Xenosaurus tzacualtipantecus. The Zacualtipán knob-scaled lizard is endemic to the Sierra Madre Oriental of eastern Mexico. This medium-large lizard (female holotype measures 188 mm in total length) is known only from the vicinity of the type locality in eastern Hidalgo, at an elevation of 1,900 m in pine-oak forest, and a nearby locality at 2,000 m in northern Veracruz (Woolrich-Piña and Smith 2012). *Xenosaurus tzacualtipantecus* is thought to belong to the northern clade of the genus, which also contains *X. newmanorum* and *X. platyceps* (Bhullar 2011). As with its congeners, *X. tzacualtipantecus* is an inhabitant of crevices in limestone rocks. This species consumes beetles and lepidopteran larvae and gives birth to living young. The habitat of this lizard in the vicinity of the type locality is being deforested, and people in nearby towns have created an open garbage dump in this area. We determined its EVS as 17, in the middle of the high vulnerability category (see text for explanation), and its status by the IUCN and SEMARNAT presently are undetermined. This newly described endemic species is one of nine known species in the monogeneric family Xenosauridae, which is endemic to northern Mesoamerica (Mexico from Tamaulipas to Chiapas and into the montane portions of Alta Verapaz, Guatemala). All but one of these nine species is endemic to Mexico. *Photo by Christian Berriozabal-Islas.*

Amphibian & Reptile Conservation 7(1): 1–47.

A conservation reassessment of the reptiles of Mexico based on the EVS measure

[1]Larry David Wilson, [2]Vicente Mata-Silva, and [3]Jerry D. Johnson

[1]*Centro Zamorano de Biodiversidad, Escuela Agrícola Panamericana Zamorano, Departamento de Francisco Morazán, HONDURAS* [2,3]*Department of Biological Sciences, The University of Texas at El Paso, El Paso, Texas 79968–0500, USA*

***Abstract.*—Mexico is the country with the most significant herpetofaunal diversity and endemism in Mesoamerica. Anthropogenic threats to Mexico's reptiles are growing exponentially, commensurate with the rate of human population growth and unsustainable resource use. In a broad-based multi-authored book published in 2010 (*Conservation of Mesoamerican Amphibians and Reptiles*; CMAR), conservation assessment results differed widely from those compiled in 2005 by IUCN for a segment of the Mexican reptile fauna. In light of this disparity, we reassessed the conservation status of reptiles in Mexico by using the Environmental Vulnerability Score (EVS), a measure previously used in certain Central American countries that we revised for use in Mexico. We updated the total number of species for the Mexican reptile fauna from that reported in CMAR, which brought the new number to 849 (three crocodilians, 48 turtles, and 798 squamates). The 2005 assessment categorized a small percentage of species in the IUCN threat categories (Critically Endangered, Endangered, and Vulnerable), and a large number of species in the category of Least Concern. In view of the results published in CMAR, we considered their approach overoptimistic and reevaluated the conservation status of the Mexican reptile fauna based on the EVS measure. Our results show an inverse (rather than a concordant) relationship between the 2005 IUCN categorizations and the EVS assessment. In contrast to the 2005 IUCN categorization results, the EVS provided a conservation assessment consistent with the threats imposed on the Mexican herpetofauna by anthropogenic environmental degradation. Although we lack corroborative evidence to explain this inconsistency, we express our preference for use of the EVS measure. Based on the results of our analysis, we provide eight recommendations and conclusions of fundamental importance to individuals committed to reversing the trends of biodiversity decline and environmental degradation in the country of Mexico.**

Key words. EVS, lizards, snakes, crocodilians, turtles, IUCN categories, IUCN 2005 Mexican Reptile Assessment

***Resumen*.—México es el país que contiene la diversidad y endemismo de herpetofauna más significativo en Mesoamérica. Las amenazas antropogénicas a los reptiles de México crecen exponencialmente acorde con la tasa de crecimiento de la población humana y el uso insostenible de los recursos. Un libro publicado por varios autores en 2010 (*Conservation of Mesoamerican Amphibians and Reptiles*; CMAR) produjo resultados sobre conservación ampliamente contrarios a los resultados de una evaluación de un segmento de los reptiles mexicanos conducida en 2005 por la UICN. A la luz de esta disparidad, se realizó una nueva evaluación del estado de conservación de los reptiles mexicanos utilizando una medida llamada el Cálculo de Vulnerabilidad Ambiental (EVS), revisado para su uso en México. Se actualizó el número de especies de reptiles mexicanos más allá del estudio de CMAR, por lo que el número total de especies se incrementó a 849 (tres cocodrílidos, 48 tortugas, y 798 lagartijas y serpientes). La evaluación de 2005 de la UICN clasificó una proporción inesperadamente pequeña de especies en las categorías para especies amenazadas (En Peligro Crítico, En Peligro, y Vulnerable) y un porcentaje respectivamente grande en la categoría de Preocupación Menor. En vista de los resultados publicados en CMAR, consideramos que los resultados de este enfoque son demasiado optimistas, y reevaluamos el estado de conservación de todos los reptiles mexicanos basándonos en la medida de EVS. Nuestros resultados muestran una relación inversa (más que concordante) entre las categorizaciones de la UICN 2005 y EVS. Contrario a los resultados de las categorizaciones de la UICN 2005, la medida de EVS proporcionó una evaluación para la conservación de reptiles mexicanos que es coherente con las amenazas impuestas por la degradación antropogénica del medio ambiente. No tenemos la evidencia necesaria para proporcionar una explicación para esta inconsistencia, pero expresamos las razones de nuestra preferencia por el uso de los resultados del EVS. A la luz de los resultados de nuestro análisis, hemos**

Correspondence. *Emails:* [1]*bufodoc@aol.com* (Corresponding author), [2]*vmata@utep.edu,* [3]*jjohnson@utep.edu*

construido nueve recomendaciones y conclusiones de importancia fundamental para las personas comprometidas en revertir las tendencias asociadas con la pérdida de biodiversidad y la degradación del medio ambiente.

Palabras claves. EVS, lagartijas, culebras, cocodrílidos, tortugas, categorías de UICN, 2005 UICN valoración de reptiles mexicanos

Citation: Wilson LD, Mata-Silva V, Johnson JD. 2013. A conservation reassessment of the reptiles of Mexico based on the EVS measure. *Amphibian & Reptile Conservation* 7(1): 1–47 (e61).

The history of civilization is a history of human beings as they become increasingly knowledgeable about biological diversity.

Beattie and Ehrlich 2004: 1.

Introduction

From a herpetofaunal standpoint, Mexico is the most significant center of diversity in the biodiversity hotspot of Mesoamerica (Mexico and Central America; sensu Wilson and Johnson [2010]). Of the 1,879 species of amphibians and reptiles listed by Wilson and Johnson (2010) for all of Mesoamerica, 1,203 (64.0%) occur in Mexico; reptiles are especially diverse in this country, with 830 species (72.3%) of the 1,148 species distributed throughout Mesoamerica.

Wilson and Johnson (2010) also reported that the highest level of herpetofaunal endemism in Mesoamerica is found in Mexico (66.8% for amphibians, 57.2% for reptiles [60.2% combined]), with the next highest level in Honduras (36.2% for amphibians, 19.2% for reptiles [25.3% combined]). The reported level of herpetofaunal diversity and endemism in Mexico has continued to increase, and below we discuss the changes that have occurred since the publication of Wilson et al. (2010).

Interest in herpetofaunal diversity and endemicity in Mexico dates back nearly four centuries (Ramírez-Bautista et al. 2009). Herpetologists, however, only have become aware of the many threats to the survival of amphibian and reptile populations in the country relatively recently. The principal driver of these threats is human population growth (Wilson and Johnson 2010), which is well documented as exponential. “Any quantity that grows by a fixed percent at regular intervals is said to possess exponential growth” (www.regentsprep.org). This characteristic predicts that any population will double in size depending on the percentage growth rate. Mexico is the 11th most populated country in the world (2011 Population Reference Bureau World Population Data Sheet), with an estimated mid-2011 total of 114.8 million people. The population of Mexico is growing at a more rapid rate (1.4% rate of natural increase) than the global average (1.2%), and at a 1.4% rate of natural increase this converts to a doubling time of 50 years (70/1.4 = 50). Thus, by the year 2061 the population of Mexico is projected to reach about 230 million, and the population density will increase from 59 to 118/km^2 (2011 PBR World Population Data Sheet).

Given the widely documented threats to biodiversity posed by human population growth and its consequences (Chiras 2009; Raven et al. 2011), as well as the increasing reports of amphibian population declines in the late 1980s and the 1990s (Blaustein and Wake 1990; Wake 1991), the concept of a Global Amphibian Assessment (GAA) originated and was described as “a first attempt to assess all amphibians against the IUCN Red List Categories and Criteria” (Stuart et al. 2010). The results of this assessment were startling, and given broad press coverage (Conservation International 2004; Stuart et al. 2004). Stuart et al. (2010) reported that of the 5,743 species evaluated, 1,856 were globally threatened (32.3%), i.e., determined to have an IUCN threat status of Critically Endangered (CR), Endangered (EN), or Vulnerable (VU). An additional 1,290 (22.5%) were judged as Data Deficient (DD), i.e., too poorly known for another determinable status. Given the nature of the Data Deficient category, eventually these species likely will be judged in one of the threat categories (CR, EN, or VU). Thus, by adding the Data Deficient species to those determined as globally threatened, the total comes to 3,146 species (54.8% of the world’s amphibian fauna known at the time of the GAA). Our knowledge of the global amphibian fauna has grown since the GAA was conducted, and a website (AmphibiaWeb) arose in response to the realization that more than one-half of the known amphibian fauna is threatened globally or too poorly known to conduct an evaluation. One of the functions of this website is to track the increasing number of amphibian species on a global basis. On 8 April 2013 we accessed this website, and found the number of amphibian species at 7,116, an increase of 23.9% over the number reported in Stuart et al. (2010).

As a partial response to the burgeoning reports of global amphibian population decline, interest in the conservation status of the world’s reptiles began to grow (Gibbons et al. 2000). Some of this interest was due to the recognition that reptiles constitute “an integral part of natural ecosystems and […] heralds of environmental quality,” just like amphibians (Gibbons et al. 2000: 653). Unfortunately, Gibbons et al. (2000: 653) concluded that, “reptile species are declining on a global scale,” and further (p. 662) that, “the declines of many reptile popula-

Dermatemys mawii. The Central American river turtle is known from large river systems in Mexico, from central Veracruz southward into Tabasco and Chiapas and northeastward into southwestern Campeche and southern Quintana Roo, avoiding the northern portion of the Yucatan Peninsula. In Central America, it occurs in northern Guatemala and most of Belize. The EVS of this single member of the Mesoamerican endemic family Dermatemyidae has been calculated as 17, placing it in the middle of the high vulnerability category, and the IUCN has assessed this turtle as Critically Endangered. This image is of an individual emerging from its egg, with its egg tooth prominently displayed. The hatching took place at the Zoológico Miguel Álvarez del Toro in Tuxtla Gutiérrez, Chiapas, as part of a captive breeding program for this highly threatened turtle. The parents of this hatchling came from the hydrologic system of the Río Usumacinta and Playas de Catazajá. *Photo by Antonio Ramírez Velázquez.*

Terrapene mexicana. The endemic Mexican box turtle is distributed from southern Tamaulipas southward to central Veracruz and westward to southeastern San Luis Potosí. Its EVS has been determined as 19, placing it in the upper portion of the high vulnerability category, but this turtle has not been evaluated by IUCN. This individual is from Gómez Farias, Tamaulipas, within the Reserva de la Biósfera El Cielo. *Photo by Elí García Padilla.*

tions are similar to those experienced by amphibians in terms of taxonomic breath, geographic scope, and severity." They also identified the following significant threats to reptile populations: habitat loss and degradation, introduced invasive species, environmental pollution, disease [and parasitism], unsustainable use, and global climate change. Essentially, these are the same threats identified by Vitt and Caldwell (2009) in the Conservation Biology chapter of their textbook *Herpetology*.

In the closing chapter of *Conservation of Mesoamerican Amphibians and Reptiles*, Wilson and Townsend (2010: 774–777) provided six detailed and intensely critical recommendations for the conservation of the herpetofauna of this region, based on the premise that "problems created by humans … are not solved by treating only their symptoms." Because of the nature of these recommendations, we consider it important to note that the IUCN conducted a conservation assessment of the Mexican reptiles in 2005, for which the results were made available in 2007 (see NatureServe Press Release, 12 September 2007 at www.natureserve.org). The contents of this press release were startling and unexpected, however, as indicated by its title, "New Assessment of North American Reptiles Finds Rare Good News," and contrast the conclusions of Wilson and Townsend (2010), which were based on the entire herpetofauna of Mesoamerica. The principal conclusion of the press release was that "a newly completed assessment of the conservation status of North American reptiles shows that most of the group is faring better than expected, with relatively few species at severe risk of extinction." Wilson and Townsend (2010: 773) commented, however, that "conserving the Mesoamerican herpetofauna will be a major challenge for conservation biologists, in part, because of the large number of species involved and the considerable number that are endemic to individual countries, physiographic regions, and vegetation zones."

Given the contrast in the conclusions of these two sources, and because the 2005 Mexican reptile assessment was based on the IUCN categories and criteria without considering other measures of conservation status, herein we undertake an independent reassessment of the reptile fauna of Mexico based on the Environmental Vulnerability Score (EVS), a measure developed by Wilson and McCranie (2004) for use in Honduras, which was applied to the herpetofauna of certain Central American countries in Wilson et al. (2010), and modified in this paper for use in Mexico.

The IUCN System of Conservation Status Categorization

The 2005 Mexican reptile assessment was conducted using the IUCN system of conservation status categorization. This system is used widely in conservation biology and applied globally, and particulars are found at the IUCN Red List of Threatened Species website (www.iucnredlist.org). Specifically, the system is elaborated in the online document entitled "IUCN Red List of Categories and Criteria" (2010), and consists of nine categories, identified and briefly defined as follows (p. 9):

Extinct (EX): "A taxon is Extinct when there is no reasonable doubt that the last individual has died."

Extinct in the Wild (EW): "A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range."

Critically Endangered (CR): "A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild."

Endangered (EN): "A taxon is Endangered when the best available evidence indicated that it meets any of the criteria A to E for Endangered, and is therefore considered to be facing a very high risk of extinction in the wild."

Vulnerable (VU): "A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild."

Near Threatened (NT): "A taxon is Near Threatened when it has been evaluated against the criteria but does not quality for Critically Endangered, Endangered, or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Least Concern (LC): "A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category."

Data Deficient (DD): "A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status."

Not Evaluated (NE): "A taxon is Not Evaluated when it is has not yet been evaluated against the criteria."

As noted in the definition of the Near Threatened category, the Critically Endangered, Endangered, and Vulnerable categories are those with a threat of extinction in the wild. A lengthy discussion of criteria A to E mentioned in the definitions above is available in the 2010 IUCN document.

A Revised EVS for Mexico

In this paper, we revised the design of the EVS for Mexico, which differs from previous schemes in the components of geographic distribution and human persecution.

Trachemys gaigeae. The Big Bend slider is distributed along the Rio Grande Valley in south-central New Mexico and Texas, as well as in the Río Conchos system in Chihuahua. Its EVS has been calculated as 18, placing it in the upper portion of the high vulnerability category, and the IUCN has assessed this turtle as Vulnerable. This individual is from the Rio Grande about 184 straight kilometers SE of Ciudad Juarez, Chihuahua. Although the picture was taken on the US side (about 44 km SSW of Van Horn, Hudspeth County, Texas), it was originally in the water. *Photo by Vicente Mata-Silva.*

Kinosternon oaxacae. The endemic Oaxaca mud turtle occurs in southern Oaxaca and adjacent eastern Guerrero. Its EVS has been estimated as 15, placing it in the lower portion of the high vulnerability category, and the IUCN considers this kinosternid as Data Deficient. This individual was found in riparian vegetation along the edge of a pond in La Soledad, Tututepec, Oaxaca. *Photo by Vicente Mata-Silva.*

Initially, the EVS was designed for use in instances where the details of a species' population status (upon which many of the criteria for the IUCN status categorizations depend) are not available, so as to estimate its susceptibility to future environmental threats. In this regard, the EVS usually can be calculated as soon as a species is described, as it depends on information generally available when the species is discovered. Use of the EVS, therefore, does not depend on population assessments, which often are costly and time consuming. Nonetheless, its use does not preclude the implementation of other measures for assessing the conservation status of a species, when these measures can be employed. After all, conservation assessment measures are only a guide for designing conservation strategies, and constitute an initial step in our effort to protect wildlife.

The version of the EVS algorithm we developed for use in Mexico consists of three scales, for which the values are added to produce the Environmental Vulnerability Score. The first scale deals with geographic distribution, as follows:

1 = distribution broadly represented both inside and outside Mexico (large portions of range are both inside and outside Mexico)
2 = distribution prevalent inside Mexico, but limited outside Mexico (most of range is inside Mexico)
3 = distribution limited inside Mexico, but prevalent outside Mexico (most of range is outside Mexico)
4 = distribution limited both inside and outside Mexico (most of range is marginal to areas near border of Mexico and the United States or Central America)
5 = distribution only within Mexico, but not restricted to vicinity of type locality
6 = distribution limited to Mexico in the vicinity of type locality

The second scale deals with ecological distribution based on the number of vegetation formations occupied, as follows:

1 = occurs in eight or more formations
2 = occurs in seven formations
3 = occurs in six formations
4 = occurs in five formations
5 = occurs in four formations
6 = occurs in three formations
7 = occurs in two formations
8 = occurs in one formation

The third scale relates to the degree of human persecution (a different measure is used for amphibians), as follows:

1 = fossorial, usually escape human notice
2 = semifossorial, or nocturnal arboreal or aquatic, nonvenomous and usually non-mimicking, sometimes escape human notice
3 = terrestrial and/or arboreal or aquatic, generally ignored by humans
4 = terrestrial and/or arboreal or aquatic, thought to be harmful, might be killed on sight
5 = venomous species or mimics thereof, killed on sight
6 = commercially or non-commercially exploited for hides, meat, eggs and/or the pet trade

The score for each of these three components is added to obtain the Environmental Vulnerability Score, which can range from 3 to 20. Wilson and McCranie (2004) divided the range of scores for Honduran reptiles into three categories of vulnerability to environmental degradation, as follows: low (3–9); medium (10–13); and high (14–19). We use a similar categorization here, with the high category ranging from 14–20.

For convenience, we utilized the traditional classification of reptiles, so as to include turtles and crocodilians, as well as lizards and snakes (which in a modern context comprise a group).

Recent Changes to the Mexican Reptile Fauna

Our knowledge of the composition of the Mexican reptile fauna keeps changing due to the discovery of new species and the systematic adjustment of certain known species, which adds or subtracts from the list of taxa that appeared in Wilson et al. (2010). Since that time, the following nine species have been described:

Gopherus morafkai: Murphy et al. (2011). *ZooKeys* 113: 39–71.
Anolis unilobatus: Köhler and Vesely (2010). *Herpetologica* 66: 186–207.
Gerrhonotus farri: Bryson and Graham (2010). *Herpetologica* 66: 92–98.
Scincella kikaapoda: García-Vásquez et al. (2010). *Copeia* 2010: 373–381.
Lepidophyma cuicateca: Canseco-Márquez et al. (2008). *Zootaxa* 1750: 59–67.
Lepidophyma zongolica: García-Vásquez et al. (2010). *Zootaxa* 2657: 47–54.
Xenosaurus tzacualtipantecus: Woolrich-Piña and Smith (2012). *Herpetologica* 68: 551–559.
Coniophanes michoacanensis: Flores-Villela and Smith (2009). Herpetologica 65: 404–412.
Geophis occabus: Pavón-Vázquez et al. (2011). *Herpetologica* 67: 332–343.

Abronia smithi. Smith's arboreal alligator lizard is endemic to the Sierra Madre de Chiapas, in the southeastern portion of this state. Its EVS has been determined as 17, placing it in the middle of the high vulnerability category; the IUCN, however, lists this lizard as of Least Concern. This individual was found in cloud forest in the Reserva de la Biósfera El Triunfo, Chiapas. *Photo by Elí García-Padilla.*

The following 18 taxa either have been resurrected from the synonymy of other taxa or placed in the synonymy of other taxa, and thus also change the number of species in the CMAR list:

Phyllodactylus nocticolus: Blair et al. (2009). *Zootaxa* 2027: 28–42. Resurrected as a distinct species from *P. xanti*.

Sceloporus albiventris: Lemos-Espinal et al. (2004). *Bulletin of the Chicago Herpetological Society* 39: 164–168. Resurrected as a distinct species from *S. horridus*.

Sceloporus bimaculatus: Leaché and Mulcahy (2007). *Molecular Ecology* 16: 5216–5233. Returned to the synonymy of *S. magister*.

Plestiodon bilineatus: Feria-Ortiz et al. (2011). *Herpetological Monographs* 25: 25–51. Elevated to full species from *P. brevirostris*.

Plestiodon dicei: Feria-Ortiz et al. (2011). *Herpetological Monographs* 25: 25–51. Elevated to full species from *P. brevirostris*.

Plestiodon indubitus: Feria-Ortiz et al. (2011). *Herpetological Monographs* 25: 25–51. Elevated to full species from *P. brevirostris*.

Plestiodon nietoi: Feria-Ortiz and García-Vázquez (2012). *Zootaxa* 3339: 57–68. Elevated to full species from *P. brevirostris*.

Aspidoscelis stictogramma: Walker and Cordes (2011). *Herpetological Review* 42: 33–39. Elevated to full species from *A. burti*.

Xenosaurus agrenon: Bhullar (2011). *Bulletin of the Museum of Comparative Zoology* 160: 65–181. Elevated to full species from *X. grandis*.

Xenosaurus rackhami: Bhullar (2011). *Bulletin of the Museum of Comparative Zoology* 160: 65–181. Elevated to full species from *X. grandis*.

Lampropeltis californiae: Pyron and Burbrink (2009). *Zootaxa* 2241: 22–32. Elevated to full species from *L. getula*.

Lampropeltis holbrooki: Pyron and Burbrink (2009). *Zootaxa* 2241: 22–32. Elevated to full species from *L. getula*.

Lampropeltis splendida: Pyron and Burbrink (2009). *Zootaxa* 2241: 22–32. Elevated to full species from *L. getula*.

Sonora aequalis: Cox et al. (2012). *Systematics and Biodiversity* 10: 93–108. Placed in synonymy of *S. mutabilis*.

Coniophanes taylori: Flores-Villela and Smith (2009). *Herpetologica* 65: 404–412. Resurrected as a distinct species from *C. piceivittis*.

Leptodeira maculata: Daza et al. (2009). *Molecular Phylogenetics and Evolution* 53: 653–667. Synonymized with *L. cussiliris*. The correct name of the taxon, however, contrary to the decision of Daza et al. (2009), is *L. maculata*, inasmuch as this name was originated by Hallowell in 1861, and thus has priority. *Leptodeira cussiliris*, conversely, originally was named as a subspecies of *L. annulata* by Duellman (1958), and thus becomes a junior synonym of *L. maculata*.

Crotalus ornatus: Anderson and Greenbaum (2012). *Herpetological Monographs* 26: 19–57. Resurrected as a distinct species from the synonymy of *C. molossus*.

Mixcoatlus browni: Jadin et al. (2011). *Zoological Journal of the Linnean Society* 163: 943–958. Resurrected as a distinct species from *M. barbouri*.

The following species have undergone status changes, including some taxa discussed in the addendum to Wilson and Johnson (2010):

Anolis beckeri: Köhler (2010). *Zootaxa* 2354: 1–18. Resurrected as a distinct species from *A. pentaprion*, which thus no longer occurs in Mexico.

Marisora brachypoda: Hedges and Conn (2012). *Zootaxa* 3288: 1–244. Generic name originated for a group of species formerly allocated to *Mabuya*.

Sphaerodactylus continentalis: McCranie and Hedges (2012). Zootaxa 3492: 65–76. Resurrection from synonymy of *S. millepunctatus*, which thus no longer occurs in Mexico.

Holcosus chaitzami, *H. festivus*, and *H. undulatus*: Harvey et al. (2012). *Zootaxa* 3459: 1–156. Generic name originated for a group of species formerly allocated to *Ameiva*.

Lampropeltis knoblochi: Burbrink et al. (2011). *Molecular and Phylogenetic Evolution*. 60: 445–454. Elevated to full species from *L. pyromelana*, which thus no longer is considered to occur in Mexico.

Leptodeira cussiliris: Mulcahy. 2007. *Biological Journal of the Linnean Society* 92: 483–500. Removed from synonymy of *L. annulata*, which thus no longer occurs in Mexico. See *Leptodeira maculata* entry above.

Leptodeira uribei: Reyes-Velasco and Mulcahy (2010). *Herpetologica* 66: 99–110. Removed from the genus *Pseudoleptodeira*.

Rhadinella godmani: Myers. 2011. *American Museum Novitates* 3715: 1–33. Species placed in new genus from *Rhadinaea*.

Rhadinella hannsteini: Myers (2011). *American Museum Novitates* 3715: 1–33. Species placed in new genus from *Rhadinaea*.

Rhadinella kanalchutchan: Myers (2011). *American Museum Novitates* 3715: 1–33. Species placed in new genus from *Rhadinaea*.

Rhadinella kinkelini: Myers (2011). *American Museum Novitates* 3715: 1–33. Species placed in new genus from *Rhadinaea*.

Barisia ciliaris. The widespread Sierra alligator lizard is endemic to Mexico, and is part of a complex that still is undergoing systematic study. Its distribution extends along the Sierra Madre Occidental from southern Chihuahua southward through western Durango and into central Jalisco, and thence into northern Guanajuato and central Querétaro and northward in the Sierra Madre Oriental to central Nuevo León. Its EVS has been calculated as 15, placing it in the lower portion of the high vulnerability category. The IUCN does not recognize this taxon at the species level, so it has to be considered as Not Evaluated. This individual is from 10.1 km WNW of La Congoja, Aguascalientes. *Photo by Louis W. Porras.*

Lampropeltis mexicana. The endemic Mexican gray-banded kingsnake is distributed from the Sierra Madre Occidental in southern Durango and the Sierra Madre Oriental in extreme southeastern Coahuila southward to northern Guanajuato. Its EVS has been gauged as 15, placing it in the lower portion of the high vulnerability category, but its IUCN status, however, was determined as of Least Concern. This individual was found at Banderas de Aguila (N of Coyotes), Durango. *Photo by Ed Cassano.*

Rhadinella lachrymans: Myers (2011). *American Museum Novitates* 3715: 1–33. Species placed in new genus from *Rhadinaea*.

Rhadinella posadasi: Myers (2011). *American Museum Novitates* 3715: 1–33. Species placed in new genus from *Rhadinaea*.

Rhadinella schistosa: Myers (2011). *American Museum Novitates* 3715: 1–33. Species placed in new genus from *Rhadinaea*.

Sonora aemula: Cox et al. (2012). *Systematics and Biodiversity* 10: 93–108. Generic name changed from *Procinura*, which thus becomes a synonym of *Sonora*.

Epictia goudotii: Adalsteinsson et al. (2009). *Zootaxa* 2244: 1–50. Species placed in a new genus from *Leptotyphlops*.

Rena boettgeri: Adalsteinsson et al. (2009). *Zootaxa* 2244: 1–50. Species placed in a new genus from Leptotyphlops.

Rena bressoni: Adalsteinsson et al. (2009). *Zootaxa* 2244: 1–50. Species placed in a new genus from *Leptotyphlops*.

Rena dissecta: Adalsteinsson et al. (2009). *Zootaxa* 2244: 1–50. Species placed in a new genus from *Leptotyphlops*.

Rena dulcis: Adalsteinsson et al. (2009). *Zootaxa* 2244: 1–50. Species placed in a new genus from *Leptotyphlops*.

Rena humilis: Adalsteinsson et al. (2009). *Zootaxa* 2244: 1–50. Species placed in a new genus from *Leptotyphlops*.

Rena maxima: Adalsteinsson et al. (2009). *Zootaxa* 2244: 1–50. Species placed in a new genus from *Leptotyphlops*.

Rena myopica: Adalsteinsson et al. (2009). *Zootaxa* 2244: 1–50. Species placed in a new genus from *Leptotyphlops*.

Mixcoatlus barbouri: Jadin et al. (2011). *Zoological Journal of the Linnean Society* 163: 943–958. New genus for species removed from *Cerrophidion*.

Mixcoatlus melanurus: Jadin et al. (2011). *Zoological Journal of the Linnean Society* 163: 943–958. New genus for species removed from *Ophryacus*.

Results of the 2005 Mexican Reptile Assessment

The 2005 Mexican Reptile Assessment "was carried out by zoologists from the non-profit conservation group NatureServe, working in partnership with reptile experts from universities, the World Conservation Union (IUCN), and Conservation International" (NatureServe Press Release; available at natureserve.org/aboutUS/PressReleases). This study dealt with "721 species of lizards and snakes found in Mexico, the United States, and Canada." Turtles and crocodilians previously were assessed. The press release indicated that, "about one in eight lizards and snakes (84 species) were found to be threatened with extinction [i.e., judged as Critically Endangered, Endangered, or Vulnerable], with another 23 species labeled Near Threatened. For 121 lizards and snakes, the data are insufficient to allow a confident estimate of their extinction risk [i.e., judged as Data Deficient], while 493 species (about two-thirds of the total) are at present relatively secure [i.e., judged as Least Concern]." Thus, the percentages of species that fall into the standard IUCN assessment categories are as follows: CR, EN, and VU (11.7); NT (3.2); DD (16.8); and LC (68.4).

Inasmuch as the above results include species that occur in the United States, Canada, and also those not evaluated in the survey, we extracted information from the IUCN Red List website on the ratings provided for Mexican species alone, and also used the "NE" designation for species not included in the 2005 assessment. We list these ratings in Appendix 1.

Critique of the 2005 Results

Our primary reason for writing this paper is to critique the results of the Mexican reptile assessment, as reported in the above press release, and to reassess the conservation status of these organisms using another conservation assessment tool. We begin our critique with the data placed in Appendix 1, which we accessed at the IUCN Red List website up until 26 May 2012. The taxa listed in this appendix are current to the present, based on the changes to the Mexican reptile fauna indicated above. The data on the IUCN ratings are summarized by family in Table 1 and discussed below.

We based our examination on the understanding that the word "critique" does not necessarily imply an unfavorable evaluation of the results of the Mexican reptile assessment, as conducted using the IUCN categories and criteria. "Critique," in the strict sense, implies neither praise nor censure, and is neutral in context. We understand, however, that the word sometimes is used in a negative sense, as noted in the 3rd edition of *The American Heritage Dictionary* (1992: 443). Nonetheless, our usage simply means to render a careful analysis of the results.

Presently, we recognize 849 species of reptiles in Mexico, including three crocodilians, 48 turtles, 413 lizards and amphisbaenians, and 385 snakes, arrayed in 42 families. This total represents an increase of 19 species (14 lizards, five snakes) over the totals listed by Wilson and Johnson (2010). The number and percentage of each of these 849 species allocated to the IUCN categories, or not evaluated, are as follows: CR = 9 (1.1%); EN = 38 (4.5%); VU = 45 (5.3%); NT = 26 (3.1%); LC = 424 (49.9%); DD = 118 (13.9%); and NE (not evaluated) = 189 (22.2%). The number and percentage of species collectively allocated to the three threat categories (CR, EN, and VU) are 92 and 10.8%, respectively. This number is exceeded by the 118 species placed in the DD category, and is slightly less than one-half of the 189 species not

Anolis dollfusianus. The coffee anole is distributed on the Pacific versant from southern Chiapas to western Guatemala. Its EVS has been determined as 13, placing it at the upper end of the medium vulnerability category, and its IUCN status is undetermined. This individual was found in cloud forest in Reserva de la Biósfera El Triunfo, Chiapas. *Photo by Elí García-Padilla.*

Table 1. IUCN Red List categorizations for the Mexican reptile families (including crocodilians, turtles, lizards, and snakes).

Families	Number of species	IUCN Red List categorizations						
		Critically Endangered	Endangered	Vulnerable	Near Threatened	Least Concern	Data Deficient	Not Evaluated
Alligatoridae	1	—	—	—	—	1	—	—
Crocodylidae	2	—	—	1	—	1	—	—
Subtotals	3	—	—	1	—	2	—	—
Cheloniidae	5	2	2	1	—	—	—	—
Chelydridae	1	—	—	1	—	—	—	—
Dermatemydidae	1	1	—	—	—	—	—	—
Dermochelyidae	1	1	—	—	—	—	—	—
Emydidae	15	—	2	4	2	2	1	4
Geoemydidae	3	—	—	—	2	—	—	1
Kinosternidae	17	—	—	—	6	6	3	2
Testudinidae	3	—	—	1	—	1	—	1
Trionychidae	2	—	—	—	—	1	—	1
Subtotals	**48**	**4**	**4**	**7**	**10**	**10**	**4**	**9**
Biporidae	3	—	—	—	—	3	—	—
Anguidae	48	—	10	4	1	17	10	6
Anniellidae	2	—	1	—	—	1	—	—
Corytophanidae	6	—	—	—	—	1	—	5
Crotaphytidae	10	—	1	1		8		
Dactyloidae	50	—	3	2	—	16	12	17
Dibamidae	1	—	—	—	—	1	—	—
Eublepharidae	7	—	—	—	—	6	—	1
Gymnophthalmidae	1	—	—	—	—	—	—	1
Helodermatidae	2	—	—	—	1	1	—	—
Iguanidae	19	1	—	2	2	3	—	11
Mabuyidae	1	—	—	—	—	—	—	1
Phrynosomatidae	135	1	5	8	6	89	6	20
Phyllodactylidae	15	—	—	—	1	10	1	3
Scincidae	23	—	—	1	—	12	5	5
Sphaerodactylidae	4	—	—	—	—	—	—	4
Sphenomorphidae	6	—	—	—	—	3	—	3
Teiidae	46	—	—	3	1	35	2	5
Xantusiidae	25	—	1	2	—	6	8	8
Xenosauridae	9	—	2	1	—	2	1	3
Subtotals	**413**	**2**	**23**	**24**	**12**	**214**	**45**	**93**
Boidae	2	—	—	—	—	1	—	1
Colubridae	136	2	3	1	3	77	18	32
Dipsadidae	115	—	3	3	—	44	38	27
Elapidae	19	—	—	1	—	13	4	1
Leptotyphlopidae	8	—	—	—	—	5	1	2
Loxocemidae	1	—	—	—	—	—	—	1
Natricidae	33	—	2	3	—	20	3	5
Typhlopidae	2	—	—	—	—	2	—	—
Ungaliophiidae	2	—	—	1	—	—	—	1
Viperidae	59	1	3	4	1	33	4	13
Xenodontidae	8	—	—	—	—	3	1	4
Subtotals	385	3	11	13	4	198	69	87
Totals	**849**	**9**	**38**	**45**	**26**	**424**	**118**	**189**

Mastigodryas cliftoni. The endemic Clifton's lizard eater is found along the Pacific versant from extreme southeastern Sonora southward to Jalisco. Its EVS has been determined as 14, placing it at the lower end of the high vulnerability category, and its IUCN status has not been assessed. This individual is from El Carrizo, Sinaloa. *Photo by Ed Cassano.*

Geophis dugesi. The endemic Dugès' earthsnake occurs from extreme southwestern Chihuahua along the length of the Sierra Madre Occidental southward to Michoacán. Its EVS has been assessed as 13, placing it at the upper end of the medium vulnerability category, and its IUCN status has been determined as of Least Concern. This individual was found at El Carrizo, Sinaloa. *Photo by Ed Cassano.*

evaluated on the website. Thus, of the total of 849 species, 307 (36.2%) are categorized either as DD or NE. As a consequence, only 542 (63.8%) of the total number are allocated to one of the other five categories (CR, EN, VU, NT, or LC).

These results provided us with a substantially incomplete picture of the conservation status of reptiles in Mexico, which sharply contrasts the picture offered for Central American reptiles (the other major portion of Mesoamerica), as recorded in Wilson et al. (2010). This situation is underscored by the relatively low species numbers of Mexican reptiles placed in any of the three IUCN threat categories. In addition, a substantial proportion (13.9%) of the Mexican species are assessed as DD, indicating that insufficient information exists for the IUCN rating system to be employed. Finally, 189 species (22.3%) are not evaluated, largely because they also occur in Central America (and in some cases, also in South America) and will be assessed presumably in future workshops, which was the case for most of these species when they were assessed in a Central American workshop held on May 6–10, 2012; as yet, the results of that assessment are not available.

Given that only 10.8% of the Mexican species were allocated to one of the three IUCN threat categories and that about six in 10 species in the country are endemic, we examined the IUCN ratings reported for species inhabiting five of the countries in Central America (see Wilson et al. 2010). For Guatemala, Acevedo et al. (2010) reported that 56 reptile species (23.0%) of a total of 244 then recognized were assigned to one of the three threat categories. Of 237 Honduran reptiles assessed by Townsend and Wilson (2010), 74 (31.2%) were placed in one of the threat categories. Sunyer and Köhler (2010) listed 165 reptile species from Nicaragua, a country with only three endemic reptiles known at the time, but judged 10 of them (6.1%) as threatened. Of 231 reptile species assessed by Sasa et al. (2010) for Costa Rica, 36 (15.6%) were placed in a threat category. Finally, Jaramillo et al. (2010) placed 22 of 248 Panamanian reptile species (8.9%) in the threat categories. Collectively, 17% of the reptile species in these countries were assessed in one of the three threat categories.

The number of species in Central America placed into one of the threat categories apparently is related to the number allocated to the DD category. Although the DD category is stated explicitly as a non-threat category (IUCN Red List Categories and Criteria 2010), its use highlights species so poorly known that one of the other IUCN categories cannot be applied. The percentage of DD species in the reptile faunas of each of the five Central American countries discussed above ranges from 0.9 in Honduras to 40.3 in Panama. Intermediate figures are as follows: Nicaragua = 1.2; Guatemala = 5.3; Costa Rica = 34.2. These data apparently indicate that the conservation status of the Costa Rican and Panamanian reptile faunas are by far more poorly understood than those of Guatemala, Honduras, and Nicaragua.

The length of time for placing these DD species into another category is unknown, but a reassessment must await targeted surveys for the species involved. Given the uncertainty implied by the use of this category supplemented by that of NE species in Mexico, we believe there is ample reason to reassess the conservation status of the Mexican reptiles using the Environmental Vulnerability Score (EVS).

EVS for Mexican Reptiles

The EVS provides several advantages for assessing the conservation status of amphibians and reptiles. First, this measure can be applied as soon as a species is described, because the information necessary for its application generally is known at that point. Second, the calculation of the EVS is an economical undertaking and does not require expensive, grant-supported workshops, such as those held in connection with the Global Reptile Assessment sponsored by the IUCN. Third, the EVS is predictive, because it provides a measure of susceptibility to anthropogenic pressure, and can pinpoint taxa in need of immediate attention and continuing scrutiny. Finally, this measure is simple to calculate and does not “penalize” species that are poorly known. One disadvantage of the EVS, however, is that it was not designed for use with marine species. So, the six species of marine turtles and two of marine snakes occurring on the shores of Mexico could not be assessed. Nevertheless, given the increasing rates of human population growth and environmental deterioration, an important consideration for a given species is to have a conservation assessment measure that can be applied simply, quickly, and economically.

We calculated the EVS for each of the 841 species of terrestrial reptiles occurring in Mexico (Wilson and Johnson 2010, and updated herein; see Appendix 1). In this appendix, we listed the scores alongside the IUCN categorizations from the 2005 Mexican Reptile Assessment, as available on the IUCN Red List website (www.iucnredlist.org) and as otherwise determined by us (i.e., as NE species).

Theoretically, the EVS can range from 3 to 20. A score of 3 is indicative of a species that ranges widely both within and outside of Mexico, occupies eight or more forest formations, and is fossorial and usually escapes human notice. Only one such species (the leptotyphlopid snake *Epictia goudotii*) is found in Mexico. At the other extreme, a score of 20 relates to a species known only from the vicinity of the type locality, occupies a single forest formation, and is exploited commercially or non-commercially for hides, meat, eggs and/or the pet trade. Also, only one such species (the trionychid turtle *Apalone atra*) occurs in Mexico. All of the other scores fall within the range of 4–19. We summarized the EVS for reptile species in Mexico by family in Table 2.

Rhadinaea laureata. The endemic crowned graceful brownsnake is distributed along the Sierra Madre Occidental from west-central Durango southward into the Tranverse Volcanic Axis as far as central Michoacán, Morelos, and the Distrito Federal. Its EVS has been calculated as 12, placing it in the upper portion of the medium vulnerability category, and its IUCN status has been determined as Least Concern. This individual is from Rancho Las Canoas, Durango. *Photo by Louis W. Porras.*

Thamnophis mendax. The endemic Tamaulipan montane gartersnake is restricted to a small range in the Sierra Madre Oriental in southwestern Tamaulipas. Its EVS has been determined as 14, placing it at the lower end of the high vulnerability category, and its IUCN status has been assessed as Endangered. This individual came from La Gloria, in the Gómez Farías region of Tamaulipas. *Photo by Ed Cassano.*

Table 2. Environmental Vulnerability Scores for the Mexican reptile species (including crocodilians, turtles, lizards, and snakes, but excluding the marine species), arranged by family. Shaded area to the left encompasses low vulnerability scores, and to the right high vulnerability scores.

Families	Number of species	Environmental Vulnerability Scores																	
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alligatoridae	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Crocodylidae	2	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—
Subtotals	3	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	—	—	—
Subtotal %	—	—	—	—	—	—	—	—	—	—	—	33.3	33.3	—	33.3	—	—	—	—
Chelydridae	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
Dermatemydidae	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
Emydidae	15	—	—	—	—	—	—	—	—	—	—	1	1	1	2	1	4	5	—
Geoemydidae	3	—	—	—	—	—	1	—	—	—	—	1	1	—	—	—	—	—	—
Kinosternidae	17	—	—	—	—	—	—	—	3	1	1	1	6	3	2	—	—	—	—
Testudinidae	3	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	1	—
Trionychidae	2	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1
Subtotals	**42**	**—**	**—**	**—**	**—**	**—**	**1**	**—**	**3**	**1**	**1**	**3**	**8**	**6**	**4**	**3**	**5**	**6**	**1**
Subtotal %	**—**	**—**	**—**	**—**	**—**	**—**	**2.4**	**—**	**7.1**	**2.4**	**2.4**	**7.1**	**19.0**	**14.3**	**9.5**	**7.1**	**11.9**	**14.3**	**2.4**
Bipedidae	3	—	—	—	—	—	—	—	—	—	1	—	2	—	—	—	—	—	—
Anguidae	48	—	—	—	1	—	—	1	2	—	1	3	6	11	7	8	8	—	—
Anniellidae	2	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—
Corytophanidae	6	—	—	—	—	1	1	1	—	2	—	1	—	—	—	—	—	—	—
Crotaphytidae	10	—	—	—	—	—	—	1	—	1	2	2	—	—	4		—	—	—
Dactyloidae	50	—	—	—	—	1	2	3	3	—	3	8	3	8	15	4	—	—	—
Dibamidae	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Eublepharidae	7	—	—	—	—	—	—	1	—	1	—	—	2	1	—	1	1	—	—
Gymnophthalmidae	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Helodermatidae	2	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—
Iguanidae	19	—	—	—	—	—	1	—	—	1	2	1	1	4	4	2	1	2	—
Mabuyidae	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Phrynosomatidae	135	—	—	1	1	2	1	3	3	11	18	22	16	23	23	11	—	—	—
Phyllodactylidae	15	—	—	—	—	—	1	—	2	—	—	1	1	4	5	1	—	—	—
Scincidae	23	—	—	—	—	—	—	—	1	4	5	2	4	4	2	1	—	—	—
Sphaerodactylidae	4	—	—	—	—	—	—	—	1	1	1	1	—	—	—	—	—	—	—
Sphenomorphidae	6	—	—	—	—	1	1	—	—	1	1	1	—	—	—	1	—	—	—
Teiidae	46	—	—	—	—	1	2	1	1	2	2	3	14	7	6	7	—	—	—
Xantusiidae	25	—	—	—	—	—	2	—	—	2	1	3	4	3	9	1	—	—	—
Xenosauridae	9	—	—	—	—	—	—	1	—	1	1	—	1	1	3	1	—	—	—
Subtotals	**413**	**—**	**—**	**1**	**3**	**6**	**11**	**13**	**14**	**28**	**39**	**49**	**54**	**67**	**78**	**38**	**10**	**2**	**—**
Subtotal %	**—**	**—**	**—**	**0.2**	**0.7**	**1.5**	**2.7**	**3.1**	**3.4**	**6.8**	**9.4**	**11.9**	**13.1**	**16.2**	**18.9**	**9.2**	**2.4**	**0.5**	**—**
Boidae	2	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—

Table 2. Continued.

Colubridae	136	—	—	4	7	3	6	10	15	8	8	18	22	14	16	5	—	—	—
Dipsadidae	115	—	1	3	3	3	8	4	7	6	13	14	13	19	15	6	—	—	—
Elapidae	17	—	—	—	—	—	2	—	—	2	—	2	2	3	—	2	3	1	—
Leptotyphlopidae	8	1	—	—	—	—	1	—	—	2	—	2	2	—	—	—	—	—	—
Loxocemidae	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Natricidae	33	—	—	—	—	3	1	—	2	2	2	3	6	7	4	2	1	—	—
Typhlopidae	2	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—
Ungaliophiidae	2	—	—	—	—	—	—	—	1	—	—	—	—	1	—	—	—	—	—
Viperidae	59	—	—	—	—	—	1	2	1	3	7	5	6	6	9	8	5	6	—
Xenodontidae	8	—	—	—	—	—	—	1	1	1	—	3	1	—	—	1	—	—	—
Subtotals	**383**	**1**	**1**	**7**	**10**	**9**	**19**	**17**	**30**	**25**	**31**	**47**	**52**	**50**	**44**	**24**	**9**	**7**	**—**
Subtotal %	**—**	**0.3**	**0.3**	**1.8**	**2.6**	**2.3**	**5.0**	**4.4**	**7.8**	**6.5**	**8.1**	**12.3**	**13.6**	**13.1**	**11.5**	**6.3**	**2.3**	**1.8**	**—**
Totals	**841**	**1**	**1**	**8**	**13**	**15**	**31**	**30**	**47**	**54**	**71**	**100**	**115**	**123**	**127**	**65**	**24**	**15**	**1**
Total %	**—**	**0.1**	**0.1**	**1.0**	**1.5**	**1.8**	**3.7**	**3.6**	**5.6**	**6.4**	**8.4**	**11.9**	**13.7**	**14.6**	**15.1**	**7.7**	**2.9**	**1.8**	**0.1**

The range and average EVS for the major reptile groups are as follows: crocodilians = 13–16 (14.3); turtles = 8–20 (15.3); lizards = 5–19 (13.8); and snakes = 3–19 (12.8). On average, turtles are most susceptible and snakes least susceptible to environmental degradation, with lizards and crocodilians falling in between. The average scores either are at the upper end of the medium category, in the case of snakes and lizards, or at the lower end of the high category, in the case of crocodilians and turtles. The average EVS for all the reptile species is 13.4, a value close to the lower end of the high range of vulnerability.

Nineteen percent of the turtle species were assigned an EVS of 14, at the lower end of the high vulnerability category. For lizards, the respective figures are 18.9% and 16, about midway through the range for the high vulnerability category; for snakes, the values are 13.6% and 14.

The total EVS values generally increase from the low end of the scale (3) to about midway through the high end (16), with a single exception (a decrease from 31 to 29 species at scores 8 and 9), then decrease thereafter to the highest score (20). The peak number of taxa (127) was assigned an EVS of 16, a score that falls well within the range of high vulnerability.

Of the 841 total taxa that could be scored, 99 (11.8%) fall into the low vulnerability category, 272 (32.3%) in the medium category, and 470 (55.9%) in the high category. Thus, more than one-half of the reptile species in Mexico were judged as having the highest degree of vulnerability to environmental degradation, and slightly more than one-tenth of the species the lowest degree.

This increase in absolute and relative numbers from the low portion, through the medium portion, to the high portion varies somewhat with the results published for both the amphibians and reptiles for some Central American countries (see Wilson et al. 2010). Acevedo et al. (2010) reported 89 species (23.2%) with low scores, 179 (46.7%) with medium scores, and 115 (30.0%) with high scores for Guatemala. The same trend is seen in Honduras, where Townsend and Wilson (2010) indicated the following absolute and relative figures in the same order, again for both amphibians and reptiles: 71 (19.7%); 169 (46.8%); and 121 (33.5%). Comparable figures for the Panamanian herpetofauna (Jaramillo et al. 2010) are: 143 (33.3%); 165 (38.4%); and 122 (28.4%).

The principal reason that EVS values are relatively high in Mexico is because of the high level of endemism and the relatively narrow range of habitat occurrence. Of the 485 endemic species in Mexico (18 turtles, 264 lizards, 203 snakes), 124 (25.6%) were assigned a geographic distribution score of 6, signifying that these creatures are known only from the vicinity of their respective type localities; the remainder of the endemic species (361 [74.4%]) are more broadly distributed within the country (Appendix 1). Of the 841 terrestrial Mexican reptile species, 212 (25.2%) are limited in ecological distribution to one formation (Appendix 1). These features of geographic and ecological distribution are of tremendous significance for efforts at conserving the immensely important Mexican reptile fauna.

Comparison of IUCN Categorizations and EVS Values

Since the IUCN categorizations and EVS values both measure the degree of environmental threat impinging on a given species, a certain degree of correlation between the results of these two measures is expected. Townsend and Wilson (2010) demonstrated this relationship with reference to the Honduran herpetofauna, by comparing the IUCN and EVS values for 362 species of amphibians and terrestrial reptiles in their table 4. Perusal of the data in this table indicates, in a general way, that an increase in

Crotalus catalinensis. The endemic Catalina Island rattlesnake is restricted in distribution to Santa Catalina Island in the Gulf of California. Its EVS has been determined as 19, placing it in the upper portion of the high vulnerability category, and its IUCN status as Critically Endangered. *Photo by Louis W. Porras.*

Crotalus stejnegeri. The endemic Sinaloan long-tailed rattlesnake is restricted to a relatively small range in western Mexico, where it is found in the western portion of the Sierra Madre Occidental in western Durango and southeastern Sinaloa. Its EVS has been determined as 17, placing it in the middle of the high vulnerability category, and its IUCN status as Vulnerable. This individual came from Plomosas, Sinaloa. *Photo by Louis W. Porras.*

Table 3. Comparison of the Environmental Vulnerability Scores (EVS) and IUCN categorizations for terrestrial Mexican reptiles. Shaded area on top encompasses the low vulnerability category scores, and at the bottom high vulnerability category scores.

EVS	IUCN categories							Totals
	Critically Endangered	Endangered	Vulnerable	Near Threatened	Least Concern	Data Deficient	Not Evaluated	
3	—	—	—	—	—	—	1	1
4	—	—	—	—	1	—	—	1
5	—	—	—	—	3	—	5	8
6	—	—	—	—	5	—	8	13
7	—	—	—	—	5	—	10	15
8	—	—	—	—	20	—	11	31
9	—	—	1	—	16	—	13	30
10	—	—	—	—	25	1	21	47
11	—	—	1	1	36	2	14	54
12	—	1	1	—	49	4	16	71
13	—	2	5	3	66	5	19	100
14	—	5	6	8	65	15	16	115
15	—	13	11	7	54	25	13	123
16	—	8	3	6	48	38	24	127
17	4	3	11	1	21	14	11	65
18	—	2	2	—	4	12	4	24
19	2	2	3	—	4	2	2	15
20	—	—	—	—	—	—	1	1
Totals	**6**	**36**	**44**	**26**	**422**	**118**	**189**	**841**

EVS values is associated with a corresponding increase in the degree of threat, as measured by the IUCN categorizations. If average EVS values are determined for the IUCN categories in ascending degrees of threat, the following figures result: LC (206 spp.) = 10.5; NT (16 spp.) = 12.9; VU (18 spp.) = 12.5; EN (64 spp.) = 14.1; CR (50 spp.) = 15.1; and EX (2 spp.) = 16.0. The broad correspondence between the two measures is evident. Also of interest is that the average EVS score for the six DD species listed in the table is 13.7, a figure closest to that for the EN category (14.1), which suggests that if and when these species are better known, they likely will be judged as EN or CR.

In order to assess whether such a correspondence exists between these two conservation measures for the Mexican reptiles, we constructed a table (Table 3) similar to table 4 in Townsend and Wilson (2010). Important similarities and differences exist between these tables. The most important similarity is in general appearance, i.e., an apparent general trend of decreasing EVS values with a decrease in the degree of threat, as indicated by the IUCN categorizations. This similarity, however, is more apparent than real. Our Table 3 deals only with Mexican reptiles, excludes the IUCN category EX (because presently this category does not apply to any Mexican species), and includes a NE category that we appended to the standard set of IUCN categories. Apart from these obvious differences, however, a closer examination of the data distribution in our Table 3 reveals more significant differences in the overall picture of the conservation status of the Mexican reptiles when using the IUCN categorizations, as opposed to the EVS, especially when viewed against the backdrop of results in Townsend and Wilson (2010: table 4).

1. Nature of the IUCN categorizations in Table 3

Unlike the Townsend and Wilson (2010) study, we introduced another category to encompass the Mexican reptile species that were not evaluated in the 2005 IUCN study. The category is termed "Not Evaluated" (IUCN 2010) and a large proportion of the species (189 of 841 Mexican terrestrial reptiles [22.5%]) are placed in this category. Thus, in the 2005 study more than one-fifth of the species were not placed in one of the standard IUCN categories, leaving their conservation status as undetermined. In addition, a sizable proportion of species (118 [14.0%]) were placed in the DD category, meaning their conservation status also remains undetermined. When the species falling into these two categories are added, evidently 307 (36.5%) of the 841 Mexican terrestrial reptiles were not placed in one of the IUCN threat assessment categories in the 2005 study. This situation leaves less than two-thirds of the species as evaluated.

Xantusia sanchezi. The endemic Sanchez's night lizard is known only from extreme southwestern Zacatecas to central Jalisco. This lizard's EVS has been assessed as 16, placing it in the middle of the high vulnerability category, but its IUCN status has been determined as Least Concern. This individual was discovered at Huaxtla, Jalisco. *Photo by Daniel Cruz-Sáenz.*

2. Pattern of mean EVS vs. IUCN categorizations

In order to more precisely determine the relationship between the IUCN categorizations and the EVS, we calculated the mean EVS for each of the IUCN columns in Table 3, including the NE species and the total species. The results are as follows: CR (6 spp.) = 17.7 (range 17–19); EN (36 spp.) = 15.4 (12–19); VU (44 spp.) = 15.3 (10–19); NT (26 spp.) = 14.6 (11–17); LC (422 spp.) = 13.0 (4–19); DD (118 spp.) = 15.5 (10–19); and NE (189 spp.) = 12.0 (3–20); and Total (841 spp.) = 13.3 (3–20). The results of these data show that the mean EVS decreases from the CR category (17.7) through the EN category (15.4) to the VU category (15.3), but only slightly between the EN and VU categories. They also continue to decrease from the NT category (14.6) to the LC category (13.0). This pattern of decreasing values was expected. In addition, as with the Townsend and Wilson (2010) Honduran study, the mean value for the DD species (15.5) is closest to that for the EN species (15.4). To us, this indicates what we generally have suspected about the DD category, i.e., that the species placed in this category likely will fall either into the EN or the CR categories when (and if) their conservation status is better understood. Placing species in this category is of little benefit to determining their conservation status, however, since once sequestered with this designation their significance tends to be downplayed. This situation prevailed once the results of the 2005 assessment were reported, given that the 118 species evaluated as DD were ignored in favor of the glowing report that emerged in the NatureServe press release (see above). If the data in Table 3 for the DD species is conflated with that for the 86 species placed in one of the three threat categories, the range of EVS values represented remains the same as for the threat categories alone, i.e., 10–19, and the mean becomes 15.5; the same as that indicated above for the DD species alone and only one-tenth of a point from the mean score for EN species (15.4). On the basis of this analysis, we predict that if a concerted effort to locate and assess the 118 DD species were undertaken, that most or all of them would be shown to qualify for inclusion in one of the three IUCN threat categories. If that result were obtained, then the number of Mexican reptile species falling into the IUCN threat categories would increase from 86 to 204, which would represent 24.3% of the reptile fauna.

Based on the range and mean of the EVS values, the pattern for the LC species appears similar to that of the NE species, as the ranges are 4–19 and 3–20 and the means are 13.0 and 12.0, respectively. If these score distributions are conflated, then the EVS range becomes the broadest possible (3–20) and the mean becomes 12.7, which lies close to the upper end of the medium vulnerability category. While we cannot predict what would happen to the NE species once they are evaluated (presumably most species were evaluated during the Central American reptile assessment of May, 2012), because they were evaluated mostly by a different group of herpetologists from those present at the 2005 Mexican assessment, we suspect that many (if not most) would be judged as LC species. A more discerning look at both the LC and NE species might demonstrate that many should be partitioned into other IUCN categories, rather than the LC. Our reasoning is that LC and NE species exhibit a range of EVS values that extend broadly across low, medium, and high categories of environmental vulnerability. The number and percentage of LC species that fall into these three EVS categories are as follows: Low (range 3–9) = 50 spp. (11.8%); Medium (10–13) = 176 (41.7); and High (14–20) = 196 (46.5). For the NE species, the following figures were obtained: Low = 48 (25.8); Medium = 68 (36.6); and High = 70 (37.6). The percentage values are reasonably similar to one another, certainly increasing in the same direction from low through medium to high.

Considering the total number of species, 99 (11.8%) fall into the low vulnerability category, 272 (32.3%) into the medium vulnerability category, and 470 (55.9%) into the high vulnerability category. These results differ significantly from those from the 2005 study. If the three IUCN threat categories can be considered most comparable to the high vulnerability EVS category, then 86 species fall into these three threat categories, which is 16.1% of the total 534 species in the CR, EN, VU, NT, and LC categories. If the NT category can be compared with the medium vulnerability EVS category, then 26 species fall into this IUCN category (4.9% of the 534 species). Finally, if the LC category is comparable to the low vulnerability EVS category, then 422 species (79.0%) fall into this IUCN category. Clearly, the results of the EVS analysis are nearly the reverse of those obtained from the IUCN categorizations discussed above.

Discussion

In the Introduction we indicated that our interest in conducting this study began after the publication of Wilson et al. (2010), when we compared the data resulting from that publication with a summary of the results of a 2005 Mexican reptile assessment conducted under the auspices of the IUCN, and later referenced in a 2007 press release by NatureServe, a supporter of the undertaking. Our intention was not to critique the IUCN system of conservation assessment (i.e., the well-known IUCN categorizations), but rather to critique the results of the 2005 assessment. We based our critique on the use of the Environmental Vulnerability Score (EVS), a measure used by Wilson and McCranie (2004) and in several Central American chapters in Wilson et al. (2010).

Since the IUCN assessment system uses a different set of criteria than the EVS measure, we hypothesized that the latter could be used to test the results of the former. On this basis, we reassessed the conservation status of the reptiles of Mexico, including, by our definition of convenience, crocodilians, turtles, lizards, and snakes, by determining the EVS value for each terrestrial species (since the measure was not designed for use with marine species). Based on our updating of the species list in Wilson and Johnson (2010), our species list for this study consisted of 841 species. We then developed an EVS measure applicable to Mexico, and employed it to calculate the scores indicated in Appendix 1.

Our analysis of the EVS values demonstrated that when the scores are arranged in low, medium, and high vulnerability categories, the number and percentage of species increases markedly from the low category, through the medium category, to the high category (Table 2). When these scores (Table 3) are compared to the IUCN categorizations documented in Table 1, however, an inverse correlation essentially exists between the results obtained from using the two methods. Since both methods are designed to render conservation status assessments, the results would be expected to corroborate one another.

We are not in a position to speculate on the reason(s) for this lack of accord, and simply are offering a reassessment of the conservation status of Mexico's reptile species based on another measure (EVS) that has been used in a series of studies since it was introduced by Wilson and McCranie (1992), and later employed by McCranie and Wilson (2002), Wilson and McCranie (2004), and several chapters in Wilson et al. (2010). Nonetheless, we believe our results provide a significantly better assessment of the conservation status Mexico's reptiles than those obtained in the 2005 IUCN assessment. We consider our results more consonant with the high degree of reptile endemism in the country, and the restricted geographic and ecological ranges of a sizable proportion of these species. We also believe that our measure is more predictive, and reflective of impact expected from continued habitat fragmentation and destruction in the face of continuing and unregulated human population growth.

Conclusions and Recommendations

Our conclusions and conservation recommendations draw substantially from those promulgated by Wilson and Townsend (2010), which were provided for the entire Mesoamerican herpetofauna; thus, we refined them specifically for the Mexican reptile fauna, as follows:

1. In the introduction we noted the human population size and density expected for Mexico in half a century, and no indication is available to suggest that this trend will be ameliorated. Nonetheless, although 66% of married women in Mexico (ages 15–49) use modern methods of contraception, the current fertility rate (2.3) remains above the replacement level (2.0) and 29% of the population is below the age of 15, 1% above the average for Latin America and the Caribbean (2011 PRB World Population Data Sheet).

2. Human population growth is not attuned purposefully to resource availability, and the rate of regeneration depends on the interaction of such societal factors as the level of urbanization; in Mexico, the current level is 78%, and much of it centered in the Distrito Federal (2011 PRB World Population Data Sheet). This statistic is comparable to that of the United States (79%) and Canada (80%), and indicates that 22% of Mexico's population lives in rural areas. Given that the level of imports and exports are about equal (in 2011, imports = 350.8 billion US dollars, exports = 349.7 billion; CIA World Factbook 2012), the urban population depends on the basic foodstuffs that the rural population produces. An increase in human population demands greater agricultural production and/or efficiency, as well as a greater conversion of wild lands to farmlands. This scenario leads to habitat loss and degradation, and signals an increase in biodiversity decline.

3. Although the rate of conversion of natural habitats to agricultural and urban lands varies based on the methods and assumptions used for garnering this determination, most estimates generally are in agreement. The Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT; Secretariat of Environment and Natural Resources; semarnat.gob.mx) has attempted to measure the rate of deforestation from 1978 to 2005, with estimates ranging from about 200,000 to 1,500,000 ha/yr. Most estimates, however, range from about 200,000 to 400,000 ha/yr. A study conducted for the years 2000 to 2005 reported an average rate of 260,000 ha/yr. Another source of information (www.rainforests.mongabay.com) reports that from 1990 to 2010 Mexico lost an average of 274,450 ha (0.39% of the total 64,802,000 ha of forest in the country), and during that period lost 7.8% of its forest cover (ca. 5,489,000 ha). No matter the precise figures for forest loss, this alarming situation signifies considerable endangerment for organismic populations, including those of reptiles. About one-third of Mexico is (or was) covered by forest, and assuming a constant rate of loss all forests would be lost in about 256 years (starting from 1990), or in the year 2246. Forest loss in Mexico, therefore, contributes significantly to the global problem of deforestation.

4. As a consequence, no permanent solution to the problem of biodiversity decline (including herpetofaunal decline) will be found in Mexico (or elsewhere in the world) until humans recognize overpopulation as the major cause of degradation and loss of humankind's fellow organisms. Although this problem is beyond the scope of this investigation, solutions will not be

available until humanity begins to realize the origin, nature, and consequences of the mismatch between human worldviews and how our planet functions. Wilson (1988) labeled this problem "the mismanagement of the human mind." Unfortunately, such realignment is only envisioned by a small cadre of humans, so crafting provisional solutions to problems like biodiversity decline must proceed while realizing the ultimate solution is not available, and might never be.

5. Mexico is the headquarters of herpetofaunal diversity and endemism in Mesoamerica, which supports the conclusions of Ochoa-Ochoa and Flores-Villela (2006), Wilson and Johnson (2010), and the authors of four chapters on the Mexican herpetofauna in Wilson et al. (2010). Furthermore, field research and systematic inquiry in Mexico will continue to augment the levels of diversity and endemicity, which are of immense conservation significance because reptiles are significant contributors to the proper functioning of terrestrial and aquatic ecosystems (Gibbons et al. 2000). From a political and economic perspective, diversity and endemism are important components of Mexico's patrimony, as well as a potential source of income from ecotourism and related activities. Investing in such income sources should appeal to local stakeholders, as it provides an incentive for preserving natural habitats (Wilson 2011).

6. Given that the ultimate solutions to biodiversity decline are unlikely to be implemented in any pertinent time frame, less effective solutions must be found. Vitt and Caldwell (2009) discussed a suite of approaches for preserving and managing threatened species, including the use of reserves and corridors to save habitats, undertaking captive management initiatives, and intentionally releasing individuals to establish or enlarge populations of target species. Unquestionably, preserving critical habitat is the most effective and least costly means of attempting to rescue threatened species. Captive management is less effective, and has been described as a last-ditch effort to extract a given species from the extinction vortex (Campbell et al. 2006). Efforts currently are underway in segments of the herpetological community to develop programs for ex situ and in situ captive management of some of the most seriously threatened herpetofaunal species, but such efforts will succeed only if these species can be reproduced in captivity and reintroduced into their native habitats. In the case of Mexico, Ochoa-Ochoa, et al. (2011: 2710) commented that, "given the current speed of land use change, we cannot expect to save all species from extinction, and so must decide how to focus limited resources to prevent the greatest number of extinctions," and for amphibians proposed "a simple conservation triage method that: evaluates the threat status for 145 micro-endemic Mexican amphibian species; assesses current potential threat abatement responses derived from existing policy instruments and social initiatives; and combines both indicators to provide broad-scale conservation strategies that would best suit amphibian micro-endemic buffered areas (AMBAs) in Mexico." These authors concluded, however, that a quarter of the micro-endemic amphibians "urgently need field-based verification to confirm their persistence due to the small percentage of remnant natural vegetation within the AMBAs, before we may sensibly recommend" a conservation strategy. Their tool also should apply to Mexican reptiles, and likely would produce similar results.

7. The preferred method for preserving threatened species is to protect habitats by establishing protected areas, both in the public and private sectors. Habitat protection allows for a nearly incalculable array of relationships among organisms. Like most countries in the world, Mexico, has developed a governmentally established system of protected areas. Fortunately, studies have identified "critical conservation zones" (Ceballos et al. 2009), as well as gaps in their coverage (Koleff et al. 2009). The five reserves of greatest conservation importance for reptiles are the Los Tuxtlas Biosphere Reserve, the islands of the Gulf of California in the UNESCO World Heritage Site, the Sierra Gorda Biosphere Reserve, the Tehuacán-Cuicatlán Biosphere Reserve, and the Chamela-Cuixmala Biosphere Reserve. Significantly, all of these areas are part of the UNESCO World Network of Biosphere Reserves, but attainment of this status does not guarantee that these reserves will remain free from anthropogenic damage. Ceballos et al. (2009, citing Dirzo and García 1992) indicated that although the Los Tuxtlas is the most important reserve in Mexico for amphibians and reptiles, a large part of its natural vegetation has been lost. This example of deforestation is only one of many, but led Ceballos et al. (2009: 597) to conclude (our translation of the original Spanish) that, "The determination of high risk critical zones has diverse implications for conservation in Mexico. The distribution of critical zones in the entire country confirms the problem of the loss of biological diversity is severe at the present time, and everything indicates it will become yet more serious in future decades. On the other hand, the precise identification of these zones is a useful tool to guide political decisions concerning development and conservation in the country, and to maximize the effects of conservation action. Clearly, a fundamental linchpin for the national conservation strategy is to direct resources and efforts to protect the high-risk critical zones. Finally, it also is evident that tools for management of production and development, such as the land-use planning and environmental impact, should be reinforced in order to

fully comply with their function to reconcile development and conservation." We fully support this recommendation.

8. Humans have developed an amazing propensity for living in an unsustainable world. Organisms only can persist on Earth when they live within their environmental limiting factors, and their strategy is sustainability, i.e., in human terms, living over the long term within one's means, a process made allowable by organic evolution. *Homo sapiens* is the only extant species with the capacity for devising another means for securing its place on the planet, i.e., a strategy of unsustainability over the short term, which eventually is calculated to fail. Conservation biology exists because humans have devised this unworkable living strategy. What success it will have in curbing biodiversity loss remains to be seen.

Acknowledgments.—We are grateful to the following individuals for improving the quality of this contribution: Irene Goyenechea, Pablo Lavín-Murcio, Julio Lemos-Espinal, and Aurelio Ramírez-Bautista. We are especially thankful to Louis W. Porras, who applied his remarkable editorial skills to our work.

Literature Cited

Acevedo M, Wilson LD, Cano EB, Vásquez-Almazán C. 2010. Diversity and conservation status of the Guatemalan herpetofauna. Pp. 406–435 In: *Conservation of Mesoamerican Amphibians and Reptiles*. Editors, Wilson LD, Townsend JH, Johnson JD. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, USA.

Adalsteinsson SA, Branch WR, Trapé S, Vitt LJ, Hedges SB. 2009. Molecular phylogeny, classification, and biogeography of snakes of the family Leptotyphlopidae (Reptilia, Squamata). *Zootaxa* 2244: 1–50.

American Heritage Dictionary (3rd edition). 1993. Houghton Mifflin Company, Boston, Massachusetts, USA.

Anderson CG, Greenbaum E. 2012. Phylogeography of northern populations of the black-tailed rattlesnake (*Crotalus molossus* Baird and Girard, 1853), with the revalidation of *C. ornatus* Hallowell, 1854. *Herpetological Monographs* 26: 19–57.

Beattie A., Ehrlich PR. 2004. *Wild Solutions: How Biodiversity is Money in the Bank* (2nd edition). Yale University Press, New Haven, Connecticut, USA.

Bhullar, B-AS. 2011. The power and utility of morphological characters in systematics: a fully resolved phylogeny of *Xenosaurus* and its fossil relatives (Squamata: *Anguimorpha*). *Bulletin of the Museum of Comparative Zoology* 160: 65–181.

Blair C, Méndez de la Cruz FR, Ngo A, Lindell J, Lathrop A, Robert WM. 2009. Molecular phylogenetics and taxonomy of leaf-toed geckos (Phyllodactylidae: *Phyllodactylus*) inhabiting the peninsula of Baja California. *Zootaxa* 2027: 28–42.

Blaustein AR, Wake DB. 1990. Declining amphibian populations: A global phenomenon? *Trends in Ecology and Evolution* 5: 203–204.

Bryson Jr. RW, Graham MR. 2010. A new alligator lizard from northeastern Mexico. *Herpetologica* 66: 92–98.

Burbrink FT, Yao H, Ingrasci M, Bryson Jr RW, Guiher TJ, Ruane S. 2011. Speciation at the Mogollon Rim in the Arizona mountain kingsnake (*Lampropeltis pyromelana*). *Molecular and Phylogenetic Evolution* 60: 445–454.

Campbell NA, Reese JB, Taylor MR, Simon EJ. 2006. *Biology: Concepts and Connections* (5th edition). Pearson Benjamin Cummings, New York, New York, USA.

Canseco-Márquez L, Gutiérrez-Mayen G, Mendoza-Hernández AA. 2008. A new species of night-lizard of the genus *Lepidophyma* (Squamata: Xantusiidae) from the Cuicatlán Valley, Oaxaca, México. *Zootaxa* 1750: 59–67.

Ceballos G, Díaz Pardo E, Espinosa H, Flores-Villela O, García A, Martínez L, Martínez Meyer E, Navarro A, Ochoa L, Salazar I, Santos Barrera G. 2009. Zonas críticas y de alto riesgo para la conservación de la biodiversidad de México. Pp. 575–600 In: *Capital natural de México* (Volume II). Estado de conservación y tendencias de cambio. CONABIO, México, DF, Mexico.

Central Intelligence Agency. 2012. *The World Factbook*. United States Government Printing Office, Washington, DC, USA.

Chiras DD. 2009. *Environmental Science* (8th edition). Jones and Bartlett Publishers, Burlington, Massachusetts, USA.

Conservation International. 2004. Amphibians in dramatic decline; study finds nearly one-third of species threatened with extinction. *ScienceDaily*. Available: www.sciencedaily.com/releases/2004/10/041015103700.htm [Accessed: 21 May 2012].

Cox CL, Dadis Rabosky AR, Reyes-Velasco J, Ponce-Campos P, Smith EN, Flores-Villela O, Campbell JA. 2012. Molecular systematics of the genus *Sonora* (Squamata: Colubridae) in central and western Mexico. *Systematics and Biodiversity* 10: 93–108.

Daza JM, Smith EN, Páez VP, Parkinson CL. 2009. Complex evolution in the Neotropics: The origin and diversification of the widespread genus *Leptodeira* (Serpentes: Colubridae). *Molecular Phylogenetics and Evolution* 53: 653–667.

Dirzo R, García MC. 1992. Rates of deforestation in Los Tuxtlas, a Neotropical area in southeast Mexico. *Conservation Biology* 6: 84–90.

Duellman WE. 1958. A monographic study of the colubrid snake genus *Leptodeira*. *Bulletin of the American Museum of Natural History* 114: 1–152.

Feria-Ortiz MN, Manríques-Morán NL, Nieto-Montes de Oca A. 2011. Species limits based on mtDNA and morphological data in the polytypic species *Pleistodon brevirostris* (Squamata: Scincidae). *Herpetological Monographs* 25: 25–51.

Feria-Ortiz M, García-Vázquez. 2012. A new species of *Plestiodon* (Squamata: Scincidae) from Sierra Madre del Sur of Guerrero, México. *Zootaxa* 3339: 57–68.

Flores-Villela O, Smith EN. 2009. A new species of *Coniophanes* (Squamata: Colubridae), from the coast of Michoacán, Mexico. *Herpetologica* 65: 404–412.

García-Vásquez UO, Canseco-Márquez L, Aguilar-López JL. 2010. A new species of night lizard of the genus *Lepidophyma* (Squamata: Xantusiidae) from southern Puebla, México. *Zootaxa* 2657: 47–54.

García-Vásquez UO, Canseco-Márquez L, Nieto-Montes de Oca A. 2010. A new species of *Scincella* (Squamata: Scincidae) from the Cuatra Ciénegas Basin, Coahuila, Mexico. *Copeia* 2010: 373–381.

Gibbons, JW, Scott DE, Ryan TJ, Buhlmann KA, Tuberville TD, Metts BS, Greene JL, Mills T, Leiden Y, Poppy S, Winne CT. 2000. The global decline of reptiles, déja vu amphibians. *BioScience* 50: 653–666.

Hallowell E. 1861 (1860). Report upon the Reptilia of the North Pacific Exploring Expedition, under command of Capt. John Rogers [sic], U.S.N. *Proceedings of the Academy of Natural Sciences of Philadelphia* 12: 480–510.

Harvey, MB, Ugueto GN, Gutberlet Jr. RL. 2012. Review of teiid morphology with a revised taxonomy and phylogeny of the Teiidae (*Lepidosauria*: Squamata). *Zootaxa* 3459: 1–156.

Hedges SB, Conn CE. 2012. A new skink fauna from Caribbean islands (Squamata, Mabuyidae, Mabuyinae). *Zootaxa* 3288: 1–244.

IUCN Red List Categories and Criteria. 2010. Available: www.iucnredlist.org [Accessed: 22 July 2011].

Jadin R, Smith EN, Campbell JA. 2011. Unravelling a tangle of Mexican serpents: A systematic revision of highland pitvipers. *Zoological Journal of the Linnean Society* 163: 943–958.

Jaramillo C, Wilson LD, Ibáñez R, Jaramillo F. 2010. The herpetofauna of Panama: Distribution and conservation status. Pp. 604–673 In: *Conservation of Mesoamerican Amphibians and Reptiles*. Editors, Wilson LD, Townsend JH, Johnson JD. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, USA.

Johnson JD. 2009. Prologue. Pp. *xvii–xx* In: *Herpetofauna del Valle de Mexico: Diversidad y conservación*. Ramírez-Bautista A, Hernández-Salinas U, García-Vázquez UO, Leyte-Manrique A, Canseco-Márquez L. Universidad Autónoma del Estado de Hidalgo, CONABIO, Tlalpan, México, DF, Mexico.

Köhler G. 2010. A revision of the Central American species related to *Anolis pentaprion* with the resurrection of *A. beckeri* and the description of a new species (Squamata: Polychrotidae). *Zootaxa* 2354: 1–18.

Köhler G, Vesely M. 2010. A revision of the *Anolis sericeus* complex with the resurrection of *A. wellbornae* and the description of a new species (Squamata: Polychrotidae). *Herpetologica* 66: 186–207.

Koleff P, Tambutti M, March IJ, Esquivel R, Cantú C, Lira-Noriega A et al. 2009. Identificación de prioridades y análisis de vacíos y omisiones en la conservación de la biodiversidad de México. Pp. 651–718 In: *Capital Natural de México* (Volume II). Estado de conservación y tendencias de cambio. CONABIO, México, DF, Mexico.

Leaché AD, Mulcahy DG. 2007. Phylogeny, divergence times and species limits of spiny lizards (*Sceloporus magister* species group) in western North American deserts and Baja California. *Molecular Ecology* 16: 5216–5233.

Lemos-Espinal JA, Chiszar D, Smith HM, Woolrich-Piña G. 2004. Selected records of 2003 lizards from Chihuahua and Sonora, Mexico. *Bulletin of the Chicago Herpetological Society* 39: 164–168.

McCranie JR, Hedges SB. 2012. Two new species of geckos from Honduras and resurrection of *Sphaerodactylus continentalis* Werner from the synonymy of *Sphaerodactylus millepunctatus* Hallowell (Reptilia, Squamata, Gekkonoidea, Sphaerodactylidae). *Zootaxa* 3492: 65–76.

McCranie JR, Wilson LD. 2002. *The Amphibians of Honduras*. Society for the Study of Amphibians and Reptiles, Contributions in Herpetology, Number 19. Ithaca, New York, USA.

Mulcahy DG. 2007. Molecular systematics of Neotropical cat-eyed snakes: A test of the monophyly of *Leptodeirini* (Colubridae: Dipsadinae) with implications for character evolution and biogeography. *Biological Journal of the Linnean Society* 92: 483–500.

Murphy RW, Berry KH, Edwards T, Leviton AE, Lathrop A, Riedle JD. 2011. The dazed and confused identity of Agassiz's land tortoise, *Gopherus agassizii* (Testudines, Testudinidae) with the description of a new species, and its consequences for conservation. *ZooKeys* 113: 39–71.

Myers CW. 2011. A new genus and new tribe for *Enicognathus melanauchen* Jan, 1863, a neglected South American snake (Colubridae, Xenodontinae), with taxonomic notes on some Dipsadinae. *American Museum Novitates* 3715: 1–33.

NatureServe Press Release. 2007. New assessment of North American reptiles finds rare good news. Available: www.natureserve.org [Accessed: 21 May 2012].

Ochoa-Ochoa LM, Bezaury-Creel JE, Vázquez L-B, Flores-Villela O. 2011. Choosing the survivors? A GIS-based triage support tool for micro-endemics: application to data for Mexican amphibians. *Biological Conservation* 144: 2710–2718.

Ochoa-Ochoa LM, Flores-Villela OA. 2006. *Áreas de*

Diversidad y Endemismo de la Herpetofauna Mexicana. Universidad Nacional Autónoma de México-Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México, DF, Mexico.

Pavón-Vázquez CJ, García-Vázquez UO, Blancas-Hernández JC, Nieto-Montes A. 2011. A new species of the *Geophis sieboldi* group (Squamata: Colubridae) exhibiting color pattern polymorphism from Guerrero, Mexico. *Herpetologica* 67: 332–343.

Population Reference Bureau. 2011. World Population Data Sheet. Available: www.prb.org [Accessed: 27 January 2012].

Pyron RA, Burbrink FT. 2009. Systematics of the common kingsnake (*Lampropeltis getula*; Serpentes: Colubridae) and the burden of heritage in taxonomy. *Zootaxa* 2241: 22–32.

Raven PH, Hassenzahl DM, Berg LR. 2009. *Environment* (8th edition). John Wiley & Sons, Inc. Hoboken, New Jersey, USA.

Reyes-Velasco J, Mulcahy DG. 2010. Additional taxonomic remarks on the genus *Pseudoleptodeira* (Serpentes: Colubridae) and the phylogenetic placement of "*P. uribei*." *Herpetologica* 66: 99–110.

Sasa M, Chaves G, Porras LW. 2010. The Costa Rican herpetofauna: conservation status and future perspectives. Pp. 510–603 In: *Conservation of Mesoamerican Amphibians and Reptiles*. Editors, Wilson LD, Townsend JH, Johnson JD. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, USA.

Stuart SN, Chanson JS, Cox NA, Young BE, Rodrigues ASL, Fischman DL, Waller RW. 2004. Status and trends of amphibian declines and extinctions worldwide. *Science* 306(5702): 1783–1786.

Stuart SN, Chanson JS, Cox NA, Young BE. 2010. The global decline of amphibians: Current trends and future prospects. Pp. 2–15 In: *Conservation of Mesoamerican Amphibians and Reptiles*. Editors, Wilson LD, Townsend JH, Johnson JD. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, USA.

Sunyer J, Köhler G. 2010. Conservation status of the herpetofauna of Nicaragua. Pp. 488–509 In: *Conservation of Mesoamerican Amphibians and Reptiles*. Editors, Wilson LD, Townsend JH, Johnson JD. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, USA.

Townsend JH, Wilson LD. 2010. Conservation of the Honduran herpetofauna: issues and imperatives. Pp. 460–487 In: *Conservation of Mesoamerican Amphibians and Reptiles*. Editors, Wilson LD, Townsend JH, Johnson JD. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, USA.

Vitt LJ, Caldwell JP. 2009. Herpetology (3rd edition). Academic Press, Burlington, Maine, USA.

Wake DB. 1991. Declining amphibian populations. *Science* 253(5022): 860.

Walker JM, Cordes JE. 2011. Taxonomic implications of color pattern and meristic variation in *Aspidoscelis burti burti*, a Mexican whiptail lizard. *Herpetological Review* 42: 33–39.

Wilson EO (Editor). 1988. *Biodiversity*. National Academy Press, Washington, DC, USA.

Wilson LD. 2011. Imperatives and opportunities: reformation of herpetology in the age of amphibian decline. *Herpetological Review* 42: 146–150.

Wilson LD, Johnson JD. 2010. Distributional patterns of the herpetofauna of Mesoamerica, a biodiversity hotspot. Pp. 30–235 In: *Conservation of Mesoamerican Amphibians and Reptiles*. Editors, Wilson LD, Townsend JH, Johnson JD. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, USA.

Wilson LD, McCranie JR. 1992. *Status of amphibian populations in Honduras*. Unpublished Report to the Task Force on Declining Amphibian Population, 15 August 1992. 14 p.

Wilson LD, McCranie JR. 2004. The conservation status of the herpetofauna of Honduras. *Amphibian & Reptile Conservation* 3: 6–33.

Wilson LD, Townsend JH. 2010. The herpetofauna of Mesoamerica: biodiversity significance, conservation status, and future challenges. Pp. 760–812 In: *Conservation of Mesoamerican Amphibians and Reptiles*. Editors, Wilson LD, Townsend JH, Johnson JD. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, USA.

Wilson LD, Townsend JH, Johnson JD. 2010. *Conservation of Mesoamerican Amphibians and Reptiles*. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, USA.

Woolrich-Piña, GA, Smith GR. 2012. A new species of *Xenosaurus* from the Sierra Madre Oriental, Mexico. *Herpetologica* 68: 551–559.

World Wildlife Fund. 2012. *Living Planet Report 2012*. WWF International, Gland, Switzerland.

Received: 18 Feb 2013
Accepted: 24 April 2013
Published: 09 June 2013

Larry David Wilson is a herpetologist with lengthy experience in Mesoamerica, totaling six collective years (combined over the past 47). Larry is the senior editor of the recently published *Conservation of Mesoamerican Amphibians and Reptiles* and a co-author of seven of its chapters. He retired after 35 years of service as Professor of Biology at Miami-Dade College in Miami, Florida. Larry is the author or co-author of more than 290 peer-reviewed papers and books on herpetology, including the 2004 *Amphibian & Reptile Conservation* paper entitled "The conservation status of the herpetofauna of Honduras." His other books include *The Snakes of Honduras*, *Middle American Herpetology*, *The Amphibians of Honduras*, *Amphibians & Reptiles of the Bay Islands and Cayos Cochinos, Honduras*, *The Amphibians and Reptiles of the Honduran Mosquitia*, and *Guide to the Amphibians & Reptiles of Cusuco National Park, Honduras*. He also served as the Snake Section Editor for the Catalogue of American Amphibians and Reptiles for 33 years. Over his career, Larry has authored or co-authored the descriptions of 69 currently recognized herpetofaunal species and six species have been named in his honor, including the anuran *Craugastor lauraster* and the snakes *Cerrophidion wilsoni*, *Myriopholis wilsoni*, and *Oxybelis wilsoni*.

Vicente Mata-Silva is a herpetologist interested in ecology, conservation, and the monitoring of amphibians and reptiles in Mexico and the southwestern United States. His bachelor's thesis compared herpetofaunal richness in Puebla, México, in habitats with different degrees of human related disturbance. Vicente's master's thesis focused primarily on the diet of two syntopic whiptail species of lizards, one unisexual and the other bisexual, in the Trans-Pecos region of the Chihuahuan Desert. Currently, he is a postdoctoral research fellow at the University of Texas at El Paso, where his work focuses on rattlesnake populations in their natural habitat. His dissertation was on the ecology of the rock rattlesnake, *Crotalus lepidus*, in the northern Chihuahuan Desert. To date, Vicente has authored or co-authored 34 peer-reviewed scientific publications.

Jerry D. Johnson is Professor of Biological Sciences at The University of Texas at El Paso, and has extensive experience studying the herpetofauna of Mesoamerica. He is the Director of the 40,000 acre "Indio Mountains Research Station," was a co-editor on the recently published *Conservation of Mesoamerican Amphibians and Reptiles*, and is Mesoamerica/Caribbean editor for the Geographic Distribution section of *Herpetological Review*. Johnson has authored or co-authored over 80 peer-reviewed papers, including two 2010 articles, "Geographic distribution and conservation of the herpetofauna of southeastern Mexico" and "Distributional patterns of the herpetofauna of Mesoamerica, a biodiversity hotspot."

Appendix 1. Comparison of the IUCN Ratings from the 2005 Mexican Assessment (updated to the present time) and the Environmental Vulnerability Scores for 849 Mexican reptile species (crocodilians, turtles, lizards, and snakes). See text for explanation of the IUCN and EVS rating systems. * = species endemic to Mexico. [1] = IUCN status needs updating. [2] = Not rated because not recognized as a distinct species. [3] = not described at the time of assessment.

Species	IUCN Ratings	Environmental Vulnerability Scores			
		Geographic Distribution	Ecological Distribution	Degree of Human Persecution	Total Score
Order Crocodylia (3 species)					
Family Alligatoridae (1 species)					
Caiman crocodilus	LC[1]	3	7	6	16
Family Crocodylidae (2 species)					
Crocodylus acutus	VU	3	5	6	14
Crocodylus moreletii	LC	2	5	6	13
Order Testudines (48 species)					
Family Cheloniidae (5 species)					
Caretta caretta	EN	—	—	—	—
Chelonia mydas	EN	—	—	—	—
Eretmochelys imbricata	CR	—	—	—	—
Lepidochelys kempii	CR	—	—	—	—
Lepidochelys olivacea	VU	—	—	—	—
Family Chelydridae (1 species)					
Chelydra rossignonii	VU	4	7	6	17
Family Dermatemydidae (1 species)					
Dermatemys mawii	CR	4	7	6	17
Family Dermochelyidae (1 species)					
Dermochelys coriacea	CR	—	—	—	—
Family Emydidae (15 species)					
Actinemys marmorata	VU	3	8	6	17
Chrysemys picta	LC	3	8	3	14
Pseudemys gorzugi	NT	4	6	6	16
*Terrapene coahuila**	EN	5	8	6	19
*Terrapene mexicana**	NE	5	8	6	19
*Terrapene nelsoni**	DD	5	7	6	18
Terrapene ornata	NT	3	6	6	15
*Terrapene yucatana**	NE	5	7	6	18
Trachemys gaigeae	VU	4	8	6	18
*Trachemys nebulosa**	NE	5	7	6	18
*Trachemys ornata**	VU	5	8	6	19
Trachemys scripta	LC	3	7	6	16
*Trachemys taylori**	EN	5	8	6	19
Trachemys venusta	NE	3	4	6	13
*Trachemys yaquia**	VU	5	8	6	19
Family Geoemydidae (3 species)					
Rhinoclemmys areolata	NT	4	6	3	13
Rhinoclemmys pulcherrima	NE	1	4	3	8
*Rhinoclemmys rubida**	NT	5	6	3	14
Family Kinosternidae (17 species)					
Claudius angustatus	NT[1]	4	7	3	14
Kinosternon acutum	NT[1]	4	7	3	14

*Kinosternon alamosae**	DD	5	6	3	14
Kinosternon arizonense	LC	4	8	3	15
*Kinosternon chimalhuaca**	LC	5	8	3	16
*Kinosternon creaseri**	LC	5	7	3	15
*Kinosternon durangoense**	DD	5	8	3	16
Kinosternon flavescens	LC	3	6	3	12
*Kinosternon herrerai**	NT	5	6	3	14
Kinosternon hirtipes	LC	2	5	3	10
*Kinosternon integrum**	LC	5	3	3	11
Kinosternon leucostomum	NE	3	4	3	10
*Kinosternon oaxacae**	DD	5	7	3	15
Kinosternon scorpioides	NE	3	4	3	10
Kinosternon sonoriense	NT	4	7	3	14
Staurotypus salvinii	NT[1]	4	6	3	13
Staurotypus triporcatus	NT[1]	4	7	3	14
Family Testudinidae (3 species)					
Gopherus berlandieri	LC[1]	4	8	6	18
*Gopherus flavomarginatus**	VU	5	8	6	19
Gopherus morafkai	NE[3]	4	5	6	15
Family Trionychidae (2 species)					
*Apalone atra**	NE	6	8	6	20
Apalone spinifera	LC	3	6	6	15
Order Squamata (798 species)					
Family Bipedidae (3 species)					
*Bipes biporus**	LC	5	8	1	14
*Bipes canaliculatus**	LC	5	6	1	12
*Bipes tridactylus**	LC	5	8	1	14
Family Anguidae (48 species)					
*Abronia bogerti**	DD	6	8	4	18
*Abronia chiszari**	EN	6	7	4	17
*Abronia deppii**	EN	6	6	4	16
*Abronia fuscolabialis**	EN	6	8	4	18
*Abronia graminea**	EN	5	6	4	15
*Abronia leurolepis**	DD	6	8	4	18
*Abronia lythrochila**	LC	6	7	4	17
*Abronia martindelcampoi**	EN	5	6	4	15
Abronia matudai	EN	4	7	4	15
*Abronia mitchelli**	DD	6	8	4	18
*Abronia mixteca**	VU	6	8	4	18
*Abronia oaxacae**	VU	6	7	4	17
Abronia ochoterenai	DD	4	8	4	16
*Abronia ornelasi**	DD	6	8	4	18
*Abronia ramirezi**	DD	6	8	4	18
*Abronia reidi**	DD	6	8	4	18
*Abronia smithi**	LC	6	7	4	17
*Abronia taeniata**	VU	5	6	4	15
*Anguis ceroni**	NE	5	7	2	14
*Anguis incomptus**	NE	5	8	2	15
*Barisia ciliaris**	NE	5	7	3	15

*Barisia herrerae**	EN	5	7	3	15
*Barisia imbricata**	LC	5	6	3	14
*Barisia jonesi**	NE[2]	6	7	3	16
*Barisia levicollis**	DD	5	7	3	15
*Barisia planifrons**	NE[2]	5	7	3	15
*Barisia rudicollis**	EN	5	7	3	15
*Celestus enneagrammus**	LC	5	6	3	14
*Celestus ingridae**	DD	6	8	3	17
*Celestus legnotus**	LC	5	6	3	14
Celestus rozellae	NT	4	6	3	13
*Elgaria cedrosensis**	LC	5	8	3	16
Elgaria kingii	LC	2	5	3	10
Elgaria multicarinata	LC	3	4	3	10
*Elgaria nana**	LC	5	8	3	16
*Elgaria paucicarinata**	VU	5	5	3	13
*Elgaria velazquezi**	LC	5	6	3	14
*Gerrhonotus farri**	NE[3]	6	8	3	17
*Gerrhonotus infernalis**	LC	5	5	3	13
Gerrhonotus liocephalus	LC	2	1	3	6
*Gerrhonotus lugoi**	LC	6	8	3	17
*Gerrhonotus ophiurus**	LC	5	4	3	12
*Gerrhonotus parvus**	EN	6	8	3	17
*Mesaspis antauges**	DD	6	7	3	16
*Mesaspis gadovii**	LC	5	6	3	14
*Mesaspis juarezi**	EN	5	7	3	15
Mesaspis moreleti	LC	3	3	3	9
*Mesaspis viridiflava**	LC	5	8	3	16
Family Anniellidae (2 species)					
*Anniella geronimensis**	EN	5	7	1	13
Anniella pulchra	LC	3	8	1	12
Family Corytophanidae (6 species)					
Basiliscus vittatus	NE	1	3	3	7
Corytophanes cristatus	NE	3	5	3	11
Corytophanes hernandesii	NE	4	6	3	13
Corytophanes percarinatus	NE	4	4	3	11
Laemanctus longipes	NE	1	5	3	9
Laemanctus serratus	LC	2	3	3	8
Family Crotaphytidae (10 species)					
*Crotaphytus antiquus**	EN	5	8	3	16
Crotaphytus collaris	LC	3	7	3	13
*Crotaphytus dickersonae**	LC	5	8	3	16
*Crotaphytus grismeri**	LC	5	8	3	16
*Crotaphytus insularis**	LC	6	7	3	16
Crotaphytus nebrius	LC	2	7	3	12
Crotaphytus reticulatus	VU	4	5	3	12
Crotaphytus vestigium	LC	3	3	3	9
Gambelia copeii	LC	2	6	3	11
Gambelia wislizenii	LC	3	7	3	13

Family Dactyloidae (50 species)					
Anolis allisoni	NE	3	7	3	13
*Anolis alvarezdeltoroi**	DD	6	8	3	17
*Anolis anisolepis**	LC	5	7	3	15
*Anolis barkeri**	VU	5	7	3	15
Anolis beckeri	NE[3]	3	6	3	12
Anolis biporcatus	NE	3	4	3	10
*Anolis breedlovei**	EN	6	7	3	16
Anolis capito	NE	3	6	3	13
*Anolis compressicauda**	LC	5	7	3	15
Anolis crassulus	NE	3	4	3	10
Anolis cristifer	DD	4	6	3	13
*Anolis cuprinus**	LC	6	7	3	16
*Anolis cymbops**	DD	6	8	3	17
Anolis dollfusianus	NE	4	6	3	13
*Anolis duellmani**	DD	6	8	3	17
*Anolis dunni**	LC	5	8	3	16
*Anolis forbesi**	DD	6	7	3	16
*Anolis gadovi**	LC	5	8	3	16
*Anolis hobartsmithi**	EN	6	6	3	15
*Anolis isthmicus**	DD	5	8	3	16
Anolis laeviventris	NE	3	3	3	9
Anolis lemurinus	NE	3	2	3	8
*Anolis liogaster**	LC	5	6	3	14
*Anolis macrinii**	LC	5	8	3	16
Anolis matudai	NE	4	6	3	13
*Anolis megapholidotus**	LC	5	8	3	16
*Anolis microlepidotus**	LC	5	7	3	15
*Anolis milleri**	DD	5	6	3	14
*Anolis naufragus**	VU	5	5	3	13
*Anolis nebuloides**	LC	5	6	3	14
*Anolis nebulosus**	LC	5	5	3	13
*Anolis omiltemanus**	LC	5	7	3	15
*Anolis parvicirculatus**	LC	6	7	3	16
Anolis petersii	NE	2	4	3	9
*Anolis polyrhachis**	DD	5	8	3	16
*Anolis pygmaeus**	EN	5	8	3	16
*Anolis quercorum**	LC	5	8	3	16
Anolis rodriguezii	NE	4	3	3	10
Anolis sagrei	NE	2	7	3	12
*Anolis schiedii**	DD	5	8	3	16
*Anolis schmidti**	LC	5	8	3	16
Anolis sericeus	NE	2	3	3	8
Anolis serranoi	NE	4	5	3	12
*Anolis simmonsi**	DD	5	7	3	15
*Anolis subocularis**	DD	5	7	3	15
*Anolis taylori**	LC	5	8	3	16
Anolis tropidonotus	NE	4	2	3	9
Anolis uniformis	NE	4	6	3	13

Anolis unilobatus	NE[3]	1	3	3	7
*Anolis utowanae**	DD	6	8	3	17
Family Dibamidae (1 species)					
*Anelytropsis papillosus**	LC	5	4	1	10
Family Eublepharidae (7 species)					
Coleonyx brevis	LC	4	6	4	14
Coleonyx elegans	NE	2	3	4	9
*Coleonyx fasciatus**	LC	5	8	4	17
*Coleonyx gypsicolus**	LC	6	8	4	18
Coleonyx reticulatus	LC	4	7	4	15
Coleonyx switaki	LC	4	6	4	14
Coleonyx variegatus	LC	4	3	4	11
Family Gymnophthalmidae (1 species)					
Gymnophthalmus speciosus	NE	3	3	3	9
Family Helodermatidae (2 species)					
Heloderma horridum	LC	2	4	5	11
Heloderma suspectum	NT	4	6	5	15
Family Iguanidae (19 species)					
Ctenosaura acanthura	NE	2	4	6	12
Ctenosaura alfredschmidti	NT	4	8	3	15
*Ctenosaura clarki**	VU	5	7	3	15
*Ctenosaura conspicuosa**	NE	5	8	3	16
*Ctenosaura defensor**	VU	5	7	3	15
*Ctenosaura hemilopha**	NE	5	7	6	18
*Ctenosaura macrolopha**	NE	5	8	6	19
*Ctenosaura nolascensis**	NE	6	8	3	17
*Ctenosaura oaxacana**	CR	5	8	6	19
*Ctenosaura pectinata**	NE	5	4	6	15
Ctenosaura similis	LC	1	4	3	8
*Dipsosaurus catalinensis**	NE	6	8	3	17
Dipsosaurus dorsalis	LC	4	4	3	11
Iguana iguana	NE	3	3	6	12
Sauromalus ater	LC	4	6	3	13
*Sauromalus hispidus**	NT	5	6	3	14
*Sauromalus klauberi**	NE	6	7	3	16
*Sauromalus slevini**	NE	5	8	3	16
*Sauromalus varius**	NE	5	8	3	16
Family Mabuyidae (1 species)					
Marisora brachypoda	NE	1	2	3	6
Family Phrynosomatidae (135 species)					
Callisaurus draconoides	LC	4	5	3	12
Cophosaurus texanus	LC	4	7	3	14
*Holbrookia approximans**	NE	5	6	3	14
Holbrookia elegans	LC	4	6	3	13
Holbrookia lacerata	NT	4	7	3	14
Holbrookia maculata	LC	1	6	3	10
Holbrookia propinqua	LC	4	8	3	15
Petrosaurus mearnsi	LC	4	5	3	12
*Petrosaurus repens**	LC	5	5	3	13

*Petrosaurus slevini**	LC	5	8	3	16
*Petrosaurus thalassinus**	LC	5	5	3	13
Phrynosoma asio	NE	2	6	3	11
Phrynosoma blainvillii	NE	3	7	3	13
*Phrynosoma braconnieri**	LC	5	7	3	15
*Phrynosoma cerroense**	NE	6	7	3	16
Phrynosoma cornutum	LC	1	7	3	11
*Phrynosoma coronatum**	LC	5	4	3	12
*Phrynosoma ditmarsi**	DD	5	8	3	16
Phrynosoma goodei	NE	4	6	3	13
Phrynosoma hernandesi	LC	3	7	3	13
Phrynosoma mcallii	NT	4	8	3	15
Phrynosoma modestum	LC	4	5	3	12
*Phrynosoma orbiculare**	LC	5	4	3	12
Phrynosoma platyrhinos	LC	3	7	3	13
Phrynosoma solare	LC	4	7	3	14
*Phrynosoma taurus**	LC	5	4	3	12
*Phrynosoma wigginsi**	NE	5	8	3	16
Sceloporus acanthinus	NE	3	7	3	13
*Sceloporus adleri**	LC	5	7	3	15
*Sceloporus aeneus**	LC	5	5	3	13
*Sceloporus albiventris**	NE	5	8	3	16
*Sceloporus anahuacus**	LC	5	7	3	15
*Sceloporus angustus**	LC	5	8	3	16
*Sceloporus asper**	LC	5	6	3	14
*Sceloporus bicanthalis**	LC	5	5	3	13
*Sceloporus bulleri**	LC	5	7	3	15
Sceloporus carinatus	LC	4	5	3	12
*Sceloporus cautus**	LC	5	7	3	15
*Sceloporus chaneyi**	EN	5	7	3	15
Sceloporus chrysostictus	LC	4	6	3	13
Sceloporus clarkii	LC	2	5	3	10
*Sceloporus couchii**	LC	5	7	3	15
Sceloporus cowlesi	NE	4	6	3	13
*Sceloporus cozumelae**	LC	5	7	3	15
*Sceloporus cryptus**	LC	5	6	3	14
*Sceloporus cupreus**	NE	5	8	3	16
*Sceloporus cyanogenys**	NE	6	7	3	16
*Sceloporus cyanostictus**	EN	5	8	3	16
*Sceloporus druckercolini**	NE	5	6	3	14
*Sceloporus dugesii**	LC	5	5	3	13
*Sceloporus edwardtaylori**	LC	5	6	3	14
*Sceloporus exsul**	CR	6	8	3	17
*Sceloporus formosus**	LC	5	7	3	15
*Sceloporus gadoviae**	LC	5	3	3	11
*Sceloporus goldmani**	EN	5	7	3	15
Sceloporus grammicus	LC	2	4	3	9
*Sceloporus grandaevus**	LC	6	7	3	16
*Sceloporus halli**	DD	6	8	3	17

*Sceloporus heterolepis**	LC	5	6	3	14
*Sceloporus horridus**	LC	5	3	3	11
*Sceloporus hunsakeri**	LC	5	6	3	14
*Sceloporus insignis**	LC	5	8	3	16
Sceloporus internasalis	LC	4	4	3	11
*Sceloporus jalapae**	LC	5	5	3	13
Sceloporus jarrovii	LC	2	6	3	11
*Sceloporus lemosespinali**	DD	5	8	3	16
*Sceloporus licki**	LC	5	5	3	13
*Sceloporus lineatulus**	LC	6	8	3	17
*Sceloporus lineolateralis**	NE	5	8	3	16
Sceloporus lundelli	LC	4	7	3	14
*Sceloporus macdougalli**	LC	5	8	3	16
*Sceloporus maculosus**	VU	5	8	3	16
Sceloporus magister	LC	1	5	3	9
Sceloporus marmoratus	NE	2	6	3	11
*Sceloporus megalepidurus**	VU	5	6	3	14
Sceloporus melanorhinus	LC	2	4	3	9
Sceloporus merriami	LC	4	6	3	13
*Sceloporus minor**	LC	5	6	3	14
*Sceloporus mucronatus**	LC	5	5	3	13
*Sceloporus nelsoni**	LC	5	5	3	13
*Sceloporus oberon**	VU	5	6	3	14
Sceloporus occidentalis	LC	3	6	3	12
*Sceloporus ochoterenae**	LC	5	4	3	12
Sceloporus olivaceus	LC	4	6	3	13
Sceloporus orcutti	LC	2	2	3	7
*Sceloporus ornatus**	NT	5	8	3	16
*Sceloporus palaciosi**	LC	5	7	3	15
*Sceloporus parvus**	LC	5	7	3	15
Sceloporus poinsetti	LC	4	5	3	12
Sceloporus prezygus	NE	4	8	3	15
*Sceloporus pyrocephalus**	LC	5	4	3	12
*Sceloporus salvini**	DD	5	7	3	15
*Sceloporus samcolemani**	LC	5	7	3	15
*Sceloporus scalaris**	LC	5	4	3	12
Sceloporus serrifer	LC	2	1	3	6
*Sceloporus shannonorum**	NE	5	7	3	15
Sceloporus siniferus	LC	2	6	3	11
Sceloporus slevini	LC	2	6	3	11
Sceloporus smaragdinus	LC	4	5	3	12
*Sceloporus smithi**	LC	5	7	3	15
*Sceloporus spinosus**	LC	5	4	3	12
Sceloporus squamosus	NE	3	5	3	11
*Sceloporus stejnegeri**	LC	5	5	3	13
*Sceloporus subniger**	NE	5	7	3	15
*Sceloporus subpictus**	DD	6	7	3	16
*Sceloporus sugillatus**	LC	5	8	3	16
Sceloporus taeniocnemis	LC	4	5	3	12

*Sceloporus tanneri**	DD	6	7	3	16
Sceloporus teapensis	LC	4	6	3	13
*Sceloporus torquatus**	LC	5	3	3	11
Sceloporus uniformis	NE	3	7	3	13
*Sceloporus utiformis**	LC	5	7	3	15
Sceloporus vandenburgianus	LC	4	7	3	14
Sceloporus variabilis	NE	1	1	3	5
Sceloporus virgatus	LC	4	8	3	15
*Sceloporus zosteromus**	LC	5	4	3	12
*Uma exsul**	EN	5	8	3	16
Uma notata	NT	4	8	3	15
*Uma paraphygas**	NT	6	8	3	17
*Uma rufopunctata**	NT	5	8	3	16
*Urosaurus auriculatus**	EN	6	7	3	16
*Urosaurus bicarinatus**	LC	5	4	3	12
*Urosaurus clarionensis**	VU	6	8	3	17
*Urosaurus gadovi**	LC	3	6	3	12
Urosaurus graciosus	LC	3	8	3	14
*Urosaurus lahtelai**	LC	5	8	3	16
Urosaurus nigricaudus	LC	3	2	3	8
Urosaurus ornatus	LC	2	5	3	10
*Uta encantadae**	VU	6	8	3	17
*Uta lowei**	VU	6	8	3	17
*Uta nolascensis**	LC	6	8	3	17
*Uta palmeri**	VU	6	8	3	17
*Uta squamata**	LC	6	8	3	17
Uta stansburiana	LC	3	1	3	7
*Uta tumidarostra**	VU	6	8	3	17
Family Phyllodactylidae (15 species)					
*Phyllodactylus bordai**	LC	5	5	3	13
*Phyllodactylus bugastrolepis**	LC	6	8	3	17
*Phyllodactylus davisi**	LC	5	8	3	16
*Phyllodactylus delcampoi**	LC	5	8	3	16
*Phyllodactylus duellmani**	LC	5	8	3	16
*Phyllodactylus homolepidurus**	LC	5	7	3	15
*Phyllodactylus lanei**	LC	5	7	3	15
*Phyllodactylus muralis**	LC	5	6	3	14
Phyllodactylus nocticolus	NE	2	5	3	10
*Phyllodactylus partidus**	LC	5	8	3	16
*Phyllodactylus paucituberculatus**	DD	6	7	3	16
Phyllodactylus tuberculosus	NE	1	4	3	8
*Phyllodactylus unctus**	NT	5	7	3	15
*Phyllodactylus xanti**	LC	5	7	3	15
Thecadactylus rapicauda	NE	3	4	3	10
Family Scincidae (23 species)					
*Mesoscincus altamirani**	DD	5	6	3	14
Mesoscincus schwartzei	LC	2	6	3	11
*Plestiodon bilineatus**	NE	5	5	3	13
*Plestiodon brevirostris**	LC	5	3	3	11

Plestiodon callicephalus	LC	2	7	3	12
*Plestiodon colimensis**	DD	5	6	3	14
*Plestiodon copei**	LC	5	6	3	14
*Plestiodon dicei**	NE	5	4	3	12
*Plestiodon dugesi**	VU	5	8	3	16
Plestiodon gilberti	LC	3	6	3	12
*Plestiodon indubitus**	NE	5	7	3	15
*Plestiodon lagunensis**	LC	6	6	3	15
*Plestiodon lynxe**	LC	5	2	3	10
*Plestiodon multilineatus**	DD	5	8	3	16
Plestiodon multivirgatus	LC	3	8	3	14
*Plestiodon nietoi**	NE	6	8	3	17
Plestiodon obsoletus	LC	3	5	3	11
*Plestiodon ochoterenae**	LC	5	5	3	13
*Plestiodon parviauriculatus**	DD	5	7	3	15
*Plestiodon parvulus**	DD	5	7	3	15
Plestiodon skiltonianus	LC	3	5	3	11
Plestiodon sumichrasti	NE	4	5	3	12
Plestiodon tetragrammus	LC	4	5	3	12
Family Sphaerodactylidae (4 species)					
Aristelliger georgeensis	NE	3	7	3	13
Gonatodes albogularis	NE	3	5	3	11
Sphaerodactylus continentalis	NE	4	3	3	10
Sphaerodactylus glaucus	NE	4	5	3	12
Family Sphenomorphidae (6 species)					
*Scincella gemmingeri**	LC	5	3	3	11
*Scincella kikaapoda**	NE[3]	6	8	3	17
Scincella lateralis	LC	3	7	3	13
*Scincella silvicola**	LC	5	4	3	12
Sphenomorphus assatus	NE	2	2	3	7
Sphenomorphus cherriei	NE	3	2	3	8
Family Teiidae (46 species)					
Aspidoscelis angusticeps	LC	4	6	3	13
*Aspidoscelis bacata**	LC	6	8	3	17
Aspidoscelis burti	LC	4	8	3	15
*Aspidoscelis calidipes**	LC	5	6	3	14
*Aspidoscelis cana**	LC	5	8	3	16
*Aspidoscelis carmenensis**	LC	6	8	3	17
*Aspidoscelis catalinensis**	VU	6	8	3	17
*Aspidoscelis celeripes**	LC	5	7	3	15
*Aspidoscelis ceralbensis**	LC	6	8	3	17
*Aspidoscelis communis**	LC	5	6	3	14
*Aspidoscelis costata**	LC	5	3	3	11
*Aspidoscelis cozumela**	LC	5	8	3	16
*Aspidoscelis danheimae**	LC	6	7	3	16
Aspidoscelis deppii	LC	1	4	3	8
*Aspidoscelis espiritensis**	LC	5	8	3	16
Aspidoscelis exanguis	LC	4	7	3	14
*Aspidoscelis franciscensis**	LC	6	8	3	17

Aspidoscelis gularis	LC	2	4	3	9
*Aspidoscelis guttata**	LC	5	4	3	12
Aspidoscelis hyperythra	LC	2	5	3	10
Aspidoscelis inornata	LC	4	7	3	14
*Aspidoscelis labialis**	VU	5	7	3	15
Aspidoscelis laredoensis	LC	4	7	3	14
*Aspidoscelis lineattissima**	LC	5	6	3	14
Aspidoscelis marmorata	NE	4	7	3	14
*Aspidoscelis martyris**	VU	6	8	3	17
Aspidoscelis maslini	LC	4	8	3	15
*Aspidoscelis mexicana**	LC	5	6	3	14
Aspidoscelis motaguae	LC	4	5	3	12
Aspidoscelis neomexicana	LC	4	8	3	15
*Aspidoscelis opatae**	DD	5	8	3	16
*Aspidoscelis parvisocia**	LC	5	7	3	15
*Aspidoscelis picta**	LC	6	8	3	17
*Aspidoscelis rodecki**	NT	5	8	3	16
*Aspidoscelis sackii**	LC	5	6	3	14
Aspidoscelis semptemvittata	LC	3	7	3	13
Aspidoscelis sexlineata	LC	3	8	3	14
Aspidoscelis sonorae	LC	4	6	3	13
Aspidoscelis stictogramma	NE	4	7	3	14
Aspidoscelis tesselata	LC	4	7	3	14
Aspidoscelis tigris	LC	3	2	3	8
Aspidoscelis uniparens	LC	4	8	3	15
Aspidoscelis xanthonota	NE	4	7	3	14
Holcosus chaitzami	DD	4	7	3	14
Holcosus festiva	NE	3	5	3	11
Holcosus undulatus	NE	2	2	3	7
Family Xantusiidae (25 species)					
*Lepidophyma chicoasense**	DD	6	8	2	16
*Lepidophyma cuicateca**	NE[3]	6	8	2	16
*Lepidophyma dontomasi**	DD	6	6	2	14
Lepidophyma flavimaculatum	NE	1	5	2	8
*Lepidophyma gaigeae**	VU	5	6	2	13
*Lepidophyma lineri**	DD	5	8	2	15
*Lepidophyma lipetzi**	EN	6	8	2	16
*Lepidophyma lowei**	DD	6	8	2	16
*Lepidophyma micropholis**	VU	5	8	2	15
*Lepidophyma occulor**	LC	5	7	2	14
*Lepidophyma pajapanense**	LC	5	6	2	13
*Lepidophyma radula**	DD	6	5	2	13
Lepidophyma smithii	NE	2	4	2	8
*Lepidophyma sylvaticum**	LC	5	4	2	11
*Lepidophyma tarascae**	DD	5	7	2	14
*Lepidophyma tuxtlae**	DD	5	4	2	11
*Lepidophyma zongolica**	NE[3]	6	8	2	16
*Xantusia bolsonae**	DD	6	8	3	17
*Xantusia extorris**	LC	5	7	3	15

*Xantusia gilberti**	NE	5	8	3	16
Xantusia henshawi	LC	4	5	3	12
*Xantusia jaycolei**	NE	5	8	3	16
*Xantusia sanchezi**	LC	5	8	3	16
*Xantusia sherbrookei**	NE	5	8	3	16
Xantusia wigginsi	NE	4	7	3	14
Family Xenosauridae (9 species)					
*Xenosaurus agrenon**	NE	5	4	3	12
*Xenosaurus grandis**	VU	5	1	3	9
*Xenosaurus newmanorum**	EN	5	7	3	15
*Xenosaurus penai**	LC	6	7	3	16
*Xenosaurus phalaroanthereon**	DD	5	8	3	16
*Xenosaurus platyceps**	EN	5	6	3	14
Xenosaurus rackhami	NE	4	4	3	11
*Xenosaurus rectocollaris**	LC	5	8	3	16
*Xenosaurus tzacualtipantecus**	NE	6	8	3	17
Family Boidae (2 species)					
Boa constrictor	NE	3	1	6	10
Charina trivirgata	LC	4	3	3	10
Family Colubridae (136 species)					
Arizona elegans	LC	1	1	3	5
*Arizona pacata**	LC	5	5	4	14
Bogertophis rosaliae	LC	2	5	3	10
Bogertophis subocularis	LC	4	7	3	14
*Chilomeniscus savagei**	LC	6	7	2	15
Chilomeniscus stramineus	LC	4	2	2	8
Chionactus occipitalis	LC	4	6	2	12
Chionactus palarostris	LC	4	7	2	13
Coluber constrictor	LC	1	6	3	10
*Conopsis acuta**	NE	5	7	2	14
*Conopsis amphisticha**	NT	5	8	2	15
*Conopsis biserialis**	LC	5	6	2	13
*Conopsis lineata**	LC	5	6	2	13
*Conopsis megalodon**	LC	5	7	2	14
*Conopsis nasus**	LC	5	4	2	11
Dendrophidion vinitor	LC	3	7	3	13
Drymarchon melanurus	LC	1	1	4	6
Drymobius chloroticus	LC	1	3	4	8
Drymobius margaritiferus	NE	1	1	4	6
*Ficimia hardyi**	EN	5	6	2	13
*Ficimia olivacea**	NE	5	2	2	9
Ficimia publia	NE	4	3	2	9
*Ficimia ramirezi**	DD	6	8	2	16
*Ficimia ruspator**	DD	6	8	2	16
Ficimia streckeri	LC	3	7	2	12
*Ficimia variegata**	DD	5	7	2	14
*Geagras redimitus**	DD	5	7	2	14
Gyalopion canum	LC	4	3	2	9
Gyalopion quadrangulare	LC	3	6	2	11

Lampropeltis alterna	LC	4	7	3	14
Lampropeltis californiae	NE[2]	3	4	3	10
*Lampropeltis catalinensis**	DD	6	8	3	17
*Lampropeltis herrerae**	CR	6	8	3	17
Lampropeltis holbrooki	NE[2]	3	8	3	14
Lampropeltis knoblochi	NE[2]	2	5	3	10
*Lampropeltis mexicana**	LC	5	7	3	15
*Lampropeltis ruthveni**	NT	5	8	3	16
Lampropeltis splendida	NE[2]	4	5	3	12
Lampropeltis triangulum	NE	1	1	5	7
*Lampropeltis webbi**	DD	5	8	3	16
Lampropeltis zonata	LC	3	7	5	15
Leptophis ahaetulla	NE	3	3	4	10
*Leptophis diplotropis**	LC	5	5	4	14
Leptophis mexicanus	LC	1	1	4	6
Leptophis modestus	VU	3	7	4	14
Liochlorophis vernalis	LC	3	8	3	14
*Masticophis anthonyi**	CR	6	8	3	17
*Masticophis aurigulus**	LC	5	4	4	13
*Masticophis barbouri**	DD	6	8	3	17
Masticophis bilineatus	LC	2	5	4	11
Masticophis flagellum	LC	1	3	4	8
Masticophis fuliginosus	NE	2	3	4	9
Masticophis lateralis	LC	3	3	4	10
Masticophis mentovarius	NE	1	1	4	6
Masticophis schotti	LC	4	5	4	13
*Masticophis slevini**	LC	6	8	3	17
Masticophis taeniatus	LC	1	5	4	10
*Mastigodryas cliftoni**	NE	5	6	3	14
Mastigodryas melanolomus	LC	1	1	4	6
Opheodrys aestivus	LC	3	7	3	13
Oxybelis aeneus	NE	1	1	3	5
Oxybelis fulgidus	NE	3	2	4	9
Pantherophis bairdi	NE	4	7	4	15
Pantherophis emoryi	LC	3	6	4	13
Phyllorhynchus browni	LC	4	7	2	13
Phyllorhynchus decurtatus	LC	4	5	2	11
Pituophis catenifer	LC	4	1	4	9
*Pituophis deppei**	LC	5	5	4	14
*Pituophis insulanus**	LC	6	6	4	16
Pituophis lineaticollis	LC	2	2	4	8
*Pituophis vertebralis**	LC	5	3	4	12
Pseudelaphe flavirufa	LC	2	4	4	10
*Pseudelaphe phaescens**	NE	5	7	4	16
*Pseudoficimia frontalis**	LC	5	5	3	13
Pseustes poecilonotus	LC	3	4	3	10
*Rhinocheilus antonii**	NE	5	8	3	16
*Rhinocheilus etheridgei**	DD	6	7	3	16
Rhinocheilus lecontei	LC	1	3	4	8

*Salvadora bairdi**	LC	5	6	4	15
Salvadora deserticola	NE	4	6	4	14
Salvadora grahamiae	LC	4	2	4	10
Salvadora hexalepis	LC	4	2	4	10
*Salvadora intermedia**	LC	5	7	4	16
*Salvadora lemniscata**	LC	5	6	4	15
*Salvadora mexicana**	LC	5	6	4	15
Scaphiodontophis annulatus	NE	1	5	5	11
Senticolis triaspis	NE	2	1	3	6
*Sonora aemula**	NT	5	6	5	16
*Sonora michoacanensis**	LC	5	6	3	14
*Sonora mutabilis**	LC	5	6	3	14
Sonora semiannulata	LC	1	1	3	5
Spilotes pullatus	NE	1	1	4	6
Stenorrhina degenhardtii	NE	3	3	3	9
Stenorrhina freminvillii	NE	1	2	4	7
*Symphimus leucostomus**	LC	5	6	3	14
Symphimus mayae	LC	4	7	3	14
*Sympholis lippiens**	NE	5	6	3	14
Tantilla atriceps	LC	2	7	2	11
*Tantilla bocourti**	LC	5	2	2	9
*Tantilla briggsi**	DD	6	8	2	16
*Tantilla calamarina**	LC	5	5	2	12
*Tantilla cascadae**	DD	6	8	2	16
*Tantilla ceboruca**	NE	6	8	2	16
*Tantilla coronadoi**	LC	6	7	2	15
Tantilla cuniculator	LC	4	7	2	13
*Tantilla deppei**	LC	5	6	2	13
*Tantilla flavilineata**	EN	5	7	2	14
Tantilla gracilis	LC	3	8	2	13
Tantilla hobartsmithi	LC	3	6	2	11
Tantilla impensa	LC	3	5	2	10
*Tantilla johnsoni**	DD	6	8	2	16
Tantilla moesta	LC	4	7	2	13
Tantilla nigriceps	LC	3	6	2	11
*Tantilla oaxacae**	DD	6	7	2	15
Tantilla planiceps	LC	4	3	2	9
*Tantilla robusta**	DD	6	8	2	16
Tantilla rubra	LC	2	1	2	5
Tantilla schistosa	NE	3	3	2	8
*Tantilla sertula**	DD	6	8	2	16
*Tantilla shawi**	EN	5	8	2	15
*Tantilla slavensi**	DD	5	7	2	14
*Tantilla striata**	DD	5	7	2	14
*Tantilla tayrae**	DD	6	7	2	15
*Tantilla triseriata**	DD	5	6	2	13
Tantilla vulcani	NE	4	6	2	12
Tantilla wilcoxi	LC	2	6	2	10
Tantilla yaquia	LC	2	6	2	10

Tantillita brevissima	LC	4	3	2	9
Tantillita canula	LC	4	6	2	12
Tantillita lintoni	LC	4	6	2	12
Trimorphodon biscutatus	NE	2	1	4	7
Trimorphodon lambda	NE	4	5	4	13
Trimorphodon lyrophanes	NE	4	2	4	10
*Trimorphodon paucimaculatus**	NE	5	6	4	15
*Trimorphodon tau**	LC	5	4	4	13
Trimorphodon vilkinsonii	LC	4	7	4	15
Family Dipsadidae (115 species)					
*Adelphicos latifasciatum**	DD	6	7	2	15
*Adelphicos newmanorum**	NE	5	5	2	12
*Adelphicos nigrilatum**	LC	5	7	2	14
Adelphicos quadrivirgatum	DD	4	4	2	10
Adelphicos sargii	LC	4	6	2	12
Amastridium sapperi	NE	4	4	2	10
*Chersodromus liebmanni**	LC	5	5	2	12
*Chersodromus rubriventris**	EN	5	7	2	14
*Coniophanes alvarezi**	DD	6	8	3	17
Coniophanes bipunctatus	NE	1	5	3	10
Coniophanes fissidens	NE	1	3	3	7
Coniophanes imperialis	LC	2	3	3	8
*Coniophanes lateritius**	DD	5	5	3	13
*Coniophanes melanocephalus**	DD	5	6	3	14
*Coniophanes meridanus**	LC	5	7	3	15
*Coniophanes michoacanensis**	NE[3]	6	8	3	17
Coniophanes piceivittis	LC	1	3	3	7
Coniophanes quinquevittatus	LC	4	6	3	13
*Coniophanes sarae**	DD	5	7	3	16
Coniophanes schmidti	LC	4	6	3	13
*Coniophanes taylori**	NE	5	7	4	16
*Cryophis hallbergi**	DD	5	7	2	14
Diadophis punctatus	LC	1	1	2	4
Dipsas brevifacies	LC	4	7	4	15
*Dipsas gaigeae**	LC	5	8	4	17
Enulius flavitorques	NE	1	1	3	5
*Enulius oligostichus**	DD	5	7	3	15
*Geophis anocularis**	LC	6	8	2	16
*Geophis bicolor**	DD	5	8	2	15
*Geophis blanchardi**	DD	5	8	2	15
Geophis cancellatus	LC	4	6	2	12
Geophis carinosus	LC	2	4	2	8
*Geophis chalybeus**	DD	6	7	2	15
*Geophis dubius**	LC	5	6	2	13
*Geophis duellmani**	LC	5	8	2	15
*Geophis dugesi**	LC	5	6	2	13
Geophis immaculatus	LC	4	8	2	14
*Geophis incomptus**	DD	6	8	2	16
*Geophis isthmicus**	DD	6	8	2	16

*Geophis juarezi**	DD	6	8	2	16
*Geophis juliai**	VU	5	6	2	13
*Geophis laticinctus**	LC	5	4	2	11
*Geophis laticollaris**	DD	6	8	2	16
*Geophis latifrontalis**	DD	5	7	2	14
*Geophis maculiferus**	DD	6	8	2	16
*Geophis mutitorques**	LC	5	6	2	13
Geophis nasalis	LC	4	3	2	9
*Geophis nigrocinctus**	DD	5	8	2	15
*Geophis occabus**	NE[3]	6	8	2	16
*Geophis omiltemanus**	LC	5	8	2	15
*Geophis petersi**	DD	5	8	2	15
*Geophis pyburni**	DD	6	8	2	16
Geophis rhodogaster	LC	3	7	2	12
*Geophis russatus**	DD	6	8	2	16
*Geophis sallei**	DD	6	7	2	15
*Geophis semidoliatus**	LC	5	6	2	13
*Geophis sieboldi**	DD	5	6	2	13
*Geophis tarascae**	DD	5	8	2	15
Heterodon kennerlyi	NE	3	4	4	11
*Hypsiglena affinis**	NE	5	7	2	14
Hypsiglena chlorophaea	NE	1	5	2	8
Hypsiglena jani	NE	1	3	2	6
Hypsiglena ochrorhyncha	NE	2	4	2	8
*Hypsiglena slevini**	NE	5	4	2	11
*Hypsiglena tanzeri**	DD	5	8	2	15
*Hypsiglena torquata**	LC	5	1	2	8
Imantodes cenchoa	NE	1	3	2	6
Imantodes gemmistratus	NE	1	3	2	6
Imantodes tenuissimus	NE	4	7	2	13
Leptodeira frenata	LC	4	4	4	12
Leptodeira maculata	LC	2	1	4	7
Leptodeira nigrofasciata	LC	1	3	4	8
*Leptodeira punctata**	LC	5	8	4	17
Leptodeira septentrionalis	NE	2	2	4	8
*Leptodeira splendida**	LC	5	5	4	14
*Leptodeira uribei**	LC	5	8	4	17
Ninia diademata	LC	4	3	2	9
Ninia sebae	NE	1	1	2	5
Pliocercus elapoides	LC	4	1	5	10
*Pseudoleptodeira latifasciata**	LC	5	5	4	14
*Rhadinaea bogertorum**	DD	6	8	2	16
*Rhadinaea cuneata**	DD	6	7	2	15
Rhadinaea decorata	NE	1	6	2	9
*Rhadinaea forbesi**	DD	5	8	2	15
*Rhadinaea fulvivittis**	VU	5	4	2	11
*Rhadinaea gaigeae**	DD	5	5	2	12
*Rhadinaea hesperia**	LC	5	3	2	10
*Rhadinaea laureata**	LC	5	5	2	12

*Rhadinaea macdougalli**	DD	5	5	2	12
*Rhadinaea marcellae**	EN	5	5	2	12
*Rhadinaea montana**	EN	5	7	2	14
*Rhadinaea myersi**	DD	5	5	2	12
*Rhadinaea omiltemana**	DD	5	8	2	15
*Rhadinaea quinquelineata**	DD	5	8	2	15
*Rhadinaea taeniata**	LC	5	6	2	13
Rhadinella godmani	NE	3	5	2	10
Rhadinella hannsteini	DD	4	5	2	11
*Rhadinella kanalchutchan**	DD	6	8	2	16
Rhadinella kinkelini	LC	4	6	2	12
Rhadinella lachrymans	LC	4	2	2	8
Rhadinella posadasi	NE	4	8	2	14
*Rhadinella schistosa**	LC	5	6	2	13
*Rhadinophanes monticola**	DD	6	7	2	15
Sibon dimidiatus	LC	1	5	4	10
*Sibon linearis**	DD	6	8	2	16
Sibon nebulatus	NE	1	2	2	5
Sibon sanniolus	LC	4	6	2	12
*Tantalophis discolor**	VU	5	6	3	14
*Tropidodipsas annulifera**	LC	5	4	4	13
*Tropidodipsas fasciata**	NE	5	4	4	13
Tropidodipsas fischeri	NE	4	3	4	11
*Tropidodipsas philippi**	LC	5	5	4	14
*Tropidodipsas repleta**	DD	5	8	4	17
Tropidodipsas sartorii	NE	2	2	5	9
*Tropidodipsas zweifeli**	NE	5	7	4	16
Family Elapidae (19 species)					
Laticauda colubrina	LC	—	—	—	—
Micruroides euryxanthus	LC	4	6	5	15
*Micrurus bernadi**	LC	5	5	5	15
*Micrurus bogerti**	DD	5	7	5	17
Micrurus browni	LC	2	1	5	8
Micrurus diastema	LC	2	1	5	8
*Micrurus distans**	LC	5	4	5	14
Micrurus elegans	LC	4	4	5	13
*Micrurus ephippifer**	VU	5	5	5	15
*Micrurus laticollaris**	LC	5	4	5	14
Micrurus latifasciatus	LC	4	4	5	13
*Micrurus limbatus**	LC	5	7	5	17
*Micrurus nebularis**	DD	5	8	5	18
Micrurus nigrocinctus	NE	3	3	5	11
*Micrurus pachecogili**	DD	6	7	5	18
*Micrurus proximans**	LC	5	8	5	18
*Micrurus tamaulipensis**	DD	6	8	5	19
Micrurus tener	LC	1	5	5	11
Pelamis platura	LC	—	—	—	—
Family Leptotyphlopidae (8 species)					
Epictia goudotii	NE	1	1	1	3

*Rena boettgeri**	NE	5	8	1	14
*Rena bressoni**	DD	5	8	1	14
Rena dissecta	LC	4	6	1	11
Rena dulcis	LC	4	8	1	13
Rena humilis	LC	4	3	1	8
*Rena maxima**	LC	5	5	1	11
*Rena myopica**	LC	5	7	1	13
Family Loxocemidae (1 species)					
Loxocemus bicolor	NE	1	5	4	10
Family Natricidae (33 species)					
*Adelophis copei**	VU	5	8	2	15
*Adelophis foxi**	DD	6	8	2	16
Nerodia erythrogaster	LC	3	4	4	11
Nerodia rhombifer	LC	1	5	4	10
Storeria dekayi	LC	1	4	2	7
*Storeria hidalgoensis**	VU	5	6	2	13
*Storeria storerioides**	LC	5	4	2	11
*Thamnophis bogerti**	NE	5	7	4	16
*Thamnophis chrysocephalus**	LC	5	5	4	14
*Thamnophis conanti**	NE	5	8	4	17
Thamnophis cyrtopsis	LC	2	1	4	7
Thamnophis elegans	LC	3	7	4	14
Thamnophis eques	LC	2	2	4	8
*Thamnophis errans**	LC	5	7	4	16
*Thamnophis exsul**	LC	5	7	4	16
Thamnophis fulvus	LC	4	5	4	13
*Thamnophis godmani**	LC	5	5	4	14
Thamnophis hammondii	LC	4	5	4	13
*Thamnophis lineri**	NE	5	8	4	17
Thamnophis marcianus	NE	1	5	4	10
*Thamnophis melanogaster**	EN	5	6	4	15
*Thamnophis mendax**	EN	5	5	4	14
*Thamnophis nigronuchalis**	DD	5	3	4	12
*Thamnophis postremus**	LC	5	6	4	15
Thamnophis proximus	NE	1	2	4	7
*Thamnophis pulchrilatus**	LC	5	6	4	15
*Thamnophis rossmani**	DD	6	8	4	18
Thamnophis rufipunctatus	LC	4	7	4	15
*Thamnophis scalaris**	LC	5	5	4	14
*Thamnophis scaliger**	VU	5	6	4	15
Thamnophis sirtalis	LC	3	7	4	14
*Thamnophis sumichrasti**	LC	5	6	4	15
*Thamnophis validus**	LC	5	3	4	12
Family Typhlopidae (2 species)					
Typhlops microstomus	LC	4	7	1	12
Typhlops tenuis	LC	4	6	1	11
Family Ungaliophiidae (2 species)					
*Exiliboa placata**	VU	5	8	2	15
Ungaliophis continentalis	NE	3	5	2	10

Family Viperidae (59 species)					
Agkistrodon bilineatus	NT	1	5	5	11
Agkistrodon contortrix	LC	3	6	5	14
*Agkistrodon taylori**	LC	5	7	5	17
Atropoides mexicanus	NE	3	4	5	12
*Atropoides nummifer**	LC	5	3	5	13
Atropoides occiduus	NE	4	6	5	15
Atropoides olmec	LC	4	6	5	15
Bothriechis aurifer	VU	3	6	5	14
Bothriechis bicolor	LC	4	5	5	14
*Bothriechis rowleyi**	VU	5	6	5	16
Bothriechis schlegelii	NE	3	4	5	12
Bothrops asper	NE	3	4	5	12
Cerrophidion godmani	NE	3	3	5	11
*Cerrophidion petlalcalensis**	DD	5	8	5	18
*Cerrophidion tzotzilorum**	LC	6	8	5	19
*Crotalus angelensis**	LC	6	7	5	18
*Crotalus aquilus**	LC	5	6	5	16
Crotalus atrox	LC	1	3	5	9
*Crotalus basiliscus**	LC	5	6	5	16
*Crotalus catalinensis**	CR	6	8	5	19
Crotalus cerastes	LC	4	7	5	16
*Crotalus culminatus**	NE	5	5	5	15
*Crotalus enyo**	LC	5	3	5	13
*Crotalus ericsmithi**	NE	5	8	5	18
*Crotalus estebanensis**	LC	6	8	5	19
Crotalus helleri	NE	4	3	5	12
*Crotalus intermedius**	LC	5	5	5	15
*Crotalus lannomi**	DD	6	8	5	19
Crotalus lepidus	LC	2	5	5	12
*Crotalus lorenzoensis**	LC	6	8	5	19
Crotalus mitchellii	LC	4	3	5	12
Crotalus molossus	LC	2	1	5	8
*Crotalus muertensis**	LC	6	8	5	19
Crotalus ornatus	NE	4	4	5	13
*Crotalus polystictus**	LC	5	6	5	16
Crotalus pricei	LC	2	7	5	14
*Crotalus pusillus**	EN	5	8	5	18
*Crotalus ravus**	LC	5	4	5	14
Crotalus ruber	LC	2	2	5	9
Crotalus scutulatus	LC	2	4	5	11
Crotalus simus	NE	3	2	5	10
*Crotalus stejnegeri**	VU	5	7	5	17
*Crotalus tancitarensis**	DD	6	8	5	19
Crotalus tigris	LC	4	7	5	16
*Crotalus totonacus**	NE	5	7	5	17
*Crotalus transversus**	LC	5	7	5	17
*Crotalus triseriatus**	LC	5	6	5	16
Crotalus tzabcan	NE	4	7	5	16

Crotalus viridis	LC	1	6	5	12
Crotalus willardi	LC	2	6	5	13
*Mixcoatlus barbouri**	EN	5	5	5	15
*Mixcoatlus browni**	NE	5	7	5	17
*Mixcoatlus melanurus**	EN	5	7	5	17
*Ophryacus undulatus**	VU	5	5	5	15
*Porthidium dunni**	LC	5	6	5	16
*Porthidium hespere**	DD	5	8	5	18
Porthidium nasutum	LC	3	6	5	14
*Porthidium yucatanicum**	LC	5	7	5	17
Sistrurus catenatus	LC	3	5	5	13
Family Xenodontidae (8 species)					
Clelia scytalina	NE	4	5	4	13
Conophis lineatus	LC	2	3	4	9
*Conophis morai**	DD	6	7	4	17
Conophis vittatus	LC	2	5	4	11
*Manolepis putnami**	LC	5	5	3	13
Oxyrhopus petolarius	NE	3	6	5	14
Tretanorhinus nigroluteus	NE	3	5	2	10
Xenodon rabdocephalus	NE	3	5	5	13