

THE AMPHIBIANS AND REPTILES OF  
THE NORTHERN SELVA LACANDONA:  
NAHÁ AND METZABOK, OCOSINGO, CHIAPAS,  
MÉXICO; WITH SOME ETHNOHERPETOLOGICAL NOTES

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## ABSTRACT

Chiapas harbors significant biological and cultural diversity. The region known as Selva Lacandona is an ideal example to study what is called the "biocultural axiom". This neotropical region is inhabited by multiple indigenous groups, such as the Tsoziles, Tseltales, Tojolabales, Ch'oles, Kanjobales, Chujes, Mames, Lacandones (*Hach Winik*), and Zoques. The herpetofaunistic diversity of Chiapas is currently represented by 107 species of amphibians and 223 species of reptiles. In the Selva Lacandona region a total of 35 species of amphibians and 90 reptiles has been documented, with some areas still remaining to be formally explored. Traditionally, the use of natural resources by native indigenous communities has been linked to the selective use of those species that have economical, traditional, and/or magical-religious value. Many of these human groups have a deep traditional knowledge about the environment in which they live, as well as the diversity of plant, fungal, and animal species with which they have coexisted over millennia. The Nahá and Metzabok communities are inhabited by the Maya-Lacandón del Norte culture. The objective of this study is to identify the herpetofaunistic species diversity found within the Flora and Fauna Protection Areas (APFF's) of Nahá and Metzabok. Additionally, we analyzed whether the Lacandones from the north have a herpetofaunistic ethnical taxonomic classification system. A total of 67 species that are recognized by the Lacandones were recorded for both APFFs. The Lacandones del Norte classify the herpetofauna into six groups, i.e., *Ak* (Turtles), *Kan* (Snakes), *Ayim* (Crocodiles), *Torok* (Lizards), *Xut* (Frogs), and *Be'p* (Toads). For Metzabok, the three most frequently mentioned species are *Bothrops asper*, *Boa imperator*, and *Crocodylus moreletii*. For Nahá, the three species of most importance are *Basiliscus vittatus*, *Boa imperator*, and *Kinosternon leucostomum*. The differences lie in the fact that for the Lacandones of Metzabok, the most important animals are those that are represented in their oral narratives, while for the Nahá community; the most important species are those that they usually find on a daily basis when walking along the trails in the jungle.

## RESUMEN

Chiapas alberga una gran diversidad biológica y cultural. La región conocida como Selva Lacandona es un ejemplo idóneo para estudiar a lo que se conoce como "axioma biocultural". En esta región neotropical habitan varios grupos originarios, como los Tsoziles, Tseltales, Tojolabales, Ch'oles, Kanjobales, Chujes, Mames, Lacandones (*Hach Winik*), y Zoques. La diversidad herpetofaunística de Chiapas está representada al presente por 107 especies de anfibios y 223 especies de reptiles. En la región Selva Lacandona por su parte, se han documentado un total de 35 especies de anfibios y 90 de reptiles, permaneciendo aún algunas zonas sin exploración formal. Tradicionalmente el uso de los recursos naturales por parte de las comunidades originarias, ha estado ligado al aprovechamiento selectivo de aquellas especies que tienen valor económico, tradicional y/o mágico-religioso. Muchos de estos grupos humanos tienen profundos conocimientos acerca del medio en que viven, así como de la diversidad de especies de plantas, hongos y animales con las que coexisten desde hace milenios. Las comunidades de Nahá y Metzabok están habitadas por la cultura Maya-Lacandón del Norte. El objetivo de este estudio es identificar a la diversidad de especies herpetofaunísticas que se encuentran dentro de las Áreas de Protección de Flora y Fauna (APFF's) de Nahá y Metzabok. Adicionalmente, se analizó si el pueblo lacandón del norte contaba con un sistema de clasificación etnotaxonómica de la herpetofauna. Se registraron un total de 67 especies que son reconocidas por los lacandones para ambas APFF's. Se identificó que los lacandones clasifican a la herpetofauna en 6 grupos: *Ak* (Tortugas), *Kan* (Serpientes), *Ayim* (Cocodrilos), *Torok* (Lagartijas), *Xut* (ranas) y *Be'p* (Sapos). El análisis de frecuencia de mención sitúa a las especies en distinto orden. Para Metzabok, las primeras 3 especies de importancia son: *Bothrops asper*, *Boa imperator* y *Crocodylus moreletii*. Para Nahá, las primeras tres especies de importancia son: *Basiliscus vittatus*, *Boa imperator*, y *Kinosternon leucostomum*. La diferencia radica en que para los lacandones de Metzabok los animales más importantes son los que se encuentran representados en sus narrativas orales, mientras que para la comunidad de Nahá, las especies de mayor importancia son las que suelen encontrar cotidianamente al realizar recorridos por los senderos de la selva.



**Palabras clave:** Etnoherpetología, Anfibios, Reptiles, Selva Lacandona, Nahá, Metzabok

**Key words:** Ethnoherpetology, Amphibians, Reptiles, Selva Lacandona, Nahá, Metzabok



### *DEDICATION*

**W**E DEDICATE THIS CONTRIBUTION TO THE MEMORY OF CHAN K'IN VIEJO, "EL SABIO DE LA SELVA LACANDONA" (1900-1996; FIGURE 1). HE WAS THE LAST TO'OHIL OR SPIRITUAL LEADER IN THE HISTORY, MYTHOLOGY, AND COSMOGONY OF THE LACANDONES OR HACH WINIK OF THE COMMUNITY OF NAHÁ. HE MANAGED TO PRESERVE AND KEEP TOGETHER THE CUSTOMS AND TRADITIONS OF HIS PEOPLE, SHARING THROUGH COSMOLOGICAL STORIES THE ORAL TRADITION OF THE MAYAN ANCESTORS. IN 1994, DURING A LACANDÓN COUNCIL, HE DENOUNCED THE THEFT AND FELLING OF TREES IN HIS COMMUNITY BY OUTSIDERS WHO THREATENED THEM. ONE OF HIS MOST REMEMBERED PHRASES IS: "THE GOVERNMENT SENT US HERE TO NAHÁ, AND THEY TOLD US THAT THIS IN NAHÁ WAS OURS. WE TAKE CARE OF THE FOREST. NOW THEY HAVE TAKEN AWAY OUR LAND AND ARE SELLING THE TREES. GOD IS ANGRY; I AM SADDENED BY THE COLD THAT HAS ENTERED THE HEARTS OF THE PEOPLE. I AM VERY OLD AND HERE I AM GOING TO DIE. WE DON'T WANT THEM TO TAKE OUT THE TREES THAT ARE OUR LIFE, THEY ASK FOR THE RAIN TO COME. THE CAOBA AND CHICLE TREES ARE OUR LIFE, THEY HAVE LIFE, WHEN THE TREES ARE FINISHED, WE ARE GOING TO FINISH TOO". HE FINALLY DIED IN NAHÁ ON DECEMBER 23, 1996 AND HE LEFT THE SPIRITUAL RESPONSIBILITY TASK ON THE FIGURE OF DON ANTONIO MARTÍNEZ CHAN K'IN (FIGURE 2) WHO HAS TAKEN THE LEAD AND MAINTAINS ALIVE TO DATE THE SACRED RITUALS, TRADITIONS, AND CULTURAL BELIEFS OF THE HACH WINIK (THE TRUE PEOPLE) IN THE MYTHICAL SELVA LACANDONA.

"ALL LIVING BEINGS ARE RELATED, TIED TO THE SAME ROOT. WHEN HACHAKIUM (TRUE GOD) MADE THE STARS, HE MADE THEM OUT OF SAND AND STONES AND PLANTED THEM. THE ROOTS OF EACH STAR ARE THE ROOTS OF A TREE; WHEN A TREE FALLS, A STAR FALLS FROM THE SKY." ~ CHAN K'IN VIEJO



## INTRODUCTION

The Mexican state of Chiapas stands out for its great biodiversity of amphibians and reptiles, only surpassed by that harbored in Veracruz and Oaxaca (García-Padilla *et al.*, 2022). A total of 107 species of amphibians and 223 species of reptiles have been identified, of which a total of 26 species are endemic at the state level (Johnson *et al.*, 2015). The mythical region known as Selva Lacandona is one of the most important multicultural and biodiverse regions of the state of Chiapas and in all of Mexico. Rzedowski (1983 cited in Lazcano-Barrero *et al.*, 1992) estimated that the tropical forests of Mexico originally included 12% of the national territory, and that by 1981 they constituted less than 1%. In 1985, the figures for the National Institute of Statistics, Geography and Information Technology of Mexico (INEGI, 1985), point out that in the country remained a total of 114,060 km<sup>2</sup> of "jungles". In the Lacandona region, the jungles had an original extension of approximately 1,300,000 has; According to Calleros and Brauer (1983) by 1982, a total of 584,178 hectares had been transformed, that is the 45% of the total wooded area (Lazcano-Barrero *et al.*, *op. cit.*).

After this severe rhythm of transformation of the territory, however, the federal Natural Protected Areas of the Selva Lacandona, which only represent ca. 0.9% of the national territory, currently remains with less than 300,000 hectares of pristine rainforest, which are estimated to conserve a fifth of the biological diversity of Mexico and 30 % of the clean water resources. The herpetofauna of the region has been estimated as a total of 35 species of amphibians and 90 species of reptiles (Hernández-Ordoñez *et al.*, 2015), with vast areas remaining without formal exploration, such as the northern portion.

The National Commission of Natural Protected Areas (CONANP), an environmental government institution affiliated with SEMARNAT, regulates and establishes the management plans for Natural Protected Areas (NPA's). They have provided a deficient record of the biodiversity of Nahá and Metzabok composed of a total of 19 herpetofaunal species (CONANP, 2006 a, b). This document lacked peer review and the checklist has not been updated until now. Here we present an updated checklist of the herpetofauna with some pertinent ethnoherpetological notes as a result of the field work led by IMG and ECC, who carried out over ca. one-year sampling in the field with the help of the local indigenous field guides of the Maya Lacandón or "Hach Winik" communities from Nahá and Metzabok in the northern portion of the mythical Selva Lacandona.

## METHODS

The field work in the two study areas was carried out for six months (August to October 2015 and February to



**Figure 2.-** A portrait of Don Antonio Martínez Chan K'in, the current spiritual leader of the community of Nahá. Photo by Elí García-Padilla

June 2016) with visits from 10 to 15 days per month in the two communities, gathering the necessary information through the application of informal interviews in a participant observation framework and complemented with ethnobiological tours led by local members of the communities. During the interviews, we had the help of a local translator. The first stage of the interviews was carried out through informal conversations and adding as an aid a catalog of photographs of the herpetofaunistic species that were registered previously by the National Commission of Protected Natural Areas (CONANP) personnel or those of expected occurrence based on the pertinent literature available in each of the two Natural Protected Areas.

The searches for the existing herpetofauna were carried out under the criteria of Gaviño *et al.*, (1982), in which there is no fixed limit of search extension, but rather the direct search, by known microhabitat, as well as a fixed time for the researcher; the search was from September 2015 to June 2016 covering the dry and rainy seasons. The hours were from 7 am to 10 am, from 1 to 3 pm, and from 9 pm





**Figure 3.** A portrait of Moisés, a Lacandón child from the community of Nahá. Photo by Ana Iris Melgar-Martínez

to 12 am. For the collection of corresponding data for the species, the capture techniques of Casas-Andreu *et al.*, (1991) were taken into account. The searches were carried out in the company of park rangers, people from the community, or external companions. The identifications were carried out with the taxonomic identification keys by Flores-Villela (1995), as well as with the help of Köhler's field guides (2003, 2010).

## AREA OF STUDY

The research area of this study is included in the northern portion of the Selva Lacandona region, in the Maya Lacandón (*Hach Winik*) communities of Nahá and Metzabok (Figure 3, 5, 6). The polygonal outline of the site extends from 16 ° 56' 41 " to 17 ° 08' 36 " north latitude and from 91 ° 32' 52 " to 91 ° 40' 09 " west longitude. The total area of the protected areas of Nahá and Metzabok amounts to 7, 215.76 hectares; the latter were declared as protected areas with the character of Protected Areas of Flora and Fauna (APFF) on September 23, 1998, according to the publication of the Official Gazette of the Federation (DOF, 1998).

The Selva Lacandona derives its name from an indigenous community that has lived in it since pre-hispanic times, i.e., The Lacantunes=Lacandones. During the colonization, this is how the Spaniards referred to the Indians of Lacamtún. The etymology is derived from *lacam*: large; and *tun*: stone), as the Lacandones designated the main islet of the Miramar lagoon, in

which they had built the small headquarters of their extensive jungle territory.

The Spanish conquest changed the Mayan toponym *Lacamtún* for that of "Lacandón" and used this Castilianized name to designate not only the island but also the lagoon and the region around it. In the last century, the foreign hunters who also cut mahogany and cedar in the region no longer used the colonial name; they called that part of the Lacandona Desert of Ocosingo or "Desierto de La Soledad," and the lagoon was known as Laguna Buenavista. The current names of Selva Lacandona and Miramar are recent appellations, assigned by explorers and loggers in the 1920s. Worth noting is that the modern concept of Selva Lacandona, in addition to being botanical and geographical, is also political, since it refers exclusively to the Mexican part of the tropical forest (De Vos and Marion, 2015).

## VEGETATION

The Nahá and Metzabok areas are located in the transition zone between the Nearctic and Neotropical regions, and are characterized by their great diversity, richness, and ecological fragility (CONANP, 2006b). The vegetation of Nahá and Metzabok, according to the classification of Rzedowski (1978) includes five different types of plant associations, including: Tropical Evergreen Forest, Thorny Forest, Cloudy Mountain Forest, Coniferous Forest, and Secondary Vegetation (Acahuals), which specifically for Nahá, are the Mesophyllous Mountain and Coniferous



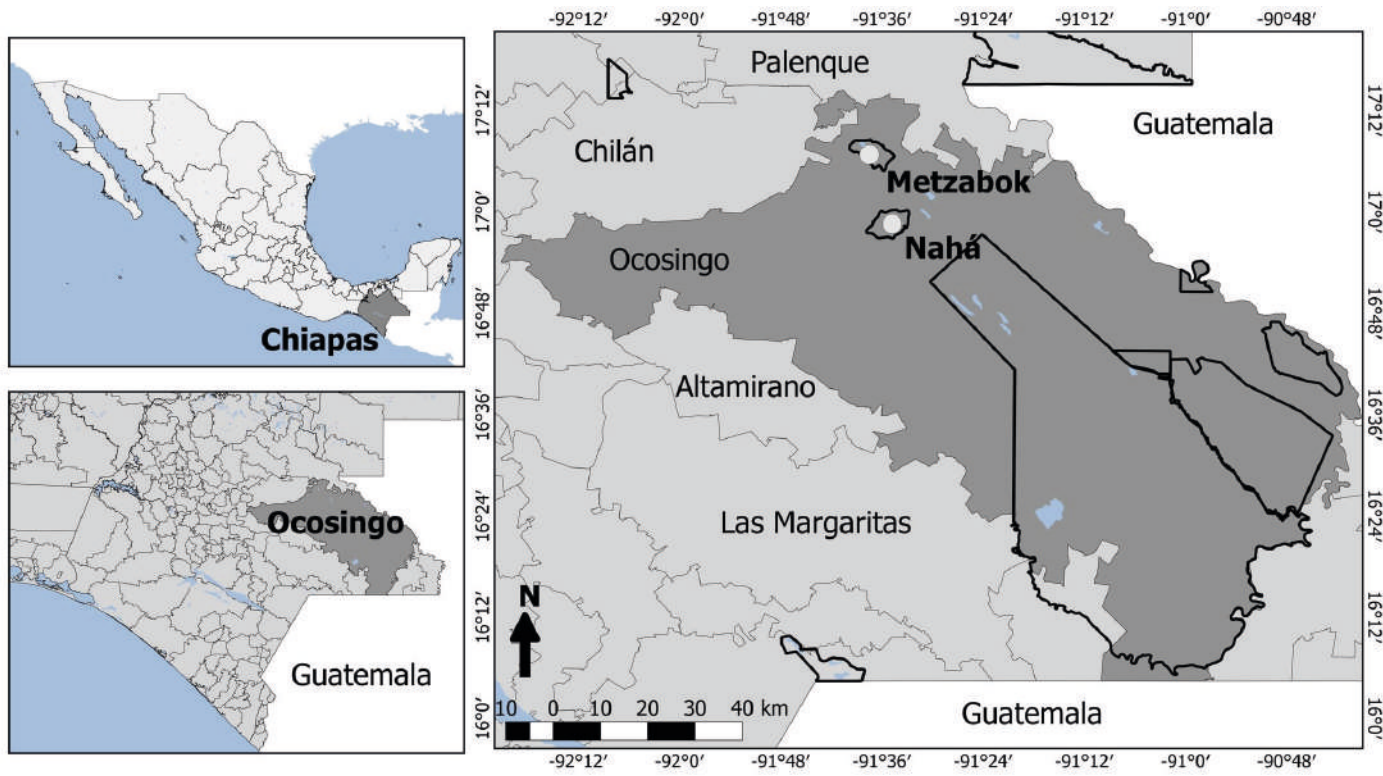


Figure 4. The geographic location of the Nahá and Metzabok communities in the Mexican state of Chiapas, México.

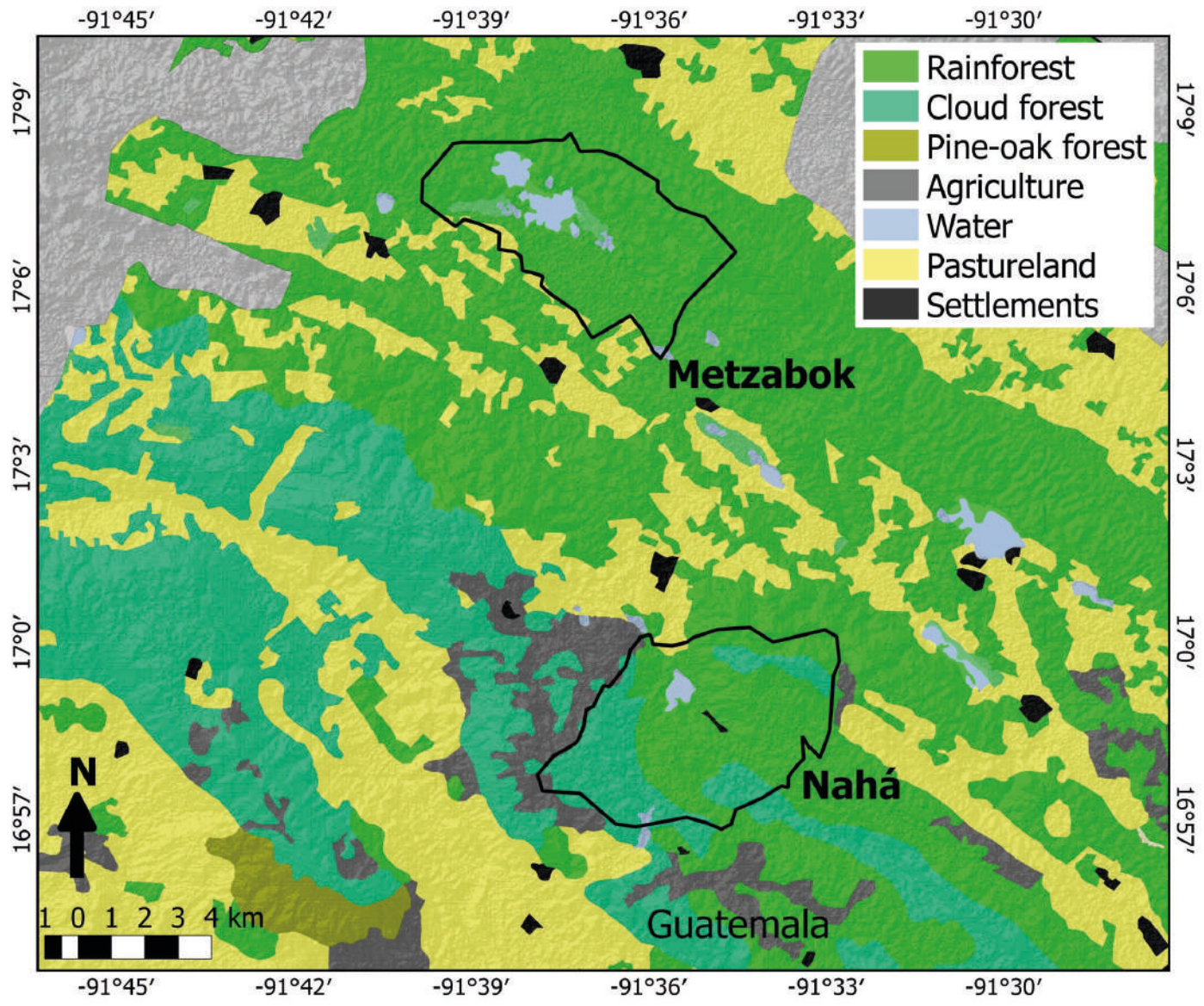


Figure 5.-. A map depicting the types of vegetation within the Nahá and Metzabok communities.



Forests, and for Metzabok, the Thorny Forest (Figure 4). Both Protected Areas have a registry of 779 species of vascular plants, which belong to 452 genera of 116 families (CONANP, 2006b). Fifty-one percent of the species are grouped in the families Araceae, Arecaceae, Bromeliaceae, Euphorbiaceae, Fabaceae, Melastomataceae, Meliaceae, Moraceae, Orchidaceae, and Rubiaceae (CONANP, 2006a).

## FAUNA

The Selva Lacandona harbors a high level of biological biodiversity. Being in the midst of political, social, cultural, and ecological conflicts, however, it has been transforming day after day. Chiapas has a total record of 207 species of mammals (Rivero and Medellín, 2015). The region with the highest species richness is the Selva Lacandona with 134 species (Rivero and Medellín, op. cit.). The diversity of amphibians and reptiles reported is 35 species of amphibians and 90 species of reptiles (Hernández-Ordoñez *et al.*, 2015). The analysis of the avifauna in the Lacandona is complemented by other previous and subsequent works that give an updated result in the list that is totally made up of 344 bird species (González-García, 1993).

## CULTURAL CONTEXT

The Lacandon Maya tribe have inhabited the region known as the Selva Lacandona since ancient times. Some authors have characterized the Maya-Lacandón as an indigenous group that, for a long time, remained isolated in the jungle. In the mid-nineteenth century, however, with the entry of logging and chiclero groups, as well as oil exploration workers, new paths were opened that allowed access to communication between the Lacandón villages and the rest of the state (CONANP, 2006b). In the mid-20th century, the distribution of indigenous groups of the Tseltal and Cho'l ethnic groups, mainly from the Altos de Chiapas and the Ocosingo Valley, gradually colonized the region starting in 1960, integrating more than 1,000 communities, rural areas of between 50 and 100 families who demanded the expropriation of land to be assigned to them as social property through the provision of ejidos, leaving the Lacandón clans immersed within the new established ejido population centers (CONANP, op.cit). Thus, some civil society organizations promoted the relocation of Lacandon families in new areas, so that in 1972 the current five Lacandón nuclei were formed: Lacanjá Chansayab, San Javier, Bethel, Nahá, and Metzabok, the last two communities being the ones that constitute those known as Lacandones del Norte, concentrating approximately 20% of the total of this ethnical group that is at the same time one of the smallest ethnic groups of Mexico (CONANP, 2006 a, b)

Currently, the official organization at the regional level is represented by the authorities of the Zona Lacandona Community, an indigenous alliance made up of three ethnic groups: Maya-Lacandones, Choles, and Tseltales. Its highest authority is constituted by the Commissariat

of Communal Assets and its Surveillance Council, made up of members of the three ethnic groups, elected in the Great Assembly held every three years, for which they bring together all 51 of the comuneros belonging to the Community. By regulation, the Commissariat must always be occupied by a Maya-Lacandón member (CONANP, 2006a).

The subsistence of the Lacandones has been based on the empirical knowledge of their environment and the development of a complex traditional agricultural system, which is complemented by the collection of fruits, seeds, and vines from the jungle, and hunting and fishing in rivers and lakes. It can be assured, with certainty, that, since the end of the 20th century, the Lacandón ethnic group has been subject to a constant and growing external influence, which contrasts with the fact that, during most of their history, they were a human group that lived outside many of the economic and social processes that shaped the history of Chiapas and the rest of the indigenous groups that inhabit the state territory.

The Nahá and Metzabok area is made up of eight ejidos and small communities, which are settled in the valleys, where the rivers and dirt roads run that link the region with two cities, to the east with the city of Palenque, and to the south with the city of Ocosingo. According to the most recent censuses carried out by the Rural Medical Units for the year 2006, in Nahá there are 253 inhabitants and Metzabok has 67 inhabitants.

The population of the region is totally indigenous, and they use their mother language, the Maya-Lacandón, to express themselves on a daily basis. Virtually all men under the age of 50 speak Spanish fluently, and the vast majority of young people can read and write. In general terms, few adult women can speak Spanish fluently; this is largely due to reduced contact with outsiders relative to the men. The indigenous language is solidly maintained and used daily in its oral form; however, only a few members of the community are interested in developing writing in their language, so the vast majority ignores the grammatical elements to express themselves in writing in their own language. Some schools have now included elementary lessons in reading and writing in their local language, which is of great value to their cultures (Montes, 2005).

## RESULTS

As a result of the field work and the literature records, we found that the herpetofauna in both communities is composed as follows: in the case of amphibians, we recorded 22 species grouped into nine families and two orders. In the case of the reptiles, 45 species were recorded grouped into 21 families and three orders. In general, 67 herpetofaunal species were registered in the area of the APFF Nahá and Metzabok, included in 30 families and five orders (see Table 1; figures 7 to 35).

The distributional categorization analysis of the 67 species involved in this study produced a figure of a total of 2 country endemic species, 40 species native to Mexico



**Table 1. Average temperature and precipitation data recorded by the Las Tazas station, for the Naha and Metzabok regions.**

Months	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total
Tem (°C)	20.9	21.2	23.1	25.2	25.6	25.6	24.7	24.6	25.3	24.2	22.3	21.1	23.6
Pre (mm)	41.9	24.7	26.1	32.7	101.3	265.4	263.6	350.6	345.3	249.9	107.5	52.9	1862

and Central America, 19 species are ranging from Mexico to South America, 4 are species ranging from the United States to Central America and only 2 are species ranging from the United States to South America.

The Environmental Vulnerability Score (EVS; Wilson et al., 2013a, b) was applied to the 67 herpetofaunistic species. We found that 32 species are considered inside the low vulnerability category, 28 species fell inside the medium vulnerability category and a total of 6 species are in the highest vulnerability category.

During the field work, a total of 67 informal interviews were carried out in the two study communities (Metzabok n=37 and Nahá n=30), covering 50% and 11%, respectively, of the total population of each town (Metzabok n= 67 and Nahá n=253, according to the Instituto Nacional Electoral [INEGI, 2001]). The interviews were directed to two people in each family. If focus groups were formed, they were also taken into account; in this way, older adults, adults, young people, and children were able to participate.

We found that the northern Lacandones have a traditional classification of the amphibians and reptiles, in which they separate the herpetofauna into six major groups: toads or *be'p*, frogs or *xut*, turtles or *ak*, crocodiles or *ayim*, lizards or *torok*, and snakes or *kan*. Within each group, some species are given a more specific name, either because of their morphology, their color, some vocalization they generate, the place where they have been found, or some history or story related to that species (see Table 2).

## DISCUSSION

Most previous herpetofaunistic works consider Montes Azules Biosphere Reserve (REBIMA) to refer to the Selva Lacandona, an approach that is in fact incorrect. The

area of the REBIMA is just ca. 331, 200 hectares of the great total of ca. 1.8 million of hectares that comprises the entire Selva Lacandona. Lazcano-Barrero *et al.* (1992) recorded a total of 72 species for the REBIMA and Ramírez and León-Pérez (2016) recorded a total 119 species for the region. More recently, Hernández-Ordoñez *et al.* (2015) documented a total of 35 species of amphibians and 90 species of reptiles. The last authors, however, did not cover the northern portion of the Selva Lacandona. Taking this last piece of information as a reference, we can see how Nahá and Metzabok together contain a little more than half the species of REBIMA, which would place them as areas of great biological importance. If the lists made by CONANP are taken as a reference, the APFF Metzabok has a total record of 19 species and currently 67 herpetofaunistic species were obtained, contributing 3 times more than what was recorded in 2006 by the Mexican government and its environmental institutions.

The herpetofauna of Naha and Metzabok consisting of 67 species, are estimated to be only ca. 50 % of that of the Selva Lacandona as a whole. However, it is quite significant when we compare these numbers with those available in other important tropical areas also considered or believed as being the most biodiverse areas in Mexico, as it is the case of the Los Chimalapas region in the Isthmus of Tehuantepec, Oaxaca and Los Tuxtlas in Veracruz. The herpetofauna of Naha and Metzabok represents the 43 % of that of the Los Chimalapas and 41 % of that of the Los Tuxtlas (García-Padilla *et al.*, 2021; López-Luna *et al.*, 2017).

Regarding the ethno-taxonomy, Góngora-Arones (1987) mentioned that the Lacandones of Lacanjá Chansayab recognize six groups into which they divide the herpetofauna: *torok* (lizards), *ak* (turtles), *kan* (snakes), *ayim* (crocodiles), *chut* or *T'iu* (frog), *ran* (toads). This classification in some groups is identical to the classification provided by the Northern Lacandones in

**Table 2. Summary of ordinal numbers of native and non-native species in the herpetofauna of the Naha and Metzabok region of Chiapas, the state of Chiapas, and the country of Mexico. Percentages include ratios of those in the Nahá and Metzabok compared to those in the state of Chiapas and the country of México. Data for the state of Chiapas from Johnson *et al.*, 2015 and for Mexico from Johnson (*et al.*, 2017).**

Groups	Nahá and Metzabok	Chiapas	Mexico	Percentage
Anura	20	79	253	25.3/7.9
Caudata	2	25	156	8.0/1.3
Gymnophiona	—	3	3	0/0
Subtotals	22	107	412	20.5/5.3
Crocodylia	1	3	3	33.3/33.3
Squamata	39	203	906	19.2/4.3
Testudines	5	17	52	29.4/9.6
Subtotals	45	223	961	20.1/4.6
<b>Totals</b>	<b>67</b>	<b>330</b>	<b>1,373</b>	<b>20.3/4.8</b>



**Figure 6.-** A panoramic view of the main lagoons and the tropical evergreen forest in the community of Puerto Bello Metzabok, in the municipality of Ocosingo. Photo by Elí García-Padilla.

this study; however, while investigating the classification of the herpetofauna in the Lacanjá Chansayab community, we can see that some data provided by Góngora-Arones (1987) might not have been understood in the correct or inclusive way. According to more recent informal interviews with Lacandones from Lacanjá, the herpetofauna is classified into: *torok* (lizards), *ak* (turtles), *kan* (snakes), *ayim* (crocodiles) and *Rerek* (frogs and toads), forming five groups, of which there are subdivisions that take into account the morphology, coloration, vocalization, and habits. This is still similar to what the northern Lacandones identify; however, a notable difference in the classification of reptiles and amphibians is that toads are separated from frogs. The importance of a species within a culture, however, will give it more specific names; this happens with snakes, which would give us an idea of how important snakes are for the Lacandon people. Their interest in conservation, as well as their beliefs and fears, make snakes very important in their culture.

The Tojolabales (González, 2001) recognize four groups, separating toads, turtles, snakes, and venomous snakes. The Mam culture also has its own classification system where snakes are recognized as *Kan*. These are clear examples that the herpetofauna in certain cultures of Chiapas has an important place and is given a classification. In the case of the northern Lacandones, the group of snakes is called *Kan*, which coincides with how the Mam culture knows snakes; it is possible that it derives from ancestral knowledge given the Mayan roots of most ethnic groups in Chiapas.

## CONCLUSIONS AND RECOMMENDATIONS

### CONCLUSIONS

Through this study, it was possible to expand the herpetofaunistic record that was described by CONANP in 2006. In total, the Nahá and Metzabok communities

contain a total of 67 species, including 22 species of amphibians and 45 species of reptiles.

The traditional form of classification of the Lacandones from the north divides and recognizes the groups of crocodiles, lizards, turtles, frogs, toads and snakes. Salamanders are included within lizards. Their organization system depends on coloration, morphology, vocalization, habits, and habitat of the involved groups of species.

Among the factors that constantly threaten the behavior and culture of the Lacandones is the establishment of the APFF's decrees. These areas and their own dynamics have contributed to increase the abandonment of cultural beliefs and traditions regarding faunal species, to the detriment of the conservation of all species. In this sense, a series of operating rules have been generated that the Lacandón people must abide by in order to have access to federal projects that generate monetary gains for them.

The income from environmental services implemented by the federal government in the Lacandona has led to the abandonment of daily practices in Nahá, allowing entry to Tzeltal or Chol people to work the land. On the other hand, the Evangelical, Pentecostal, and Seventh-day churches are undoubtedly a very important and decisive factor in cultural change by prohibiting the worship of traditional deities, speaking of their beliefs, the development of their rituals, of their songs and prayers. This influence results in the interruption of the previously strong link between nature and human societies.

### RECOMMENDATIONS

We strongly urge the Mexican government to guarantee the effective recognition of the collective rights of the ethnical groups of Mexico and their traditional knowledge and languages. In the case of




the Maya Lacandones of Nahá and Metzabok, we are talking about one of the smallest ethnical groups or minorities; however, they still possess their native language and cultural traditions, beliefs, and customs. They are in fact the owners and the best guardians of one of the most important remnants of biodiversity at the country and Mesoamerica levels. Their strong link between society and nature enables them to persist during millennia with a semi-nomadic style of life inside the great Selva Maya. The knowledge and cosmogony they maintain is vital to understanding the reasons why they have resisted the destruction of their common home, i.e., the rainforest.

## ACKNOWLEDGMENTS

The preparation of this document and the photographic inventory would not have been possible without the field collaboration and contribution of Rafael Tarano-González and Jaime Tarano-López (father and son, respectively) who are both members

of the Lacandon community of Puerto Bello Metzabok. We also thank the biologist and photographer Daniel Ochoa for the donation of his splendid image of *Agalychnis moreletii*. We also thank the local authorities and members of the communities of Nahá and Metzabok for all their support and companionship during the field work invested by AIMM and ECC, specially to Don Enrique Valenzuela (current Subcomisariado) and his wife María Gutiérrez. EGP also visited the communities of Nahá and Metzabok twice in 2011 and 2012 to explore and photograph the deepest regions of Chiapas and the mythical Selva Lacandona and their current guardians: The Hach Winik or Mayas-Lacandones, the true people. AIMM would like to dedicate all this academic effort invested to her parents, and to the entire people of Metzabok who adopted her as if she were part of the community, especially to the local children Bor and Moisés for always running with her looking for herps ("bichos"). EGP would also like to dedicate this collaborative contribution to his only begotten son K'in B'alam (Sol Jaguar) García-Morales.



**T**HEN HACHAKYUM (TRUE GOD) MADE THE FOREST. IT WAS GOOD... HE SAW THAT IT WAS GOOD. HE SAW THE STONES COME OUT. THERE WERE STONES IN THE FOREST, EVERYTHING WAS LIFTED (...IN DUE ORDER). SO THE LAND WAS GOOD."

(CHAN K'IN VIEJO)

**Table 3. Updated and corrected list of the amphibians and reptiles in the Naha & Metzabok region.**

Taxa	Maya Lacandon names	Distributional status	Environmental Vulnerability Category (Score)	IUCN Categorization	SEMARNAT Status
<b>Order Anura (20 species)</b>					
<b>Family Bufonidae (3 species)</b>					
<i>Incilius macrocristatus</i>	<i>Sut/Torosh</i>	NE4	M (11)	VU	Pr
<i>Incilius valliceps</i>	<i>Sut/Torosh</i>	NE4	L (6)	LC	NS
<i>Rhinella horribilis</i>	<i>Be'p</i>	NE7	L (3)	LC	NS
<b>Family Centrolenidae (1 species)</b>					
<i>Hyalinobatrachium viridissimum</i>	<i>Yax xut</i>	NE4	M (10)	NE	NS
<b>Family Craugastoridae (3 species)</b>					
<i>Craugastor alfredi</i>	<i>Xut</i>	NE4	M (11)	VU	NS
<i>Craugastor laticeps</i>	<i>Xut</i>	NE4	M (12)	NT	Pr
<i>Craugastor rugulosus*</i>	<i>Xut</i>	CE	M (13)	LC	NS
<b>Family Hylidae (7 species)</b>					
<i>Dendropsophus ebraccatus</i>	<i>Xut</i>	NE6	M (10)	LC	NS
<i>Dendropsophus microcephala</i>	<i>Xut</i>	NE6	L (7)	LC	NS
<i>Smilisca baudinii</i>	<i>Kek ich</i>	NE7	L (3)	LC	NS
<i>Smilisca cyanosticta</i>	<i>Kek ich</i>	NE4	M (12)	NT	NS
<i>Tlalocohyla loquax</i>		NE4	L (7)	LC	NS
<i>Tlalocohyla picta</i>		NE4	L (8)	LC	NS
<i>Trachycephalus vermiculatus</i>	<i>Xut Kek ich</i>	NE6	L (4)	LC	NS
<b>Family Microhylidae (1 species)</b>					
<i>Hypopachus variolosus</i>	<i>Xut</i>	NE7	L (4)	LC	NS
<b>Family Phyllomedusidae (2 species)</b>					
<i>Agalychnis moreletii</i>		NE4	L (7)	CR	NS
<i>Agalychnis taylori</i>		NE4	M (11)	NE	NS
<b>Family Ranidae (2 species)</b>					
<i>Lithobates brownorum</i>	<i>Yax o' xut</i>	NE4	L (8)	NE	Pr
<i>Lithobates vaillanti</i>	<i>Yax o' xut</i>	NE6	L (9)	LC	NS
<b>Family Rhinophrynidae (1 species)</b>					
<i>Rhinophrynus dorsalis</i>	<i>Wo´</i>	NE7	L (8)	LC	NS
<b>Order Caudata (2 species)</b>					
<b>Family Plethodontidae (2 species)</b>					
<i>Bolitoglossa mulleri</i>	<i>Chum pets kin</i>	NE4	H (15)	VU	NS
<i>Bolitoglossa rufescens</i>	<i>Xum pets kin</i>	NE4	L (9)	LC	Pr
<b>Order Crocodylia (1 species)</b>					
<b>Family Crocodylidae (1 species)</b>					
<i>Crocodylus moreletii</i>	<i>Ayim</i>	NE4	M (13)	LC	Pr
<b>Order Squamata (39 species)</b>					
<b>Family Corytophanidae (3 species)</b>					
<i>Basiliscus vittatus</i>	<i>Ter´ torok</i>	NE4	L (7)	NE	NS
<i>Corytophanes hernandesii</i>		NE4	M (13)	NE	Pr
<i>Laemanctus longipes</i>		NE4	L (9)	LC	Pr
<b>Family Dactyloidae (6 species)</b>					
<i>Norops biporcatus</i>	<i>Sat</i>	NE6	M (10)	NE	Pr
<i>Norops capito</i>	<i>Sat/Torok</i>	NE4	M (13)	NE	NS
<i>Norops laeiventris</i>	<i>Sat/Torok</i>	NE4	L (9)	NE	NS
<i>Norops lemurinus</i>	<i>Sat/Torok</i>	NE4	L (8)	NE	NS

\* = endemic species of Mexico. \*\* = endemic species of Chiapas-Naha and Metzabok. TC = Species documented in the authors' field work. M = record of a scientific collection-museum specimen. Distribution Status: NE = non-endemic; CE = country endemic; RE = regional endemic. The numbers suffixed to the NE category signify the distributional categories developed by Wilson et al., (2017) and implemented in the taxonomic list at the Mesoamerican Herpetology website (mesoamericanherpetology.com), as follows: 3 (species distributed only in Mexico and the United States); 6 (species ranging from Mexico to South America); 7 (species ranging from the United States to Central America); and 8 (species ranging from the United States to South America). Environmental Vulnerability Category (Score): A = High (14–20), M = Medium (10–13) and B = Low (3–9). IUCN categorizations: CR (Critically Endangered); EN (Endangered); VU (Vulnerable); NT (Near Threatened); LC (Least Concern); DD (Data Deficient); NE (Not Evaluated). SEMARNAT Status: P = Endangered; A = Threatened; Pr = Special Protection; NS = No Status.



**Table 3. Updated and corrected list of the amphibians and reptiles in the Naha & Metzabok region.**

<i>Norops uniformis</i>	<i>Sat/Torok</i>	NE4	M (13)	NE	NS
<i>Norops unilobatus</i>	<i>Sat/Torok</i>	NE4	L (7)	NE	NS
<b>Family Eublepharidae (1 species)</b>					
<i>Coleonyx elegans</i>		NE4	L (9)	NE	A
<b>Family Iguanidae (1 species)</b>					
<i>Iguana rhinolopha</i>	<i>Huj</i>	NE4	M (10)	NE	NS
<b>Family Phrynosomatidae (2 species)</b>					
<i>Sceloporus serrifer</i>	<i>Si ro</i>	NE4	L (6)	LC	NS
<i>Sceloporus variabilis</i>	<i>Si ro</i>	NE4	L (5)	NE	NS
<b>Family Phyllodactylidae (1 species)</b>					
<i>Thecadactylus rapicauda</i>	-	NE6	M (10)	NE	Pr
<b>Family Scincidae (1 species)</b>					
<i>Plestiodon sumichrasti</i>	<i>Pi kan puts</i>	NE4	M (12)	NE	NS
<b>Family Sphenomorphidae (1 species)</b>					
<i>Scincella cherriei</i>	<i>Pi kan puts</i>	NE4	L (8)	NE	NS
<b>Family Teiidae (2 species)</b>					
<i>Holcosus festivus</i>	<i>Mechech</i>	NE6	M (11)	NE	NS
<i>Holcosus stuarti*</i>	<i>Mechech</i>	CE	L (13)	NE	NS
<b>Family Xantusidae (1 species)</b>					
<i>Lepidophyma flavimaculatum</i>	<i>Pik an puts</i>	NE4	L (8)	NE	Pr
<b>Family Boidae (1 species)</b>					
<i>Boa imperator</i>	<i>Ach kan</i>	NE6	M (10)	NE	A
<b>Family Colubridae (7 species)</b>					
<i>Drymarchon melanurus</i>	<i>U kan i ja</i>	NE6	L (6)	LC	NS
<i>Drymobius margaritiferus</i>	<i>Yax kan /Mejen chay</i>	NE8	L (6)	NE	NS
<i>Lampropeltis polyzona</i>	<i>Chak kan</i>	NE6	L (7)	NE	A
<i>Leptophis mexicanus</i>	<i>Yax kan</i>	NE4	L (6)	LC	A
<i>Oxybelis fulgidus</i>	<i>Yax kan</i>	NE6	L (9)	NE	NS
<i>Oxybelis potosiensis</i>	-	NE4	H (15)	NE	NS
<i>Phrynonax poecilonotus</i>	-	NE6	M (10)	LC	NS
<b>Family Dipsadidae (7 species)</b>					
<i>Adelphicos quadrivirgatum</i>	<i>Chak kan</i>	NE4	M (10)	DD	NE
<i>Coniophanes piceivittis</i>	<i>LE' kan</i>	NE4	L (7)	LC	NS
<i>Imantodes cenchoa</i>	<i>LE' kan</i>	NE6	L (6)	NE	Pr
<i>Leptodeira septentrionalis</i>	<i>Awichu/LE'kan</i>	NE8	L (8)	NE	NS
<i>Ninia sebae</i>	<i>Chak kan</i>	NE4	L (5)	NE	NS
<i>Rhadinella kinkelini</i>	-	NE4	M (12)	LC	NE
<i>Xenodon angustirostris</i>	<i>Upe chik u vah</i>	NE6	M (13)	NE	NS
<b>Family Elapidae (1 species)</b>					
<i>Micrurus apiatus</i>		NE4	M (13)	LC	Pr
<b>Family Viperidae (4 species)</b>					
<i>Bothriechis schlegelli</i>	<i>U ko mi</i>	NE6	M (12)	NE	NS
<i>Bothrops asper</i>	<i>Jach kan</i>	NE6	M (12)	NE	NS
<i>Metlapilcoatlus mexicanus</i>	<i>U ko mi</i>	NE4	M (12)	NE	NS
<i>Porthidium nasutum</i>	<i>U ko mi</i>	NE6	H (14)	LC	Pr

\* = endemic species of Mexico. \*\* = endemic species of Chiapas-Naha and Metzabok. TC = Species documented in the authors' field work. M = record of a scientific collection-museum specimen. Distribution Status: NE = non-endemic; CE = country endemic; RE = regional endemic. The numbers suffixed to the NE category signify the distributional categories developed by Wilson et al., (2017) and implemented in the taxonomic list at the Mesoamerican Herpetology website (mesoamericanherpetology.com), as follows: 3 (species distributed only in Mexico and the United States); 6 (species ranging from Mexico to South America); 7 (species ranging from the United States to Central America); and 8 (species ranging from the United States to South America). Environmental Vulnerability Category (Score): A = High (14–20), M = Medium (10–13) and B = Low (3–9). IUCN categorizations: CR (Critically Endangered); EN (Endangered); VU (Vulnerable); NT (Near Threatened); LC (Least Concern); DD (Data Deficient); NE (Not Evaluated). SEMARNAT Status: P = Endangered; A = Threatened; Pr = Special Protection; NS = No Status.



**Table 3. Updated and corrected list of the amphibians and reptiles in the Naha & Metzabok region.**

Order Testudines (5 species)					
<b>Family Chelydridae (1 species)</b>					
<i>Chelydra rossignonii</i>	<i>Ne ak</i>	NE4	H (17)	VU	NS
<b>Family Dermatemydidae (1 species)</b>					
<i>Dermatemys mawii</i>	-	NE4	H (17)	CR	P
<b>Family Emydidae (1 species)</b>					
<i>Trachemys venusta</i>	<i>Kan ak</i>	NE6	M (13)	VU	NE
<b>Family Kinosternidae (1 species)</b>					
<i>Kinosternon leucostomum</i>	<i>Chak ich</i>	NE6	M (10)	NE	Pr
<b>Family Staurotypidae (1 species)</b>					
<i>Staurotypus triporcatus</i>	<i>Ak / Le't</i>	NE4	H (14)	NT	A

\* = endemic species of Mexico. \*\* = endemic species of Chiapas-Naha and Metzabok. TC = Species documented in the authors' field work. M = record of a scientific collection-museum specimen. Distribution Status: NE = non-endemic; CE = country endemic; RE = regional endemic. The numbers suffixed to the NE category signify the distributional categories developed by Wilson et al., (2017) and implemented in the taxonomic list at the Mesoamerican Herpetology website (mesoamericanherpetology.com), as follows: 3 (species distributed only in Mexico and the United States); 6 (species ranging from Mexico to South America); 7 (species ranging from the United States to Central America); and 8 (species ranging from the United States to South America). Environmental Vulnerability Category (Score): A = High (14–20), M = Medium (10–13) and B = Low (3–9). IUCN categorizations: CR (Critically Endangered); EN (Endangered); VU (Vulnerable); NT (Near Threatened); LC (Least Concern); DD (Data Deficient); NE (Not Evaluated). SEMARNAT Status: P = Endangered; A = Threatened; Pr = Special Protection; NS = No Status.

**Table 4. Summary of distributional categorization for the species of the herpetofauna of the Nahá and Metzabok region of the Selva Lacandona.**

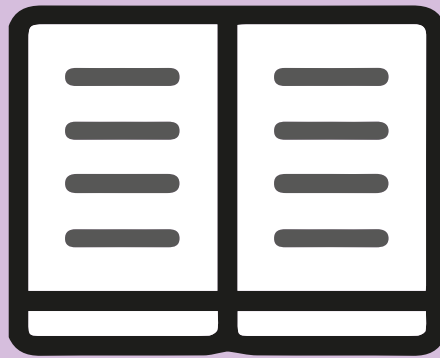
Groups	Non-endemic Species				Country Endemics	Totals
	4	6	7	8		
Anura	11	4	4	—	1	20
Caudata	2	—	—	—	—	2
<b>Subtotals</b>	<b>13</b>	<b>4</b>	<b>4</b>	<b>—</b>	<b>1</b>	<b>22</b>
Crocodylia	1	—	—	—	—	1
Squamata	23	13	—	2	1	39
Testudines	3	2	—	—	—	5
<b>Subtotals</b>	<b>27</b>	<b>15</b>	<b>—</b>	<b>2</b>	<b>1</b>	<b>45</b>
<b>Totals</b>	<b>40</b>	<b>19</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>67</b>

The numbers indicated below the non-endemic box refer to the following distributional categories (as explained in Wilson et al., 2017): 3 (MXUS—species distributed only in Mexico and the United States); 4 (MXCA—species found only in Mexico and Central America); 6 (MXSA—species ranging from Mexico to South America); 7 (USCA—species ranging from the United States to Central America); and 8 (USSA—species ranging from the United States to South America).

**Table 5. Summary of conservation status for the species of the herpetofauna of the Nahá and Metzabok region of the Selva Lacandona, Mexico. The numbers below the Environmental Vulnerability Score box are the range of scores evident for the herpetofauna.**

Groups	Environmental Vulnerability Score																	IUCN Categorizations						SEMARNAT				Totals
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	CR	EN	VU	NT	LC	DD	NE	P	A	Pr	NS		
Anura	2	2	—	1	3	3	1	2	3	2	1	—	—	—	—	1	—	2	2	12	—	3	—	—	2	18	<b>20</b>	
Caudata	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	1	—	1	—	—	—	—	1	1	<b>2</b>	
<b>Subtotals</b>	<b>2</b>	<b>2</b>	<b>—</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>—</b>	<b>1</b>	<b>—</b>	<b>—</b>	<b>1</b>	<b>—</b>	<b>3</b>	<b>2</b>	<b>13</b>	<b>—</b>	<b>3</b>	<b>—</b>	<b>—</b>	<b>3</b>	<b>19</b>	<b>22</b>	
Crocodylia	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	<b>1</b>	
Squamata	—	—	2	5	4	4	4	6	1	5	6	1	1	—	—	—	—	—	9	1	29	—	4	8	27	<b>39</b>		
Testudines	—	—	—	—	—	—	—	1	—	—	1	1	—	—	2	1	—	2	1	—	—	1	1	1	1	2	<b>5</b>	
<b>Subtotals</b>	<b>—</b>	<b>—</b>	<b>2</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>7</b>	<b>1</b>	<b>5</b>	<b>7</b>	<b>2</b>	<b>1</b>	<b>—</b>	<b>2</b>	<b>1</b>	<b>—</b>	<b>2</b>	<b>1</b>	<b>10</b>	<b>1</b>	<b>30</b>	<b>1</b>	<b>5</b>	<b>9</b>	<b>29</b>	<b>45</b>	
<b>Totals</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>9</b>	<b>4</b>	<b>7</b>	<b>8</b>	<b>2</b>	<b>2</b>	<b>—</b>	<b>2</b>	<b>2</b>	<b>—</b>	<b>5</b>	<b>3</b>	<b>23</b>	<b>1</b>	<b>33</b>	<b>1</b>	<b>5</b>	<b>12</b>	<b>48</b>	<b>67</b>	

The abbreviations below the IUCN Categorization box signify the following: CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; DD = Data Deficient; and NE = Not Evaluated. The abbreviations below the SEMARNAT box signify the following: P = Endangered; A = Threatened; Pr = Special Protection; and NS = No Status. The Totals are the same for each of the three systems of conservation assessment. Non-native species not included.



## LITERATURE CITED

- Acosta-Chaves, V., A. Batista, G. Chaves, R. Ibáñez, G. Köhler, K. Nicholson, L.W. Porras, and J. Sunyer. 2020. *Anolis capito*. The IUCN Red List of Threatened Species 2022:
- Armstead, J. V., F. Ayala-Varela, O. Torres-Carvajal, M. J. Ryan, and S. Poe. 2017. Systematics and ecology of *Anolis biporcatus* (Squamata: Iguanidae). *Salamandra* 53 (2): 285-293.
- Calleros, G. y F.A. Brauer, 1983. Problemática regional de la Selva Lacandona. Dirección General de Desarrollo Forestal, Secretaría de Agricultura y Recursos Hidráulicos. Coordinación Ejecutiva del Programa Ecológico de la Selva Lacandona. Palenque, Chiapas. México.
- Card, D.C., D.R. Schield, R.H. Adams, A.B. Corbin, B.W. Perry, A.L. Andrew, G.I.M. Pasquesi, E.N. Smith, T. Jezkova, S.M. Boback, W. Booth, and T.A. Castoe. 2016. Phylogeographic and population genetic analyses reveal multiple species of *Boa* and independent origin of insular dwarfism. *Molecular Phylogenetics and Evolution* 102:104-116.
- Campbell, J.A., and Lamar, W.W. 1989. *The Venomous Reptiles of Latin America*. Ithaca, U.S.A. Pp.442.
- Campbell, J.A. 1998. *Amphibians and Reptiles of Northern Guatemala, the Yucatan and Belize*. University of Oklahoma Press, Norman, OK, USA Pp.400.
- Casas-Andreu, G., G. Valenzuela-López, y A. Ramírez-Bautista. 1991. *Cómo hacer una colección de anfibios y reptiles*. Serie Cuadernos No. 10. Instituto de Biología. Universidad Nacional Autónoma de México. Pp. 68.
- Comisión Nacional de Áreas Naturales Protegidas. 2006a. Programa de Conservación y Manejo Área de Protección de Flora y Fauna Metzabok. 1ª edición. Comisión Nacional de Áreas Naturales Protegidas. México, D.F. Pp.179.
- Comisión Nacional de Áreas Naturales Protegidas. 2006b. Programa de Conservación y Manejo Área de Protección de Flora y Fauna Nahá. 1ª edición. Comisión Nacional de Áreas Naturales Protegidas. México, D.F., México. Pp.180.
- Conant, R., and Collins, J.T. 1991. *A Field Guide to Reptiles and Amphibians: Eastern and Central North America*. Third Edition. Houghton Mifflin Company, Boston, Massachusetts. Pp.640.
- CONABIO. 2006. Estrategia Tri-nacional Belice-Guatemala-México para la Conservación y el Manejo Sostenible del Cocodrilo de Morelet (*Crocodylus moreletii*). CONABIO, México, D.F.
- Cruz-Elizalde, R, A. Ramírez-Bautista, R. Pineda-López, V. Mata-Silva, D.L. DeSantis, E. García-Padilla, J.D. Johnson, A. Rocha, L.A. Fucsko, and Wilson. 2022. The herpetofauna of Querétaro, Mexico: composition, distribution, and conservation status. *Amphibian & Reptile Conservation* 16(1):148-192.
- De Vos, J., y M.O. Marion. 2015. La colonización de la Selva Lacandona (Paginas: 35-44). In: Carabias, J., J. de la Maza, y R. Cadena (coords.), 2015. *Conservación y desarrollo sustentable en la Selva Lacandona. 25 años de actividades y experiencias*, México, *Natura y Ecosistemas Mexicanos*.
- Diario Oficial de la Federación (DOF). 1998. Decreto por el cual se declara como Área Natural Protegida, con el carácter de Área de Protección de Flora y Fauna, la región conocida como Metzabok y Nahá, Estado de Chiapas. 23 de septiembre de 1998. Tomo DXL, N° 16. México D.F.
- Flores-Villela, O. A. F., F.M. Quijano, y G.G. Porter. 1995. Recopilación de Claves Para la Determinación de Anfibios y Reptiles de México. Universidad Nacional Autónoma de México, Facultad de Ciencias, Departamento de Biología. Pp. 286.
- Frost, D.R. 2022. *Amphibian Species of the World: An Online Reference*. Version 6.1. Available at <https://amphibiansoftwareworld.amnh.org/index.php>. doi. org/10.5531/db.vz.0001 [Accessed June 2022].
- García-Padilla E., V. Mata-Silva, I. Villalobos-Juárez, E. A. López-Esquivel, M. C. Lavariega, A. Rocha, D. De Santis, A. I. Melgar-Martínez, J. D. Johnson, L. A. Fucsko, D. Lazcano, and L. D. Wilson. 2022. The amphibians and reptiles of the Los Chimalapas region, Isthmus of Tehuantepec, Oaxaca, Mexico: composition, distributional categorization, conservation status, and biodiversity significance. *Revista Biología y Sociedad* 5 (10): 37-76.
- García-Padilla E., D. De Santis, A. Rocha, J.D. Johnson, L.A. Fucsko, D. Lazcano, and L.D. Wilson. 2022. Biological and cultural diversity in the state of Oaxaca, México: strategies for conservation among indigenous communities. *Revista Biología y Sociedad* 5(9):48-72.
- Gaviño, G., C. Juárez, y H. H. Figueroa. 1982. *Técnicas biológicas selectas de laboratorio y de campo*. Editorial Limusa. México D.F. Pp. 251.
- Góngora-Arones, E. 1987. *Etnozoología lacandona: la herpetotau-na de Lacanja Chansayab*. No. Folleto 11435. Pp. 31.
- González-Torres, Y. 2011. Lo animal en la cosmovisión mexicana o mesoamericana (Pp. 107-122). In: González-Torres (coordinadora). *Animales y plantas en la cosmovisión mesoamericana*. Conaculta/ INAH.



- González-García, F. 1993. Avifauna de la Reserva de la Biosfera "Montes Azules", Selva Lacandona, Chiapas. México. Acta Zoológica Mexicana (N.S.), (55):1-86.
- Heimes, P. 2016. Herpetofauna Mexicana Vol. 1. Snakes of Mexico. Edition Chimaira, Frankfurt am Main. Pp.572.
- Hernández-Ordoñez O., V. Arroyo-Rodríguez, A. González-Hernández, G. Russildi, R. Luna-Reyes, M. Martínez-Ramos, and V. H. Reynoso. 2015. Range extensions of amphibians and reptiles in the southeastern part of the Lacandona rainforest, Mexico. *Revista mexicana de biodiversidad* 86(2): 457-468.
- Instituto Nacional de Estadística, Geografía e Informática (INEGI). 2001. Chiapas, Síntesis de Resultados del Censo General de Población y Vivienda para la Selva Lacandona. INEGI. México.
- Iverson, J.B. 1992. A Revised Checklist with Distribution Maps of the Turtles of the World. Privately published, Richmond, Indiana. Pp. 377.
- Jadin, J.C. C. Blair, S. A. Orlofske, M. J. Jowers, G. A. Rivas, L. J. Vitt, J. M. Ray, E. N. Smith, and J. C. Murphy. 2020. Not withering on the evolutionary vine: systematic revision of the Brown Vine Snake (Reptilia: Squamata: Oxybelis) from its northern distribution. *Organisms Diversity and Evolution* 14(4): 723–746.
- Johnson, J. D., V. Mata-Silva, E. García-Padilla, and L. D. Wilson. 2015. The herpetofauna of Chiapas, Mexico: composition, physiographic distribution, and conservation status. *Mesoamerican Herpetology* 2: 272–329.
- Johnson, J.D., L.D. Wilson, V. Mata-Silva, E. García-Padilla, and D.L. DeSantis. 2017. The endemic herpetofauna of Mexico: organisms of global significance in severe peril. *Mesoamerican Herpetology* 4: 543–620.
- Köhler, G. 2003. Reptiles of Centroamerica. Herpeton Verlag. Edenkoben Germany. Pp. 367.
- Köhler G. 2008. Reptiles of Central America. Second Edition. Herpeton Verlag Elke Köhler, Offenbach, Germany. Pp. 400.
- Köhler, G. 2010. Amphibians of Centroamérica. Herpeton Verlag. Edenkoben Germany. Pp. 379.
- Lazcano-Barrero, M. A., E., Góngora-Arones, y R.C. Vogt. 1992. Anfíbios y Reptiles de la Selva Lacandona (Pp. 145-171). En: M.A. Vásquez-Sánchez, y M.A. Ramos (eds). Reserva de la Biosfera Montes Azules, Selva Lacandona: Investigación para su Conservación. Publicación Especial Ecosfera.
- Lazcano-Barrero, M.A., I.J. March, y M.A. Vásquez-Sánchez, 1992. Importancia y situación actual de la Selva Lacandona: perspectivas para su conservación (Pp. 393-437). En: M.A. Vásquez-Sánchez y M.A. Ramos (eds.). Reserva de la Biosfera Montes Azules, Selva Lacandona: Investigación para su conservación. Publicación Especial Ecosfera.
- Lee, J.C. 1996. The Amphibians and Reptiles of the Yucatan Peninsula. Comstock Publishing Associates, Ithaca and London. Pp. 500.
- Lemos-Espinal, J., and J.R. Dixon. 2013. Amphibians and Reptiles of San Luis Potosí. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, United States. Pp. 300.
- López-Luna, M. A. 2017. Estado actual de la diversidad y poblaciones de los anfibios y reptiles en Los Tuxtlas (Pp. 347-369). En: V.H. Reynoso, R.I. Coates, y M. L. Vázquez Cruz (eds.) Avances y Perspectivas en la Investigación de los Bosques Tropicales y sus Alrededores: la Región de Los Tuxtlas. Instituto de Biología, Universidad Nacional Autónoma de México, Ciudad de México.
- Mata-Silva, V., J.D. Johnson, L.D. Wilson, and E. García-Padilla. 2015. The herpetofauna of Oaxaca, Mexico: Composition Update, Physiographic Distribution, and Conservation Status. *Mesoamerican Herpetology* 2: 5–62.
- Mata-Silva, V., E. García-Padilla, A. Rocha, D.L. DeSantis, J.D. Johnson, A. Ramírez-Bautista, and L.D. Wilson. 2021. A reexamination of the herpetofauna of Oaxaca, Mexico: Composition Update, Physiographic Distribution, and Conservation Commentary. *Zootaxa* 4996:201-252.
- Montes, Q. S. 2005. Descripción socioeconómica en la región norte de la Selva Lacandona. Comisión Nacional de Áreas Naturales Protegidas adscripción Áreas de Protección de Flora y Fauna Nahá y Metzabok (Pp.34-37). En: Publicación Inédito. Chiapas, México.
- Ramírez, A., R. León-Pérez, y D. Noriega. 2015. Anfíbios y reptiles de la subcuenca del Lacantún. En: J. Carabias, J. de la Maza y R. Cadena. (Coords.), Conservación y desarrollo sustentable en la Selva Lacandona. 25 años de actividades y experiencias. México D.F.: Natura/ Ecosistemas Mexicanos.
- Rzedowski, J. 1978. Vegetación de México. Limusa. México. Pp 432.
- Rivero, M., and R. Medellín. 2015. Mamíferos del estado de Chiapas. *Revista Mexicana de Mastozoología Nueva época* 5(2): 23-37.
- Savage, J.M. 2002. The Amphibians and Reptiles of Costa Rica: A Herpetofauna between two Continents, between two Seas. University of Chicago Press, Chicago. Pp. 954.
- Sigler, L. and J. Dominguez-Laso. 2008. Historical and current distribution of the Morelet's crocodile *Crocodylus moreletii* (Duméril and Duméril, 1851) in Mexico. *Crocodile Specialist Group Newsletter* 27(1): 11-13.
- Wilson, L. D., and J.D. Johnson. 2010. Distributional patterns of the herpetofauna of Mesoamerica, a biodiversity hotspot (Pp. 30–235). In: Conservation of Mesoamerican Amphibians and Reptiles. L.D. Wilson, J.H. Townsend, and J.D. Johnson (Eds.). Eagle Mountain Publishing, Eagle Mountain, Utah, USA. Pp. 812.
- Wilson, L.D., Johnson, J.D., and V. Mata-Silva. 2013a. A conservation reassessment of the amphibians of Mexico based on the EVS measure. *Amphibian & Reptile Conservation* 7(1): 97–127.
- Wilson, L.D., Mata-Silva, V., and J.D. Johnson. 2013b. A conservation reassessment of the reptiles of Mexico based on the EVS measure. *Amphibian & Reptile Conservation* 7(1): 1–47.
- Wilson, L.D., J.D. Johnson, L.W. Porras, V. Mata-Silva, and E. García-Padilla. 2017. A system for categorizing the distribution of the Mesoamerican herpetofauna. *Mesoamerican Herpetology* 4(4): 901–913



**Figure 7.** A panoramic view of the main lagoon called Laguna de Nahá in the community of Nahá, in the municipality of Ocosingo. Photo by Elí García-Padilla.

**Figure 8.** Tropical evergreen forest in the community of Nahá. Photo by Elí García-Padilla.







**Figure 9.** The vegetation type known as “tintales” which consist on a seasonally flooded ecosystem. Metzabok. Photo by Ana Iris Melgar-Martínez.



**Figure 10.** *Incilius valliceps* (Weigmann, 1833). The Southern Gulf Coast Toad is distributed from Central Veracruz (Mexico) to northern Costa Rica on the Atlantic versant; from the Isthmus of Tehuantepec to south-central Guatemala on the Pacific slope; isolated record for El Salvador, sea level to 2000 m elevation (Frost, 2022). This individual came from the community of Nahá, in the municipality of Ocosingo. Wilson *et al.*, (2013a) ascertained its EVS as 6 placing it in the low vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and it is not listed by SEMARNAT. Photo by Elí García-Padilla





**Figure 11.** *Rhinella horribilis* (Weigmann, 1833). The Mesoamerican Cane Toad is distributed from the Lower Rio Grande Valley region of southern Texas (USA) and southern Sonora and southwestern Chihuahua (Mexico) south along the coastal plains through tropical lowland Mexico and Central America to the west slope of the Venezuelan Andes, western and northern Colombia, west coast of Ecuador, and extreme northwestern Peru (Frost, 2022). This individual came from the vicinity of Nahá in the municipality of Ocosingo. Wilson *et al.*, (2013a) ascertained its EVS as 3 placing it in the lowest limit of the low vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and not listed by SEMARNAT. Photo by Ana Iris Melgar-Martínez.



**Figure 12.** *Craugastor laticeps* (Duméril, 1853). The Broad-headed Rainfrog is distributed in the Atlantic premontane slopes and some immediately adjacent lowland sites from the Sierra de Los Tuxtlas in southern Veracruz, Mexico, through the base of the Yucatan Peninsula through northern Guatemala and to the Maya Mountains of Belize to western and northern Honduras, near sea level to 1600 m elevation (Frost, 2022). This individual came from near Lake Nahá in the municipality of Ocosingo. Wilson *et al.*, (2013a) ascertained its EVS as placing it in the vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and it is not listed by SEMARNAT. Photo by Elí García-Padilla.





**Figure 13.** *Agalychnis moreletii* (Duméril, 1853) The Morelet's Leaf Frog is distributed in disjunct populations from on both Atlantic and Pacific slopes from Veracruz, adjacent Puebla, and Guerrero through Chiapas, Mexico, to the Maya Mountains of Belize, Guatemala, northwestern Honduras, and El Salvador, 200 to 2130 m elevation (Frost, 2022). This individual came from Nahá in the municipality of Ocosingo. Wilson *et al.*, (2013a) ascertained its EVS as 7 placing in the low vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and not listed by SEMARNAT. Photo by Daniel Ochoa.



**Figure 14.** *Agalychnis taylori*. (Funkhouser, 1957). The Red Eyes Tree Frog is distributed from west-central Honduras north through Guatemala to Belize and along the Atlantic lowlands of Oaxaca and southern Veracruz, Mexico. This individual came from Puerto Bello Metzabok in the municipality of Ocosingo. Mata-Silva *et al.*, (2021) ascertained its EVS as 10 placing it in medium vulnerability category. Its conservation status has not been assessed by the IUCN and it is not listed by SEMARNAT. Photo by Ana Iris Melgar-Martínez.



**Figure 15.** *Dendropsophus microcephalus*. (Cope, 1886) The Yellow Treefrog is distributed Open lowlands from southeastern Mexico (southern Veracruz and northern Oaxaca), through Central America, to Colombia and thence south through Ecuador, Peru, to northern Bolivia and Amazonian Brazil (Frost, 2022). This individual came from Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013a) ascertained its EVS as 7 placing it in the low vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and not listed by SEMARNAT. Photo by Ana Iris Melgar-Martínez.



**Figure 16.** *Lithobates vaillanti*. (Brocchi, 1877). The Vaillant's Frog is a non-endemic species occurring at low and moderate elevations from north-central Veracruz and northern Oaxaca to the central Rio Magdalena region in Colombia, on the Atlantic versant, and on the Pacific versant from southeastern Oaxaca and northwestern Chiapas, Mexico, and from northwestern Nicaragua to southwestern Ecuador, at elevations from near sea level to 1,700 masl (Frost, 2022). This individual is from the vicinity of Puerto Bello Metzabok, in the municipality of Ocosingo. Wilson *et al.*, (2013a) ascertained its EVS as 9 placing it at the higher portion of the low vulnerability category. Its conservation status has been assessed as Least Concern (LC) by IUCN, and this species is not listed by SEMARNAT. Photo by Iris Melgar-Martínez.





**Figure 17.** *Bolitoglossa rufescens* (Cope, 1869). The Common Dwarf Salamander is a non-endemic species found from “extreme eastern San Luis Potosí south through Veracruz, and, provisionally east of the Isthmus of Tehuantepec in Chiapas to Belize and northwestern Honduras” (Frost, 2022). This individual was encountered at the vicinity of Puerto Bello Metzabok, in the municipality of Ocosingo. Wilson *et al.*, (2013a) calculated its EVS as 9, placing it at the upper limit of the low vulnerability category. Its conservation status was determined as Least Concern (LC) by the IUCN, and as Special Protection (Pr) by SEMARNAT. Photo by Ana Iris Melgar-Martínez.



**Figure 18.** *Norops biporcatus* (Wiegmann, 1834). The Giant Green Anole occurs on the Atlantic versant from Chiapas, Mexico, exclusive of the Yucatan Peninsula, southward to lower northern South America, and on the Pacific versant from southern Nicaragua to northern Colombia (Armstead *et al.*, 2017). This individual was photographed in the locality of Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013b) ascertained its EVS as 10 placing it in the low vulnerability category. Its conservation status has been determined as Least Concern (LC) by the IUCN and Species of Special Protection (Pr) by SEMARNAT. Photo by Ana Iris Melgar-Martínez.





**Figure 19.** *Norops capito* (Peters, 1863). The Anole occurs on the Atlantic slope of Central America (excluding the Yucatan Peninsula), ranging from Tabasco and Chiapas in Mexico, southward to Panama, and on the Pacific versant in Costa Rica and Panama. Its elevational range extends from near sea level to 1,900 masl (Acosta *et al.*, 2020; IUCN, 2022). This individual came from Sendero Nahá in the community of Nahá in the municipality of Ocosingo. Wilson *et al.*, (2013b) ascertained its EVS as 13 placing it in the upper limit of the medium vulnerability category. Its conservation status has been evaluated as Least Concern (LC) by the IUCN and not listed by SEMARNAT. Photo by Elí García-Padilla.



**Figure 20.** *Sceloporus serrifer*. (Cope, 1866). The range encompasses southern Texas, Mexico, northern Guatemala, and Belize (Conant and Collins 1991; Lee 1996). The range of *S. serrifer* (*sensu lato*) is substantially larger than that of *S. s. cyanogenys* (or *S. cyanogenys*). The range in Mexico is several disjunct populations representing several subspecies. Mexican range includes north Coahuila, Nuevo Leon, to southern Tamaulipas, Northern Veracruz, and northern Yucatan Peninsula, and central Chiapas. It occurs from 700 to 2,300 masl. (IUCN, 2022). This individual came from Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013b) ascertained its EVS as 6 placing it in the low vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and not listed by SEMARNAT. Photo by Rafael Tarano-González.





**Figure 21.** *Lepidophyma flavimaculatum* (Duméril, 1851). The Yellow-spotted Night Lizard is found at low and moderate elevations on the Atlantic slope from Veracruz eastward through northern Guatemala, Belize, and northern Honduras. In the Yucatan Peninsula it is known from northeastern Chiapas, El Petén, Belize, and southern Quintana Roo (Lee, 1996). This individual was located in Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013b) assessed its EVS as 8, placing it in the upper portion of the low vulnerability category. Its conservation status has been evaluated as Least Concern (LC) by the IUCN, and this species was placed in the Special Protection (Pr) category by SEMARNAT. Photo by Ana Iris Melgar-Martínez.



**Figure 22.** *Corythophanes cristatus* (Merrem, 1820) The Smooth Helmeted Iguana range extends from the Gulf and Caribbean slopes of Tabasco, northern Chiapas, southern Campeche, and Quintana Roo (Mexico) to Colombia. The species also can be found in the Pacific versant in central and south and marginally northwestern Costa Rica, Panama, and Colombia. It is known from elevations below 1,640 masl (Savage, 2002). This individual came from of Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013b) ascertained its EVS as 11 placing it in the medium vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and not listed by SEMARNAT. Photo by Ana Iris Melgar-Martínez.





**Figure 23.** *Coleonyx elegans*. (Gray, 1845). The Yucatan Banded Gecko is a non-endemic species ranging on the Pacific slope from southern Nayarit (Mexico) to western El Salvador, and on the Atlantic slope from Veracruz (Mexico) southward through the Yucatan Peninsula, including northern Guatemala and Belize. Its elevational range extends from near sea level to about 1,055 masl (Wilson and Johnson, 2010). This individual was photographed in Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013b) calculated its EVS as 9, placing it at the upper portion of the low vulnerability category. Its conservation status has not been assessed by IUCN, and this species is listed as Endangered (A) by SEMARNAT. Photo by Rafael Tarano-González.



**Figure 24.** *Boa imperator* (Daudin, 1803). The Central American Boa Constrictor is a non-endemic species occurring in Central America (including South American populations in the Choco of Colombia and Ecuador [and probably Peru], and North American populations along the Gulf coast of Mexico (west of the Isthmus of Tehuantepec; Card *et al.*, 2016)). This individual was encountered in Puerto Bello Metzabok in the municipality of Ocosingo. Mata-Silva *et al.*, (2021) calculated its EVS as 10, placing it at the lower limit of the medium vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and not listed by SEMARNAT. Photo by Rafael Tarano-González.





**Figure 25.** *Drymobius margaritiferus* (Schlegel, 1837) The speckled racer occurs at low and moderate elevations (up to 2000 masl) on the Atlantic versant from Texas, and on the Pacific versant from Sonora, southward through Mesoamerica to Colombia (Heimes, 2016). This individual was found in Puerto Bello Metzabok the municipality of Ocosingo. Its EVS has been determined as 6 placing in it in the low vulnerability category Wilson *et al.*, (2013b). Its conservation status has been considered as Least Concern (LC) by the IUCN and not listed by SEMARNAT. Photo by Ana Iris Melgar-Martínez.



**Figure 26.** *Leptophis mexicanus*. Duméril, Bibron, and Duméril, 1854. The Mexican Parrot Snake is distributed in southeastern Mexico, including Chiapas, Veracruz, Oaxaca, Tabasco, Yucatán, Campeche, San Luis Potosí, Querétaro, Tamaulipas, Puebla, Hidalgo, Nuevo León, Guerrero, and Yucatán Peninsula, into Guatemala, Honduras, Belize, El Salvador, Nicaragua, and Costa Rica. In Guatemala it occurs from near 1,360 masl in elevation (Lee 1996; Campbell, 1998). This individual was found in Puerto Bello Metzabok in the municipality of Ocosingo. Its EVS has been determined as 6 Wilson *et al.*, (2013b), placing it in the middle portion of the low vulnerability category. Its conservation status has been considered as Least Concern (LC) by the IUCN and it is allocated to the Threatened (A) category by SEMARNAT. Photo by Ana Iris Melgar-Martínez.





**Figure 27.** *Oxybelis fulgidus* (Daudin, 1803). The Green Vinesnake ranges “on the Atlantic and Pacific versant from the Isthmus of Tehuantepec through Central America to Argentina” (Lee, 1996). This individual is from Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013b) assessed its EVS as 9, placing it at the upper limit of the low vulnerability category. Its conservation status has not been determined by the IUCN, and this species is not listed by SEMARNAT. Photo by Ana Iris Melgar-Martínez.



**Figure 28.** *Oxybelis potosiensis*. (Taylor, 1941). The Gulf Coast Vine Snake is distributed from San Luis Potosí and northern Veracruz, southward to Yucatán, Mexico, and Belize (Jadin *et al.*, 2020). This individual was found in Puerto Bello Metzabok in the municipality of Ocosingo. Its EVS has been determined as 5 (Cruz-Elizalde *et al.*, 2022), placing it in the lower portion of the low vulnerability category. Its conservation status has not been evaluated (NE) by the IUCN, and it is considered as having No Status (NS) by SEMARNAT. Photo by Ana Iris Melgar-Martínez.





**Figure 29.** *Phrynonax poecilonotus*. (Günther, 1858) The Northern birdsnake occurs at low and moderate elevations (up to 1,300 m) along the Atlantic slope from extreme southeastern San Luis Potosí southward to Brazil and Bolivia; the range extends through much of the Yucatán Peninsula, but apparently excludes the drier western portion (Lee 1996); *P. poecilonotus* also occurs on the Pacific versant in lower Central America and South America (Heimes, 2016). This individual came from in the municipality of the same name. Its EVS has been determined as 5 (Cruz-Elizalde *et al.*, 2022), placing it in the lower portion of the low vulnerability category. Its conservation status has not been evaluated (NE) by the IUCN, and it is considered as having No Status (NS) by SEMARNAT. Photo by Ana Iris Melgar-Martínez.



**Figure 30.** *Xenodon rabdocephalus* (Wied, 1824. The False barba amarilla occurs at low and moderate elevations (up to 1,200 m) from central Veracruz and Guerrero southward through Central America to Amazonian South America (Heimes, 2016). This individual came from Puerto Bello Metzabok in the municipality of Ocosingo. Its EVS has been determined as 13 (Cruz-Elizalde *et al.*, 2022), placing it in the medium vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN, and it is considered as having No Status (NS) by SEMARNAT. Photo by Ana Iris Melgar-Martínez.





**Figure 31.** *Imantodes cenchoa*. (Linnaeus, 1758). The Blunt-headed Treesnake is a non-endemic species occurring at low and intermediate elevations (up to 1,600 masl) on the Atlantic versant, from southern Tamaulipas southward through Central and South America to Argentina. This snake also occurs along the Pacific lowlands and premontane slopes from Chiapas to Guatemala. In the Yucatán Peninsula, it is known from southern Campeche and Quintana Roo, but this species apparently is absent from the arid northwestern region of the peninsula (Heimes, 2016). This individual was found at Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013b) determined its EVS as 6 placing it in the low vulnerability category. Its conservation status is listed as Least Concern (LC) by IUCN and not listed by SEMARNAT. Photo by Ana Iris Melgar-Martínez.



**Figure 32.** *Metlapilcoatlus mexicanus*. (Duméril, Bibron, and Duméril, 1854). The Central American Jumping Pitviper occurs at low, moderate, and intermediate elevations on the Atlantic slope “from southern Mexico through Central America south to Costa Rica and Panama, where it is also found on the Pacific versant” (Heimes, 2016). This individual was found in Puerto Bello Metzabok in the municipality of Ocosingo. Its EVS has been determined as 12 (Wilson *et al.*, 2013b), placing it in the upper portion of the medium vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and it is allocated to the Threatened (A) category by SEMARNAT. Photo by Ana Rafael Tarano-González.





**Figure 33.** *Bothriechis schlegelii* (Berthold, 1846). The Eyelash palm-pitviper ranges at low and moderate elevations from southern Mexico to western Venezuela and northern Peru (Campbell and Lamar, 1989; 2004). In northern Central America, this species occurs only on the Atlantic versant, but from Costa Rica southward it is also found on the Pacific side. In Mexico, it is rare and known only from scattered localities in the northern and eastern highlands of Chiapas (in the areas of El Ocote, Ocozocoautla, El Mercadito near Cintalapa, and Ocosingo), at elevations ranging from about 200 to 1,200 masl (Heimes, 2016). This individual came from Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013b) determined its EVS as 14, placing it at the lower limit of the high vulnerability category. Its conservation status has been assessed as Near Threatened by the IUCN, and as Threatened (A) by SEMARNAT. Photo by Miguel Cruz-Ríos.



**Figure 34.** *Bothrops asper* (Garman, 1883). The Terciopelo is a non-endemic species ranging from southwestern Tamaulipas to coastal Venezuela on the Atlantic versant, and from Costa Rica to southern Ecuador on the Pacific versant, with a disjunct population in southern Chiapas and adjacent Guatemala (Lemos-Espinal and Dixon, 2013). This individual was found at Puerto Bello Metzabok, in the municipality of Ocosingo. Wilson *et al.*, (2013b) determined its EVS at 12, placing it in the upper portion of the medium vulnerability category. Its conservation status has not been assessed by IUCN or SEMARNAT. Photo by Rafael Tarano-González.





**Figure 35.** *Chelydra rossignonii*. (Bocourt, 1868). The Mesoamerican Snapping Turtle is a non-endemic species distributed from Veracruz, Mexico, through southern Belize and central Guatemala to northwestern Honduras; it is not known from Yucatán (Iverson, 1992). This individual is from Puerto Bello Metzabok, in the municipality of Ocosingo. Wilson *et al.*, (2013b) ascertained its EVS as 17, placing it in the middle portion of the high vulnerability category. Its conservation status has been assessed as Vulnerable by IUCN, and this species is not listed by SEMARNAT. Photo by Rafael Tarano-González.



**Figure 36.** *Staurotypus triporcatus*. (Wiegmann, 1828). The Mexican Giant Musk Turtle is a non-endemic species distributed from Veracruz through the base of the Yucatan Peninsula to western Honduras (Köhler, 2008). This individual was found at Puerto Bello Metzabok in the municipality of Ocosingo. Wilson *et al.*, (2013b) determined its EVS as 14, placing it at the lower limit of the high vulnerability category. Its conservation status has been assessed as Near Threatened by the IUCN, and as Threatened (A) by SEMARNAT. Photo by Rafael Tarano-González.





**Figure 37.** *Crocodylus moreletii*. (Duméril & Bribon, 1851) The Morelet´s crocodile s distributed from northeastern Mexico´s central Tamaulipas area, through the Yucatan Peninsula to northern Guatemala and central Belize. From 2002 to 2004, Mexico developed the “COPAN” project to assess the presence of the species across its historical range and in outlying areas; 63 localities were surveyed in 10 States (Sigler and Dominguez, 2008). In Mexico, *C. moreletii* occupies an estimated area of 396,455 km<sup>2</sup> (estimated by GARP algorithm and based on historical and actual localities). Total historical distribution across all three range states has been estimated as 450,000 km<sup>2</sup>, of which 88% lies in Mexico (CONABIO, 2006). This individual came from of Puerto Bello Metzabok. Wilson *et al.*, (2013b) ascertained its EVS as 13 placing it in the medium vulnerability category. Its conservation status has been assessed as Least Concern (LC) by the IUCN and Special protection (Pr) by SEMARNAT. Photo by Ana Iris Melgar-Martínez.











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