

= Bobcat =

The bobcat (*Lynx rufus*) is a North American cat that appeared during the Irvingtonian stage of around 1 @.@ 8 million years ago (AEO) . Containing 12 recognized subspecies , it ranges from southern Canada to central Mexico , including most of the continental United States . The bobcat is an adaptable predator that inhabits wooded areas , as well as semidesert , urban edge , forest edges , and swampland environments . It remains in some of its original range , but populations are vulnerable to local extinction (" extirpation ") by coyotes and domestic animals . The bobcat is vital for controlling pest populations . With a gray to brown coat , whiskered face , and black @-@ tufted ears , the bobcat resembles the other species of the mid @-@ sized *Lynx* genus . It is smaller on average than the Canada lynx , with which it shares parts of its range , but is about twice as large as the domestic cat . It has distinctive black bars on its forelegs and a black @-@ tipped , stubby tail , from which it derives its name .

Though the bobcat prefers rabbits and hares , it will hunt anything from insects , chickens , geese and other birds and small rodents to deer . Prey selection depends on location and habitat , season , and abundance . Like most cats , the bobcat is territorial and largely solitary , although with some overlap in home ranges . It uses several methods to mark its territorial boundaries , including claw marks and deposits of urine or feces . The bobcat breeds from winter into spring and has a gestation period of about two months .

Although bobcats have been hunted extensively by humans , both for sport and fur , their population has proven resilient though declining in some areas . The elusive predator features in Native American mythology and the folklore of European settlers .

= = Taxonomy = =

There had been debate over whether to classify this species as *Lynx rufus* or *Felis rufus* as part of a wider issue regarding whether the four species of *Lynx* should be given their own genus , or be placed as a subgenus of *Felis* . The *Lynx* genus is now accepted , and the bobcat is listed as *Lynx rufus* in modern taxonomic sources .

Johnson et al. reported *Lynx* shared a clade with the puma , leopard cat (*Prionailurus*) , and domestic cat (*Felis*) lineages , dated to 7 @.@ 15 million years ago (mya) ; *Lynx* diverged first , approximately 3 @.@ 24 million years ago .

The bobcat is believed to have evolved from the Eurasian lynx , which crossed into North America by way of the Bering Land Bridge during the Pleistocene , with progenitors arriving as early as 2 @.@ 6 million years ago . The first wave moved into the southern portion of North America , which was soon cut off from the north by glaciers . This population evolved into modern bobcats around 20 @, @ 000 years ago . A second population arrived from Asia and settled in the north , developing into the modern Canada lynx . Hybridization between the bobcat and the Canada lynx may sometimes occur .

= = = Subspecies = = =

Thirteen bobcat subspecies are currently recognized :

- L. rufus rufus* (Schreber) ? eastern and midwestern United States
- L. r. gigas* (Bangs) ? northern New York to Nova Scotia and New Brunswick
- L. r. floridanus* (Rafinesque) ? southeastern United States and inland to the Mississippi valley , up to southwestern Missouri and southern Illinois
- L. r. superiorenensis* (Peterson & Downing) ? western Great Lakes area , including upper Michigan , Wisconsin , southern Ontario , and most of Minnesota
- L. r. baileyi* (Merriam) ? southwestern United States and northwestern Mexico
- L. r. californicus* (Mearns) ? California west of the Sierra Nevada
- L. r. mohavensis* (B.Anderson) ? Mojave Desert of California
- L. r. escuinapae* (J. A. Allen) ? central Mexico , with a northern extension along the west coast to

southern Sonora

L. r. fasciatus (Rafinesque) ? Oregon , Washington west of the Cascade Range , northwestern California , and southwestern British Columbia

L. r. oaxacensis (Goodwin) ? Oaxaca

L. r. pallescens (Merriam) ? northwestern United States and southern British Columbia , Alberta , and Saskatchewan

L. r. peninsularis (Thomas) ? Baja California

L. r. texensis (Mearns) ? western Louisiana , Texas , south central Oklahoma , and south into Tamaulipas , Nuevo León , and Coahuila

The subspecies division has been challenged , given a lack of clear geographic breaks in their ranges and the minor differences between subspecies .

= = Physical characteristics = =

The bobcat resembles other species of the *Lynx* genus , but is on average the smallest of the four . Its coat is variable , though generally tan to grayish @-@ brown , with black streaks on the body and dark bars on the forelegs and tail . Its spotted patterning acts as camouflage . The ears are black @-@ tipped and pointed , with short , black tufts . There is generally an off @-@ white color on the lips , chin , and underparts . Bobcats in the desert regions of the southwest have the lightest @-@ colored coats , while those in the northern , forested regions are darkest . Kittens are born well @-@ furred and already have their spots . A few melanistic bobcats have been sighted and captured in Florida . They appear black , but may still exhibit a spot pattern .

The face appears wide due to ruffs of extended hair beneath the ears . Bobcat eyes are yellow with black pupils . The nose of the bobcat is pinkish @-@ red , and it has a base color of gray or yellowish- or brownish @-@ red on its face , sides , and back . The pupils are round , black circles and will widen during nocturnal activity to maximize light reception . The cat has sharp hearing and vision , and a good sense of smell . It is an excellent climber , and will swim when it needs to , but will normally avoid water . Though there have been recorded cases of bobcats swimming long distances across lakes .

The adult bobcat is 47 @. @ 5 to 125 cm (18 @. @ 7 to 49 @. @ 2 in) long from the head to the base of the tail , averaging 82 @. @ 7 cm (32 @. @ 6 in) ; the stubby tail adds 9 to 20 cm (3 @. @ 5 to 7 @. @ 9 in) and its " bobbed " appearance gives the species its name . An adult stands about 30 to 60 cm (12 to 24 in) at the shoulders . Adult males can range in weight from 6 @. @ 4 to 18 @. @ 3 kg (14 to 40 lb) , with an average of 9 @. @ 6 kg (21 lb) ; females at 4 to 15 @. @ 3 kg (8 @. @ 8 to 33 @. @ 7 lb) , with an average of 6 @. @ 8 kg (15 lb) . The largest bobcat accurately measured on record weighed 22 @. @ 2 kg (49 lb) , although unverified reports have them reaching 27 kg (60 lb) . Furthermore , a June 20 , 2012 report of a New Hampshire roadkill specimen listed the animal 's weight at 27 kg (60 lb) . The largest @-@ bodied bobcats are from eastern Canada and northern New England of the subspecies (*L. r. gigas*) , while the smallest are from the southeastern subspecies (*L. r. floridanus*) , particularly those in the southern Appalachians . The bobcat is muscular , and its hind legs are longer than its front legs , giving it a bobbing gait . At birth , it weighs 0 @. @ 6 to 0 @. @ 75 lb (270 to 340 g) and is about 10 in (25 cm) in length . By its first birthday , it will reach about 10 lb (4 @. @ 5 kg) .

The cat is larger in its northern range and in open habitats . A morphological size comparison study in the eastern United States found a divergence in the location of the largest male and female specimens , suggesting differing selection constraints for the sexes .

= = Behavior = =

The bobcat is crepuscular . It keeps on the move from three hours before sunset until about midnight , and then again from before dawn until three hours after sunrise . Each night it will move from 2 to 7 mi (3 @. @ 2 to 11 @. @ 3 km) along its habitual route . This behavior may vary seasonally , as bobcats become more diurnal during fall and winter in response to the activity of

their prey , which are more active during the day in colder months .

= = = Social structure and home range = = =

Bobcat activities are confined to well @-@ defined territories , which vary in size depending on gender and the distribution of prey . The home range is marked with feces , urine scent , and by clawing prominent trees in the area . In its territory , the bobcat will have numerous places of shelter , usually a main den , and several auxiliary shelters on the outer extent of its range , such as hollow logs , brush piles , thickets , or under rock ledges . Its den smells strongly of the bobcat .

The sizes of bobcats ' home ranges vary significantly ; a World Conservation Union (IUCN) summary of research suggests ranges from 0 @.@ 23 to 126 sq mi (0 @.@ 60 to 326 @.@ 34 km²) . One study in Kansas found resident males to have ranges of roughly 8 sq mi (21 km²) , and females less than half that area . Transient bobcats were found to have both larger (roughly 22 sq mi (57 km²)) and less well @-@ defined home ranges . Kittens had the smallest range at about 3 sq mi (7 @.@ 8 km²) . Research has shown dispersal from the natal range is most pronounced with males .

Reports on seasonal variation in range size have been equivocal . One study found a large variation in male range sizes , from 16 sq mi (41 km²) in summer up to 40 sq mi (100 km²) in winter . Another found that female bobcats , especially those which were reproductively active , expanded their home range in winter , but that males merely shifted their range without expanding it , which was consistent with numerous earlier studies . Other research in various American states has shown little or no seasonal variation .

Like most felines , the bobcat is largely solitary , but ranges will often overlap . Unusual for cats , males are more tolerant of overlap , while females rarely wander into others ' ranges . Given their smaller range sizes , two or more females may reside within a male 's home range . When multiple male territories overlap , a dominance hierarchy is often established , resulting in the exclusion of some transients from favored areas .

In line with widely differing estimates of home range size , population density figures are divergent , from one to 38 bobcats per 10 sq mi (26 km²) in one survey . The average is estimated at one bobcat per 5 square miles (13 km²) . A link has been observed between population density and sex ratio . One study noted a dense , un hunted population in California had a sex ratio of 2 @.@ 1 males per female . When the density decreased , the sex ratio skewed to 0 @.@ 86 males per female . Another study observed a similar ratio , and suggested the males may be better able to cope with the increased competition , and this would help limit reproduction until various factors lowered the density .

= = = Hunting and diet = = =

The bobcat is able to survive for long periods without food , but will eat heavily when prey is abundant . During lean periods , it will often prey on larger animals it can kill and return to feed on later . The bobcat hunts by stalking its prey and then ambushing it with a short chase or pounce . Its preference is for mammals weighing about 1 @.@ 5 to 12 @.@ 5 lb (0 @.@ 68 to 5 @.@ 67 kg) . Its main prey varies by region . In the eastern United States , it is the eastern cottontail species , and in the north it is the snowshoe hare . When these prey species exist together , as in New England , they are the primary food sources of the bobcat . In the far south , the rabbits and hare are sometimes replaced by cotton rats as the primary food source . Birds up to the size of a swan are also taken , along with their fledglings and eggs . The bobcat is an opportunistic predator that , unlike the more specialized Canada lynx , will readily vary its prey selection . Diet diversification positively correlates to a decline in numbers of the bobcat 's principal prey ; the abundance of its main prey species is the main determinant of overall diet .

The bobcat hunts animals of different sizes , and will adjust its hunting techniques accordingly . With small animals , such as rodents (including squirrels) , birds , fish , including small sharks , and insects , it will hunt in areas known to be abundant in prey , and will lie , crouch , or stand , and wait

for victims to wander close . It will then pounce , grabbing its prey with its sharp , retractable claws . For slightly larger animals , such as geese , rabbits and hares , it will stalk from cover and wait until they come within 20 to 35 ft (6 @. @ 1 to 10 @. @ 7 m) before rushing in to attack . Less commonly , it will feed on larger animals , such as young ungulates and other carnivores such as fishers (primarily female) , foxes , minks , skunks , small dogs and domesticated cats . Bobcats are considered the major predatory threat to the endangered whooping crane . Bobcats are also occasional hunters of livestock and poultry . While larger species , such as cattle and horses , are not known to be attacked , bobcats do present a threat to smaller ruminants , such as sheep and goats . According to the National Agricultural Statistics Service , bobcats killed 11 @, @ 100 sheep in 2004 , comprising 4 @. @ 9 % of all sheep predator deaths . However , some amount of bobcat predation may be misidentified , as bobcats have been known to scavenge on the remains of livestock kills by other animals .

It has been known to kill deer , especially in winter when smaller prey is scarce , or when deer populations become more abundant . One study in the Everglades showed a large majority of kills (33 of 39) were fawns , but prey up to eight times the bobcat 's weight could be successfully taken . It stalks the deer , often when the deer is lying down , then rushes in and grabs it by the neck before biting the throat , base of the skull , or chest . On the rare occasions a bobcat kills a deer , it eats its fill and then buries the carcass under snow or leaves , often returning to it several times to feed .

The bobcat prey base overlaps with that of other midsized predators of a similar ecological niche . Research in Maine has shown little evidence of competitive relationships between the bobcat and coyote or red fox ; separation distances and territory overlap appeared random among simultaneously monitored animals . However , other studies have found bobcat populations may decrease in areas with high coyote populations , with the more social inclination of the canid giving them a possible competitive advantage . With the Canada lynx , however , the interspecific relationship affects distribution patterns ; competitive exclusion by the bobcat is likely to have prevented any further southward expansion of the range of its felid relative .

= = = Reproduction and life cycle = = =

The average Bobcat lifespan is 7 years long and rarely exceeds 10 years . The oldest wild Bobcat on record was 16 years old , and the oldest captive Bobcat lived to be 32 .

Bobcats generally begin breeding by their second summer , though females may start as early as their first year . Sperm production begins each year by September or October , and the male will be fertile into the summer . A dominant male will travel with a female and mate with her several times , generally from winter until early spring ; this varies by location , but most mating takes place during February and March . The pair may undertake a number of different behaviors , including bumping , chasing , and ambushing . Other males may be in attendance , but remain uninvolved . Once the male recognizes the female is receptive , he grasps her in the typical felid neck grip and mates with her . The female may later go on to mate with other males , and males will generally mate with several females . During courtship , the otherwise silent bobcat may let out loud screams , hisses , or other sounds . Research in Texas has suggested establishing a home range is necessary for breeding ; studied animals with no set range had no identified offspring . The female has an estrous cycle of 44 days , with the estrus lasting five to ten days . Bobcats remain reproductively active throughout their lives .

The female raises the young alone . One to six , but usually two to four , kittens are born in April or May , after roughly 60 to 70 days of gestation . Sometimes a second litter is born as late as September . The female generally gives birth in an enclosed space , usually a small cave or hollow log . The young open their eyes by the ninth or tenth day . They start exploring their surroundings at four weeks and are weaned at about two months . Within three to five months , they begin to travel with their mother . They will be hunting by themselves by fall of their first year , and usually disperse shortly thereafter . In Michigan , however , they have been observed staying with their mother as late as the next spring .

== Tracks ==

Bobcat tracks show four toes without claw marks, due to their retractable claws. The tracks can range in size from 1 to 3 in (2 @. @ 5 to 7 @. @ 6 cm); the average is about 1 @. @ 8 inches. When walking or trotting, the tracks are spaced roughly 8 to 18 in (20 to 46 cm) apart. The bobcat can make great strides when running, often from 4 to 8 ft (1 @. @ 2 to 2 @. @ 4 m).

Like all cats, the bobcat 'directly registers', meaning its hind prints usually fall exactly on top of its fore prints. Bobcat tracks can be generally distinguished from feral or house cat tracks by their larger size: about 2 @. @ 0 in² (13 cm²) versus 1 @. @ 5 in² (10 cm²).

== Ecology ==

The adult bobcat has few predators other than humans, although it may be killed in interspecific conflict. Cougars and gray wolves will kill adult bobcats, a behavior repeatedly observed in Yellowstone National Park. Coyotes have killed adult bobcats and kittens. There is at least one confirmed observation of a bobcat and an American black bear (*Ursus americanus*) fighting over a carcass. Bobcat remains have occasionally been found in the resting sites of male fishers.

Kittens may be taken by several predators, including owls, eagles, and foxes, as well as other adult male bobcats; when prey populations are not abundant, fewer kittens are likely to reach adulthood. Golden eagles (*Aquila chrysaetos*) have been reportedly observed preying on adult bobcats.

Diseases, accidents, hunters, automobiles, and starvation are the other leading causes of death. Juveniles show high mortality shortly after leaving their mothers, while still perfecting their hunting techniques. One study of 15 bobcats showed yearly survival rates for both sexes averaged 0 @. @ 62, in line with other research suggesting rates of 0 @. @ 56 to 0 @. @ 67. Cannibalism has been reported; kittens may be taken when prey levels are low, but this is very rare and does not much influence the population.

The bobcat may have external parasites, mostly ticks and fleas, and will often carry the parasites of its prey, especially those of rabbits and squirrels. Internal parasites (endoparasites) are especially common in bobcats. One study found an average infection rate of 52 % from *Toxoplasma gondii*, but with great regional variation. One mite in particular, *Lynxacarus morlani*, has to date been found only on the bobcat. Parasites' and diseases' role in the mortality of the bobcat is still unclear, but they may account for greater mortality than starvation, accidents, and predation.

== Distribution and habitat ==

The bobcat is an adaptable animal. It prefers woodlands ? deciduous, coniferous, or mixed ? but unlike the other *Lynx* species, it does not depend exclusively on the deep forest. It ranges from the humid swamps of Florida to desert lands of Texas or rugged mountain areas. It will make its home near agricultural areas, if rocky ledges, swamps, or forested tracts are present; its spotted coat serves as camouflage. The population of the bobcat depends primarily on the population of its prey; other principal factors in the selection of habitat type include protection from severe weather, availability of resting and den sites, dense cover for hunting and escape, and freedom from disturbance.

The bobcat's range does not seem to be limited by human populations, as long as it can find a suitable habitat; only large, intensively cultivated tracts are unsuitable for the species. The animal may appear in back yards in "urban edge" environments, where human development intersects with natural habitats. If chased by a dog, it will usually climb up a tree.

The historical range of the bobcat was from southern Canada, throughout the United States, and as far south as the Mexican state of Oaxaca, and it still persists across much of this area. Range maps typically show a pocket of territory in the US Midwest and parts of the Northeast, where it is no longer thought to exist, including southern Minnesota, eastern South Dakota and much of

Missouri , mostly due to habitat changes from modern agricultural practices . While thought to no longer exist in western New York and Pennsylvania , multiple confirmed sightings of bobcats (including dead specimens) have been recently reported in New York 's Southern Tier and in central New York . In addition , bobcat sightings have been confirmed in northern Indiana , and one was recently killed near Albion , Michigan . In early March , 2010 , a bobcat was sighted (and later captured by animal control authorities) in a parking garage in downtown Houston , TX . In August and September , 2010 , a number of sightings were reported in the Houston suburbs of Pearland and Friendswood .

Its population in Canada is limited due to both snow depth and the presence of the Canadian lynx . The bobcat does not tolerate deep snow , and will wait out heavy storms in sheltered areas ; it lacks the large , padded feet of the Canadian lynx and cannot support its weight on snow as efficiently . The bobcat is not entirely at a disadvantage where its range meets that of the larger felid : displacement of the Canadian lynx by the aggressive bobcat has been observed where they interact in Nova Scotia , while the clearing of coniferous forests for agriculture has led to a northward retreat of the Canadian lynx 's range to the advantage of the bobcat . In northern and central Mexico , the cat is found in dry scrubland and forests of pine and oak ; its range ends at the tropical southern portion of the country .

= = Conservation = =

It is listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) , which means it is not considered threatened with extinction , but hunting and trading must be closely monitored . The animal is regulated in all three of its range countries , and is found in a number of protected areas of the United States , its principal territory . Estimates from the US Fish and Wildlife Service placed bobcat numbers between 700 @, @ 000 and 1 @, @ 500 @, @ 000 in the US in 1988 , with increased range and population density suggesting even greater numbers in subsequent years ; for these reasons , the U.S. has petitioned CITES to remove the cat from Appendix II . Populations in Canada and Mexico remain stable and healthy . The IUCN lists it as a species of " least concern " , noting it is relatively widespread and abundant , but information from southern Mexico is poor . The species is considered endangered in Ohio , Indiana , and New Jersey . It was removed from the threatened list of Illinois in 1999 and of Iowa in 2003 . In Pennsylvania , limited hunting and trapping are once again allowed , after having been banned from 1970 to 1999 . The bobcat also suffered population decline in New Jersey at the turn of the 19th century , mainly because of commercial and agricultural developments causing habitat fragmentation ; by 1972 , the bobcat was given full legal protection , and was listed as endangered in the state in 1991 . *L. r. escuinipae* , the subspecies found in Mexico , was for a time considered endangered by the US Fish and Wildlife Service , but was delisted in 2005 .

The bobcat has long been valued both for fur and sport ; it has been hunted and trapped by humans , but has maintained a high population , even in the southern United States , where it is extensively hunted . In the 1970s and 1980s , an unprecedented rise in price for bobcat fur caused further interest in hunting , but by the early 1990s , prices had dropped significantly . Regulated hunting still continues , with half of mortality of some populations being attributed to this cause . As a result , the rate of bobcat deaths is skewed in winter , when hunting season is generally open .

Urbanization can result in the fragmentation of contiguous natural landscapes into patchy habitat within an urban area . Animals that live in these fragmented areas often have reduced movement between the habitat patches , which can lead to reduced gene flow and pathogen transmission between patches . Animals such as the bobcat are particularly sensitive to fragmentation because of their large home ranges . A study in coastal Southern California has shown bobcat populations are affected by urbanization , creation of roads , and other developments . The populations may not be declining as much as predicted , but instead the connectivity of different populations is affected . This leads to a decrease in natural genetic diversity among bobcat populations . For bobcats , preserving open space in sufficient quantities and quality is necessary for population viability . Educating local residents about the animals is critical , as well , for conservation in urban areas .

= = Mythology = =

There is archeological evidence that the bobcat was revered by members of the Hopewell culture . Grave artifacts from dirt domes excavated in the 1980s along the Illinois River revealed a complete skeleton of a young bobcat along with a collar made of bone pendants and shell beads . The type and place of burial indicate mythological relevance or possibly domestication . The bones were initially identified as remains of a puppy , but dogs were usually buried close to the village and not in the mounds themselves .

In Native American mythology , the bobcat is often twinned with the figure of the coyote in a theme of duality . Lynx and coyote are associated with the fog and wind , respectively ? two elements representing opposites in Amerindian folklore . This basic story , in many variations , is found in the native cultures of North America (with parallels in South America) , but they diverge in the telling . One version , which appears in the Nez Perce folklore for instance , depicts lynx and coyote as opposed , antithetical beings . However , another version depicts them with equality and identity . Claude Lévi @-@ Strauss argues the former concept , that of twins representing opposites , is an inherent theme in New World mythologies , but they are not equally balanced figures , representing an open @-@ ended dualism rather than the symmetric duality of Old World cultures . The latter notion then , Lévi @-@ Strauss suggests , is the result of regular contact between Europeans and native cultures . Additionally , the version found in the Nez Perce story is of much greater complexity , while the version of equality seems to have lost the tale 's original meaning .

In a Shawnee tale , the bobcat is outwitted by a rabbit , which gives rise to its spots . After trapping the rabbit in a tree , the bobcat is persuaded to build a fire , only to have the embers scattered on its fur , leaving it singed with dark brown spots . The Mohave believed dreaming habitually of beings or objects would afford them their characteristics as supernatural powers . Dreaming of two deities , cougar and lynx , they thought , would grant them the superior hunting skills of other tribes . European settlers to the Americas also admired the cat , both for its ferocity and its grace , and in the United States , it " rests prominently in the anthology of ... national folklore . "