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A search for Cougars (*Puma concolor*) in western Kentucky

Introduction

In the United States, many species have a history that includes having been nearly extirpated by the early 1900's. Some of these species, such as white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallapavo*), and American beaver (*Castor canadensis*), have rebounded after the implementation of protection measures and the regrowth of habitat (Bolen and Robinson 1999). Similarly, by the early 1900's, habitat loss and eradication measures had eliminated cougars from the eastern United States. Until relatively recently, they were found almost exclusively in the Rocky Mountains, with a small remnant population in Florida's swampland (Schwartz and Schwartz 1981). Now cougars have begun to expand from Texas north through Arkansas and Missouri (Schwartz and Schwartz 1981), and from southeastern Canada into Maine, Vermont, and Massachusetts (Rezendes 1999).

Almost every publication that deals with the expansion of cougar range suggests the possibility that captive cougars have been released illegally. This is a very good possibility when one considers the fact that many people are licensed to keep these animals, and many people have cougars without permits (Combes 2002). In fact, some road-killed cougars that have been found in the east have had characteristics of previously captive cougars (Bolgiano 1995).

This is not true, however, of all specimens that have been found in the east in recent years. A young male cougar hit by a train in southern Illinois was found to have a completely North American genotype (most pet cougars have at least some South American mtDNA). There was no evidence that this animal had worn a collar recently, and wear patterns on its foot pads were not consistent with having been housed in a cage. The stomach contents were of a single white-tailed deer, and all parasites were consistent with those found in other wild North American cougars (Heist et al. 2001). Similarly, a cougar scat found

in Louisiana was from a North American animal that was feeding on locally occurring prey items (Leberg et al. 2004). It is impossible to determine the exact origins of these animals, but it is at least very plausible that they were wild animals.

It is possible that cougar habitat has recovered and human policies have changed enough to allow these large predators to re-inhabit their former range. White-tailed deer, a primary prey item for cougars, have recovered to astounding population levels. Also, bounty hunting programs have been discontinued, and cougar hunting has been banned or regulated in most states. Only Texas still allows unrestricted killing of cougars (Hansen 1995). Male cougars certainly possess the ability to expand into new areas. The record dispersal distance is of a male who moved 483 km from northern Wyoming to an area west of Denver, Colorado (Logan and Sweanor 2000 cited in Sweanor et al. 2000). Some populations migrate seasonally with game herds and may cover 817 km² in a year (Pierce et al. 1999).

The ability of cougars to re-inhabit their original range is not without limits. These large Felids require large areas of habitat and are not good at dispersing in zones of extensive human disturbance. For example, one study found that the dispersal of male Florida panthers (*Puma concolor coryi*) was "circular, frustrated, and of insufficient length to ameliorate inbreeding." In this population, male dispersal averaged 68.4 km (Maehr et al. 2002). Comparatively, a study of cougar dispersal conducted in New Mexico found that male dispersal averaged 108.04 km (Sweanor et al. 2000). Sample sizes were understandably low in both studies (27 and 43 respectively) and the populations were in completely different habitats; however, these data suggest that cougar dispersal may be limited by human activities.

Another barrier to the success of cougar range recovery is that female cougars are often philopatric, and even when they do move out of their natal area it may not be very far. Sweanor et al. (2000) found that females dispersed an average of 13.5 km from their natal area, and Maehr et al.

(2002) found that Florida panthers dispersed an average of 20.3 km. So, even if young male cougars move into uninhabited parts of former cougar range, it may be some time before breeding populations are established. Also, fragmentation of the eastern landscape may leave few areas of contiguous habitat that can accommodate the home range size of cougars. For example, cougars in the northeastern United States use between 76 (females) and 175 (males) square miles (Rezendes 1999). This is a large area of habitat, but these large predators can use corridors to move between smaller areas of habitat (Beier 1995).

Aspects of cougar life history and also human barriers have prevented these large predators from returning to the eastern landscape thus far, but recovery of forested cover and prey species since the early 1900's may now provide an avenue for redispersal. Evidence for the expansion of cougar populations is currently documented by the Cougar Network (Cougar Network 2004). This group summarizes and maps the occurrence of reputable cougar sightings, along with the type of evidence used to substantiate the sightings. Central to this effort is a group of scientists including Dr. Clay Nielsen of Southern Illinois University. Dr. Nielsen has recently received funding to map potential cougar habitat in the Midwestern United States (Dowling 2005). This data might be used to outline areas where cougars may currently exist. It could also be used to identify and improve potential expansion corridors for this species.

Recent, reputable sightings of cougars, as documented by Jessica Wilson (personal communication), suggest that cougars have returned to the creek bottoms of Hickman county in Western Kentucky. Through this project, I sought to confirm these sightings with hard evidence.

Methods

My search areas were located on various public lands in Hickman County in western Kentucky. These areas include several locations within Westvaco Wildlife Management Area near Columbus, Kentucky and within the Obion Creek Wildlife Management Area.

lands where many sightings have taken place could not be obtained, but one sighting did occur near Westvaco Wildlife Management area (Jessica Wilson pers. comm.). The habitat in both areas is mostly bottomland hardwood and bald cypress (*Taxodium distichum*) swampland. At Obion Creek, there is a relatively intact bottomland forest that extends from the eastern side of Hickman County to the Mississippi River. Westvaco WMA is located directly adjacent to the Mississippi River and includes extensive wetlands and bluffs.

I completed four 1-3 km sign-search transects at Obion Creek WMA and three transects at Westvaco WMA. Along these transects I searched for cougar sign which included tracks, scrapes, scat, and kill sites as described by Elbroch (2003), Rezendes (1999), and Young and Goldman (1946). I also set up motion-sensitive cameras at each WMA (see figures 1-3). Cameras were set

Obion Creek WMA

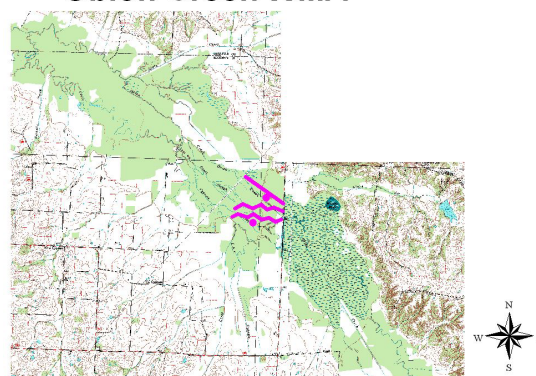


Fig. 1 Locations of cameras (dots) and transects (lines) at one Obion Creek site.

Obion Creek WMA Travis Slough

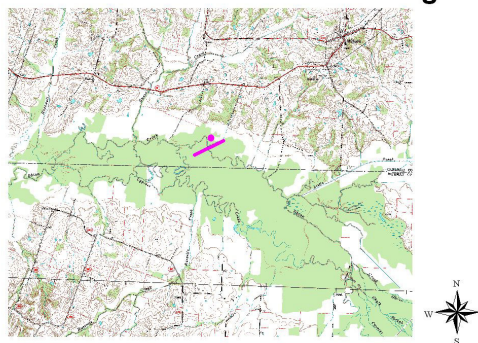


Fig. 2 Locations of cameras (dots) and transects (lines) at one Obion Creek site.

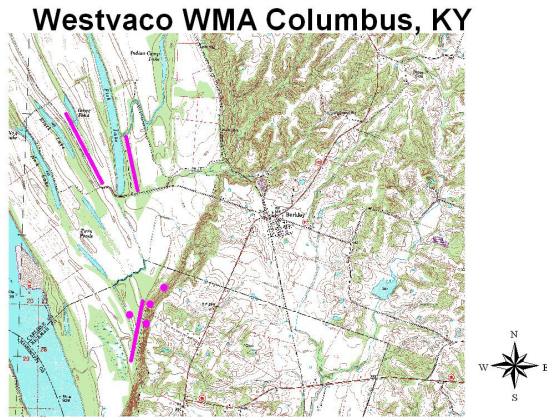


Fig. 3 Locations of cameras (dots) and transects (lines) at the Westvaco WMA site.

for seven nights at each location and baited with cougar urine (Murray Lures Inc.) which was squirted onto a prominent tree, stump, rock, or area. An attempt was made to locate cameras along game trails, especially at the junction of two trails.

Results and Discussion

Sign searches resulted in no evidence of cougar presence. All areas that were searched had muddy substrate, in which cougar tracks would have been easily detectable. Sign from several other large predatory species was found, but it was easily distinguishable from that of cougars. These species included, but were not limited to, domestic dog (*Canis familiaris*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and river otter (*Lutra canadensis*). In parts of cougar range where they are known to occur, sign surveys are used as a rough population index (Beier and Cunningham 1996). A large number of transects (30-190 8 km transects) is required in order to observe changes in cougar population density within an area (Beier and Cunningham 1996). In comparison, seven, 1-3 km transects is quite low, although, for simple detection purposes, one would not need as many transects as for population density comparisons. I would suggest that future studies use more transects.

No cougars were photographed using motion-sensitive cameras. There were a total of twenty-one camera nights (# cameras x # nights set) at Obion WMA and twenty-eight camera nights at Westvaco WMA. Several other species were caught on film, including bobcat, white-tailed deer, wild turkey, coyote, and common raccoon (*Procyon lotor*). All of the mammalian species tended to express interest in the area where cougar urine had been sprayed. It is not surprising that I was unable to obtain photographs of a cougar. Even in areas where cougars absolutely occur, their large home range would make it difficult to attract them to the small area that can be monitored with a motion-sensitive camera.

If cougars had been found, there would be multiple implications, both on a local and national level. Locally, implementation of habitat protection measures might further benefit expanding populations. Also, it would be necessary for local people, especially children, to be educated about what to do in the unlikely event that they come into contact with a cougar. On the state level, legislation for protection measures would be necessary in order to prevent the eradication of repopulating cougars before there are consequences for such actions. Eventually, it would be necessary to form a relocation taskforce that could deal with problem-cougars. On a nationwide level, this would have given further support to the idea that cougars are reclaiming their eastern habitat and could have added to our knowledge of cougar life history and habitat in the eastern U.S.

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