RANGE EXPANSION OF A LOCALLY ENDANGERED MUSTELID (*EIRA BARBARA*) IN SOUTHERN MEXICO

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ABSTRACT.—We documented the occurrence of *Eira barbara* in the municipalities of Tecpán de Galeana and Petatlán, state of Guerrero, Mexico. Our records represent a 450-km range expansion from the most recent northern occurrences of this species in the Mexican Pacific coast states.

RESUMEN.—Se documentó la presencia del viejo de monte (*Eira barbara*) en los municipios de Tecpán de Galeana y Petatlán, Guerrero, México. Estos registros representan un aumento de su área de distribución al norte en 450-km de los registros más recientes de la especie en la costa del Pacífico Mexicano.

The tayra (*Eira barbara*) is a medium-sized mustelid listed as endangered by Mexican law (NOM-059-SEMARNAT-2010; Official Journal of the Federation 2010). It is a widely distributed species occurring from sea level to 2600 masl, being historically present from Mexico to Argentina (Presley 2000, Chávez 2014) but having several information gaps about its ecology (Emmons and Freer 1990, Brooks 1993). Populations in its northernmost distribution (i.e., many areas of Mexico) have been the least studied (López-González and Aceves 2007). On the northern Pacific Slope of Mexico, only a single record has been reported in Sinaloa in 1904 by Allen (1906). South of Sinaloa, there is an absence of tayra records in several Mexican states of the Pacific coast region: Nayarit, Jalisco, Colima, Michoacán, and Guerrero. It is therefore hypothesized that the 2 young individuals collected at low elevation in Sinaloa (Allen 1906) probably stemmed from an introduction (Álvarez-Castañeda 2000), since most samples from the Pacific Slope of Mexico have been recorded in Oaxaca and Chiapas (Pérez-Irineo and Santos-Moreno 2010, Chávez 2014, Espinosa-Lucas et al. 2015; Fig 1.) at altitudes higher than 2000 masl (Chávez 2014). In the state of Guerrero there are museum records from Acahuizotla (1957) at the mammal collection of the Biodiversity Research and Teaching Collection, Texas A&M University, College Station (López-Wilchis and López-Jardines 1999).

Due to limited knowledge and lack of current records, the specific objective of this paper is to provide information on recent records of tayra, especially in areas where the species was previously assumed absent or at a very low probability of occurrence.

Field sampling was conducted in 2 municipalities in the state of Guerrero, Tecpán de Galeana and Petatlán (2258 masl), in the tropical lowlands of the Mexican Pacific coast. These areas are characterized by humid tropical weather, with summer rainfall and intermittent rainfall in other seasons. The predominant vegetation types are tropical semievergreen forest, tropical deciduous forest, semideciduous forest, oak forest, pine forest, and pine-oak forest associations; cloud forest is present at 1000 to 2000 masl and in areas with greater humidity (Werre and Estrada 1999).

The information presented in this note comes from one of several projects conducted during 2009–2014 in the state of Guerrero, with different sampling efforts by camera trapping. Three individuals were photographed as a result of a sampling effort of 6096 camera trap days. In addition, a specimen (skeleton) was collected and deposited at the Colección Nacional de Mamíferos (= National Collection of Mammals) at the Instituto de Biología, Universidad Nacional Autónoma de México (= Biology Institute, National Autonomous University of Mexico [UNAM]). Also, the vegetation type, altitude, and geographical

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Fig. 1. Records of *Eira barbara* on the Pacific Slope (Sinaloa to Oaxaca), Mexico. **Guerrero**: (1) Petatlán-La Soledad*, 1 km NE; (2) Petatlán-Banco Nuevo*, 3 km NE; (3) Petatlán-La Ceiba*; (4) Tecpan de Galeana-Cordón Grande*; (6) Chilpancingo-Acahuizotla (1957). **Sinaloa**: (5) Escuinapa (1904; Allen 1906). **Oaxaca**: (7) Tuxtepec-San Miguel Soyaltepec (before 2010; Pérez-Irineo and Santos-Moreno 2010); (8) Ixtlán-Capulalpam (before 2008; Cruz-Espinoza et al. 2012); (9) Chimalapas-La Fortaleza (2009–2010; Lira-Torres and Briones-Salas 2012); (10) Santa María Pápalo (2012; Espinosa-Lucas et al. 2015). Asterisks indicate records from this study.

coordinates were recorded at each camera trap station.

The information obtained from the field-work was complemented by records from the vertebrate collections of the Texas Cooperative Wildlife Collection (TCWC; now the Texas A&M Biodiversity Research and Teaching Collections), which are available online in the databases of the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (= National Biodiversity Information System of the National Commission on Knowledge and Use of Biodiversity [CONABIO]).

Our records of *E. barbara* represent the most recent evidence of the species' presence in the state of Guerrero. Our photographs constitute 3 records in the Mexican Pacific coastal state in a region where the tayra has

never been documented (Fig. 1). On 23 June 2009, the skeletal remains of a male tayra (National Collection of Mammals: CNMA-47868) were collected in the community of La Ceiba, municipality of Petatlán, Guerrero, in a pine-oak forest (17°43'16.9"N, 101°2'46.9"W; 1252 masl) (locations of records are shown in Fig. 1; Table 1). The individual died presumably due to attacks by dogs owned by residents. In May 2011, two female tayras were photographed by camera traps (Cuddeback®, Digital Expert 3 mp, Green Bay, WI), at a site located about 1 km NE of La Soledad. The vegetation type in the area is semideciduous tropical forest interspersed with coffee trees (17°34'24"N, 101°06'02"W; 1151 masl). Another individual was captured by camera traps 3 km NE of Banco Nuevo, in an area dominated by pine

TABLE 1. Collection sites of *Eira barbara* on the Pacific Slope (Sinaloa to Oaxaca), Mexico. Nd = no data.

No.	Species	Localities	Latitude	Longitude	Elevation (masl)	Source	Museum
1	<i>Eira barbara</i>	Petatlán, La Soledad 1 km NE.	17.5733	-101.1006	1252	This study	TAMU, 1957
2	<i>Eira barbara</i>	Petatlán, Banco Nuevo, 3 km NE.	17.6564	-101.0367	1291	This study	
3	<i>Eira barbara</i>	Petatlán, La Ceiba.	17.7214	-101.0464	1151	This study	
4	<i>Eira barbara</i>	Tecpan, Cordon Grande	17.5965	-100.5797	2258	This study	
5	<i>Eira barbara</i>	Escuinapa, Sinaloa	22.8400	-105.7773	23	Allen 1906 (Hall and Kelson 1959)	
6	<i>Eira barbara</i>	Chilpancingo de los Bravo, Acahuizotla.	17.3603	-99.4667	840	Pérez-Irineo and Santos-Moreno 2010	
7	<i>Eira barbara</i>	San Miguel Soyaltepec, Tuxtepec; Oaxaca	18.1475	-96.3411	Nd	Cruz-Espinoza et al. 2012	
8	<i>Eira barbara</i>	Capulalpam, Ixtlán Oaxaca	17.3056	-96.4461	Nd	Lira-Torres and Briones-Salas 2012	
9	<i>Eira barbara</i>	La Fortaleza, Chimalapas, Oaxaca	17.1500	-94.2167	Nd	Espinosa-Lucas et al. 2015	
10	<i>Eira barbara</i>	Santa María Pápalo, Oaxaca	17.8385	-96.7667	921		

forests (17°39'23"N, 101°02'12"W; 1291 masl). Both records were made in Petatlán. On 7 March 2014, one male specimen was photographed in the *ejido* (communal land tenure in Mexico) Cordón Grande, municipality of Tecpán de Galeana, Guerrero (17°35'47"N, 100°34'47"W; 2258 masl). The dominant vegetation type is pine-oak forest. All records consisted of adult individuals, captured at 17:34, 12:35 and 19:02, respectively (Fig. 2). It was possible to identify at least 2 individuals by camera trapping, due to the distinct color patterns of their heads.

The nearest records for the species were obtained in 2008 at Capulalpam de Méndez, Ixtlán (Cruz-Espinoza et al. 2012), Tuxtepec (Pérez-Irineo and Santos-Moreno 2010), and Santa María Pápalo in 2012, all of which are in the state of Oaxaca (Table 1; Espinosa-Lucas et al. 2015).

There are additional museum records of 2 females collected in 1957 and deposited with the mammal collection at TCWC (catalog number 5865). These records represent skeletons recovered at Acahuizotla (Fig. 3; Table 1).

Our records have confirmed the presence of *E. barbara* in Guerrero thereby increasing its geographic distribution more than 170 km from the nearest historic record of Acahuizotla and 450 km from Santa María Pápalo, Oaxaca (Espinosa-Lucas et al. 2015). There are no published records in Sinaloa, Nayarit, Jalisco, Colima, or Michoacán, as reported by Álvarez-Castañeda (2000); and *E. barbara* is not included on systematic lists of mammals of Michoacán (Monterrubio-Rico et al. 2014) or Jalisco (Godínez et al. 2011). Therefore, the tayra records presented in this paper represent the northernmost records.

We believe our tayra records in Banco Nuevo and Cordón Grande are especially significant because this species had not been previously recorded in pine forest or pine-oak forest an altitude higher than 2000 masl in Mexico (Chávez 2014).

The tayra is considered by Mexican law as endangered, mainly due to habitat loss and fragmentation (NOM-059-SEMARNAT-2010; Official Journal of the Federation 2010, Chávez 2014). *Eira barbara* is a species mainly found in habitats with minimal disturbance, although it has rarely been recorded in secondary forests, fragmented gallery forest, and agricultural areas. Tayras may be attracted to the

Fig. 2. Images of tayras (*Eira barbara*) obtained by camera traps in the study area.

Fig. 3. **Top panel:** An individual of *E. barbara* deposited in the Texas Cooperative Wildlife Collection (TCWC), Department of Wildlife and Fisheries Sciences, Texas A&M University. **Middle and bottom panels:** Original specimen labels.

latter sites due to the high availability of fruit trees and small vertebrates. However, the tayra is rarely found outside the forest due to its arboreal tendencies (Presley 2000). Other carnivore species detected at the tayra localities are margay (*Leopardus wiedii*), jaguarondi (*Puma yagouaroundi*), puma (*Puma concolor*), jaguar (*Panthera onca*), gray fox (*Urocyon cinereoargenteus*), weasel (*Mustela frenata*), and white-nosed coati (*Nasua narica*).

The camera trapping conducted in this study contributes significantly to the basic information on the distribution of *E. barbara*. In the short term, an assessment of the tayra's population status in Guerrero could be implemented due to the distinct markings of individuals in the study population. The assessment would be especially relevant, because land use changes are occurring at all the sites where records were found.

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