

CONSERVATION ASSESSMENT AND FRAMEWORK
FOR THE
JAGUAR IN ARIZONA, NEW MEXICO, AND NORTHERN
MEXICO

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1. INTRODUCTION

The jaguar (*Panthera onca*) is the largest species of cat native to the Western Hemisphere and the third largest cat in the world. It is listed as endangered under the Endangered Species Act of 1973 from the United States southward to include Mexico and Central and South America. Jaguars are still observed in the United States from time to time, but there is no evidence of a breeding population of jaguars here. Several reports have been confirmed since 1996 of individuals along the U.S./Mexico border in southern Arizona and New Mexico, with the most recent being photographed in 2006. The presence of this species in the United States is currently dependent on movement from northern Mexico (U.S. Fish and Wildlife Service 1997). However, habitat fragmentation and barriers to cross-border movements could prevent jaguars from using previously inhabited areas in the United States.

In 1996, two mountain lion hunters documented the presence of jaguars in the United States through photographs. The first one, Warner Glenn, was in the Peloncillo Mountains along the Arizona/New Mexico border in March and the second one, Jack Childs, was in the Baboquivari Mountains in southern Arizona in August (see Glenn 1996, Childs 1998). As a result of these sightings, a Jaguar Conservation Agreement was developed in 1997 in hopes of conserving the species in Arizona and New Mexico through voluntary collaborative conservation efforts, thus precluding the need to list the species federally north of the U.S. border (Johnson and Van Pelt 1997). Glenn's and Childs' encounters prompted both men (and their families) to become directly involved and influential in the emerging conservation efforts for northern jaguars.

The Jaguar Conservation Agreement document, *Conservation Assessment and Strategy for the Jaguar in Arizona and New Mexico* (Johnson and Van Pelt 1997), described the current status of the jaguar in the United States and identified and assessed risks to the jaguar in Arizona and New Mexico. Further, the conservation strategy portion of the document described goals, objectives, strategies, and activities to implement to conserve jaguars in Arizona and New Mexico. The strategy also recognized the need to encourage and support parallel conservation efforts in northern Mexico.

In addition, a Memorandum of Agreement (MOA) for Conservation of the Jaguar in Arizona and New Mexico was developed and was signed by various federal, state, and local agency leaders in 1997. A key component of the MOA was establishment of a Jaguar Conservation Team (Team) responsible for directing conservation measures identified in the Conservation Agreement. Although the Conservation Agreement ultimately did not preclude the need to list the jaguar, the U. S. Fish and Wildlife Service (USFWS) stated in its final listing rule that the Conservation Agreement would serve as a template for protections necessary for the conservation of the jaguar (USFWS 1997).

The Team has been meeting regularly (twice or more yearly) since 1996, and has produced three assessment reports documenting progress on its activities (Van Pelt and Johnson 1998; Johnson and Van Pelt 2000, O'Neill and Van Pelt in prep). Various subcommittees have been formed and assigned specific tasks to complete. While this

Team remains the focal point of jaguar conservation in the United States, its activities have helped spur desired companion efforts in northern Mexico. Over the past several years, considerable progress has been made, although much more is needed to adequately protect jaguar populations in Mexico, thus ensuring progress toward recovery and natural dispersal of animals to sustain the peripheral occurrences. Specifically, conservation is needed for a known and potentially significant population of jaguars that exists approximately 140 miles south of the U.S./Mexico border. According to Brown and Lopez-Gonzalez (2001), as was recognized by the Team in 1997 while crafting the U.S. effort, the fate of the borderlands jaguar depends entirely upon what happens to this population in Mexico.

Although the jaguar is federally listed as endangered, the USFWS is not developing a Jaguar Recovery Plan at this time, because:

- (1) There is no known breeding population of jaguars in the United States. All the animals identified here since the 1960s have been males. USFWS priority is given to developing recovery plans for species with known breeding populations in the United States.
- (2) The vast majority of the jaguar's geographic distribution occurs outside the United States, and recovery of the species must occur within that core range. However, a Conservation Framework for the northern portion of the jaguar range will contribute to the overall jaguar conservation effort.
- (3) USFWS believes that much more conservation benefit can be gained through existing, voluntary conservation approaches, like the Team, and by fostering incentive-based approaches to conservation.

Thus, this Conservation Framework has been developed to summarize conservation efforts in place for the jaguar in Arizona and New Mexico, to focus attention on needed jaguar conservation efforts in the United States and Mexico, and to assist with efforts to ensure connectivity and movement across the International Border. In addition, it identifies information gaps that must be addressed to implement long-term management strategies that will help ensure presence of jaguars in the United States and long-term persistence in Mexico.

This Framework is intended to replace, and build on the foundation laid down by, the previous Jaguar Conservation Strategy and guide future work on behalf of the northern population of the species. It was developed cooperatively by AGFD and NMDGF with assistance from USFWS, and with input from other signatory members of the Team, and voluntary participants (i.e. the public) in the Jaguar Conservation Team's Working Group.

For purposes of this document, the geographic range of the northern jaguar population primarily includes the Sierra Madre Mountains along the eastern boundary of the state of Sonora, Mexico, and extends into the state of Chihuahua, south to the Alamos area and back north, staying primarily east and north of Mexican Highways 2 and 15. Individual jaguars occurring in Arizona and New Mexico are considered members of the northern jaguar population.

2. SPECIES STATUS

2.1 Description

The jaguar is a member of the cat family (Felidae; genus *Panthera*) and is allied with the “roaring” cats. Recent phylogenetic relationships among felid species show jaguars genetically related to the African lion (*P. leo*), leopard (*P. pardus*), tiger (*P. tigris*), snow leopard (*P. uncia*), and clouded leopard (*Neofelis nebulosa*) (Johnson et al. 2006).

Jaguars are easily identified by their distinctive spotted coat, which has small dots or irregular shapes within larger rosette markings. The spotted rosette pattern of the jaguar may act as camouflage (see Brown and Lopez-Gonzalez 2001:19). No two jaguars have the same coloration or are marked exactly alike (Brown and Lopez-Gonzalez 2001), thus, coloration patterns can be used to identify individuals. Jaguars are one of the few species of wild cats that have melanistic (black) individuals. Black jaguars are common in certain parts of the Americas (primarily southern South America) and are often referred to as “black panthers” (no black jaguars have been documented in the northern population). As the largest species of cat native to North America, jaguars measure five to eight feet from nose to tail and weigh 140 to 300 pounds (Seymour 1989). Typically, females are slightly smaller than males (Emmons 1999).

2.2 Taxonomy

Five subspecies of jaguar were recognized by Hall (1981) and eight by Seymour (1989)¹, including two with historical ranges extending into the United States (the Arizona jaguar, *Panthera onca arizonensis*; and the northeastern jaguar, *P. o. veraecrucis*). Records from Arizona and New Mexico (and California) are attributed to *arizonensis*, the type specimen of which was collected by Jack Funk in 1924, near Cibique, Navajo County, Arizona (Goldman 1932). Nelson and Goldman (1933) described the distribution of *arizonensis* as the mountainous parts of eastern Arizona north to the Grand Canyon, southwestern New Mexico, northeastern Sonora, and perhaps southeastern California. Jaguar records for Texas, and perhaps Louisiana, have been attributed to *veraecrucis*. Nelson and Goldman (1933) described the distribution of *veraecrucis* as the Gulf slope of eastern and southeastern Mexico, from the coast region of Tabasco north through Vera Cruz and Tamaulipas to central Texas.

2.3 Population Status and Trends

The jaguar's population decline in the United States was concurrent with predator control associated with settlement of land and development of the cattle industry, especially in Arizona (Brown 1983, USFWS 1990). Hock (1955) and Lange (1960) summarized jaguar records from Arizona and New Mexico known up to that time. Between 1885 and

¹*Panthera* is used herein as the genus for the jaguar, per Nowak (1991) and others. Various earlier publications, including some of those referenced herein, refer it to the genus *Felis*.

1959, the reports consisted of 45 jaguars killed, 6 sighted, and 2 recorded by evidence such as tracks and/or droppings.

Brown (1991) related that accumulation of all known records indicated a minimum of 64 jaguars killed in Arizona after 1900. When plotted at 10-year intervals, records of jaguars reported killed in Arizona and New Mexico between 1900 and 1980 demonstrated a decline characteristic of an over-exploited resident population (Brown 1983). Further, Nowak (1975) identified killing of jaguars for commercial sale of their furs as a factor in extermination of a substantial resident population in central Texas during the late 1800s.

The number of records indicates the jaguar was probably resident in the United States, but evidence of breeding is scant. Although female jaguars have been reported from the United States, evidence of breeding north of Mexico is limited to 3 reports in Arizona: a reported kill of a female with 2 kittens near the Grand Canyon between 1885 and 1890 (Lange 1960), a reported kill of a female and her young at the head of Chevelon Creek in 1910 (Brown 1987 and Nowak 1975), and a newspaper report of a female killed and her 2 kittens captured in the Chiricahua Mountains in 1906 (Brown 1989). Recent sightings (post-1960) in Arizona and New Mexico appear to be mostly of transient males from Mexico. Of the 8 animals that have been identified to gender, only 1 was a female. It is likely that these animals had dispersed from a core population in Sonora, Mexico.

Currently, there are no known breeding populations of jaguars in the United States. However, reports of single jaguars have been recorded in the United States from 1996 to 2006 (see below). Further, a breeding jaguar population exists in central Sonora, Mexico, approximately 140 miles south of the International Border. This population has been estimated to be approximately 100 individuals (C. Lopez-Gonzalez, pers. comm.).

2.4 Distribution – Historical and Current

United States – The historical range of the jaguar in the United States includes portions of the states of Arizona, New Mexico, California, Louisiana, and Texas. Brown and Lopez-Gonzalez (2001) have compiled the most comprehensive information on the northern jaguar population. They documented 58 jaguars killed or photographed in Arizona and New Mexico from 1900 to 2000. Jaguars were reported (killed) as far north as the Grand Canyon in Arizona and the Datil Mountains in New Mexico (Brown and Lopez-Gonzalez 2001). Hill (1942) cited a report from near Springer in northeastern New Mexico. Brown and Lopez-Gonzalez (2001) noted that every distribution map published includes portions of New Mexico and Arizona as part of the species' historical range. Although there is disagreement about the jaguar's historical status, evidence strongly indicates its historical range included the southwestern United States (USFWS 1997, Swank and Teer 1989, Brown 1983, Davis 1982, Goldman 1932, Bailey 1905).

Bailey (1905) stated that the jaguar was once reported as common in southern and eastern Texas, but had become extremely rare. Nowak (1975) believed an established population once occurred along the lower Nueces River, northeast to the Guadalupe River. He suggested that jaguars probably continued to wander from Mexico into the brush country

of the southernmost part of Texas..

Goldman (1932) believed the jaguar was a regular, but not abundant, resident in southeastern Arizona. Hoffmeister (1986) considered the jaguar an uncommon resident species in Arizona, concluding that reports of jaguars between 1885 and 1965 indicated a small but resident population once occurred in southeastern Arizona. Rabinowitz (1997, 1999) suggested evidence does not support that a significant population or habitat suitable for establishing a persistent population exists in the United States. Brown (1983) suggested that the jaguar in Arizona ranged widely throughout a variety of vegetation communities, from Sonoran desertscrub upward through subalpine conifer forest. Most of the Arizona records to date have been from Madrean evergreen-woodland, shrub-invaded semidesert grassland, and along rivers.

From 1996 through February 2006, four jaguars were documented in the United States. In 1996, two separate houndsmen encountered and photographed jaguars in the United States. The first was Warner Glenn, who photographed a jaguar on March 7, 1996, in the Peloncillo Mountains, along the Arizona-New Mexico border (Glenn 1996). The Peloncillos run approximately north-south to the Mexican border, where they join the beginnings of the Sierra San Luis and other ranges that connect to the Sierra Madre Occidental. The second was Jack Childs, who photographed a treed jaguar on August 31, 1996, in the Baboquivari Mountains in southern Arizona (Childs 1998). Jaguars have also been photographed by remote-sensing cameras along the Arizona-Mexico border, beginning in 2001 and as recently as November 2005 (J. Childs, pers. comm.). Most recently, in February 2006 a jaguar was observed and photographed in Hidalgo County, New Mexico (W. Glenn, pers. comm.).

Northern Mexico - Swank and Teer (1989) described the distribution of the jaguar in Mexico as a broad belt from central Mexico to Central America. They found that the most northerly established populations, as reported by Mexican officials, were in southern Sinaloa and southern Tamaulipas. Despite rumors to the contrary, Brown (1991) did not believe the jaguar was extirpated from northern Mexico. Although jaguars were considered relatively common in Sonora in the 1930s and 1940s, he cited a population about 800 miles south of the United States-Mexico border as the most northern officially reported. However, Brown (1991) suggested there might be more jaguars in Sonora than are officially reported. He mentioned reports of two jaguars killed in central Sonora around 1970, and discussed assertions by local Indians that both male and female jaguars still occurred in the Sierra Bacatete, about 200 miles south of Arizona. Brown speculated that if a reproducing population of jaguars were still present in those mountains, it might be the source of individuals that travel northward through the Sierra Libre and Sierra Madera until they reach Arizona.

Brown and Lopez-Gonzalez (2001) summarized jaguars reportedly killed or captured in the Mexican states of Sonora and Chihuahua from 1900 to 2000. They also discussed an extant population of jaguars in the State of Sonora. They described an extant population in the rugged *barrancas* (canyons) connecting northern Sinaloa and Sonora. Other reports and photographs indicated jaguar populations in the Sierra Bacatete and adjoining lands

in the Yaqui Indian area in southeastern Sonora. However, the most northern population of jaguars reported by Brown and Lopez-Gonzalez (2001) is within a 50-mile radius of the towns of Huasabas and Sahuaripa, about 140 miles south of the U.S-Mexico border.

2.5 Habitat

Little is known about the characteristics of habitat used by jaguars in the northern extent of their range. Jaguars are known from a variety of vegetation communities (Nowak 1991, Seymour 1989), including those found in the arid American Southwest (Nowak 1994). Toward and at middle latitudes, they show a high affinity for lowland wet communities, typically swampy savannas or tropical rain forests. However, they also occur in upland vegetation communities in warmer regions of North and South America. Swank and Teer (1989) stated that jaguars prefer a warm, tropical climate, usually associated with water, and are only rarely found in extensive arid areas. However, jaguars occur in dry tropical forest in Jalisco (B. Miller pers. comm.), and were reported by local residents as recently as 1991 as being not unusual, and in fact, still hunted in the arid Sierra del Bacatete (Sonora, Mexico) (D.E. Brown and T.B. Johnson, pers.com.).

Knowledge of jaguar distribution and ecology suggests that this species occupies or at least occasionally uses a variety of habitats here at the edge of its range. This is typical of a wide-ranging “top carnivore,” which tends to have less finite habitat requirements than many other species. Recently, several studies have helped refine general understanding of habitats that have been or might be used in Arizona and New Mexico, including studies by the Sierra Institute Field Studies Program (2000), Hatten et al. (2002), Menke and Hayes (2003), Boydston and Lopez-Gonzalez (2005), and Robinson and Bradley (2005). Conclusions about the conservation importance of historical and current habitats in these two states vary widely, depending upon assumptions factored into the analyses, including reliability of historic records and their significance as a predictor of habitat quality and value as well as use by jaguars. For example, Boydston and Lopez-Gonzalez (2005) described land cover types where jaguars occurred. Predicted jaguar occurrences were on average warmer, sunnier, and had older soils than the study area as a whole. However, jaguars were not predicted to occur on Sonora’s coast, even though one male was recorded there. Jaguars occur in similar coastal habitats in northern South America (T.B. Johnson, pers. comm.).

2.6 Pertinent Biological and Ecological Factors

The list of prey taken by jaguar range-wide includes more than 85 species (Seymour 1989). Known prey species include peccaries (javelina), capybara, paca, armadillos, caimans, turtles, livestock, and various birds and fish. Although it is commonly thought javelina and deer are mainstays in the diet of jaguars in the U.S.-Mexico borderlands, other available prey, including livestock, are probably taken as well.

Similar to most large carnivores, jaguars have relatively large home ranges. Little information is available on this subject outside of tropical America, where several studies of jaguar ecology have been conducted. Quigley and Crawshaw (1992) estimated that a

minimum of 772 to 1160 mi² is needed to support 30 to 50 adult jaguars; the actual area depends upon prey density, habitat composition, and the amount of human exploitation. Individual jaguar home ranges vary from 11 to 16 mi² in Belize (Rabinowitz and Nottingham 1986) and from 10 to 20 mi² in Jalisco, Mexico (B. Miller pers. comm.). In Jalisco, home ranges tend to be smaller in the dry season than in the wet season, and females with young kittens tend to have smaller home ranges than those with older kittens (B. Miller pers. comm.). However, B. Miller (pers. comm.) has noted that individuals recorded at the same location on consecutive days have actually traveled as much as nine miles overnight before returning to that location. According to Brown and Lopez-Gonzalez (2001), the home ranges of jaguars are highly variable and depend on topography, available prey, and population dynamics. The average home range of radio-collared male jaguars in Venezuela was calculated at 19 to 30 square miles (49 and 78 sq km) (Brown and Lopez-Gonzalez 2001:60). A recent publication on sexual differentiation in the distribution potential of northern jaguars modeled distributions of males and females (Boydston and Lopez-Gonzalez 2005). Their results indicated that eastern Sonora appeared capable of supporting male and female jaguars, with potential range expansion into southeastern Arizona. In addition, New Mexico and Chihuahua contained environmental characteristics primarily limited to the “male niche,” and thus might be areas into which males occasionally disperse. Boydston and Lopez-Gonzalez (2005) further suggest the environmental requirements for female jaguars might be an important factor limiting the distribution of northern jaguars.

2.7 Regulatory Mechanisms

Convention on International Trade in Endangered Species - The jaguar is listed under the Convention on International Trade in Endangered Species (CITES) as an Appendix 1 species. CITES prohibits international trade among member nations in Appendix 1 species, including trophies, skins, and products.

Mexico – Mexico’s federal government lists the jaguar as an endangered species throughout Mexico.

Endangered Species Act - On July 22, 1997, the USFWS extended endangered status to the jaguar throughout its range, under the authority of the Endangered Species Act (ESA)(USFWS 1997). The final rule listed the jaguar as endangered throughout its range, whereas it had previously only been listed in Mexico and Central and South America.

State of Arizona - Jaguars are listed as a nongame mammal under Commission Order 14, with no open season for legal take by hunting. Violation of this order is considered a Class 2 misdemeanor. In 1998, AGFD successfully advocated state legislation (Senate Bill 1106) imposing a \$2500 criminal penalty (Class 2 Misdemeanor) and up to \$72,500 in civil penalties for unlawful take of a jaguar. These fines are commensurate with current federal penalties under the ESA. The legislation was signed into law by Jane Hull, Governor of Arizona, on May 7, 1998, but only takes effect if the jaguar is removed from the federal endangered species list. The legislature’s stated desire was to ensure that state

penalties would not be additive to current federal penalties, and would serve as an inducement to federal delisting.

State of New Mexico- In 1999, during the 44th New Mexican Legislative Session, Senate Bill 252 was signed into law establishing new regulations and penalties for illegally killing a jaguar. These would take effect if the jaguars are removed from the federal endangered species list. Although this law provided state penalties as high as the amounts for any animal protected by the state of New Mexico, these penalties are not as high as those under the federal ESA. In the 2006 New Mexico legislative session, House Bill 536 (“Unlawful Trophy Animal Disposition”) was passed and signed into law. The new law allows the New Mexico Game Commission to establish regulations that authorize higher civil damages than previously allowable for wildlife designated as trophy animals, and establishes a minimum \$2,000 in civil penalties (without requiring removal from ESA listing to take effect). Thus, higher penalties for illegal jaguar killing may be established through Commission action.

3. CONSERVATION STATUS

3.1 Threats

According to the 1997 final rule listing the jaguar as endangered, the primary threat to the species in the United States is illegal shooting. The most recent known killing of a jaguar in the United States was in 1986, in Arizona (Brown and Lopez-Gonzalez 2001). Although the demand for jaguar pelts apparently has diminished, it still exists along with the business of illegal hunting of jaguars. Conflicts between ranchers and jaguars in Sonora also might result in jaguar killings (Lopez-Gonzalez 2004).

Loss, fragmentation, and modification of the jaguar's habitat are likely to have contributed to population declines throughout its range, including those areas used by the northern jaguar population. While the extant population in Sonora occurs in an extremely rugged area (Lopez-Gonzalez 2004), habitat loss or road development into this area is at least a potential threat to this population.

Since September 11, 2001, it has become more likely that international border issues such as lighting, fencing, road construction and maintenance, vehicle traffic, bridges, border surveillance and security activities, and habitat alteration to facilitate law enforcement could potentially influence jaguar conservation. Actions, such as the signing of the North America Free Trade Agreement in 1994, increased border monitoring associated with illegal immigration starting in 1998, and homeland security since 2001 have impacted other endangered species (e.g. ocelot in Texas), and have the potential to impact current and future jaguar conservation efforts by limiting natural movement across the border (in either direction). For example, illegal immigration activities and homeland security operations are being pushed from traditional entry points into the most inaccessible zones, where impacts on the jaguar and other species might be high (Ackerman 1998). This creates a potential impact to the jaguar and other wildlife by increasing human activities in areas that traditionally had little disturbance. With the drafting of the

Programmatic Environmental Impact Statement for US Border Patrol Activities within the Border Areas of the Tucson and Yuma Sectors, AZ in October 2002 (Immigration and Naturalization Service 2002), border security actions will need to be addressed as they relate to jaguar conservation and maintaining connectivity between the United States and Mexico.

3.2 Conservation Efforts and Research in the United States

Conservation efforts are on-going for this species, with the majority of these being voluntary actions by non-governmental entities. Below, we summarize known conservation and research efforts being conducted on jaguars in the borderland region. Studies to assess the status and ecological needs of the jaguar within the borderlands region are also summarized.

Jaguar Conservation Team – In September 1996, the Arizona Game and Fish Department (AGFD), New Mexico Department of Game and Fish (NMDGF), and Texas Parks and Wildlife Department began discussing the need for a conservation agreement for jaguars. The Arizona and New Mexico agencies finalized a *Conservation Assessment and Strategy for the Jaguar in Arizona and New Mexico*, on March 24, 1997 (Johnson and Van Pelt 1997). This document described the current status of the jaguar in the United States, and identified and assessed risks to the jaguar in Arizona and New Mexico. Further, the conservation strategy portion of the document described goals, objectives, strategies, and activities intended to conserve jaguars in Arizona and New Mexico.

In 1997, the Jaguar Conservation Team (JAGCT) held its first meeting in Douglas, Arizona. The JAGCT is composed of agencies signatory to the March 24, 1997, Memorandum of Agreement for the Conservation of the Jaguar in Arizona and New Mexico (hereafter abbreviated “MOA”). It conducts its periodic meetings to discuss recent sightings, management issues, education needs, and jaguar research efforts. According to the document entitled; “Conservation Assessment and Strategy for the Jaguar in Arizona and New Mexico” (dated March 24, 1997), the JAGCT is comprised of one representative from each agency signatory to the MOA. In accordance with the MOA, the JAGCT established a Jaguar Working Group (JAGWG) to provide for direct public involvement in addressing specific jaguar conservation issues and reporting recommendations to the JAGCT. The JAGWG is thus comprised of an innovative group of ranchers, stakeholders, and State and federal representatives. Since 1997, the JAGCT and its JAGWG have established camera-monitoring in Arizona, identified habitats known to have been used by jaguars and/or potentially of use to jaguars, and developed a jaguar-centric teaching guide that meets both national and state education standards.

U.S. Fish and Wildlife Service - The Listed Cats of Texas and Arizona Recovery Plan (With Emphasis on the Ocelot) was completed in 1990 (U.S. Fish and Wildlife Service 1990). The jaguar was one of three cats addressed in this plan, but the plan primarily focuses on the ocelot. The plan only provides limited information on the jaguar, stating that the status in northern Mexico needs to be determined before recovery recommendations can be made.

Malpai Borderlands Group - The Malpai Borderlands Group is comprised of private landowners living in the Borderlands in southeastern Arizona and southwestern New Mexico, near the U.S.-Mexican border. These Borderlands total approximately one million acres and include approximately 30 privately-owned ranches and two small National Wildlife Refuges.. The goal of the Malpai Borderlands Group is to restore and maintain the natural processes that create and protect a healthy, unfragmented landscape to support a diverse, flourishing community of human, plant, and animal life in our borderlands region. After the 1996 sighting and photographs of the jaguar in the Peloncillo Mountains, the Malpai Borderlands Group met with the Arizona and New Mexico state wildlife agencies, Bureau of Land Management, Forest Service, and USFWS to discuss the sighting and its implications. As a result, the Malpai Borderlands Group established a fund to help compensate ranchers for livestock killed by jaguars. A portion of the proceeds from the book, *Eyes of Fire*, in which Warner Glenn described his 1996 jaguar sighting in the Peloncillo mountains, is donated to the Jaguar Fund.

Northern Jaguar Project - The Northern Jaguar Project, Inc., a non-profit organization based in Tucson, Arizona, is dedicated to the conservation of jaguar habitat in Sonora and the creation of a safe-haven corridor between the Sonoran breeding population and the United States/Mexico borderlands. The Northern Jaguar Project works to promote conservation ranching and stewardship and to increase regional awareness of the value of wildlife, particularly of charismatic endangered species like the jaguar. The Northern Jaguar Project works to eliminate conflict between ranchers and wildlife, particularly mountain lions and jaguars. This organization has partnered with Naturalia (see below) to set up jaguar preserves in Mexico. The two organizations signed a memorandum of agreement to cooperate in the management, operation, and expansion of the existing reserve in northern Sonora, Mexico.

All funding received by the Northern Jaguar Project goes to support the protection of habitat and wildlife in the Northern Jaguar Reserve and the surrounding area. The Northern Jaguar Project operates a small field station and research program on the reserve, in conjunction with Naturalia. Researchers are conducting studies related to large carnivores, using trip cameras and hair snares to gather data on population densities, movement, dispersal, diet, and habitat needs. Visiting researchers are conducting plant inventories and making preliminary lists of birds and insects. The Northern Jaguar Project's "jaguar guardian" program maintains a permanent presence on the reserve, an effort to ensure protection for all species.

Borderlands Jaguar Detection Project. To date, the Borderlands Jaguar Detection Project has documented 47 jaguar events inside the state of Arizona since its initiation in 2001 (Haynes et al. 2005). This includes 28 photographs, 9 sets of tracks, and 10 scat/fecal samples. These detections confirm the occasional presence of two adult male jaguars and possibly a third unidentified individual in southeastern Arizona.

3.3 Conservation and Research Efforts in Mexico

On October 12-15, 2005 the country of Mexico, under the direction of CONANP sponsored the 21st Century Mexican jaguar symposium. CONANP recognizes the value of conservation strategies, known as PREPs, for diverse species established by the specialists, and the necessity to identify the threats to species and prioritize consensus actions, set specific dates, and establish clear goals, indicators of success, responsible parties, resources, and follow-up to implement actions for conservation. Direct actions would include protection, management, and restoration of the species and its habitat, and indirect actions would include information, captive population maintenance, and administration, all in an Action Plan for the Conservation of the Jaguar over a five-year period.

Jaguar conservation in Mexico was elevated to the highest level of government when the President of the Republic declared 2005 to be “The Year of the Jaguar.” Approximately 38,000 hectares of the Sierra de Vallejo in Nayarit were decreed as State Natural Protected Areas, in coordination with Hojanay, (NGO). Fideicomiso Fund for Natural Heritage in Mexico and Banamex reached an agreement with the Ejido Ursilo Galvan, from the same mountain range, to set aside 1900 hectares as an Ejidal Sanctuary for the jaguar. Likewise, Mexico signed a brotherhood pact for protected areas with Belize and Guatemala to support a biological corridor in this critical area of “Jaguars without Borders” with Unity for Conservation (an NGO). State-specific jaguar conservation strategies have been produced for the states of Jalisco, Michoacán, and Oaxaca. In coordination with PROFEPA, communities and nongovernmental organizations have implemented community watch groups in 14 states. There are 25 such watch groups, with more than 400 rural community members that protect areas to stop hunting and change land use.

Naturalia, A.C - Naturalia is one of Mexico's most active and forward-looking conservation organizations. In 2003, Naturalia, S.A. purchased a 10,000-acre ranch in northern Sonora that has become the core of a new jaguar reserve. The reserve is dedicated to protection of jaguars and all other wildlife species present, and to the rehabilitation of habitat. The reserve has a small research field station, one of a handful of such field stations in Sonora. Staffing and operations at the field station are the responsibility of Northern Jaguar Project. At the reserve, biologists are working on the first inventories of birds, mammals, butterflies, and plant species ever done in northern jaguar habitat.

An additional trip camera project has been implemented in Sonora, south of the New Mexico border, with a goal to document jaguar presence in this part of Mexico (C. Lopez-Gonzales, pers. comm.).

4. CONSERVATION FRAMEWORK

4.1 INTRODUCTION

This Conservation Framework (Framework) describes the:

- 1) Goal of the Framework
- 2) Objectives and Conservation Actions identified to achieve the Goal
- 3) Administrative tasks required to implement the Framework.

The Framework reflects a metapopulation concept² for species persistence and an ecosystem management³ approach for habitat conservation. Planning, management, and conservation actions will be coordinated by the interstate/intergovernmental JAGCT, which was originally established in 1997 following execution of the initial Memorandum of Agreement for Conservation of the Jaguar in Arizona and New Mexico (JAGMOA). The Framework also recognizes the importance of cooperative efforts with government agencies and non-governmental organizations in Mexico. JAGCT members may be assigned to various technical subcommittees, as information (e.g. review of materials) or other needs arise. Each state wildlife agency JAGCT member is responsible for coordinating the conservation strategy activities within its respective state. Any member of the public can assist with this effort by attending JAGCT meetings, by providing comment on documents and proposed actions, and by voluntary participation in the Arizona-New Mexico Jaguar Working Group (JAGWG).

This Framework will be further developed and implemented by its federal, state, tribal, and other government cooperators, and through partnerships with private landowners and organizations. Species restoration and habitat conservation are linked to key federal, state, and private land ownership patterns. This Framework identifies both short and long-term objectives, and sets various time frames where appropriate to complete activities. The cooperators will allocate funds and personnel as available to implement this Framework. Cooperators will seek funds to facilitate implementation through their budgeting process.

²For the purposes of this document, a metapopulation of wildlife is one in which animals occur within disjunct patches of suitable habitat separated by intervening unsuitable habitat, which may result in local extinction within given patches, followed by recolonization of these patches following dispersal (McCullough 1996) In this situation, a functioning core subpopulation of jaguars in northwestern Mexico is believed essential to providing dispersing or recolonizing individuals that range into Arizona and New Mexico for as-yet unknown periods of time.

³For purposes of this document, ecosystem management means coordinated management of habitats and species within a given broad area to maintain, or restore where appropriate, biological diversity. Effective management of one species, the jaguar, cannot be achieved without considering the full spectrum of wildlife, habitats, land uses, and human factors that operate within its area of occurrence. The very presence of jaguars may indicate an increasingly hospitable landscape in Arizona-New Mexico, and/or landscape changes in Mexico that are causing jaguar populations there to increase and disperse, or to decrease through emigration.

Effective conservation of the jaguar and its habitat under this Framework will necessarily depend on cooperation of federal, state, and private landowners. Thus, all cooperators must, from the beginning, be aware of the importance of full involvement of private landowners to the extent that they wish to be involved, and further recognize the importance of compatible rural livelihoods and activities, such as ranching and outdoor recreation (including hunting and wildlife watching), and voluntary participation by private landowners in habitat identification, enhancement, and protection, as key to the Framework.

4.2 Goal

Provide coordination and conservation measures to public and private natural resource managers in the United States and Mexico that will contribute to maintaining a viable northern jaguar population.

4.3. Implementation of the Conservation Framework.

4.3.1 Memorandum of Agreement.

4.3.1.1-This Framework will be implemented through a revised Memorandum of Agreement for Conservation of the Jaguar in Arizona and New Mexico (JAGMOA), which will be signed by state and federal cooperators and local and tribal governments with land or wildlife management responsibilities in the area of interest (principally Hidalgo County, New Mexico, south of Interstate 10; and Cochise, southern Pima, and Santa Cruz counties, Arizona) that wish to voluntarily cooperate in conserving the jaguar. Timelines for implementation of Conservation Actions in the Framework will be dependent on funding, personnel availability, and other responsibilities of the individual signatories.

In an effort to encourage international cooperation for jaguar conservation between the United States and Mexico, JAGCT will solicit cooperation from federal, state, and local agencies and organizations in Mexico involved in comparable research and conservation of the northern jaguar population.

4.3.1.2-The JAGCT is not a regulatory entity, and it is fundamental that the needs of the jaguar must be met in the context of a wide spectrum of other wildlife needs and a variety of land uses on federal, state, and private lands. Thus, it follows that this Framework must be implemented in complete recognition of those factors, and through close coordination with other planning and management efforts, including federal, state, and private cooperative efforts in ecosystem management, wildlife management, allotment management, etc. The responsibility for making changes in such plans rests with the appropriate lead agency. Any JAGCT recommended changes to Allotment Management Plans or through other land management planning processes will occur through careful and considered cooperation and coordination with the lessees, permittees, other involved landowners, and any state or states having lands within the area covered by the proposal, per Section 8 of the Public Rangelands Improvement Act (PRIA) (Public Law 95-514/714/1978, U.S.C. Title 43 §1901).

4.3.1.3 Although this Framework applies to the full historical range of the northern jaguar population, it is focused in a priority geographic area that includes Cochise, southern Pima, and Santa Cruz counties in Arizona and Hidalgo County in New Mexico, basically the area from Interstate 10 south to the International Boundary. This restricted geographic approach will allow available resources to be focused in the area in which a substantive return is most likely. Expansion of the priority geographic area to include other parts of Arizona and New Mexico may eventually be warranted, and will be addressed in this Framework, if new evidence of broader jaguar occurrence becomes available.

To the extent that the Framework applies to cooperative efforts between the United States and Mexico, populations in northern Mexico may also be included in activities identified in the Framework when JAGCT activities have been appropriately integrated with conservation efforts now developing in Mexico, which are subject to approval and oversight by Mexico.

4.3.1.4 Participation in developing and implementing this Framework is strictly voluntary.

4.3.2 Operation of the Jaguar Conservation Team (JAGCT).

4.3.2.1 The JAGCT will be comprised of one representative from each government agency signatory to the JAGMOA. Multiple subdivisions of a single government entity should be represented at the highest appropriate level (e.g. the U.S. Forest Service Southwestern Region might be a signatory, rather than each individual National Forest in Arizona and New Mexico). This is necessary to ensure that members have the authority to carry out the actions to which they voluntarily agree, and that each agency has an appropriate share of the responsibility. Each signatory shall identify a representative and an alternate to represent the signatory.

4.3.2.2 In accordance with their primary responsibilities for wildlife conservation, AGFD, NMDGF, and USFWS will each (upon signing of the Framework) be known as Primary Cooperator in developing and implementing this Framework.

4.3.2.3 Other JAGMOA signatories will be known as Cooperators in developing and implementing this Framework. They will be comprised of state and federal agencies and local and tribal governments. The cooperators may include the Bureau of Land Management (Arizona and New Mexico), National Park Service, USDA Forest Service (SW Region), USDA Wildlife Services (Arizona and New Mexico), the Arizona and New Mexico State Land Departments, the Arizona and New Mexico Departments of Agriculture, and the counties of Cochise, Pima, and Santa Cruz (Arizona) and Hidalgo (New Mexico), and possibly others. The Border Patrol and the Immigration and Naturalization Service are also encouraged to participate as Cooperators, in regard to their land-use activities along the Arizona-New Mexico/Mexico Border. The JAGCT will also solicit participation by entities in Mexico to enhance this trans-border conservation effort.

4.3.2.4 Interested private citizens and organizations will be encouraged to cooperate with the JAGCT by attending its public meetings and by participating in voluntary, action-specific agreements to promote jaguar conservation and education activities. Information on meetings, activities, and links to other relevant web sites will be provided on the AGFD's website and through a self-subscription electronic newsletter, *Endangered Species Updates*.

4.3.2.5 The JAGCT will coordinate and assist in directing the activities outlined in this Framework. It will also review information provided by interested and affected parties, outline management guidelines, research, and education needs, and identify known and potential funding sources for carrying out this work.

4.3.2.6 The JAGCT will meet publicly at least once annually, and more often as deemed appropriate by the Cooperators. Agendas for JAGCT public meetings will be available to the public at least 30 calendar-days in advance, via notice posted on the AGFD website.

4.3.2.7 JAGCT public meetings will be held in available venues in southeastern Arizona and southwestern New Mexico, on a rotational basis between the two states whenever possible. In the event that jaguars are found to occur in other areas of Arizona-New Mexico, locations for JAGCT public meetings will be re-set to ensure that each general area of occurrence has an equitable share of the JAGCT meetings.

4.3.2.8 JAGCT will be chaired by a representative from one of the two state wildlife agencies. This will ensure appropriate administrative support for JAGCT meetings. The chair's term of office will be one year, without limit on the number of terms served.

4.3.3 Operation of the Jaguar Working Group (JAGWG)

4.3.3.1 The JAGCT will continue to use a JAGWG, to provide for direct public involvement in addressing specific jaguar conservation issues and reporting recommendations back to the JAGCT.

4.3.3.2 Participation in JAGWG is strictly voluntary, and consists of attendance at JAGCT meetings and/or participation in JAGCT activities.

4.3.3.3 JAGWG participation may be at the individual or the organizational level. All agencies, organizations, and individuals with an interest in jaguar biology, conservation, and management are encouraged to participate.

4.3.3.4 JAGWG participants will be informed of all JAGCT meetings at least 30 calendar-days in advance by notice distributed through the AGFD website.

4.3.4 Operation of the Jaguar Scientific Advisory Group (JAGSAG).

4.3.4.1 The JAGCT will continue to work toward providing an improved and sound scientific basis for jaguar management and an avenue for enhanced technical information exchange. Toward that end, it will maintain a non-cooperator affiliated Jaguar Scientific Advisory Group (JAGSAG) to review appropriate aspects of its work, such as its survey and research findings and its management recommendations. Meetings of the JAGSAG will be held on an as-needed basis, and may be conducted through teleconferencing or electronic format to facilitate participation.

4.3.4.2 In appointing members of the JAGSAG, the JAGCT will give preference to individuals with expertise in the areas needed for jaguar conservation.

4.3.4.3 Any information and analysis or summary of information assembled by the JAGSAG shall be made available to the JAGCT.

4.3.5 Conservation and Cooperation with Mexican Partners

4.3.5.1 The primary cooperators will continue to ensure that coordination with Mexico occurs within the framework of the Trilateral Committee, which meets annually, and is comprised of the United States, Mexico, and Canada. Participation by cooperators and stakeholders from Mexico in JAGCT meetings will also continue to be encouraged.

4.3.5.2 Through the Trilateral Committee, the JAGCT will continue to encourage and support Mexico's ongoing efforts to determine the present distribution and status of jaguars and jaguar habitats within its boundaries, and to identify areas important to natural movement of jaguars into Arizona and New Mexico and back into Mexico. As relevant information becomes available from studies assessing habitat and needs of a viable northern jaguar population, JAGCT will work with Mexico to ensure that all relevant information is available to Mexico for consideration.

4.3.5.3 Through the Trilateral Committee, the JAGCT will continue to cooperate with agencies, organizations, and individuals in Mexico to explore the possibility of developing a bi-national jaguar conservation plan for the border region, integrating this Framework with the emerging Mexico strategy.

4.3.6 Cooperation with the Native American Nations

4.3.6.1 The JAGCT will encourage and provide technical support when requested to appropriate Native American Tribes in the United States to determine the present distribution and status of jaguars and to identify possible jaguar travel areas.

4.4 Objectives and Conservation Actions

Objectives to achieve the Goal of this plan are identified in bold in the following sections. Conservation actions identified to achieve specific objectives are listed in the subsections under each objective. Conservation actions are not necessarily listed in order of priority. On-the-ground activities pursuant to this Framework shall not occur on private lands without prior permission from the landowner(s).

4.4.1 Identify habitat characteristics and distribution of the northern jaguar population.

4.4.1.1 JAGCT will continue to review relevant literature, advocate and provide support for jaguar studies, and incorporate findings from current jaguar studies, to identify and continually refine understanding of habitat use-patterns, using ground-tested methods as appropriate to the area inhabited by the northern jaguar population.

4.4.1.2 AGFD and NMDGF will continue to collect and compile jaguar distribution and occurrence information, based on verified sightings and other information relevant to conservation of the species, from the United States, northern Mexico, and elsewhere as appropriate. They will collect these data through mechanisms such as investigation of jaguar reports, verification of sightings, and other field observations. As necessary, funding and field support from cooperators, outside agencies, organizations, and individuals will be sought to assist in this work. Compiled occurrence information will be submitted to at least three experts in the field for evaluation as to accuracy and importance. Collection of additional information will be ongoing.

4.4.2 Identify and map habitat of the northern jaguar population, including key linkages from Mexico to the United States.

4.4.2.1 The primary cooperators, in cooperation with other signatories, will coordinate with partners in Mexico and the United States to identify and assess areas occupied seasonally or otherwise by jaguars. At a minimum, these assessments will consider physical features important for jaguars, and attempt to identify the nature and important components of areas that may facilitate connectivity between Mexico and the United States.

4.4.2.2 AGFD and NMDGF will maintain and revise as needed state-specific maps delineating land ownership patterns overlaid with jaguar distribution information, including habitats of known and potential occurrence, insofar as such areas and habitats can be delineated at that time. Private lands on such maps will not list or be described by individual property names or owners. These maps will be a primary basis for evaluating constraints to, and opportunities for ensuring jaguar presence within each state, i.e. they will focus JAGCT efforts to ensure that jaguars are not killed unlawfully or unintentionally and that their ability to move freely across the landscape is not unnecessarily and inappropriately constrained.

4.4.3 Assess threats to the northern jaguar population and identify limiting factors

4.4.3.1 The JAGCT, in cooperation with partners in the United States and Mexico, will provide recommendations for assessing the benefits and impacts of current and planned actions on the jaguar in the United States and Mexico.

4.4.3.2 JAGCT members will share information on any impact assessments they conduct regarding proposed actions occurring where jaguars may occur and provide those results to JAGCT for informational purposes and for possible summarization in the JAGCT annual report. JAGCT members may request assistance from other members of JAGCT to assist with impact assessments. It is anticipated that such assessments would be part of the agency's existing review and evaluation process for proposed actions (e.g. NEPA and ESA Section 7 compliance measures), where applicable.

4.4.4 Conserve habitat of the northern jaguar population, including key habitat linkages from Mexico to the United States.

4.4.4.1 The JAGCT will provide technical assistance and conservation recommendations to the Border Patrol and other federal agencies on issues, such as border security actions and border infrastructure, that might constrain movement of jaguars between the United States and Mexico.

4.4.4.2 The JAGCT will assist Mexico, as appropriate, in encouraging land managers to conserve or enhance habitats, including corridors connecting habitat blocks, to ensure that the jaguar's current and future needs for natural dispersal and habitat expansion are appropriately addressed for the northern jaguar population. JAGCT will also continue to cooperate with Mexico in developing guidelines for habitat conservation and enhancement appropriate for each country but contributing toward the overall conservation goal.

4.4.4.3 The JAGCT will assist land and resource managers, as appropriate, both north and south of the international border to conserve key habitat linkages, in order to ensure that the jaguar's current and future needs for natural dispersal and range expansion are appropriately addressed for the northern jaguar population.

4.4.4.4 JAGCT will assist Mexico, as appropriate, in developing funding for conservation and enhancement of jaguar habitat in the northern jaguar population area.

4.4.4.5 Implementation of conservation measures for private lands shall occur only in response to invitation from the landowner(s). Private property owners shall not be involuntarily subject to any such measures.

4.4.4.6 The JAGCT will monitor and identify new, continued, or diminishing management issues and concerns relevant to conservation of the northern jaguar population. A list of identified issues and concerns will be made available to the public via the JAGCT website.

4.4.4.7 The JAGCT will identify possible incentives available for landowners that would encourage the presence of jaguars within the area.

4.4.4.7.1 Private property owner claims in the United States for compensation for livestock lost to jaguar depredation will continue to be referred to the Malpai Borderlands Group for payment from a fund established for that purpose, and will be based on established compensation and jaguar kill identification guidelines. Updates to these guidelines will be made available to the JAGCT for informational purposes. The JAGCT will coordinate with Mexican partners to determine if a similar program can be developed in Mexico.

4.4.4.7.2 The JAGCT will conduct workshops as needed to identify landowner, land manager, and permittee issues and concerns related to jaguar conservation and to develop solutions. Workshops would incorporate discussion of conservation biology at the landscape level, property rights, land-use philosophies, and other relevant topics and should involve JAGCT members, agency decision-makers, and other interested members of the public.

4.4.5 Protect jaguars in the United States

4.4.5.1 Trapping practices and guidelines

4.4.5.1.1 Predator control activities by cooperators will not be purposefully directed at jaguars. However, it is understood by all cooperators that predator control activities are subject to a variety of federal and state laws, local ordinances, and oversight by various federal and state land management, wildlife management, and agricultural agencies or programs. Thus, any JAGCT discussions or recommendations regarding predator control must be carefully coordinated with those entities. In the future, JAGCT may modify current recommendations in this Framework based upon new information being collected.

4.4.5.1.2 For purposes of predator control within the priority geographic area, USDA Wildlife Services will continue not using leghold traps with a jaw spread larger than a #3 Victor (the #3 Victor and equivalent or smaller leghold traps are too small to hold a jaguar).

4.4.5.1.3 The JAGCT will continue to evaluate, as necessary, possible effects of leg-hold traps, M-44s, and similar predator control devices on jaguars in the above-referenced geographic area and propose potential revisions to the allowable devices and areas of use, should new evidence of impacts to jaguars become available.

4.4.5.1.4 In the event that USDA Wildlife Services or other agents kill, injure, or trap a jaguar during lawfully authorized predator control activities: the incident shall immediately be reported to the primary cooperators; the capture method resulting in such take will cease immediately within 25 miles of the take location and within 25 miles of any other location of a confirmed reliable jaguar occurrence within the preceding six months; and, USDA Wildlife Services will solicit guidance from the primary cooperators to determine how to proceed and whether additional guidelines and/or mitigation measures should be established for use of such methods in the priority geographic area.

4.4.5.1.5 JAGCT will continue coordinating with the Arizona and New Mexico Departments of Agriculture, Wildlife Services, and the County Extension Services of Arizona and New Mexico to review wildlife depredation control measures practiced within the priority geographic area to ensure that they do not compromise jaguar occurrence in, or population expansion into, Arizona and New Mexico.

4.4.5.2 State legal disincentives

4.4.5.2.1 AGFD and NMDGF will continue to evaluate the need and ability to equalize or increase their state legal disincentives for unlawful take of jaguars. They may also include recommending increased criminal penalties (fines and prison terms) for unlawful take.

4.4.6 Conduct research to improve knowledge of jaguars

4.4.6.1 If a jaguar is found residing in or consistently inhabiting areas within Arizona and/or New Mexico, or along the International Border, the state wildlife agencies and USFWS will make a concerted effort to monitor its movements through the least intrusive, but most effective, means possible. Further, any jaguar captured in a trap shall be reported to the appropriate state wildlife agency and USFWS before release, so a decision can be made as to whether to radio-collar and monitor it. If the trapped animal is judged by those on site to be in danger of debilitating injury or death prior to the opportunity to radio-collar, it shall be released and the appropriate state wildlife agency will coordinate subsequent monitoring and assessment of the trap location, with support from the JAGCT.

4.4.6.2 JAGCT will review and revise as necessary, based on new information, its existing procedures for handling jaguars that are captured alive.

4.4.6.3 The primary cooperators, in cooperation with other signatories, will continue to coordinate and maintain a jaguar sighting report procedure and database that will enable cooperators and the public to assist in providing information about occurrence of the species. The system will continue to include detailed criteria by which to assign a credibility ranking, so confirmed records are the primary basis for JAGCT recommendations and actions. The criteria address such factors as type and quality of sighting (e.g. distinct tracks, clear and well focused photograph, detailed sight record), the observer's experience with jaguars and similar species, weather conditions at time of sighting, total time in which the animal was under observation, etc.

4.4.6.4 JAGCT will continue to update and make available reports on the status of the jaguar in Arizona-New Mexico, on the basis of scientific literature and all relevant information gathered pursuant to this Framework. Draft reports will be submitted to at least three qualified and appropriate individuals for review, and to the general public for comment. Finalized reports will be made available to the public.

4.4.6.5 JAGCT will evaluate the feasibility of a Population and Habitat Viability Analysis/Assessment (PHVA) for the northern jaguar population as a means of better defining the conditions under which a viable northern jaguar population can be maintained, including potential population projections in Arizona, New Mexico, and northern Mexico, and established timelines for achieving allowable population sizes via natural recruitment.

4.4.7 Develop and implement information and education programs to promote conservation of jaguars and their habitat

4.4.7.0 The JAGCT will monitor jaguar research and management publications and unpublished reports and inform the public of their availability.

4.4.7.1 JAGCT will continue to promote public support of jaguar conservation through development and distribution of informational and educational material (e.g., brochures, media kits, web pages, etc.). Jaguar conservation efforts must have the support of an informed public throughout the species' range in Arizona, New Mexico, and Mexico. Public support will facilitate implementation of the Framework and enhance funding opportunities. The public that will be targeted for information and education efforts will include wildlife viewers, hunters, ranchers, farmers, other private landowners, conservation groups, and local governments. All educational materials developed by or for the JAGCT shall be reviewed by professional educators with appropriate expertise, the JAGWG, and/or a subcommittee established by the JAGCT. Where practical, materials will be made available in Spanish as well as English.

4.4.7.2 Specific information and education actions

4.4.7.2.1 AGFD and NMDGF will continue to promote their 24-hour "hot lines" (1-800 numbers) for reporting wildlife violations, and rewards for information that leads to convictions. Private donations will be sought to supplement the rewards offered by the state agencies for convictions in cases of unlawful take of jaguars.

4.4.7.2.2 The JAGCT will develop and maintain a balanced, scripted slide show or PowerPoint presentation on jaguar conservation for general use by cooperators. Any group that desires to participate in this or a similar effort, or to adapt these materials for its own use, whether or not at its own expense, must provide the materials for review by the JAGCT, and acknowledge in said materials whether JAGCT endorsed the final product.

4.4.7.2.3 The JAGCT will, at a minimum, produce and distribute: jaguar conservation information for distribution through annual hunting regulations publications, hunting license vendors, or other outlets; a jaguar fact sheet summarizing the status of the species and its conservation needs available through the internet or other means; jaguar conservation articles for agency magazines; and a segment on the jaguar conservation effort for at least one agency television show episode.

4.4.8 Evaluate progress and accomplishments.

4.4.8.1 In January of each year following execution of the revised JAGMOA, the Directors of AGFD and NMDGF will jointly submit a written annual report on activities implemented to date to conserve the jaguar. The report will be based on and will reference specific Objectives and Conservation Actions identified in the Framework and will identify tasks that were proposed in the previous year and accomplished or not accomplished. The report will be submitted to the USFWS, and made available to all interested parties.

4.4.8.2 The JAGCT will use an adaptive management approach to evaluate implementation of the Framework and incorporate necessary revisions to the Conservation Actions based on changed circumstances.

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