

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Animal Abstract

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CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Puma concolor* (Linnaeus, 1771)
COMMON NAME: Mountain lion, puma, cougar, panther, catamount
SYNONYMS: *Felis concolor* Linnaeus, 1771
FAMILY: Felidae

AUTHOR, PLACE OF PUBLICATION: *Puma concolor* (Linnaeus, 1771). Mantissa Plantarum, 2: 266. Based on North American subspecies: *P. concolor couguar* (Kerr), 1792: 151 (Mammalia).

TYPE LOCALITY: Species *Puma concolor*: “Brassilia”, restricted by Goldman (In Young and Goldman, 1946: 200) to “Cayenne region, French Guiana”.
Based on only North American subspecies *P. concolor couguar*: “North and South Carolina, Georgia, Pennsylvania; restricted to Pennsylvania by Nelson and Goldman (1929).” (Curren 1983).

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: *Puma concolor* was formerly included in the genus *Felis*. It was placed in the genus *Puma* by Wozencraft (in Wilson and Reeder 1993) and Jones et al. (1997). In 1981, Hall described 15 subsp. of *Puma* in North America. Subspecies recognition was based primarily on skull, dental, and pelage characteristics. Culver et al. (2000) suggest only one subspecies (*P. c. couguar*) should be recognized based on mitochondrial DNA analysis that reveals genetic uniformity across all regions of North America, relative to Central and South America populations. According to Culver et al. (2000), the Florida population (formerly subsp. *coryi*) is highly inbred which is consistent with its demographic history (Belden 1986; Maehr 1998; Roelke et al. 1993). Museum samples from the Florida population dating to the turn of the 19th century show much higher heterozygosity levels. They postulate that cougars were extirpated from North America during the Pleistocene extinctions of many large mammals, and only recently (circa 10,000 years ago) reinvaded North America. The reassignment of the puma subspecies based on the genetic work performed by Culver et al. (2000) are North America (NA) – *P. c. couguar*, Central America (CA) – *P. c. costaricensis*, Eastern South America (ESA) – *P. c. capricornensis*, Northern South America (NSA) – *P. c. concolor*, Central South America (CSA) – *P. c. cabreriae*, and Southern South America (SSA) – *P. c. puma*. Subspecies of puma that were formerly recognized in Arizona included *azteca*, *browni*, and *kaibabensis*.

DESCRIPTION: A large cat with an elongated body. Adult males weigh between 80-150 lbs

(36.3-68 kg), and females 70-100 lbs (32-45.4 kg) (AZGFD 2005). Wilson and Ruff (1999) reports weights between 36-120 kg for males and 29-64 kg for females. Head and body lengths vary between 3.3-5 feet (1.02-1.54 m) for males, and 2.82-4.3 feet (0.86-1.31 m) for females. The tail is long, cylindrical, and about one-third of the animal's total length, measuring between 2.23-3.15 feet (0.68-0.96 m) in males and 2.1-2.6 feet (0.63-0.79 m) in females. The monotone coloration and long tail, which is usually held close to the ground when walking, are the best field marks. The pelage has a short and coarse texture, and does not vary in color over the back, sides, limbs, and tail (except the tip), as indicated in the specific epithet *concolor*. The shade of brown varies geographically and seasonally from gray to reddish-brown. The general coloration ranges from yellowish brown to grayish brown on the upper parts and a paler, almost buffy color on the belly. The throat and chest are whitish. They have a pinkish nose with a black border that extends to the lips. The muzzle stripes, the area behind the ears, and the tip of the tail are black; individual cougars vary in facial color patterns. The eyes of mature animals are grayish brown to golden. The ears are small, short and rounded. The young are black spotted (fading by three to four months of age), with blue eyes. (Wilson and Ruff 1999; Shivaraju and Dewey 2003; AZGFD 2005).

The limbs are short and muscular, although the hind legs are larger. The feet are broad, with four digits on the hind feet and five on the forefeet. The pollex is small and set above the other digits. The retractile claws are sharp and curved. The skull is noticeably broad and short. The forehead region is high and arched, and the rostrum and the nasal bones are broad. The dental formula is $3/3 \ 1/1 \ 3/2 \ 1/1$. The mandible is short, deep, and powerfully constructed. The carnassial teeth are massive and long. The canines are heavy and compressed. The incisors are small and straight. Pumas have one additional small premolar on each side of the upper jaw than do bobcats and lynx. (Shivaraju and Dewey 2003).

AIDS TO IDENTIFICATION: The monotone coloration and long tail, which is usually held close to the ground when walking, are the best field marks of mountain lions. For example, they can be distinguished from the jaguar (*Panthera onca*), the only other large New World cat, by unspotted pelage, and from the bobcat (*Lynx rufus*) by its much longer tail. In addition, they have one additional small premolar on each side of the upper jaw than do bobcats and lynx (Shivaraju and Dewey 2003).

ILLUSTRATIONS: Color photo (Johnson 1990).
Color photo of species (Wilson and Ruff, 1999: p. 227)
Color photo (Larry Master, *in* NatureServe 2006 at <http://www.natureserve.org/explorer>)
Color photo (in AZGFD 2005, at http://www.azgfd.gov/h_f/game_lion.shtml)
Color photos of adults and cubs (*in* http://animaldiversity.ummz.umich.edu/site/accounts/information/Puma_concolor.html)
Color photo (in <http://home.globalcrossing.net>)
Color photo (TPWD, *in* <http://www.tpwd.state.tx.us/huntwild/wild/species/mlion/>)
Color photos (Jim Dutcher, *in*

<http://lynx.uio.no/lynx/catsgportal/cat-website/catfolk/puma-02.htm>)

Color photos (Daniel J. Cox, *in*

<http://lynx.uio.no/lynx/catsgportal/cat-website/catfolk/puma-04.htm>)

TOTAL RANGE: Widely distributed from Canada to South America, including Argentina, Belize, Bolivia, Brazil, Canada, Chile, Columbia, Costa Rica, Ecuador, El Salvador, French Guiana, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, USA, Uruguay, Venezuela (Wilson and Reeder 2005). Habitat has been reduced to primarily the most remote and inaccessible areas, but the species remains relatively common (for a top predator) in several regions of the western U.S. (consider game species in Arizona and some other states) and probably elsewhere to the south of the U.S. (NatureServe 2006).

Historically, mountain lion had the widest distribution of any native American mammal (other than humans); from Canada south to Chile and southern Argentina and from the Pacific to the Atlantic coast. In eastern North America, now only known to occur only in southern Florida and the Upper Peninsula of Michigan (Evers 1992). There is possibly a small population that exists in southeastern Canada (Stocek 1995). Elsewhere in North America, they are currently restricted mainly to mountainous, relatively unpopulated areas from sea level to 14,800 ft. (NatureServe 2006). In Canada, they have been extirpated from most of its former range, and the main population is now found in south-western British Columbia (estimated 3,500-5,000, in Hummel 1990, in IUCN 1996 - The World Conservation Union), with a smaller population (685, in Jalkotzy et al. 1992, in IUCN 1996 - The World Conservation Union) in adjacent Alberta.

RANGE WITHIN ARIZONA: In Arizona, mountain lions range throughout the state, absent in areas which are heavily impacted by human development. "In general, the distribution of mountain lions in Arizona corresponds with the distribution of its major prey species, deer." (AZGFD 2005; Germaine et al. 1997, 2000).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Mountain lions are strongly nocturnal and crepuscular, and are active throughout the year, any time, day or night, but most hunting occurs at dawn or dusk. They are essentially solitary animals, with the exception of 1 to 6 days of associations during mating and periods of juvenile dependence. Adult females may be accompanied by kittens, but as mentioned, are normally not associated with other adult animals except for mating purposes. According to Shivaraju and Dewey (2003), "Population densities vary from as low as one individual per 85 square kilometers to as high as one per 13 to 54 square kilometers, depending on density of prey and other resources in the area." Homorange size for adult males average between 20-150 miles, while for females they average between 10-50 miles, probably varying seasonally. Territories of males and females may overlap, but males tend to avoid other males. This spatial separation between each other is maintained, thereby assuring that each individual has the resources necessary to survive. If these separations are not maintained, mountain lions will kill each other, which is the normal method of population regulation in undisturbed mountain lion populations. The cryptic system of boundary marking employed by resident lions

serves to provide for mutual avoidance and survival. (AZGFD 2005). Mountain lions may live up to 18-20 years in the wild (average is 8-10 years), and can live slightly longer in captivity.

Sight is its most acute sense, along with a good sense of hearing, but is thought to have a poorly developed sense of smell. When communicating, unlike the roars of other large cat species, mountain lions use low-pitched hisses, growls, purrs, yowls, and screams in different circumstances. Loud, chirping whistles by young serves to call the mother. Touch is important in social bonding between mother and young. Scent marking is important in advertising territory boundaries and reproductive state. (Shivaraju and Dewey 2003). Mountain lions are extremely agile and have great jumping power, and may leap from the ground up to a height of 18 feet into a tree. They are also good swimmers, but prefer not to enter the water.

Most hunting occurs dawn or dusk, with peak activity occurring within 2 hours of sunset and sunrise in the absence of human disturbance. Near human presence, activity peaks after sunset. In Arizona, deer, both whitetail and mule, are the principal prey species, while some areas, javelina and/or livestock can be major components of their diets. In some areas of their range outside of Arizona, bighorn sheep and pronghorn antelope make up a substantial part of their diet. While in areas farther north, bigger species of deer, such as elk and moose, are frequently consumed. Large prey species are killed with regularity, usually one deer-sized animal is killed every 6 to 12 days. Considerable skill executing stalks and more importantly consummating the kill is required to avoid debilitating injury. The lion quietly stalks the prey animals, then leaps at close range onto their back and breaks the animal's neck with a powerful bite below the base of the skull. After a kill has been made, mountain lions will almost always attempt to cover the uneaten portion of the kill with leaves or other debris. An entire deer can be consumed in two nights. (Shivaraju and Dewey 2003; AZGFD 2005). In a recent study conducted during the winter in south-central Idaho and northwestern Utah (Laundre and Hernandez 2003), "Pumas killed deer more often than expected ($P < 0.001$) in juniper-pinyon habitat and in edge areas. Tree density and dbh at cache points were significantly greater ($P < 0.001$) than at kill points or surrounding areas."

REPRODUCTION: Mountain lions may breed anytime during the year, with most births occurring in April-September in the Northern Hemisphere, although summer is the peak period for births. Estrus lasts about 9 days. Gestation time is around 90 (+-7) days. Litter size is 1-6, with 2-4 kittens the most common size. Each blind neonate weighs about 500 g (17.6 oz), and has a spotted pelage. Shivaraju and Dewey (2003), report cub weights at birth ranging from 226-453 g (8-16 oz). Cubs open their eyes about 10 days after birth, while at the same time, their ear pinnae unfolds, their first teeth begin to erupt, and they begin to play. The parturition site, usually in nearly impenetrable vegetation, is kept free of feces and prey remains, lacks any nest-like modifications, and is abandoned when the cubs are about 40-70 days old (Wilson and Ruff 1999). At about 14 weeks the young begin to hunt with their mother. They remain with her for 15 to 22 months learning the skills necessary for survival. Juvenile males tend to disperse long distances compared to relatively short dispersals for juvenile females. Females become sexually mature at 2 to 3 years old, but mating is probably delayed until a home territory is established. The interval between births is usually about 24 months, but decreases when a litter is lost or disperses early (Wilson and Ruff 1999). Females remain reproductively active

until about 12 years of age. Males reach sexual maturity at about 3 years of age, and can remain sexually active to about 20 years.

FOOD HABITS: Carnivore: Deer (whitetail and mule), elk, javelina, and domestic livestock (sheep, goats, and young calves). They also may feed on coyotes, bobcats, porcupines, lagomorphs, beavers, opossums, raccoons, and skunks (Wilson and Ruff 1999). Young will nurse for 3 or more months, but will begin to take meat at 6 weeks of age.

HABITAT: Desert Mountains with broken terrain and steep slopes, along with dense vegetation, caves, and rocky crevices that provide shelter. Stream courses and ridgetops are frequently used as travel corridors and hunting routes. Riparian vegetation along streams provides cover for lions traveling in open areas. In Colorado, "...they are most abundant in foothills, canyons or mesa country. They are more at home in brushy areas and woodlands than in forests or open prairies." (Colorado Division of Wildlife, 2005). For their entire range, they can be found from arid desert to tropical rainforest to cold coniferous forest, from sea level to 5,800 m in the Andes (Redford and Eisenberg 1992, *in* IUCN 1996 - The World Conservation Union).

ELEVATION:

PLANT COMMUNITY: Desert scrub, chaparral, pinyon-juniper woodlands, and conifer forests.

POPULATION TRENDS: According to Wilson and Ruff (1999), "Populations in western North America are stable except in areas of urban growth."

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS:

Although only one subspecies is considered to exist in North America, USFWS lists the subspecies *coryi* (Florida panthers) and cougar (Eastern panther) as Endangered and extant.

STATE STATUS:

None

OTHER STATUS:

Both the Florida (formerly subsp. *coryi*) and Eastern (subsp. *cougar*) populations are listed Critically Endangered on the IUCN Red List 2004, and listed on Appendix I of CITES 2006.

MANAGEMENT FACTORS: Loss of habitat is probably the greatest threat to mountain lion populations throughout its range. Large tracts of roadless habitat are necessary to maintain individual populations, and the corridors that connect these tracts are required for dispersal of lions between populations. In addition, any loss of habitat of their prey species (deer) may cause

a reduction in the mountain lion population. (Tesky 1995).

Mountain lions have considerable trophy value and are hunted for sport. They are important to humans in their role as top predators, helping to control ungulate populations. On the negative side, they are considered to be threats to domestic livestock, and are also considered a potential danger to children and adults. These threats are sometimes exaggerated. It is important to learn about mountain lion behavior in order to avoid encounters.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Nationally, census of population is needed. Studies needed to determine minimum habitat needs.

LAND MANAGEMENT/OWNERSHIP: Many including BIA, BLM, FWS, NPS, USFS, State and Private.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

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ADDITIONAL INFORMATION:

The scientific name *Felis concolor*, comes from Latin for cat and for same color.

In Arizona, "Lions were classified as a "predatory animal" by the territorial legislature and were subject to a statewide bounty of \$50 dollars in 1919. This status continued until 1970 when the mountain lion was classified as a big-game animal and a tag was required to take one, even though ranchers and their agents could still take a depredating lion. A mandatory checkout procedure and other reporting requirements were instituted in 1982. Reporting information indicates that lion harvests have gradually increased over time. Recently, the annual kill has ranged between 250 and 350 animals, of which approximately 15 percent were taken by predator control agents." (AZGFD 2005).

If you encounter a Mountain Lion: Stay calm, talking calmly yet firmly to it. Stop and back away slowly, but not run. Raise your arms to appear larger. If the lion behaves aggressively, throw stones, branches, or whatever you can get your hands on, without crouching down or turning your back. Fight back if a lion attacks you. Lions have been driven away by prey that fights back.

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