CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

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Twenty-fifth meeting of the Animals Committee
Geneva, (Switzerland), 18-22 July 2011

Periodic review of animal species included in the CITES Appendices

Periodic review of Felidae

REVIEW OF THE STATUS OF THE JAGUAR (*PANTHERA ONCA*) IN THE APPENDICES

1. This document has been submitted by the CITES Scientific Authority of Mexico[*].

2. At its 13th meeting (Bangkok, June 2004), the Conference of the Parties included the family Felidae in the Periodic Review of the Appendices through the adoption of Decision 13.93 [now Decision 13.93 (Rev. CoP15)]. With a view to contributing to the review, at the 23rd meeting of the Animals Committee (Geneva, April 2008), Mexico offered to undertake the periodic review of the jaguar (*Panthera onca*) throughout its range.

3. Mexico's CITES Scientific Authority contacted Dr Rodrigo Medellín Legorreta of the Institute of Ecology at the National Autonomous University of Mexico (UNAM), a specialist in the ecology and conservation of terrestrial vertebrates, to undertake the project "Periodic review of the jaguar (*Panthera onca*) in the CITES Appendices, " funded by CONABIO.

4. The project involved a comprehensive review of available sources of information, consultation with the CITES Scientific and Management Authorities of all the range States of the species, using standardized questionnaires, and also organization of an expert symposium entitled *The jaguar in the 21st century: the continental perspective* (Mérida, Mexico, November 2009). Those steps enabled updated information to be gathered on the taxonomy, distribution, habitat, biology, morphology, population and habitat size, status and trends, threats, management, utilization and trade (legal and illegal) and conservation.

5. As the outcome, a Fact Sheet was produced based on Annex 6 of Resolution 9.24 (Rev. CoP15). The most relevant information in the sheet is described in Section 1 of the present document.

6. Additionally, an assessment was performed of the status of the species in the CITES Appendices, based on applying the criteria for amending Appendices I and II [Resolution 9.24, (Rev. CoP15)]. This assessment is presented in Section 2 of this document.

7. From the results of the project, it was concluded that:
   - The species meets criterion C of Annex 1 of Resolution Conf 9.24 (Rev. CoP15) for inclusion in Appendix I. That is, there is a decline in the population size in the wild, and it is inferred that there will be an additional decline owing to current losses in area and quality of habitat, a trend which will be exacerbated due to high vulnerability to factors intrinsic to the species. Additionally, it meets trade criteria ii), iii) and iv) (see Section 2 of the document).

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[*] *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat or the United Nations Environment Programme concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

- The conclusions of the symposium *The jaguar in the 21st century: the continental perspective* confirm the estimate reported in 2002 (Sanderson *et al*., 2002b) that there has been a decline of 46 % in the size of the historical range of the species and a decrease of more than half in the size of its population over the last 100 years. They also make it clear that these processes and trends are still present today.
- The main threat to jaguar populations identified during the symposium is direct hunting, either arising out of human-jaguar conflicts because of their opportunistic preying on livestock, or in order to make use of pelts and fangs, or for sport. Other threats include hunting of the species on which the jaguar preys, and conversion and fragmentation of habitat (Sanderson *et al*., 2002b).
- Although commercial taking of wild jaguars is not legally permitted in any of its range States, there do exist records of illegal killings to supply local markets with pelts, fangs and meat for medicinal purposes.
- Internationally, 205 illegal movements relating to the species have been recorded between 1975 and 2010, of which 73 % were of pelts.

8. Based on the information collected and the above arguments, it is considered that inclusion of the species in Appendix I is appropriate and it is recommended that it be kept there, consistent with the criteria for amendment of Appendices I and II, and in accordance with Article II, paragraph 1, of the Convention.

9. The Animals Committee is invited to consider the results of the periodic review of the jaguar and to recommend that the species be retained in Appendix I.

SECTION 1 – Summary of the Fact Sheet on *Panthera onca*

Taxonomy

Class	Mammalia
Order	Carnivora
Family	Felidae
Genus, species or subspecies	*Panthera onca* (Linnaeus, 1758)

Seymour (1989) recognizes eight subspecies: *P. o. arizonensis* (Goldman, 1932) from southern Arizona in the United States of America to Sonora, Mexico; *P. o. centralis* (Mearns, 1901) in Central America and extending to the north of Colombia; *P. o. goldmani* (Mearns, 1901) in the Yucatan Peninsula, Guatemala and Belize, *P. o. hernandensii* (Gray, 1857) in western Mexico; *P. o. onca* (Linnaeus, 1758) from Venezuela (Bolivarian Republic of) to the Amazon and also in Suriname, Guyana and French Guiana; *P. o. paraguensis* (Hollister, 1914) in southern Brazil, Argentina, Paraguay and formerly in Uruguay; *P. o. peruviana* (Blainville, 1843) in Peru and Ecuador; and *P. o. veraecrucis* (Nelson and Goldman, 1933) from Texas, United States to south-eastern Mexico. However, the genetic study by Eizirik *et al*. (2001) does not recognize subspecies for the jaguar.

Scientific synonyms

Seymour (1989) recognizes 11 synonyms for *Panthera onca*: *Felis onca* (Linnaeus, 1758), *Felis nigra* (Erxleben, 1777), *Felis panthera* (Schreber, 1778), *Felis jaguar* (Link, 1795), *Leopardus hernandensii* (Gray, 1857), *Felis jaguarete* (Liais, 1872), *Felis jaguapara* (Liais, 1872), *Felis centralis* (Mearns, 1901), *Felis paraguensis* (Hollister, 1914), *Felis notialis* (Hollister, 1914) and *Felis ramsayi* (Miller, 1930).

Common names

Jaguar (English, French, German, Spanish), yaguareté (Guarani), jaguareté (Paraguay), yaguar [Venezuela (Bolivarian Republic of)], onça verdadeira (Brazil), balam (Maya), barum (Lacandon Maya), otorongo (Peru), penitigri (Suriname), tig marqué (French Guiana).

Species characteristics

Distribution

Until 1900, the jaguar (*Panthera onca*) was distributed over an area of about 19,100,000 km² (Seymour, 1989; Swank and Teer, 1989, Sanderson *et al.*, 2002a, Sanderson *et al.*, 2002b) in 21 countries of the American continent, from the southern United States to southern Argentina. Currently, the species is found in 46 % of its historical range (approximately 8,750,000 km²) in the United States, Mexico, Belize, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela (Bolivarian Republic of), Guyana, Suriname, French Guiana, Ecuador, Peru, Brazil, Bolivia (Plurinational State of), Paraguay and Argentina (see Figures 1 and 2 in the Annex). It has disappeared from El Salvador and Uruguay. South America has 93 % of the potential habitat, followed by Central America with 5.5 % and Mexico with 1 % (Sanderson *et al.*, 2002a and 2002b).

Habitat

Throughout their range, jaguar use as their habitat a large number of vegetation types, including tropical and temperate forests, grasslands and drylands. It has also been documented that they use both primary and secondary forest (Sanderson *et al.*, 2002a, Sanderson *et al.*, 2002b; Zarza, 2008). The analysis of the conservation status and distribution of jaguars performed 10 years ago (Sanderson *et al.*, 2002a and 2002b) determined the Jaguar Geographic Regions, which are units defined by the potential type of habitat and bioregion. In terms of the jaguar's historical range, the Jaguar Geographic Regions are 39 % tropical lowland rainforest, 22 % tropical dry forest, 13 % arid habitats and 10 % lowland herbaceous pastures (Sanderson *et al.* 2002a and 2002b .)

Biological characteristics

The jaguar is an opportunistic land hunter. It has a broad spectrum of prey and its diet depends on the availability thereof (Seymour, 1989). More than 85 species have been reported in its diet, including fish, reptiles, birds and mammals. Mammals weighing over 1 kg and some reptiles and birds are the most common prey (Seymour, 1989). Table 1 in the Annex shows the most important prey of the jaguar, by country.

The breeding season varies by geographical area (Chávez, 2006). Litters have been reported in June, July, August, September, November and December (Leopold, 1959; Seymour, 1989; Quigley and Crawshaw, 2002). New data obtained in the Pantanal region of Brazil indicate that there is probably no defined breeding season and that the jaguar's mating system is polygamous and promiscuous (Cavalcanti and Gese 2009). The average gestation period is 93 to 105 days and the litter is from one to four offspring, usually two. Cubs are

altricial. They start following their mother a month and a half or two after birth and stay with her for 15 to 22 months (Oliveira, 1994). Females reach sexual maturity at between two and three years of age and do not mate again while they are still looking after their young; males mature at between three and four years of age (Tewes and Schmidly, 1987; Seymour, 1989). Life expectancy is 10 to 12 years in the wild and up to 22 years in captivity (Chávez, 2006). Dispersion (separation from the mother) occurs between 18 and 24 months and males tend to disperse over greater distances than females (Quigley and Crawshaw, 2002; Crawshaw *et al.*, 2004).

The jaguar is a species of solitary habits, except in the mating and breeding seasons (Chavez, 2006; Zarza, 2008). Like other species of the genus *Panthera*, mating occurs at roughly two-year intervals (Quigley and Crawshaw, 2002; Carrillo *et al.*, 2009). Females have territories smaller than those of males, and the territory of a male overlaps with and includes that of several females (Schaller and Crawshaw, 1980; Rabinowitz and Nottingham, 1986; Chavez, 2006; Cavalcanti and Gese 2009).

The areas of activity of the jaguar vary in size, apparently in inverse proportion to the abundance and availability of prey (Chávez, 2006). The areas range from 10 to 65 km² for females and 25 to 130 km² for males (Schaller and Crawshaw, 1980; Rabinowitz and Nottingham, 1986; Crawshaw and Quigley, 1991; Ceballos *et al.*, 2002; Scognamillo *et al.*, 2003; Nuñez, 2006; Azevedo and Murray, 2007). Recent studies with GPS radio-collars gave estimated areas of activity from 69 to 492 km² for females and from 152 to 650 km² for males (Cavalcanti and Gese 2009; McBride, 2009; Chavez, 2010; O. Figueroa, personal communication).

The jaguar has few natural predators and there is very little information on the impact of infectious or parasite-borne diseases. Like other big cats, mortality and reproductive success are related to the abundance of prey and water as well as to dispersion and migration (Chavez, 2006). The main cause of mortality in the species is related to anthropogenic factors (Woodroffe and Ginsberg, 1998; Sanderson *et al.*, 2002b). Recently, as one of the main outcomes of the expert symposium *The jaguar in the 21st century: the continental perspective*, it was noted that direct hunting is the most significant cause of mortality in the species.

Morphological characteristics

The jaguar is the largest feline in the Americas (Seymour, 1989; Swank and Teer, 1989), and the third largest of all cats after the lion (*Panthera leo*) and the tiger (*Panthera tigris*). Its body is robust, with short and muscular legs, broad head, small rounded ears and a short tail that ends in a point and does not exceed one third of total body length. It has a robust skull, broad in the face and in the zygomatic arch. The sagittal crest is well developed. The pelt varies in colour from pale yellow to reddish brown and changes to white on the cheeks, chest and insides of the legs. The body shows rosettes or rings, which regularly have one or more black spots inside them. Melanistic jaguars have been reported in some locations (Tewes and Schmidly, 1987). The subspecies of Mexico and Central America are smaller than those of South America (Oliveira, 1994), but females generally measure from 1570 to 2190 mm in length and males from 1720 to 2410 mm (Seymour, 1989). Body weight is greater in males (64 to 114 kg) than in females (45 to 82 kg, Leopold, 1959). The tooth pattern is 3/3 incisors, 1/1 canines, 3/2 premolars, 1/1 molars (Hall, 1981).

Role of the species in its ecosystem

Jaguars are at the top of the food chain of the ecosystem in which they live, and consequently it has been suggested that they control the populations of mesopredators and herbivores, in a system of top-down regulation (Hairston *et al.*, 1960; Mengue, 1992; Palomares *et al.*, 1995; Crooks and Soulé, 1999; Miller *et al.*, 2001; Miller and Rabinowitz, 2002; Terborgh, 2005). Thus, it may be anticipated that removal of the jaguars, as would happen with other large carnivores, would cause significant changes in the structure of the ecological communities they inhabit (Ray *et al.*, 2005).

Status and trends

Habitat trends

It is estimated that habitat fragmentation and conversion affect 21 % of the jaguar's range, notably in Mexico, the United States, Brazil and Argentina (Figures 1 and 2 in the Annex). The fauna loss caused by hunting of its prey occurs in 27 % of its range, reducing habitat quality (Sanderson *et al.*, 2002b). Females are more sensitive to anthropogenic habitat changes than males, as they select the least disturbed sites within their areas of activity, avoiding roads and paths, while males may move into areas with livestock and low-intensity agriculture and stockbreeding (Conde *et al.*, 2010; Coachman *et al.*, 2010). Although the jaguar may also be present in secondary habitats with some degree of human disturbance (Bush *et al.*, 2007; Chavez, 2010), it does require a minimum of diversity and abundance of prey to survive (Chávez, 2006).

Geographic trends

Based on the maps of historical distribution up to 1900 (Seymour, 1989) and those developed in 2002 (Sanderson *et al.*, 2002a and 2002b), it may be estimated that the jaguar has lost about 10,350,000 km^2 of its historical range in 100 years (retaining 46 %) (Figures 1 and 2).

Population size

There is currently no accurate estimate of the number of jaguars at the continental level, and estimated population sizes by country are extrapolations from local monitoring. Based on those, average densities of 2 ± 1 to 5.7 ± 3.25 individuals per km^2 in 12 of its 19 range States are reported. Thus, Nicaragua reported sampling sites with the lowest densities (1-2 specimens/100 km^2) and Belize and Guatemala those with the highest densities (around 12 specimens/100 km^2). Table 2 in the Annex summarizes the available information on estimated densities and population sizes in all countries that are currently range States.

Population structure

According to reports given by experts in the symposium *The jaguar in the 21st century: the continental perspective* (2009), there is no information on jaguar population structure.

Population trends

There is not yet a monitoring programme of jaguar populations over the long term, which would enable population trends to be assessed. However, the general perception is that jaguar populations continue to decline throughout its range (Swank and Teer, 1989; Sanderson *et al.*, 2002a; Sanderson *et al.*, 2002b; Sanderson *et al.*, 2002c; Caso *et al.*, 2008; see Section 2.2). Figure 3 in the Annex shows the updated potential distribution of the jaguar, indicating the areas that have a high probability that populations will remain and those where it is necessary to take action to prevent the loss of populations.

The jaguar has disappeared from El Salvador and Uruguay (Caso *et al.*, 2008). It appears that the main cause of its extinction in Uruguay was systematic hunting to satisfy the international demand for pelts. According to Humboldt, 2,000 jaguar skins were exported annually from the port of Montevideo in the early 1800s (Cabrera and Yepes, 1940). In 1808 the most important trade in the department of Canelones was in jaguar pelts (Acosta and Lara, 1983). No precise data are reported on the causes of extinction in El Salvador.

Threats

During the symposium *The jaguar in the 21st century: the continental perspective* held in 2009, hunting (for sport, resulting from conflicts with farmers, or for their pelt, products and derivatives) was identified as the main threat to wild jaguar populations. Moreover, according to Sanderson *et al.* (2002b), 10 years ago this threat was present in at least 31 % of its range. The second most significant threat is the hunting of its prey, and according to Sanderson *et al.* (2002b) this threat impacted the jaguar in at least 27 % of its range 10 years ago. Third, habitat conversion and fragmentation affect 21 % of its range (Sanderson *et al.*, 2002b), thus also posing a severe threat.

Utilization and trade

National utilization

Jaguars may not lawfully be taken from their natural environment in any of their range States. Despite this, in Bolivia (Plurinational State of), Brazil, Colombia, Ecuador, Mexico, Nicaragua, Panama, Paraguay and Peru, there are records of illegal killing to supply the local market with trophies, pelts and fangs, and in some cases to enable the consumption of meat for medicinal purposes. In exceptional cases, the killing of "problem specimens" is allowed with a special permit, in countries such as Costa Rica and Belize. In Brazil, such specimens may be moved to a different location. Collection and capture for scientific purposes are regulated by national laws in countries such as Brazil, Mexico and Guatemala. Additionally, the jaguar is exhibited for educational purposes in Belize, Brazil, Mexico, the United States and Uruguay

Legal international trade

The UNEP-WCMC (United Nations Environment Programme, World Conservation Monitoring Centre) database reported 926 events of legal international trade in the species in the period 1975-2010 (UNEP-WCMC CITES Trade Database, 2011). Of all the events, 22 % relate to animals bred in captivity. Trade is mainly in live animals (30.9 %) and pelts (12.1 %). Most international trade in the jaguar is limited to animals for zoos (14.3 %), for personal use (6.8 %), for commercial purposes (6.3 %), for circuses or traveling exhibitions (4.5 %) and for scientific purposes (3.1 %). The main exporting countries in the period under consideration are Germany (8.4 %), the United States (7.8 %), Mexico (6.6 %), the United Kingdom of Great Britain and Northern

Ireland (6.6 %) and Brazil (5.2 %), while the major importers are the United States (25.4 %), Canada (6.0 %), Germany (5.6 %), China (3.8 %) and the United Kingdom (3.1 %).

Between 1992 and 2009, there were 26 records (8.53 %) involving specimens from the wild (source code W) or specimens that did not meet the definition of "bred in captivity," according to Resolution Conf. 10.16 (Rev.) (code F). These individuals included specimens intended as hunting trophies (code H, 2 specimens), for circuses and exhibitions (code Q, 26 specimens), trade (code T, 2 specimens) and zoos (code Z, 24 specimens). For these 26 records, the main exporters were Brazil (4 records), Guatemala (4 records) and Mexico (3 records), while the major importers are the United States (10 records) and Mexico (5 records).

Illegal international trade

The UNEP-WCMC database, for the period 1975-2010 (CITES Trade Database, 2011), has recorded 205 events of illegal trade in the species (18.1 % of total records). The intended purpose of 84 % of these events is unknown. Most of the items involved in illegal trade in the species were pelts (73.1 %), followed by clothing (5.4 %). Of these records, the greatest proportion (20 %) are from unidentified countries, followed by Mexico (12 %), Bolivia (Plurinational State of) (9.3 %), Peru (9.3 %), Colombia (5.4 %) and Guatemala (4.4 %). The main importers are the United States (86.3 %), Canada (3.9 %) and Spain (2.4 %).

In many of the range States of this species, surveillance at the borders is not sufficient to prevent smuggling of wildlife specimens. The experts and Management Authorities consulted consider the illegal trade to be an indicator of the potential demand for the species in markets. Local trade in pelts, fangs and other jaguar products seems to be a by-product of hunting of jaguars because they have been preying on domestic livestock, or of opportunistic hunting of them. Apparently, interest in commercial killing of jaguars declined along with the legal trade in pelts when the species was listed in CITES Appendix I.

Actual or potential trade impacts

Illegal hunting of and trade in specimens are considered a threat to the survival of the species in Argentina, Belize, Costa Rica, Ecuador, Nicaragua, Panama and Peru. In the opinion of the experts and authorities consulted, listing the jaguar in Appendix I has kept the combination of supply and demand for pelts and other jaguar products at a low level, so that allowing international trade in the species would have a greater impact than the sum of the effects caused by current threats, putting its long-term survival at risk.

Species management

Management measures

The jaguar is currently subject to programmes for conservation and management of captive animals, carried out by government agencies in countries such as Argentina, Belize, Guatemala, Paraguay, Mexico and the United States, and by non-governmental organizations in Bolivia (Plurinational State of), Guatemala, Panama, Paraguay and Mexico. None of the range States has plans for its utilization.

Population monitoring

Monitoring and research projects are carried out at local level in Argentina, Belize, Bolivia (Plurinational State of), Costa Rica, Ecuador, Guatemala, Nicaragua, Panama, Paraguay, Peru, the United States and Venezuela (Bolivarian Republic of), and at national level in Brazil, Colombia and Mexico.

International control measures

Only some countries have measures additional to those established by CITES to control international trade in the species, such as the United States with its Endangered Species Act.

National control measures

Jaguar protection is provided for in national legislation banning hunting or trading in the species, in countries including Argentina, Belize, Bolivia (Plurinational State of), Brazil, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, the United States and Venezuela (Bolivarian Republic of). However, the need is recognized to improve and enhance management and law implementation.

Countries such as Argentina, Belize, Bolivia (Plurinational State of), Brazil, Colombia, Guatemala, Mexico, Nicaragua, Panama and the United States are holding workshops, consultations and discussions for environmental awareness-raising, to promote positive attitudes towards the conservation of the jaguar and to change current stockbreeding practices so as to minimize its preying on livestock and therefore the human-jaguar conflict.

Captive breeding

According to reports of specialists at the symposium *The jaguar in the 21st century: the continental perspective*, most captive populations with birth records are kept in zoos or private collections for educational purposes, rather than with a view to strengthening populations in the wild. Some captive populations come from "problem animals" captured because they were preying on livestock. Over its whole range, only a few countries have a rough estimate of the population held in captivity; the list is headed by Brazil (200 specimens) and the United States (119 specimens), followed by Argentina (55 specimens), Guatemala (31 specimens), Costa Rica (30 specimens), Uruguay (22 specimens) and Bolivia (Plurinational State of) (13 specimens).

Similarity with other species

The jaguar is one of four spotted cats that are found in the Americas, but is easily distinguished from the others by its size and weight. The jaguar has a total length of 1574 to 2419 mm and a weight ranging from 36 to 158 kg, followed by the ocelot (*Leopardus pardalis*, 920 to 1367 mm and 6 to 15 kg), the margay (*Leopardus wiedii*, 805-1300 mm and 3 to 5 kg) and the tiger cat (*Leopardus tigrinus*, 620 to 800 mm and 2 to 3 kg) (Oliveira, 1994; Sunquist and Sunquist, 2000; Reid, 2006).

Jaguar pelts are similar to those of the leopard (*Leopardus pardus*), but can be distinguished because each of the rosettes or markings on the jaguar skin may contain one or more spots within it. However, owing to the gradient of phenotypic variation among jaguar pelts it is not always possible to distinguish them with certainty (Seymour, 1989). Since the ranges of leopards and jaguars do not overlap, and both are listed in CITES Appendix I, there are few implementation problems in this regard. Finally, jaguar pelts can be distinguished from those of the Asian tiger (*Panthera tigris*) given that the latter have stripes rather than rosettes. It is possible to distinguish jaguar pelts from those of cheetahs (*Acinonyx jubatus*) as the latter have no rosettes, only small black spots. The ranges of other species of medium-sized or large spotted cats, such as the clouded leopard and snow leopard, do not overlap with that of the jaguar and their pelts are easily distinguishable.

Habitat conservation

The great majority of the range States of the jaguar provide for protection of the habitat of the species by means of protected areas and similar schemes. In addition, several international jaguar conservation initiatives contribute to the protection and recovery of the species and its habitat, as well as the exchange of information between experts on various aspects of its biology, ecology and conservation needs. These include: Jaguar Corridors of the international organization *Panthera* (promoting connectivity between jaguar habitats), *Jaguares Sin Fronteras* (Mexico-Guatemala-Belize partnership to preserve the largest population of jaguars north of Colombia) and the symposium *The jaguar in the 21st century: the continental perspective*, (at which the Declaration of Mérida was signed, urging governments to stop the hunting of the jaguar).

Consultations

All of the range States were consulted; the list of experts and authorities from whom responses were received is given in Tables 3 and 4 of the Annex..

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SECTION 2 – Analysis of the status of *Panthera onca* in the CITES Appendices in accordance with the criteria of Resolution Conf. 9.24 (Rev. CoP15)

Criteria for listing of species in the CITES Apéndices

(Adapted from document Doc. AC.16.8, Annex 2,
Guidelines for the review of animal species listed in CITES Appendices)

Appendix I*

Biological criteria[1]											**Trade criteria**[2]				**Implementation problems if the species is removed from Appendix I**
A					**B**				**C**						
The wild population is small, and is characterized by **at least one** of the following (i-v):					The wild population has a restricted area of distribution and is characterized by **at least one** of the following (i-iv):				A decline in the number of individuals in the wild, which has been either (i-ii):		At least one of the following (i-iv):				
i	**ii**	**iii**	**iv**	**v**	**i**	**ii**	**iii**	**iv**	**i**	**ii**	**i**	**ii**	**Iii**	**Iv**	
									✓	✓		✓	✓	✓	If the species is removed from Appendix I, it is probable that it will additionally meet criteria A and/or B.

* *A species should be included in Appendix I if it meets criterion **A, B or C.***

[1] ***Biological criteria for Appendix I** [in accordance with Annex 1 of Resolution Conf. 9.24 (Rev. CoP15)]*

[2] ***Trade criteria** [in accordance with paragraph b) of the second RESOLVES of Resolution Conf. 9.24 (adopted at CoP9)]*

Annex

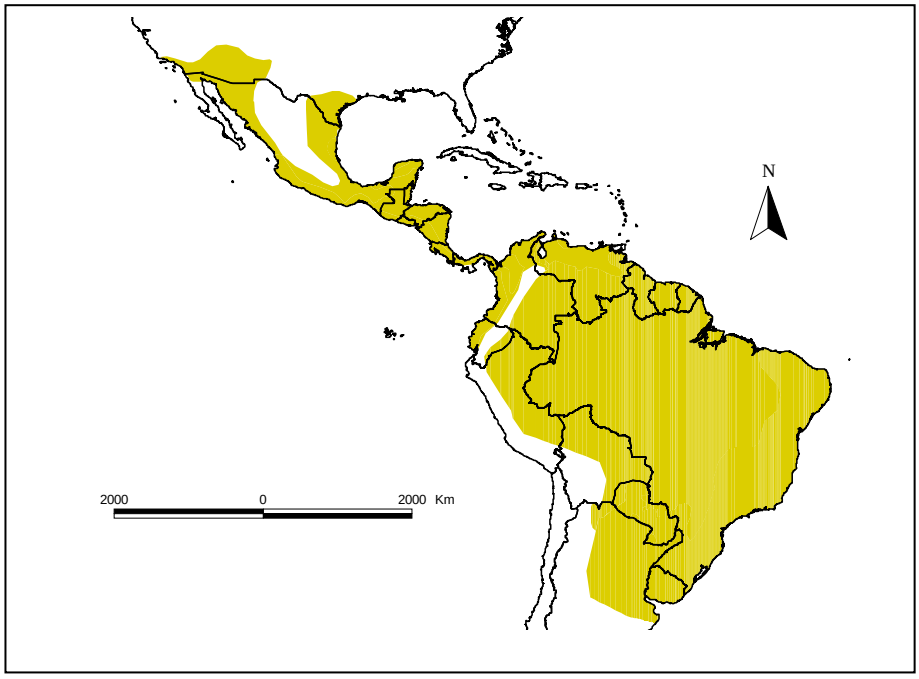

Figure 1 Historical distribution of the jaguar over the continent according to Seymour (1989). This includes the United States, Mexico, Belize, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, El Salvador, Uruguay, Colombia, Venezuela (Bolivarian Republic of), Guyana, Suriname, French Guiana, Ecuador, Peru, Brazil, Bolivia (Plurinational State of), Paraguay and Argentina.

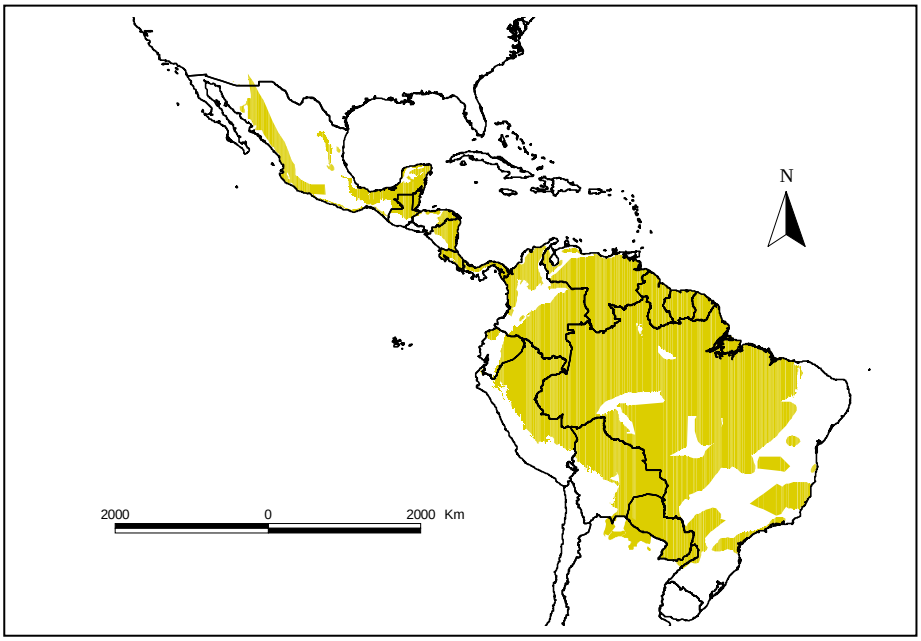

Figure 2 Present distribution of the jaguar over the continent according to Marieb (2006). The greatest decreases in area of distribution have occurred in Mexico, the United States, Brazil and Argentina. The jaguar is extinct in El Salvador and Uruguay.

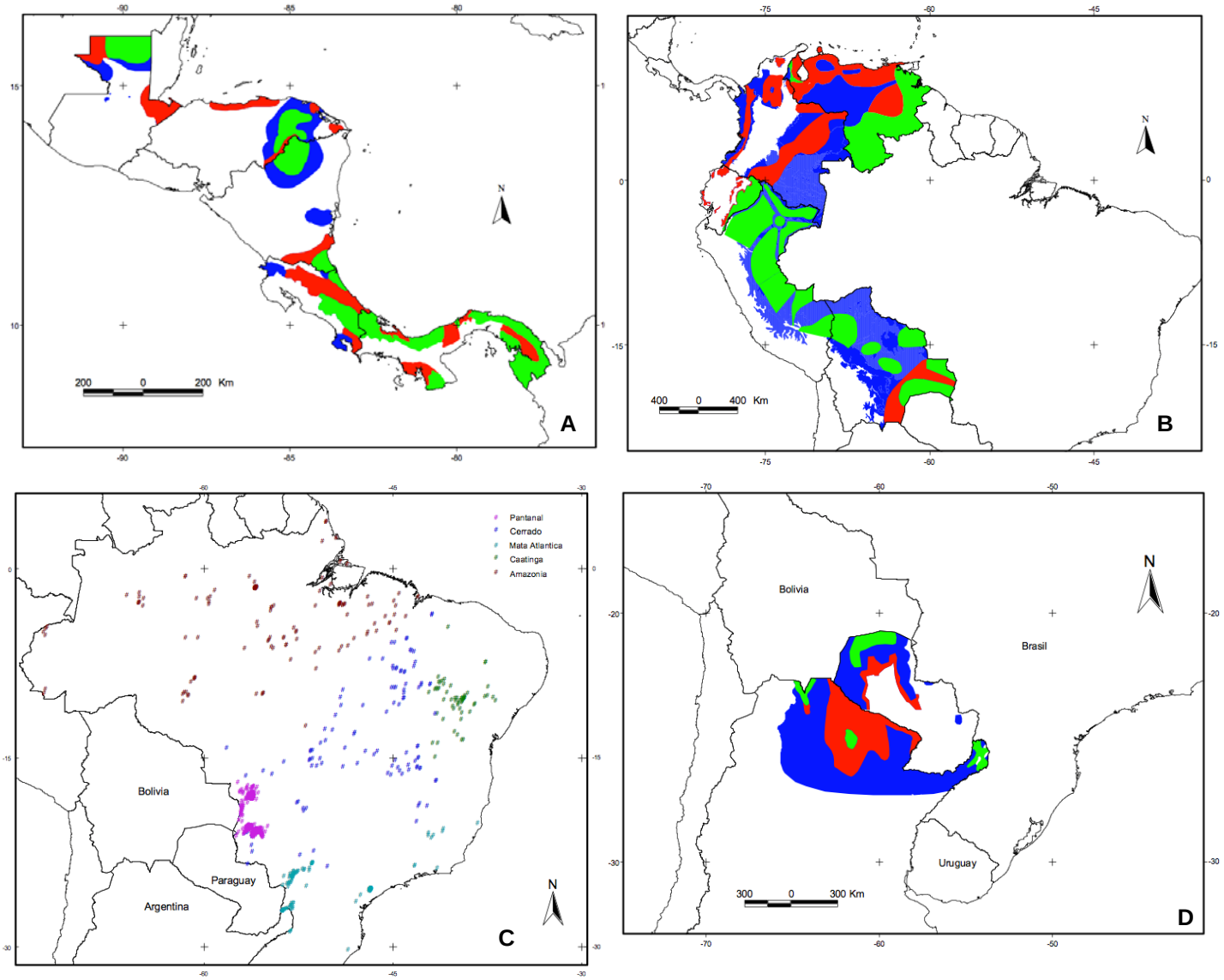

Figure 3 Present potential distribution. The maps show the potential distribution (blue), areas having high probability that the species will persist for more than 50 years (green) and locations in which the populations will be lost unless suitable measures are taken (red). The map of Brazil (C) does not show the same pattern; it indicates confirmed records by biome.

Table 1 Most significant jaguar prey reported in studies of feeding habits carried out in various countries

Country	Prey species reported	References
Belize	Nine-banded armadillo, paca, collared peccary and brocket.	Rabinowitz and Nottingham, (1986), Weckel *et al*. (2006), Foster *et al*. (2010)
Brazil (Atlantic forest)	White-lipped peccary, collared peccary, tapir, brocket and armadillo (*Dasypus spp*.)	Garla *et al*. (2001), Leite *et al*. (2002)
Brazil (El Cerrado)	Giant anteater, tapir (*Tapirus terrestris*) and white-lipped peccary.	Silveira (2004)
Brazil (El Pantanal)	Capybara, cayman (*Caiman cocodrilus*), domestic livestock, white-lipped peccary and marsh deer (*Blastocerus dichotomus*).	Schaller and Vasconcelos (1978), Crawshaw and Quigley, (2002), Dalponte (2002), Azevedo and Murray (2007), Cavalcanti (2008)
Costa Rica (Cocovado National Park)	White-lipped peccary, Hoffmann's two-toed sloth (*Cholepus hoffmani*), brocket and turtle (*Geochelone denticulada*).	Chinchilla (1997)
Guatemala	Collared peccary, nine-banded armadillo, coati, white-tail deer and white-lipped peccary.	Novack *et al*. (2005)
Mexico	Collared peccary (*Pecari tajacu*), white-lipped peccary (*Tayassu pecari*), paca (*Cuniculus paca*), red brocket (*Mazama temama*), white-tail deer (*Odocoileus virginianus*), coati (*Nasua narica*), nine-banded armadillo (*Dasypus novemcinctus*) and domestic livestock.	Aranda and Sánchez-Cordero (1996), Nuñez *et al*. (2000), Amin (2004), Rosas *et al*., (2008), Cruz and Palacios, personal communication
North-eastern Argentina	Peccary, brocket, tapir, southern tamandua (*Tamandua tetradactyla*) and capybara	Perovic (2002)
Paraguay (Chaco)	Grey brocket (*Mazama gouazoubira*) and forest rabbit (*Sylvilagus brasilensis*).	Taber *et al*. (1997)
Amazon region of Peru	Collared and white-lipped peccary, paca, cayman and turtle.	Emmons (1987), Koroiwa and Azcorra (2002)
Venezuela (Bolivarian Republic of) (Los Llanos)	Capybara (*Hydrochaerys hydrochaerys*), collared and white-lipped peccary, giant anteater (*Myrmecophaga tridactylya*) and cayman (*Caiman cocodrilos*).	Polisar *et al*. (2003), Scognamillo *et al*. (2003)

Table 2 Jaguar population density and size by country examined. The population densities and estimates include only reports from local-level studies, not from studies over the total area of distribution in each country.

Country	Density (specimens/100 km²) in some sampling locations	Estimated size of the population by country	References
Argentina	-	200	Di Bitteti *et al*., 2010
Belize	2 to 12	-	Harmsen and Foster, 2009
Bolivia (Plurinational State of)	1 to 5	-	Maffei *et al*., 2010
Brazil	3 to 7	≈10,000	Azevedo *et al*., 2010
Colombia	2.7 to 3.6	2,071 (Amazon protected areas)	Payan *et al*., 2010
Costa Rica	1 to 5	-	González-Maya *et al*., 2010
Ecuador	2.80 ± 1.21	1,600 (In the east of the country)	Espinosa *et al*., 2010
El Salvador	Extinct	-	-
Fr. Guiana and Suriname	3 to 5	2,000 to 3,500	De Thoisy, 2010
Guatemala	1.5 to 11.8	-	García *et al*., 2010
Guyana	No experts	-	-
Honduras	4.2	-	Mora *et al*., 2010
Mexico	-	4,000	Ceballos *et al*., 2006
Nicaragua	1 to 2	336	Polisar and Díaz, 2010
Panama	2.92 to 4	-	Moreno and Bustamante, 2010
Paraguay	No information	-	McBride, 2010
Peru	2.7 to 7.7	-	Carrillo-Percastegui and Maffei, 2009
Uruguay	Extinct	-	Pereira-Garbero, 2010
United States	Last sighting in 2009	-	Johnson and Van Pelt, 2010
Venezuela (Bolivarian Republic of)	No information	-	Hoogestejin *et al*., 2010

Table 3 Information provided by jaguar experts at the symposium *The jaguar in the 21st century* (Mérida, Mexico, November 2009)

Country	Report title	Authors	Contact
Argentina	Estado de conservación del jaguar en Argentina	Mario S. Di Bitetti, Carlos De Angelo, Verónica Quiroga, Mariana Altrichter, Agustín Paviolo, Griet A. E. Cuyckens and Pablo G. Perovic	Consejo Nacional de Investigaciones Científicas and Técnicas (CONICET), Instituto de Biología Subtropical (IBS), Facultad de Ciencias Forestales, Universidad Nacional de Misiones, Argentina. Andresito 21, (3370) Puerto Iguazú, Misiones, Argentina. dibitetti@yahoo.com.ar
Belize	Belize Status report	Bart Harmsen and Rebeca Foster	2 Panthera, New York, NY, USA. bharmsen@panthera.org
Bolivia (Plurinational State of)	Situación del jaguar en Bolivia	Leonardo Maffei, Rosario Arispe, Damián Rumiz and Andrew Noss	Jaguar Conservation Program/WCS Av. Arias Schereiber 347 – Urb. Aurora, Miraflores. Lima – Peru lmaffei@wcs.org
Brazil	Status of the Jaguar (*Panthera onca*) in Brazil	Fernando Cesar* Cascelli de Azevedo, Tadeu Gomes de Oliveira, Rogério Cunha de Paula, Claudia Bueno de Campos, Edsel Amorim Moraes Jr., Sandra Maria Cintra Cavalcanti, Walfrido Moraes Tomas, Ricardo Luiz Pires Boulhosa, Peter Gransden Crawshaw Jr., Beatriz de Mello Beisiegel, Dênis Aléssio Sana, Katia Maria Paschoaletto Micchi de Barros Ferraz.	Pró. Carnivoros*. Rua Dep. Luiz F. Azevedo 570 Itajuba, MG. oncaf@yahoo.com
Colombia	Distribución y estado de conservación del jaguar en Colombia	Esteban Payán Garrido, José F. González-Maya, Carolina Soto, Carlos Valderrama Vásquez, Carlos óCastaño-Uribe, and Manuel Ruiz-García	Panthera. Cl. 93Bis # 19-40, Oficina 206. Bogotá, Colombia. epayan@panthera.org
Costa Rica	Estado de conservación y prioridades para el jaguar en Costa Rica	José F. González-Maya, Aida Bustamante, Ricardo Moreno, Roberto Salom-Pérez and Jan Schipper	ProCAT Internacional/Colombia. Las Alturas, Coto Brus, Puntarenas, Costa Rica. jfgonzalez@procat-conservation.org
Ecuador	Análisis del estado de conservación del jaguar en el Ecuador	Santiago Espinosa, Luis Albuja, Diego G. Tirira, Galo Zapata-Ríos, Edison Araguillin, Víctor Utreras and Andrew Noss	University of Florida. 110 Newins-Ziegler Hall. Gainesville, FL 32611. USA. santiagoea@gmail.com
French Guiana	Conservation status of the Jaguar in the Guianas, with a focus on French Guiana	De Thoisy, B.	Kwata NGO BP 972, 97335 Cayenne cedex, French Guiana. benoit@kwata.net
Guatemala	Estatus del Jaguar en Guatemala; informe del año 2010	Rony García Anleu, Roan Balas McNab, Víctor Hugo Ramos, José Moreira, Gabriela Ponce-Santizo, Kurt Duchez, Melvin Mérida and Gustavo Ruano	Wildlife Conservation Society, Programa para Guatemala. Avenida 15 de Marzo, casa No. 3 Flores, Petén. Guatemala rgarcia@wcs.org
Honduras	Estado de conservación del Jaguar (*Panthera onca*) en Honduras	Mora, J. N., J. Polisar, H. Portillo and F. Castañeda	Centro Zamorano de Biodiversidad, Escuela Agrícola Panamericana. El Zamorano, Honduras. jmora@zamorano.edu
Mexico	Estado de conservación del jaguar en México	De la Torre A. and R. A. Medellín	Instituto de Ecología, Cuidad Universitaria, UNAM. México D. F. adelatorre@miranda.ecologia.unam.mx
Nicaragua	JAGUARS IN NICARAGUA	John Polisar, Fabricio Díaz Santos	Coordinador Programa Conservación del Jaguar / WCS. Bronx, NY 10460. jpolisar@yahoo.com, fjdsni@yahoo.com
Panama	Jaguares (*Panthera onca*) en Panamá; Estado actual y conservación.	Ricardo Moreno and Aida Bustamante	Yaguará. Puerto Jiménez, Península de Osa, Costa Rica. Apdo. 67-8203 rmoreno@yaguara.org / abustamante@yaguara.org
Paraguay	Historia y población actual del jaguareté	Roy Thomas McBride Jr.	rocktmcbride@yahoo.com
Peru	Jaguar population status report in Peru.	Samia Carrillo-Percastegui and Leonardo Maffei.	Areas-Amazonia/WWF. 3505 Grande Ave., Tucson, AZ. samiac@email.arizona.edu
Uruguay	El jaguar en Uruguay	Ramiro Pereira-Garbero and Alvaro Sappa	Museo Nacional de Historia Natural, Montevideo, Uruguay. rpereirag@gmail.com
United States	Report for: United States of America	Terry B. Johnson and William E. Van Pelt	Arizona Game and Fish Department. bvanpelt@azgfd.gov
Venezuela (Bolivarian Republic of)	SITUACIÓN DEL JAGUAR EN VENEZUELA.	Almira Hoogesteijn, Rafael Hoogesteijn, Ernesto O. Boede, Antonio González-Fernández, Emiliana Isasi-Catalá	Centro de Investigación y de Estudios Avanzados del IPN. Human Ecology Department. Antigua Carretera a Progreso KM 6. Mérida, Yucatán, Mexico. almirahoo@mda.cinvestav.mx

Table 4 CITES authorities/experts responding to the questionnaire on management and use of and trade in the jaguar, in the context of the symposium *The jaguar in the 21st century* (Mérida, Mexico, November 2009)

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Argentina	Nicolás Lodeiro Ocampo	Red Yaguareté. nicolas@redyaguarete.org.ar, www.RedYaguarete.org.ar
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Bolivia (Plurinational State of)	Damian Rumiz, Andrew Noss, Guido Ayala and Leonardo Maffei*	*Jaguar Conservation Program/WCS Av. Arias Schereiber 347 – Urb. Aurora, Miraflores. Lima – Perú. lmaffei@wcs.org
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Ecuador	Santiago Espinosa	University of Florida. 110 Newins-Ziegler Hall. Gainesville, FL 32611. USA. santiagoea@gmail.com
Guatemala	Kurt Duchez	Consejo Nacional de Áreas Protegidas, Departamento de Vida Silvestre. kduchez@conap.gob.gt
Mexico	Martín Vargas | Mónica Samaniego	Dirección General de Vida Silvestre, SEMARNAT. martin.vargas@semarnat.gob.mx | monica.samaniego@semarnat.gob.mx
Nicaragua	Fabricio Díaz Santos	Coordinador Programa Terrestre / WCS en Nicaragua, Km 9 y medio carretera a Masaya, callejón ladrillería San Pablo, 70 vrs adentro. Managua, Nicaragua. fjdsni@yahoo.com
Panama	Ricardo Moreno | Marcel Calvar Agrelo	Instituto Smithsonian de Investigaciones Tropicales. Unit 0948, APO AA 34992-0948, Panamá. rmoreno@yaguara.org | Departamento de Fauna Autoridad CITES-Uruguay Ministerio de Ganadería, Agricultura y Pesca. Dirección Gral. de Recursos Naturales Renovables mcalvar@mgap.gub.uy
Paraguay	Bauer, F.	Dirección de Vida Silvestre- Dirección General de Protección y Conservación de la Biodiversidad, Paraguay. vidasilvestre@seam.gov.py.
Peru	Miguel Rosas Silva	Saemi Domínguez Guillen. Secretaria DGFFS/DGEFFS. Ministerio de Agricultura. sdominguez@minag.gob.pe
Uruguay	Ramiro Pereira-Garbero	Museo Nacional de Historia Natural, Montevideo, Uruguay. rpereirag@gmail.com
United States	Rosemarie S. Gnam	Contact: Kevin Doyle. Administrative Support Assistant. Division of Scientific Authority. United States Fish and Wildlife Service. Kevin_Doyle@fws.gov