

## Appendix I

### Comments Concerning Federally Listed Endangered Species

The following information and management guidelines are from the 130 page book "Endangered and Threatened Animals of Texas - Their Life History and Management", by Linda Campbell. Published by the Texas Parks and Wildlife Press, Austin, Texas in 1995. Distributed by the University of Texas Press, Austin, Texas, and revised in 2003 as an electronic book available on the TPWD website at [www.tpwd.state.tx.us](http://www.tpwd.state.tx.us).

### Jaguarundi

Scientific Name: *Felis yagouaroundi cacomitli*  
Federal Status: Endangered,  
6/14/76 • State Status:  
Endangered

#### Description

The Jaguarundi is a small, slenderbodied, unspotted cat, slightly larger than a domestic cat (7-22 pounds).

Jaguarundis are characterized by slender, elongated bodies, small flattened heads, and long tails (11-24 inches) more reminiscent of an otter or weasel than a cat. Other characteristics include short legs standing at a height of 11 inches at the shoulder; and short, rounded, widely spaced ears. There are three color phases: black, reddish-brown and a brownishgray. Because of similarity in size, the Jaguarundi can easily be confused with a large black feral cat, especially when seen in low light or dense cover.



#### Habitat

Little is known about the habitat of Jaguarundis in Texas. It is thought that they occur in the dense thorny shrublands of the Rio Grande Valley. Their habitat may be very similar to that of the Ocelot, although sightings and information from Mexico indicate that the Jaguarundi may be more tolerant of open areas, such as grasslands and pastures, than the Ocelot. Typical habitat consists of mixed thornshrub species such as spiny hackberry, brasil, desert yaupon, wolfberry, lotebush, amargosa, whitebrush, catclaw, blackbrush, lantana, guayacan, cenizo, elbowbush, and Texas persimmon. Interspersed trees such as mesquite, live oak, ebony, and hackberry may also occur. Riparian habitats along rivers or creeks are sometimes used by Jaguarundis. Canopy cover and density of shrubs are important considerations in identifying suitable habitat. Little information exists concerning optimal habitat for the Jaguarundi in Texas. Scientists speculate that these elusive cats are similar to the Ocelot in their requirement for dense brush cover. Tracts of at least 100 acres of isolated dense brush, or 75 acres of brush interconnected with other habitat tracts by brush corridors, are considered important habitat. Even brush tracts as small as 5 acres, when adjacent to larger areas of habitat,

may be used by Jaguarundis. Roads, narrow water bodies, and rights-of-way are not considered barriers to movements. Brushy fence lines, water courses, and other brush strips connecting areas of habitat are very important in providing escape and protective cover. These strip corridors are considered important habitat.

Texas counties where Jaguarundis occurred during the past 30 years include Cameron and Willacy.

### **Life History**

Little information is available concerning the biology of the Jaguarundi in Texas. Most of what is known comes from anecdotal or historical writings and information gained through the study of Ocelots in south Texas. Jaguarundis hunt primarily during the day with peak activity occurring at midday. They are less nocturnal than the Ocelot and have been observed more often during the day. Jaguarundis forage mainly on the ground. Prey includes birds, rabbits, reptiles, and small rodents. Historical accounts from Mexico suggest that Jaguarundis are good swimmers and enter the water freely. Little is known regarding Jaguarundi reproduction in Texas. In Mexico, Jaguarundis are said to be solitary, except during the mating season of November and December. Kittens have been reported in March and also in August. It is not known whether females produce one or two litters each season. The gestation period is 60 to 75 days, and litters contain two to four young.

### **Threats and Reasons for Decline**

Historically, dense mixed brush occurred along dry washes, arroyos, resacas, and the flood plains of the Rio Grande. The extensive shrub lands of the Lower Rio Grande Valley have been converted to agriculture and urban development over the past 60 years. Much of this land, particularly the more fertile soils, has been cleared for production of vegetables, citrus, sugarcane, cotton, and other crops. Unfortunately for the Jaguarundi and Ocelot (another endangered South Texas cat), the best soil types also grow the thickest brush and thus produce the best habitat. Less than 5% of the original vegetation remains in the Rio Grande Valley. The Jaguarundi is one of the rarest cats in Texas, with only the Jaguar, which has not been reported in recent years, being rarer. Information about this species is urgently needed. Unless vigorous conservation measures are taken soon, this elusive cat may join the list of species extirpated from the United States.

### **Recovery Efforts**

Very little is known concerning Jaguarundi biology in south Texas. Research regarding capture techniques, reproduction, rearing of young, dispersal, home range, and movements is urgently needed. Recently initiated Jaguarundi research in northeast Mexico, where they are more common, will enable biologists to better understand the requirements for a viable population. This information can then be used to assist conservation efforts for the Jaguarundi in Texas. Efforts to inform landowners and the public about the habitat needs, land management options, and biology of the Jaguarundi are also critical to recovery. Conservation of remaining habitat, and maintenance or creation of brush corridors connecting these habitats, is necessary for survival of the Jaguarundi population in Texas. The U.S. Fish and Wildlife Service,

Texas Parks and Wildlife Department, The Nature Conservancy, and many local landowners have been working to protect, acquire and restore Jaguarundi habitat in the Rio Grande Valley. Restoration generally involves revegetating previously cleared areas with native trees and shrubs.

### **Where To Learn More About Jaguarundis**

The best places to visit to learn more about the Jaguarundi are the Laguna Atascosa National Wildlife Refuge near Rio Hondo (956) 748-3607, Santa Ana National Wildlife Refuge near Alamo (956) 787-3079, Bentsen-Rio Grande Valley State Park near Mission (956) 585-1107, Las Palomas Wildlife Management Area near Edinburg (956) 447-2704, and Audubon's Sabal Palm Grove Sanctuary near Brownsville (956) 541-8034.

### **How You Can Help**

You can be involved with the conservation of Texas' nongame wildlife resources by supporting the Special Nongame and Endangered Species Conservation Fund. Special nongame stamps and decals are available at Texas Parks and Wildlife Department (TPWD) field offices, most state parks, and the License Branch of TPWD headquarters in Austin. The Feline Research Program at the Caesar Kleberg Wildlife Research Institute (Texas A&M University-Kingsville) also accepts contributions to its Cat Conservation Fund. These funds are dedicated to the research and recovery of free-ranging wild cats of Texas. For more information, contact the Feline Research Program at (361) 593-3922. The public is asked to report sightings of Jaguarundis to the Feline Research Program, Texas Parks and Wildlife Department, or U.S. Fish and Wildlife Service. Be sure to note size, color, habitat, behavior, location, date, and time of day seen.

### **For More Information Contact**

Texas Parks and Wildlife Department  
Wildlife Diversity Branch  
4200 Smith School Road  
Austin, Texas 78744  
(512) 912-7011 or (800) 792-1112

or

U.S. Fish and Wildlife Service  
Laguna Atascosa National Wildlife  
Refuge  
P.O. Box 450  
Rio Hondo, Texas 78583  
(956) 748-3607

or

U.S. Fish and Wildlife Service  
Ecological Services – LRGV Office  
Route 2, Box 202-A  
Alamo, Texas 78516  
(956) 784-7560

Management guidelines are available from the Texas Parks and Wildlife Department or U.S. Fish and Wildlife Service for landowners and managers wishing to conserve and improve habitat for the Jaguarundi.

### **References**

- Burt, W.H. and R.P. Grossenheider. 1964. *A field guide to the mammals*. Houghton Mifflin Company, Boston, Mass. 284pp.
- Davis, W.B. and D.J. Schmidly. 1994. *The mammals of Texas*. Texas Parks and Wildlife Press. Austin, Texas. 338pp.
- Tewes, M.E. and D.J. Schmidly. 1987. "The neotropical felids: jaguar, ocelot, margay, and jaguarundi" in M. Novak, J. Baker, M.E. Obbard and B. Malloch (eds.) *Wild Furbearer Management and Conservation in North America*. Ministry of Natural Resources, Ontario. 703-705.
- U.S. Fish and Wildlife Service. 1990. *Listed cats of Texas and Arizona recovery plan (with emphasis on the ocelot)*. Endangered Species Office, Albuquerque, N.M.
- Walker, E.P., F. Warnick, K.I. Lange, H.E. Uible, and P.F. Wright. 1975. *Mammals of the world*. Vol. 2. John Hopkins Univ. Press, Baltimore. 1500pp.

# Ocelot

Scientific Name: *Leopardus pardalis*

Federal Status: Endangered,  
3/30/72 • State Status: Endangered



## Description

The Ocelot is a beautiful medium-sized spotted cat with body dimensions similar to the bobcat (30-41 inches long and 15-30 lbs). Its body coloration is variable; with the upper parts gray or buff with

dark brown or black spots, small rings, blotches, and short bars. A key feature is the parallel stripes running down the nape of the neck. The under parts are white spotted with black. The Ocelot's long tail is ringed or marked with dark bars on the upper surface. The backs of the rounded ears are black with a white central spot.

## Habitat

In Texas, Ocelots occur in the dense thorny shrub lands of the Lower Rio Grande Valley and Rio Grande Plains. Deep, fertile clay or loamy soils are generally needed to produce suitable habitat. Typical habitat consists of mixed brush species such as spiny hackberry, brasil, desert yaupon, wolfberry, lotebush, amargosa, whitebrush, catclaw, blackbrush, lantana, guayacan, cenizo, elbowbush, and Texas persimmon. Interspersed trees such as mesquite, live oak, ebony, and hackberry may also occur. Canopy cover and density of shrubs are important considerations in identifying suitable habitat. Optimal habitat has at least 95% canopy cover of shrubs, whereas marginal habitat has 75-95% canopy cover. Shrub density below the six foot level is the most important component of Ocelot habitat. Shrub density should be such that the depth of vision from outside the brush line is restricted to about five feet. Because of the density of brush below the six foot level, human movement within the brush stand would often be restricted to crawling. Tracts of at least 100 acres of isolated dense brush, or 75 acres of brush interconnected with other habitat tracts by brush corridors, are considered very important. Even brush tracts as small as 5 acres, when adjacent to larger areas of habitat, may be used by Ocelots. Roads, narrow water bodies, and rights-of-way are not considered barriers to movement. Brushy fence lines, water courses, and other brush strips connecting areas of habitat are very important. Historical records indicate that the Ocelot once occurred throughout south Texas, the southern Edwards Plateau Region, and along the Coastal Plain. Over the years, the Ocelot population declined primarily due to loss of habitat and predator control activities. Today, Texas counties that contain areas identified as occupied habitat are: Cameron, Duval, Hidalgo, Jim Wells, Kenedy, Kleberg, Live Oak, McMullen, Nueces, San Patricio, Starr, Willacy, and Zapata.

## Life History

Ocelots normally begin their activities at dusk, when they set out on nightly hunts for rabbits, small rodents, and birds. They move around during the night, usually within a

well-established home range (area of activity) of one to two square miles for females and three to four square miles for males. Most mornings they bed down in a different spot within the territory. Male Ocelots tend to travel more than females. Males generally cover an extensive area in a short time, whereas females cover less area but use the home range more intensively. Female Ocelots occupy a den for their kittens in thick brush or dense bunchgrass areas surrounded by brush. The den is often a slight depression with the dead leaves and mulch scraped away. The usual litter size is one or two kittens. The mother goes off to hunt at night, but spends each day at the den site. The kittens begin to accompany their mother on hunts at about 3 months of age. They stay with her until they are about a year old. Studies have shown that kittens are born from late spring through December.

### **Threats and Reasons for Decline**

Historically, the South Texas Plains supported grassland or savanna-type climax vegetation with dense mixed brush along dry washes and flood plains of the Rio Grande. The extensive shrub lands of the Lower Rio Grande Valley have been converted to agriculture and urban development over the past 60 years. Much of this land, particularly the more fertile soils, has been cleared for production of vegetables, citrus, sugarcane, cotton, and other crops. Unfortunately for the Ocelot, the best soil types also grow the thickest brush and thus produce the best habitat. Less than 5% of the original vegetation remains in the Rio Grande Valley. Only about 1% of the South Texas area supports what is currently defined as optimal habitat. Most of this habitat occurs in scattered patches probably too small to support Ocelots for extended periods. As a result, young cats dispersing from areas of suitable habitat have no place to go and most are probably hit by cars or die of disease or starvation. Road mortality is a more recent reason for decline. As Ocelot habitat in South Texas becomes fragmented by bigger highways with faster traffic, Ocelots have become increasingly vulnerable to being struck by vehicles while crossing roads. About half of the Ocelot mortality documented in the past 20 years has been from road mortality. The Ocelot population in Texas is very small, probably no more than 80 to 120 individuals. Approximately 30 to 35 live in the chaparral remaining at or near the Laguna Atascosa National Wildlife Refuge. Unless vigorous conservation measures are taken soon, this beautiful cat may join the list of species extirpated from the United States.

### **Recovery Efforts**

Much information has been obtained recently concerning Ocelot biology in south Texas. However, there is still much to be learned regarding reproduction, rearing of young, dispersal, home range, and movements. Efforts to inform landowners and the public about the habitat needs, land management options, and biology of the Ocelot are critical to recovery. Conservation of remaining habitat, and maintenance or creation of brush corridors connecting these habitats, is necessary for survival of the Ocelot population in Texas. The U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department, The Nature Conservancy, and many local landowners have been working to protect, acquire and restore Ocelot habitat in the Rio Grande Valley. Restoration generally involves revegetating previously cleared areas with native trees and shrubs. The U.S. Fish and Wildlife Service and the Texas Department of Transportation are also working together

to try and reduce Ocelot road mortality by installing Ocelot underpasses under roads where Ocelots are known to frequently cross.

### **Where To Learn More About Ocelots**

The best places to visit to learn more about the Ocelot are the Laguna Atascosa National Wildlife Refuge near Rio Hondo (956) 748-3607, Santa Ana National Wildlife Refuge near Alamo (956) 787-3079, Bentsen-Rio Grande Valley State Park near Mission (956) 585-1107, Las Palomas Wildlife Management Area near Edinburg (956) 447-2704, and Audubon's Sabal Palm Grove Sanctuary near Brownsville (956) 541-8034.

### **How You Can Help**

You can be involved with the conservation of Texas' nongame wildlife resources by supporting the Special Nongame and Endangered Species Conservation Fund. Special nongame stamps and decals are available at Texas Parks and Wildlife Department (TPWD) field offices, most state parks, and the License Branch of TPWD headquarters in Austin. The Feline Research Program at the Caesar Kleberg Wildlife Research Institute (Texas A&M University-Kingsville) also accepts contributions to its Cat Conservation Fund. These funds are dedicated to the research and recovery of free-ranging wild cats of Texas. For more information, contact the Feline Research Program at (361) 593-3922. The non-profit group, Friends of Laguna Atascosa Refuge, has an Adopt-an-Ocelot program in which 100% of the donated funds go towards ocelot conservation. For a small donation, participants receive an adoption packet that includes life histories and pictures of ocelots living at Laguna Atascosa National Wildlife Refuge, ocelot facts, and an adoption certificate. To learn more, contact Linda Laack at (956) 748-3607 or write Adopt-an-Ocelot, P.O. Box 942, Rio Hondo, Texas 78583. The public is asked to report sightings of Ocelots to the Feline Research Program, Texas Parks and Wildlife Department, or U.S. Fish and Wildlife Service. Be sure to note tail length, size, color, habitat, behavior, location, date, and time of day seen.

### **For More Information Contact**

Texas Parks and Wildlife Department  
Wildlife Diversity Branch  
4200 Smith School Road  
Austin, Texas 78744  
(512) 912-7011 or (800) 792-1112

or

U.S. Fish and Wildlife Service  
Laguna Atascosa National Wildlife Refuge  
P.O. Box 450  
Rio Hondo, Texas 78583  
(956) 748-3607

or

U.S. Fish and Wildlife Service  
Ecological Services – LRGV Office  
Route 2, Box 202-A

Alamo, Texas 78516  
(956) 784-7560

Management guidelines are available from the Texas Parks and Wildlife Department or U.S. Fish and Wildlife Service for landowners and managers wishing to conserve and improve habitat for the Ocelot.

### **References**

- Burt, W.H. and R.P. Grossenheider. 1964. *A field guide to the mammals*. Houghton Mifflin Company, Boston, Mass. 284pp.
- Davis, W.B. and D.J. Schmidly. 1994. *The mammals of Texas*. Texas Parks and Wildlife Press. Austin, Texas. 338pp.
- Tewes, M.E. and D.J. Schmidly. 1987. "The neotropical felids: jaguar, ocelot, margay, and jaguarundi" in M. Novak, J. Baker, M.E. Obbard and B. Malloch (eds.) *Wild Furbearer Management and Conservation in North America*. Ministry of Natural Resources, Ontario. 697-711.
- U.S. Fish and Wildlife Service. 1990. *Listed cats of Texas and Arizona recovery plan (with emphasis on the ocelot)*. Endangered Species Office, Albuquerque, N.M.
- Walker, E.P., F. Warnick, K.I. Lange, H.E. Uible, and P.F. Wright. 1975. *Mammals of the world. Vol. 2*. John Hopkins Univ. Press, Baltimore. 1500pp.



*The following guidelines address land management practices that can be used to maintain, enhance, or create habitat for the Jaguarundi and Ocelot. They are intended primarily to serve as general guidance for landowners or managers of livestock/ wildlife operations in South Texas. The guidelines are based on our current understanding of the biology of these species.*

## **Management Guidelines for the Jaguarundi and Ocelot**

### **Habitat Preservation**

Conservation of dense stands of mixed thornshrub, which serve as habitat for the Ocelot and Jaguarundi, is vital to the survival of these cats in Texas. Habitat preservation around the Laguna Atascosa National Wildlife Refuge, in the Lower Rio Grande Valley, and in counties directly north of this area is particularly important.

Mechanical or chemical brush control, including prescribed burning, should not be conducted in habitat areas or in brushy corridors connecting larger areas of habitat. In everyday agricultural operations (i.e., livestock water facilities, fence construction), it is important to minimize disturbances that would destroy the integrity of a habitat tract or corridor. Tracts of at least 100 acres of isolated brush (of the required density and structure), or 75 acres of brush interconnected with other habitat tracts by brush corridors, are considered important habitat. Useful habitat can be provided by smaller tracts especially if these tracts are adjacent to larger areas of habitat.

On rangeland that does not provide the required brush cover and density (non-habitat areas), normal brush management practices, including prescribed burning, are not considered detrimental.

### **Habitat Restoration**

Where dense mixed brush has developed into a tree form, or shrub density below four feet is inadequate, mechanical brush treatment methods such as chaining or roller chopping may be used to restore or create suitable habitat. These mechanical methods encourage basal sprouting by breaking off limbs or trunks of established plants, and can be used to increase cover and density of brush below the four foot level. Adapted native shrubs, such as ebony, brasil, and granjeno, can be planted to increase habitat or to provide interconnecting corridors to existing habitat. Methods are currently being developed to allow for more successful establishment of these species. Technical assistance in habitat management is available to landowners and managers by contacting the Texas Parks and Wildlife Department, U.S. Natural Resources Conservation Service (formerly Soil Conservation Service), U.S. Fish and Wildlife Service, Texas Agricultural Extension Service, or the Caesar Kleberg Wildlife Research Institute.