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Leopardus pardalis. By Julie L. Murray and Gregory L. Gardner

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Leopardus pardalis (Linné, 1758)

Ocelot

Felis pardalis Linné, 1758:42. Type locality “America,” but later restricted by Allen (1919:345) to “State of Vera Cruz, Mexico.”

Felis mexicana Kerr, 1792:151. Type locality “New Spain” [probably Mexico].

Felis ocelot Link, 1793:90. Type locality state of Vera Cruz, Mexico.

Renaming of Felis ocelot Linné

Felis armillatus Cuvier, 1820:139. Type locality unknown (Cabrera, 1957:283).

Felis mitis Cuvier, 1820:141, plate 54. Type locality unknown, but later restricted to “Rio de Janeiro, Brasil” (Cabrera, 1957:284).

Felis chibi-gouazou Gray, in Griffith, 1827:167. Type locality “Paraguay.”

Felis chati Gray, in Griffith, 1827:169. Type locality “America.”

Felis griffithii Fischer, 1829:569. Type locality unknown, but probably from Veracruz, Mexico (Goldman, 1943:375).

Felis chibigouazu Fischer, 1829:560. Type locality “America australi.”

Felis hamiltonii Fischer, 1829:566. Type locality “America australi.”

Felis canescens Swainson, 1838:118. Type locality [probably from Veracruz, Mexico].

Felis smithii Swainson, 1838:120, figure 19. Type locality unknown.

Felis marina Wagner, 1841:492. Type locality unknown.

Leopardus griseus Gray, 1842:260. Type locality “Central America,” but later restricted to “Guatemala” (Gray, 1867:270).

Leopardus pictus Gray, 1842:260. Type locality “Central America.”

Felis pseudopardalis Boitard, 1842:157. Type locality given as “Mexique et la baie de Campeché,” but emended by Cabrera (1957:284) to Cartagena, Colombia.

Felis brasilianus Schim, 1844:433. Type locality “Brasil” [= Brazil].


Felis albescens Pucheran, in Geoffroy Saint-Hilaire, 1855:149.

Type locality “Etat d’Arkansas.”

Felis limitis Mearns, 1902:166. Type locality “Brownsville [Cameron County], Texas.”

Felis aequatorialis Mearns, 1903:246. Type locality “Parana, northern Ecuador (altitude 3,500 feet).”


Felis maripensis Allen, 1904a:331. Type locality “Maripa, Caura district, Venezuela.”

Felis sanctaemartae Allen, 1904a:332. Type locality “Santa Marta district, Colombia.”

Felis ludoviciana Brass, 1911:411. Type locality “In Louisiana, Arkansas and Texas.”

Felis buffoni Brass, 1911:412. Type locality “Mexiko.”

CONTEXT AND CONTENT. Order Carnivora, Family Felidae. Subfamily Felinae, Genus Leopardus, Subgenus Leopardus.

The genus Leopardus contains three species: L. pardalis, L. tigrinus, and L. wiedii. L. pardalis contains 10 subspecies (Cabrera, 1957; Goldman, 1943; Wozencraft, 1990):

L. p. aequatorialis (Mearns, 1903:246), see above (mearnsi Allen and minimus Wilson are synonyms).

L. p. albescens (Pucheran, in Geoffroy Saint-Hilaire, 1855:149), see above (limitis Mearns and ludoviciana Brass are synonyms).

L. p. melanura (Ball, 1844:128), see above (maripensis Allen and tumatumi Allen are synonyms).

L. p. mitis (Cuvier, 1820:141), see above (armillatus Cuvier, brasiliensis Schinz, chati Gray, chibi-gouazu Gray, chibigouazu Fischer, hamiltonii Fischer, maripensis Fischer, limitis Swainson, mitis Allen are synonyms).

L. p. melas (Goldman, 1925:122). Type locality “Manzanillo, Colima, Mexico.”

L. p. pardalis (Linné, 1758:42), see above (canescens Swainson, griffithii Fischer, grisitus Gray, ocelot Link, pictus Gray, and probably buffoni Brass, mexicana Kerr, and pseudopardalis Boitard are synonyms).

L. p. pseudopardalis (Boitard, 1842:157). Type locality “Camoa, Rio Mayo, Sonora, Mexico.”

L. p. steinbachi Pocock, 1914a:235. Type locality “Buenavista, Santa Cruz, Bolivia.”

DIAGNOSIS. The ocelot (Leopardus pardalis; Fig. 1) is the largest of the small spotted cats (Redford and Eisenberg, 1992). It is about the same size as the bobcat (Lynx rufus), but the tail is longer (27–45 cm vs. 12–19 cm—Leyhausen, 1990) and the pelage is shorter. Compared with the jaguar (Panthera onca), L. pardalis is smaller (11–16 kg vs. 74–104 kg—Kiltie, 1984; Leyhausen, 1990) and has parallel black stripes on the nape and oblique stripes near the shoulder (Davis, 1974). The ocelot closely resembles the margay (Leopardus wiedii), but L. pardalis is heavier (11–16 kg vs. 3–9 kg—Leyhausen, 1990), has a longer body length (70–100 cm vs. 53–79 cm—Leyhausen, 1990), and is shorter than the jaguar (40–50 cm vs. 30–45 cm—Leyhausen, 1990), and L. pardalis has a longer tail that barely touches the ground (27–45 cm vs. 33–51 cm—Leyhausen, 1990).

GENERAL CHARACTERS. Pelage color varies greatly, even within a population. Markings on one side do not match the other, with the forehead, crown, nape, and shoulders showing the greatest variability. Ocelots north of the Rio Grande are more gray-
ish than those to the south, with black markings reduced to the width of the spaces between them (Cahalane, 1947; Cisin, 1967; Goldman, 1943). Ground colors vary from grayish to cinnamon to buff. Base color from the crown to just behind the shoulder blades is a deeper tone than that of the posterior half of the dorsal area, and ground color of the sides is paler than the back. The most distinguishing marks are black-bordered elongated spots that enclose portions of the ground color and form chainlike streaks that run obliquely down the sides. Underparts are white, spotted with black, and the tail is spotted and ringed with black (Allen, 1919; Davis, 1974; Denis, 1964). The head has small black spots and two black stripes on the cheeks, four to five parallel stripes run down the neck, and one or two transverse bars run along the inside of the forelegs. The hair grows forward along the neck from shoulder to ear. Eyes are dark brown, and when illuminated with artificial light appear golden rather than the more common green (Brown, 1969; Cisin, 1967). Females average smaller than males (Goldman, 1943) and physically resemble males even down to a vestigial scrotum in females (Cisin, 1967).

External measurements (in mm) for adult males and females for L. p. equatorialis, L. p. albescens, L. p. melanura, and L. p. mitis, respectively, are: total length, 1410-1580 and 1240-1400, 1290-1427 and 1170-1350, 1440-1510 and —, 1420-1530 and 1280; condylobasal length, 1300-1460 and —, 1160-1290, 1220-1322 and 1113-1147, 1330-1390 and 1290-1320, 1370-1390 and 1180; basal length, 1190 and —, 970-1180 and 96.5-1020, 129.0-136.0 and 120.0, 128.0-131.0 and 109.0; basilar length, 120.0-134.0 and 112.0-118.0, 105.0-114.0 and 103.0-108.0, 121.0-139.0 and 114.0-117.0, — and —; zygomatic width, 90.0-108.0 and 92.0-96.4, 86.8-93.2 and 82.0-85.7, 90.0-106.0 and 87.0-91.8, 101.0-104.0 and 86.0; postorbital width, 27.8-33.0 and 27.8-39.7, 27.8-33.0 and 31.0-35.0, 32.0-36.0 and 29.0, 26.0-28.0 and 31.0; interorbital width, 25.0-30.0 and 19.0-29.8, 24.0-26.9 and 22.6-25.0, 27.0-32.0 and 25.0, 26.0-29.0 and 23.0; length of hulla, 25.0-29.0 and 22.0-27.0, 23.0-26.0 and 22.5-23.5, 25.0-27.0 and 24.0, 24.0-26.9 and 22.0; bullar width, 15.0-18.0 and 15.0-10.0, 15.2-15.0 and 14.5-15.5, 15.0-19.0 and 18.0, 15.0-18.0 and 15.0-10.0; —; —; —; —; 0-0 and —; 7.5-10.0 and 7.8-8.0, — and 7.0, 9.5-13.0 and 6.5, M, 12.0-13.0 and 11.0-11.5, 10.5-11.5 and 12.0-11.0. 11.5-12.0 and 11.5 (Allen, 1904b; 1906; Goldman, 1943; Mears, 1903; Pocock, 1911).

**DISTRIBUTION.** The ocelot once ranged into Louisiana, Arkansas, and Arizona, south to Peru and northern Argentina (Fig. 2). Currently it ranges from extreme southern Texas through Mexico and Central America to Ecuador and northern Argentina, but it does not occur south of the Province of Entre Rios in Argentina (Denis, 1984; Redford and Eisenberg, 1992). The ocelot also is known from French Guiana, Ile de Marajó, Venezuela, but not from the Antilles (Bisbal, 1983; Tewes and Schmidly, 1987). L. pardalis does not inhabit the high plateaus of southern Peru, and there is no record from Chile (Oliveira, 1994).

**FOSSIL RECORD.** Leopards pardalis fossils from North America include the proximal end of a right humerus from Haile IA, Alachua Co., Florida (Kurtén, 1965), and a left mandibular ramius from the Rancholabrean Reddick I fauna in Marion Co., Florida (Berta and Marshall, 1978; Glass and Martin, 1978; Kurtén, 1965; Ray, et al., 1963). This limited fossil record in North America may represent a brief extension of the range of L. pardalis during the Sangamonian (Wendel, 1955). Although the exact date of habitation is unknown, a Native American village site on the San Pedro River, near Redington, Arizona, shows the ocelot was present in the United States before the arrival of Spaniards (Bart, 1961). There are no fossil records from Texas, but the ocelot probably occurred there in prehistoric times and may have ranged over the entire southeastern United States (Navarro, 1985; Rappole, 1988). Moorehead (1968) reports a picture of an ocelot carved on human bone found in the Hopewell Mound Group in Ross Co., Ohio and states his belief that the site was occupied sometime between 1400 and 1500 A.D. Cahalane (1947) suggested this finding indicated the prehistoric range of the ocelot may have extended as far north as Ohio. Moorehead (1968), however, notes that many objects in the Hopewell burial mounds came from exchange with people living further south. Fossils of ocelots from South America have been reported from Rancholabrean deposits in the Caves of Lagoa Santa, Minas Gerais, Brazil (Berta and Marshall, 1978), as well as a radius, premaxilla, and the distal end of a scapula from Pleistocene deposits in Yucatan, Mexico (Hatt, 1953).

**FORM AND FUNCTION.** Guard hairs are ca. 10 mm long and underfur is ca. 8 mm long (Tewes and Schmidly, 1987). The carnassials are well-developed and canines are elongated. The relative maximum bite force, when cross sectional areas of the temporals and masseter muscles are taken as proportional to maximum force, is 1,395 mm², and relative maximum gape is 73 mm (Kittle, 1964). The dental formula is i 3/3, c 1/1, p 0/0, m 3/2, total 26 (Cisin, 1967). Deciduous teeth are replaced by adult teeth at ca. 7-8 months of age (Mansard, 1991). The skull (Fig. 3) has a truncated rostrum, strongly developed postorbital processes, and well-developed sagittal and occipital crests (Tewes and Schmidly, 1987). The neck has thickened skin, offering protection against attacks (Cisin, 1967). Muscles of the forelimb and pectoral girdle are strong, making the ocelot a powerful climber (Enders, 1989). Although the Felidae have reduced and truncated bacula, the ocelot has the most complex baculum in the family (Ewet, 1973).

The feet are broad and short, with forepaws larger than hind paws. Webs of the forefeet are deep and extend to the distal ends of the digital pads. The ocelot has well-developed claw sheaths with distinct inner lobes on the second, third, and fourth digits (Enders, 1950; Pocock, 1917). There are five digits with claws in the hind feet, and four digits with claws in the forefeet. Normal body temperature is 37.7-38°C (Cisin, 1967).

**ONTOGENY AND REPRODUCTION.** In the wild, phys-
Fig. 3. Dorsal, ventral, and lateral views of cranium, and lateral view of mandible of an adult male Leopardus pardalis aequatorialis, from Rio Indio, Canal Zone, Panama (United States National Museum of Natural History 170955). Greatest length of cranium is 145.3 mm. Photographs by T. L. Best.

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Ocelots presumably are polyestrous, although in northern latitudes captive may show a 4-month winter anoestrous (Mansard, 1991) years, while one captive female was reported to reproduce at 13 years of age in captivity, and one captive lived 20 years, 3 months. Estrus shortly afterwards is one or two (Mondolfi, 1986), rarely three or four (Navarro, 1985). Average litter size is 1.5 in Venezuela and 1 in Peru (Emmons, 1988; Mondolfi, 1986), and 1-3 in captive ocelots (Eaton, 1977). Unlike the domestic cat, which has eight mammae, the ocelot has four, the presumed maximum litter size (Cisin, 1967). Lactation can last for 3-9 months (Mansard, 1991; Tews, 1986).

Newborn ocelots are fully marked, but their coats are gray and their lower limbs are almost black. Adult coloration appears gradually over the first few months, beginning at the nape (Mansard, 1991). Young are born with blue eyes, which change to brown when they are ca. 3 months old (Cisin, 1967; Davis, 1974). Young open their eyes at 14 days, sit up and begin walking at 3 weeks, leave the den and accompany their mother on hunts at 4-6 weeks, and begin to take solid food at ca. 8 weeks (Laack, 1991; Mansard, 1991).

Body measurements (in mm) of newborn in Texas are: total length, 230-248; length of tail, 55; length of hind foot, 33-35; length of ear, 9-10; mass, 200-276 g (Navarro, 1985). In Texas, young may be independent at 1 year, the interval between successive litters in the wild is 2 years (Emmons, 1988). Ocelots may live ≥10 years in the wild, but they can live to 18 years of age in captivity, and one captive lived 20 years, 3 months (Brown, 1989; Cisin, 1967; Laack, 1991).

ECOLOGY. In Venezuela, ocelots occur in a variety of habitats from tropical-humid forests to dry scrub country (Bisbal, 1986), typically occurring at elevations <1,200 m (Eisenberg, 1989). Ocelots have been captured in tropical-dry and tropical-
humid forests, and in marshy areas, along riverbanks, in mangroves, and in swampy savannas. Preferred habitat seems to begallery (riverine) forests (Handley, 1976; Mondolfi, 1986). L. pardalis occurs in all the life zones of Venezuela (Eisenberg, 1989). In the lowlands of Venezuela, it usually is captured in evergreen forests (72%), deciduous forests and thorn forests (14%), and in swamps, marshes, or pastures (14%—Handley 1976). In Brazil, radio-collared ocelots were found 88% of the time in semideciduous forests, 15% in marshes, 10% in riverine forests, and 2% in grasslands. Although not quantified, these percentages seemed to be proportional to habitat availability in the area (Crawshaw and Quigley, 1989). In southern Texas, L. pardalis inhabits live-oak forests and dense chaparral thickets offering seclusion (Navarro, 1985). Although ocelots generally use the same habitats during the day, they sometimes sleep in them at night (Emmons, 1987; Sunquist, 1992). Despite such diversity of habitats, ocelots are not habitat specialists. Instead, movement patterns indicate they are strongly associated with areas of dense vegetation or forest cover, suggesting that ocelots occupy a much narrower range of microhabitats than would have been predicted by their wide geographical distribution (Emmons, 1988; Sunquist, 1992).

Although ocelots will hunt in trees, their diet indicates they are more efficient hunters on the ground. Ocelots will take any vertebrate they can handle, most of which are nocturnal. In Venezuela, mammals account for 88% of the total volume of their diet, with spiny rats (Prochimys) the most frequent prey item (Bisbal, 1986). In Peru, ocelots consume 66% small mammals, 5% large mammals, 5% bats and arboreal mammals other than opossums, 11% birds, 12% reptiles, and 2% fish (Emmons, 1987, 1988). In Belize, opossums (Didelphis marsupialis and Phalanger opossum) are the most common prey (Konecny, 1989).

Ocelots will prey upon other mammals and reptiles, such as rats (Oryzomys), mouse opossums (Marmosa cinerea and M. nocitissa), coatis (Nasua narica and N. nasua), howler monkeys (Alouatta caraya), cottontails (Sylvilagus floridanus), and small rodents such as the white-footed mouse (A. flavicollis) and the white-breasted mouse opossum (M. leucopus) (Emmons, 1988; Sunquist, 1992). In Peru, ocelots consume 66% small mammals, 5% large mammals, 5% bats and arboreal mammals other than opossums, 11% birds, 12% reptiles, and 2% fish (Emmons, 1987, 1988). In Belize, opossums (Didelphis marsupialis and Phalanger opossum) are the most common prey (Konecny, 1989).

Most mammalian prey (92%) weigh <1 kg, and in Venezuela almost 65% of the prey is <100 g (Emmons, 1987; Ludlow and Sunquist, 1987). In Peru, ocelots take small mammal (<0.1 kg) in numbers close to those available. Thus, there is no evidence for selection among small mammals as prey by ocelots (Emmons, 1987). In Venezuela ocelots also show seasonality in selection of prey, presumably concurrent with seasonal population fluctuations (Ludlow and Sunquist, 1987). For prey >1 kg, however, prey abundance is not as important as prey size. Instead, relatively large prey occurs in the diet of the ocelot in inverse order of size of the prey. Although larger animals such as pacas (Agouti paca), collared peccaries (Pecari tajacu), brocket deer (Mazama americana), armadillos (Dasypus novemcinctus), and tamanduas (Tamandua mexicana) can be taken by ocelots, they are relatively infrequent in the diet (Emmons, 1987; Ludlow and Sunquist, 1987).

In Guárico, Venezuela, rats and mice are the dominant prey, occupying 53% of the focus examined between the dry season and 84% of the wet season in the study. Land crabs (Dilocarcinus dentatus), iguanas (I. iguana), and rodents (Zygodemomyxy breviceuda, Sigmodon alstoni, and Holochilus brasiliensis) were taken most frequently in the dry season, although rabbits (Sylvilagus floridanus), birds, and other small to medium-sized animals were also taken. In the wet season, frequency of occurrence of crabs increased significantly in the diet, but the frequency of iguanas and Z. breviceuda decreased significantly (Ludlow and Sunquist, 1987).

In Peru, Emmons (1987) estimated that the average adult ocelot eats 558–837 g of meat/day, or ca. 68 g of meat/day/kg of ocelot. The mean number of prey/kg is 3.0 ± 1.4, or the approximate number of prey killed each day that are traveled by an ocelot in its active period, hunting success was ca. 0.9 prey captured/km walked (Emmons, 1988). Ocelots consume 6% of the total Proechimys production per year (Emmons, 1987).

Home ranges of adult males typically are larger than home ranges of females in the same area. In Venezuela, home ranges of adult males are 3–4 times larger than ranges of females (Ludlow and Sunquist, 1987), but in Texas they are 2 times larger. Nata ranges of subadults in Texas are comparable in size to home ranges of adult females; subadult males usually do not establish home ranges until they are 23–47 months old (Lauck, 1991). Prior to establishing their own home ranges, subadults often live in their natal ranges, tolerated by their parents. In Guárico, Venezuela, home ranges of adult males are 10–11 km² and of females 2–7 km² (minimum area). Home ranges are smaller in gallery forests, presumably indicating better habitat (Ludlow and Sunquist, 1987). In Texas, average size of home range for males is 2.5 km² and for females 2.1 km² (minimum area—Navarro, 1985). Using the 95% harmonic contour method, Tewes (1986) calculated that other ocelots had home ranges of 1.8 km² for males and 11 km² for females. Lauck (1991) hypothesized that the density of ocelots in Navarro's study was greater, resulting in constriction of home ranges rather than sharing territories. In the central llanos of Venezuela, males use 9.7 km² and females use 3 km² (minimum-convex polygon—Sunquist et al., 1989). In Belize, however, an adult female used a home range of 15 km² and a subadult male used a home range of 31 km² (minimum-convex polygon—Konecny, 1989).

To understand how individuals use their home ranges, home-range data must be coupled with space-use data. In Texas, the average area defined by the 75%–use contour for adult ocelots is 8 km² and 3 km² for the 50%–use contour. The average core area for adult males is 6 km² and for adult females 3 km², although the intensity with which the two sexes use their core areas is similar. Surprisingly, home range size and use of space are not reduced during periods of high prey abundance (Tewes, 1986).

 Territories of adult male ocelots usually overlap territories of several females, but territories of females rarely overlap, suggesting intrasexual territorialism for resident adult females. The only exceptions are when a female allows her independent offspring to reside within her territory, although size of home area of the offspring is smaller than that of their presumed mother. Emmons (1988) tracked four resident adult and five subadult ocelots in Peru and reported that adult males tend to use the boundaries of their territories more often than the interior, visiting the entire boundaries every 2–4 days. Six adult females in Venezuela used their home ranges in a less localized manner than two adult males, who traveled farther (Ludlow and Sunquist, 1987). In Belize, one adult female living in early and late secondary growth vegetation used all of her range equally and showed no habitat preferences for either growth stage (Konecny, 1989).

For both sexes, size of home range in the wet season normally was a subset of the range in the dry season. In Guárico, Venezuela during 1983–1984, the average reduction for males, females, and one subadult male, respectively, were 11, 32, and 14% (Ludlow and Sunquist, 1987). In the central llanos of Venezuela a study from 1982–1983 revealed home ranges in the wet season were reduced by 27 and 38% for two adult females, 31% for an adult male, and 24% for a subadult female (Sunquist et al., 1989). In Texas, ocelots reduced their home range from winter (average = 7 km²) to summer (average = 4 km²). Similarly, winter core areas were ca. 3 km² and summer core areas were ca. 2 km² (Tewes, 1986). In wet and dry seasons, both sexes are active and moving ca. 3–4 km/day. In the central llanos of Venezuela, adult males travel farther than females in both the dry season (4 km/6-h period for males; 2 km/6-h period for females) and wet season (3 km/6-h period for males; 2 km/6-h period for females), and movement in the wet season is less than in the dry season (Ludlow and Sunquist, 1987; Sunquist, 1992). In other studies of ocelots in the central llanos, females move farther in the dry season than the wet season.
but the difference was not significant (Sunquist et al., 1989). When movement was based on straight-line distance between consecutive daily locations, male ocelots in Texas cruised an average of 792 m per day while females cruised a mean of 510 m per day (Navarro, 1985). Females with kittens traveled a mean of 2 km/night, generally staying within 1 km of the den (Laack, 1991). In Belize, mean distance traveled/hour was 329 m, and mean total distance traveled/24 h was 6 km. Ocelot movements backtrack or cross themselves in Belize (Konecny, 1989), but in Peru, ocelots travel in continuous lines, rarely doubling back (Emmons, 1988).

Other than humans, the ocelot has few natural enemies. An ocelot was found in the stomach of a boa constrictor (Boa constrictor—Green, 1983), and ocelots occasionally are taken by harpy eagles (Harpia harpyja), pumas (Puma concolor), jaguars (Panthera onca), and crocodiles (Crocodylus acutus). Two interactions between ocelots and crab-eating foxes (Cerdocyon thous) have been reported, one in which two foxes were fighting an ocelot, and another in which the fresh carcass of a hunter-killed ocelot was dragged away by two foxes (Mondolfi, 1986). Although cannibalism is not a frequent occurrence, it occurred in a pair of ocelots (L. pardalis mutis) at Brasilia Zoo, Brazil (Silva, 1972).

Parasites and diseases have been noted in ocelots. A necropsy indicated a pulmonary condition and presence of ancylostomid and strongilid parasites in an ocelot (Crawshaw and Quigley, 1989). Common nematodes are Toxascaris, Lagochilascaris, Toxocara cati, T. canis, T. leonina, Syngamus, Ankylostoma caninum, A. braziliense, A. tubuliform, Uncinaria stenocephala, Dipylidium caninum, Diphyllobothrium urichi, Taenia taeniaeformis, Dipylidium caninum (usually only in captives), and Dibertiocoelus mansonioides (Ashton and Jones, 1960; Bravo-Holins and Deloya, 1973; Brenes et al., 1972, 1980; Cameron, 1936; Cisin, 1967; Navarro, 1985). Class Arachnida is represented by chiggers (Dermanyssus gallinae, Ornithodoros fieldi, Trombicula dunnii) and mange (Otodectes cynotis, Notoedres cati, Demodex folliculorum, Sarcoptes scabiei). Many diseases are known from captive animals, and wild ocelots may also suffer from them. L. pardalis have hairballs and occasionally die in the last day of occupation by these items. Ocelots have been known to die of feline panleukopenia (feline infectious enteritis), although South American subspecies may be less susceptible. If given early in life, killed-virus vaccines have proven 98% effective and should be given prior to transport (Ashton and Jones, 1960; Navarro, 1985). The only acanthocephalans known to afflict ocelots are Oxycolea chibigouzouensis and O. venezuelensis (Filbo, 1965; Marre, 1977). Protists include Toxoplasma gondii, HammondiaHLaxa, Isopoda bigemin, I. rivolta, and I. felis. Ringworm (Microsporum canis, M. gypseum, Trichophyton mentagrophytes) may affect ocelots (Cisin, 1967; Hendricks et al., 1979).

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Behavior. In Texas, ocelots are active 21% of the day and 76% of the night (Navarro, 1985). However, on Barro Colorado Island, Panama, ocelots may be active at any hour. One ocelot was trapped during mid-day; most others were observed before 0900 h and two were seen at night (Enders, 1985). Ocelots usually rest in a den site from shortly after dawn until afternoon. In Venezuela, activity level is 36% during the day, increases to 72–92% until dawn (Ludlow, 1986). In Peru, activity increases markedly between 1600 and 1900 h and peaks at midnight. After midnight, activity peaks for males lag 2 h behind peaks for females. After midnight, activity levels drop slightly, rise again a few hours later, then drop dramatically around sunset (Emmons, 1988). In Texas, movement patterns change in the wet season; more activity occurs on full moon nights, and males rest 1.1 ± 1.0 times/night and females rest 1.5 ± 1.1 times/night. Males walked without rest on 30% of the nights they were observed, while females walked continuously on only 6% of the nights they were tracked (Emmons, 1988). Movement patterns reflect activity times of major prey items, as eight of nine species of small (<1 kg) mammals taken by ocelots are nocturnal (Konecny, 1989; Ludlow and Sunquist, 1987).

Behavior may be affected by overcast days in Belize and Venezuela. Diurnal activity is more frequent on rainy or overcast days (Konecny, 1989; Sunquist, 1992), and in Venezuela diurnal activity increases significantly from the dry to the wet season (Ludlow and Sunquist, 1987). Nighttime activity patterns remain highly synchronous, and usually 2 h of activity are followed by 1 h of inactivity (Ludlow and Sunquist, 1987). In Peru, males rest 1.1 ± 1.0 times/night and females rest 1.5 ± 1.1 times/night. Males walked without rest on 30% of the nights they were observed, while females walked continuously on only 6% of the nights they were tracked (Emmons, 1988). Movement patterns reflect activity times of major prey items, as eight of nine species of small (<1 kg) mammals taken by ocelots are nocturnal (Konecny, 1989; Ludlow and Sunquist, 1987).
on larger prey may be started at the neck to detach the head. If the prey is large, ocelots begin feeding at the belly or the haunches. Ocelots usually stay with their kills, but if the kill provides too much food to consume at one sitting, they will cover the remains and retrieve it the next night (Kitchener, 1991).

Estrus occurs once a year to two years. During estrus, females use corridors such as gallery forest, strips of dense brush 5-100 m wide, and drainage systems (Laack, 1991; Ludlow and Sunquist, 1987; Sunquist, 1992). In hunting, ocelots move at a slow, steady walk with an occasional pause, and average ca. 0.5 km/h. When ocelots move without apparent attempts to hunt, they may move 0.8-1.4 km/h, a rate often used by males patrolling territory boundaries (Emmons, 1988). During these inactive walks, ocelots mark trails and home ranges. Both males and females participate in such behaviors as clawing at logs and spraying trailside vegetation with urine. Ocelots also tend to defecate at selected sites in their home ranges, and feces may accumulate at such latrines for several months during the dry season. These latrines may be used by more than one ocelot, and they generally are under shelter and situated so that the ocelot may back up to an object. Both males and females leave their feces prominently on trails. Feces generally are deposited on sandy substrate along the edge of a river, lake, or stream, and often on territorial boundaries. When urinating, ocelots will clear a space, usually 10 by 15 cm, but not cover the area when finished (Isenberg, 1989; Emmons, 1967, 1968; Enders, 1955; Kitchener, 1973). Such trail-marking may be temporal avoidance (Emmons, 1987).

Temporal and spatial avoidance is especially prominent during reproductive periods when females intensify patrolling and marking behavior. In Peru, there was virtually no overlap in the adjacent territories of two reproductive females (Emmons, 1988). Females, having sole responsibility of raising young and thus increased energy requirements, use their ranges more intensively. Males, however, are adapted to the distribution of females. Because a single male's territory overlaps those of several females, the male must range further to meet energy requirements and to check on the reproductive condition of females in the area (Ludlow and Sunquist, 1987; Sunquist, 1992).

Excellent climbers, ocelots frequently sleep in trees during the day. Several ocelots may use the same rest sites but not at the same time. *Leopardus pardalis* rest in sheltered areas such as tangle trees, buttress cavities between roots of large trees, matas (hammocks), brush piles, and culverts (Emmons, 1988; Ludlow and Sunquist, 1987). Ocelots use many rest sites within their territory, but it is uncommon for an ocelot to use the same site on sequential days. In addition, an ocelot may use a den for a litter (Emmons, 1988). Distances between daytime rest sites of animals with overlapping home ranges indicate that, other than presumed mating associations, adult ocelots are solitary, and usually rest 600-1,200 m apart (Ludlow and Sunquist, 1987). Despite the ocelot's solitary nature, they do interact. In Peru, there was virtually no overlap in the adjacent territories of two reproductive females (Emmons, 1988). Males, having sole responsibility of raising young and thus increased energy requirements, use their ranges more intensively. Males, however, are adapted to the distribution of females. Because a single male's territory overlaps those of several females, the male must range further to meet energy requirements and to check on the reproductive condition of females in the area (Ludlow and Sunquist, 1987; Sunquist, 1992).

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Three dispersed at 18-23 months, and four were 30-35 months old (Sunquist, 1987). In Texas, one ocelot dispersed at 14.5 months old, the mean of 8.4 h away from the den per night, with no apparent return to the den for the first 3-4 weeks but may move her kittens from den to den. Mothers may move young when the den becomes soiled, when trails leading to the den have become worn, or possibly to aid temperature regulation. Ocelots in Texas used dens for 13-64 days, averaging 30.5 days/den, with an inter-den distance of 133 m (Laack, 1991).

Because ocelots have no active role in caring for the young, females must increase their activity levels during lactation. A female, caring for a litter ca. 1 month old, increased the time she spent moving in a 24-h period from her usual 40% to 93%, and walked for 12 h, covering 9 km between 1800 and 0000 h. Upon losing her litter, her activity decreased to 52% of the 24-h day (Emmons, 1988). In Texas, females with small kittens spent 89% of daylight hours at their litter. The mother stays close to the den for the first 3-4 weeks but may move her kittens from den to den. Mothers may move young when the den becomes soiled, when trails leading to the den have become worn, or possibly to aid temperature regulation. Ocelots in Texas used dens for 13-64 days, averaging 30.5 days/den, with an inter-den distance of 133 m (Laack, 1991).

Although the age at which ocelots disperse is variable, many subadults do not disperse until ca. 2 years of age (Ludlow and Sunquist, 1987). In Texas, one ocelot dispersed at 14.5 months old, three dispersed at 18-23 months, and four were 30-35 months old (Laack, 1991). In Peru, dispersal begins by the time young reach 80% of adult mass (Emmons, 1988). In Guárico, Venezuela, one subadult male dispersed 10 km north and another went 12 km south (Ludlow, 1986). In Texas, two young adult males survived after dispersing 10 km and 3.5 km northward during winter into areas not previously occupied (Navarro, 1985). Also in Texas, a young male dispersed 13 km southwest during the summer, but died presumably as a result of a major fracture of the zygomatic arch sustained from a collision with a car (Tewes, 1996). Flooding from Emmons (1968) and Tewes (1996) show that four of eight ocelots that dispersed died shortly after leaving their natal ranges (Ludlow and Sunquist, 1987).

Despite occasional aggression, ocelots are docile animals. Even when trapped and faced with death, they remain placid (Cahalane, 1947). If spotted in trees, they usually climb down and slip into the forest, preferring to avoid questionable encounters. If pur-
GENETICS. The diploid number of chromosomes is 36 and the fundamental number is 70 (Collier and O'Brien, 1985; Dubost and Royère, 1990). The karyotype consists of 36 metacentric, submetacentric, and acrocentric chromosomes. The X chromosome is a minute submetacentric and the Y chromosome is a minute submetacentric (Hau and Benirschke, 1967). Electrophoresis showed there was polymorphism at 10 of 25 loci among six ocelots sampled (Newman, et al., 1985). Extending this study to include additional loci also examined in the cheetah (*Acinonyx jubatus*), 20.8% of 48 loci were polymorphic, and the average heterozygosity was 0.072 (O'Brien et al., 1985).

In captivity, the ocelot hybridizes with the other small South American spotted cats such as the margay (*L. wiedii*), tiger cat (*L. tigrinus*), Geoffroy’s cat (*O. geoffroyi*), and the kodkod (*Oncifelis guttata*), but they do not interbreed in the wild (Newman et al., 1985). In French Guiana, a male ocelot and a female puma (*Puma concolor*) raised and housed together produced four litters. The cubs showed intermediate body size and spot pattern, but more closely resembled the ocelot. Body measurements for eight of the newborn hybrids showed a lighter birth mass than ocelots (average of 258 versus 278 g), but a larger body size (average of 216 versus 189 mm—Dubost and Royère, 1993).

CONSERVATION STATUS. The greatest threat to the survival of the ocelot is habitat destruction; Amazonia is the ocelot's last major stronghold (Mansard, 1990a). In South America, forests are converted to pastures and croplands. In the wooded areas of the western llanos, for example, deforestation has proceeded at a rate of 50,000 ha/year since 1950 (Mondolfi, 1986). The Texas population is reduced each year from deaths related to predator-control activities directed at other species as well as from the clearing of brush in the Rio Grande Valley. By 1960, 99% of ocelot habitat in southern Texas was cleared for agriculture and urbanization (Brown, 1989). Subsequently, ocelots are found only on a few disjunct tracts of thorn forest and must travel great distances to secure enough habitat to survive, crossing several roads in the process (Laack and Twees, 1989; Twees, 1990). Estimated annual rate of mortality in southern Texas is 29%, with most mortalities known or suspected to be caused by collisions with automobiles (Tewes, 1986). These collisions usually occur at intersections of roads and creeks or along densely vegetated riparian strips (Tewes and Everett, 1988). About 100 ocelots exist in the United States, the largest population of ca. 40 exists at the Laguna Atascosa National Wildlife Refuge (Rappole, 1988).

Easily trapped and shot, the ocelot has been one of the most heavily exploited cats in international trade (Broad, 1987). In the late 1960s, ca. 80,000 ocelots were killed annually in Brazilian Amazonas (International Union for Conservation of Nature and Natural Resources, 1982). Ocelot fur is used in coats, taking an average of 13 pelts/garment (Kitchener, 1991). Until recently, hunting for fur has been the main reason for its threatened status, but the number of skins in legal international trade has declined from a total net trade of 34,520 skins in 1978 to 560 skins in 1985, although 1983 reached a peak of over 69,000 skins (Broad, 1987). Based on life history traits, Sunquist (1992) doubts that ocelot populations would be able to tolerate the annual removal of more than 2–3% of the population. Yet, despite protection by CITES regulations and changes in fashion design, illicit trade continues (Broad, 1987).

The pet trade can be as harmful to a species as trapping for the sale of skins (Guggisberg, 1975). Hunters steal young from the den or club the mother over the head so as not to damage the pelt, take the young to be sold as pets, and sell their mother's pelt. Many young die, however, before they reach homes or pet stores (Cisin, 1967). From 1968 to 1972, the United States imported 2,083 live ocelots (Clapp, 1974), but during 1982–1984 <100 live specimens were imported (Jorgenson and Jorgenson, 1991).

The ocelot is protected by international regulations, and most countries now prohibit its hunting. However, enforcement is lax or non-existent, and the numbers taken in illegal trade are unknown (International Union for Conservation of Nature and Natural Resources, 1982). For example, Brazil passed a law in 1967 prohibiting the killing of wild animals for profit, but in 1969 Brazil exported 81,226 ocelot skins to the United States. Peru also has an enforcement problem. Although intended to protect the ocelot, Peru's 1970 law prohibiting ocelot hunting only led to a shift in the fur trade from Peru to Colombia. There is circumstantial evidence that hunting is reducing ocelot populations in South America, because hunters travel farther every year to kill the same number of ocelots they killed in previous years. Many even hunt in Xingu National Park, Brazil (Myers, 1973).

Initially *L. pardalis* was overlooked for endangered status in the United States in 1972, but the error was corrected with a separate rule in July 1982. This ruling protected the ocelot in Texas and Arizona, although the Texas population had been protected by state law since 1977 (Laack, 1991). The ocelot was protected in Florida in 1978 and in California in 1979, when Felidae (except *Felis silvestris*) was listed under CITES Appendix II and two subspecies, *L. p. neotropicalis* and *L. p. milis*, were listed on the Appendix I list of endangered species, making hunting and importation illegal (International Union for Conservation of Nature and Natural Resources, 1982). Currently, however, all subspecies of the ocelot are listed on CITES Appendix I (Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1992). The United States is trying to increase the amount of land under the jurisdiction of federal, state, and private organizations from 13,355 to 43,504 ha in an effort to protect the ocelot and 114 other species occurring in Texas (Brown, 1989).

National parks and reserves designed to preserve ocelots should be of sufficient size to ensure that adequate populations exist within their boundaries. In Costa Rica, Venezuela, and Peru, the common density was 0.4 ocelots/km² for animals that predominately used gallery forest (Ludlow and Sunquist, 1987), but in Peru the common density was estimated at 0.8 ocelots/km² (Emmons, 1987; Robinson and Redford, 1989). For a density of ca. 1 individual/km², an area of 2,622 km² is needed to support a population of 300 individuals (Redford and Robinson, 1991). Because one male typically mates with several females, 1,334 individuals are needed to reach an effective population size of 500. This means that the original calculation of 2,622 km² would support a density of only 0.4 ocelots/km² (Ludlow, 1986).

Brown (1989) suggests that future efforts to protect the ocelot should extend to preserve remaining tracts of Tamaulipan riparian semideciduous forest and dense thornscrub in south Texas and northeastern Mexico known to support populations of ocelots. In addition, corridors are needed to connect the few remaining populations. In these areas, leg-hold traps and neck snares need to be banned, and trappers should be required to check their traps daily (Brown, 1989; Twees and Everett, 1986). Cleared areas should be allowed to revert to brush either naturally or by planting preferred vegetation, and the population cannot be hunted and ever cleared for agriculture (Brown, 1989). If ocelots fail to move into these areas or other suitable habitat, then the possibility of restocking the population with captive bred or translocated individuals may be considered, although previous efforts have been met with mixed success, as some ocelots have returned to their original natal range (Brown, 1989; Laack and Twees, 1989).

REMARKS. The ocelot's association with man can be traced back through the Aztec and Inca civilizations, both of which portrayed the ocelot in their art (Cisin, 1967). The name, ocelot, originally was French, and was derived from the Nahua word "ocelot," a jaguar. Its specific epithet came from the Latin, *pardalis*, meaning a panther or a leopard, and the Latin suffix, -alis, meaning relating to (Gotch, 1979). The ocelot often is called tigre and tigrillo in Spanish (Ludlow and Sunquist, 1987), but in Peru the common density was estimated at 0.8 ocelots/km² (Emmons, 1987; Robinson and Redford, 1989). For a density of ca. 1 individual/km², an area of 2,622 km² is needed to support a population of 300 individuals (Redford and Robinson, 1991). Because one male typically mates with several females, 1,334 individuals are needed to reach an effective population size of 500. This means that the original calculation of 2,622 km² would support a density of only 0.4 ocelots/km² (Ludlow, 1986).

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