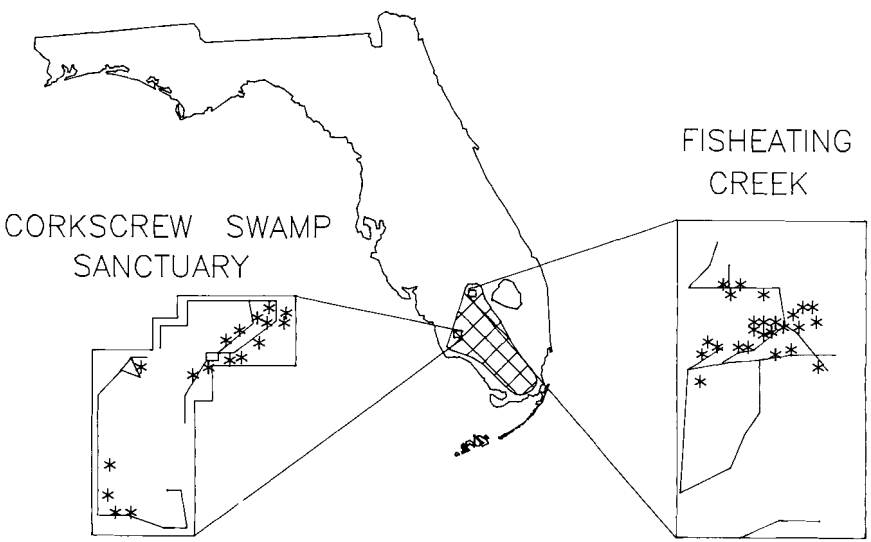

Figure 1. Location and distribution of panther sign (asterisks) on Fisheating Creek and Corkscrew Swamp Sanctuary. Cross-hatching represents limits of known panther distribution. Lines within expanded enclosed areas represent survey routes.

collared panthers in southwestern Florida (Maehr 1987). Considering the continuity of surrounding habitat and the observation of a radio-collared panther within 32 km of Fisheating Creek (Maehr 1987) it is likely that panthers inhabiting Fisheating Creek are northern members of the southwestern Florida population (Fig. 1). Monitoring of Fisheating Creek was discontinued in May 1985 when the landowner withdrew the area from the GFC refuge and Type II Management Area program. Access to the property for continued surveys was no longer permitted.

Track sizes indicated at least one male and one female panther used the Corkscrew Swap survey area. Panther sign was found irregularly an average of every 26 days or one observation per 17 man-hours. Sporadic use of Corkscrew Swamp by at least two panthers indicates that it is not the core of either panther's home range. Large tracts of land to the south, west and northeast may be primary use areas in as much as suitable habitat also exists on these private lands, and most of the panther sign was found near the periphery of Corkscrew Swamp (Fig. 1).

Van Dyke et al. (1986) used track counts as an indicator for the presence of mountain lions and suggested that females were more detectable than males. Because males have much larger home ranges and travel greater distances per time interval than females (Maehr 1987), male sign should have a higher probability of discovery. Van Dyke et al. (1986) conducted their study in an area known to be occupied and may have biased their search method with previous knowledge of home ranges of radio-collared mountain lions. Our data at Fisheating Creek and Corkscrew Swamp, and experience in southwestern Florida during panther capture activities indicate male sign is encountered with greater frequency than female.

Ackerman et al. (1981) observed that searching for mountain lion sign is an extremely labor intensive activity. Our experience in southwestern Florida supports this observation. Nonetheless, without the aid of radio telemetry, sign surveys are the only way of detailing temporal and geographic use by panthers. While both methods used were productive, we prefer the one used at Corkscrew Swamp. The use of an all-terrain cycle allows trails and roads to be checked more effectively because the observer can see the entire tracking surface and rides closer to the ground. A once each week schedule allows for a modest accumulation of signs and still permits estimation of temporal use by panthers.

The situation encountered at Fisheating Creek concerning access for panther related activities may be an example of landowner anxiety over implications of panther presence. Further, it is not unusual in depicting a situation where known occupied panther range is unavailable for study. These peripheral areas are essential in our understanding of panther dispersal and recruitment patterns and in determining what environmen-

tal factors influence them. Efforts should be made to foster cooperation between landowners and public resource agencies. In this way the status of Florida panthers on private lands may be adequately assessed and management strategies proposed to minimize development impacts on this endangered subspecies.

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LITERATURE CITED

ACKERMAN, B. B., T. P. HEMKER, F. G. LINDZEY, AND A. J. BUTTON. 1981 Cougar numbers in the Hendry Mountains, Utah. Encyclia 58: 57-62.

BELDEN, R. C. 1978. How to recognize panther tracks. Proc. Ann. Conf. Southeast. Assoc. Fish and Wildl. Agencies 32: 112-115.

GOLDMAN, E. A. 1946. Classification of the races of the puma, Part 2. Pages 117-302 *in* The puma, mysterious American cat (S. P. Young and E. A. Goldman, eds.). Washington, D. C.: The Amer. Wildl. Inst.

HORNOCKER, M. G. 1969. Winter territorality in mountain lions. J. Wildl. Manage. 33: 457-464.

LAYNE, J. N., AND D. A. WASSMER. 1988. Records of the panther in Highlands County, Florida. Fla. Field Nat. 16: 70-72.

MAEHR, D. S. 1987. Florida panther movements, social organization, and habitat utilization. Tallahassee, Florida: E-1-11 Annual performance report. Florida Game and Fresh Water Fish Comm.

MARTH, D., AND J. M. MARTH. 1983. The Florida Almanac 1983-84. Gretna, Louisiana: Pelican Publishing Co.

MUSGRAVE, M. E. 1926. Some habits of mountain lions in Arizona. J. Mammal. 7: 282-285.

SHAW, H. G. 1979. A mountain lion field guide. Phoenix, Arizona: Arizona Game and Fish Dept. Special Rept. no. 9.

U. S. FISH AND WILDLIFE SERVICE. 1987. Florida panther (*Felis concolor coryi*) recovery plan. Atlanta, Georgia: Prepared by the Florida Panther Interagency Committee for the U. S. Fish and Wildlife Service.

VAN DYKE, F. G., R. H. BROCKE, AND H. G. SHAW. 1986. Use of road track counts as indices of mountain lion presence. J. Wildl. Manage. 50: 102-109.