Mountain Lion

Puma concolor (Linnaeus, 1771)

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CONTENT AND TAXONOMIC COMMENTS

The taxonomic classification of the *Felis concolor* group was revised and described by Nelson and Goldman (1929) and Young and Goldman (1946). Nowell and Jackson (1996) reviewed the taxonomy and placed the mountain lion into the genus *Puma* (Clark 2001, Baker et al. 2003). The mountain lion includes 15 recognized subspecies (Wilson and Ruff 1999); however, Culver et al. (2000) proposed a reduction of the genus to six subspecies based on genetic diversity. The only known reproducing population of mountain lions in the South today is that of the subspecies *P. c. coryi*, the Florida panther (Whitaker and Hamilton 1998, U. S. Fish and Wildlife Service 2006). The life history of the mountain lion is reviewed by Currier (1983) and Lindzey (1987). Beier et al. (2003) and the U. S. Fish and Wildlife Service (2006) reviewed the literature on the Florida panther.

DISTINGUISHING CHARACTERISTICS

The mountain lion is the largest native North American cat. Measurements are: total length, 150–274 cm; tail, 53.5–90.0 cm; hind foot, 22.0–29.5 cm; ear, 7.5–10.0 cm; weight, 35–100 kg. Adult dorsal pelage is tan but may appear grayish, reddish, or brownish. The cylindrical tail is long and is usually tipped with black. The ears are rounded and lack tufts or black coloration. The pads of the feet have a distinctive three-lobed appearance and the toes are equipped with long, sharp, retractile claws. The skull is short and rounded dorsally with a blunt rostrum and is distinguished from that of the bobcat (*Lynx rufus*) by size and number of teeth. The mountain lion skull exceeds 130 mm in length and has four cheek teeth in the upper jaw whereas the bobcat skull is smaller and has only three upper cheek teeth. The skull of the Florida panther is unique, with a flat, frontal region with broad, high-arched nasal bones (Young and Goldman 1946). The dental formula is I 3/3, C 1/1, P 3/2, M 1/1 = 30 (Figure 1). See keys for details.

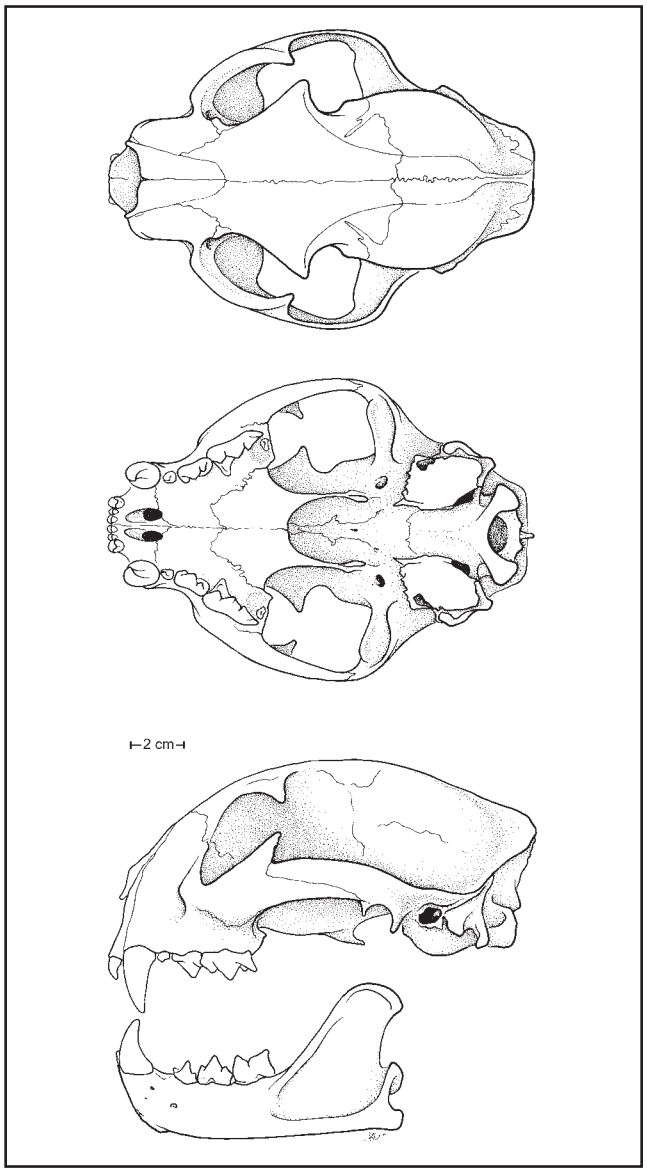

Figure 1. Dorsal, ventral, and lateral view of cranium and lateral view of mandible of *Puma concolor* from Gila County, Arizona (USNM 271971 female).

The Florida panther is unspotted and typically rusty reddish-brown on the back, tawny on the sides, and pale gray underneath. A right angle crook (kink) near the end of the tail and a hair whorl (cowlick) in the middle of the back were commonly observed in Florida panthers through the early 1990s (U. S. Fish and Wildlife Service 2006). These were considered expressions of inbreeding (Seal 1994). Since genetic introgression with the mountain lion (*P. c. stanleyana*) released into Florida from west Texas in 1995, these characteristics have dramatically decreased (Land et al. 2004).

CONSERVATION STATUS

The mountain lion has a global rank of Secure (NatureServe 2007). In Florida, is it considered Apparently Secure. It is Presumed Extirpated in Alabama and Kentucky and Possibly Extirpated in Georgia, North Carolina, and South Carolina. It is Imperiled in Texas and Critically Imperiled in Arkansas, Louisiana, Mississippi, and Oklahoma. It is unranked in Virginia. The U. S. Fish and Wildlife Service (U. S. Department of the Interior 2007) lists *P. c. cory*i as Endangered.

DISTRIBUTION

The historical distribution of the mountain lion extended from southern Canada through most of the United States into South America (Hall 1981, Choate et al. 1994, Whitaker and Hamilton 1998). The species disappeared from much of the eastern United States during the latter half of the last century (Downing 1984, McBride et al. 1993). Although generally considered unreliable (U. S. Fish and Wildlife Service 2006), sightings of mountain lions occasionally occur throughout the South. These include areas throughout the central Appalachians in Virginia (Handley 1991) and the southern Appalachians of North Carolina and Tennessee in or near the Great Smoky Mountains National Park (Linzey 1995). Sealander and Heidt (1990) believed that mountain lions might be present in the Ozark-Ouachita Mountains of Arkansas. Recent observations include Oklahoma (Pike et al. 1999), Louisiana (Leberg et al. 2004), and Arkansas (Witsell et al. 1999, Clark et al. 2002). However, the origins of these reported animals could not be determined. They may have been released captive animals (Pike et al. 1997, Heck 1998) or dispersing subadult males from northern and western populations (C. Belden, U. S. Fish and Wildlife Service, personal communication). The dispersal of mountain lion over long distances (1067 km) recently described in the Black Hills of South Dakota (Thompson and Jenks 2005) and reports of verified sightings in the Badlands of North Dakota (North Dakota Game and Fish Department 2006) suggest that these are potential source populations in addition to those in western and southern Texas.

Currently, the only known reproducing population of mountain lions in the South is in Florida (Belden et al. 1988, Maehr 1992, Foster and Humphrey 1995, Land et al. 1998, Main and Richardson 2002). Historically, the Florida panther ranged from Arkansas and Louisiana east to portions of South Carolina and south to Florida (Clark 2001). The panther's current breeding range includes the Big Cypress Swamp and Everglades physiographic region in Collier, Lee,

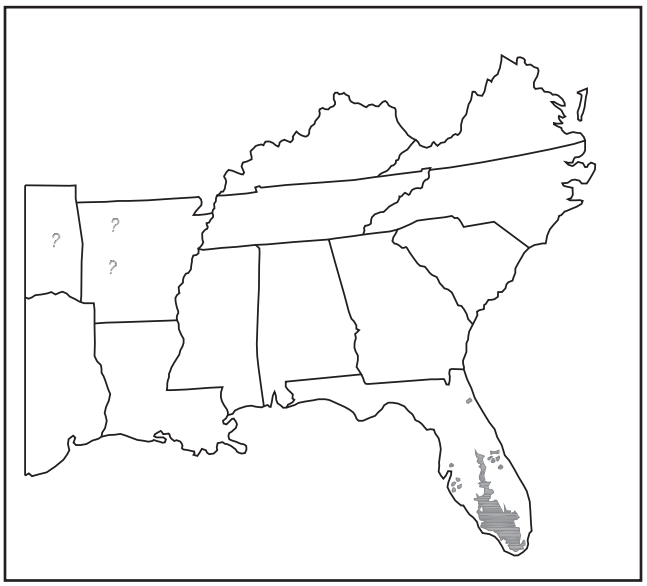

Figure 2. Distribution of *Puma concolor* in the South.

Hendry, Dade, and Monroe counties south of the Caloosahatchee River (Belden et al. 1991). Radio-collared male panthers and uncollared males killed by vehicles (McBride 2002, Belden and McBride 2005) have also been recorded in 11 counties within central and northeastern Florida (Figure 2). Between 1988–1995, 26 Texas mountain lions were released near Okefenokee National Wildlife Refuge and Osceola National Forest to evaluate the feasibility of reintroducing panthers into unoccupied areas of their historic range. Although the animals successfully established territories in the reintroduction areas (U. S. Fish and Wildlife Service 2006), they were subsequently removed from the wild at the end of the study.

ABUNDANCE STATUS

The Florida panther is secretive and occurs at low densities. In the early 1970s, Nowak and McBride (1974) estimated the population from Lake Okeechobee southward at 20–30 animals. After this initial research, additional surveys on public and private lands were completed (Belden et al. 1991). Maehr et al. (1991*a*) estimated a density of 1 panther/110 km^2 based on extrapolation of areas occupied by radio-collared panthers during the period 1985–1990 for southwest Florida. McBride (2003) reported a minimum population estimate of 87 panthers based upon a count of adult and subadult panthers. Today, the panther is restricted to a breeding population of less than 100 animals (U. S. Fish and Wildlife Service 2006).

PRIMARY HABITATS

The Florida panther uses a mosaic of habitats for denning, hunting, and dispersal. These include cypress (*Taxodium distichum*) swamps, live oak (*Quercus virginiana*) hammocks, pine flatwoods, cabbage palm (*Sabal palmetto*) forests, flooded prairies, sawgrass (*Cladium jamaicense*) marshes, and agricultural lands (Belden 1986, Maehr 1992). Kautz et al. (in press) reported that forest patches of variable size are important components of the panther landscape, although the species will also use non-forested habitats (Comiskey et al. 2002). Den sites are often located in dense, understory vegetation such as saw palmetto (*Serona repens*; Land et al. 1998). Shindle et al. (2003) reported that 73% of panther dens were located in palmetto thickets. Panther habitat use is also related to prey availability (Janis and Clark 1999, Dees et al. 2001). Although daytime habitat use from radio-telemetry indicates that panthers use the majority of habitats available to them, additional nocturnal research is required to provide a comprehensive understanding of panther habitat relationships (Beier et al. 2003).

REPRODUCTION

Age at first reproduction for the female panther ranges between 1.8–3.2 years; successful reproduction has occurred up to 11 years of age (U. S. Fish and Wildlife Service 2007). Mating may not occur until a territory is established (Maehr et al. 1989). Male panthers are polygynous, maintaining large, overlapping home ranges containing several adult females and their offspring. The average age at sexual maturity is 3 years (Maehr et al. 1991), although some males may breed as early as 17 months (U. S. Fish and Wildlife Service 2007). The breeding activity peaks between December–March (Shindle et al. 2003). Gestation lasts 90–96 days (Maehr 1992). Prior to giving birth, females establish den sites which may include rock crevices, brush piles, thickets, and uprooted trees (Maehr et al. 1989; 1990*b*). Although litters are produced throughout the year, most births occur between May–June (Jansen et al. 2005). The average litter size ranges from 2–3 kittens; the mean birth interval between litters is 20 months (Lotz et al. 2005). Females that lose their litters generally produce another within an average of 10.4 months (Land 1994). Den sites are used for up to two months by female panthers and their litters. Dispersal of young typically occurs at 18 months, but may occur as early as 12 months (Maehr 1992).

FOOD HABITS

The white-tailed deer (*Odocoileus virginianus*) and feral pig (*Sus scrofa*) are the dominant prey species of the Florida panther (Maehr et al. 1990, Dalrymple and Bass 1996). In the northern portion of its range, feral pigs comprise the bulk of the diet, whereas white-tailed deer are more important in the southern portion (Clark 2001). The northern raccoon (*Procyon lotor*), nine-banded armadillo (*Dasypus novemcinctus*), and marsh rabbit (*Sylvilagus palustris*) are of secondary importance (Dalrymple and Bass 1996). Seasonal variation in the diet has not been detected (U. S. Fish and Wildlife Service 2007). An adult male consumes the equivalent of one white-tailed deer every 8–11 days; this frequency is 14–17 days for a female (Ackerman et al. 1986). Maehr et al. (1990*a*) documented domestic livestock infrequently in scats or kills, although cattle were readily available on their study area.

ASSOCIATED SPECIES

In addition to its primary prey species, the panther commonly occurs in habitats occupied by the swamp rabbit (*Sylvilagus aquaticus*), round-tailed muskrat (*Neofiber alleni*), marsh rice rat (*Oryzomys palustris*), coyote (*Canis latrans*), common gray fox (*Urocyon cinereoargenteus*), northern river otter (*Lontra canadensis*), striped skunk (*Mephitis mephitis*), and American mink (*Mustela vison*). Potential competitors of the Florida panther include the American black bear (*Ursus americanus*), bobcat, and American alligator (*Alligator mississippiensis*; Beier et al. 2003).

VULNERABILITY AND THREATS

Habitat loss and degradation are significant threats to the continued survival of the panther throughout its range (Belden 1986, Maehr 1992, U. S. Fish and Wildlife Service 2007). Intolerant of human disturbance, panthers are sensitive to habitat fragmentation stemming from road construction, agricultural development, and urban expansion (Beier et al. 2003). Illegal shooting and highway collision also are major problems; off-road vehicle traffic has increased in South Florida, making accessible large areas that formerly had been isolated wilderness (Clark 2001). Due to habitat alteration, a reduced prey base also is a concern. The Florida panther is susceptible to infectious disease such as feline leukemia and pseudorabies virus and environmental contaminants such as mercury, polychlorinated biphenyls, and organochlorines (Land et al. 2004, Newman et al. 2004). Finally, the problems associated with being a small, isolated population have resulted in the loss of genetic variability. Panther populations are losing genetic diversity

by 3–7 percent per generation (Clark 2001). Data on polymorphism and physiological abnormalities suggest that the panther population has experienced inbreeding depression (Roelke et al. 1993, Barone et al. 1994). To address this problem, eight female Texas puma were released into South Florida in 1995 (U. S. Fish and Wildlife Service 2006). The initial results have been promising: atrial septal defects and cryptorchidism have not been found in introgressed panthers, while the occurrence of kinked tails and cowlicks in intercross progeny has been reduced (Land et al. 2004).

MANAGEMENT SUGGESTIONS

Because the Florida panther range includes public and private lands, coordination of management and proactive land use planning is essential. The key to panther conservation is the protection and acquisition of large, interconnected blocks of suitable habitat. Objectives of the recovery plan focus on achieving long-term viability (U. S. Fish and Wildlife Service 2007). These include: (1) maintaining and expanding the panther population and its habitat in South Florida; (2) providing for the expansion of the breeding population into south-central Florida; (3) facilitating panther recovery through public awareness and education; and (4) establishing viable populations of the panther in potential reintroduction areas in other parts of the South. Thatcher et al. (2006) identified prospective sites for panther reintroduction within the historic range based on several landscape parameters (e.g., natural and urban land cover, contagion, patch density, human population density, and road density). Of the nine areas identified, the Okefenokee National Wildlife Refuge in Georgia, and the Ozark National Forest and Felsenthal National Wildlife Refuge in Arkansas rank as the top prospective reintroduction sites based on effective habitat area and expert opinion (Thatcher et al. 2006).

Additional conservation measures include implementing a genetics management plan to monitor physical and physiological characteristics correlated with the depletion of genetic variability; devising appropriate biomedical strategies to limit population disease threats; and actively managing white-tailed deer and feral pig populations and their habitats. The construction of wildlife crossings, road signs, and fencing can ameliorate highway fatalities where roadways intersect panther habitat; incorporating habitat connectivity and dispersal corridors into road expansion projects is key. Public support is critical to attainment of recovery goals and reintroduction efforts; political and social issues must be resolved before these efforts are initiated.

REFERENCES

Ackerman, B. B., F. G. Lindzey, and T. P. Hemker. 1986. Predictive energetics model for cougars. Pages 333–352 *in* S. D. Miller and D. D. Everett, editors. Cats of the world: Biology, conservation, and management. National Wildlife Federation and Caesar Kleberg Wildlife Research Institute, Washington, D. C., USA.

Baker, R. J., L. C. Bradley, R. D. Bradley, J. W. Dragoo, M. D. Engstrom, R. S. Hoffman, C. A. Jones, F. Reed, D. W. Rice, and C. Jones. 2003. Revised checklist of North American mammals north of Mexico, 2003. Occasional Papers, The Museum, Texas Tech University 229:1–23.

Barone, M. A., M. E. Roekle, J. Howard, J. L. Brown, A. E. Anderson, and D. E. Wildt. 1994. Reproductive characteristics of male Florida panthers: Comparative studies from Florida, Texas, Colorado, Latin America, and North American zoos. Journal of Mammalogy 75:150–162.

Beier P., M. R. Vaughan, M. J. Conroy, and H. Quigley. 2003. An analysis of scientific literature related to the Florida panther. Final report, Project NG01-105, Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

Belden, R. C. 1986. Florida panther recovery plan implementation: A progress report. Pages 159–172 *in* S. D. Miller and D. D. Everett, editors. Cats of the world: Biology, conservation, and management. National Wildlife Federation, Washington, D. C., USA.

Belden, R. C., and R. T. McBride. 2005. Florida panther peripheral areas survey final report 1998–2004. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

Belden, R. C., W. B. Frankenberger, and J. C. Roof. 1991. Florida panther distribution. Final Report 7501, E-1 II-E-1. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida, USA.

Belden, R. C., W. B. Frankenberger, R. T. McBride, and S. T. Schwikert. 1988. Panther habitat use in southern Florida. Journal of Wildlife Management 52:660–663.

Choate, J. R., J. K. Jones, Jr., and C. Jones. 1994. Handbook of mammals of the south-central states. Louisiana State University, Baton Rouge, Louisiana, USA.

Clark, J. D. 2001. Florida panther. Pages 234–239 *in* J. Dickson, editor. Wildlife of the southern forests: Habitat and management. Hancock House, Blaine, Washington, USA.

Clark, D. W., S. C. White, A. K. Bowers, L. D. Lucio, and G. A. Heidt. 2002. A survey of recent accounts of the mountain lion (*Puma concolor*) in Arkansas. Southeastern Naturalist 1:269–278.

Comiskey, E. J., O. L. Bass, Jr., L. J. Gross, R. T. McBride, and R. Salinas. 2002. Panthers and forests in South Florida: An ecological perspective. Conservation Ecology 6:18.

Culver, M., W. E. Johnson, J. Pecon-Slattery, and S. J. O'Brien. 2000. Genomic ancestry of the American puma (*Puma concolor*). Journal of Heredity 91:186–197.

Currier, M. J. P. 1983. Felis concolor. Mammalian Species 200:1–7.

Dalrymple, G. H., and O. L. Bass. 1996. The diet of the Florida panther in Everglades National Park, Florida. Bulletin of the Florida Museum of Natural History 39:173–193.

Dees, C. S., J. D. Clark, and F. T. Van Manen. 2001. Florida panther habitat use in response to prescribed fire. Journal of Wildlife Management 65:141–147.

Downing, R. L. 1984. The search for cougars in the eastern United States. Cryptozoology 3:31–49.

Foster, M. L., and S. R. Humphrey. 1995. Use of highway underpasses by Florida panthers and other wildlife. Wildlife Society Bulletin 23:95–100.

Hall, E. R. 1981. The mammals of North America, Second edition. John Wiley and Sons, New York, New York, USA.

Handley, C. O., Jr. 1991. The mammals. Pages 539–616 *in* K. Terwilliger, coordinator. Virginia's endangered species: Proceedings of a symposium. McDonald and Woodward, Blacksburg, Virginia, USA.

Heck, B. A. 1998. Mountain lion cranium from McCurtain County, Oklahoma. Proceedings of the Oklahoma Academy of Science 78:127–128.

Janis, M. W., and J. D. Clark. 1999. The effects of recreational deer and hog hunting on the behavior of Florida panthers. Final report to Big Cypress National Preserve, National Park Service, Ochopee, Florida, USA.

Jansen, D. K., S. R. Schulze, and A. T. Johnson. 2005. Florida panther (*Puma concolor coryi*) research and monitoring in Big Cypress National Preserve: Annual report 2004–2005. National Park Service, Ochopee, Florida, USA.

Kautz, R., R. Kawula, T. Hoctor, J. Comiskey, D. Jansen, D. Jennings, J. Kasbohm, F. Mazzotti, R. McBride, L. Richardson, and K. Root. *In press.* How much is enough? Landscape-scale conservation for the Florida panther. Biological Conservation.

Land, E. D. 1994. Response of the wild Florida panther population to removals for captive breeding. Final Report 7571. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida, USA.

Land, E. D., D. R. Garman, and G. A. Holt. 1998. Monitoring female Florida panthers via cellular telephone. Wildlife Society Bulletin 26:29–31.

Land, D., D. Shindle, M. Cunningham, M. Lotz, and B. Ferree. 2004. Florida panther genetic restoration and management annual report: 2003–2004. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

Leberg, P. L., M. R. Carloss, L. J. Dugas, K. L. Pilgrim, L. S. Mills, M. C. Green, and D. Scognamillo. 2004. Recent record of a cougar (*Puma concolor*) in Louisiana, with notes on diet, based on analysis of fecal materials.

Lindzey, F. 1987. Mountain lion. Pages 657–668 *in* M. Novak, J. A. Baker, M. E. Obbard, and B. Malloch, editors. Wild furbearer management and conservation in North America. Ontario Ministry of Natural Resources, Toronto, Canada.

Linzey, D. W. 1995. Mammals of Great Smoky Mountains National Park. McDonald and Woodward, Blacksburg, Virginia, USA.

Lotz, M., D. Land, M. Cunningham, and B. Ferree. 2005. Florida panther annual report: 2004–2005. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

Maehr, D. S. 1990. The Florida panther and private lands. Conservation Biology 4:167–170.

Maehr, D. S. 1992. Florida panther. Pages 176–189 *in* S. R. Humphrey, editor. Rare and endangered biota of Florida: Volume I, Mammals. University of Florida, Gainesville, Florida, USA.

Maehr, D. S., E. D. Land, and J. C. Roof. 1991. Social ecology of Florida panthers. National Geographic Research and Exploration 7:414–431.

Maehr, D. S., E. D. Land, J. C. Roof, and J. W. McCown. 1989. Early maternal behavior in the Florida panther (*Felis concolor coryi*). American Midland Naturalist 122:34–43.

Maehr, D. S., R. C. Belden, E. D. Land, and L. Wilkins. 1990*a*. Food habits of panthers in southwest Florida. Journal of Wildlife Management 54:420–423.

Maehr, D. S., E. D. Land, J. C. Roof, and J. W. McCown. 1990*b*. Day beds, natal dens, and activity of Florida panthers. Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies 44:310–318.

Maehr, D. S., J. C. Roof, E. D. Land, J. W. McCown, and R. T. McBride. 1992. Home range characteristics of a panther in south central Florida. Florida Field Naturalist 20:97–103.

Main, M. B., and L. W. Richardson. 2002. Response of wildlife to prescribed fire in southwest Florida flatwoods. Wildlife Society Bulletin 30:213–221.

McBride, R. T. 2002. Current panther distribution and conservation implications: Fall 2001-Winter 2002. Report to Florida Panther Subteam of MERIT, U. S. Fish and Wildlife Service, Vero Beach, Florida, USA.

McBride, R. T. 2003. The documented panther population (DPP) and its current distribution from July 1, 2002 to June 30, 2003. Appendix IV *in* D. Shindle, M. Cunningham, D. Land, R. McBride, M. Lotz, and B. Ferree, editors. Florida panther genetic restoration and management. Annual report 93112503002. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

McBride, R. T., R. M. McBride, J. L. Cashman, and D. S. Maehr. 1993. Do mountain lions exist in Arkansas? Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies 47:394–402.

NatureServe. 2007. An online encyclopedia of life [Database]. Version 6.1. Association for Biodiversity Information. *http://www.natureserve.org/*.

Nelson, E. W., and E. A. Goldman. 1929. List of the pumas with three described as new. Journal of Mammalogy 10:345–350.

Newman, J., E. Zillioux, E. Rich, L. Liang, and C. Newman. 2004. Historical and other patterns of monomethyl and inorganic mercury in the Florida panther (*Puma concolor coryi*). Archives of Environmental Contaminants and Toxicology 48:75–80.

North Dakota Game and Fish Department. 2006. Status of mountain lions (*Puma concolor*) in North Dakota: A report to the legislative council. North Dakota Game and Fish Department, Bismarck, North Dakota, USA.

Nowak, R. M., and R. T. McBride. 1974. Status survey of the Florida panther. Project 973. World Wildlife Fund Yearbook 1973–74:237–242.

Nowell, K., and P. Jackson. 1996. Status survey and conservation action plan: Wild cats. International Union for Conservation of Nature and Natural Resources. Burlington, Cambridge, United Kingdom.

Pike, J. R., J. H. Shaw, and D. M. Leslie, Jr. 1997. The mountain lion in Oklahoma and surrounding states. Proceedings of the Oklahoma Academy of Science 77:39–42.

Pike, J. R., J. H. Shaw, D. M. Leslie, Jr., and M. G. Shaw. 1999. A geographic analysis of the status of mountain lions in Oklahoma. Wildlife Society Bulletin 27:4–11.

Roekle, M. E., J. S. Martenson, and S. J. O'Brien. 1993. The consequences of demographic reduction and genetic depletion in the endangered Florida panther. Current Biology 3:340–350.

Seal, U. S., editor. 1994. A plan for genetic restoration and management of the Florida panther (*Felis concolor coryi*). Report to the Florida Game and Fresh Water Fish Commission by the Conservation Breeding Specialist Group, Species Survival Commission, IUCN, Apple Valley, Minnesota, USA.

Sealander, J. A., Jr., and G. A. Heidt. 1990. Arkansas mammals: Their natural history, classification and distribution. University of Arkansas, Fayetteville, Arkansas, USA.

Shindle D., M. Cunningham, D. Land, R. McBride, M. Lotz, and B. Ferree. 2003. Florida panther genetic restoration and management. Annual Report 93112503002. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

Thatcher, C., F. T. van Manen, and J. D. Clark. 2006. Identifying suitable sites for Florida panther reintroduction. Journal of Wildlife Management 70:752–763.

Thompson, D. J., and J. A. Jenks. 2005. Long-distance dispersal by a subadult male cougar from the Black Hills, South Dakota. Journal of Wildlife Management 69:818–820.

U. S. Department of the Interior, Fish and Wildlife Service. 2007. Southeast Region 4. *http://www.endangered.fws.gov/wildlife/html.*

U. S. Fish and Wildlife Service. 2006. Technical/Agency Draft, Florida Panther Recovery Plan (*Puma concolor coryi*), Third Revision. U. S. Fish and Wildlife Service. Atlanta, Georgia, USA.

Whitaker, J. O. and W. J. Hamilton, Jr. 1998. Mammals of the Eastern United States. Comstock Publishing, Ithaca, New York, USA.

Wilson, D. E., and S. Ruff, editors. 1999. The Smithsonian book of North American mammals. Smithsonian Institution, Washington, D. C., USA.

Witsell, T., G. A. Heidt, P. L. Dozhier, T. Frothingham, and M. Lynn. 1999. Recent documentation of mountain lion (*Puma concolor*) in Arkansas. Journal of the Arkansas Academy of Science 53:157–158.

Young, S. P., and E. A. Goldman. 1946. The puma, mysterious American cat. The American Wildlife Institute, Washington, D. C., USA.