THERYA NOTES 2024, Vol. 5 : 237-241 DOI: 10.12933/therya_notes-24-179 ISSN 2954-3614

New field records document the survival of the Altamira jackrabbit (*Lepus altamirae*)

Nuevos registros de campo documentan la sobrevivencia de la liebre de Altamira (*Lepus altamirae*)

Fernando A. Cervantes[1]*, Gabriel A. Cruz-Reséndiz[2], and Mauricio Hernández[3]

[1]Colección Nacional de Mamíferos, Pabellón Nacional de la Biodiversidad. Instituto de Biología, Universidad Nacional Autónoma de México. Circuito Cultural, CU, C. P. 04510. Ciudad de México. México. E-mail: fac@ib.unam.mx (FAC).
[2]Fundación Wildx A. C. Tlaxcala 103 poniente, Colonia Ampliación Unidad Nacional, C. P. 89603, Ciudad Madero. Tamaulipas México. E-mail: gabriel110795@hotmail.com (GAC-R).
[3]Oficina de Correos de México en Altamira. Venustiano Carranza 10, Zona Centro, C. P. 89600, Altamira. Tamaulipas, México. E-mail: mmauro402@gmail.com (MH).
*Corresponding author

Lepus altamirae is a little-known jackrabbit from northeastern México. Its taxonomic validity was recently reestablished and the absence of its field records was noted. It was recently rediscovered, but its geographic distribution is unknown, and it is uncertain whether it survives in its type locality. This study aims to confirm its presence in its type locality and encourage their study. We searched for jackrabbits on roads and trails using a car and by walking in natural and disturbed areas in and around Altamira (June - August 2020). We noted visual records of jackrabbits encountered and sought permission from falconers who encountered incidentally to use their capture data according to recommendations for using wild mammals in research. We confirmed identification with specialized references. We did not find jackrabbits at the type locality, whose habitat is already degraded, but we visually recorded specimens near Altamira. We also found additional records of *L. altamirae* in the scientific literature and in a citizen science portal that show previously unknown occurrence localities in different geographic directions from the type locality, including the state of Veracruz. *Lepus altamirae* no longer exists in its type locality, where the level of urbanization has increased. However, it is known to occur in areas that increase its previously known geographic distribution. It is necessary to encourage their study to propose appropriate measures for its conservation, as well as to promote the inclusion of its name in the lists of Mexican mammals.

Key words: Conservation; endemic; Lagomorpha; Leporidae, México; Tamaulipas; threatened; type locality.

Lepus altamirae es una liebre poco conocida del noreste de México. Recientemente se restableció su validez taxonómica y se alertó sobre la ausencia de sus registros de campo. Se redescubrió recientemente, pero desconocemos su distribución geográfica completa y si sobrevive en su localidad tipo. Este estudio pretende confirmar su presencia en su localidad tipo y contribuir con recomendaciones para su supervivencia. Buscamos liebres en caminos y brechas utilizando un carro y caminando en áreas naturales y perturbadas en Altamira y sus alrededores de junio a agosto de 2020. Anotamos los registros visuales de las liebres encontradas y pedimos permiso a cetreros encontrados casualmente para usar sus datos de captura de liebres. Confirmamos la identificación taxonómica de las liebres con referencias especializadas. No encontramos liebres en la localidad tipo, cuyo habitat ya se encuentra degradado, pero registramos visualmente ejemplares en las inmediaciones de Altamira. Asimismo, encontramos registros adicionales de *L. altamirae* en la literatura científica y en un portal de ciencia ciudadana que muestran localidades donde previamente se desconocía su presencia en distintas direcciones geográficas de la localidad tipo, incluyendo el estado de Veracruz. *Lepus altamirae* ya no existe en su localidad tipo, en donde se ha incrementado su nivel de urbanización. Sin embargo, se sabe de su presencia en áreas que incrementan su distribución geográfica previamente conocida. Se requiere continuar explorando su distribución potencial para proponer medidas apropiadas para su conservación, además de promover la inclusión de su nombre en las listas de mamíferos mexicanos.

Palabras clave: Amenazada; conservación; endémica; Lagomorpha; Leporidae; localidad tipo; México; Tamaulipas.

The jackrabbit *Lepus altamirae* Nelson, 1904 is a mammal (Leporidae, Lagomorpha) originally described as the subspecies *L. merriami altamirae*; its common name, "Alta Mira Jack Rabbit", refers to its type locality: "Altamira, Tamaulipas, Mexico" (Nelson 1904). In 1898 Altamira was a small town near sea level on the shore of extensive fresh-water lagoons connected with the Río Tamesí in extreme southern Tamaulipas, where immediately about the town and stretching away for many miles to the north is a gently rolling, rather sandy plain (Goldman 1951). A low, thin growth of scrubland peculiar to a dry climate covers the greater part of the plain near Altamira. The distribution of this jackrabbit reported then (Nelson 1904) was a small region of the arid tropical zone of extreme northern Veracruz, eastern San Luis Potosí, and coastal plains in the southern part of Tamaulipas, probably not as far north as Victoria town (*ca*. 190 km NW Altamira).

Shortly after, Nelson (1909) raised its status to a specific level as *L. altamirae*. In contrast, Hall (1951) later concluded that it should stay at a subspecific level but as *L. californicus altamirae*, a result supported a few years later by Álvarez (1963). The latter also reported 2 specimens from near Soto la Marina, Tamaulipas (1-2; Figure 1; *ca*.153 km N Altamira) and emphasized that until then *L. c. altamirae* had been known previously only from Altamira. Afterward, this jackrabbit remained virtually unknown and without an appearance in the scientific literature.

It took 56 years until Vargas *et al.* (2019) proposed the reinstatement of *L. altamirae* as they concluded that this mammal could not be a subspecies of the black-tailed jackrabbit because it is more related to the group of white-sided jackrabbits. Therefore, it was confirmed that *L. altamirae* is a valid taxonomic entity that stands for a species of jackrabbit, endemic to a small region of northeastern México. However, they also expressed concern about whether this jackrabbit still existed in its natural habitat, given that no evidence of field records in more than 100 years in or near its type locality. Fortunately, Silva-Caballero and Rosas-Rosas (2022) recently reported the presence of *L. altamirae* from ca. 100 km WSW Altamira, in northeastern San Luis Potosí.

In parallel, several records have been uploaded to the iNaturalist México platform in the last few years of the occurrence of *L. altamirae* in localities where its presence was unknown (Figure 1; iNaturalistMX 2022). Some records (3-6; Figure 1) stand out as extending the known geographic area of *L. altamirae* to *ca*. 100 km W of the town of Altamira. By the way, 3 research grade records (8-10; Figure 1; https://www.inaturalist.org/observations/105780393, 21 June 2021; 105780171, 30 June 2021, and 182281485, 24 August 2023) from this iNaturalist México contribution documented the presence of *L. altamirae* in the state of Veracruz for the first time.

The fact of having considered this mammal as a subspecies and not a species for so many years may have caused a lack of interest and attention on the subject; *e.g.*, the

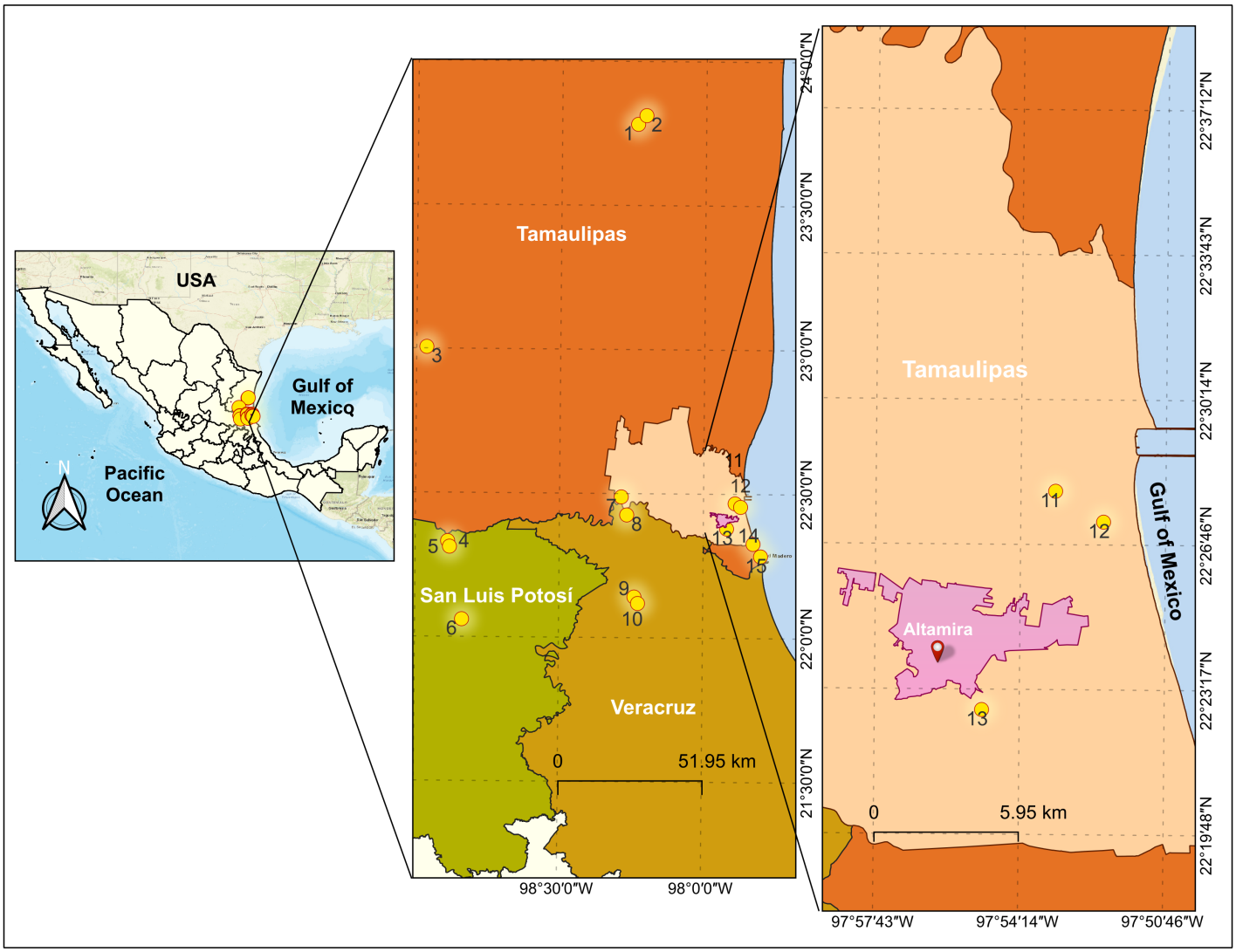

Figure 1. Field records (yellow circles) of the Altamira jackrabbit (*Lepus altamirae*) in the Mexican states of Tamaulipas, San Luis Potosí, and Veracruz. From the scientific literature: 1, 2 (Álvarez 1963) 4, and 6 (Silva-Caballero and Rosas-Rosas 2022). From iNaturalist México (research grade): 3, 5, 7, 8, 9, 10, 12, 15 (see text for references). From the authors' fieldwork: 11, 13, 14. Type locality: Altamira (red pin; Hall 1951). Light pink: Municipality of Altamira, Tamaulipas.

absence of specimens in scientific collections is remarkable. Unfortunately, this lack of records of occurrence may have also been due to the loss of its populations, which would be a conservation concern. Therefore, it is necessary to document the existence of *L. altamirae* throughout its originally reported range. Without this information, it will be difficult to recognize this species as part of the endemic fauna of the state of Tamaulipas and plan research actions to know its conservation status. Thus, our research aimed to explore the type locality and surroundings of *L. altamirae* to corroborate or refute the presence of the jackrabbit in that region.

The study area was Altamira City and its surroundings, which is currently a small city (22° 24′ 27.89″ N, 97° 55′ 16.17″ W) of 1,667 km^2 at 26 m above sea level, on the Tamaulipan coast of the Gulf of México. We scouted this area for a total of 3 weeks from June to August 2020 in a southeast-northwest direction along the main Altamira - Mante road and back. We also explored in a southwest-northeast direction along the road to the Altamira Industrial Port, as well as suburban and wilderness sites on the city limits and periphery of the city; in some cases extending to the border with the municipalities of Tampico and Ciudad Madero, where the habitat conditions resembled those in previous reports (Nelson 1909). We drove a motor vehicle for approximately 90 min after sunrise and before dusk and did cross-country walking tours on the same schedule. In addition, we ran into falconers in areas with difficult access in the field and to whom we requested permission to witness catches of their Harris's hawks (*Parabuteo unicinctus*) and use their data. If a jackrabbit was sighted or captured, we took photographs and recorded the locality, and geographical coordinates. To confirm the taxonomic identity of the jackrabbit and compare its occurrence records, we consulted Brown *et al.* (2018) and the previous references cited. This study followed the recommendations of Sikes *et al.* (2016) for the use of wild mammals in research.

Our searches with the motorized vehicle on roads did not record *L. altamirae*, nor live specimens crossing the road or running over on the road; no jackrabbits were observed within the city limits. However, we were able to find jackrabbits during our walks in the countryside and when we ran into falconers. In cases where information was collected from specimens killed by falconer hunting, it took place so that no additional mortality occurred as a result of our research, either directly or indirectly, this included our searches with the motorized vehicle on roads and our walks.

On July 22, 2020 at 6:40 hr, walking through a thorn scrub site we spotted an adult jackrabbit (22° 28′ 2.615″ N, 97° 53′ 24.648″ W; field record 11 in Figure 1; Figure 2a) inside the grounds of the industrial port of Altamira (7.4 km N Altamira, Municipality Altamira). Although this area lies near the border of the urban areas of Altamira and it has not been developed yet, it is well-preserved and there is a small patch of scrubland. However, anyone can enter this site, but activities that disturb the environment are not allowed. A few meters away, in the construction yards where the Industrial Port platforms are made, we observed jackrabbits on several days both at dawn (between 6:13 hr and 8:01 hr) and at dusk (between 5:05 hr and 18:17 hr). These observations are very close to the site reported by iNaturalist México on June 23, 2022 (field record 12 in Figure 1; https://www.inaturalist.org/observations/124415922) for the presence of *L. altamirae*.

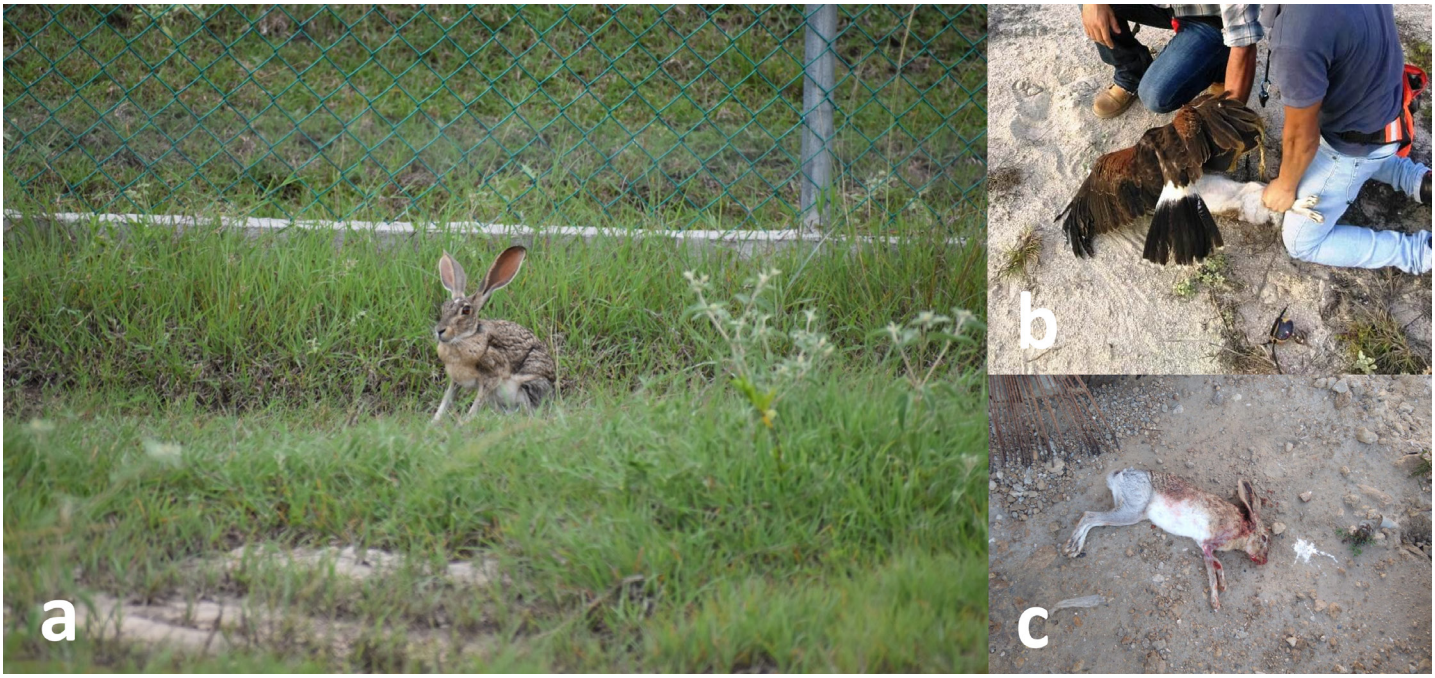

Figure 2. Altamira jackrabbit (*Lepus altamirae*). a) specimen in its natural habitat on August 21, 2020 (photo by G. Cruz-Reséndiz); b) Harris's hawk (*Parabuteo unicinctus*) holding a freshly captured specimen on March 2, 2020 (photo by M. Hernández); c) specimen recovered from the Harris's hawk capture on April 7, 2020 (photo by M. Hernández). Images available at fac@ib.unam.mx.

The result of the falconers' activities produced the capture by Harris's hawk of 3 adult jackrabbit specimens. Two of these were captured on April 7 and 8, 2020 (respectively) at 1 km NNE Fraccionamiento 17 de enero, municipality Ciudad Madero, Tamaulipas (22° 19′ 37.650″ N, 97° 49' 35.300″W; field record 15 in Figure 1), at 13 km SE Altamira. These specimens were captured by Harris's hawk at 8:11 hr and 6:58 hr, respectively in a place with grassland and halophilic vegetation. Similarly, at a nearby site in the same municipality (field record 15 in Figure 1) again a contribution in iNaturalist reported the presence of a specimen of *L. altamirae* in the area known as Playa Miramar (22º 17′ 2.350″ N, 97º 48′ 1.010″ W). Even though this record has research grade status, it should be taken with caution as the quality of the image is not good.

The third individual (Figure 2b) was caught at 7:14 hr on March 2, 2020, in the Altamira industrial corridor, 3.1 km S Altamira (22° 22′ 47.420″ N, 97° 55′ 8.680″ W; field record 13 in Figure 1) where we were able to observe between 3 and 4 jackrabbits more. The vegetation on the site was mesquital with patches of grassland.

All jackrabbit specimens observed during our fieldwork were positively identified as adult individuals of *L. altamirae* according to pelage characteristics summarized by Vargas *et al.* (2019). In short, the white coloration of the flanks of the body from the chest to the belly, the light gray coloration of the thighs, the dark to light buff color of the back of the body, the light buff coloration of the throat, the absence of the large black spot both on the tips of the ears and on the tail and lower part of the hip; likewise, the nape with two lateral black bands extending back from the base of ears and separated by a median band of buffy (Figure 3a, 3b) that characterizes *L. altamirae*, a condition confirmed by Silva-Caballero and Rosas-Rosas (2022). This character also supports the genetic analyses by Vargas *et al.* (2019) who showed that *L. altamirae* is phylogenetically closer to *L. flavigularis* than to any other *Lepus* species.

As expected, *L. altamirae* does not occur in the City of Altamira, its type locality. However, we did confirm its presence in the surrounding area, being the closest record to the city in the Altamira industrial corridor, Municipality Altamira (field record 13 in Figure 1). In agreement, the scientific literature shows no record of another jackrabbit species in the southeastern region of Tamaulipas, and we did not observe any jackrabbit specimen that could be different from *L. altamirae*. Therefore, our data support that *L. altamirae* is a representative of the group of "white side" species in the tropical-subtropical zone of the southeastern coastal plain of Tamaulipas and northeastern San Luis Potosí (Vargas *et al.* 2019; Silva-Caballero and Rosas-Rosas 2022). As Brown *et al.* (2018) stated, this information is relevant for the taxonomic, evolutionary, and biogeographic assessment of the genus *Lepus* in North America and the knowledge and conservation of jackrabbit species of restricted distribution.

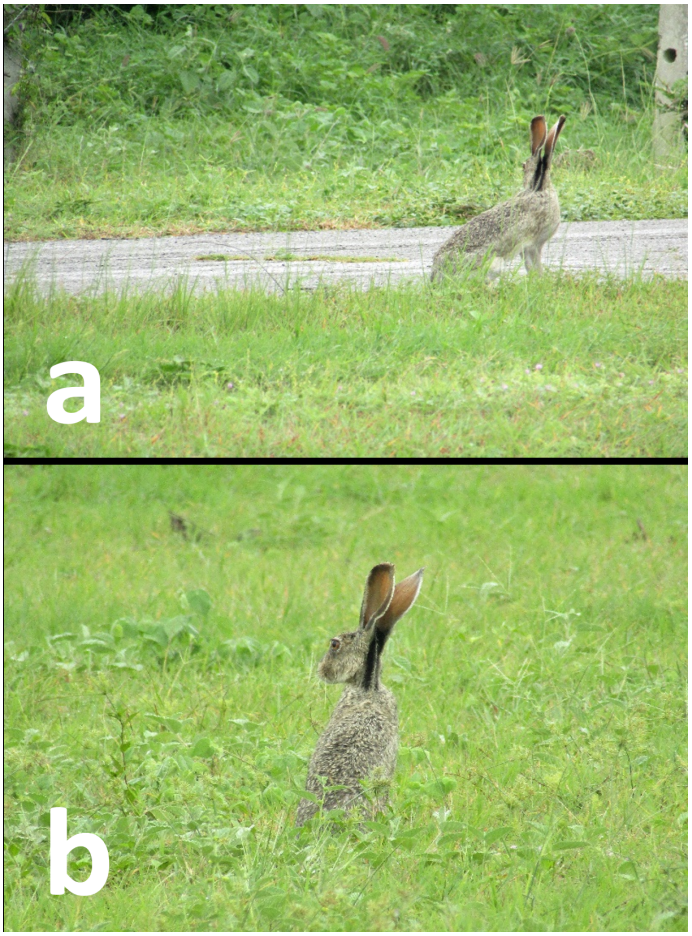

Figure 3. a) and b) Specimens of the Altamira jackrabbit (*Lepus altamirae*) from near the Altamira Industrial Port (7.4 km N Altamira) shows the typical black stripes behind the ears. Photos by G. A. Cruz-Reséndiz. Images available at fac@ib.unam.mx.

Unfortunately, so far the name *L. altamirae* has not appeared yet in any updated list of Mexican mammals other than a brief mention in a recent report on the rabbit hemorrhagic disease in Mexican leporids (Lorenzo *et al.* 2024); nor has its conservation status been assessed by the IUCN or by the Mexican government (García-Aguilar *et al.* 2017). However, it is recognized in The Mammal Diversity Database of the American Society of Mammalogists (ASM; Burgin *et al.* 2018).

Its originally reported range (Nelson 1909) is a small region that is currently being modified by anthropogenic factors that may be reducing its population (Gobierno del Estado de Tamaulipas 2009). The establishment of international companies in the region led to urban development and changes in land use, mainly in the municipality of Altamira. The presence of *L. altamirae* on the grounds of the Industrial Port of Altamira suggests that this leporid is resistant to some environmental changes in its original habitat. Still, it will not be for long as the urbanization of the area continues proliferating. Other agents of ecological deterioration that can be easily noticed in the surroundings of Altamira are cattle ranching, expansion of the agricultural frontier, and deforestation. In addition, this jackrabbit has recently been identified as a potential victim of rabbit viral

hemorrhagic disease that threatens the survival of lagomorph populations in northern México (Lorenzo *et al.* 2024).

Therefore it is important to explore the localities for *L. altamirae* mentioned by Vargas *et al.* (2019) to confirm the presence of the species on those sites, which would considerably increase the known scope of its geographic distribution. Also, it is necessary to evaluate the conservation status of their populations and habitat and the main causes threatening their survival there (Sánchez-Salas *et al.* 2013). Consequently, the local people and government must be made aware of this concern to plan actions and preserve this unique and distinctive mammal. According to our data, today, 120 years after the first scientific evidence of the existence of *L. altamirae*, this mammal no longer exists in its type locality, but survives in the surrounding area of the Altamira municipality. It is confirmed that it is an endemic species of the Tamaulipan mezquital ecosystem from the coastal plain of southern Tamaulipas and west to the eastern border of San Luis Potosí (Silva-Caballero and Rosas-Rosas 2022). It also incorporates the contribution of iNaturalist México records that reveal the presence of *L. altamirae* in the state of Veracruz for the first time. It is therefore another medium-sized mammal that stands out for its endemism and for inhabiting a reduced distribution area. Although the type locality of another mammal has been erased by urban development, its survival deserves attention and consideration for its integral knowledge and conservation since we now know of new localities of its presence.

Acknowledgements

A. L. Avilés, A. B. Villalba, and The Altamira Institute of Technology assisted with fieldwork. We thank the falconers for sharing their field data, and M. E. Arcia Portillo and A. K. Nava Salazar for preparing Figure 1. To the reviewers whose comments improved this note. We dedicate this paper to the memory of Leonor Villegas de Magnón, a Tamaulipeca teacher and journalist, who founded the White Cross during the Mexican Revolution to help the wounded during the struggle between the Porfirista army and the revolutionary forces.

Literature cited

Álvarez, T. 1963. The recent mammals of Tamaulipas, Mexico. University of Kansas Publications, Museum of Natural History 14:363-473.

Brown, D. E., *et al.* 2018. Distribution, status and conservation needs of the white-sided jackrabbit *Lepus callotis* (Lagomorpha). Revista Mexicana de Biodiversidad 89:310-320.

Burgin, C. J., *et al.* 2018. How many species of mammals are there? Journal of Mammalogy 99:1-14.

García-Aguilar, M. C., *et al.* 2017. Mexican native fauna at risk and the NOM-059 listing. Are all the called there, and are those there called? Acta Zoologica Mexicana (nueva serie) 33:188-198.

Gobierno del Estado de Tamaulipas. 2009. Atlas de riesgos. https://www.tamaulipas.gob.mx/proteccioncivil/wp-content/uploads/sites/ 36/2011/12/ ATLAS-DE-RIESGOS-MPIOS-TAMPICO-MADERO-Y-ALTAMIRA.pdf. Accessed on January 9, 2022.

Goldman, E. A. 1951. Biological investigations in Mexico. Smithsonian Miscellaneous Collections 115:1-476.

Hall, E. R. 1951. A synopsis of the North American Lagomorpha. University of Kansas Publications, Museum of Natural History 5:19-202.

iNaturalistMX. 2022. Observaciones. https://mexico.inaturalist.org/observations?place_id=7443&quality_grade=research&taxon_id=43117. Accessed on January 3, 2022.

Lorenzo, C., *et al.* 2024. Rabbit Hemorraghic Disease Virus in Mexico in 2020-2021: Risk Areas and Climatic Distribution. Viruses 16:1344.

Nelson, E. W. 1904. Descriptions of seven new rabbits from Mexico. Proceedings of the Biological Society of Washington 17:103-110.

Nelson, E. W. 1909. The rabbits of North America. North American Fauna 29:1-314.

Sánchez-Salas, J., *et al.* 2013. El MER: un instrumento para evaluar el riesgo de extinción de especies en México. Revista Chapingo Serie Zonas Áridas 12:30-35.

Sikes, R. S., and the Animal Care and Use Committee of the American Society of Mammalogists. 2016. 2016 Guidelines of the American Society of Mammalogists for the use of wild mammals in research and education. Journal of Mammalogy 97:663-668.

Silva-Caballero, A., and O. C. Rosas-Rosas. 2022. Rediscovery of the Tamaulipas white-sided jackrabbit (*Lepus altamirae*) after a century from its description. Therya Notes 3:1-5.

Vargas, K., *et al.* 2019. Reinstatement of the Tamaulipas white-sided jackrabbit, *Lepus altamirae*, based on DNA sequence data. Revista Mexicana de Biodiversidad 90:e902520.

Associated editor: Beatríz Bolívar Cimé.
Submitted: May 28, 2024; Reviewed: September 13, 2024.
Accepted: September 20, 2024; Published on line: October 1, 2024.