THERYA, 2018, Vol. 9 (3): 261-264 DOI: 10.12933/therya-18-580 ISSN 2007-3364

Record of American black bear (*Ursus americanus*) in Durango, Mexico

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In Mexico, the American black bear (*Ursus americanus*) has withstood a number of anthropogenic pressures such as habitat loss, illegal poaching, poor legislation regarding conservation, management and exploitation, etc. Consequently, these have been the major causes of the decline of large carnivorous mammals in Mexico. The new technologies currently available have provided tools that facilitate their study, documenting their presence and distribution, in addition to expanding the biological and ecological information of this group of predators. During the 2009 winter season, intensive field surveys were conducted in southeastern Chihuahua and western Durango. In each area surveyed, 40 fixed monitoring stations were set, fitted with a camera trap and an scent station, distributed at distances ≥ 1 km between stations across the study areas. A total sampling effort of 2,400 days/trap resulted in one record of a juvenile American black bear (*Ursus americanus*; Figure 1) at Ejido "Lobos y Pescaderos", in the municipality of Tepehuanes, Durango, in Sierra Madre Occidental, Mexico (Figure 2). This record was obtained at 2436 masl, representing the second reliable report of the presence of the American black bear at these altitudes. The photographic record currently available underscores the need to implement and intensify long-term surveys that contribute to determine the presence of American black bear in the northwestern states of Mexico, specifically in Sierra Madre Occidental in the state of Durango, in sites already identified as having temperate forests habitat conditions that are potentially suitable for the American black bear.

En México, los osos negros americanos (*Ursus americanus*) se han enfrentado a diversas presiones antropogénicas como la pérdida de hábitat, cacería ilegal, falta de legislación hacia la conservación, manejo y aprovechamiento, etc., siendo estas las principales causas de disminución de los mamíferos carnívoros de gran talla en México. En la actualidad las nuevas tecnológicas han permitido contar con herramientas que faciliten su estudio, documentar su presencia y distribución, además de incrementar la información biológica y ecológica de este grupo de depredadores. Durante la temporada invernal de 2009 se realizaron prospecciones intensivas de campo en el sureste de Chihuahua y noroeste de Durango. En cada zona de prospección se colocaron 40 estaciones de monitoreo fijas, dotadas de una cámara-trampa y una estación olfativa, distribuidas a distancias ≥ a 1 km entre estaciones en las áreas de estudio. Con un esfuerzo de muestreo total de 2400 días/trampa, se obtuvo el registro de un oso negro americano (*Ursus americanus*) juvenil (Figura 1), en el Ejido "Lobos y Pescaderos", en el municipio de Tepehuanes, Durango, en la Sierra Madre Occidental de México (Figura 2), el registro se obtuvo a una altitud de 2436 msnm, lo que representa el segundo reporte fidedigno de la presencia de oso negro americano a estas altitudes. El presente registro fotográfico hace patente la necesidad de implementar e intensificar prospecciones a largo plazo que contribuyan a conocer la presencia de oso negro americano en los estados del noroeste de México, específicamente en la Sierra Madre Occidental del estado de Durango, sobre todo en aquellas entidades en las que se han identificado las condiciones de hábitat adecuadas de bosques templados y que favorezcan la presencia del oso negro americano.

Key words: black bear; carnivores; Durango; photographic record; México; survey.

Introduction

The American black bear (*Ursus americanus*, Pallas, 1780) is the largest carnivorous mammal in Mexican territory. There is incomplete information regarding its geographical distribution in Mexico, partly because this species has disappeared from many areas of its original range (Delfín-Alfonso *et al.* 2011; Juárez-Casillas and Varas 2013; Scheick and McCown, 2014; Monroy-Vilchis *et al.* 2016). It should be noted that ecological information is even more scarce for black bear populations inhabiting Sierra Madre Occidental, which, according to Hall (1981), belong to two subspecies: *U. a. machetes* and *U. a. amblyceps*.

In Mexico, black bear have withstood a number of anthropogenic pressures, the most significant being the decline of wild populations by the end of the decade of 1950s as a result of campaigns aiming to the extermination of carnivores promoted by the Federal Government (Villa 1960; Baker and Greer 1962). Other factors made the situation worse, such as hunting, habitat loss, and fragmentation caused by the promotion of livestock and agriculture from 1950 across the country (Leopold 1959; Moctezuma and Doan-Crider 2005). Likewise, the social perception of rural communities about large predators, sometimes coupled with the lack of environmental legislation and poor law enforcement, among others, have historically contributed to the few records and lack of robust scientific information about large carnivorous mammals, including the black bear (Delfín-Alfonso *et al.* 2012; Juárez-Casillas and Varas 2013, Servín 2013). In recent years, the incorporation of new technologies to the study of wildlife, including camera traps, genetic analysis and telemetry, has started to yield reliable data on these mammals, whose unique biological characteristics of large-scale movements and nocturnal habits, as well as low population densities, make them hard to spot, so they frequently go unnoticed in the wild (Delfín-Alonso *et al.* 2011; Juárez-Casillas and Varas 2013; Monroy-

Vilchis *et al*. 2016; Camargo-Aguilera *et al.* 2017).

Recently, historical and current records on the presence of black bear in Mexico have been reviewed (Deflín-Alfonso *et al.* 2011; Juárez-Casillas and Varas 2013; Monroy-Vilchis *et al.* 2016). These reviews found seven records of black bear for the State of Durango, distributed in four municipalities. One record corresponds to the municipality of Canatlan, evidenced by a skin in 1989; four records, to the municipality of Mezquital, through the recovery of one skull and one partial skeleton in 1956 (MSU 817), one stool sample and two cubs captured in 1957; a direct sighting in 2005; one specimen was recorded in the municipality of Ocampo, from a skull in 1903; and, finally, one record was obtained from the municipality of Tepehuanes through direct sighting in 2004 (Baker and Greer 1962; Deflín-Alfonso *et al.* 2011).

Materials and Methods

During the winter (22 December to 20 March) of 2009, intensive field surveys were conducted in Sierra Madre Occidental ranging from southwestern Chihuahua to northwestern Durango, in regions covered by well-preserved temperate forests, through camera traps (Wildview® Xtreme4 model). These were distributed at a distance of approximately one kilometer between stations across the study areas, along old roads used for timber extraction, bridle paths, and trails. Each area surveyed included 40 fixed monitoring stations equipped with one camera trap (placed at a height of approximately 50 cm, depending on the characteristics of the land) plus an scent station; bait consisted of sardines in tomato sauce, vanilla extract, and apple. Cameras were operating 24-hours a day for 30 days, capturing 3 images per motion detection event. Sampling effort was calculated by multiplying total number of monitoring stations by total number of sampling days (Chavez *et al.* 2013).

Results

A total sampling effort of 2400 days/trap resulted in one record of an American black bear (*Ursus americanus*) standing upright on its two hind legs; based on body size, it corresponds to a juvenile individual. The animal was photographed at 08:40 hrs on 2 February 2009 (Figure 1), at 25° 09′ 45.14″ N and 105° 57′ 15.90″ W, in pasture land of Ejido "Lobos y Pescaderos", municipality of Tepehuanes, Durango (Figure 2). The record was obtained at 2,436 meters above sea level, representing the second reliable report of the presence of American black bear at these altitudes in the Western Sierra Madre, as the altitudinal distribution of this species ranges between 1,015 and 2,809 masl (Deflín-Alfonso *et al.* 2011). The full identification of the American black bear individual involved an exchange of opinions of specialists, where six observers determined that the images correspond to a black bear.

Based on this record, and given that the specimen photographed is a juvenile, is could not be determined whether this individual belongs to an established population inhabiting the municipality of Tepehuanes or whether it is a juvenile individual in a dispersal process. The same camera trap station also recorded the presence of other wildlife species, such as coyote (*Canis latrans*), white-tailed deer (*Odocoileus virginianus*), rabbit (*Sylvilagus* spp.), hare (*Lepus californicus*), and even creole cattle. There were no further records of *U. americanus* over the course of the survey.

Figura 1. Individuo de oso negro americano (*Ursus americanus*) fotografiado en los terrenos de agostadero del Ejido "Lobos y Pescaderos", en el Municipio de Tepehuanes, Durango, México

The area where the record was obtained is characterized by pine and pine-oak forest, at an altitude of 2,436 masl. The local climate is temperate, semi-cold with cool and long summer, Cb (w2), with summer rainfall; precipitation ranges between 873 and 1,200 mm. The maximum temperatures recorded in the area vary between 24 °C and 34 °C, and the minimum from -8 °C to -16 °C (INEGI, 2016; Medina *et al.* 2005). The local topography is mountainous, with areas of gullies to the northwest of the ejido, with elevations ranging from 1,900 to 2,800 masl. in mountainous zones (INEGI, 2016). The study area comprises a broad extension of perennial and intermittent runoff, the latter primarily during the rainy season.

Discussion

Except for two records, one involving direct sighting in 2004 in Sierra de la Candela, municipality of Tepehuanes, Durango, at 2,809 meters a.s.l. in a pine forest (pers. comm., Jorge I. Servin in Deflín-Alfonso *et al.* 2011), and one capture in 2014 in the town of Felipe Carrillo Puerto, municipality of Guadalupe Victoria, where it was determined that this individual was dispersing from Sierra Madre Oriental (Camargo-Aguilera *et al.* 2017), no other recent study had formally reported the presence of American black bear in the State of Durango.

In Mexico, the historical range of the species covered forested regions of northwestern and northeastern States (Leopold 1959; Baker and Greer 1962; Hall 1981). It is currently acknowledged that not all areas within its historical distribution range in Mexico has been properly explored, so that there is a geographic gap regarding its current dis-

Figura 2. Mapa mostrando el área de estudio en donde se efectuaron las prospecciones en el año 2009, en el Ejido de Lobos y Pescaderos, municipio de Tepehuanes y donde se obtuvo el registro de Oso negro americano (*Ursus americanus*). Ubicación de la fotocolecta (triangulo rojo). Municipio de Tepehuanes (achurado en gris). División del estado (línea oscura). Sierra madre Occidental (achurado verde).

tribution, mainly in the States of Durango, Aguascalientes and Zacatecas. These gaps, together with insufficient field work aimed at the monitoring of the species, have led to consider *U. americanus* as locally absent or extirpated from these regions (Delfín-Alonso *et al.* 2011; Monroy-Vilchis *et al.* 2016).

The present photographic record have determined its presence and underscores the need to implement and intensify field surveys spanning at least one full year, or better still, develop mid- and long-term projects contributing to monitor the presence and even the habitat use and activity patterns of the American black bear in the northwestern regions of Mexico, particularly in the State of Durango on Sierra Madre Occidental. These surveys should be conducted in areas that have been identified as having suitable habitat conditions that favor the presence of this bear as in the municipalities of Guanacevi, Tepehuanes, Topia, Tamazula, Otaez, Santiago Papasquiaro, Durango, Canelas, Pueblo Nuevo, Mezquital and Suchil, just to mention a few.

Acknowledgments

These field surveys received funding from the following institutions: Universidad Juárez of the State of Durango, Universidad Autónoma Metropolitana, Campus Xochimilco, CONABIO (Project H019), CONANP (2008), VISILMEX (Project 2008-1). We received field support from J. Vizcarra, A. Mendez and staff of UCODEFO, Tepehuanes, Durango. Thanks to C. Rodríguez-Luna for drafting Figure 2. Thanks also to three anonymous reviewers and Juan Pablo Gallo for the recommendations that improved the manuscript. María Elena Sánchez-Salazar translated the manuscript into English.

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Associated editor: Pablo Teta
Submitted: November 19, 2017; Reviewed: January 10, 2018;
Accepted: September 2, 2018; Published on line: September 27, 2018.