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Chrysocyon brachyurus, Maned Wolf

Errata version

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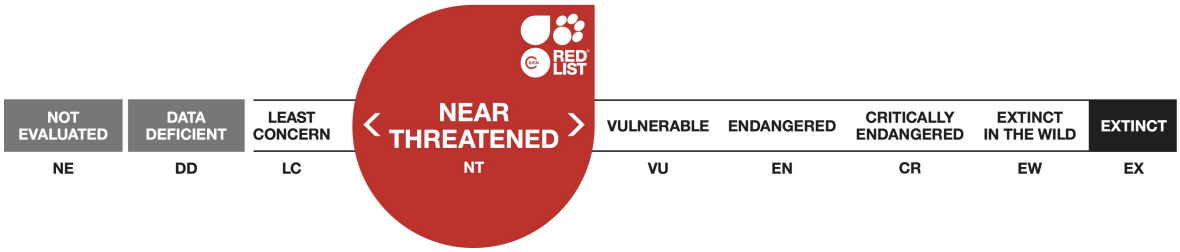

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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Carnivora	Canidae

Taxon Name: *Chrysocyon brachyurus* (Illiger, 1815)

Synonym(s):

- *Canis brachyurus* Illiger, 1815

Common Name(s):

- English: Maned Wolf
- French: Loup à crinière
- Spanish: Aguara Guazu, Borochi, Lobo De Crin

Assessment Information

Red List Category & Criteria: Near Threatened ver 3.1

Year Published: 2015

Date Assessed: August 13, 2015

Justification:

The current population of Maned Wolves is estimated at approximately 17,000 mature individuals (≥ 2 years of age), with the majority of the population (>90%) in Brazil. In the last decade or so, the species' main habitats in Brazil have been subject to intense deforestation. A population viability model for Brazil generated using real and predicted deforestation rates over 15 years (three generations) resulted in an estimated reduction of ~20% in the metapopulation (based on current estimates of habitat loss ranging from 1.0 to 1.5% per year). If deforestation reaches the maximum estimated rate of loss (2% per year), then simulation suggests a national population reduction of 56% at the end of 100 years (Paula *et al*. 2008, Paula and Desbiez 2014). In addition to the estimated population reduction from deforestation, the species is also subject to other threats, including road kills, direct persecution by humans, and disease due to contact with domestic animals (Paula and Desbiez 2014). In other range countries (Argentina, Paraguay and Bolivia), the species' status is even more precarious with small isolated populations and declining numbers due to the low quality of habitat and hunting. The Maned Wolf does not meet the thresholds for listing under criteria B, C or D, but taking into account the combined impacts of habitat loss, persecution and disease, it approximates the thresholds for listing under A3, and is therefore assessed as Near Threatened. The species' situation is considered to be of major concern due to the various threats acting throughout its entire range and should be regularly re-evaluated.

Previously Published Red List Assessments

2008 – Near Threatened (NT)
http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T4819A11097908.en

2004 – Near Threatened (NT)

1996 – Lower Risk/near threatened (LR/nt)

1994 – Vulnerable (V)

1990 – Vulnerable (V)

1988 – Vulnerable (V)

1986 – Vulnerable (V)

1982 – Vulnerable (V)

1965 – Status inadequately known-survey required or data sought

Geographic Range

Range Description:

The Maned Wolf inhabits lowland grasslands and scrublands of central South America, south of the mouth of the Parnaiba River in northeastern Brazil, throughout eastern Paraguay east of the Rio Paraguay, extending into north/northeast Rio Grande do Sul State in Brazil, south to Santa Fe and Entre Rios provinces in Argentina and west to the Pampas del Heath in Peru (Queirolo *et al*. 2011, Williams *et al*. 2012).

In Brazil, the range is limited by the Amazon forest in the north/northwest and by the arid Caatinga in the northeast (Queirolo *et al*. 2011). In the last five years, the Maned Wolf has been recorded in areas where no records (> 50 years) previously existed, specifically in areas where habitat degradation and conversion are occurring. In the "Amazonian arc of deforestation", south of Amazonas and south/east of Para states, the species has been increasingly registered in areas that were converted from forests into pastures and agricultural fields (R. Paula pers. comm. 2015). The same is true, but to a greater degree, in southeastern Brazil where the Atlantic Forest biome has been deforested and the Cerrado has been degraded (Queirolo *et al*. 2011). Although these records might suggest an expansion of the species' distribution range, records are scattered and populations may not be stable. In Argentina, the species is present in the northern and central region of the country (Queirolo *et al*. 2011) but a range contraction has occurred in the south with most recent records in the provinces of Chaco, eastern Santiago del Estero, northeastern Córdoba, northern Santa Fe, northern Entre Ríos, Corrientes, and southern Misiones (Queirolo *et al*. 2011). The range across eastern Paraguay is considered widespread, but discontinuous, with no large concentration in any single area (Cartes *et al*. 2014). The Maned Wolf is distributed across the savannas of Bolivia; however, all detailed information for this country is limited to a single park in the department of Santa Cruz (Emmons 2014). The species historically ranged into northern Uruguay, but to date there have been only sporadic and unconfirmed occurrences in the north-east (Queirolo *et al*. 2011) since the last confirmed record in 1990 (Mones and Olazarri 1990).

Two recent evaluations of Maned Wolf distribution have provided an update on the full extent of the range (Quierolo *et al*. 2011), including range shifts within Brazil (Paula *et al*. 2013). These studies recorded that the Maned Wolf distribution covers nearly five million km^2 with ~72% of the range located in Brazil, which corresponds to an increase in the total area reported 30 years ago (3,414,169 km^2) by Dietz (1984). This increase in the Maned Wolf distribution is likely due to both genuine change (the species' expansion into new regions) as well as non-genuine change (mostly new or additional records from the field).

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More recently, to seek greater precision concerning the distribution range of the species in Brazil, potential distribution and probability of presence were modelled with Maxent, a software using maximum entropy algorithms (R. Paula and E. Ferraz pers. comm. 2015). All Brazilian biomes, with the exception of the Amazon and Caatinga, neither of which are suitable for the Maned Wolf, were modelled using >1,000 presence points collected in the last 10 years combined with several variables (including topographic, bioclimatic, geophysical and anthropogenic) at a resolution of one km^2. The results indicate that the potential distribution area for Maned Wolves in Brazil is 2,815,061 km^2. The majority (70%) of this area represents areas with <25% probability of presence and those areas are considered unsuitable for the Maned Wolf occupancy. In addition, the highly suitable area (i.e., >75% probability of presence) accounts for only 0.4% of the total of the species' distribution area within Brazil. These declines in both total area and overlap with lower probabilities of presence reflect an increase in deforestation rates in the Cerrado over the last 20 years. While the species has been documented in other biomes, the model suggests a retraction of their distribution within the Cerrado due to the ongoing conversion of intact habitat to areas with agriculture and pastures; therefore, while there is evidence that Maned Wolves can persist in mosaics of natural and disturbed areas, extensive monocultures and exotic pasturelands have been indicated as unsuitable areas.

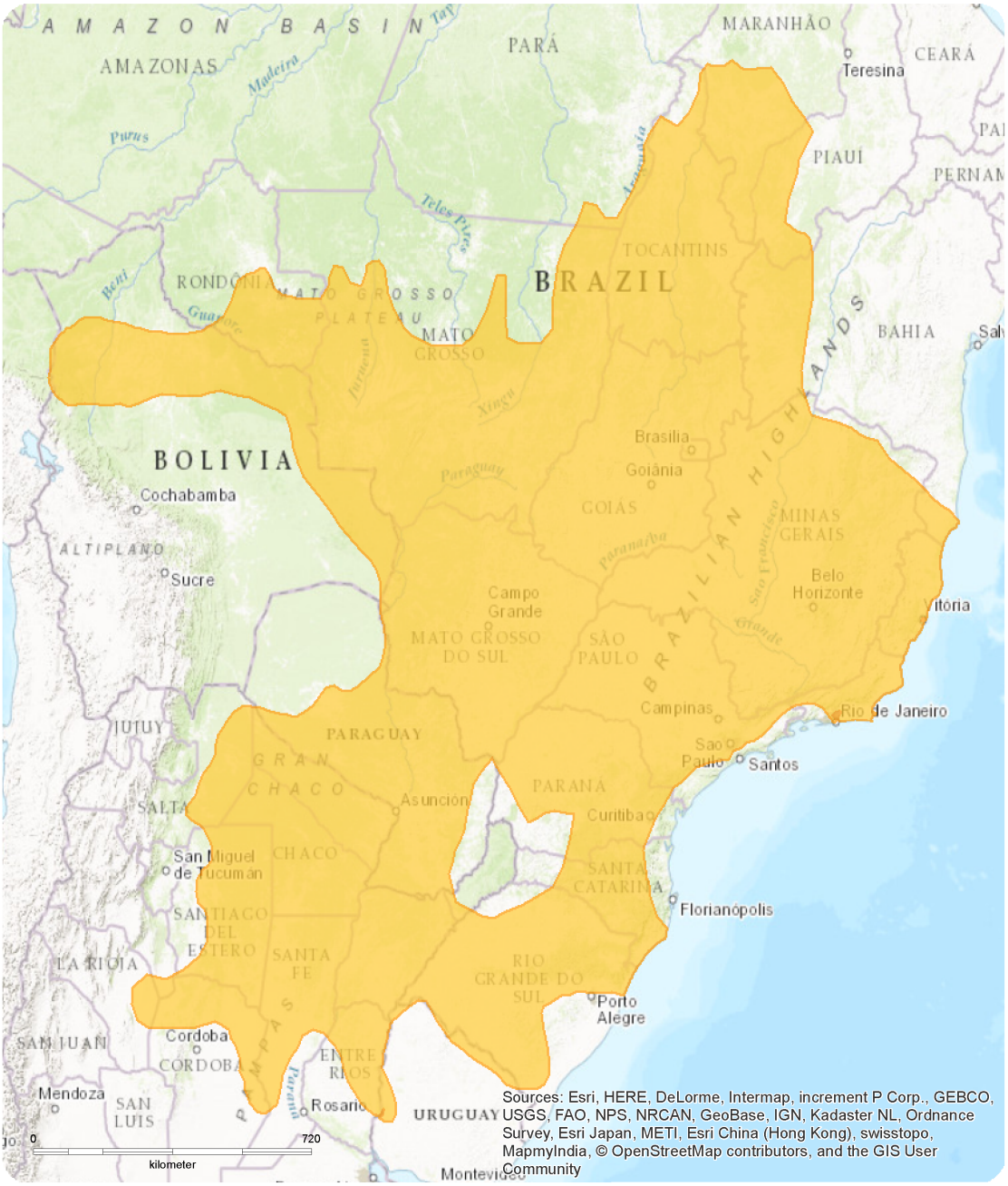
Country Occurrence:

Native: Argentina; Bolivia, Plurinational States of; Brazil; Paraguay; Peru

Possibly extinct: Uruguay

Distribution Map

Chrysocyon brachyurus

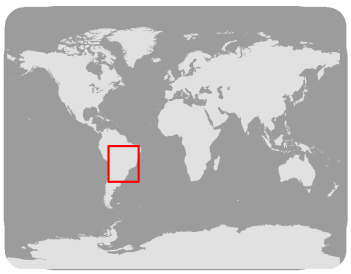


Range

Extant (resident)

Compiled by:
Paula et al. 2013

NE DD LC **NT** NEAR THREATENED VU EN CR EW EX



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

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Population

A Population and Habitat Viability Assessment (PHVA) workshop held in 2005 estimated the total population (newborn pups, juveniles and adults) of Maned Wolves at ~23,600 animals, including 21,746 in Brazil, 830 in Paraguay, and 660 in Argentina (Paula *et al*. 2008). If only mature individuals (≥ 2 years of age) are considered, the population size is estimated at 17,000 animals, including 15,849 in Brazil, 613 in Paraguay, and 487 in Argentina (Paula *et al*. 2008). Numbers in Bolivia are unlikely to exceed 1,000 animals. Numbers in Pampas del Heath, Peru are less than 40 individuals, declining, and likely geographically isolated from the adjacent Bolivian population (Williams *et al*. 2012). The population estimates from the PHVA workshop were generated using Vortex simulation computer models and so do require some caution (Paula *et al*. 2008). Even though the species has been supposedly expanding into new areas in Brazil, the species' overall range has contracted in the Brazilian Cerrado (its typical habitat) and in other countries. In addition, over the last 10 years some of the areas previously defined as the most suitable in Brazil have suffered from habitat degradation, suggesting that these prior published estimates may now be considered high.

To account for the effects of habitat loss, one of the main threats to Maned Wolf, on persistence, simulations of the effects of habitat loss using detailed data on deforestation rates in Brazil were performed (and measured as permanent reduction in K or carrying capacity). This was modelled as a linear decrease (1.5% / annum) in carrying capacity over one generation or five years, which effectively reduced the maximum size a population could attain. The simulation model showed that small populations were affected more than large populations, with populations <25 individuals showing negative growth rates due to their vulnerability to stochastic processes. Populations with ≤25 individuals declined with a high probability of extinction within 100 years; however, populations of 50-100 individuals persisted, albeit with low levels of genetic diversity. Therefore, several hundred wolves may be needed to maintain a long-term, viable population depending upon the severity of threats, management goals, and acceptable levels of risk for wildlife managers.

In the last 10 years, the main habitats of Maned Wolf in Brazil have been subject to intense deforestation. For the current assessment, a population viability model was generated using recent observed deforestation rates, ranging from 1.0 to 1.5% per year over 15 years (three generations). These results suggested a 20% reduction in the metapopulation based on these rates of loss. If deforestation rates reach a loss of 2% per year, the simulation suggests a 56% reduction in the Brazilian population in 100 years (Paula *et al*. 2008, Paula and Desbiez 2014). The areas of supposed distribution expansion were not accounted for in this simulation since they represent edge areas for the distribution range and because from what is known presently these areas do not seem to hold stable and resident populations of the species.

Maned Wolves are found at low densities throughout the range. Even in Brazilian protected areas, population densities range from 0.01 to 0.05 animals/km^2 (Silveira 1999, Rodrigues 2002). The highest density reported is 0.08 individuals/km^2 in Serra da Canastra, Minas Gerais, Brazil (Paula *et al*. 2013). In Argentina, information about wild populations is scarce and the northern population is thought to be declining (Soler and Carenton 2008). Despite the lack of information on population densities across it range, high food availability may potentially support higher population densities (Amboni 2007, Azevedo 2008).

Current Population Trend: Unknown

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Habitat and Ecology (see Appendix for additional information)

In general, Maned Wolves inhabit open habitat types favouring grasslands, shrub habitats, woodland with an open canopy (cerrado), mixed forest/grassland, and wet fields (which may be seasonally flooded). Rocky fields associated with open grasslands in higher altitudes (1,000-2,000 m asl) can be an important habitat for the species in some areas (Coelho *et al*. 2008, R. Paula pers. obs.). In central Brazil, similar to Bestelmeyer (2000), who found Maned Wolves prefer areas with low to medium shrub density, Vynne *et al*. (2011) found they avoided areas where the closed canopy was ≥30%. Coelho *et al*. (2008) found the Maned Wolf strongly avoided the forested areas that border the Cerrado and Atlantic forest ecoregions. In northeastern Argentina, south/southeastern Brazil, and southeastern Paraguay, Maned Wolves have been recorded in the exotic eucalyptus, pine, soybean and sunflower plantations (Orozco *et al*. 2009, Soler 2009, A.J. Giordano pers. comm. 2015, R. Paula pers. obs.) and in remnants of Atlantic forest (Chiarello 2000, A.J. Giordano pers. comm. 2015). Also, the presence of Maned Wolves in populated rural and urban areas was also documented in the last ten years in Santa Fe, Corrientes, Chaco and Santiago de Estero provinces in Argentina (Pautasso *et al*. 2009, Orozco *et al*. 2013a). In addition while Maned Wolves preferred open, natural grasslands, they were as likely to use low-standing croplands within five kilometres due to the high density of rodents (Vynne *et al*. 2011). While Queirolo *et al*. (2011) proposed that Maned Wolves are expanding their former range in Brazil to include areas converted from inhospitable primary or thick secondary forest into open areas for grassland, agriculture and livestock. Muir and Emmons (2012) failed to find evidence of Maned Wolves expanding into agricultural areas in Bolivia. In Paraguay, preliminary studies with camera traps suggest that sustainable cattle-ranching was compatible with high Maned Wolf activity (A.J. Giordano pers. comm. 2015). Vynne (2010) suggests the foraging benefits of agricultural areas are negated when the crops become tall, homogenous, monoculture crops (e.g., sugarcane). Vynne *et al*. (2014) found that Maned Wolves may be tolerant of these habitat conversions as long as there are sufficient remnant vegetation patches for den sites, food, water and resting, including gallery forests (Dietz 1984), cerrado and marshy areas near rivers (Bestelmeyer 2000, F. Rodrigues pers. comm. 2015).

The omnivorous diet of the Maned Wolf includes a wide variety of plant material and animal matter, including fruits, arthropods and small- to medium-sized vertebrates (Dietz 1984, Carvalho and Vasconcellos 1995, Motta-Júnior *et al*. 1996, Azevedo and Gastal 1997, Motta-Júnior 1997, Rodrigues *et al*. 1998, Jácomo 1999, Santos 1999, Silveira 1999, Juarez and Marinho-Filho 2002, Amboni 2007). Although the frequency of plant and animal items found in faecal samples is approximately equal, the biomass of animal items is usually greater than that of plant items (Motta-Júnior *et al*. 1996, Santos 1999, Motta-Junior *et al*. 2014). The relative importance of specific food items may vary depending on location and season (Bueno and Motta-Júnior 2006, Amboni 2007). In areas of high food availability, the degree of overlap of home ranges increases and can reach levels of 92% between female-female and 100% for male-female (couple; Amboni 2007, Azevedo 2008, R. Paula pers. obs.).

While historically Maned Wolves were considered to be crepuscular-nocturnal in their activities, recent observations in Bolivia and Brazil reveal that their activity is actually variable or cathermeral, with activity patterns changing according to daily temperatures and the season (dry or wet; Emmons 2012). In Santa Cruz, Bolivia, Emmons (2012) found Maned Wolves tend to forage for longer distances when temperatures are cooler (between 21-28°C) and show considerable decreases in activity levels when temperatures increase (>28°C). In addition, while the Maned Wolf is strictly nocturnal during the dry season, it varies in its temporal activity pattern during the wet season (Emmons 2012). These patterns

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shift some in southeastern Brazil, an area defined by higher humidity levels, abundant permanent water sources in the form of rivers, well-defined seasons reflecting extreme temperature differences, and shifts in the seasonal food availability. While the activity pattern of Maned Wolves in Brazil is cathemeral and affected by overall temperature and seasonality, the high degree of daily variation in minimum and maximum temperature in a season means that there is additional variation in the daily pattern each season (R. Paula pers. obs.). For example, during the dry season when temperatures drop to 5°C during the night, the species is more diurnal having higher activity during the day when temperatures are likely to be warmer. In contrast during the wet season activity is typically nocturnal, except after extended periods of rain when the species can be active during the middle of the day.

The home range of Maned Wolves is variable, ranging from 20-115 km^2 (fixed kernel, 95%). Despite considerable variation ranges average between 50-80 km^2 (fixed kernel, 95%; Rodrigues 2002, Coelho *et al*. 2008, Azevedo 2008, Emmons 2012) and about 30 km^2 in agricultural landscape of northern Argentina (L. Soler pers. comm. 2015). Food availability and habitat integrity have been linked to variation in home range size (Amboni 2007, Azevedo 2008, R. Paula pers. obs.). Sharing of home ranges has been noted in Brazil and Bolivia (Azevedo 2008, Emmons 2012). While home range overlap can be found during the breeding season, it is possible throughout the year in areas with high food availability. In these areas, the greatest sharing of home ranges is between females followed by male-female pairs with very little sharing tolerance noted among males (Azevedo 2008).

In northern Argentina the Maned Wolf shows a preference for open grassland habitats and also utilizing human disturbed areas such as cattle ranches (Soler and Carenton 2008). Direct competition with other carnivores has not been observed; however, scat analyses reveal that Maned Wolves, Crab-eating Fox (*Cerdocyon thous*) and Pampas Fox (*Lycalopex gymnocercus*) and Crab-eating Raccoon (*Procyon cancrivorus*) consume many of the same prey species (Soler and Carenton 2008).

Paula *et al*. (2008) calculated a generation time of 5.3 years in Vortex (using the exponential growth rate as another variable to account to the net reproductive rate calculations, which is the age-specific survival multiplied by fecundity over all age classes; see Lacy *et al*. 2015 for further details). Using the formula Sum (x l_x m_x)/Sum (l_x m_x) where l_x represents the survivourship over x years and m_x the maternity over x years, Paula and Desbiez (2014) calculated a generation length of 7 years. No differences on population reduction were observed when using the two different generation times.

Systems: Terrestrial

Use and Trade

There is no commercial use. Indications are that the use of Maned Wolf parts for medicinal purposes does not involve any sort of large-scale commercial transactions and is confined to native folk medicine (Soler *et al.* 2008, Orozco *et al.* 2009, Emmons 2012, Paula and Gambarini 2013).

Threats (see Appendix for additional information)

The four main threats affecting Maned Wolf populations throughout their distribution range are: habitat loss and alteration, especially due to conversion to crop fields and pasturelands; human persecution due to livestock losses and cultural beliefs; increasing vehicular traffic in highways resulting in road kills; and pathogens contracted from domestic animals due to increased contact in disturbed environments (Paula

et al. 2008, 2013, Emmons 2012, Orozco *et al*. 2013a).

The intensive conversion of native habitat for agriculture results in loss of optimal habitat and creation of areas often subject to desertification. The fragmentation of highly suitable habitat causes isolation of subpopulations and often results in the remaining intact landscape become intersected by high speed roads. Many Maned Wolves are killed on roadways throughout its range. In central Brazil, road kills are a threat of major concern potentially leading to local extinction of small, isolated populations as estimates range from four to 10 individuals killed/year in some regions (Paula and Gambarini 2013, Rodrigues *et al*. 2014). Similar impact of vehicular collisions was detected in marginal populations from Argentina where 21 Maned Wolves were reported dead along National Route 34, concentrated between 2000 and 2005 (Orozco *et al.* 2013a). The same negative effect is potentially true in the humid Chaco of Paraguay where increased traffic on the Trans-Chaco highway leads to numerous road kills each year (A.J. Giordano pers. comm. 2015). Extreme climatic conditions such as uncontrolled fires and droughts are likely to exacerbate the scarcity of living resources and consequently the loss on roadways, as Maned Wolves are forced to travel farther for food and water (Pautasso *et al*. 2009, Orozco *et al*. 2013a); the latter is especially important during periods when females are lactating (Emmons 2014).

Direct interactions with humans also pose a threat to the species. Conflicts with people, road mortality, the potential for infectious diseases spread by domestic dogs and direct persecution resulting from widely held superstitions and beliefs, are the primary threats facing Maned Wolves (Songsasen and Rodden 2010). In some areas of Argentina, Maned Wolves are persecuted with hunting, trapping, and shooting due to a mix of long-standing cultural beliefs, general ignorance of the species, and trophy hunting (Orozco *et al*. 2009, Orozco *et al*. 2013a, Soler 2014). In southeastern Santiago del Estero (Argentina), 30 Maned Wolves were reported sold to game ranches in a 10-year period (Orozco *et al*. 2013a). In Brazil and Paraguay, this targeted persecution of Maned Wolves extends beyond the traditional and natural medicine needs to include the low public tolerance of poultry depredation, for which Maned Wolves are constantly blamed (Paula *et al*. 2013, Cartes *et al*. 2014, A.J. Giordano pers. comm. 2015). In some areas this hunting pressure is so high it is having a significant negative effect on local Maned Wolf numbers (Paula *et al*. 2013). While illegal trade is not common, Orozco *et al*. (2009) found it was widespread in Argentina, and even included the sale of young animals or pups to private zoos and collections. Of the Maned Wolves kept in captivity in Argentina during the last five years 68% were wild born and came from/were victims of illegal trade, road collisions or were orphaned after their mother was killed (P. Gonzalez Ciccia pers. comm. 2015).

Domestic dogs pose a serious threat to Maned Wolves on several levels, as often times domestic dogs accompany humans into the field for recreation and hunting. In addition, both Maned Wolves and dogs overlap in their use of habitat that has been converted to agriculture and pasture. Dogs are known to pursue Maned Wolves, which often results in the killing of the animal (Soler *et al*. 2005, Pautasso *et al.* 2009, Orozco *et al*. 2013a, Soler 2014, A.J. Giordano pers. comm. 2015). In a study carried out in Argentina, 26% of sightings by local villagers involved close contact between Maned Wolves and domestic dogs (Orozco *et al*. 2013a). Dogs are also a source of infectious diseases and parasites. However the epidemiological effects remain unclear for Maned Wolf conservation. Rural domestic dog populations in Argentina had very high seroprevalence for *Neospora caninum*, canine coronavirus, canine adenovirus, *Dirofilara immitis*, canine distemper virus, *Toxoplasma gondii*, and *L. interrogans* spp. In the same area, all of these agents (except *N. caninum*, *Toxoplasma gondii* and CCV) were serologically positive in local Maned Wolves (Orozco *et al*. 2013a). In a Bolivian population, Maned Wolves were

serologically positive for two domestic dog pathogens (morbillivirus and parvovirus) that can cause pup mortality and high levels of potentially fatal (*Dirofilara immitis*) and debilitating (*Dioctophyme renale*) parasites were detected (Deem and Emmons 2005, Bronson *et al*. 2008, Deem *et al*. 2012, Emmons 2014). In Brazil, Maned Wolves were serologically positive for several dog-related infectious diseases including parvovirus, canine distemper virus, coronavirus, and leishmaniosis (Paula *et al*. 2014). These data from Bolivia, Brazil and Argentina suggest that other wild populations are at risk in areas where domestic dogs are present (May Jr and Felippe 2014). The frequent use of dogs for herding and hunting, along with their frequent foraging in natural habitats, could favour direct or indirect transmission of multiple pathogens (Orozco *et al*. 2013a).

Conservation Actions (see Appendix for additional information)

Legislation

It is included on CITES Appendix II. Maned Wolves are protected by law in many parts of their range, but enforcement is frequently problematic. This species is classified as Endangered in Argentina (Ojeda *et al*. 2012) and declared a Provincial Natural Monument in select areas, including Santa Fe, Corrientes, and Chaco (Soler 2014). It is classified as Vulnerable in Brazil (Paula *et al*. 2013). Hunting is prohibited in Brazil, Paraguay, Bolivia and in Argentina. The species is included in the United States Endangered Species list.

Presence in protected areas

This species occurs in many protected areas in Argentina, Bolivia, Brazil, Paraguay and Peru

Occurrence in captivity

As of January 2012, 150 institutions held a total of 394 Maned Wolves (182 males, 211 females, one unknown) in captivity (Holland 2014).

Other

In Brazil, conservation actions to reverse population decline have focused on addressing the issues associated with the human dimension. Raising public awareness and using proactive methods to prevent conflict are among the main tools used in increasing tolerance towards the species. In addition, campaigns to vaccinate domestic dogs in areas that border or overlap with Maned Wolf populations have been ongoing for several years (Paula *et al*. 2014). New proposals to reduce the high number of road kills in southeast Brazil have been discussed at a political level. The 2005 Population and Habitat Viability Assessment workshop for Maned Wolves generated an Action Plan aimed at addressing the five main themes that effect the long-term conservation of the species across its distribution: 1) threats and habitat management; 2) distribution and status; 3) environmental education, social aspects, and economic alternatives; 4) ex-situ conservation; and 5) population dynamics and modelling (Paula *et al*. 2008). Each of these themes address gaps in knowledge for the species or specific problems associated with the species survival. Each theme was broken into multiple goals with specific actions set to address the associated problems, names of personnel responsible for seeing the action is completed, timeline for when these actions should be completed, associated costs, potential obstacles, and expected outcome defined (Paula *et al*. 2008). As a follow up to this workshop, Brazil and Argentina used information on recent and ongoing changes in the species' status and threats to modify the international Action plan and generate specific National Action Plans that could help direct local efforts in Maned Wolf conservation. In 2014, the Brazilian government officially recognized the technical advisory group (originally formed in 2010) aimed at assisting the government on implementing the

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strategies developed in the National Action Plan. A Maned Wolf working group has also been implemented in continental level under the coordination of the IUCN SSC Canid Specialist Group, with an aim to ensure long-term coordination among researchers across the Maned Wolves distribution and work together to share strategies directed at reversing population decline.

In Argentina, the GAAG (Grupo Argentino Aguará Guazú or Maned Wolf Argentine Group) was founded as a national strategy to develop, manage, execute, and monitor the Action Plan for the Maned Wolf's conservation in Argentina. The group comprises 16 institutional members, which includes provincial and national government agencies, zoos, NGOs and research groups from universities and museums. Between 2002 and 2011, GAAG carried out 10 regional workshops aimed at: 1) mapping threats for Maned Wolf in natural habitats; 2) prioritizing conflicts in the wild and problems in captivity; 3) prioritizing strategies and actions for its ex situ and in situ conservation; 4) developing recommendations for conservation in the wild and management in captivity; 5) developing efficient education strategies for Maned Wolf conservation both *in situ* and *ex situ*, and 6) validating methodologies and strategies for conservation education. Since 2005, five species-directed projects have been developed and include work in five of the eight provinces in the Maned Wolf's distribution (Orozco *et al*. 2013b). Extensive surveys of farmers and ranchers have provided valuable information about the distribution of the species and also about people's attitudes towards Maned Wolves (Songsasen and Rodden 2010). Ongoing education programs are aimed at changing negative perceptions of this wild carnivore (Soler 2008, Orozco *et al*. 2013b).

Credits

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Bibliography

Amboni, M.P.M. 2007. Dieta, disponibilidade alimentar e padrão de movimentação do lobo-guará, *Chrysocyon brachyurus*, no Parque Nacional da Serra da Canastra. MG. Dissertação de Mestrad, Universidade Federal de Minas Gerais, Belo Horizonte.

Aragona, M. and Setz, E.Z.F. 2001. Diet of the maned wolf, *Chrysocyon brachyurus* (Mammalia: Canidae), during wet and dry seasons at Ibitipoca State Park, Brazil. *Journal of Zoology (London)* 254: 31-136.

Azevedo, F.C. 2008. Área de vida e organização espacial de lobos-guará (*Chrysocyon brachyurus*) na região do Parque Nacional da Serra da Canastra, Minas Gerais, Brasil. Dissertação de Mestrado, Universidade Federal de Minas Gerais, Belo Horizonte.

Azevedo, F.C.C. and Gastal, M.L.A. 1997. Hábito alimentar do lobo-guará (*Chrysocyon brachyurus*) na APA Gama/Cabeça do Veado.In: L.L. Leite and C.H. Saito (eds), pp. 238-240. Dept. Ecologia, Universidade de Brasília, Brasília, DF, Brazil.

Baillie, J. and Groombridge, B. (comps and eds). 1996. *1996 IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland and Cambridge, UK.

Beccaceci, M. D. 1992. The maned wolf, *Chrysocyon brachyurus*, in Argentina. In: Matern, B. (ed.), *1991 International studbook for the maned wolf Chrysocyon brachyurus (Illiger, 1811)*, pp. 50-56. Frankfurt Zoological Garden, Frankfurt, Germany.

Bernardes, A. T., Machado, A. B. M. and Rylands, A. B. (eds). 1990. *Fauna brasileira ameaçada de extinção*. pp. 65 pp.. Fundação Biodiversitas, Belo Horizonte, Brazil.

Bestelmeyer, S.V. 2000. Solitary, reproductive and parental behavior of maned wolves (*Chrysocyon brachyurus*). M.Sc. Thesis, Colorado State University.

Bestelmeyer, S.V. and Westbrook, C. 1998. Maned wolf (*Chrysocyon brachyurus*) predation on pampas deer (*Ozotoceros bezoarticus*) in Central Brazil. *Mammalia* 62: 591-595.

Bronson, E., Emmons, L.H., Murray, S., Dubovi, E.J., and Deem, S. 2008. Serosurvey of pathogens in domestic dogs on the border of Noel Kempff Mercado National Park, Bolivia. *Journal of Zoology and Wildlife Medicine* 39: 28-36.

Bueno, A.A. and Motta-Junior, J.C. 2006. Small mammals selection and functional response in the diet of the maned wolf, *Chrysocyon brachyurus* (Mammalia: Canidae), in southeast Brazil. *Mastozoología Neotropical* 13(1): 11-19.

Cartes, J.L., Giordano, A.J. and Cameroni, M.N.M. 2014 . Chapter 17: The maned wolf (*Chrysocyon brachyurus*) in Paraguay. In: Consorte-McCrea, A.G. and Santos, E.F. (eds), *Ecology and Conservation of the Maned Wolf – Multidisciplinary Perspectives*, pp. 235-247. CRC press, Florida, USA.

Carvalho, C.T. and Vasconcellos, L.E.M. 1995. Disease, food and reproduction of the maned wolf - *Chrysocyon brachyurus* (Illiger) (Carnivora, Canidae) in southeast Brazil. *Revista Brasileira de Zoologia* 12: 627-640.

Chiarello, A.G. 2000. Conservation value of a native forest fragment in a region of extensive agriculture. *Revista Brasileira de Biologia* 60(2): 237-247.

Coelho, C.M., De Melo, L.F.B., Sábato, M.A.L., Magni, E.M.V., Hirsch, A. and Young, R.J. 2008. Habitat use by wild maned wolves (*Chrysocyon brachyurus*) in a transition zone environment. *Journal of Mammalogy* 89(1): 97-104.

da Fonseca, G. A. B., Rylands, A. B., Costa, C. M. R., Machado, R. B. and Leite, Y. R. 1994. Mamíferos Brasileiros sob Ameaça. In: G. A. B. Fonseca, A. B. Rylands, C. M. R. Costa, R. B. Machado and Y. R. Leite (eds), *Livro vermelho dos mamíferos ameaçados de extinção*, pp. 1-10. Fundação Biodiversitas, Belo Horizonte, Brazil.

Deem, S.L. and Emmons, L.H. 2005. Exposure of free-ranging maned wolves (*Chryosocyon brachyurus*) to infectious and parasitic disease agents in the Noel Kempff Mercado National Park, Bolivia. *Journal of Wildlife Medicine* 36: 192-197.

Deem, S.L., Bronson, E., Angulo, S., Acosta, V., Murray, S., Robbins, R.G., Giger, U., Rothschile, B., and Emmons, L.H. 2012. Morbidity and Mortality . *Smithsonian Contribution Zoology* 639: 77-89.

Dietz, J.M. 1984. Ecology and social organization of the maned wolf (*Chrysocyon brachyurus*). *Smithsonian Contributions to Zoology* 392: 1-51.

Dietz, J.M. 1985. *Chrysocyon brachyurus*. *Mammalian Species* 234: 1-4.

Emmons, L.H. 2012. The Maned Wolves of Noel Kempff Mercado National Park. *Smithsonian Contributions to Zoology* 639 : 1-135.

Emmons, L.H. 2014. Chapter 16: Environmental Influences on Maned Wolf in Bolivia. In: Consorte-McCrea, A.G. and Santos, E.F (eds), *Ecology and Conservation of the Maned Wolf – Multidisciplinary Perspectives*, pp. 221-234. CRC press, Florida, USA.

Groombridge, B. (ed.). 1994. *1994 IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland and Cambridge, UK.

Holland, R. 2014. Chapter 4: The maned wolf Ex-Situ worldwide. In: Consorte-McCrea, A.G. and Santos, E.F. (eds), *Ecology and Conservation of the Maned Wolf – Multidisciplinary Perspectives*, pp. 53-62. CRC press, Florida, USA.

IUCN. 1990. *IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland and Cambridge, UK.

IUCN. 2015. The IUCN Red List of Threatened Species. Version 2015-4. Available at: www.iucnredlist.org. (Accessed: 19 November 2015).

IUCN. 2016. The IUCN Red List of Threatened Species. Version 2016-1. Available at: www.iucnredlist.org. (Accessed: 30 June 2016).

IUCN Conservation Monitoring Centre. 1986. *1986 IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland and Cambridge, UK.

IUCN Conservation Monitoring Centre. 1988. *1988 IUCN Red List of Threatened Animals.* IUCN, Gland, Switzerland and Cambridge, UK.

Jácomo, A.T.A. 1999. Nicho alimentar do lobo guará (*Chrysocyon brachyurus* Illiger, 1811) no Parque Nacional das Emas. M.Sc. Thesis, Universidade federal de Goiás.

Juarez, K.M. and Marinho-Filho, J. 2002. Diet, habitat use, and home ranges of sympatric canids in central Brazil. *Journal of Mammalogy* 83: 925-933.

Lacy, R.C., P.S. Miller, and K. Traylor-Holzer. 2015. *Vortex 10 User's Manual. 15 April 2015 update*. IUCN SSC Conservation Breeding Specialist Group, and Chicago Zoological Society, Apple Valley, Minnesota, USA.

May Jr., J.A. and Felippe, P.A.N. 2014. 2014. Chapter 9: Conservation Medicine. In: Consorte-McCrea, A.G. and Santos, E.F. (eds), *Ecology and Conservation of the Maned Wolf – Multidisciplinary*

Perspectives, pp. 109-127. CRC press, Florida, USA.

Mones, A. and Olazarri, J. 1990. Confirmacion de la existensia de *Chrysocyon brachyurus* (Illiger) en el Uruguay (Mammalia: Carnivora: Canidae). *Comunicaciones Zoologicas del Museo de Historia Natural de Montevideo* 12: 1-5.

Motta-Júnior, J.C. 1997. Ecologia alimentar do lobo-guará, *Chrysocyon brachyurus* (Mammalia: Canidae). In: C. Ades (ed.), *Anais de XV Encontro Anual de Etologia*, pp. 197-209. Brazil.

Motta-Júnior, J.C., Queirolo, D. and Bueno, A.B. 2014. Chapter 7: Feeding Ecology – A Review. In: A.G. Consorte-McCrea and E.F. Santos (eds), *Ecology and Conservation of the Maned Wolf – Multidisciplinary Perspectives*, pp. 87-98. CRC press, Florida, USA.

Motta-Júnior, J.C., Talamoni, S.A., Lombardi, J.A. and Simokomaki, K. 1996. Diet of the maned wolf *Chrysocyon brachyurus*, in central Brazil. *Journal of Zoology (London)* 240: 277-284.

Muir, M.J. and Emmons, L.H. 2012. Conservation. In: Emmons, L.H. (ed.), *The Maned Wolf of Noel Kempff Mercado National Park*, pp. 91-116. Smihsonian Institution Press, Washington, DC.

Myers, N., Mittermeier, R.A., Mittermeier, C.G., da Fonseca, G.A.B. and Kent, J. 2000. Biodiversity hotspots for conservation priorities. *Nature* 403: 853-858.

Ojeda, R.A Chillo, V. and Díaz, G.B. 2012. *Libro rojo mamíferos amenazados de la Argentina. Sociedad Argentina para el Estudio de los Mamíferos (SAREM)*.

Orozco M. , Ceballos L.A., Pino M. de la C. and Gurtler, R.E. 2013a. Local threats and potential infectious hazards to maned wolves (*Chrysocyon brachyurus*) in the southeastern Argentine Chaco. *Mammalia* 78: 339-349.

Orozco, M.M., Soler, GL. and González Paula, P. 2013b. El aguará guazú en Argentina: acciones para la conservación de la especie y su hábitat. Grupo Argentino Aguará Guazú (GAAG).

Orozco, M., Pautasso, A.A. and Rago, V. 2009. *Aguara guazú (*Chrysocyon brachyurus*) en Argentina. Situación actual y acciones de conservación. [Maned Wolf (Chrysocyon brachyurus) in Argentina. Current status and conservation actions.]* . Dirección de Fauna Silvestre Secretaria de Ambiente y Desarrollo Sustentable, Argentina.

Paula, R.C. and Desbiez, A. 2014. Chapter 2: Population Viability Analysis. In: Consorte-McCrea, A.; Ferraz, E. (ed.), *Ecology and Conservation of the Maned Wolf: Multidisciplinary Perspectives*, CRC Press, Florida, USA.

Paula, R.C. and Gambarini, A. 2013. *Historias de Um Lobo – Stories of a Golden Wolf*. Avis Brasilis, Vinhedo.

Paula, R. C., Medici, P. and Morato, R. G. 2008. Maned Wolf Action Plan - Population and Habitat Viability Assessment/Plan de Acción para la Conservación del Aguará Guazu - Análisis de Viabilidad Poblacional y de Hábitat. Edições IBAMA, Brasília, Brazil.

Paula, R.C., Rodrigues, F.H.G., Bizerril, M.X., Songsasen, N., Eizirik, E., Morato, R.G., Santos, J.P., Azevedo, F.C., May Junior, J.A., Soares, C.C., Rocha, F.L. and Arrais, R.C. 2014. Chapter 13: The Maned Wolf Conservation Project – Serra da Canastra, Minas Gerais, Brazil. In: Consorte-McCrea, A.; Ferraz, E. (ed.), *), Ecology and Conservation of the Maned Wolf: Multidisciplinary Perspectives*, CRC Press., Florida, USA.

Paula, R.C., Rodrigues, F.H.G., Queirolo, D., Jorge, R.P.S., Lemos, F.G. and de Almeida Rodrigues, L. 2013. Avaliação do estado de conservação do Lobo-guará *Chrysocyon brachyurus* (Illiger, 1815) no Brasil. *Biodiversidade Brasileira* 3: 146-159.

Pautasso, A.A (ed). 2009. Estado de conocimiento y conservación del aguará guazú (*Chrysocyon brachyurus*) en la provincia de Santa Fe, Argentina. *Biológica* 11: 1-125.

Queirolo, D., Moreira, J.R., Soler, L, Emmons, L.H., Rodrigues, F.H.G., Pautasso, A.A., Cartes, J.L. and Salvatori, V. 2011. Historical and current range of the Near Threatened Maned Wolf *Chrysocyon brachyurus* in South America. *Oryx* 45: 296-303.

Ratter, J. A., Riveiro, J. F. and Bridgewater, S. 1997. The Brazilian cerrado vegetation and threats to its biodiversity. *Annals of Botany* 80: 223-230.

Richard, E., Giraudo, A. and Abdala, C. 1999. Confirmación de la presencia del aguará guazú (*Chrysocyon brachyurus*, Mammalia: Canidae) en la provincia de Santiago del Estero, Argentina. *Acta Zoológica Lilloana* 45: 155-156.

Rodrigues, F.H.G. 2002. Biologia e conservação do lobo-guará na Estação Ecológica de Águas Emendadas. DF. Tese (Doutorado em Ecologia), Universidade Estadual de Campinas.

Rodrigues, F.H.G., Desbiez, A.L.J., Grando, R.L.S.C., Lacerda, A.C.R., Hass, A. and Silva, W.R. 2014. Chapter 2: Population Viability Analysis. In: A. Consorte-McCrea and E. Ferraz (eds), *Ecology and Conservation of the Maned Wolf: Multidisciplinary Perspectives* , CRC Press, Florida, USA.

Rodrigues, F.H.G., Hass, A., Lacerda, A.C.R. and Grando, R.L.S.C. 1998. Biologia e conservação do lobo-guará na Estação Ecológica de Águas Emendadas, DF. Seminário de pesquisa em Unidades de Conservação. SEMATEC/IEMA.

Santos, E.F. 1999. Ecologia alimentar e dispersão de sementes pelo lobo-guará (*Chrysocyon brachyurus*, Illiger, 1811) em uma área rural no sudeste do Brasil (Carnivora: Canidae). M.Sc. Dissertation, UNESP.

Scott, P. 1965. Section XIII. Preliminary List of Rare Mammals and Birds. *The Launching of a New Ark. First Report of the President and Trustees of the World Wildlife Fund. An International Foundation for saving the world's wildlife and wild places 1961-1964*, pp. 15-207. Collins, London, UK.

Sillero-Zubiri, C., Hoffmann, M. and Macdonald, D.W. (eds). 2004. *Canids: Foxes, Wolves, Jackals and Dogs. Status Survey and Conservation Action Plan*. IUCN/SSC Canid Specialist Group, IUCN, Gland, Switzerland and Cambridge, UK.

Silveira, L. 1999. Ecologia e conservação dos mamíferos carnívoros do Parque Nacional das Emas, Goiás. M.Sc. Thesis, Universidade Federal de Goiás.

Soler, L. 2008. Wild carnivores: from conflict to tolerance. International Zoo . *Educators Journal* 44: 47-50.

Soler, L. 2009. Aspectos ecológicos y perspectivas de conservación de Chrysocyon brachyurus en Argentina. MSc. Dissertation, Universidad Nacional del Sur.

Soler, L. 2014. Chapter 15: Maned Wolf in Argentina. In: Consorte-McCrea, A.G. and Santos, E.F. (eds), *Ecology and Conservation of the Maned Wolf – Multidisciplinary Perspectives*, pp. 203-220. CRC press, Florida, USA.

Soler, L. and Carenton, J. 2008. The Maned Wolf: a flagship species for the conservation of wetlands. *WAZA Magazine* 10: 4-6.

Soler, L., Carenton, J.M., Birochio, D., Salvatori, V., Orozco, M.M., Rosso, M.S., Carpinetto, M., Heinonen Fortabat, S., Steiman, L., Díaz, M.L., Pino, M.C., Chávez Calvimontes, V., Kina, A.M., Torres Jiménez, G., Prates, P. and Solís, G. 2005. Problems and recommendations for the conservation of Maned Wolf in Argentina. Results from the First Workshop of *Chrysocyon brachyurus* in Argentina and surrounding countries: conservation in situ and ex situ. *Endangered Species UPDATE* 22(1): 1-9.

Songsasen, N. and Rodden, M.D. 2010. The role of the Species Survival Plan in Maned Wolf *Chrysocyon brachyurus* conservation. *International Zoo Yearbook* 44: 136-148.

Thornback, J. and Jenkins, M. 1982. *The IUCN Mammal Red Data Book. Part 1: Threatened mammalian taxa of the Americas and the Australasian zoogeographic region (excluding Cetacea)*. IUCN, Gland, Switzerland.

Vynne, C. 2010. Landscape use by wide-ranging mammals of the cerrado. Department of Biology, University of Washington.

Vynne, C. 2014. Chapter 12: Agricultural expansion and the future of the Maned Wolf. In: Consorte-McCrea, A.G. and Santos, E.F. (eds), *Ecology and Conservation of the Maned Wolf – Multidisciplinary Perspectives*, pp. 165-176. CRC press, Florida, USA.

Vynne, C. Keim, J.L., Machado, R.B., Marinho-Filho, J. Silveira, L., Groom, M.J. and Wasser, S.K. 2011. Resource selection and its implications for wide-ranging mammals of the Brazilian Cerrado. *PLoS ONE* 6(12): e28939.

Williams, R.S.R., Torres, E., Magan, J., Cruz, A. and Leite Pitman, R. 2012. Continued presence of the Maned Wolf in Peru. Available at: http://www.canids.org/canidsnews/15/Maned_wolf_in_Peru.pdf.

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External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
14. Artificial/Terrestrial -> 14.2. Artificial/Terrestrial - Pastureland	-	Suitable	No
14. Artificial/Terrestrial -> 14.1. Artificial/Terrestrial - Arable Land	-	Suitable	No
5. Wetlands (inland) -> 5.4. Wetlands (inland) - Bogs, Marshes, Swamps, Fens, Peatlands	-	Suitable	No
4. Grassland -> 4.6. Grassland - Subtropical/Tropical Seasonally Wet/Flooded	-	Suitable	Yes
4. Grassland -> 4.5. Grassland - Subtropical/Tropical Dry	-	Suitable	Yes
3. Shrubland -> 3.6. Shrubland - Subtropical/Tropical Moist	-	Suitable	Yes
3. Shrubland -> 3.5. Shrubland - Subtropical/Tropical Dry	-	Suitable	Yes
2. Savanna -> 2.2. Savanna - Moist	-	Suitable	Yes
2. Savanna -> 2.1. Savanna - Dry	-	Suitable	Yes
1. Forest -> 1.6. Forest - Subtropical/Tropical Moist Lowland	-	Suitable	Yes
1. Forest -> 1.5. Forest - Subtropical/Tropical Dry	-	Suitable	Yes

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.3. Agro-industry grazing, ranching or farming	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	Majority (50-90%)	Negligible declines	Low impact: 5
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.3. Persecution/control	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		

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8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Canis familiaris)	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
8. Invasive and other problematic species, genes & diseases -> 8.5. Viral/prion-induced diseases -> 8.5.2. Named species	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: Yes
Systematic monitoring scheme: No
In-Place Land/Water Protection and Management
Conservation sites identified: No
Occur in at least one PA: Yes
Area based regional management plan: No
Invasive species control or prevention: Not Applicable
In-Place Species Management
Harvest management plan: No
Successfully reintroduced or introduced beningly: No
Subject to ex-situ conservation: Yes
In-Place Education
Subject to recent education and awareness programmes: Yes
Included in international legislation: Yes
Subject to any international management/trade controls: Yes

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
2. Land/water management -> 2.1. Site/area management

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T4819A82316878.en

Conservation Actions Needed
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.5. Threats
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Distribution
Lower elevation limit (m): 0
Upper elevation limit (m): 2000
Population
Number of mature individuals: 17000
Population severely fragmented: No
Habitats and Ecology
Generation Length (years): 5

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T4819A82316878.en

Errata

Errata reason: The first version of this assessment (published in 2015) erroneously recorded the lead Assessor's name as "Cunha de Paula, R." This was corrected to "Paula, R.C." in 2016.

The IUCN Red List Partnership

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