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

Nineteenth meeting of the Conference of the Parties
Panama City (Panama), 14 – 25 November 2022

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Transfer *Cynomys mexicanus* from Appendix I to Appendix II considering that international trade does not pose a threat to the species, in accordance with paragraph 1 of the Fundamental Principles set out in Article II of the text of the Convention and precautionary measures A1 and A2 listed in Annex 4 of Resolution Conf. 9.24 (Rev. CoP17).

B. Proponent

Mexico*

C. Supporting statement

1. Taxonomy

1.1 Class: Mammalia

1.2 Order: Rodentia

1.3 Family: Sciuridae

1.4 Genus, species or subspecies, including author and year: *Cynomys mexicanus* Merriam, 1892 (Wilson and Reeder, 2005)

1.5 Scientific synonyms: No subspecies or synonyms

1.6 Common names:
English: Mexican Prairie Dog, Mexican Prairie Marmot
French: Chien de Prairie du Mexique
Spanish: Perrito de las Praderas, Perro de la Pradera Mexicano, Perrito Llanero Mexicano, Perrito Llanero

1.7 Code numbers: 7981

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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.*

2. Overview

At the 29th meeting of the Animals Committee (2017, Geneva), Mexico volunteered to assess C. mexicanus as part of the Periodic Review process in accordance with Resolution Conf. 14.8 (Rev. CoP17) during the period between CoP17 and CoP19. This amendment proposal is the result of the periodic review.

Cynomys mexicanus is a rodent that is endemic to Mexico and lives in family groups known as clans. It has a restricted distribution in the north west of the country. Its main threat is habitat loss. The decrease and fragmentation of its habitat in the last 35 years are due to changes in land use for agriculture and overgrazing. The species is classified as Endangered in the Mexican list of species at risk (NOM-059-SEMARNAT-2010; DOF 2019) and as Endangered in the IUCN Red List. However, the number of colonies has remained stable since 1999 (~54 colonies). There are three natural protected areas that cover 30% of its current distribution and an Action Program for the Conservation of Species (PACE) for the Mexican prairie dog (*Cynomys mexicanus*). There are no records of domestic use of the species and the Ejido El Cercado Wildlife Management and Conservation Unit (UMA) in the State of Coahuila is the only one that has recorded two harvests of individuals of the species (150 specimens in 2008 and 130 in 2010). Since the species was included in CITES Appendix I in 1975, only two international trade transactions have been recorded (of wild specimens for scientific purposes in both cases). The Mexican law enforcement authority (PROFEPA) reported the seizure of nine specimens of Mexican prairie dog (*Cynomys mexicanus*) in Mexico from 2013 to 2019. There are no official records of the sale of specimens of this species and there is no domestic or international market threatening its wild populations. Therefore, the species does not meet the criteria for inclusion in the CITES Appendices.

3. Species characteristics

3.1 Distribution

Cynomys mexicanus is a rodent that is endemic to Mexico and whose distribution is restricted to the States of Coahuila, Zacatecas, San Luis Potosí and Nuevo León. Two ecological niche models (MaxEnt and Random Forest) developed considering the records of the World Information Network on Biodiversity (REMIB), field data and climatic variables (Cuervo-Robayo et al., 2014), slope (Guevara and Arroyo-Cruz, 2016), the valley bottom flatness index (Guevara and Arroyo-Cruz, 2016) and soil-related variables (INIFAP-CONABIO, 1995) yielded a potential distribution of at least 4,365 km2 (Figure 1). The estimated historical distribution of the species is 800 km2 (Ceballos and Wilson, 1985; Treviño-Villareal, 1990); however, based on the human activities recorded and the quality of its present habitat, validated by satellite imagery, it was determined that the species' area of occupancy is 215 km2 (see Figure 3 in Section 4.5 on geographic trends; Medellín et al., 2019). It is the species of *Cynomys* with the southernmost distribution of the genus (Ceballos and Wilson 1985).

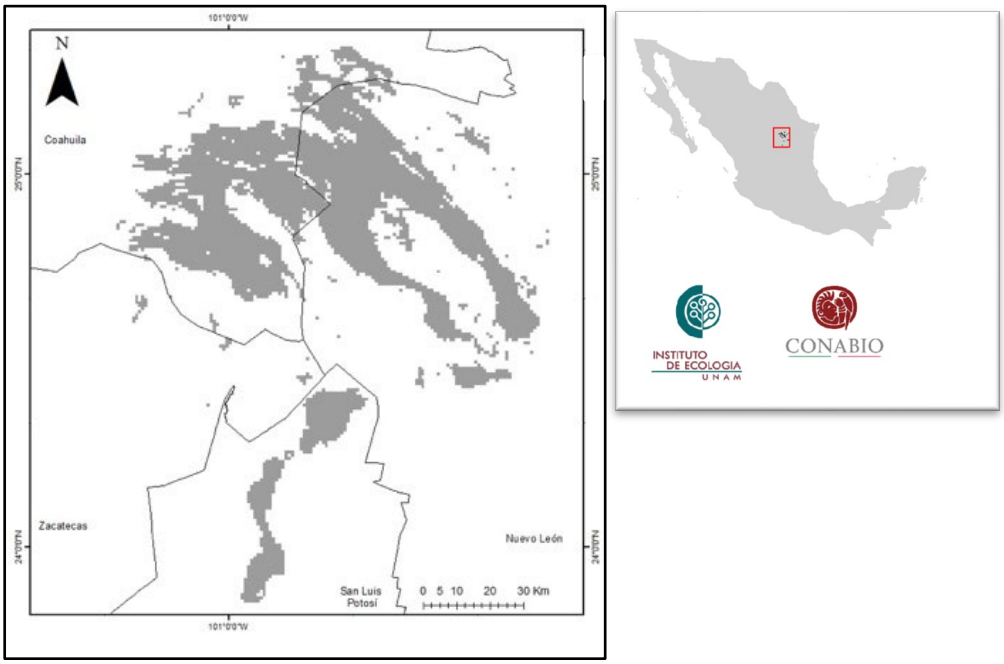

Figure 1. Ecological niche model (in grey) obtained with Random Forest that yielded a potential distribution of 4,365 km^2 for the species (Medellín *et al.*, 2019).

3.2 Habitat

The Mexican prairie dog inhabits the short grasslands of valleys, prairies and intermontane basins of north-eastern Mexico (Rioja-Paradela *et al*., 2008) at elevations between 1,600 and 2,200 m. Reciprocal dependence between this species and grasslands has been reported: grasslands are essential for the survival of prairie dogs and provide them with food and adequate conditions for the establishment of their colonies, and prairie dogs play a key role in the dynamics and preservation of this ecosystem (Mellink and Madrigal, 1993).

Such grasslands are open environments with herbs and grasses 10 to 20 cm high. These plant communities are known as blue grama grasslands, and are characterized by the presence of *Bouteloua gracilis, Bouteloua cutipendula, Bouteloua eriopoda, Bouteloua chasei, Lycurus phleoides, Stipa eminens, Aristida glauca* and *Muhlenbergia monticola* and by associations between a large group of perennial herbaceous species as well as various composite plants (Yeaton and Flores, 2006). This type of vegetation allows the species to establish its colonies and have a good view of predators.

The characteristic soil types of the areas are gypsum and xerosol prairie soils with low calcium carbonate content and a loamy-silty texture, followed by loamy-clayey soils and loamy-sandy soils to a lesser extent (Pando-Moreno, 2013).

3.3 Biological characteristics

Mexican prairie dogs live in family groups called clans, with adjacent clans forming a colony. Family groups are composed of 3 to 4 related adult females, 1 adult male and 1 to 2 young males. This species has been reported to breed annually and produce a single litter per year, even in optimal conditions (Rioja-Paradela, 2003; Rioja-Paradela and Scott-Morales, 2004). Typically, individuals of this species reach sexual maturity at the age of two years in both sexes, although under favourable environmental conditions they may reach maturity at one year of age (Pizzimenti and McClenaghan, 1974; González-Saldívar, 1990). The mating season is reported to take place in late January and early February; it starts with the presence of descended testes in males and the characteristic reproductive behaviours of this species, including the sniffing of the genitals of females, which present a swollen and whitish vulva (Rioja-Paradela *et al*., 2003). However, this behaviour can vary and extend until the month of April, depending on the latitude and the resources of the colony.

Gestation lasts 28-32 days and pups are usually born between mid-February and early March; an average litter produces about six blind and hairless pups (Benítez, 2006). Pups are covered in hair at four weeks and open their eyes at five or six weeks; locomotion is entirely quadrupedal. The pups start to come out of the burrow in early May-late June. They nurse from February to April and are weaned 30-40 days later; pups can sometimes be seen nursing from their mother outside the burrow (Ceballos and Wilson, 1985; Pizzimenti and McClenaghan, 1974; Rioja-Paradela, 2003). Juveniles reach the weight of the adults at 6 months of age; this differs from black-tailed prairie dogs (*C. ludovicianus*), which reach adult size at 15 months.

Parental care of pups has been reported to last for about 7 weeks (SEMARNAT, 2004). In order to keep the colony as safe as possible and escape predators, both juveniles and adults develop a repertoire of vocalizations and sounds to communicate and make alarm signals (Benítez, 2006; Rioja and Scott-Morales, 2004).

Cynomys mexicanus is a herbivore that feeds mainly on herbs and grasses during the spring and other soft herbaceous plants during the summer; it never stores the food it consumes (Mellink and Madrigal, 1993 in Rioja-Paradela, 2003). According to some reports, its diet is composed of at least 75 species, mostly gramineous plants (54%), followed by herbaceous plants (43%; Mellado *et al*., 2005; Mellado and Olvera, 2008). It has been reported that the El Manantial colony in San Luis Potosí feeds mainly on *Muhlenbergia repens, Halimolobos* sp., *Arista pansa* and *Calylophus hartwegii* (Mellink and Madrigal, 1993).

3.4 Morphological characteristics

The Mexican prairie dog (*C. mexicanus*) is one of the largest rodents of Mexico but it is the smallest of the five species of the genus *Cynomys* described; it has a robust body and short legs; its dorsal coloration is yellowish brown, and individual hairs have four bands of colour: black at the proximal end, then white, red, and yellow at their tips, giving the pelage a grizzled effect (Figure 2). On the ventral

side, the hairs are dark at the base and yellowish at the tip, with paler colours than the dorsal region. The tip of the tail is black (Ceballos and Wilson, 1985). The skull is wide and angular with expansive malar bones, which makes it superficially similar to other *Cynomys* species (Ceballos and Wilson, 1985). The average length of adults is 38.9 cm, ranging between 38.5 and 44.0 cm; females are smaller than males; the other total body measurements are: tail length, 8.87 cm; leg length, 6.04 cm; ear length, 1.0 to 1.4 cm (Pacheco, 2005). Body weight ranges from 700 to 1,400 g (Pacheco, 2005). The dental formula is i 1/1, c 0/0, p 1/1, m 3/3, total = 20 (Ceballos and Wilson, 1985).

3.5 Role of the species in its ecosystem

This species is very important for its ecosystem because it influences plant succession, hydrology, the nutrient cycle, biodiversity and the landscape architecture; it is a prey of species such as American badgers (*Taxidea taxus*), coyotes (*Canis latrans*), golden eagles (*Aquila chrysaetos*), red-tailed hawks (*Buteo jamaicensis*) and rattlesnakes (*Crotalus* sp.) (Ceballos and Wilson, 1985); its burrows are a refuge for other species such as the burrowing owl (*Athene cunicularia*) (Ruiz *et al*., 2016). In Mexico it is considered a species of conservation priority (SEMARNAT, 2018).

Figure 2. Female *Cynomys mexicanus*. Photograph by Horacio V. Bárcenas, municipality of Vanegas, in San Luis Potosí, Mexico (2019).

4. State and trends

4.1 Habitat trends

The decrease in the habitat of the species is mainly due to changes in land use for agriculture and overgrazing, which have led to the loss and fragmentation of the species' habitat over the last 35 years (Ceballos *et al*., 1993; Treviño-Villarreal and Grant, 1998; Scott-Morales *et al*., 2004). Habitat fragmentation causes two main problems: a reduction of its populations and their isolation in the existing habitats, resulting in a rising risk of extinction of the species compared to other species of *Cynomys* (Scott-Morales *et al*., 2005); changes in land use are in turn affecting the ecosystem services that this species provides, leading to a reduction of the quality of life of the human populations that depend on them. Overgrazing affects reproduction and the survival of the young, as well as the social interactions between individuals of the colony (Mellado *et al*., 2005; Yeaton and Flores, 2006). This has a negative impact on the densities of prairie dog colonies, which are highly related to plant cover: a cover of 45-50% is associated with high densities, while colonies with a vegetation cover of less than 5% have lower densities (Scott-Morales *et al*., 2004).

4.2 Population size

There is no estimate of the total population size of all the colonies of the species. Although there are historical records, they were obtained with indirect abundance indices that were inadequate for estimating population size (i.e., burrow counts; Medina and de la Cruz, 1976; Ceballos *et al*., 1993); the density reported was 35-107 burrows/ha. Ceballos and Wilson (1985) qualitatively reported the existence of areas with colonies of fewer than 50 individuals, but there are also reports of areas with colonies numbering hundreds of individuals (Sánchez-Cordero, 2003). Scott-Morales *et al*. (2005) reported average densities of 6.9 ind/ha in the Rancho de Los Ángeles-La Perforadora complex,

located between the States of Nuevo León and Coahuila, while the average density reported in the El Manantial complex in San Luis Potosí was 1.6 ind/ha.

Medellín *et al.* (2019) conducted field visits of the colonies of San Luis Potosí and Zacatecas in the dry and wet seasons. With the exception of the colony of Ciénega de Rocamontes in Zacatecas, they recorded pups in all the colonies in the dry season. Densities per hectare ranged from 4 to 42 individuals, and the estimated population size of colonies in these two States ranged from 26 to 1,588 individuals. Table 1 summarizes data on the density and area of the various colonies of Mexican prairie dogs.

Table 1. Average area and density of Mexican prairie dog colonies in Mexico

State	Number of colonies	Average area (ha)	Average density (ind/ha) [number of colonies surveyed]	Area of distribution per State (ha)	% of the distribution compared to the total area
Nuevo León	13.0	949.6	3.2 [1]***	12,345.0	57.2
Coahuila	21.0	437.8	6.1 [13]**	8,759.0	40.6
San Luis Potosí	12.0	36.3	1.6 [1]** a 15.6 [6]*	435.0	2.0
Zacatecas	3.0	14.3	20.6 [3]*	43.0	0.2

*Medellín *et al*. (2019), **Data reported by Scott-Morales *et al*. (2005); ***Data published by González-Uribe, 2011.

4.3 Population structure

Mexican prairie dogs are social and live in family groups called clans, which in turn form colonies. The structure and sex ratio of a family or clan in the colony of Tokio, Nuevo León, was found to be composed of 1 to 2 adult males, 1 to 4 adult females, and 16 to 20 juveniles. A clan comprises 7 individuals on average.

4.4 Population trends

According to the International Union for the Conservation of Nature (IUCN), this species is classified as Endangered (EN) with a decreasing trend (Álvarez-Castañeda et al., 2018).

Population changes can also be estimated on the basis of the number of colonies reported: of the 88 colonies reported in 1993 (counted by Treviño-Villarreal and Grant (1998) in the entire range of the species, 54 remained in 1999 (Scott-Morales *et al*., 2004), and there were 56 in 2010 (González-Uribe, 2011). In 2019, Medellín *et al*. reported the existence of 49 colonies of the species. Yet, many of these colonies may have been part of a single large colony but counted as two or more by some authors. Overall, the number of colonies has remained stable since 1999 (**Table 2**).

Table 2. Area in hectares (ha), percentage of the area occupied (%) and number of colonies reported in each State

State	Variable	Treviño-Villarreal and Grant, 1998	Scott-Morales *et al*., 2004	González-Uribe, 2011	Medellín *et al*., 2019
Coahuila	area (ha)	11,250	8,200	14,317.79	8,759
	area (%)	24	25.4	50.4	40.58
	number of colonies	36	20	26	21
Nuevo León	area (ha)	35,470	23,400	13,511.35	12,345
	area (%)	74	72.5	47.5	57.2
	number of colonies	32	24	24	13

State	Variable	Treviño-Villarreal and Grant, 1998	Scott-Morales *et al.*, 2004	González-Uribe, 2011	Medellín *et al.*, 2019
San Luis Potosí	area (ha)	950	550	593.3	435
	area (%)	2	1.9	2.1	2.01
	number of colonies	20	10	6	12
Zacatecas	area (ha)	0	0	0	43
	area (%)	0	0	0	0.19
	number of colonies	0	0	0	3
Total area (ha)		47,670.0	32,150.0	28,442.0	21,582.0
Total no. of colonies		88	54	56	49

4.5 Geographic trends

The first estimate of the habitat occupied by this species was 800 km^2 in four States: Nuevo León, Coahuila, Zacatecas and San Luis Potosí (Ceballos and Wilson, 1985, and Treviño-Villareal, 1990). Later estimates have suggested declines. In surveys conducted in 1986-1988, Ceballos *et al*. (1993) reported an area of 600 km^2. In a survey conducted in 1993, Treviño-Villarreal and Grant (1998) reported 478 km^2; in 1999, Scott *et al*. (2004) estimated an area of 322 km^2; and the most recent survey, conducted by González-Uribe in 2011 yielded an estimated 284 km^2. In the present review, the area of occupancy was estimated to be 215 km^2 (2019), implying already a 73% reduction of the historical range of the species (Figure 3).

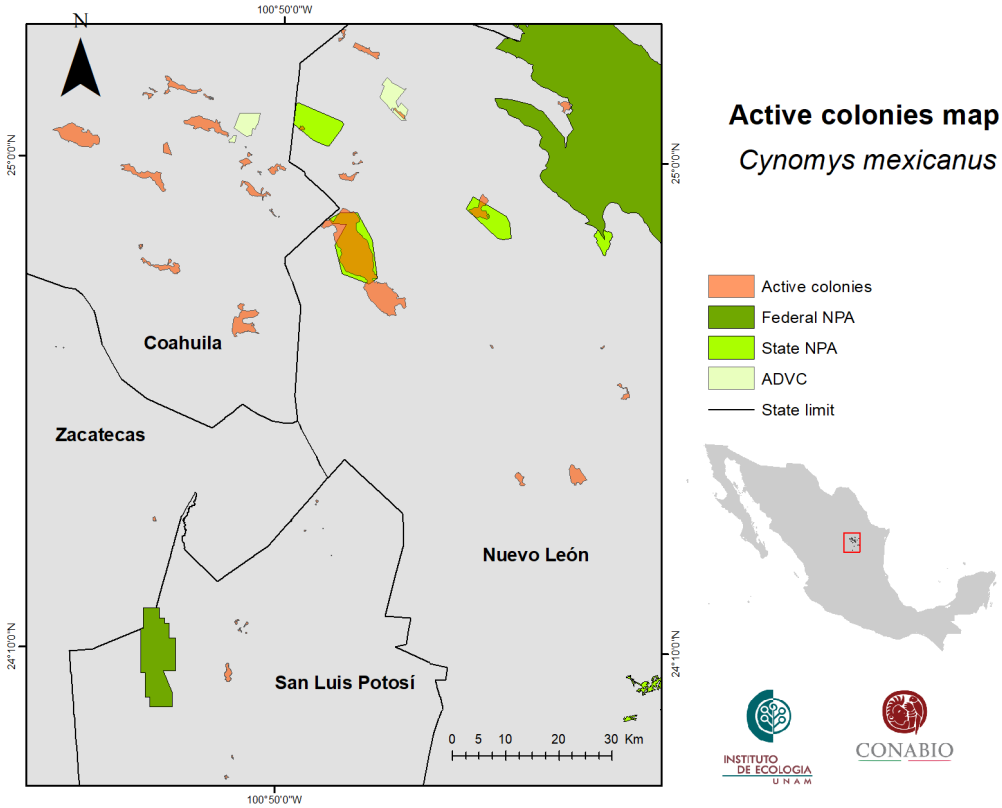

Figure 3. Active colonies of *C. mexicanus* and federal and state Natural Protected Areas (NPAs) as well as Voluntary Conservation Areas (ADVC).

5. Threats

The main anthropogenic threat is habitat loss due to agriculture, livestock farming, hunting and poisoning, as the species is considered an agricultural pest (Ceballos and Wilson, 1985; Ceballos *et al*., 1993).

6. Utilization and trade

6.1 National utilization

There is no record of national utilization of the species. In a study conducted by Medellín *et al*. (2019), 8 online sale websites and Facebook pages based in Mexico City were consulted: 6 sold pets and 2 sold exotic meat. No searches revealed the sale of any specimens or by-products of the species.

6.2 Legal trade

Domestic trade

The species occurs in four Wildlife Management and Conservation Units known as UMAs for their Spanish acronym (UMAs are the only legal entities that can manage wildlife) registered at the General Directorate for Wildlife of the Mexican Department of the Environment and Natural Resources (Dirección General Vida Silvestre de la Secretaría de Medio Ambiente y Recursos Naturales, DGVS-SEMARNAT). The Ejido El Cercado UMA in the State of Coahuila is the only one that has recorded two harvests of individuals of the species (150 individuals in 2008 and 130 in 2010). This UMA has provided individuals for reintroduction into the wild in the following UMAs: Lagunillas, DGVS-CR-EX-3487-ZAC; Ciénega de Rocamontes, SEMARNAT-UMA-EX-0152-ZAC; and Ejido Concepción del Oro, SEMARNAT-UMA-EX-012-ZAC.

International trade

Since the species was included in the CITES Appendices in 1975, only two cases of international trade have been recorded. One took place in 2012 and involved 200 biological samples (exported to Germany) and the other one took place in 2004 and included 300 tissue samples exported to the United States. The source of the specimens was wild (W) and the exports were for scientific purposes (CITES Trade Database, UNEP-WCMC; trade.cites.org; 1975-2019).

6.3 Parts and derivatives in trade

The WCMC database only includes two records of international trade (2004 and 2012) corresponding to 500 biological samples of wild origin exported for scientific purposes (see Section 6.2; international trade).

6.4 Illegal trade

The Mexican CITES law enforcement authority (PROFEPA) reported the seizure of 9 individuals of *Cynomys mexicanus* in Mexico from 2013 to 2019: 7 in the State of Sonora and 2 in the State of Yucatán. The data regarding Sonora should be taken with caution, since they probably refer to prairie dogs of the species *Cynomys ludovicianus*. The WCMC database does not contain any records of illegal international trade of the species from 1975 to date (trade.cites.org).

6.5 Actual or potential trade impacts

There are no official records of the sale of individuals or other specimens of this species and there does not seem to exist a domestic or international market that threatens the wild populations. The only records of international transactions involve scientific samples.

7. Legal instruments

7.1 National

The main legal instruments to regulate the use and conservation of wild species in Mexico as well as their habitats and ecosystems are the General Ecological Balance and Environmental Protection Act (Ley General de Equilibrio Ecológico y Protección al Ambiente, LGEEPA; DOF, 1988) and the General

Wildlife Act (Ley General de Vida Silvestre, LGVS; DOF 2000) and their respective regulations (DOF-LGEEPA, 2014; DOF-LGVS, 2014). In addition, there is the Official Mexican Standard NOM-059-SEMARNAT-2010 and its latest update ("Modificación del anexo Normativo III" DOF-2019), which lays down the criteria and mechanisms necessary to determine the category of risk of a species and contains the list of species considered to be at risk on a national level.

The General Wildlife Act establishes the criteria regarding the types of use and harvest that are permitted. In Mexico, it is only possible to harvest wild species through a Unidad de Manejo para la Conservacion de Vida Silvestre (UMA – Management Unit for wildlife conservation) with a management plan listing specific actions for the species of interest that has been approved by the authorities. The Act also establishes that wildlife specimens can only be harvested for commercial purposes if conservation activities are implemented. It sets the criteria required to apply for permits to harvest specimens or samples for scientific purposes.

The species is included in the Mexican national list of species at risk (Anexo Normativo III, modificado en 2019; DOF 2019) of the Official Mexican Standard NOM-059-SEMARNAT-2010 in the category Endangered (DOF, 2010). Consequently, its harvest and trade require meeting additional requirements, including population surveys, and verifying the existence of specific measures and actions to counter the factors that led to the population decline (among other activities listed in the Mexican General Wildlife Act).

According to Article 420, Section IV of the Mexican Federal Penal Code (CPF), the inclusion of *C. mexicanus* in the list of species at risk (NOM-059-SEMARNAT-2010) implies that any illegal activity for the purpose of trafficking, possession, transportation, storage, import or export is punishable with a fine equivalent to 300-3,000 days and a maximum of nine years' imprisonment (CPF 2020). There is an additional penalty of three years' imprisonment and a fine equivalent to up to 1,000 days if these illegal activities take place in or affect a protected area or are conducted for commercial purposes.

The Mexican prairie dog is also included in the Mexican list of species of conservation priority (DOF, 2014). This list was established in 2014 to promote the development of projects for the conservation and recovery of these species and therefore that of their ecosystems, habitats and associated species.

7.2 International

The Mexican prairie dog is the only one of the five known species of the genus *Cynomys* that is included in the CITES Appendices (Appendix I since 1975). It is also listed on the Endangered Species Act of the United States as Endangered.

8. Species management

8.1 Management measures

In Mexico, the National Commission for Protected Areas (CONANP/SEMARNAT) created the Action Program for the Conservation of Species (PACE), which establishes the goals and targets for the conservation of the black-tailed prairie dog (*Cynomys ludovicianus*) and the Mexican prairie dog (*Cynomys mexicanus*). The Program includes a general diagnosis of the current status of the populations of both species and their main threats and highlights the importance of social engagement to enhance habitat conservation and implement best practices in livestock farming, promoting programs for the restoration and conservation of native grasslands (SEMARNAT, 2018).

8.2 Population monitoring

The populations of Mexican prairie dogs have been studied by scholars from various institutions in Mexico. However, despite the existence of the PACE (see Section 8.1), there is no regular monitoring of populations of the species.

8.3 Control measures

8.3.1 International

International trade of the species is regulated through CITES Appendix I. The species is also listed on the ESA as Endangered, which implies that any actions leading to its capture and its import, export, interstate or foreign commerce are prohibited (https://www.fws.gov/).

8.3.2 Domestic

All cross-border movements must be accompanied by documentation proving the legal origin of the specimens, the records of institutions and CITES permits and/or certificates and must be subject to a review by the environmental law enforcement agency (PROFEPA) at the ports, airports and borders designated for the export of specimens. In some cases, an animal health certificate issued by the Department of Agriculture and Rural Development (Secretaría de Agricultura y Desarrollo Rural, SADER) is also required.

8.4 Captive breeding and artificial propagation

The species has been bred in captivity in the Desert Museum in Saltillo, Coahuila, since 1999. The museum currently has a population of 50-60 individuals living in an outdoor colony (Medellín *et al*., 2019).

8.5 Habitat conservation

The Mexican System of National Protected Areas, coordinated by the National Commission for Protected Areas (Comisión Nacional de Áreas Naturales Protegidas, CONANP), includes three State Natural Reserves in which the species is protected: Llano de la Soledad (7,607 ha), La Trinidad (3,282 ha) and La Hedionda (4,381.90 ha), all located in the State of Nuevo León. These reserves protect 6,521.21 ha (65.2 km^2), which amounts to 30 % of the current distribution of the species (Figure 3).

8.6 Safeguards

Hunting and all other uses of *C. mexicanus* and any other threatened species are prohibited in the above-mentioned protected areas.

9. Information on similar species

The Mexican prairie dog (*C. mexicanus*) is very similar to the black-tailed prairie dog (*C. ludovicianus*), which also occurs in Mexico in other areas further north west. Reportedly, it is possible to distinguish between both species by the black area on the tail; it covers the distal half in *C. mexicanus*, whereas it only covers the distal third in *C. ludovicianus* (Clark et al. 1971; Ceballos and Wilson, 1985). However, this trait exhibits variability within both species. The only morphological quantitative trait that can be used to distinguish both species is the skull: *Cynomys mexicanus* has more inflated auditory bullae, its molars are triangular, and the posterior border of the inflected angle of the mandible is nearly at a right angle to the axis of the jaw; by contrast, in the only other species of the genus with a black tail, this angle is about 45º (Clark et al. 1971) and the nasal bones are broad and usually posteriorly truncate (Hall, 1981; Sánchez-Cordero, 2003). Both species can be distinguished through genetic tests (Castellano-Morales *et al*., 2015). Yet, according to the consultations made, *C. ludovicianus* is not traded either for its meat or for use as a pet and is not listed in the CITES Appendices.

10. Consultations

No other countries were consulted because the species is endemic to Mexico.

11. Additional remarks

NA

ACKNOWLEDGMENTS

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