

Natural History of Mountain Lions



Mountain lions in Arizona

Arizona is home to approximately 2,500 to 3,000 mountain lions, although population estimates are unreliable. The large cats can be found throughout Arizona but are most common in rocky or mountainous regions (Fig. 1).ⁱ The Arizona Game and Fish Department classifies mountain lions as a big game mammal.

Physical characteristics

Mountain lions – also known in the U.S. as cougars, pumas, panthers and catamounts – are large felids, or cats, native to the Americas. They are the fourth largest cat in the world and the second largest native North American cat after the jaguar. The sexes look alike, though males are 30 to 40 percent larger than females. A typical adult male will weigh 110 to 180 pounds and an adult female 80 to 130 pounds. Males measure six to 9.5 feet from nose to tail tip and females 5.2 to 7.2 feet.ⁱⁱ In the wild, mountain lions typically live less than 12 years.ⁱⁱⁱ

While the coloring of adult mountain lions can vary by individual, region and season, they tend to be tawny, reddish-brown, or grayish-brown in color, with creamy white accents on the chin, throat, chest and belly.^{iv} Mountain lions also have dark brown or black accents on the sides of their muzzles (almost resembling a moustache), backs of their ears and at the tip of their long tails.

Kittens are born with black spots on reddish-brown to grayish-brown colored coats.^v The spotting helps camouflage kittens and keep them protected from predators. The spots slowly disappear usually by two years of age when lions reach sexual maturity.^{vi}

Habitat & range

Mountain lions live in a wide variety of habitats such as forests, deserts and mountain ranges. They tend to prefer rough terrain with moderately dense, low-lying vegetation.^{vii} In Arizona, mountain lions are typically found in desert and forested mountains with broken terrain

and steep slopes.^{viii} Lions require three essential habitat characteristics:^{ix}

- Freedom from excessive human interference
- Adequate large-bodied prey (ungulates)
- Ambush or stalking cover

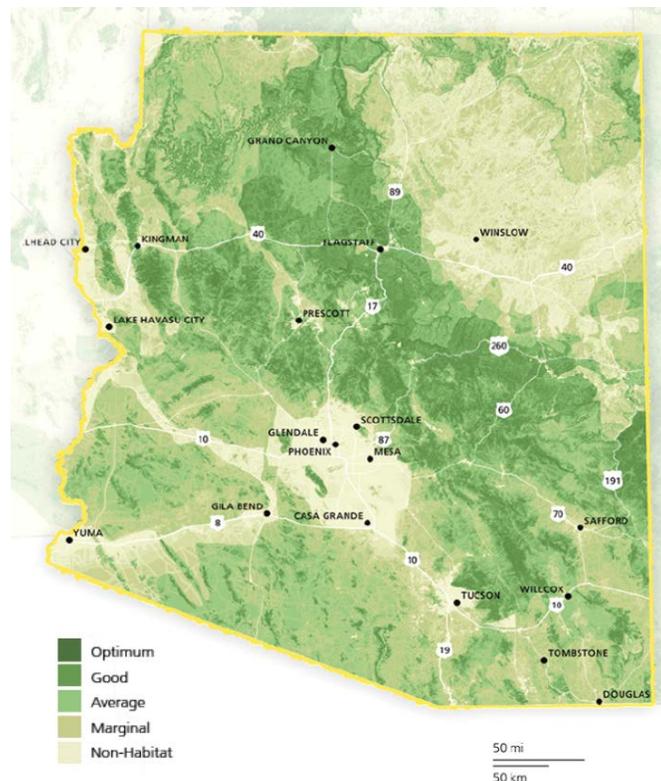
Mountain lions require large habitats and maintain home ranges that overlap with each other. Lions are not a densely populated species because their prey, usually deer or elk, often occur at low densities.^x Lion populations decline when their prey populations decrease, or by competition from other native carnivores

for limited prey.^{xi} This makes the species sensitive to both bottom-up (e.g., prey declines) and top-down (e.g., human persecution) influences.^{xii}

Home range: A lion's home range is a fixed area that includes necessary resources for life, such as available prey and denning sites where mother lions can rear their kittens.^{xiii} Lions who occupy home ranges are referred to as "residents."

Mountain lions are generally solitary and territorial. Male mountain lions occupy larger home ranges than females. In a study in the San Andres Mountains of New Mexico, researchers found that male lions averaged an annual home range of 193.4 km² (approx. 75 square miles). Females, on the other hand, averaged an annual home range of 69.9 km² (approx. 27 square miles).^{xiv}

Figure 1: Potential mountain lion habitat in Arizona



Male ranges usually overlap or encompass a few female ranges. An estimate for mountain lion density is roughly two individuals per 100 km² (approx. 39 square miles).^{xv} Therefore, conserving large, connected habitats is fundamental to the long-term survival of mountain lion populations in any region.

Geographic range: Mountain lions once ranged from northern Canada to the tip of South America, and from the Pacific to the Atlantic.^{xvi} European settlement led to massive declines in mountain lion populations across most of their historic range. By the late 1800's, mountain lion populations in the eastern U.S. were extirpated as a result of widespread human persecution, declining access to habitat and a significant loss of white-tailed deer. By the early 1900s, populations in the western U.S. were also seriously diminished.^{xvii}

Today, the mountain lion spans 28 countries in North, Central and South America (Fig. 2).^{xviii} In the United States, breeding populations of lions are acknowledged by agencies in 15 western states and Florida. This represents about half of the mountain lion's historic range.^{xix} Many other states have occasional sightings of mountain lions but these are likely independent males in search of their own territory.^{xx}

Prey types & hunting methods

Mountain lions are considered "obligate carnivores;" that is, they solely eat meat. Additionally, male and female lions select different prey depending on season and the lion's body size.^{xxi} In most habitats, deer are mountain lions' primary prey.^{xxii}

Mountain lions will commonly prey on other ungulates, such as elk and moose, as well as smaller mammals such as rabbits, porcupines and skunks.^{xxiii} On occasion, mountain lions have been known to prey on unprotected livestock,^{xxiv} domestic horses, dogs and cats.^{xxv} However, a variety of effective non-lethal options exist to protect these vulnerable domestic animals.^{xxvi}



Figure 2: Current mountain lion range

Built to hunt: Mountain lions are capable of reaching sprinting speeds of 50 mph and leaping up to 40 feet.^{xxvii} Lions are considered "ambush predators" because they stalk and ambush their prey running only a short distance.^{xxviii} Mountain lions have webbed skin and fur between their toes to muffle walking sounds. During their normal walking gait, their claws are retracted, but the claws are extended for acceleration and used for traction and to seize prey.^{xxix}

Mountain lions typically attack their prey at the shoulders, neck, or face, and kill bites are often located on the throat or nape of the neck.^{xxx} Mountain lions carry their prey to secure locations. When they have eaten their fill, they "cache," or hide, the uneaten portions of the prey with snow or vegetation both to prevent spoilage and deter scavengers.^{xxxi} Lions will repeatedly return to the cache and feed on a single kill for days, depending on the size of the prey.^{xxxii}

Rearing of young

Female mountain lions spend 44-83 percent of their lifetime raising kittens.^{xxxiii} They produce few kittens, giving birth to approximately two to three kittens every two years.^{xxxiv} Kittens are totally reliant upon their mother until they are at least six months old, but they may be wholly dependent for up to nine

months and even beyond. Kittens up to 12 months of age are incapable of dispatching prey animals on their own.^{xxxv}

When kittens get older and are self-sufficient, typically between 12 and 24 months of age, they become independent and are considered "subadults." It is during this life stage that mountain lions disperse from their natal areas (where they were born and raised) and attempt to find a new home range.^{xxxvi}

Almost all male offspring and 20 to 50 percent of female offspring disperse from the natal area.^{xxxvii} Females rarely disperse long distances.^{xxxviii} Dispersal distance varies for each individual, but males generally range from 23 to 276 km, whereas females generally range from nine to 140 km.^{xxxix}

The dispersal period is a tumultuous stage for subadult lions and often results in death for these individuals. During this time, mountain lions are exposed to new, unknown dangers resulting in low survival rates.^{xl} They often perish from anthropogenic causes such as trophy hunting or vehicle collisions. They also suffer from intraspecific strife, or conflict with other mountain lions, typically from older male lions killing interlopers who immigrate into their territories.^{xli} Dispersing lions are also often killed by wildlife officers when the animals enter the boundaries of a human community.

Threats to survival

Mountain lions face a variety of threats to survival but mortalities are human caused. Trophy hunting, trapping, poaching, accidental killing and killing for livestock depredation are all significant threats to mountain lion survival. More than 3,000 mountain lions are legally trophy hunted or trapped in the U.S. each year. Between 2005 and 2014, trophy hunters killed approximately 2,496 mountain lions in Arizona alone.^{xlii} Additionally, habitat loss and fragmentation, disease, starvation, poisoning, inbreeding, intra-specific strife, and the effects of climate change are also threats to mountain lion survival.^{xliii}

ⁱ The Humane Society of the United States. 2017. State of the Mountain Lion: A Call to End Trophy Hunting of America's Lion. Washington, DC. Retrieved from <https://humanesociety.org/stateofthemountainlion>; Arizona Game and Fish. 2017. Living with Mountain Lions. Retrieved from <https://www.azgfd.com/wildlife/livingwith/mountainlions/>.

ⁱⁱ Shaw, H. 2010. The Emerging Cougar Chronical. Pages 19-26 in M. Hornocker and S. Negri, editors. Cougar: Ecology and Conservation. The University of Chicago Press, Chicago and London.

ⁱⁱⁱ Shaw, H. 2010.

-
- ^{iv} Logan, K. A., and L. L. Sweanor. 2001.
- ^v Logan, K. A., and L. L. Sweanor. 2001.
- ^{vi} Logan, K. A., and L. L. Sweanor. 2001.
- ^{vii} Shaw, H. 2010.
- ^{viii} Arizona Game and Fish. 2017. Mountain Lion: Puma concolor. Retrieved from <https://www.azgfd.com/hunting/species/biggame/mountainlion/>.
- ^{ix} Beier, P. 2010. A Focal Species for Conservation Planning. Pages 177-189 in M. C. Hornocker and S. Negri, editors. *Cougar: Ecology and Conservation*. University of Chicago Press, Chicago and London.
- ^x Logan, K. A., and L. L. Sweanor. 2001.
- ^{xi} Stoner, D. C., J. O. Sexton, J. Nagol, H. H. Bernales, and T. C. Edwards. 2016. Ungulate Reproductive Parameters Track Satellite Observations of Plant Phenology across Latitude and Climatological Regimes. *PLOS One* 11; Stoner, D., M., M. L. Wolfe, and D. Choate. 2006. Cougar Exploitation Levels in Utah: Implications for Demographic Structure, Population Recovery, and Metapopulation Dynamics. *Journal of Wildlife Management* 70:1588-1600.
- ^{xii} Stoner, D. M., et al. 2006.
- ^{xiii} Hansen, K. 1992. *Cougar: The American Lion*. Northland Publishing, Flagstaff, AZ
- ^{xiv} Logan, K. A., and L. L. Sweanor. 2001.
- ^{xv} Beausoleil, R. A., G. M. Koehler, B. T. Maletzke, B. N. Kertson, and R. G. Wielgus. 2013. Research to Regulation: Cougar Social Behavior as a Guide for Management. *Wildlife Society Bulletin* 37:680-688.
- ^{xvi} See e.g., Hornocker, M., and S. Negri. 2010. *Cougar: Ecology & Conservation*. The University of Chicago Press, Chicago and London.
- ^{xvii} Logan, K. A., and L. L. Sweanor. 2001.
- ^{xviii} *Panthera*. 2016. *The State of the Puma*.
- ^{xix} Logan, K. A., and L. L. Sweanor. 2001.
- ^{xx} Hornocker, M., and S. Negri. 2010. *Cougar: Ecology & Conservation*. The University of Chicago Press, Chicago and London.
- ^{xxi} Elbroch, L. M., P. E. Lendrum, J. Newby, H. Quigley, and D. Craighead. 2013b. Seasonal Foraging Ecology of Non-Migratory Cougars in a System with Migrating Prey. *PLOS One* 8.
- ^{xxii} Krumm, C. E., M. M. Conner, N. T. Hobbs, D. O. Hunter, and M. W. Miller. 2009. Mountain lions prey selectively on prion-infected mule deer. *Biology Letters* 6:209-211; Ruth, T. K., D. W. Smith, M. A. Haroldson, P. C. Buotte, C. C. Schwartz, H. B. Quigley, S. Cherry, K. M. Murphy, D. Tyers, and K. Frey. 2003b. Large-carnivore response to recreational big-game hunting along the Yellowstone National Park and Absaroka-Beartooth Wilderness boundary. *Wildlife Society Bulletin* 31:1150-1161; Shaw, H. 2010.
- ^{xxiii} Logan, K. A., and L. L. Sweanor. 2001; Elbroch, L. M., et al. 2013b.
- ^{xxiv} Mountain lions rarely prey on livestock. All felids, including mountain lions, bobcats and lynx killed fewer cattle than domestic dogs, taking only 0.02 percent of the U.S. cattle inventory in 2010. U.S. Department of Agriculture - National Agricultural Statistics Service. 2011. Cattle Death Loss. <http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1625>
- ^{xxv} Logan, K. A., and L. L. Sweanor. 2001.
- ^{xxvi} Mountain Lion Foundation. Living with lions: Promoting Non-Lethal Predator Control Alternatives. Retrieved from http://www.mountainlion.org/Nonlethal_Literature_Review.asp.
- ^{xxvii} Husseman, J. S., D. L. Murray, G. Power, C. Mack, C. R. Wenger, and H. Quigley. 2003. Assessing differential prey selection patterns between two sympatric large carnivores. *Oikos* 101:591-601.
- ^{xxviii} Husseman, J. S., et al. 2003.
- ^{xxix} Logan, K. A., and L. L. Sweanor. 2001.
- ^{xxx} Van Valkenburgh, B., and C. B. Ruff. 1987. Canine tooth strength and killing behavior in large carnivores. *Journal of Zoological Society of London* 212:379-397; Murphy, K., and T. Ruth. 2010. Diet and Prey Selection of a Perfect Predator. Pages 118-137 in M. Hornocker and S. Negri, editors. *Cougar: Ecology and Conservation*. University of Chicago Press, Chicago and London.
- ^{xxxi} Allen, M. L., L. M. Elbroch, C. C. Wilmers, and H. U. Wittmer. 2014. Trophic Facilitation or Limitation? Comparative Effects of Pumas and Black Bears on the Scavenger Community. *PLOS One* 9; Allen, M. L., L. M. Elbroch, C. C. Wilmers, H. U. Wittmer, and A. M. Natural History Editor: Mark. 2015. The Comparative Effects of Large Carnivores on the Acquisition of Carrion by Scavengers. *The American Naturalist* 185:822-833.
- ^{xxxii} Allen, M. L., et al. 2014; Allen, M. L., et al. 2015.
- ^{xxxiii} Ruth, T., K. Murphy, and P. Buiotte. 2003a. Presence and Movements of Lactating and Maternal Female Cougars: Implications for State Hunting Regulations. in Seventh Mountain Lion Workshop, Jackson, Wyoming.
- ^{xxxiv} *Cougar Management Guidelines*. 2005.
- ^{xxxv} Elbroch, L. M., and H. Quigley. 2012. Observations of Wild Cougar (*Puma concolor*) Kittens with Live Prey: Implications for Learning and Survival. *Canadian Field-Naturalist* 126:333-335.
- ^{xxxvi} Logan, K. A., and L. L. Sweanor. 2010.
- ^{xxxvii} Sweanor, L. L., K. A. Logan, and M. C. Hornocker. 2000. Cougar dispersal patterns, metapopulation dynamics, and conservation. *Conservation Biology* 14:798-808.
- ^{xxxviii} Maehr, D. S., et al. 2003; Stoner, D. C., et al. 2008; Stoner, D. C., et al. 2013a.
- ^{xxxix} Beier, P. 2010.
- ^{xl} Quigley, H. B., and M. C. Hornocker. 2009.
- ^{xli} Lambert, C. M., et al. 2006; Robinson, H. S., et al. 2008; Peebles, K. A., R. B. Wielgus, B. T. Maletzke, and M. E. Swanson. 2013. Effects of Remedial Sport Hunting on Cougar Complaints and Livestock Depredations. *PLOS One* 8; Cooley, H. S., R. B. Wielgus, G. Koehler, and B. Maletzke. 2009a. Source populations in carnivore management: cougar demography and emigration in a lightly hunted population. *Animal Conservation* 12:321-328.
- ^{xlii} Based on a five-year average from 2011-2015 mortality data (2015 data remains preliminary).
- ^{xliii} Hunter, L. 2015. *Wild Cats of the World*. Puma. Bloomsbury USA, pp.157-166.