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Ecological-Niche Modeling and Prioritization of Conservation-Area Networks for Mexican Herpetofauna

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Abstract: *One of the most important tools in conservation biology is information on the geographic distribution of species and the variables determining those patterns. We used maximum-entropy niche modeling to run distribution models for 222 amphibian and 371 reptile species (49% endemics and 27% threatened) for which we had 34,619 single geographic records. The planning region is in southeastern Mexico, is 20% of the country's area, includes 80% of the country's herpetofauna, and lacks an adequate protected-area system. We used probabilistic data to build distribution models of herpetofauna for use in prioritizing conservation areas for three target groups (all species and threatened and endemic species). The accuracy of species-distribution models was better for endemic and threatened species than it was for all species. Forty-seven percent of the region has been deforested and additional conservation areas with 13.7% to 88.6% more native vegetation (76% to 96% of the areas are outside the current protected-area system) are needed. There was overlap in 26 of the main selected areas in the conservation-area network prioritized to preserve the target groups, and for all three target groups the proportion of vegetation types needed for their conservation was constant: 30% pine and oak forests, 22% tropical evergreen forest, 17% low deciduous forest, and 8% montane cloud forests. The fact that different groups of species require the same proportion of habitat types suggests that the pine and oak forests support the highest proportion of endemic and threatened species and should therefore be given priority over other types of vegetation for inclusion in the protected areas of southeastern Mexico.*

Keywords: amphibians, area prioritization, conservation planning, MaxEnt, niche-based distribution models, protected areas, reptiles, site selection

Modelado del Nicho Ecológico y Priorización de Redes de Áreas de Conservación para la Herpetofauna Mexicana

Resumen: *La información sobre la distribución geográfica de las especies y de las variables que determinan esos patrones es una de las herramientas más importantes de la biología de la conservación. Utilizamos el modelado de la máxima entropía del nicho para correr modelos de la distribución de 222 especies de anfibios y 371 de reptiles (49% endémicas y 27% amenazadas) de las que contamos con 34,619 registros geográficos individuales. La región de planificación está en el sureste de México, comprende 20% de la superficie del país, incluye 80% de la herpetofauna del país, y carece de un sistema de áreas protegidas adecuado. Utilizamos datos probabilísticos para construir modelos de distribución de la herpetofauna para utilizarlos en la priorización de áreas de conservación para tres grupos focales (todas las especies, especies endémicas y especies amenazadas). La precisión de los modelos de distribución de especies fue mejor para especies endémicas y amenazadas que para todas las especies. Cuarenta y siete porciento de la región ha sido deforestada y se requieren áreas de conservación adicionales con 13.7% a 88.6% de más vegetación nativa (76% a 96% de las áreas están afuera del actual sistema de áreas protegidas). Hubo traslape en 26 de las principales áreas seleccionadas en la red de áreas de conservación priorizada para preservar a los grupos*

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focales, y para los tres grupos focales la proporción de tipos de vegetación requeridos para su conservación fue constante: 30% bosques de pino-encino, 22% bosque tropical perennifolio, 17% bosque bajo deciduo y 8% bosques montanos de niebla. El hecho de que grupos diferentes de especies requieren la misma proporción de tipos de hábitat sugiere que los bosques de pino y encino soportan la mayor proporción de especies endémicas y amenazadas y, por lo tanto, deben ser priorizados por encima de otros tipos de vegetación para su inclusión en las áreas protegidas del sureste de México.

Palabras Clave: anfibios, áreas protegidas, MaxEnt, modelos de distribución basados en nichos, planificación de la conservación, priorización de áreas, reptiles, selección de sitios

Introduction

Changes in land use resulting from anthropogenic activities are the most critical cause of the biodiversity crisis. The current wave of species extinction is being caused by irreversible transformation of the landscape and this is making habitats unsuitable for many life forms (Margules & Sarkar 2007). Fragmentation and loss of habitats threatens both amphibians and reptiles with extinction, and habitat specialists—such as endemic or rare species—are more vulnerable to changes in habitat gradients (Urbina-Cardona et al. 2006; Urbina-Cardona 2008).

Even though their critical population decline has been documented, the herpetofauna is not often taken into account as a conservation objective (Pawar et al. 2007; Urbina-Cardona 2008). Unfortunately, many natural protected areas (PAs) were established for reasons other than the protection of biodiversity and without clear conservation objectives or systematic, scientific prioritization of the areas to include in a network of PAs. Generally, these ad hoc reserves are situated on lands with poor economic and productive value (Margules & Sarkar 2007). In Mexico there are 521 established PAs that cover 9.5% of Mexico's land mass (Bezaury-Creel et al. 2007). Over 54% of Mexican PAs effectively prevent human-driven change in land cover (Figueroa & Sánchez-Cordero 2008), but most PAs are located on mountains tops with poor soils, whereas other, more vulnerable habitats are unrepresented (Cantu et al. 2004). Currently Mexican PAs cannot protect the country's herpetofauna (García 2006) because they protect only 31% of the amphibians (29% of endemics) and 76% of the reptiles (46% of endemics) (Santos-Barrera et al. 2004).

Mexican PAs are isolated from one another, and in many cases natural gradients for animal movement are blocked by anthropogenic barriers disrupting species' natural cycles and interactions. The identification of conservation units that include and connect several ecosystems is crucial to keeping biological processes and ecosystem services operating on broad spatial scales (Margules & Sarkar 2007). One of the most important priorities for amphibian conservation is reinforcement of PA management and expansion of conservation-area networks (CAN) to include the entire distribution range of threatened species (Urbina-Cardona 2008). Currently, the core distribution of endangered hylid species lies outside existing PAs, and only the periphery of their distribution is protected (Urbina-Cardona & Loyola 2008).

We identified conservation areas for herpetofauna on the basis of geographic-niche distribution models for southeastern Mexico, a region that contains 80% of Mexico's herpetofauna. Mexico had one of the highest herpetofauna diversity in the world, and species are not distributed homogeneously in natural areas. Rather, topographic isolation determines their diversity patterns, which means it is necessary to include climatic factors in studies of species distribution across the country (Flores-Villela 1993). Niche-based distribution modeling is an innovative analytical approach that relates species locality records and environmental data (Elith et al. 2006). Because climate and topography influence the geographical distribution of amphibians and reptiles (Duellman 1966), we expected to obtain robust models for ecological niche modeling with environmental and topographic variables.

We sought to determine the relative contribution of certain environmental and topographic variables to the geographic distribution of the herpetofauna and prioritize CAN scenarios on the basis of 10% and 30% target of representation of the total geographic range of all herpetofauna, endemic species, and threatened species in southeastern Mexico.

The new method used identifies CAN for biodiversity through niche-based distribution models and fine-scale "self-learning tabu search" for conservation areas. This novel analytical approach restricts species niche models to natural remnant vegetation through the use of national land-use patterns to determine small-scale conservation scenarios and includes a large number of species as conservation objectives. This approach could be generalized to other geographic regions or taxa for realistic conservation management plans.

Methods

Study Area

The study region is composed of the Mexican states of Oaxaca, Chiapas, Veracruz, Guerrero, Puebla, and Michoacán and covers 396,311 km^2 (between lat 14° 33′N and lat 32° 43′N and from long 86°46′W to long 117°19′W). This region has 188 PAs (31% of the region is

Table 1. Number of herpetofauna species and protected areas (PAs) in the study region in southeastern Mexico.

State	*Area (ha)*	*Number of PAs**	*PA area (ha)**	*Percentage of state protected*	*Number of species*
Oaxaca	9,314,700	10	356,696	3.83	425
Chiapas	7,362,800	103	1,129,987	15.35	369
Veracruz	7,200,500	24	253,546	3.52	357
Guerrero	6,479,100	5	5,852	0.09	270
Puebla	3,415,500	6	234,904	6.88	246
Michoacán	5,858,500	40	79,898	1.36	224
Total	39,631,100	188	2,060,883	31	—

**Values obtained from Bezaury-Creel et al. (2007).*

protected; Table 1) covering 20,608.83 km^2. We selected this area for study because it has the greatest number of species of herpetofauna (Table 1), has the highest annual deforestation rates in the country (Cantu et al. 2004), is geographically interconnected, thus facilitating the prioritization of CAN for herpetofauna on the basis of areas with high habitat quality (primary natural vegetation) and complementary areas that could be restored (secondary vegetation), and has the highest number and best quality of historical, geographic species records (Ochoa-Ochoa & Flores-Villela 2006).

Herpetofauna

For herpetofauna, Mexico is one of the most biodiverse countries in world with 361 species of amphibians and 804 species of reptiles (Flores-Villela & Canseco-Márquez 2004); however, it is in second place for the number of extinct and threatened amphibians and reptiles (IUCN 2009). One of the most important components of Mexican biodiversity is the high species turnover (beta diversity) of endemic species: 65% of amphibians and 57% of reptiles in Mexico are endemics. About 70% of endemic amphibians and 53% of endemic reptiles in Mexico have restricted distributions (Flores-Villela 1993). The study region has the highest endemic herpetofauna diversity in the country (Ochoa-Ochoa & Flores-Villela 2006) and represents 50% of the physiographic provinces where Mexican herpetofauna occurs (Flores-Villela 1993).

Species' Distribution Database

We initiated the study with a secondary data set of species localities for 830 species of Mexican herpetofauna. This data set was compiled from 26 research projects and 106 biological collections and was corrected by Ochoa-Ochoa & Flores-Villela (2006), who standardized scientific names, eliminated dubious locality records, and discarded records for species with dubious synonymy.

To complement the data set, we conducted a search in three academic search engines (BIOONE, ISI Web of Knowledge, and REDALYC). We systematically searched paper titles and abstracts to find additional geographic records in the literature. Finally, we compiled data from theses, manuals, book chapters, and ongoing research projects that contained unpublished geographic records pertinent to our study (see Acknowledgments).

Ecological Niche Modeling

MaxEnt ecological niche modeling (Phillips et al. 2006, 2009) uses known occurrences and pseudo-absence data, resampled from the set of pixels where the species is not known to occur, to make inferences about probability of distribution of a species on the basis of probability of distribution of maximum entropy, association between species, and environmental variables in a geographic space. The resulting model represents the relative probability of the species' distribution over all grid cells in the defined geographic space where a high probability indicates that the space is predicted to have suitable environmental conditions for this species (Elith et al. 2006).

Nineteen environmental variables were obtained from the WorldClim database (http://www.worldclim.org) interpolated from data sets of global climate (Hijmans et al. 2005). We also used a spatial layer of elevation from the U.S. Geological Survey's Hydro-1K (http://edc.usgs.gov/products/elevation/gtopo30/gtopo30.html). Slope and topoindex were calculated on the basis of elevation in the Spatial Analyst extension in ArcView 3.3 (ESRI 2002). We resampled 22 layers of environmental and topographic variables at a resolution of 0.01°, or approximately 1 km^2 and clipped the layers to the study region bounded by 14.5341036 to 22.4714165 N and −103.737823 to −90.3728172 W (Supporting Information).

We ran MaxEnt under the "auto-features" mode as suggested by Phillips and Dudik (2008). Our use of the default settings was reasonable given that it was validated in studies with a wide range of species, environmental conditions, individual species records, and in cases with sample-selection bias (Phillips & Dudik 2008). By default, MaxEnt chose uniformly and at random 10,000 background samples of pseudo absences from the study area and used them in place of absences during modeling to represent the environmental conditions in the region (Phillips et al. 2006, 2009). We configured the machine-learning algorithm to use 75% of the species records for training the data set and 25% for testing the model. We determined the heuristic estimate of the relative contribution of each variable to species' distribution. We selected the logistic output format because it is robust when prevalence is unknown and easier to interpret as the estimated probability of a species' presence given the constraints imposed by environmental variables (Phillips & Dudik 2008). In this case, grid cells with a small logistic value were predicted to be unsuitable or only marginally suitable for the species under study given their assumed ecological niche.

We used MaxEnt software instead of other presence-only methods because its algorithm constrains predicted species ranges and thus reduces and avoids commission errors that could lead to erroneous conservation decisions (Urbina-Cardona & Loyola 2008). We produced a geographic distribution of the ecological-niche model for each species with MaxEnt software (Phillips et al. 2006) in order to include each species as conservation objectives in the CAN scenarios.

We chose the models to be included in the CAN prioritization on the basis of three criteria: higher area-under-the-curve (AUC) test values and lower standard deviation; higher test-data curve (in the receiver–operating characteristic [ROC] sensitivity-specificity plot [Phillips et al. 2006]) than the random-prediction curve; lower p values (<0.05) in the threshold test; and expert opinions of herpetologists to validate the distribution model for each species across the planning region and correct for possible overprediction by the models. The models that did not meet these criteria were eliminated from the process of area prioritization. We used test AUC values to estimate of the standard deviation of the AUC so that standard deviation values could be used as a measure of the uncertainty of the AUC parameter (DeLong et al. 1988). Thus, if standard deviation is low, then one can have greater confidence in the estimate of the AUC. We compared model performance between target groups by comparing the AUC values with Student's t tests.

Prioritization of CAN

We used ConsNet software (Ciarleglio et al. 2008, 2009) to design the CAN scenarios for herpetofauna. In ConsNet, the probability of a species' presence in each cell is obtained from the MaxEnt models and total representation for each species is the sum of all the probabilities.

The polygons of the PAs (1:250 000) were obtained from Bezaury-Creel et al. (2007) and were included in the ConsNet prioritization analysis as cells (n = 5217) from which site selection was initiated. Anthropogenic areas (human settlements, forest plantations, urban, agricultural, pastures) were identified with the third series of the land-use and vegetation layer (1:250 000; INEGI 2005) and were set in ConsNet as cells (n = 134,758) to be excluded from the prioritization and design of the CAN because they are presently unsuitable for survival of most species.

The conservation scenarios were evaluated across 153,229 cells of the planning region (i.e., 287,987 cells of the study area minus the 134,758 anthropogenic cells excluded from the analysis) for three target groups: all herpetofauna (537 species) and endemic (276 species) and threatened species (162 species). For each of the three target groups, we evaluated species' representation values of 10% and 30%, expressed as percentage of the total representation obtained from the probability of occurrence from the MaxEnt models and resulting in a total of six conservation scenarios.

ConsNet software uses a metaheuristic algorithm called self-learning tabu search that uses memory to avoid revisiting solutions that were discovered in previous iterations of the algorithm (Ciarleglio et al. 2008). It supports objectives based on rules and a dynamic neighborhood selection that controls possible movements during the search for solutions, and intelligently arranges the structure of the spatial problems (Ciarleglio et al. 2009). Using the species probability distribution for each cell in a geographic grid, ConsNet makes a binary decision (to select or not a cell to be put under a conservation plan) and orders each cell hierarchically on the basis of its biodiversity value. We built an objective that reduced the number of selected cells, maximized CAN compactness (called min cells and shape intransitive shape objective [ITS]), and met one of the two required targets of representation (i.e., 10% or 30%). For the six conservation-network scenarios, the MDS2 adjacency algorithm gave the best initial solutions on the basis of the fewest cells and lowest shape value. The MDS2 adjacency algorithm first selected cells that contained the species more distant from the representation target, and it reduced the representation deficit in the targets ("most deficient surrogates" [Ciarleglio et al. 2008]) and attempted to select cells that were contiguous with other previously selected cells. In this sense, the MDS2 algorithm uses rules similar to the concepts of rarity (i.e., the presence of taxa that are geographically restricted, less abundant, or have niche specificity) and complementarity (i.e., determining whether a new site maximizes the representation of taxa by measuring what that new site adds to the biodiversity represented by a previously existing set of sites [Margules & Sarkar 2007]).

On the basis of the initial solution generated by the MDS2 adjacency algorithm and using the same objective of min cells and ITS over the course of 306,500 iterations, we refined the initial solution with the "tabu search" for the six conservation scenarios on the basis of a strategic selection of "escape with spatial neighborhood." This allowed a compact CAN to be created when adding or deleting cells in an effort to attain a lower area to perimeter relationship (i.e., shape) with a strategy called adaptative tabu reactor. We ran 306,500 iterations to perform a thorough search with twice as many iterations as the number of cells in the network ($n = 153{,}229$).

In the final step of the CAN optimization, we began from the best solution that was currently available for the previous specific objective function and used the same objective (min cells and shape ITS) to refine prioritization over 153,229 iterations and used a basic strategic selection of "large neighborhood only" (i.e., a larger neighborhood is used to thoroughly explore the space around the current solution). This search is useful for refining best solutions because it assesses a large number of possible moves at each step and can make improvements that might otherwise have been missed (Ciarleglio et al. 2008, 2009).

The results of the six conservation scenarios solved by ConsNet were transformed into polygons, and we calculated the area and perimeter of the polygons with the Projector extension in ArcView (version 3.3; ESRI 2002) with an equal-area cylindrical projection.

Results

Ecological niche was modeled for 222 amphibians (11,170 records, mean [SD] 50.3 [88.8]) and 371 reptiles (23,449 records, mean [SD] 63.2 [97.06]) and was represented by 34,619 independent records (range 4–848, median 27). We identified 136 species that were both endemic and threatened with extinction to some degree (Supporting Information).

Main Variables in the Species' Distribution Models

The most important variables contributing to more than 30% of the 223 amphibian species distribution models were temperature seasonality (40.3%), precipitation of driest month (39%), precipitation seasonality (34.5%), and elevation (34.1%, Supporting Information). In the case of reptiles, the most important variables contributing to more than 30% of the 370 distribution models were elevation (36.2%), annual temperature range (35.1%), precipitation of driest month (34.6%), temperature seasonality (34.2%), mean diurnal range (31.1%), and precipitation seasonality (30%; Supporting Information).

Endemic amphibians and reptiles had a higher AUC value (mean [SD] 0.97 [0.083]) than all species taken together (mean [SD] 0.95 [0.095]) ($t = 3.6$; $p \leq 0.001$). There was no difference in AUC values of endemic species ($t = -1.91$; $p = 0.055$) compared with the values for threatened species (mean [SD] 0.98 [0.071]; Supporting Information). The AUC value for threatened species was higher than that of all species ($t = 4.7$; $p \leq 0.001$).

Prioritization of Conservation Area Networks

To protect herpetofauna in the planning region, it is necessary to preserve between 13.8% (for 10% target of threatened species) and 88.6% (for 30% target of all herpetofauna) of the total area under native vegetation (Table 2). The CAN generated for the six conservation scenarios required 76% to 96% more area than is currently covered by the national system of natural PAs (Table 2).

For the target of 10% species representation, CAN scenarios showed 74.7% overlap of endemic species CAN with that of all herpetofauna, 62.6% overlap of endemic species CAN with that of threatened species, and 58.8% overlap of herpetofauna CAN with that of threatened species (Fig. 1a–f). For the target of 30% representation, CAN scenarios showed 89.6% overlap of all herpetofauna CAN with that of endemic species, 82% overlap of endemic species CAN with that of threatened species, and 71.2% overlap of all herpetofauna CAN with that of threatened species (Fig. 1a–f).

The priority areas for the preservation of conservation scenarios with the target of 10% of the species' distributions included 32 native vegetation types (including preserved primary natural vegetation and secondary vegetation). For conservation of the three target groups at the 10% level, it was necessary to preserve almost the same proportion of habitat types: pine-oak forest (includes pine, oak, pine-oak, and oak-pine forests; range of values for three scenarios: 31.2–29.7%), tropical rain

Table 2. Solutions for six scenarios of conservation-area networks for the herpetofauna (all, endemic, and threatened species) of southeastern Mexico.

		Conservation scenarios / representation targets (10% or 30%)					
		all		*endemic*		*threatened*	
	Planning region	*10*	*30*	*10*	*30*	*10*	*30*
No. selected cells[a]	153,229	27,737	148,961	27,362	134,617	24,613	107,381
No. clusters[a]	5,594	3,488	5,815	2178	6,899	2,609	6,071
Perimeter (km)[a]	127,732	43,752	113,651	34,871	140,712	35,597	113,651
Area (km^2)[b]	180,605	27,533	160,120	28,251	143,514	24,901	114,140
Area out of PAs (%)[b]	88.6	78.91	96.00	79.50	95.60	76.76	94.55
Area of native vegetation types (%)[b]	100	15.24	88.65	15.64	79.46	13.78	63.20

[a] *Values obtained from the ConsNet solution.*
[b] *Values calculated from the refined and projected solutions (see Methods) (PA, protected area).*

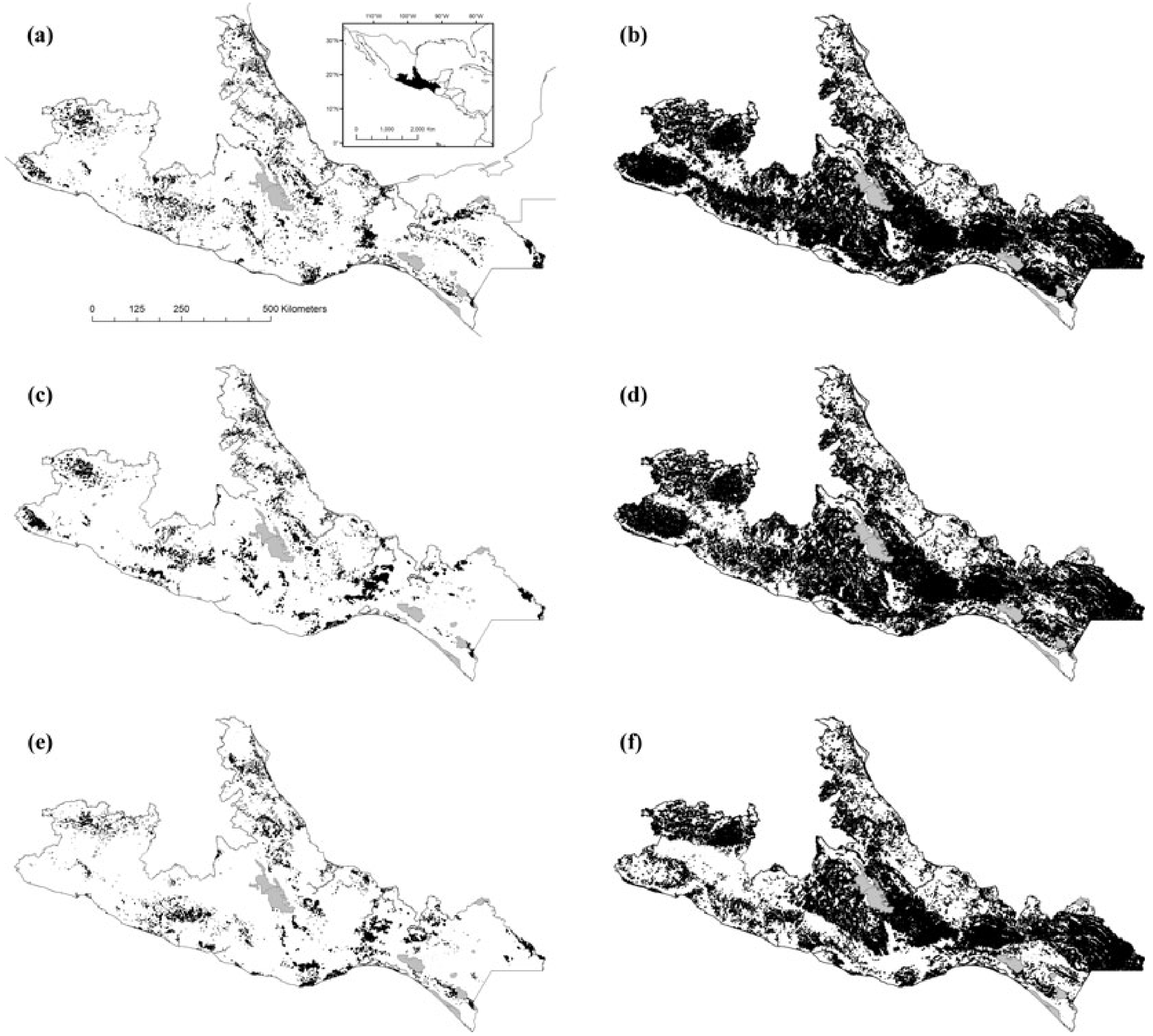

Figure 1. Prioritization of the conservation-area network along southeastern Mexico for protection of (a) all herpetofauna species, 10% target (i.e., species representation; 10% coverage of the total geographic range), (b) all herpetofauna species, 30% target, (c) endemic species of herpetofauna, 10% target, (d) endemic species of herpetofauna, 30% target, (e) threatened species of herpetofauna, 10% target, and (f) threatened species of herpetofauna, 30% target. Site selection was based on ConsNet analyses, including protected areas (PAs) and excluding anthropogenic vegetation types. Current Mexican PA networks are in gray, and the needed additional conservation-area networks are in black. The political limits of the planning region are shown in the inset of (a). See Table 2 and Supporting Information for a numerical summary of these results. Shape files can be obtained on request from J.N.U.-C.

forest (21.5–23.3%), tropical dry forest (15.8%–18.8%), and cloud forest (7.4–9.6%). The remaining area (19.8–23.1%) was covered by the other 28 vegetation types (Table 3).

We identified 26 regions that were constant and systematically prioritized for the conservation scenarios with 10% representation of all species and threatened and endemic species (Table 4). Almost two-thirds (19) of the 26 main areas were located in the highlands or mountain regions. The other one-third (seven) were in the lowlands. Twelve of the selected areas fell within the limits of at least one of the existing PAs (Table 4), but only six target areas included a significant proportion of a PA (areas 3, 18, 19, 21, 25, and 26 in Table 4). The other

Table 3. Area (km^2) of the vegetation types prioritized for the conservation scenarios for the herpetofauna (all, endemic, and threatened species) of southeastern Mexico.

		Representation target					
		10%			*30%*		
Vegetation type	*Planning region*	*all*	*endemic*	*threatened*	*all*	*endemic*	*threatened*
Natural							
pine forest	16, 952.8	2, 623.0	2, 864.5	2, 343.7	14, 900.5	13, 315.0	9, 225.1
oak forest	20, 723.4	2, 327.5	2, 376.3	1, 673.6	16, 532.8	14, 326.2	11, 015.9
oak-pine forest	8, 793.5	1, 030.9	1, 009.8	683.9	7, 386.3	5, 992.9	3, 945.8
pine-oak forest	36, 092.6	3, 244.8	3, 437.8	3, 057.7	30, 833.2	27, 301.8	18, 367.7
fir forest	373.6	80.6	58.3	76.3	329.3	313.1	327.4
drooping juniper (tascate) forest	802.5	123.9	154.3	123.3	666.9	656.7	474.6
mountain cloud forest	15, 578.7	2, 206.1	2, 084.8	2, 397.9	13, 692.8	11, 661.3	11, 155.7
chaparral	803.2	225.0	201.8	216.1	693.3	691.8	693.3
mangrove	1, 415.6	365.1	318.1	378.8	454.8	454.7	454.7
crasicaule scrub	1, 096.9	311.2	321.5	307.8	606.0	606.0	606.0
desert scrub	1, 423.3	335.0	311.2	424.2	1, 019.6	1, 002.5	1, 019.6
submontane scrub	1.4	0	0.7	0.7	0.9	0.9	0.9
mesquite	38.4	1.3	0.8	0.9	17.2	17.2	17.2
tropical cedar forest	13.4	0	0	0	9.4	9.3	9.4
gallery forest	32.3	9.7	7.1	5.8	19.3	15.8	11.5
halophilic vegetation	454.1	57.2	31.6	76.9	175.1	175.1	175.1
natural grassland	40.3	1.4	0	0.5	33.9	33.9	33.9
swamp	399.8	238.94	124.4	98.3	315.3	315.3	315.3
zacatonal grassland	75.6	25.9	38.1	29.5	70.0	69.9	70.0
savannah	702.4	220.8	58.9	154.3	601.4	600.9	568.5
tropical evergreen rainforest	31, 815.8	5, 931.0	6, 591.6	5, 552.1	29, 054.7	27, 424.2	28, 440.5
lower montane rainforest (selva alta subperennifolia)	549.2	318.7	319.3	347.6	375.3	375.3	375.3
tropical deciduous forest	54, 782.2	4, 867.7	5, 320.6	3, 933.5	32, 710.4	29, 734.0	20, 405.7
arid tropical scrub (selva baja espinosa caducifolia)	404.2	41.9	28.0	154.4	221.4	221.1	216.0
arid tropical scrub (selva baja espinosa subperennifolia)	36.7	25.7	24.3	25.2	31.0	31.0	31.0
tropical deciduous forest (selva baja perennifolia)	78.6	17.7	2.7	56.1	70.7	70.7	70.7
tropical deciduous forest (selva baja subcaducifolia)	28.4	0	0	0	25.3	25.3	2.5
gallery rainforest	25.6	0	0	0	3.4	3.4	3.4
tropical semideciduous forest (selva mediana caducifolia)	1921.3	511.6	442.9	702.6	1, 035.4	980.9	852.2
tropical semideciduous forest (selva mediana perennifolia)	3.5	1.1	0	0	2.2	2.2	2.2
tropical semideciduous forest (selva mediana subcaducifolia)	7502.6	609.2	631.6	401.8	3, 424.2	2, 908.8	1, 565.1
tropical semideciduous forest (selva mediana subperennifolia)	5193.7	1, 128.4	981.8	1, 132.2	3, 914.2	3, 282.8	2, 793.6
cattalis fields	1350.0	492.0	386.5	457.7	697.7	697.7	697.7
dune grassland	246.9	18.2	17.9	19.2	38.9	38.9	38.9
gallery vegetation	25.1	3.0	2.8	5.1	8.1	8.1	8.1
halophilic vegetation	215.7	138.5	100.0	63.0	149.0	149.0	149.0
Anthropogenic							
not applicable	158, 233.5	0	0	0	0	0	0
palm plantations	924.8	0	0	0	0	0	0
induced pasture	22, 700.2	0	0	0	0	0	0
introduced grass	1, 131.8	0	0	0	0	0	0
no vegetation	540.6	0	0	0	0	0	0

Table 4. Areas that deserve attention in solutions with targets of 10% representation for the conservation scenarios for the herpetofauna (all, endemic, and threatened species) of southeastern Mexico (see Fig. 1a–f).*

	Area					
Representation target	*Michoacán*	*Guerrero*	*Oaxaca*	*Puebla*	*Veracruz*	*Chiapas*
10% all spp.	1, 2, 3	4, 5, 6	7, 8, 9, 10, 11	12, 13, 14, 18	15, 16, 17, 18, 19, 20	21, 22, 23, 24, 25, 26
10% endemic spp.	1, 2, 3	4, 5, 6	7, 8, 9, 10, 11	12, 13, 14, 18	15, 16, 17, 18, 19, 20	21, 22, 23, 26
10% threatened spp.	1, 3	5, 6	8, 9, 10, 11	12, 18	16, 17, 18, 19, 20	21, 23, 24, 25, 26

Key: †, natural protected areas whose limits fall within those of any of the selected areas; **, cover a significant portion of the target; ‡, marginal or cover a small area of the selected targets. Number key: 1, region between Penjamillo (NE) ‡, Tingambato (SE) ‡, Paracho ‡, Pajuacarán (NW), and Periban (SW) ‡ in Michoacán (Pico de Tancítaro †, Barranca del Cupatitzio †); 2, western Sierra de Coalcomán ‡ between Villa Victoria and Aquila, Michoacán; 3, central Balsas Basin on the Temascaltepec River ‡, near the Infiernillo Dam (south of Gámbara †, Zicurián †, and La Huacana †), Michoacán (Zicuarán-Infiernillo †,); 4, Arcelia ‡, Guerrero; 5, Teloloapan ‡, Guerrero; 6, central Guerrero on Sierra Madre del Sur ‡ between Tlacotepec, Yextla, Chichihualco, and Chilapa Guerrero (General Juan N Alvarez †); 7, Sierra de Tlaxiaco ‡, South of Huajuapan de León ‡, Oaxaca (Boquerón de Tonalá †); 8, extension of Sierra de Tlaxiaco ‡ between Santa María Asunción and Santa María Zaniza ‡, Oaxaca; 9, surroundings of the Presidente Miguel Alemán Dam ‡, Oaxaca; 10, triangle between Pluma Hidalgo ‡, San Miguel del Puerto ‡, and Sta. María Huatulco ‡, Oaxaca (Huatulco †); 11, Los Chimalapas ‡, Oaxaca; 12, Sierra Norte de Puebla (between Huauchinango †, Tlatlauquitepec †, Zacapuaxtla †, and Cuetzalan †), Puebla (Cuenca H. del Río Necaxa †); 13, between Izucar de Matamoros and Huahuapan de León ‡, Oaxaca, between the drainage basins of the Atoyac and Acatlán rivers ‡, Puebla; 14, Sierra del Monumento ‡, Central Puebla; 15, Delta of the Panuco River ‡, Veracruz; 16, Tuxpan ‡, Veracruz; 17, coastal central Veracruz along Highway 180 and towns of Emilio Carranza-Cardel ‡, Calipa ‡, Juchique de Ferrer ‡, and Las Hayas ‡, Veracruz; 18, eastern Trans-Mexican Volcanic Belt ‡ between Cofre de Perote ‡ and Cañón del Río Blanco ‡, Puebla-Veracruz (Cofre de Perote mountain †,**, Mount Orizaba †,** and Río Blanco Canyon †,**); 19, Sierra de Los Tuxtlas ‡, Veracruz; 20, Nanchital ‡, Veracruz; 21, Agua Azul-Ocosingo region ‡, Chiapas (Chan-Kin †,**, Lacan-Tum †,**); 22, Marquéz de Comillas ‡, Chiapas; 23, Salto de Agua ‡, Tumbalá ‡, Amatlán ‡, Chiapas; 24, El Ocote, Chiapas (El Ocote **); 25, Sierra del Soconusco ‡, Chiapas (El Triunfo †,**); 26, Motozintla, Tacaná ‡, Chiapas ‡ (Tacaná Volcano) †,**.*

six targets fell marginally within the limits of an existing PA or the target areas were significantly larger than the existing PAs (areas 1, 6, 7, 10, 12, 24 in Table 4).

Discussion

Ecological Niche Modeling and Representation Targets

It is likely that the accuracy of niche modeling varies systematically across biological groups (McPherson & Jetz 2007; Pawar et al. 2007). It has been suggested that more-accurate niche models can be generated for species with narrow ecological niches, such as microendemics, because they have narrow distribution ranges (Tsoar et al. 2007). We found that the AUC prediction value for distribution models for the endemic and threatened species of herpetofauna had higher values than the AUC values for all herpetofauna.

We also found differences in the variables that influence species' geographic distribution in this study when we compared the relative contributions of the most important environmental variables influencing 10 anuran species' distribution in southeastern Mexico (Appendix S2) with those variables influencing the distribution of the same species at the broader spatial scale of Mesoamerica (Urbina-Cardona & Loyola 2008). Although elevation, temperature seasonality, precipitation of driest month, and precipitation seasonality broadly influenced amphibian and reptile distribution, for reptiles temperature annual range and mean diurnal range were important because these variables affect the thermal environment requirements for reptiles to efficiently thermoregulate.

Ours is one of the few studies to use probability data on species' distribution to systematically plan the conservation of herpetofauna on a fine scale, and this is important because herpetofauna is the most threatened group of all terrestrial vertebrates. The areas selected to preserve 30% of the geographic range of each species, represent 63% to 88% of the areas with native vegetation and would require implementing a CAN that covers 94% to 96% of the areas outside of current PAs, an area of land that would not be cost-effective to acquire. It would be impossible to protect these areas because of logistical, political, economic, and financial restrictions. This reinforces the need to implement conservation strategies not only within the PAs, but also by collaborating in private local initiatives (Ochoa-Ochoa et al. 2009b). Although it is possible that a target of 10% would not represent a sufficient portion of the geographic range for maintaining viable populations of species, working with conservation scenarios with targets of 10% species representation allow a more feasible alternative for implementing CANs.

Prioritization of CAN and Spatial Scale

In the study region, there are 32 native primary and secondary vegetation types, and these cover 53% of the study area. Nevertheless, only 11.4% of this native vegetation is currently under protection within a natural PA (Table 2). Given that 47% of the original vegetation of the study region has been modified by anthropogenic activities, representing the herpetofauna properly would require up to 80% of their range to be covered by native vegetation (Appendix S2 and S3).

With the increase in annual deforestation rate, it has become increasingly difficult to design areas for conservation in environments with native vegetation. Because of the need to preserve a significant portion of biodiversity in natural areas, more human and financial resources are needed to accomplish this goal.

When comparing our results with other analyses of conservation-area prioritization done with other biodiversity surrogates and at different spatial scales, we found that CANs to preserve Mexican biodiversity and ecoregions on a semicontinental scale (Sarkar et al. 2009) were coincidental with our solution in almost 30% of the 26 main selected areas in our study; CANs selected to conserve Mexican biodiversity from a study at a country level (Koleff et al. 2009) overlap with over 50% of our main selected areas (Table 4); results of a regional study on mammals in Mexico (Fuller et al. 2007) show very little coincidence with our results. It seems that the prioritized scenarios in this study are not similar to those of Mexican mammals at finer scales, but the scenarios do agree more with those that include other species groups at broader spatial scales.

Biological processes differ from broad to fine scales, and conservation priorities and decision-making scenarios may also vary with scale for the same region and same species group (Margules & Sarkar 2007). A recent GAP analysis of Mexico revealed that 74% of amphibians and 81.7% of reptiles are present in at least one natural PA, although different algorithms (e.g., ResNet, CPlex, Marxan) led to a different sites being selected (Ochoa-Ochoa et al. 2009a). Comparing Ochoa-Ochoa et al.'s (2009a) results in a broad-scale study with 10% representation with our results at a finer scale, the area prioritized for all herpetofauna species overlaps only 25%. The area for endemic species overlaps 32%, and the area for threatened species overlaps only 28%. These differences can be partially accounted for by the difference in scale, but occur mainly because Ochoa-Ochoa et al. (2009a) prioritized conservation areas throughout the country regardless of the type of land use rather than forcing the algorithm to prioritize exclusively natural vegetation, which masks the acute problem of fine-scale deforestation that is eliminating the last relicts of native vegetation that support populations of species with narrow distributional ranges.

We detected some agreement between the selected sites with a 10% target in our study and those of other fine-scale studies of herpetofauna hotspots along the Pacific coast. For all herpetofauna species, we found some priority areas in common with García (2006) in southwestern Michoacán, central Oaxaca, and the interior valleys of Guerrero. For endemic species, there was some similarity between our areas and those of García (2006) in southwestern Michoacán and the interior valleys of Guerrero. For threatened species, only some of our selected areas in central Oaxaca were similar to those in García (2006).

For the consistently prioritized regions in our study (Table 4), the data are not very promising because most of these areas are outside current PA limits. A previous analysis showed that centers of endemic species are located in our study area (Ochoa-Ochoa & Flores-Villela 2006), but a comparison with our results showed that only 38.4% of our target areas are within the limits of those centers of endemism. This discrepancy could be due to the influence and importance of range size for species that are not endemic, and for threatened species the discrepancy could be because they do not necessarily occupy areas of high endemism.

The majority of the areas selected in our study were located in mountainous regions in southeastern Mexico. Despite the fact that many of the Mexican PAs are located above 3000 m (Cantu et al. 2004), the mountainous regions in southeastern Mexico are underrepresented in the current PA system and represent areas of high diversity for many species of endemic salamanders and frogs. Between 1993 and 2003, 55 species from Chiapas, Guerrero, and Oaxaca were described as new and another 23 new species were discovered in Michoacán, Puebla, and Veracruz (Flores-Villela & Canseco-Márquez 2004). The survival of many of these species depends on the protection of montane areas with pine-oak forest and cloud forest and lowland areas with tropical rain and dry forest.

Establishing representative CANs where biodiversity can persist should be a policy goal for the government agencies responsible for conservation and natural resource management, intergovernmental, and nongovernmental organizations (Margules & Sarkar 2007). Conservation at the local level needs to be recognized as an essential component in addressing the biodiversity crisis (Ochoa-Ochoa et al. 2009b). Our minimum-area approach to prioritizing areas for conservation is based on the use of rarity and complemetarity to obtain a quantitative solution to herpetofauna species representation, sets objectives at a fine spatial scale, and takes into account land-use patterns. This protocol could be included in the selection of CANs to strengthen the practice of conservation planning elsewhere in the world.

Our results show that the CANs needed to preserve Mexican herpetofauna should not be used to identify priority areas for other groups of Mexican biota. One group of species may be a good surrogate for species in a region, but there is no guarantee that it will be a good predictor elsewhere, and the distribution of species among higher taxa can change from place to place (Gaston 1996). To set real targets of representation for each species and to ensure the persistence of biodiversity in selected areas, more work is needed to quantify viable population sizes, phylogenetic diversity, species home ranges, and source–sink population structure to define design criteria: size, shape, compactness, connectivity, dispersion, width of buffers, spacing, replication, and alignment (Margules & Sarkar 2007). To fill knowledge gaps, better distributional data and models of biodiversity for predicting biological and socioeconomic features (e.g., poverty, natural disasters, and distance to roads) of the region being analyzed are needed. Although current data sets are far from ideal, they must be used to mitigate the loss of natural habitat in the face of inadequate policy and planning decisions that are being made every day (Margules & Sarkar 2007).

Conclusions

Use of conservation planning tools can improve existing PAs by showing decision makers how PAs can be transformed into better and more efficient networks (Margules & Sarkar 2007). We identified conservation areas that are not included in the current national system of PAs that ensure representation of 80% of the Mexican herpetofauna and provide tools to guide delineation and refinement of policy alternatives.

There are more than 126 institutions working on biodiversity conservation in the planning region (http://www.directorio-delaconservacion.org.mx/directorio/instituciones.php [accessed April 2009]). If conservation NGOs purchase land, they need to know what the true biodiversity priorities are because just purchasing the cheapest land or whatever land becomes available will not necessarily contribute to biodiversity conservation and may only increase the number of inefficient ad hoc reserves (Margules & Sarkar 2007). Our planning protocols are support tools that can help local experts make good policy decisions. Nevertheless, before implementation of a CAN, it is important to identify previous conservation-area selection exercises that have been done in the region to redefine the ideal spatial configuration of the network. Multicriteria analysis is needed to satisfy divergent socioeconomic criteria and to identify natural hazards, vulnerability, and conservation goals of stakeholders during implementation at the local scale. Budgetary, ethical, and other sociopolitical constraints will determine whether prioritized sites can represent and ensure persistence of biodiversity with minimum overlap with human activities (Sarkar et al. 2006). It is only by managing whole regions and natural gradients on different spatial scales and by taking into account socioeconomic, ecosystem, and evolutionary processes and the mechanisms that support biodiversity that species will be protected from the threats they face and be assured of survival for generations to come.

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Supporting Information

"Codes for 22 environmental variables layers used to model species distribution" is available as part of the online article (Appendix S1). "Herpetofauna species distribution in southeast Mexican states, number of localities, threat and endemic categories and relative contribution of the environmental variables to the distribution models" is available as part of the online article (Appendix S2). "Values for the representation targets for herpetofauna species in the conservation scenarios in southeastern Mexico" is available as part of the online article (Appendix S3).

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Appendix S1. Codes for 22 environmental variables layers used to model species distribution

Variable code	Variable type
BIO1	Annual Mean Temperature
BIO2	Mean Diurnal Range: Mean of monthly (max temp - min temp)
BIO3	Isothermality: (P2/P7)* 100
BIO4	Temperature Seasonality (standard deviation *100)
BIO5	Max Temperature of Warmest Month
BIO6	Min Temperature of Coldest Month
BIO7	Temperature Annual Range (P5-P6)
BIO8	Mean Temperature of Wettest Quarter
BIO9	Mean Temperature of Driest Quarter
BIO10	Mean Temperature of Warmest Quarter
BIO11	Mean Temperature of Coldest Quarter
BIO12	Annual Precipitation
BIO13	Precipitation of Wettest Month
BIO14	Precipitation of Driest Month
BIO15	Precipitation Seasonality (Coefficient of Variation)
BIO16	Precipitation of Wettest Quarter
BIO17	Precipitation of Driest Quarter
BIO18	Precipitation of Warmest Quarter
BIO19	Precipitation of Coldest Quarter
DEM	Elevation
SLOPE	Degrees based on local differences in DEM
TOPOINDEX	Index of the topographic maps

Appendix S2. Herpetofauna species distribution in southeast Mexican states, number of localities, threat and endemic categories and relative contribution of the environmental variables to the distribution models. O: Oaxaca, C: Chiapas, V: Veracruz, G: Guerrero, P: Puebla, M: Michoacán. CR: critically endangered, EN: endangered, VU: vulnerable. The shape files of conservation area network prioritization scenarios are available from http://sites.google.com/site/nurbina77/site_prioritization_niche

Species	*Number of records*	*State*						*Endemic*	*Threat category*	*AUC (SD)*	*Relative contribution of the most important environmental variables to the model*			
		O	*C*	*V*	*G*	*P*	*M*				*1*	*2*	*3*	*4*
AMPHIBIANS														
Agalychnis callidryas	75	X	X	X						0.93 (0.02)	bio3 (25.6%)	bio14 (23%)	dem (17.2%)	bio4 (12.6%)
Agalychnis moreleti	42	X	X	X	X	X			CR	0.89 (0.05)	dem (18.3%)	bio2 (18%)	bio13 (16%)	bio7 (13%)
Ambystoma amblycephalum	9						X	X	CR	0,99	bio6 (43.4%)	bio7 (21.4%)	slope (15%)	bio15 (7.6%)
Ambystoma andersoni	6						X	X	CR	1	bio7 (58.3%)	bio11 (12%)	bio8 (9.2%)	bio6 (5.6%)
Ambystoma dumerili	13						X	X	CR	1 (<0.001)	bio6 (30.6%)	bio7 (16.4%)	bio8 (13%)	bio9 (10.4%)
Ambystoma ordinarium	23						X	X	EN	0.99 (0.004)	dem(30.9%)	bio7 (15.6%)	bio17 (14%)	bio6 (8.2%)
Ambystoma rivularis	3				X		X	X						
Ambystoma taylori	1					X			CR					
Ambystoma tigrinum	37			X		X	X			0.96 (0.013)	bio13 (42%)	dem (13.6%)	bio16 (11%)	bio6 (8%)
Anotheca spinosa	36	X	X	X						0.92 (0.036)	bio14 (35.5%)	bio2 (23.4%)	slope (14.4%)	bio15 (11%)
Bolitoglossa alberchi	4	X		X						0.99 (**)	bio12 (42.7%)	bio2 (21.6%)	topoind (11.6%)	bio6 (9%)
Bolitoglossa engelhardti	1		X						EN					
Bolitoglossa flavimembris	1		X						EN					
Bolitoglossa flaviventris	13		X							0.99 (<0.001)	bio16 (65.5%)	bio4 (14%)	bio3 (11%)	bio11 (6%)
Bolitoglossa franklini	10		X						EN	0.99 (0.003)	bio16 (62%)	bio4 (35.5%)	bio17 (2%)	topoind (0.4%)
Bolitoglossa hartwegi	27		X							0.99 (0.002)	dem (32%)	bio7 (21%)	bio14 (13%)	bio3 (7.8%)

Bolitoglossa hermosa	3				X									
Bolitoglossa lincolni	11		X							0.99 (0.002)	bio5 (24.6%)	bio4 (20.3%)	bio8 (15.6%)	bio7 (10.4%)
Bolitoglossa macrinii	17	X						X	VU	0.97 (0.007)	bio3 (64%)	bio13 (12%)	bio14 (5%)	bio4 (4.3%)
Bolitoglossa mexicana	38		X	X						0.83 (0.055)	bio15 (28.3%)	slope (19.7%)	bio7 (10.3%)	bio4 (10.1%)
Bolitoglossa mulleri	1		X						VU					
Bolitoglossa oaxacensis	2	X												
Bolitoglossa occidentalis	22	X	X							0.96 (0.018)	bio4 (47.6%)	bio16 (16.8%)	bio13 (8.8%)	bio12 (5.8%)
Bolitoglossa platydactyla *	142	X	X	X		X		X		0.96 (0.015)	bio4 (38.3%)	bio14 (19.3%)	bio5 (7.5%)	bio15 (6.7%)
Bolitoglossa riletti	12	X						X	EN	0.99 (<0.001)	bio2 (61%)	bio12 (7.3%)	dem (6.6%)	bio16 (6.1%)
Bolitoglossa rostrata	8		X						VU	0,99	bio5 (30.1%)	bio15 (14.1%)	bio4 (13.8%)	bio3 (12.6%)
Bolitoglossa rufescens	112	X	X	X						0.93 (0.022)	bio14 (28.2%)	bio4 (19.2%)	bio15 (12%)	bio12 (7.3%)
Bolitoglossa stuarti	1		X						EN					
Bolitoglossa zapoteca	3	X												
Bromeliohyla bromeliacea	1		X						EN					
Bromeliohyla dendroscarta	23	X		X		X		X	CR	0.97 (0.015)	bio14 (47.2%)	dem (18.5%)	bio15 (18%)	bio4 (10.1%)
Incilius bocourti	48		X							0.89 (0.081)	bio4 (34.5%)	bio5 (16.4%)	bio14 (15.9%)	bio3 (11.4%)
Incilius campbelli	4	X	X							0.78 (**)	bio9 (75.4%)	bio18 (14.3%)	bio13 (10.4%)	
Incilius canaliferus	103	X	X				X			0.94 (0.027)	bio11 (23.3%)	bio4 (23.1%)	bio13 (21.4%)	bio14 (7.2%)
Incilius cavifrons	54			X					EN	0.98 (0.011)	bio2 (54.8%)	bio19 (32.3%)	bio15 (3.4%)	slope (3.2%)
Incilius coccifer	26	X	X				X			0.99 (0.004)	bio14 (29.1%)	dem (27.7%)	bio19 (18.4%)	slope (9.3%)
Anaxyrus compactilis	23					X	X	X		0.95 (0.014)	bio7 (63.2%)	slope (6.9%)	dem (5.5%)	bio4 (5.1%)
Incilius cristatus	39		X	X		X		X	CR	0.96 (0.023)	bio14 (36.5%)	bio15 (22.1%)	bio4 (11.3%)	dem (10.2%)
Incilius cycladen	15	X			X				VU	0.92 (0.039)	bio15 (67%)	bio3 (11.8%)	bio19 (9.1%)	bio16 (4.9%)
Incilius gemmifer	4				X			X	EN	0.98 (**)	bio15 (37.3%)	bio11 (27%)	bio14 (9%)	bio3 (6.1%)
Incilius luetkeni	1		X											
Incilius macrocristata	42	X	X						VU	0.94 (0.028)	bio7 (34.9%)	bio15 (30%)	bio4 (12.4%)	dem (10.6%)
Rhinella marina	517	X	X	X	X	X	X			0.73 (0.027)	bio2 (17.9%)	bio4 (13.2%)	bio6 (10.8%)	bio18 (9.4%)

Incilius marmoreus	275	X	X	X	X	X	X	X		0.85 (0.042)	bio15 (21.8%)	bio4 (15.2%)	bio11 (14.8%)	bio7 (9.9%)
Incilius nebulifer	83			X		X				0.98 (0.006)	bio4 (68.4%)	bio18 (10.2%)	bio14 (9.4%)	bio15 (4.6%)
Incilius occidentalis	278	X		X	X	X	X			0.84 (0.024)	bio6 (21.4%)	bio15 (16.9%)	dem (15.7%)	bio13 (10.3%)
Incilius perplexus	99	X	X		X	X	X	X	EN	0.86 (0.054)	bio14 (39.5%)	bio6 (12.3%)	bio15 (8.9%)	dem (8.4%)
Incilius pisinnus	4						X			0.99 (**)	bio18 (46%)	bio2 (18%)	bio15 (16%)	bio4 (8.7%)
Incilius spiculatus	19	X				X		X	EN	0.97 (0.024)	slope (24.2%)	bio14 (17.2%)	bio16 (17.1%)	bio13 (11.4%)
Incilius tacanensis	8		X						EN	0,99	bio12 (63%)	bio3 (17.2%)	slope (16.2%)	bio18 (2.7%)
Incilius tutelarius	26	X	X						EN	0.97 (0.013)	bio7 (28.3%)	bio18 (20.7%)	bio4 (17.7%)	bio15 (10%)
Incilius valliceps	548	X	X	X						0.90 (0.011)	bio7 (25.6%)	bio2 (15.3%)	bio4 (14%)	bio16 (7%)
Charadrahyla altipotens	10	X							CR	0.93 (0.036)	bio3 (40.9%)	topoind (38%)	bio14 (9.2%)	bio19 (5.5%)
Charadrahyla chaneque	27	X	X					X	EN	0.87 (0.105)	bio14 (21%)	slope (19.1%)	bio13 (15.2%)	bio16 (10.1%)
Charadrahyla nephila	30	X		X				X	VU	0.90 (0.081)	bio14 (19.5%)	slope (18.1%)	bio19 (17.1%)	bio16 (13.4%)
Charadrahyla taeniopus	34			X		X		X	VU	0.99 (0.002)	bio14 (34.5%)	bio9 (22.5%)	bio4 (15%)	dem (9.1%)
Charadrahyla trux	4				X			X	CR	0.99 (**)	bio7 (39.3%)	bio4 (28.6%)	dem (14.5%)	bio15 (9.5%)
Chiropterotriton chiropterus	69	X		X	X	X		X		0.99 (0.002)	bio9 (40%)	bio14 (24.8%)	bio4 (9%)	bio12 (6.4%)
Chiropterotriton lavae	12			X				X	CR	1 (<0.001)	bio2 (28.6%)	bio9 (26.1%)	bio15 (9.9%)	bio6 (6.1%)
Cryptotriton adelos	6	X						X	EN	0,99	bio9 (40.1%)	bio16 (27.1%)	bio2 (11%)	bio3 (10.6%)
Cryptotriton alvarezdeltoroi	2		X					X	EN					
Dendropsophus ebraccatus	42	X	X	X						0.98 (0.004)	bio14 (30.6%)	bio2 (18.9%)	bio16 (12.1%)	dem (10.4%)
Dendropsophus microcephala	72	X	X	X						0.90 (0.035)	dem (32%)	bio14 (31%)	topoind (9.7%)	bio4 (9.4)
Dendropsophus robertmertensi	41	X	X							0.97 (0.031)	bio11 (31.8%)	bio14 (15.2%)	bio7 (12.3%)	bio4 (7.1%)
Dendropsophus sartori	8	X			X			X		0,99	bio3 (41.8%0	bio11 (21.8%)	dem (12.2%)	bio14 (12.2%)
Dendrotriton megarhinus	2		X					X	VU					
Dendrotriton xolocalcae	5		X					X	VU	0,99	bio13 (30.1%)	bio4 (23.1%)	bio16 (22%)	bio3 (6.6%)
Duellmanohyla chamulae	12		X					X	EN	0.99 (<0.001)	bio15 (66%)	bio8 (14.7%)	bio7 (6.5%)	bio3 (4.3%)
Duellmanohyla ignicolor	16	X						X	EN	0.99 (0.001)	bio16 (55.4%)	topoind (7%)	bio18 (5.4%)	bio3 (5.2%)
Duellmanohyla schmidtorum	10		X					X	VU	0.98 (0.009)	bio16 (54.2%)	bio4 (41.5%)	bio14 (3.5%)	bio11 (0.4%)

Ecnomiohyla echinata	3	X						X	CR					
Ecnomiohyla miotympanum	179	X	X	X		X		X		0.95 (0.013)	bio15 (20.5%)	bio4 (16.6%)	bio5 (15.2%)	bio14 (9.6%)
Ecnomiohyla valancifer	6			X				X	CR	0,99	bio2 (62.1%)	bio18 (36.2%)	bio4 (1.1%)	bio3 (0.4%)
Craugastor alfredi	60	X	X	X					VU	0.88 (0.041)	bio14 (54.8%)	bio4 (15.3%)	bio18 (6.6%)	bio15 (6%)
Craugastor amniscola	8		X							0,72	bio3 (38.2%)	bio16 (35.8%)	bio14 (13.1%)	bio7 (11.2%)
Eleutherodactylus angustidigitorum	47						X	X	VU	0.98 (0.004)	dem (24.3%)	bio16 (20.6%)	bio6 (14.7%)	bio7 (14.5%)
Craugastor augusti	45	X			X	X	X			0.93 (0.052)	dem (28.2%)	bio14 (17.7%)	bio12 (11.9%)	topoind (11%)
Craugastor berkenbuschi	87	X		X		X		X		0.92 (0.028)	bio14 (42.2%)	bio15 (19.4%)	slope (9%)	bio3 (7%)
*Eleutherodactylus cystignathoides **	45			X		X				0.98 (0.008)	bio14 (40.5%)	bio4 (12.4%)	bio9 (10.2%)	dem (8.6%)
Craugastor decoratus	28			X		X		X	VU	0.93 (0.053)	bio14 (39.4%)	bio9 (26.2%)	bio4 (7.2%)	bio8 (6.2%)
Eleutherodactylus dilatus	11				X			X	EN	0.93 (0.002)	bio4 (35.3%)	dem (28.6%)	bio15 (14.1%)	bio14 (8.8%)
Craugastor dixoni	7				X			X	CR	0,99	bio9 (20.9%)	bio15 (20.9%)	dem (12.1%)	bio14 (11.1%)
Craugastor glaucus	3		X											
Craugastor greggi	11		X						CR	0.98 (0.009)	bio12 (48.9%)	bio3 (20%)	slope (14.4%)	bio13 (11.3%)
Craugastor guerreroensis	3				X			X	CR					
Craugastor hobartsmithi	18				X		X	X	EN	0.91 (0.011)	dem (38.3%)	bio15 (14.1%)	topoind (14%)	bio16 (5.5%)
Craugastor laticeps	8	X	X	X						0,82	bio7 (52%)	bio12 (38%)	bio15 (6.3%)	bio6 (2%)
Craugastor lineatus	35	X	X						CR	0.69 (0.167)	bio14 (35.8%)	bio7 (22.7%)	bio13 (14.8%)	dem (9%)
Craugastor loki	19	X		X						1 (<0.001)	bio2 (41.1%)	bio14 (22.7%)	bio18 (11.8%)	bio12 (8.3%)
Craugastor matudai	11		X						VU	0.99 (0.002)	bio4 (46.5%)	bio13 (38.1%)	bio18 (5.8%)	bio16 (3.8%)
Craugastor maurus	3						X	X						
Craugastor megalotympanum	6			X				X	CR	0,99	bio2 (75.5%)	topoind (12%)	bio12 (9%)	slope (2%)
Craugastor mexicanus	178	X		X	X	X		X		0.92 (0.023)	bio5 (23.7%)	bio11 (13.7%)	slope (10%)	bio7 (8.5%)
Eleutherodactylus nitidus	192	X		X	X	X	X	X		0.92 (0.016)	bio12 (24.8%)	dem (20.6%)	bio15 (7.7%)	bio19 (6.7%)
Craugastor occidentalis	1						X	X						
Craugastor omiltemanus	17				X			X	EN	0.99 (0.001)	bio4 (21.3%)	bio8 (13.5%)	bio7 (12%)	dem (9.5%)

Craugastor palenque	3		X											
Craugastor pelorus	7		X					X		0,99	bio15 (91.8%)	bio3 (4.4%)	bio17 (2.7%)	bio18 (0.5%)
Eleutherodactylus pipilans	110	X	X		X					0.82 (0.049)	bio4 (24.6%)	bio14 (12.3%)	bio18 (11.5%)	dem (10.2%)
Craugastor planirostris	1			X										
Craugastor polymniae	1	X							CR					
Craugastor pozo	9	X	X						CR	0,97	bio13 (48.6%)	bio7 (35%)	bio18 (6.8%)	bio3 (3.2%)
Craugastor pygmaeus	131	X	X	X	X		X		VU	0.84 (0.039)	bio4 (17.6%)	bio12 (17.5%)	bio16 (11.3%)	bio6 (9.1%)
Craugastor rhodopis	165	X	X	X		X		X	VU	0.96 (0.014)	bio18 (19.8%)	bio3 (15.7%)	bio2 (11.6%)	bio12 (9.3%)
Eleutherodactylus rubrimaculatus	16		X						VU	0.99 (0.001)	bio16 (43.1%)	bio3 (33.8%)	bio13 (13%)	bio4 (6.1%)
Craugastor rufescens	4						X	X	CR	0.99 (**)	bio4 (31.2%)	bio18 (19.4%)	bio3 (18.1%)	bio17 (13.6%)
Craugastor rugulosus	127	X	X		X		X	X		0.94 (0.017)	bio4 (39.9%)	bio19 (14%)	bio15 (11.8%)	bio6 (7.8%)
Craugastor rupinius	12		X							0.80 (0.136)	bio16 (62%)	bio4 (21.5%)	bio14 (6%)	bio17 (5.1%)
Craugastor sartori	9		X					X	EN	0,99	bio16 (52.6%)	bio4 (37.3%)	bio18 (4.8%)	bio14 (2.3%)
Craugastor silvicola	1	X						X	EN					
Craugastor spatulatus	39	X		X		X		X	EN	0.99 (0.002)	bio14 (37.2%)	bio15 (18.4%)	slope (9.1%)	bio16 (8.8%)
Craugastor stuarti	15		X						EN	0.97 (0.001)	bio15 (28.8%)	bio14 (19%)	bio4 (16%)	bio3 (13%)
Eleutherodactylus syristes	5	X						X	EN	0,99	bio3 (65%)	bio6 (15.7%)	bio14 (7.5%)	bio19 (6.1%)
Craugastor taylori	1		X					X						
Craugastor uno	1				X				EN					
Eleutherodactylus verrucipes	21					X		X	VU	1 (<0.001)	bio14 (38%)	bio7 (20.8%)	slope (16.3%)	bio4 (12%)
Craugastor vocalis	9						X	X		0,89	bio14 (80%)	bio9 (9.4%)	bio18 (4.1%)	bio12 (3.8%)
Craugastor vulcani	62			X				X	EN	0.99 (0.001)	bio2 (52.1%)	bio19 (23.3%)	slope (6.8%)	bio18 (5%)
Craugastor xucanebi	1		X						VU					
Exerodonta abdivita	4	X								1 (**)	bio16 (23%)	slope (22.3%)	bio13 (20%)	bio4 (12.6%)
Exerodonta bivocata	6		X							0,99	bio15 (74.4%)	bio8 (14.1%)	bio3 (6.9%)	bio16 (3%)
Exerodonta chimalapa	8	X	X						EN	0,97	bio7 (66.5%)	bio19 (17.8%)	bio2 (10%)	bio4 (2.5%)
Exerodonta juanitae	15	X			X			X	VU	0.94 (0.021)	bio3 (62%)	bio14 (19.4%)	slope (7.9%)	bio19 (4.8%)

Exerodonta melanomma	35	X			X			X	VU	0.92 (0.046)	bio14 (20.3%)	bio16 (16.6%)	bio4 (15.6%)	bio19 (11.8%)
Exerodonta pinorum	10	X			X			X	VU	0.90 (0.014)	bio4 (64.7%)	bio15 (31.5%)	bio16 (1.5%)	bio19 (1.1%)
Exerodonta smaragdina	16					X	X	X		0.75 (0.094)	bio14 (91.7%)	bio4 (6%)	bio8 (2.1%)	bio18 (0.2%)
Exerodonta sumichrasti	74	X	X		X			X		0.76 (0.065)	bio7 (31.2%)	bio19 (19.8%)	bio4 (19.2%)	bio14 (6%)
Exerodonta xera	16	X				X		X	VU	0.97 (0.021)	bio16 (66.3%)	topoind (9.1%)	bio9 (7.1%)	bio18 (5.5%)
Gastrophryne elegans	19		X	X						0.91 (0.073)	bio2 (36.6%)	bio19 (23.5%)	bio14 (13.1%)	bio18 (12.2%)
Gastrophryne usta	158	X	X	X	X					0.88 (0.03)	dem (30.8%)	bio15 (8.8%)	bio16 (8.1%)	bio17 (6.4%)
Hyalinobatrachium fleischmanni	65	X	X	X	X					0.71 (0.085)	bio7 (16.4%)	bio13 (15.8%)	bio18 (13%)	dem (11.5%)
Hyla arboricola	23				X			X		0.99 (0.002)	dem (24.8%)	bio14 (11.4%)	bio4 (9.7%)	bio2 (8.2%)
Hyla arenicolor	82	X		X	X	X	X			0.83 (0.051)	dem (30%)	bio14 (17.2%)	topoind (10%)	bio3 (7.6%)
Plectrohyla chryses	1				X									
Dendropsophus ebraccatus	3			X										
Hyla euphorbiacea	98	X		X		X				0.96 (0.026)	dem (29%)	bio9 (19.1%)	bio15 (19%)	bio4 (13.2%)
Hyla eximia	125			X	X	X	X	X		0.86 (0.039)	bio11 (26.3%)	bio7 (20.2%)	bio4 (11%)	bio12 (9.1%)
Tlalocohyla loquax	3			X										
Dendropsophus microcephalus	2			X										
Dendropsophus plicatus	21			X		X	X	X		0.95 (0.016)	bio1 (21.5%)	dem (21.3%)	bio4 (10.6%)	bio11 (10%)
Dendropsophus sartori	3				X									
Tlalocohyla smithii	5	X			X		X			0,93	bio4 (31.1%)	bio17 (17%)	bio14 (13.8%)	bio12 (13.1%)
Ecnomiohyla valancifer	2			X										
Hyla walkeri	61		X						VU	0.98 (0.012)	dem (25.2%)	bio14 (13.4%)	bio3 (12.6%)	bio7 (11.4%)
Hypopachus barberi	18		X							0.84 (0.068)	dem (30%)	bio4 (18.3%)	bio17 (16%)	bio7 (9.2%)
Hypopachus variolosus	139	X	X	X	X	X	X			0.73 (0.061)	bio13 (19.7%)	topoind (11.6%)	bio18 (9.5%)	bio16 (7%)
Ixalotriton niger	2		X						CR					
Ixalotriton parvus	4	X	X					X	CR	0.99 (**)	bio7 (57.4%)	bio2 (18.3%)	bio19 (8.3%)	dem (7.8%)
Leptodactylus fragilis	244	X	X	X	X	X	X			0.79 (0.036)	bio2 (21%)	dem (15.2%)	slope (8.7%)	bio7 (8%)

Leptodactylus melanonotus	497	X	X	X	X	X	X			0.79 (0.032)	bio6 (28.7%)	bio7 (14.2%)	dem (9%)	bio2 (7%)
Lineatriton orchileucus	2	X							EN					
Lineatriton orchimelas	22			X		X		X	EN	0.99 (0.001)	bio2 (65.4%)	bio19 (21.1%)	slope (8%)	bio18 (2%)
Megastomatohyla mixe	6	X						X	CR	0,99	bio16 (64.5%)	bio9 (25.5%)	bio2 (4.2%)	bio3 (4.1%)
Megastomatohyla mixomaculata	15			X				X	EN	0.99 (0.001)	bio14 (30.4%)	bio6 (21.5%)	bio19 (19%)	dem (11.6%)
Megastomatohyla nubicola	6			X				X	EN	0,99	bio14 (26.6%)	bio19 (21.6%)	bio9 (12.6%)	slope (11%)
Megastomatohyla pellita	7	X						X	CR	0,99	bio3 (62.6%)	bio14 (14.1%)	bio10 (13.4%)	bio18 (4.3%)
Notophthalmus meridionalis	6			X		X			EN	0,99	bio4 (70%)	bio15 (25.2%)	bio9 (4.5%)	bio7 (0.3%)
Nyctanolis pernix	1		X						EN					
Oedipina elongata	3		X											
Pachymedusa dacnicolor	136	X			X	X	X	X		0.90 (0.024)	bio14 (49.2%)	bio3 (16.2%)	bio13 (8.1%)	bio1 (4.3%)
Parvimolge townsendi	20			X					EN	0.99 (0.001)	bio14 (36.6%)	dem (22.7%)	bio4 (9.5%)	bio15 (7.2%)
Engystomops pustulosus	128	X	X	X						0.90 (0.032)	dem (19.9%)	bio17 (15.5%)	bio7 (11.8%)	bio16 (11.6%)
Plectrohyla acanthodes	17		X					X	CR	0.98 (0.011)	bio15 (34.6%)	bio7 (25%)	bio8 (20.4%)	bio4 (10%)
Plectrohyla ameibothalame	4	X						X		0.94 (**)	bio16 (91.4%)	bio7 (7.2%)	bio17 (1%)	bio15 (0.3%)
Plectrohyla arborescandens	26			X		X		X	EN	0.97 (0.021)	bio15 (27.7%)	bio9 (22.1%)	dem (18.3%)	bio14 (9.9%)
Plectrohyla avia	6		X						CR	0,96	bio12 (64.3%)	bio3 (20.7%)	slope (9.3%)	bio18 (5.6%)
Plectrohyla bistincta	45	X		X	X	X	X	X		0.95 (0.017)	dem (43%)	slope (16.4%)	bio15 (10.2%)	bio3 (6.6%)
Plectrohyla calthula	3	X						X	CR					
Plectrohyla calvicollina	3	X							CR					
Plectrohyla celata	14	X						X	CR	1 (<0.001)	slope (19.3%)	bio8 (14.3%)	bio12 (11.3%)	bio3 (10.2%)
Plectrohyla cembra	2	X						X	CR					
Plectrohyla charadricola	15					X		X	EN	0.99 (<0.001)	bio6 (41.2%)	bio14 (23.1%)	bio4 (14%)	bio13 (5.1%)
Plectrohyla chryses	8				X			X	CR	0,99	dem (35%)	bio4 (26%)	bio7 (14%)	bio15 (10%)
Plectrohyla crassa	9	X						X	CR	0,6	dem (59.3%)	slope (11.7%)	bio9 (9.1%)	bio8 (7%)
Plectrohyla cyanomma	10	X						X	CR	1 (<0.001)	bio9 (24.1%)	bio12 (17.2%)	slope (12.8%)	bio8 (11.6%)
Plectrohyla cyclada	38	X						X	EN	0.93 (0.034)	bio16 (26.6%)	dem (16.3%)	bio15 (11%)	bio14 (10.4%)
Plectrohyla guatemalensis	12		X						CR	0.84 (0.110)	bio16 (68.2%)	bio3 (20.5%)	bio4 (7.2%)	bio18 (2.1%)

Plectrohyla hartwegi	5	X	X						CR	0,63	topoind (35.5%)	bio4 (34.4%)	bio7 (18.7%)	bio16 (9.7%)
Plectrohyla hazelae	16	X						X	CR	0.89 (0.072)	slope (32%)	bio8 (22.1%)	bio11 (15.4%)	bio2 (11%)
Plectrohyla ixil	16		X						CR	0.99 (<0.001)	bio15 (65.1%)	bio8 (23.5%)	bio4 (3.8%)	bio14 (1.6%)
Plectrohyla labedactyla	1	X												
Plectrohyla lacertosa	12		X					X	EN	0.95 (0.013)	bio4 (62.1%)	bio3 (11.7%)	bio16 (10.1%)	bio19 (6.6%)
Plectrohyla matudai	32	X	X						VU	0.95 (0.018)	bio4 (25.2%)	bio7 (12.7%)	bio16 (11.1%)	bio13 (9%)
Plectrohyla mykter	10				X			X	EN	0.99 (0.001)	bio4 (32.8%)	bio7 (32.5%)	dem (21%)	bio15 (5.2%)
Plectrohyla pentheter	24	X			X			X	EN	0.99 (0.002)	bio18 (24.7%)	dem (21.7%)	bio3 (20.5%)	bio15 (12%)
Plectrohyla psarosema	2	X							CR					
Plectrohyla pycnochila	2		X					X	CR					
Plectrohyla robertsorum	1					X		X	EN					
Plectrohyla sabrina	10	X						X	CR	0.99 (0.001)	bio16 (51.8%)	bio11 (17%)	slope (12%)	bio18 (9.1%)
Plectrohyla sagorum	29		X						EN	0.98 (0.009)	bio16 (41.7%)	bio4 (34.2%)	bio12 (6.5%)	bio3 (4%)
Plectrohyla siopela	4			X				X	CR	0.99 (**)	bio8 (25%)	bio5 (20.5%)	bio15 (18.2%)	bio10 (10.8%)
Plectrohyla thorectes	4	X			X			X	CR	0.84 (**)	bio3 (50.5%)	bio15 (17%)	bio9 (6.6%0	bio10 (6.3%)
Pseudoeurycea ahuitzotl	2				X									
Pseudoeurycea amuzga	3				X			X						
Pseudoeurycea anitae	4	X						X		0.96 (**)	bio4 (45.4%)	bio2 (39.3%)	bio12 (10.1%)	bio18 (4.6%)
Pseudoeurycea aquatica	2	X							CR					
Pseudoeurycea aurantia	1	X												
Pseudoeurycea belli	125	X	X	X	X	X	X	X	VU	0.87 (0.037)	bio11 (25.3%)	bio1 (17.5%)	bio8 (6.2%)	bio16 (6%)
Pseudoeurycea brunnata	3		X						EN					
Pseudoeurycea cephalica	74			X	X	X		X		0.96 (0.019)	bio9 (47%)	bio14 (22%)	bio15 (7%)	dem (5.4%)
Pseudoeurycea cochranae	71	X						X	EN	0.97 (0.011)	dem (30.4%)	bio4 (18.4%)	bio8 (16.1%)	bio15 (13%)
Pseudoeurycea conanti	2	X												
Pseudoeurycea firscheini	7			X		X		X	EN	0,99	bio13 (52.2%)	bio15 (15.1%)	bio9 (8.7%)	bio19 (7.2%)
Pseudoeurycea gadovi	24			X		X		X	EN	0.98 (0.012)	bio9 (53%)	bio15 (17%)	dem (16.1%)	bio13 (3.5%)

Pseudoeurycea gigantea	2			X				X	EN					
Pseudoeurycea goebeli	2		X						EN					
Pseudoeurycea juarezi	43	X						X	EN	0.94 (0.052)	slope (27.6%)	bio19 (18.6%)	bio14 (16.3%)	bio8 (14.6%)
Pseudoeurycea leprosa	77			X		X		X	VU	0.99 (0.004)	bio9 (65.4%)	bio14 (9.4%)	bio15 (8%)	bio10 (3%)
Pseudoeurycea lineola	26			X					EN	0.99 (0.008)	bio14 (39%)	bio7 (14.4%)	bio15 (14.1%)	dem (13.5%)
Pseudoeurycea longicauda	1						X	X	EN					
Pseudoeurycea lynchi	2			X				X	CR					
Pseudoeurycea maxima	6	X								1	bio2 (73%)	bio16 (24.2%)	bio18 (2.5%)	bio17 (0.2%)
Pseudoeurycea melanomolga	11			X				X	EN	0.99 (0.001)	bio5 (31.3%)	bio2 (19.6%)	bio9 (19%)	bio15 (10%)
Pseudoeurycea mixcoatl	4				X					0.99 (**)	dem (47.7%)	bio7 (24%)	bio15 (15.1%)	bio2 (5%)
Pseudoeurycea mixteca	5	X								0,99	bio13 (58.3%)	bio3 (10.4%)	bio8 (9.5%)	bio4 (7.1%)
Pseudoeurycea mystax	6	X							EN	0,99	bio8 (36.2%)	bio5 (13.6%)	bio2 (13.2%)	bio4 (8%)
Pseudoeurycea naucampatepetl	1			X					CR					
Pseudoeurycea nigromaculata	7			X				X	CR	0,7	bio14 (56.3%)	bio4 (31.3%)	topoind (5.7%)	bio15 (4.8%)
Pseudoeurycea praecellens	1			X				X						
Pseudoeurycea quetzalanensis	4					X				1 (**)	bio14 (27.2%)	bio4 (20.3%)	bio9 (16%)	bio13 (13.2%)
Pseudoeurycea rex	1		X											
Pseudoeurycea saltator	7	X							EN	1	slope (34%)	bio9 (27%)	bio12 (16.3%)	bio3 (11%)
Pseudoeurycea smithi	49	X						X	CR	0.94 (0.047)	bio8 (23.5%)	dem (18%)	bio9 (10.6%)	bio7 (9.7%)
Pseudoeurycea tenchalli	2				X									
Pseudoeurycea teotepec	2				X			X						
Pseudoeurycea tlahcuiloh	5				X			X		1	bio7 (61%)	bio4 (10.6%)	bio8 (7.7%)	dem (7.6%)
Pseudoeurycea unguidentis	9	X						X	EN	0,99	bio8 (44.1%)	bio9 (18.3%)	bio10 (11.4%)	dem (9.1%)
Pseudoeurycea werleri	30			X				X	EN	0.99 (<0.001)	bio2 (70.9%)	bio19 (20.4%)	dem (4%)	bio7 (1.7%)
Ptychohyla acrochorda	11	X						X		0.99 (0.002)	bio16 (54%)	bio13 (13.1%)	slope (10%)	topoind (8%)
Ptychohyla erythromma	7	X			X			X	EN	0,91	bio4 (53.1%)	bio18 (16%)	bio7 (15%)	topoind (11%)
Ptychohyla euthysanota	32	X	X							0.96 (0.014)	bio4 (35.4%)	bio16 (17.6%)	bio7 (13.1%)	bio15 (8.2%)

Ptychohyla leonhardschultzei	50	X			X			X	EN	0.86 (0.052)	bio3 (34.5%)	bio15 (16%)	bio13 (10.2%)	bio18 (10%)
Ptychohyla macrotympanum	18		X						CR	0.88 (0.077)	bio7 (23.4%)	dem (21.1%)	bio15 (20.3%)	bio3 (10%)
Ptychohyla zophodes	30	X						X		0.99 (0.003)	bio16 (28.2%)	bio14 (23.3%)	slope (20%)	bio15 (10.3%)
Lithobates berlandieri	136	X		X		X				0.97 (0.008)	bio4 (28.8%)	bio5 (10.6%)	bio3 (9.7%)	bio9 (8.1%)
Lithobates brownorum	44	X	X	X				X		0.75 (0.089)	bio2 (19%)	bio19 (18.2%)	bio14 (11.3%)	bio12 (10.6%)
Lithobates catesbeiana	18	X		X		X	X			0.83 (0.125)	bio4 (35.6%)	bio15 (26.1%)	bio11 (12.3%)	bio14 (7.4%)
Lithobates dunni	23						X	X	EN	0.99 (0.002)	bio7 (25.2%)	dem (17.2%)	bio8 (17.1%)	slope (12.9%)
Lithobates forreri	72	X	X		X		X			0.87 (0.059)	bio14 (28.7%)	bio11 (25%)	slope (8.8%)	bio9 (7.1%)
Lithobates maculata	46	X	X							0.95 (0.025)	bio4 (37.1%)	bio7 (15%)	bio15 (14.4%)	bio12 (11%)
Lithobates megapoda	13						X	X	VU	0.96 (0.011)	bio7 (36.4%)	bio6 (34.1%)	bio3 (19.3%)	bio18 (5.6%)
Lithobates montezumae	8					X	X	X		0,91	bio6 (70%)	bio9 (13.1%)	slope (11.3%)	bio7 (3%)
Lithobates neovolcanica	25						X	X		0.97 (0.013)	bio7 (25.4%)	bio6 (20.7%)	dem (17.3%)	bio3 (8%)
Lithobates omiltemana	9				X			X	CR	0,95	bio4 (47%)	bio14 (25.2%)	bio18 (12.6%)	dem (8.4%)
Lithobates pueblae	1					X		X	CR					
Lithobates sierramadrensis	37	X			X			X	VU	0.92 (0.042)	bio3 (25%)	bio14 (20%)	dem (17.4%)	bio16 (14%)
Lithobates spectabilis	78	X		X		X	X	X		0.91 (0.028)	dem (26.2%)	bio13 (24.7%)	bio6 (8.5%)	bio15 (8%)
Lithobates vaillanti	217	X	X	X						0.87 (0.029)	bio2 (21.6%)	bio4 (14.3%)	bio7 (10%)	slope (7.5%)
Lithobates zweifeli	74	X			X	X	X	X		0.85 (0.037)	dem (33.1)	bio15 (13.6%)	bio3 (12.8%)	bio14 (12.2%)
Rhinophrynus dorsalis	87	X	X	X	X					0.89 (0.038)	dem (47.7%)	bio7 (10.3%)	bio15 (9.1%)	topoind (5.7%)
Scaphiopus couchi	10	X		X						0.98 (0.007)	bio3 (63.4%)	slope (14.8%)	bio2 (9.3%)	bio16 (4.7%)
Scinax staufferi	290	X	X	X	X	X				0.80 (0.034)	bio2 (17.5%)	slope (12.7%)	bio7 (10%)	bio15 (9.7%)
Siren intermedia	1			X										
Smilisca baudini	719	X	X	X	X	X	X			0.82 (0.020)	dem (18.8%)	bio2 (16%)	bio7 (14.6%)	bio18 (10.5%)
Smilisca cyanosticta	70	X	X	X						0.98 (0.005)	bio2 (27.8%)	bio18 (20.9%)	bio14 (14.2%)	bio19 (12.6%)
Spea hammondi	28	X	X	X	X	X	X			0.72 (0.045)	bio13 (40.9%)	dem (30.5%)	bio12 (9%)	slope (5.1%)
Spea multiplicatus	151	X		X	X	X	X			0.82 (0.44)	bio18 (32%)	dem (23.6%)	bio13 (9.2%)	bio12 (6.7%)
Eleutherodactylus leprus	55	X	X	X						0.95 (0.021)	bio2 (43.2%)	bio14 (17.2%)	bio19 (10.6%)	bio18 (10.6%)

Thorius arboreus	10	X								EN	1 (<0.001)	bio9 (35.1%)	slope (31.3%)	bio12 (15.1%)	bio3 (7.8%)
Thorius aureus	6	X								CR	1	bio8 (21.1%)	bio9 (16.8%)	bio5 (12.5%)	bio16 (12%)
Thorius boreas	11	X								EN	0.99 (0.001)	bio8 (36.3%)	bio2 (15%)	bio5 (8.8%)	bio10 (7.4%)
Thorius dubitus	15			X		X			X	EN	0.99 (0.001)	bio6 (23.6%)	bio13 (22.3%)	bio15 (15.2%)	bio14 (9%)
Thorius grandis	2				X				X	EN					
Thorius infernalis	1				X					CR					
Thorius insperatus	1	X													
Thorius lunaris	6			X					X	EN	0,99	dem (34%)	bio14 (20%)	bio11 (13.2%)	bio1 (9.2%)
Thorius macdougalli	40	X							X	EN	0.99 (<0.001)	bio5 (34.5%)	bio8 (22.2%)	bio19 (14%)	bio15 (10.3%)
Thorius magnipes	8			X		X				CR	0,99	bio13 (38%)	bio9 (23%)	bio3 (14.3%)	bio15 (11.8%)
Thorius minutissimus	2	X							X	CR					
Thorius minydemus	4			X		X				CR	0.99 (**)	bio9 (49.4%)	bio15 (27.5%)	bio5 (13%)	bio3 (5%)
Thorius munificus	8			X					X	EN	1	bio9 (34.1%)	bio15 (18.7%)	bio2 (17.1%)	bio5 (16.1%)
Thorius narismagnus	7			X						CR	1	bio2 (68.2%)	bio18 (20.7%)	dem (5%)	bio4 (2.2%)
Thorius narisovalis	58	X							X	CR	0.98 (0.008)	dem (36%)	bio4 (19.1%)	bio6 (13.3%)	bio7 (6.7%)
Thorius omiltemi	9				X				X	EN	0,99	dem (43.3%)	bio7 (21%)	bio15 (14%)	bio4 (8%)
Thorius papaloe	3	X								EN					
Thorius pennatulus	10			X					X	CR	0.99 (<0.001)	bio19 (36%)	bio14 (30%)	bio16 (10.3%)	bio13 (10.2%)
Thorius pulmonaris	27	X							X	EN	0.98 (0.011)	dem (46.4%)	bio7 (13.7%)	bio12 (9.5%)	bio6 (5.5%)
Thorius schmidti	5					X			X	EN	0,99	bio8 (37%)	bio9 (16.1%)	bio11 (9.8%)	bio2 (9.6%)
Thorius spilogaster	5			X					X	EN	0,98	bio8 (38%)	bio11 (14%)	bio10 (10.8%)	bio14 (9.9%)
Thorius troglodytes	26			X		X				EN	1 (<0.001)	bio13 (38%)	bio14 (29%)	dem (12.1%)	bio2 (7.4%)
Tlalocohyla godmani	25			X		X				VU	0.99 (0.004)	bio14 (34%)	bio4 (16.4%)	slope (10.6%)	bio15 (7.3%)
Tlalocohyla loquax	25	X	X	X							0.91 (0.028)	bio2 (23.1%)	bio14 (21.5%)	dem (20%)	bio4 (10%)
Tlalocohyla picta	93	X	X	X		X					0.95 (0.014)	bio14 (40.4%)	bio14 (17%)	bio2 (12.1%)	bio16 (9.5%)
Tlalocohyla smithii	145	X			X	X	X		X		0.92 (0.023)	bio14 (33%)	bio3 (19%)	bio13 (9.3%)	bio16 (7.7%)
Trachycephalus venulosa *	163	X	X	X	X	X	X				0.88 (0.028)	bio4 (24.2%)	dem (18%)	bio7 (17%)	bio15 (6.4%)
Triprion spatulatus	6	X			X		X		X		0,36	bio6 (50%)	bio19 (21%)	bio2 (10%)	bio17 (8.4%)

REPTILES														
Abronia bogerti	1	X						X						
Abronia chiszari	2			X					EN					
Abronia fuscolabialis	3	X							EN					
Abronia graminea	20	X				X		X	EN	0.95 (0.037)	bio15 (30.3%)	dem (20%)	bio6 (10.6%)	bio9 (8.7%)
Abronia leurolepis	1		X					X						
Abronia lythrochila	12		X					X		0.92 (0.058)	bio4 (28%)	bio8 (18%)	bio15 (12.2%)	bio7 (9%)
Abronia martindelcampoi	22				X			X	EN	0.99 (0.004)	dem (35.1%)	bio4 (18.5%)	bio15 (12%)	bio7 (10.4%)
Abronia matudai	2		X						EN					
Abronia mitchelli	1	X												
Abronia mixteca	18	X						X	VU	0.98 (0.005)	bio6 (63.6%)	bio4 (20.6%)	bio2 (13.2%)	bio16 (1.5%)
Abronia oaxacae	17	X						X	VU	0.98 (0.012)	bio8 (30%)	bio6 (14.6%)	bio13 (9.3%)	bio2 (7.3%)
Abronia ochoterenai	1		X					X						
Abronia ornelasi	4		X							1 (**)	bio7 (50.6%)	bio19 (17.7%)	bio2 (13%)	bio9 (6.8%)
Abronia ramirezi	1		X					X						
Abronia reidi	4			X				X		0.99 (**)	bio2 (54%)	bio18 (41%)	dem (2%)	topoind (1.5%)
Abronia smithi	9		X					X		0,99	bio16 (54.4%)	bio4 (36%)	bio19 (9%)	bio6 (0.3%)
Abronia taeniata	31			X				X	VU	0.99 (0.002)	bio14 (28.3%)	dem (23.6%)	bio15 (12%)	bio16 (10%)
Adelphicos latifasciatum	13	X	X					X		0.77 (0.157)	bio7 (35%)	bio8 (20.3%)	bio16 (9.7%)	bio4 (8.8%)
Adelphicos nigrilatum	43		X					X		0.96 (0.023)	bio4 (17.8%)	bio8 (16.3%)	dem (16.2%)	bio7 (14%)
Adelphicos quadrivirgatum	80	X	X	X		X				0.85 (0.048)	bio2 (45%)	bio19 (14.5%)	bio18 (12.6%)	dem (10.4%)
Adelphicos sargii	1		X											
Adelphicos veraepacis	11	X	X							0.93 (0.034)	bio7 (74%)	slope (10.1%)	bio3 (6.8%)	bio8 (4.4%)
Agkistrodon bilineatus	20	X	X		X		X	X		0.81 (0.025)	bio4 (91.6%)	bio7 (7.8%)	bio6 (0.5%)	bio9 (0.1%)
Amastridium sapperi *	13			X						0.88 (0.079)	bio18 (47%)	bio2 (40.2%)	bio6 (3.5%)	bio14 (3%)
Ameiva festiva	7		X							0,99	bio15 (31.1%)	bio6 (25.7%)	bio9 (17.2%)	bio11 (9.5%)
Ameiva undulata	575	X	X	X	X	X	X			0.83 (0.019)	bio7 (23.7%)	bio2 (16.2%)	bio18 (9.6%)	bio4 (6.6%)

Anelytropsis papillosus	3			X				X						
Ophisaurus ceroni	3			X				X						
Anolis alvarezdeltoroi	1		X					X						
Anolis anisolepis	13		X					X		0.99 (0.006)	bio8 (27%)	bio7 (19.2%)	slope (11.4%)	bio4 (11.4%)
Anolis barkeri	35		X	X				X	VU	0.99 (0.001)	bio19 (33.8%)	bio2 (33.5%)	bio18 (16%)	slope (4.2%)
Anolis biporcatus	28	X	X	X						0.78 (0.078)	bio19 (58.2%)	bio2 (23.4%)	slope (5.1%)	dem (5.1%)
Anolis breedlovei	5	X	X					X	EN	1	bio7 (53.2%)	bio19 (13%)	bio2 (11.2%)	bio3 (6%)
Anolis capito	11		X							0.88 (0.003)	bio15 (77%)	bio3 (19%)	bio7 (3.8%)	bio9 (0.1%)
Anolis compressicaudus	27	X	X					X		0.98 (0.004)	bio14 (21.5%)	bio18 (14.5%)	bio4 (13.2%)	bio7 (13.1%)
Anolis crassulus	45		X			X				0.99 (0.002)	bio4 (30%)	bio8 (28.2%)	bio14 (12.1%)	bio18 (8.6%)
Anolis cuprinus	10	X	X					X		0.99 (0.003)	bio7 (50.3%)	bio19 (21.5%)	bio4 (9.7%)	bio2 (6.9%)
Anolis cymbops	3			X				X						
Anolis dollfusianus	19		X							0.99 (0.001)	bio16 (40.2%)	bio4 (32.1%)	bio13 (8%)	bio2 (7%)
Anolis duellmani	8			X				X		0,97	bio2 (61%)	bio18 (27.6%)	bio12 (6%)	bio7 (2.6%)
Anolis dunni	29				X		X	X		0.92 (0.033)	bio4 (43.1%)	bio14 (14.2%)	bio15 (12.3%)	bio17 (8.2%)
Anolis forbesi	1					X								
Anolis gadovi	2				X			X						
Anolis hobartsmithi	6		X					X	EN	1	bio15 (64.4%)	bio8 (14.4%)	bio7 (7%)	dem (6.5%)
Anolis isthmicus	36	X						X		0.99 (0.002)	bio15 (21.3%)	bio2 (18.7%)	bio3 (18.3%)	bio7 (11.2%)
Anolis laeviventris	73	X	X	X		X				0.94 (0.018)	bio12 (24.4%)	dem (20%)	bio19 (10.6%)	bio6 (7.4%)
Anolis lemurinus	97	X	X	X						0.89 (0.024)	bio12 (36.5%)	bio11 (18.8%)	bio2 (10.3%)	bio15 (8.5%)
Anolis liogaster	26				X			X		1 (<0.001)	dem (26.5%)	bio4 (21%)	bio7 (13%)	bio15 (11.5%)
Anolis macrinii	3	X						X						
Anolis matudai	14		X							0.86 (0.062)	bio4 (55.6%)	bio16 (25.8%)	bio14 (10%)	bio17 (6.5%)
Anolis megapholidotus	9				X			X		0,96	bio15 (46.2%)	bio4 (35.7%)	bio14 (6.5%)	bio18 (6.1%)
Anolis microlepidotus	15	X			X			X		0.85 (0.085)	bio4 (34.7%)	bio14 (30%)	bio17 (11.1%)	bio13 (10%)
Anolis milleri	11	X						X		0.99 (0.003)	bio16 (40%)	topoind (25.3%)	bio9 (16.1%)	bio14 (11.3%)

Anolis naufragus	19					X		X	VU	0.98 (0.011)	bio14 (32%)	bio4 (20%)	slope (19%)	bio18 (9.8%)
Anolis nebuloides	83	X						X		0.96 (0.018)	bio3 (36.2%)	bio15 (12.3%)	bio13 (10%)	bio14 (8.3%)
Anolis nebulosus	134				X	X	X	X		0.91 (0.026)	bio15 (21%)	dem (18.7%)	bio14 (16.1%)	bio16 (13%)
Anolis omiltemanus	11				X			X		0.99 (0.001)	dem (28.8%)	bio4 (28.2%)	bio7 (11.8%)	bio15 (10.1%)
Anolis parvicirculatus	7		X					X		0,99	bio13 (32%)	bio7 (16.7%)	bio15 (16%)	bio16 (9.1%)
Anolis pentaprion	15		X	X						0.94 (0.03)	bio12 (36.5%)	bio6 (30.1%)	dem (8.8%)	bio17 (4.4%)
Anolis petersi	29	X	X	X						0.77 (0.106)	bio2 (24.6%)	dem (20%)	topoind (10%)	slope (9%)
Anolis polyrhachis	8	X								0,99	bio16 (57.6%)	bio3 (12.4%)	slope (10%)	bio13 (7.3%)
Anolis pygmaeus	5	X	X					X	EN	0,88	bio2 (32.5%)	bio7 (23.1%)	bio9 (21%)	bio18 (8.8%)
Anolis quercorum	134	X				X		X		0.95 (0.017)	bio13 (23.1%)	bio16 (15%)	bio15 (14.1%)	bio6 (11.1%)
Anolis rodriguezi	21	X	X	X						0.97 (0.025)	bio19 (71.6%)	bio12 (5.1%)	topoind (4.8%)	bio4 (4.3%)
Anolis schiedei	5			X				X		0,99	bio14 (40.2%)	bio9 (32.2%)	bio19 (26.4%)	bio5 (1%)
Anolis schmidti	1						X	X						
Anolis sericeus	392	X	X	X		X				0.89 (0.018)	bio2 (22%)	bio7 (19.4%)	dem (9.1%)	bio4 (9.1%)
Anolis serranoi *	7		X							1	bio16 (55.1%)	bio17 (13.1%)	bio11 (13.1%)	bio2 (7.2%)
Anolis simmonsi	2	X						X						
Anolis subocularis	39	X			X			X		0.97 (0.001)	bio3 (22.7%)	bio11 (19.6%)	bio14 (16.7%)	bio15 (16.4%)
Anolis taylori	2				X									
Anolis tropidonotus	106	X	X	X		X				0.95 (0.013)	bio17 (24%)	bio4 (16.6%)	bio15 (15%)	bio14 (8.2%)
Anolis uniformis	68	X	X	X						0.99 (<0.001)	bio19 (45%)	bio2 (25.4%)	bio18 (6.7%)	bio12 (6%)
Aspidoscelis calidipes	8						X	X		0,88	bio9 (43%)	bio12 (29.3%)	bio14 (11.2%)	bio13 (8.4%)
Aspidoscelis communis	58						X	X		0.96 (0.018)	bio17 (21%)	bio8 (12%)	bio15 (11%)	bio19 (10.2%)
Aspidoscelis costata	101				X	X	X	X		0.92 (0.036)	bio14 (33.7%)	dem (15.5%)	bio6 (13%)	bio13 (6.7%)
Aspidoscelis deppii	566	X	X	X	X	X	X			0.84 (0.026)	bio1 (20%)	bio11 (12.2%)	bio17 (11.3%)	bio7 (8.3%)
Aspidoscelis guttata	482	X	X	X	X	X	X	X		0.84 (0.024)	bio7 (16.7%)	bio6 (15.4%)	bio15 (14%)	bio11 (12%)
Aspidoscelis lineattissima	55	X			X		X	X		0.98 (0.007)	bio14 (42%)	bio8 (14%)	topoind (9.7%)	bio19 (7.5%)

Aspidoscelis mexicana	38	X						X		0.99 (0.003)	dem (28.4%)	bio7 (17.7%)	bio16 (17.6%)	bio9 (12.5%)
Aspidoscelis motaguae	50	X	X							0.75 (0.124)	bio7 (18%)	bio4 (18%)	dem (11.5%)	bio16 (10.2%)
Aspidoscelis parvisocia	45	X				X		X		0.99 (<0.001)	bio13 (41%)	bio4 (17.6%)	bio7 (11.8%)	bio6 (9.6%)
Aspidoscelis sacki	182	X			X	X		X		0.94 (0.013)	bio13 (27.1%)	bio2 (13.6%)	bio18 (13.2%)	bio11 (9.8%)
Aspidoscelis septemvitatus *	9			X						0,96	bio4 (93.6%)	bio15 (2.6%)	bio9 (2.4%)	bio3 (1.2%)
Atropoides mexicanus	13		X							0.96 (0.005)	bio15 (58.1%)	bio3 (22%)	bio4 (9.7%)	bio16 (4.7%)
Atropoides nummifer	19	X		X		X				0.78 (0.155)	bio14 (48.15)	dem (31.2%)	bio7 (10.7%)	bio3 (5%)
Atropoides occiduus	5		X							0,95	bio16 (66%)	bio3 (13%)	bio18 (9.4%)	bio17 (6.1%)
Atropoides olmec	27	X	X	X				X		0.98 (0.009)	bio7 (42%)	bio2 (30%)	bio3 (6.1%)	bio14 (5.6%)
Barisia imbricata	89	X		X		X	X	X		0.93 (0.016)	bio9 (25%)	bio8 (17%)	bio11 (15%)	bio14 (15%)
Barisia jonesi	14						X	X		1 (<0.001)	bio4 (22.2%)	bio3 (17.5%)	bio18 (10.7%)	bio8 (10%)
Barisia planifrons	28	X						X		0.97 (0.017)	bio8 (33.7%)	dem (16.4%)	bio7 (13%)	bio15 (10.2%)
Barisia rudicollis	1						X	X	EN					
Basiliscus vittatus	571	X	X	X	X	X	X			0.84 (0.019)	bio7 (23.1%)	bio6 (16%)	bio2 (12.2%)	bio4 (9.5%)
Bipes canaliculatus	8				X		X	X		1	bio5 (34.5%)	bio13 (33%)	bio14 (18%)	topoind (7%)
Bipes tridactylus	2				X									
Boa constrictor	225	X	X	X	X	X	X			0.79 (0.038)	bio6 (18.6%)	bio2 (18.4%)	bio18 (11.1%)	bio4 (8.7%)
Bothriechis aurifer	1		X						VU					
Bothriechis bicolor	7		X							0,99	bio16 (65.5%)	bio4 (34.4%)		
Bothriechis rowleyi	11	X	X					X	VU	0.97 (0.012)	bio7 (99.8%)	slope (0.1%)	bio16 (0.1%)	
Bothriechis schlegelii	2		X											
Bothrops asper	148	X	X	X		X				0.88 (0.029)	bio19 (21%)	bio18 (14.2%)	bio12 (14.2%)	bio2 (10.2%)
Caiman crocodylus	8	X	X							0,97	bio16 (40.1%)	bio11 (28.6%)	bio17 (15%)	bio4 (6.2%)
Caretta caretta	1			X					EN					
Celestus enneagrammus	29	X		X				X		0.98 (0.008)	bio14 (46%)	dem (29.1%)	bio3 (6.2%)	bio1 (4.6%)
Celestus legnotus	5					X		X		1	bio4 (25.6%)	bio9 (19.3%)	bio14 (16.6%)	slope (13%)
Celestus rozellae	5	X	X	X						0,93	dem (25.3%)	bio9 (20.3%)	bio7 (19.4%)	bio2 (17.8%)
Cerrophidion barbouri	13				X			X	EN	0.99 (<0.001)	bio4 (38.6%)	dem (22%)	bio7 (9.7%)	bio15 (8.1%)

Cerrophidion godmani	39	X	X							0.83 (0.049)	bio4 (23.5%)	bio7 (12.5%)	bio5 (12.1%)	bio3 (11.6%)
Cerrophidion tzotzilorum	7		X					X		0,99	dem (19.7%)	bio5 (18.7%)	bio4 (17.1%)	bio7 (13%)
Chelonia mydas	7	X		X	X		X		EN	0.96 (**)	bio12 (43.7%)	bio18 (37%)	bio7 (13%)	slope (6.1%)
Chelydra serpentina	14		X	X						0.95 (0.031)	bio6 (48.6%)	bio2 (17.3%)	bio15 (17.2%)	dem (6.3%)
Chersodromus liebmani	20	X		X						0.97 (0.025)	bio14 (44%)	dem (18.7%)	bio15 (14%)	bio7 (6%)
Claudius angustatus *	37	X		X						0.94 (0.019)	dem (53.3%)	bio14 (14.7%)	bio15 (10%)	bio4 (8.8%)
Clelia clelia	13	X	X	X						0.65 (0.194)	bio6 (28.5%)	bio12 (24.7%)	bio13 (15.3%)	bio16 (11.4%)
Clelia scytalina	33	X	X	X	X					0.97 (0.026)	bio18 (33%)	bio2 (20.5%)	bio16 (18.5%)	bio15 (6.5%)
Coleonyx elegans	113	X	X	X	X					0.83 (0.044)	dem (39%)	bio7 (12.6%)	bio2 (12%)	bio4 (7.8%)
Coluber constrictor	9	X	X	X						0,72	bio2 (52%)	dem (23.3%)	slope (21.4%)	bio6 (2.2%)
Coniophanes alvarezi	5		X					X		1	bio4 (34.2%)	bio8 (15%)	bio16 (10.7%)	slope (7%)
Coniophanes bipunctatus	34	X	X	X		X				0.84 (0.04)	dem (33.8%)	bio12 (26.3%)	bio14 (11.7%)	topoind (6.7%)
Coniophanes fissidens	148	X	X	X	X	X				0.85 (0.038)	bio7 (20.7%)	bio18 (13.4%)	bio2 (11.6%)	dem (9.5%)
Coniophanes imperialis	142	X	X	X		X				0.78 (0.033)	bio7 (17.6%)	dem (14%)	bio14 (11%)	bio4 (8.1%)
Coniophanes piceivittis	54	X	X	X	X					0.77 (0.06)	bio7 (36.7%)	bio15 (22.4%)	bio12 (8%)	topoind (6.8%)
Coniophanes quinquevittatus	20		X	X						0.68 (0.131)	bio2 (58.2%)	bio18 (18.1%)	bio6 (11.1%)	bio7 (6.3%)
Coniophanes sarae	2						X							
Conophis lineatus	42			X		X				0.83 (0.093)	bio14 (27.6%)	bio9 (18.6%)	dem (16.2%)	slope (13.2%)
Conophis pulcher	5		X							0.96 (**)	bio4 (74.2%)	bio13 (20.5%)	bio19 (3.4%)	bio2 (1.8%)
Conophis vittatus	117	X	X		X	X	X	X		0.86 (0.066)	bio14 (30.3%)	bio19 (29.1%)	bio7 (12.7%)	bio2 (6%)
Conopsis acuta	19	X		X		X				0.99 (0.002)	bio6 (36%)	bio16 (35.7%)	bio13 (13.5%)	bio3 (7.7%)
Conopsis biserialis	33						X	X		0.92 (0.04)	dem (36.3%)	bio7 (10.7%)	bio14 (10.5%)	bio6 (7.8%)
Conopsis lineata	230	X		X	X	X	X	X		0.94 (0.011)	bio9 (40.1%)	bio11 (13.7%)	bio6 (13.7%)	bio15 (4.6%)
Conopsis megalodon	52	X			X			X		0.99 (0.002)	dem (35%)	bio7 (17%)	bio2 (11.7%)	bio15 (11.7%)
Conopsis nasus	32						X	X		0.99 (0.001)	dem (24.5%)	slope (20%)	bio7 (15.8%)	bio6 (13.1%)
Corytophanes cristatus	4		X							0.96 (**)	slope (28.1%)	topoind (26%)	bio15 (21.6%)	bio7 (20.5%)

Corytophanes hernandezi	96	X	X	X		X				0.93 (0.024)	bio2 (32.3%)	bio14 (20.5%)	bio18 (15%)	bio4 (8.6%)
Corytophanes percarinatus *	8		X							0,33	bio16 (59%)	bio14 (19%)	bio3 (7.5%)	bio2 (6%)
Crocodylus acutus	7	X	X	X	X		X		VU	0,89	dem (39%)	slope (21%)	bio8 (10.8%)	bio17 (9.8%)
Crocodylus moreleti	20	X	X	X						0.89 (0.037)	bio14 (57.1%)	bio19 (10.7%)	bio2 (10%)	dem (8.4%)
Crotalus atrox	6	X	X	X						0,86	bio7 (37%)	bio15 (33.1%)	bio2 (17.6%)	bio16 (7.8%)
Crotalus basiliscus	7						X	X		0,8	bio17 (48.8%)	slope (26.5%)	bio14 (21.9%)	bio15 (1.2%)
Crotalus culminatus	2					X								
Crotalus intermedius	78	X		X	X	X		X		0.91 (0.04)	dem (55%)	bio7 (16.3%)	bio2 (4.4%)	bio16 (3.7%)
Crotalus molossus	37	X		X		X	X			0.94 (0.018)	dem (45.7%)	bio6 (28%)	bio13 (6.8%)	bio4 (3.9%)
Crotalus polystictus	5	X		X			X	X		0.86 (**)	bio8 (56.2%)	bio11 (35.3%)	bio9 (7%)	bio5 (1.5%)
Crotalus pusillus	11						X	X	EN	0.87 (0.002)	dem (38.1%)	bio3 (26.5%)	bio4 (21.4%)	bio15 (5%)
Crotalus ravus	72	X		X	X	X		X		0.92 (0.033)	dem (49.1%)	bio9 (15%)	bio5 (6.7%)	bio13 (4.7%)
Crotalus scutulatus	17			X		X				0.99 (0.002)	bio16 (81.6%)	bio15 (6.6%)	bio9 (4.6%)	slope (3.8%)
Crotalus simus	95	X	X	X	X		X			0.67 (0.09)	bio7 (30.5%)	bio4 (18.8%)	bio15 (15.6%)	bio2 (14%)
Crotalus totonacus	2			X										
Crotalus triseriatus	57			X	X	X	X	X		0.95 (0.02)	bio8 (31.4%)	bio11 (17%)	dem (13%)	bio9 (10%)
Cryophis hallbergi	7	X								0,94	slope (44.5%)	bio11 (20.2%)	bio12 (12%)	bio18 (8.4%)
Ctenosaura acanthura *	43	X	X	X		X		X		0.89 (0.052)	dem (38%)	bio2 (20.5%)	slope (12.4%)	bio17 (4%)
Ctenosaura clarki	48				X		X	X	VU	0.94 (0.042)	bio9 (25.5%)	bio12 (17.3%)	bio13 (17.2%)	bio1 (17%)
Ctenosaura oaxacana	51	X						X	CR	0.99 (0.003)	bio19 (46.7%)	bio2 (13%)	bio7 (8.6%)	bio15 (7.7%)
Ctenosaura pectinata	228	X	X		X	X	X	X		0.87 (0.024)	bio15 (16.7%)	bio12 (10.7%)	bio19 (10%)	bio8 (9.6%)
Ctenosaura similis *	34	X	X							0.85 (0.055)	bio11 (50%)	bio13 (17.5%)	bio12 (10.6%)	bio4 (6.5%)
Dendrophidion vinitor	23	X	X	X						0.83 (0.087)	bio2 (40%)	bio14 (27.6%)	bio18 (8%)	bio4 (5.1%)
Dermatemys mawii	21		X	X					CR	0.81 (0.083)	bio15 (42.5%)	bio7 (19.4%)	bio14 (11.7%)	bio6 (6.4%)
Dermochelys coriacea	2						X		CR					
Dermophis mexicanus	72	X	X	X						0.85 (0.061)	bio7 (20%)	dem (17.7%)	bio15 (14.1%)	bio4 (10.3%)
Dermophis oaxacae	18	X	X		X					0.96 (0.03)	bio3 (52.5%)	bio6 (22.7%)	bio15 (12.2%)	bio1 (6%)
Diadophis punctatus	9	X		X			X			0,92	bio6 (89.2%)	bio3 (10.7%)	dem (0.2%)	

Drymarchon melanurus	195	X	X	X	X	X	X			0.76 (0.046)	bio6 (21.1%)	bio2 (20%)	bio12 (7.3%)	bio18 (6.6%)
Drymobius chloroticus	47	X	X	X						0.89 (0.05)	bio7 (20.7%)	bio18 (13.5%)	bio16 (12.6%)	slope (12%)
Drymobius margaritiferus	261	X	X	X	X	X	X			0.73 (0.042)	bio7 (23.3%)	bio18 (11.5%)	bio19 (9.9%)	bio6 (9.9%)
Enulius flavitorques	50	X	X		X	X	X			0.84 (0.05)	bio4 (48.1%)	bio15 (12.8%)	bio12 (7.9%)	dem (4.7%)
Eretmochelys imbricata	3	X		X					CR					
Exiliboa placata	24	X						X	VU	0.99 (0.001)	bio19 (17.6%)	bio14 (16.8%)	slope (16%)	bio9 (14.4%)
*Ficimia olivácea **	22	X		X		X		X		0.98 (0.012)	bio4 (28%)	bio14 (24.6%)	topoind (13%)	bio12 (7.6%)
Ficimia publia	74	X	X	X	X	X				0.80 (0.061)	bio2 (28.4%)	dem (11%)	bio6 (10.4%)	bio18 (10.2%)
Ficimia ramirezi	1	X						X						
Ficimia ruspator	2				X			X						
*Ficimia streckeri **	8			X		X				0,95	bio4 (57%)	bio15 (36%)	bio9 (6.2%)	bio18 (1.1%)
Ficimia variegata	6	X		X				X		0,92	dem (31.1%)	bio16 (26.3%)	bio2 (25.2%)	bio3 (11.8%)
Geagras redimitus	30	X	X		X		X	X		0.92 (0.049)	bio7 (58.3%)	bio15 (41.3%)	bio19 (0.5%)	
Geophis anocularis	6	X						X		0,99	bio8 (24.1%)	bio14 (21.6%)	bio16 (12.1%)	slope (11.5%)
Geophis blanchardi	8	X		X		X		X		0,7	topoind (25%)	bio13 (20.6%)	dem (16.5%)	bio9 (13.5%)
Geophis cancellatus	2		X											
Geophis carinosus	10		X	X						0.99 (<0.001)	bio18 (29.3%)	bio2 (25.1%)	bio7 (24.3%)	topoind (11.8%)
Geophis chalybeus	1			X				X						
Geophis dubius	19	X		X		X		X		0.99 (0.002)	bio8 (51.7%)	bio7 (12%)	bio9 (11.2%)	topoind (5.2%)
Geophis duellmani	8	X						X		0,98	bio9 (39.2%)	slope (27%)	bio12 (17.4%)	bio3 (9.5%)
Geophis dugesi	5						X	X		0,93	bio7 (63.5%)	bio18 (13%)	bio6 (12.6%)	bio3 (4.7%)
Geophis immaculatus	7		X							0,99	bio16 (64.4%)	bio4 (34.4%)	bio19 (1.2%)	
Geophis incomptus	1						X	X						
Geophis juarezi	2	X												
Geophis juliai	3			X				X	VU					
Geophis laticinctus	7	X	X					X		0,83	bio7 (50.7%)	bio15 (50%)	bio8 (0.2%)	

Geophis laticollaris	2	X										
Geophis maculiferus	1						X	X				
Geophis multitorques	22			X		X		X	0.99 (0.003)	bio14 (36.8%)	dem (24.4%)	bio4 (14.7%)	bio6 (7%)
Geophis nasalis	7		X						0,99	bio13 (56.1%)	bio3 (43.3%)	bio18 (0.4%)	bio11 (0.1%)
Geophis nigrocinctus	1						X	X					
Geophis omiltemanus	4	X			X			X	0.99 (**)	dem (53.6%)	bio4 (28.2%)	bio13 (4.8%)	slope (4.4%)
Geophis petersi	6						X	X	0,99	bio7 (32.8%)	bio8 (23.5%)	slope (19.6%)	bio6 (6.2%)
Geophis pyburni	1						X	X					
Geophis rhodogaster	5		X						0,99	bio4 (54.3%)	bio12 (35.2%)	dem (9.7%)	bio16 (0.5%)
Geophis russatus	2	X						X					
Geophis sallaei	3	X						X					
Geophis semidoliatus	49			X				X	0.99 (0.002)	bio14 (40.5%)	dem (14.5%)	bio15 (11%)	bio4 (8.4%)
Geophis sieboldi	1						X						
Geophis tarascae	1						X	X					
Gerrhonotus liocephalus	95	X	X	X	X	X		X	0.84 (0.047)	bio7 (28.3%)	bio4 (23.5%)	bio3 (12.4%)	bio15 (9.1%)
Gerrhonotus ophiurus	10			X		X		X	0.91 (0.01)	bio9 (38%)	bio14 (19.2%)	bio4 (17.8%)	bio15 (14%)
Gonatodes albogularis	4	X	X						0.98 (**)	bio13 (25%)	bio6 (24.4%)	bio4 (14.7%)	bio14 (12.6%)
Gymnophthalmus speciosus	16	X	X						0.64 (0.228)	bio7 (67.1%)	dem (15.3%)	bio4 (14.4%)	slope (3.1%)
Heloderma horridum	51	X	X		X		X		0.78 (0.099)	bio7 (26.5%)	bio14 (22%)	bio4 (14.2%)	bio3 (12.1%)
Hemidactylus frenatus	92	X	X	X	X		X		0.77 (0.07)	bio11 (59.7%)	bio6 (8.5%)	bio4 (5.8%)	bio13 (3.6%)
Hemidactylus mabouia	5	X		X					0.98 (**)	bio18 (47.6%)	bio3 (18%)	bio12 (18%)	topoind (3.7%)
Hemidactylus turcicus	5			X					0.92 (**)	bio2 (78.3%)	bio12 (14.6%)	bio7 (3.8%)	bio3 (3.3%)
Holbrookia propinqua	3			X									
Hypsiglena torquata	9	X			X		X		0.93 (**)	bio14 (51.2%)	bio18 (20.6%)	topoind (19.1%)	bio2 (5%)
Iguana iguana	138	X	X	X	X	X	X		0.78 (0.063)	bio2 (25.2%)	topoind (21%)	dem (19.1%)	bio18 (11%)
Imantodes cenchoa	104	X	X	X	X	X			0.86 (0.038)	bio19 (18.8%)	bio2 (17.5%)	bio12 (11.3%)	bio4 (8.6%)

Imantodes gemmistratus	111	X	X	X	X	X	X			0.83 (0.039)	bio6 (16.8%)	bio7 (11.4%)	bio11 (9.8%)	bio4 (9%)
Kinosternon acutum *	13	X		X						0.99 (0.001)	dem (30.1%)	bio2 (22.5%)	bio3 (18%)	topoind (12.6%)
Kinosternon flavescens	2			X										
Kinosternon herrerai	24			X		X		X		0.96 (0.018)	bio15 (20%)	bio3 (19.3%)	bio4 (12.4%)	bio16 (10%)
Kinosternon hirtipes	22						X			0.99 (<0.001)	bio7 (38.6%)	bio6 (15.2%)	dem (13%)	topoind (6.1%)
Kinosternon integrum	179	X		X	X	X	X	X		0.81 (0.04)	bio19 (30.5%)	bio12 (13.5%)	bio2 (9.3%)	topoind (7.7%)
Kinosternon leucostomum	76	X	X	X						0.90 (0.034)	bio14 (37%)	bio2 (25.7%)	bio18 (12.4%)	slope (6.5%)
Kinosternon oaxacae	7	X						X		0.99 (**)	bio3 (37.4%)	bio14 (30.6%)	dem (11.5%)	bio13 (10.4%)
Kinosternon scorpioides	116	X	X	X	X	X	X			0.83 (0.061)	bio7 (45.6%)	slope (16.3%)	dem (8.7%)	bio14 (7.3%)
Laemanctus longipes	36	X	X	X						0.90 (0.028)	bio14 (37.4%)	bio2 (21.1%)	bio18 (11.8%)	slope (7.1%)
Lampropeltis ruthveni	2						X	X						
Lampropeltis triangulum	224	X	X	X	X	X	X			0.80 (0.039)	bio4 (17.3%)	bio2 (15.4%)	slope (8.9%)	bio18 (8.7%)
Lepidochelys kempii	1			X					CR					
Lepidochelys olivacea	3	X			X		X		EN					
Lepidophyma chicoasence	1		X					X						
Lepidophyma dontomasi	1	X						X						
Lepidophyma flavimaculatum	39	X	X	X						0.88 (0.051)	bio14 (49.1%)	bio4 (9.8%)	slope (8.3%)	bio9 (5.7%)
Lepidophyma lineri	1	X												
Lepidophyma lipetzi	1		X					X	EN					
Lepidophyma lowei	1	X						X						
Lepidophyma pajapanense *	33	X		X				X		0.99 (<0.001)	bio2 (52.3%)	bio19 (32.6%)	slope (3.8%)	bio15 (1.9%)
Lepidophyma rádula	1	X						X						
Lepidophyma smithi	62	X	X		X					0.95 (0.019)	bio11 (25%)	bio16 (16.2%)	bio7 (14%)	bio14 (11%)
Lepidophyma sylvaticum *	23			X		X		X		1 (<0.001)	bio14 (36.5%)	bio7 (16%)	bio4 (15.5%)	slope (13%)
Lepidophyma tarascae	1						X	X						
Lepidophyma tuxtlae	61	X	X	X				X		0.97 (0.021)	bio2 (46%)	bio19 (22.2%)	bio18 (18.7%)	slope (2.5%)

Leptodeira annulata	288	X	X	X	X	X				0.77 (0.04)	bio7 (22.7%)	bio6 (14.2%)	bio19 (11.1%)	dem (9.8%)
Leptodeira frenata	19		X	X						0.87 (0.061)	bio2 (44.1%)	bio14 (16.4%)	dem (9.2%)	slope (8.9%)
Leptodeira maculata	64				X		X	X		0.88 (0.033)	bio14 (62%)	topoind (10.4%)	bio9 (7%)	bio2 (6.4%)
Leptodeira nigrofasciata	32	X	X		X					0.99 (0.002)	bio7 (25.5%)	bio15 (22.6%)	bio19 (13.4%)	bio16 (9.4%)
Leptodeira septentrionalis	170	X	X	X	X	X				0.81 (0.034)	bio7 (25.3%)	slope (11.5%)	bio15 (10.9%)	bio18 (8%)
Leptodeira splendida	9					X	X	X		0,48	bio17 (76%)	bio3 (9.7%)	bio5 (7.6%)	bio16 (4%)
Leptophis ahaetulla	34	X	X	X						0.72 (0.092)	bio18 (35.5%)	bio2 (18.5%)	bio19 (15.6%)	bio9 (6.6%)
Leptophis diplotropis	93	X	X		X		X	X		0.81 (0.055)	bio4 (43.2%)	bio14 (19%)	bio12 (7.9%)	bio13 (6.5%)
Leptophis mexicanus	115	X	X	X		X				0.82 (0.038)	bio2 (32.5%)	slope (10.7%)	bio18 (8.6%)	bio19 (6.7%)
Leptophis modestus	3		X						VU					
Leptotyphlops bressoni	2						X							
Leptotyphlops goudoti	128	X	X	X	X	X	X			0.73 (0.074)	bio19 (23.2%)	bio7 (20%)	bio15 (11.7%)	bio4 (10%)
Leptotyphlops maximus	26	X			X	X				0.94 (0.013)	dem (41%)	bio14 (27%)	bio2 (9.5%)	bio6 (9.2%)
Leptotyphlops myopicus	3			X		X								
Loxocemus bicolor	99	X	X		X		X			0.96 (0.01)	bio11 (34.3%)	bio14 (24.7%)	dem (7.4%)	bio7 (5.6%)
Mabuya brachypoda	155	X	X	X	X		X			0.76 (0.055)	bio7 (15.7%)	bio4 (12.4%)	bio6 (12.3%)	bio15 (11.3%)
Manolepis putnami	93	X	X		X		X	X		0.88 (0.04)	bio19 (53.7%)	bio7 (20.7%)	bio15 (9.6%)	dem (3.4%)
Coluber flagellum	3			X										
Coluber mentovarius	280	X	X	X	X	X	X			0.75 (0.044)	bio6 (19.2%)	slope (16.6%)	bio17 (10.1%)	bio15 (8.5%)
Mastigodryas melanolomus	201	X	X	X	X	X	X			0.77 (0.042)	bio7 (27.8%)	bio18 (14.4%)	bio14 (10.3%)	bio 4 (8.2%)
Mesaspis antauges	4			X		X		X		0.94 (**)	bio9 (48.3%)	bio15 (20.2%)	bio10 (18.4%)	dem (6.5%)
Mesaspis gadovii	74	X			X			X		0.99 (0.003)	dem (32%)	bio4 (30%)	bio15 (11%)	bio7 (6.5%)
Mesaspis juarezi	27	X						X	EN	0.99 (0.003)	bio19 (20.1%)	bio14 (19%)	slope (18.8%)	bio9 (15.2%)
Mesaspis moreleti	92	X	X							0.98 (0.007)	bio4 (38.6%)	bio14 (10.1%)	bio7 (7.8%)	dem (7.1%)
Mesaspis viridiflava	93	X						X		0.98 (0.003)	bio8 (38.3%)	slope (7.7%)	bio12 (7.2%)	bio14 (6.6%)
Mesoscincus altamirani	6				X		X	X		0,98	bio18 (33%)	topoind (25%)	bio14 (23%)	bio15 (7.7%)
Micrurus bernadi	3			X		X		X						

Micrurus browni	57	X	X		X	X				0.87 (0.066)	bio3 (33.5%)	bio7 (22%)	bio12 (15.4%)	bio16 (8.4%)
Micrurus diastema	73	X	X	X		X				0.84 (0.045)	bio14 (50.5%)	bio4 (12.1%)	bio2 (9.1%)	slope (7.3%)
Micrurus distans	3						X	X						
Micrurus elegans	32	X	X	X						0.91 (0.037)	bio14 (44%)	dem (22.2%)	bio2 (6.3%)	bio13 (6.2%)
Micrurus ephippifer	38	X						X	VU	0.95 (0.045)	bio19 (35.4%)	bio2 (10.5%)	bio7 (10.1%)	bio16 (8.3%)
Micrurus laticollaris	20	X			X	X	X	X		0.66 (0.187)	bio14 (64.7%)	bio13 (14.3%)	topoind (7.1%)	bio5 (5.5%)
Micrurus latifasciatus	9	X	X							0,99	bio13 (48.7%)	bio4 (42%)	dem (7.1%)	bio6 (2.2%)
Micrurus limbatus	23			X				X		0.99 (0.001)	bio2 (51%)	bio19 (26.3%)	bio18 (10.4%)	slope (3.1%)
Micrurus nebularis	5	X								0,99	bio8 (29.2%)	bio5 (10.6%)	bio13 (8.3%)	bio3 (7.4%)
Micrurus nigrocinctus	20	X	X							0.79 (0.167)	bio16 (43.4%)	bio4 (31.7%)	bio14 (7.3%)	bio12 (6.1%)
Micrurus pachecogili	2					X		X						
Nerodia rhombifer *	85		X	X		X				0.90 (0.043)	dem (68.3%)	bio2 (16.2%)	bio14 (4.6%)	bio3 (3.4%)
Ninia diademata	142	X	X	X		X				0.88 (0.029)	bio12 (23.2%)	bio11 (13.5%)	bio15 (13%)	bio7 (6.5%)
Ninia sebae	179	X	X	X		X				0.88 (0.026)	bio18 (18.1%)	bio12 (15.5%)	bio2 (14.2%)	bio7 (13%)
Ophryacus melanurus	21	X				X		X	EN	0.98 (0.001)	bio6 (57%)	bio16 (22.7%)	bio4 (5.7%)	bio13 (5.4%)
Ophryacus undulatus	34	X		X	X	X		X	VU	0.95 (0.018)	dem (45.1%)	bio4 (12.4%)	bio7 (10.6%)	bio3 (6.1%)
Oxybelis aeneus	194	X	X	X	X	X	X			0.76 (0.038)	bio18 (25.2%)	bio7 (16.5%)	bio4 (8.1%)	bio19 (8%)
Oxybelis fulgidus	50	X	X	X	X					0.78 (0.066)	bio7 (55%)	bio15 (9.7%)	topoind (9.2%)	bio4 (7.7%)
Oxyrhopus petola	26	X	X	X						0.86 (0.073)	bio14 (38.2%)	dem (16.2%)	slope (12%)	bio4 (8%)
Pituophis emoryi *	7			X						1	bio4 (78%)	bio14 (18%)	dem (2.5%)	bio18 (0.9%)
Pelamis platurus	3	X	X		X		X							
Phrynosoma asio	64	X	X		X		X			0.77 (0.111)	bio14 (31%)	bio15 (9.8%)	bio16 (9.7%)	bio3 (9.5%)
Phrynosoma braconnieri	31	X				X		X		0.941 (0.012)	dem (26%)	bio16 (24.7%)	bio9 (8.5%)	bio13 (7.5%)
Phrynosoma orbiculare	59			X	X	X		X		0.97 (0.006)	bio9 (42.4%)	dem (12%)	bio15 (10.8%)	slope (10.6%)
Phrynosoma taurus	34	X			X	X		X		0.98 (0.006)	bio12 (57.2%)	dem (9.8%)	bio11 (8.6%)	bio14 (6.8%)
Phyllodactylus bordai	42	X			X	X		X		0.99 (0.001)	bio13 (19%)	bio7 (18.7%)	bio2 (11.2%)	bio6 (10.7%)

Phyllodactylus delcampoi	3				X			X						
Phyllodactylus duellmani	7						X	X		0,99	bio13 (36%)	bio9 (21.1%)	bio1 (17%)	bio12 (13.1%)
Phyllodactylus lanei	60				X		X	X		0.96 (0.021)	bio14 (53.6%)	bio16 (11%)	slope (8.5%)	bio17 (7.3%)
Phyllodactylus muralis	73	X						X		0.98 (0.01)	bio19 (63%)	bio2 (16%)	bio3 (4%)	bio18 (3%)
Phyllodactylus paucituberculatus	3						X	X						
Phyllodactylus tuberculosus	137	X	X		X		X			0.91 (0.041)	bio14 (40%)	bio11 (16.2%)	bio7 (14%)	bio19 (8.8%)
Pituophis deppei	65	X	X	X	X	X	X	X		0.88 (0.045)	dem (22.2%)	bio18 (18.7%)	bio11 (9.7%)	slope (9.4%)
Pituophis lineaticollis	92	X	X		X	X	X			0.89 (0.04)	dem (36.2%)	bio4 (19.8%)	bio8 (11.6%)	bio9 (5.6%)
Plestiodon brevirostris	134	X		X	X	X		X		0.90 (0.02)	bio8 (21.6%)	bio6 (15.5%)	bio4 (13%)	dem (11%)
Plestiodon colimensis	2						X	X						
Plestiodon copei	2					X	X	X						
Plestiodon dugesi	14						X	X	VU	0.98 (0.006)	bio6 (55.4%)	bio15 (31.4%)	bio13 (5.4%)	bio16 (3.3%)
Plestiodon lynxe	60			X		X		X		0.98 (0.004)	bio9 (47.5%)	bio14 (25.4%)	bio15 (9%)	bio4 (5.7%)
Plestiodon ochoterenae	24				X			X		0.99 (0.002)	bio14 (22%)	dem (18%)	bio7 (15%)	bio4 (11.2%)
Plestiodon parvulus	3						X	X						
Plestiodon sumichrasti	47	X	X	X		X				0.97 (0.012)	bio2 (22.8%)	bio14 (20.6%)	bio12 (16.5%)	bio18 (13.5%)
Pliocercus bicolor	10			X		X		X		0.96 (0.002)	bio4 (68.1%)	bio15 (20.9%)	bio9 (6.6%)	topoind (2.9%)
Pliocercus elapoides	95	X	X	X		X				0.89 (0.034)	bio12 (14.7%)	bio7 (13.2%)	bio15 (10.5%)	bio4 (9.9%)
Porthidium dunni	99	X	X					X		0.94 (0.016)	bio19 (52.6%)	bio7 (23%)	bio15 (10.1%)	bio4 (3.1%)
Porthidium hespere	1						X	X						
Porthidium nasutum	4	X	X							0.96 (**)	bio3 (83.8%)	bio12 (11.7%)	slope (3.1%)	bio2 (0.8%)
Pseudelaphe flavirufa	16	X	X	X						0.75 (0.057)	dem (28.8%)	bio2 (27.7%)	slope (22.6%)	bio14 (9.4%)
Pseudoficimia frontalis	16				X		X	X		0.88 (0.061)	bio17 (68.3%)	bio14 (18%)	bio3 (9.2%)	bio4 (2.9%)
Pseudoleptodeira latifasciata	21				X	X	X	X		0.97 (0.019)	bio14 (54%)	bio1 (13.5%)	slope (13.1%)	bio13 (12.5%)
Pseustes poecilonotus	35	X	X	X						0.87 (0.059)	bio2 (23.5%)	bio19 (20.6%)	bio14 (12.6%)	bio7 (9.2%)
Ramphotyphlops braminus	43	X		X	X		X			0.87 (0.103)	bio14 (50%)	bio18 (7.7%)	bio6 (7.4%)	dem (7.1%)
Rhadinaea bogertorum	32	X						X		0.87 (0.118)	bio14 (28.8%)	slope (23.5%)	bio8 (22.2%)	bio15 (7.2%)

Rhadinaea cuneata	2			X				X						
Rhadinaea decorata	108	X	X	X		X				0.86 (0.049)	bio14 (19.5%)	bio2 (15.5%)	bio18 (14.8%)	bio12 (14.3%)
Rhadinaea forbesi	6			X				X		0,95	bio15 (31.6%)	bio9 (28.4%)	bio2 (14.4%)	bio18 (9.9%)
Rhadinaea fulvivittis	59	X		X		X		X	VU	0.91 (0.043)	dem (24.1%)	bio8 (18.7%)	bio9 (10.9%)	bio15 (7.4%)
Rhadinaea godmani	4	X	X							0.91 (**)	topoind (37%)	bio4 (33%)	bio19 (21.3%)	bio14 (7.2%)
Rhadinaea hannsteini	3		X											
Rhadinaea hesperia	24	X			X	X	X	X		0.98 (0.013)	dem (28.6%)	bio14 (27.7%)	bio2 (13.4%)	bio19 (6.8%)
Rhadinaea kanalchutchan	13		X					X		0.91 (0.061)	bio7 (24.6%)	bio4 (18%)	bio8 (15%)	bio10 (10.5%)
Rhadinaea kinkelini	1		X											
Rhadinaea lachrymans	19		X							0.72 (0.21)	bio12 (46%)	bio3 (20.5%)	bio19 (14.2%)	bio16 (7.8%)
Rhadinaea laureata	18						X	X		0.98 (0.006)	dem (24.6%)	bio6 (22%)	bio5 (20.2%)	bio16 (16%)
Rhadinaea macdougalli	6	X						X		0,98	bio13 (98.4%)	bio6 (1.4%)	bio18 (0.2%)	
Rhadinaea marcellae	4					X		X	EN	0.99 (**)	bio4 (25.6%)	bio14 (20%)	slope (16%)	bio9 (10.5%)
Rhadinaea myersi	8	X						X		0,9	bio3 (50.9%)	bio2 (16.4%)	bio15 (15.2%)	topoind (8.7%)
Rhadinaea omiltemana	20		X		X					0.95 (0.025)	dem (27.5%)	bio4 (19.5%)	bio2 (11.5%)	bio14 (9%)
Rhadinaea posadasi	1		X											
Rhadinaea schistosa	5	X		X				X		0,9	bio9 (52.2%)	bio18 (27%)	bio7 (16.2%)	dem (2.6%)
Rhadinaea taeniata	43	X			X		X	X		0.96 (0.015)	dem (37%)	bio4 (25.5%)	bio15 (8.3%)	bio14 (7.3%)
Rhadinophanes monticola	1				X									
Rhinoclemmys areolata *	11		X	X						0.60 (0.241)	dem (47.7%)	bio15 (29.4%)	bio6 (13.1%)	bio9 (9.5%)
Rhinoclemmys pulcherrima	25	X	X		X					0.99 (0.005)	bio11 (46%)	bio4 (22%)	bio16 (11.4%)	bio14 (10%)
Rhinoclemmys rubida	42	X			X		X	X	VU	0.97 (0.009)	bio19 (72.5%)	bio3 (7.9%)	bio2 (5.6%)	bio15 (3.5%)
Salvadora bairdi	60	X		X	X	X	X	X		0.81 (0.066)	dem (36.5%)	bio7 (16.8%)	bio12 (11.9%)	slope (9.7%)
Salvadora intermedia	62	X			X	X		X		0.92 (0.043)	dem (31.6%)	bio13 (31.2%)	bio7 (16.1%)	bio15 (9.1%)
Salvadora lemniscata	78	X	X		X			X		0.88 (0.038)	bio19 (46.7%)	bio7 (26.4%)	bio14 (12.1%)	bio4 (6.1%)
Salvadora mexicana	88	X			X	X	X	X		0.78 (0.081)	bio14 (45.5%)	bio5 (14%)	bio2 (10.5%)	dem (10.4%)
Scaphiodontophis annulatus	46	X	X	X		X				0.56 (0.128)	bio18 (26.3%)	bio12 (25%)	bio14 (19.1%)	bio15 (8.2%)

Sceloporus acanthinus	17		X							0.99 (0.001)	bio16 (61%)	bio4 (20.4%)	bio14 (11%)	bio3 (3.7%)
Sceloporus adleri	34				X			X		0.99 (0.001)	dem (30%)	bio4 (21.4%)	bio2 (13%)	bio15 (11.7%)
Sceloporus aeneus	60					X	X	X		0.98 (0.004)	dem (26.7%)	bio7 (20%)	bio6 (13.1%)	bio16 (12.5%)
Sceloporus asper	7				X		X	X		0,98	dem (32.2%)	bio14 (26.4%)	bio15 (24.3%)	topoind (8%)
Sceloporus bicanthalis	90	X		X		X		X		0.98 (0.006)	bio5 (37.3%)	bio9 (21%)	bio14 (12%)	bio15 (5.5%)
Sceloporus carinatus	42		X							0.87 (0.105)	dem (22%)	bio16 (18.7%)	bio7 (15.4%)	bio2 (12.4%)
Sceloporus cryptus	14	X						X		0.99 (0.003)	bio8 (45.2%)	bio6 (16.3%)	bio5 (9.6%)	bio3 (7%)
Sceloporus disparilis	106					X				0.96 (0.012)	bio9 (23.3%)	dem (20.2%)	bio13 (14.2%)	bio15 (9.5%)
Sceloporus dugesi	82						X	X		0.98 (0.003)	bio7 (41.1%)	dem (15.4%)	bio3 (13.3%)	bio6 (9.2%)
Sceloporus edwardtaylori	48	X						X		0.99 (0.001)	bio19 (35.1%)	bio15 (29.6%)	bio2 (12.4%)	bio14 (5.2%)
Sceloporus formosus	361	X		X	X	X		X		0.94 (0.013)	bio5 (32.2%)	dem (19%)	bio7 (10%)	bio8 (9.1%)
Sceloporus gadoviae	126	X			X	X	X	X		0.93 (0.024)	bio7 (23%)	bio13 (19%)	bio6 (17.3%)	bio14 (12.7%)
Sceloporus grammicus	429	X		X	X		X			0.88 (0.018)	bio1 (27.7%)	bio8 (26.7%)	bio11 (12.5%)	bio16 (5.5%)
Sceloporus halli	2	X												
Sceloporus heterolepis	7						X	X		1	dem (39.4%)	bio3 (17%)	bio17 (16.5%)	bio16 (6.8%)
Sceloporus horridus	364	X			X	X	X	X		0.90 (0.015)	bio12 (26.7%)	bio14 (15.6%)	bio2 (13%)	dem (8.2%)
Sceloporus insignis	12						X	X		0.99 (0.001)	bio4 (32.4%)	bio3 (16.1%)	bio18 (16.1%)	bio2 (9.1%)
Sceloporus internasalis	57	X	X	X				X		0.96 (0.012)	bio2 (42.3%)	bio18 (23.1%)	bio19 (9%)	bio4 (5.1%)
Sceloporus jalapae	176	X		X		X		X		0.93 (0.024)	bio13 (41.3%)	bio16 (28%)	bio6 (7.2%)	dem (4.4%)
Sceloporus macdougalli	2	X						X						
Sceloporus malachiticus	63	X	X				X			0.94 (0.034)	bio4 (33.4%)	bio14 (24.4%)	bio7 (12%)	topoind (8.8%)
Sceloporus megalepidurus	92	X		X		X		X	VU	0.91 (0.05)	bio16 (29.7%)	bio15 (13.7%)	bio9 (10.2%)	bio13 (9.9%)
Sceloporus melanorhinus	162	X	X		X		X			0.86 (0.03)	bio14 (24.1%)	bio15 (17.7%)	bio4 (16%)	bio6 (13.2%)
Sceloporus mucronatus	378	X		X	X	X		X		0.89 (0.019)	dem (18.8%)	bio10 (17.2%)	bio18 (8.2%)	bio8 (8%)
Sceloporus ochoterenae	78	X			X	X		X		0.90 (0.052)	dem (22%)	bio14 (20.2%)	bio6 (13%)	bio15 (12%)
Sceloporus olloporus	2		X											
Sceloporus palaciosi	2				X			X						

Sceloporus pyrocephalus	118				X		X	X	0.90 (0.04)	bio14 (42%)	bio5 (15%)	bio3 (7%)	bio2 (6.7%)
Sceloporus salvini	35	X		X		X		X	0.98 (0.008)	bio14 (42.2%)	dem (21.4%)	bio3 (16.5%)	bio13 (4.5%)
Sceloporus scalaris	63			X		X	X		0.92 (0.054)	dem (23.6%)	bio6 (19.2%)	bio3 (17.6%)	bio7 (16.6%)
Sceloporus serrifer	69		X	X		X			0.92 (0.049)	bio7 (22%)	bio9 (17.3%)	bio16 (16%)	bio14 (10.2%)
Sceloporus siniferus	574	X	X		X		X		0.91 (0.014)	bio4 (37.5%)	bio19 (13.7%)	bio15 (11.6%)	bio7 (9.2%)
Sceloporus smaragdinus	29		X						0.99 (0.004)	bio4 (41.4%)	bio16 (36.5%)	bio12 (12.6%)	bio3 (6.1%)
Sceloporus smithi	55	X	X					X	0.95 (0.023)	bio19 (57%)	bio7 (17.5%)	bio16 (7.6%)	bio3 (5.6%)
Sceloporus spinosus	259	X		X		X	X	X	0.89 (0.027)	bio13 (21.4%)	bio9 (21.3%)	bio16 (11.6%)	bio1 (8.8%)
Sceloporus squamosus	29		X						0.97 (0.019)	bio11 (36.1%)	bio13 (25%)	bio12 (12.1%)	bio4 (7.6%)
Sceloporus stejnegeri	6				X			X	0,99	bio4 (39.1%)	dem (24.6%)	bio15 (16%)	slope (6.2%)
Sceloporus subpictus	17	X						X	0.98 (0.011)	bio6 (58.2%)	bio4 (22.1%)	bio2 (15%)	slope (3.4%)
Sceloporus taeniocnemis	91		X						0.98 (0.008)	dem (25%)	bio7 (17.7%)	bio14 (13.5%)	bio8 (9.4%)
Sceloporus tanneri	2	X											
Sceloporus torquatus	173			X		X	X	X	0.97 (0.005)	bio6 (31.7%)	bio3 (15.6%)	bio11 (12.2%)	bio15 (8.2%)
Sceloporus utiformis	34				X		X	X	0.97 (0.015)	bio14 (24.4%)	bio16 (21.7%)	bio15 (11.4%)	slope (7.2%)
Sceloporus variabilis	848	X	X	X		X			0.88 (0.013)	bio14 (30%)	bio7 (17%)	bio2 (14.6%)	bio4 (11.4%)
Scincella assata	106	X	X		X		X		0.91 (0.041)	bio4 (31.1%)	bio15 (23%)	bio7 (9.5%)	bio6 (9.3%)
Scincella cherriae	148	X	X	X					0.86 (0.023)	bio15 (23.4%)	bio4 (13.6%)	bio7 (11.5%)	bio18 (9.5%)
Scincella gemmingeri	118	X	X	X		X		X	0.95 (0.016)	bio3 (21.3%)	bio7 (16.7%)	bio5 (9.7%)	bio2 (9.4%)
Scincella incerta	18		X						0.94 (0.023)	bio4 (28.7%)	bio7 (17%)	slope (16%)	bio8 (8.5%)
Scincella silvicola	48	X		X		X		X	0.98 (0.01)	bio4 (57.7%)	dem (10.7%)	bio13 (6.1%)	bio14 (5.1%)
Senticolis triaspis	106	X	X	X	X	X	X		0.71 (0.064)	dem (24.1%)	bio19 (23.4%)	bio2 (13.3%)	bio15 (11.6%)
Sibon dimidiata	10	X	X	X					0.68 (0.069)	bio15 (78.3%)	bio12 (12.4%)	bio7 (5.8%)	bio13 (2%)
Sibon nebulata	33	X	X	X	X		X		0.81 (0.054)	bio7 (28%)	slope (18.2%)	bio13 (12.2%)	topoind (11.3%)
Sonora michoacanensis	8				X	X	X	X	0,82	bio14 (83.5%)	bio18 (7%)	bio13 (4.4%)	slope (3.2%)
Sphaerodactylus glaucus	96	X	X	X					0.72 (0.09)	bio7 (29.4%)	bio19 (23.1%)	bio6 (11.2%)	bio18 (8.5%)
Sphaerodactylus millepunctatus	8	X	X						0,48	bio11 (38.6%)	bio12 (21%)	dem (17.2%)	bio1 (10.5%)

Spilotes pullatus	84	X	X	X		X				0.84 (0.043)	bio7 (23.2%)	bio19 (22.6%)	dem (14.7%)	bio2 (14.2%)
Staurotypus salvini	6	X	X							0,99	bio11 (45.6%)	bio13 (22%)	dem (14.4%)	bio14 (13.3%)
Staurotypus triporcatus	37	X	X	X						0.96 (0.031)	bio2 (52.4%)	bio18 (19.3%)	dem (9.2%)	bio4 (6.5%)
Stenorrhina degenhardti	59	X	X	X						0.91 (0.039)	bio14 (28%)	bio2 (20.2%)	bio4 (14.5%)	bio15 (8.3%)
Stenorrhina freminvillei	157	X	X	X	X					0.75 (0.052)	bio4 (32%)	bio7 (21%)	bio19 (11.2%)	bio15 (5.3%)
Storeria dekayi	34		X	X		X				0.96 (0.022)	bio9 (27.3%)	bio4 (18.2%)	bio14 (17.8%)	bio15 (9%)
Storeria storerioides	53	X			X	X	X	X		0.85 (0.032)	dem (54%)	bio15 (13.1%)	bio14 (7.3%)	bio17 (7.1%)
Symphimus leucostomus	15	X	X					X		0.99 (0.003)	bio7 (44.5%)	bio15 (19.6%)	bio19 (10%)	bio12 (8.6%)
Tantalophis discolor	13	X				X		X	VU	0.58 (0.095)	bio6 (48%)	bio4 (15.4%)	bio10 (7.6%)	bio5 (7.4%)
Tantilla bocourti	36	X		X	X	X	X	X		0.88 (0.054)	dem (45.3%)	bio18 (17.3%)	bio12 (12%)	slope (8.4%)
Tantilla briggsi	1	X						X						
Tantilla calamarina	9				X	X	X	X		0,88	bio14 (72.3%)	bio5 (23%)	bio12 (4.5%)	bio13 (0.2%)
Tantilla cascadae	1						X							
Tantilla coronadoi	2				X			X						
Tantilla flavilineata	8	X						X	EN	0,97	bio13 (93.3%)	bio16 (6.6%)	bio3 (0.1%)	
Tantilla impensa	1		X											
Tantilla jani	7		X							0,99	bio11 (47.4%)	bio4 (36.5%)	bio13 (12%)	bio6 (3%)
Tantilla johnsoni	1		X											
Tantilla miniata	9		X							0,78	slope (48%)	bio3 (22%)	bio6 (15.5%)	topoind (13.1%)
Tantilla oaxacae	3	X												
Tantilla robusta	1					X								
Tantilla rubra	43	X		X		X				0.94 (0.022)	slope (20.2%)	bio12 (20%)	bio19 (16.7%)	bio9 (9.9%)
Tantilla schistosa	23	X		X						0.97 (0.016)	bio14 (37%)	bio2 (25.6%)	bio15 (12%)	bio8 (8%)
Tantilla sertula	1				X			X						
Tantilla shawi	1			X				X	EN					
Tantilla slavensi	6			X						0,99	bio18 (53%)	bio2 (31.6%)	dem (5.8%)	slope (5.7%)
Tantilla striata	9	X								0,96	bio7 (33.4%)	bio15 (23.6%)	bio2 (20%)	bio18 (13.6%)

Tantilla tayrae	2		X					X						
Tantilla triseriata	3	X						X						
Tantillita brevissima	3		X											
Tantillita lintoni	6		X	X						0,74	bio18 (52.6%)	bio2 (43%)	dem (2.4%)	bio3 (0.3%)
Terrapene mexicana	3			X										
Thamnophis chrysocephalus	97	X		X	X	X		X		0.93 (0.02)	dem (56%)	bio7 (17.6%)	topoind (6%)	bio15 (3.2%)
Thamnophis conanti	19			X		X				0.97 (0.025)	bio13 (36.1%)	bio14 (25%)	dem (15.1%)	bio2 (10.4%)
Thamnophis cyrtopsis	130	X	X	X	X	X	X			0.81 (0.052)	dem (51.6%)	bio8 (8.8%)	bio2 (5.8%)	bio3 (5.5%)
Thamnophis eques	84	X		X	X	X	X			0.94 (0.025)	dem (31.1%)	bio6 (16%)	slope (12.6%)	bio7 (11.1%)
Thamnophis fulvus	21		X							0.95 (0.024)	bio4 (26.6%)	bio14 (19.1%)	dem (15%)	bio18 (13.7%)
Thamnophis godmani	63	X		X	X	X		X		0.94 (0.025)	dem (53.5%)	bio4 (11%)	bio8 (9.5%)	slope (6.6%)
Thamnophis marcianus	45	X		X						0.99 (0.001)	bio19 (30.2%)	dem (22.4%)	bio2 (21.1%)	bio15 (10.2%)
Thamnophis melanogaster	41					X	X	X	EN	0.98 (0.005)	bio7 (31.5%)	bio6 (18%)	dem (12.3%)	topoind (9%)
Thamnophis postremus	2						X							
Thamnophis proximus	152	X	X	X	X	X				0.92 (0.021)	bio14 (29%)	bio16 (12%)	dem (11%)	bio7 (6.4%)
Thamnophis pulchrilatus	12	X		X		X	X	X		0.90 (0.03)	bio6 (79.5%)	bio1 (7.4%)	bio2 (5%)	bio3 (4.5%)
Thamnophis scalaris	43			X		X	X	X		0.97 (0.011)	bio9 (35%)	bio14 (21.5%)	bio8 (17.2%)	bio16 (4.8%)
Thamnophis scaliger	3						X	X	VU					
Thamnophis sumichrasti	17			X		X		X		0.97 (0.009)	bio9 (42.6%)	bio15 (24.3%)	bio14 (15%)	bio19 (9%)
Thamnophis validus	6				X		X	X		0,99	bio6 (69.5%)	bio15 (13%)	bio3 (9.4%)	bio18 (3.2%)
Thecadactylus rapicaudus	3		X											
Trachemys cataspila	7			X						0,99	bio4 (70.2%)	bio15 (17.8%)	bio16 (11.8%)	bio2 (0.2%)
Trachemys grayi	8	X	X							0,95	bio11 (38.2%)	bio4 (21.2%)	slope (19.2%)	bio17 (7.1%)
Trachemys venusta	36	X	X	X	X					0.94 (0.037)	bio14 (26.4%)	bio2 (26.2%)	dem (9.6%)	bio9 (9.2%)
Tretanorhinus nigroluteus	13	X	X	X						0.79 (0.006)	bio2 (61.8%)	bio4 (7.2%)	bio18 (7.1%)	slope (6.5%)
Trimorphodon biscutatus	193	X	X	X	X		X			0.82 (0.054)	bio2 (16.7%)	bio19 (16%)	bio4 (15.5%)	bio14 (11%)
Trimorphodon tau	128	X		X	X	X	X	X		0.84 (0.042)	bio12 (25.1%)	bio14 (16%)	dem (13%)	bio2 (11.4%)
Tropidodipsas fasciata	41	X	X	X	X			X		0.96 (0.017)	bio7 (28.6%)	bio15 (15%)	bio14 (14.7%)	bio19 (10.8%)

Tropidodipsas fischeri	13		X							0.99 (0.001)	bio4 (28.7%)	bio7 (25.7%)	bio8 (20.6%)	topoind (6.4%)
Tropidodipsas sartorii	82	X	X	X		X				0.84 (0.059)	bio14 (29.4%)	bio2 (20.4%)	bio18 (17.6%)	slope (9%)
Tropidodipsas zweifeli	1				X									
Typhlops tenuis	18			X						0.98 (0.006)	bio15 (14.6%)	bio2 (12%)	dem (12%)	slope (10.3%)
Ungaliophis continentalis	7		X							0,99	bio4 (27.4%)	bio8 (17.3%)	bio15 (10.6%)	bio10 (8.9%)
Urosaurus bicarinatus	256	X	X		X	X	X	X		0.89 (0.025)	bio19 (26%)	dem (16%)	bio17 (10.7%)	bio15 (9.3%)
Urosaurus gadovi	7				X		X	X		0,44	bio18 (35.7%)	bio9 (21.7%)	bio14 (20.3%)	bio12 (14%)
Xenodon rabdocephalus	52	X	X	X	X					0.96 (0.013)	bio12 (19.5%)	bio18 (19.5%)	bio7 (18.5%)	bio2 (9.4%)
Xenosaurus grandis	73	X	X	X	X	X			VU	0.86 (0.07)	dem (24%)	bio2 (21%)	bio7 (19.2%)	topoind (8.7%)
Xenosaurus penai	1				X			X						
Xenosaurus phalaroanthereon	5	X						X		0,98	bio13 (38.4%)	topoind (34.5%)	bio7 (19.2%)	bio12 (6.7%)
Xenosaurus rectocollaris	6					X		X		0,98	bio16 (42.2%)	bio13 (18%)	dem (17.6%)	topoind (8.4%)

(*) Species which its distribution did not account for the representation target value of 30%

(**) models run without Test data for the Maxent models

Appendix S3. Values for the representation targets for herpetofauna species in the conservation scenarios in southeastern Mexico. The shape files of conservation area network prioritization scenarios are available from http://sites.google.com/site/nurbina77/site_prioritization_niche

	Representation in the planning region						
	All region	*All species*		*Endemic species*		*Threatened species*	
Species		*10%*	*30%*	*10%*	*30%*	*10%*	*30%*
Agalychnis callidryas	7227.75	2652.85	7227.75				
Agalychnis moreleti	23110.04	4475.23	22934.65			4474.49	16997.11
Ambystoma amblycephalum	5447.26	1483.63	5433.56	1413.25	5348.26	1430.47	4963.45
Ambystoma andersoni	260.42	186.45	260.42	191.01	260.42	167.41	260.42
Ambystoma dumerili	636.75	188.75	636.58	171.33	629.61	196.67	631.59
Ambystoma ordinarium	4205.12	749.12	4169.27	749.02	3906.86	748.81	3835.9
Ambystoma tigrinum	7110.33	1871.22	7084.55				
Anotheca spinosa	9993.26	2150.69	9988.95				
Bolitoglossa flaviventris	1914.29	676.4	1901.69				
Bolitoglossa franklini	4123.55	1156.77	3910.51			1226.98	2278.05
Bolitoglossa hartwegi	3718.31	535.6	3569.85				
Bolitoglossa lincolni	6500.96	1111.2	6103.41				
Bolitoglossa macrinii	12795.5	2007.11	11713.76	2112.35	10254.17	2430.44	6329.53
Bolitoglossa mexicana	19585.61	3761.49	19526.16				
Bolitoglossa occidentalis	6796.22	1499.7	6556.53				
Bolitoglossa platydactyla	4581.56	1763.83	4581.56	1753.3	4581.56		
Bolitoglossa riletti	1545.66	226.13	1539.41	226.17	1514.43	225.2	676.39
Bolitoglossa rostrata	5815.77	922.93	5347.45			1192.14	4522.22
Bolitoglossa rufescens	7344.41	1946.06	7343.41				
Bromeliohyla dendroscarta	6594.69	1261.4	6591.03	1416.16	6456.64	1224.34	6532.7
Incilius bocourti	5739.84	1118	5399.08				
Incilius canaliferus	5996.05	1708.41	5717.86				

Incilius cavifrons	354.37	291.08	354.37			271.55	354.37
Incilius coccifer	1624.59	485.26	1623.71				
Anaxyrus compactilis	4595.53	1175.63	4594.95	1174.83	4575.19		
Incilius cristata	16434.38	3444.94	16422.27	3445.12	16161.76	3445.32	16060.64
Incilius cycladen	32291.94	5021.45	30757.4			5022.02	15536.59
Incilius macrocristata	26916.57	4787.23	26455.6			4341.47	20174.7
Incilius marmorea	30999.91	5910.09	30386.17	6246.99	27709.95		
Incilius nebulifer	2345.8	1260.66	2345.8				
Incilius occidentalis	32494.72	5885.76	31055.21				
Incilius perplexa	15218.36	2567.6	14600.5	2483.45	11951.5	2482.93	7448.91
Incilius spiculata	9815.09	1955.78	9741.3	2163.02	9016.2	1853.35	9062.6
Incilius tacanensis	276.94	186.71	268.51			176.82	173.32
Incilius tutelaria	6702.03	1255.69	6255.76			1206.94	3205.76
Incilius valliceps	27574.51	6509.88	27050.87				
Charadrahyla altipotens	31612.73	4824.52	29087.63			4341.25	15757.02
Charadrahyla chaneque	8818.69	1414.34	8773.52	1521.28	8061.63	1319.95	7899.85
Charadrahyla nephila	2243.68	422.54	2242.61	502.69	2033.89	546.24	2202.59
Charadrahyla taeniopus	2222.73	836.86	2222.73	920.42	2219.57	803.86	2199.41
Chiropterotriton chiropterus	10225.57	2631.51	10190.5	2630.13	9995.58		
Chiropterotriton lavae	191.18	108.75	191.16	151.41	188.5	146.94	188.72
Cryptotriton adelos	8463.54	2036.3	8267.31	2312.42	7525.55	2053.7	7718.43
Dendropsophus ebraccatus	5950.89	2008.17	5950.89				
Dendropsophus microcephala	10090.08	3281.88	10089.56				
Dendropsophus robertmertensi	5562.51	1779.39	5333.97				
Dendropsophus sartori	3439.23	946.92	3424.38	858.91	3095.8		
Dendrotriton xolocalcae	4601.24	1136.79	4395.22	863.64	3039.65	1055.32	2283.51
Duellmanohyla chamulae	5163.37	1240.39	5150.83	1003.28	4679.15	830.59	5092.51
Duellmanohyla ignicolor	2129	516.84	2128.59	542.25	2026.04	524.79	2066.52

Duellmanohyla schmidtorum	14817.42	2643.07	13790	2454.84	10686.18	2716.79	7941.39
Ecnomiohyla miotympanum	11138.07	3163.89	11079.91	3204.8	10806.04		
Ecnomiohyla valancifer	411.59	302.1	411.59	259.18	409.84	310.99	411.24
Craugastor alfredi	12059.9	2950.94	12059.72			2707.65	11996.63
Eleutherodactylus angustidigitorum	2102.79	823.8	2083.48	769.95	1927.99	587.87	1950.47
Craugastor augusti	24198.3	4290.79	22785.47				
Craugastor berkenbuschi	10954.82	2189.72	10930.98	2460.74	10653.59		
Eleutherodactylus cystignathoides	1865.44	975.07	1865.44				
Craugastor decoratus	3506.49	1008.04	3506.4	1101.63	3488.22	1015.12	3490.33
Eleutherodactylus dilatus	25784.22	3940.5	23524.06	4288.17	19895.49	4568.75	12563.45
Craugastor dixoni	1738.76	584.56	1621.14	520.79	1013.36	472.81	775.48
Craugastor greggi	27377.67	4620.54	25999.42			4298.35	19108.84
Craugastor hobartsmithi	21574.78	3321.28	20061.23	3327.92	17581.82	3320.45	11355.37
Craugastor laticeps	35700.55	7534.66	34407.52				
Craugastor lineatus	21914.3	3879.76	21468.81			4014.94	18650.57
Craugastor loki	3849.58	973.82	3805.27				
Craugastor matudai	15299.77	2563.7	14242.05			2596.68	8639.77
Craugastor megalotympanum	1017.89	495.65	1009	537.04	999.72	498.1	962.7
Craugastor mexicanus	17628.97	2645.63	16411.6	2893.36	15048.83		
Eleutherodactylus nitidus	28540.02	5348.41	27689.49	5325.02	25555.98		
Craugastor omiltemanus	1475.9	210.2	1064.3	285.5	1130.99	484.36	551.96
Craugastor pelorus	3621.78	1206.66	3621.78	826.34	3236.17		
Eleutherodactylus pipilans	23199.11	3814.17	22036.47				
Craugastor pozo	49540.07	9571.79	47885.44			9620.65	33530.59
Craugastor pygmaeus	30227.69	5866.12	29120.95			5404.64	20379.55
Craugastor rhodopis	13622.72	3343.45	13572.01	3293.8	13239.27	3328.51	11126.12
Eleutherodactylus rubrimaculatus	2842.32	761.2	2616.55			915.28	1574.94
Craugastor rugulosus	26635.3	4051.64	24763.43	3919.33	21002.72		

Craugastor rupinius	2589.58	824.89	2560.51				
Craugastor sartori	7960.28	1586.58	7461.82	1372.63	5386.08	1865.58	4376.29
Craugastor spatulatus	4941.43	791.88	4934.42	846	4703.25	804.26	4819.67
Craugastor stuarti	23315.74	3970.27	22775.52			3960.19	17504.44
Eleutherodactylus syristes	39479.69	6241.01	37038.25	6359.47	32265.58	6269.12	22513.8
Eleutherodactylus verrucipes	328.31	124.07	328.31	123.77	328.31	132.46	328.31
Craugastor vocalis	42582.35	7271.53	41538.34	7358.66	36233.54		
Craugastor vulcani	354.92	292.14	354.92	209.84	354.92	264.39	354.92
Exerodonta bivocata	2078.88	682.58	2078.88				
Exerodonta chimalapa	17238.45	3706.93	15816.01			3618.88	8901.87
Exerodonta juanitae	23541.4	3361.07	21202.7	3361.52	17037.76	3381.55	10079.93
Exerodonta melanomma	18887.16	2909.02	17278.03	2966.28	14473.35	3108.23	7872.03
Exerodonta pinorum	30116.9	4570.68	27830.14	4490.02	21788.21	5270.91	13300.21
Exerodonta smaragdina	50976.15	8867.4	49828.94	8867.71	43935.7		
Exerodonta sumichrasti	40420.34	6644.29	38590.04	6598.97	34212.98		
Exerodonta xera	20805.88	3915.28	20426.41	4080.12	18436.93	3683.67	16101.77
Gastrophryne elegans	4671.87	1577.77	4671.87				
Gastrophryne usta	15277.93	4345.33	15273.93				
Hyalinobatrachium fleischmanni	28483.02	5788.66	27893.75				
Hyla arboricola	4471.34	847.79	3960.14	1018.99	3510.53		
Hyla arenicolor	25394.79	5048.56	24959.97				
Hyla euphorbiacea	13976.89	2265.12	13841.31				
Hyla eximia	10715.84	2544.72	10687.59	2527.36	10476.53		
Dendropsophus plicatus	15925.61	3352.72	15831.8	3429.78	15202.64		
Tlalocohyla smithii	12654.24	2332.89	12479.03				
Hyla walkeri	5928.72	1137.23	5723.1			968.87	4732.39
Hypopachus barberi	9556.92	1727.7	8989.36				
Hypopachus variolosus	33145.08	6295.91	32609.21				

Leptodactylus fragilis	32976.82	7865.48	32675.88				
Leptodactylus melanonotus	34169.56	8239.45	33802.17				
Lineatriton orchimelas	962.32	433.61	960.37	404.87	944.3	443.55	904.62
Megastomatohyla mixe	35897.92	7225	34618.55	7640.9	31336.83	6594.64	27505.06
Megastomatohyla mixomaculata	1810.22	504.78	1800.75	531.3	1779.21	435.45	1716.83
Megastomatohyla nubicola	81.03	41.47	81.03	54.79	81.03	48.41	81.03
Megastomatohyla pellita	8574.23	1369.54	7423.43	1469.67	6320.82	1548.57	3598.38
Notophthalmus meridionalis	6889.78	2539.92	6889.78			2539.21	6889.78
Pachymedusa dacnicolor	14333.6	2945.11	13979.88	2886.48	12408.12		
Parvimolge townsendi	624.18	324.45	624.18			273.5	624.18
Engystomops pustulosus	11484.87	3326.45	11456.79				
Plectrohyla acanthodes	10629.28	1773.89	9991.24	1627.69	9425.27	1825.97	8607.7
Plectrohyla arborescandens	7061.94	1582.61	7048.83	1524.57	6950.02	1524.6	6942.96
Plectrohyla avia	505.61	263.42	502.42			262.8	379.74
Plectrohyla bistincta	30193.07	4613.95	29129.2	4554.1	26214.14		
Plectrohyla celata	3054.54	704.84	3031.43	802.34	2660.62	715.35	2925.14
Plectrohyla charadricola	2236.01	742.3	2236	848.66	2157.39	683.9	2217.08
Plectrohyla chryses	8610.93	1095.06	7285.72	1177.3	5950.39	1667.41	3641.77
Plectrohyla cyanomma	2369	628.57	2358.48	727.07	2042.14	616.81	2286.4
Plectrohyla cyclada	7910.37	1216.72	7857.56	1371.39	7234.83	1229.65	7264.38
Plectrohyla guatemalensis	1950.64	655.17	1887			768.24	1222.35
Plectrohyla hazelae	31475.4	5715.68	29584.24	5951.91	26205.27	5764.13	23701.23
Plectrohyla ixil	693.71	214.65	693.71			110.96	693.71
Plectrohyla lacertosa	9460.73	1690.56	8256.58	1416.76	5925.92	2026.09	3748.81
Plectrohyla matudai	6777.84	1464.48	6240.74			1672.47	3731.94
Plectrohyla mykter	6062.3	773.42	4845.72	963.4	4007.89	1368.89	2242.73
Plectrohyla pentheter	12628.61	1751.81	10987.77	1752.13	9627.54	1751.24	5711.36
Plectrohyla sabrina	6270.62	1565.56	6229.89	1895.33	5632.54	1587.29	5992.41

Plectrohyla sagorum	3557.82	924.18	3380.69			1053.31	1756.8
Plectrohyla thorectes	21894.73	3347.39	19507.27	3748.11	16181.33	3407.51	9636.05
Pseudoeurycea belli	24718.4	4352.78	23325.77	4412.43	21046.03	4465.31	18157.91
Pseudoeurycea cephalica	4589.95	1241.28	4586.16	1395.15	4506.67		
Pseudoeurycea cochranae	16959.27	2610.34	16254.11	2543.47	14705.48	2542.27	12333.32
Pseudoeurycea firscheini	3220.25	895.61	3211.86	798.55	3166.51	838.2	3079.87
Pseudoeurycea gadovi	3049.18	642.22	3041.04	642.23	2972.24	642.2	3027.01
Pseudoeurycea juarezi	3679.01	550.88	3665.02	614.97	3336.1	535.03	3579.81
Pseudoeurycea leprosa	5807.25	1404.23	5798.95	1386.78	5676.93	1345.33	5723.7
Pseudoeurycea lineola	1508.22	530.26	1502.89			409.68	1465.87
Pseudoeurycea maxima	2306.74	360.76	2241.17				
Pseudoeurycea melanomolga	1082.39	361.75	1062.64	444.82	1040.14	502.87	1003.33
Pseudoeurycea mixteca	3193.21	959.02	3191.41				
Pseudoeurycea mystax	8253.31	1532.44	7896.59			1804.02	6117.44
Pseudoeurycea saltator	4271.62	979.29	4223.55			978.52	4133.51
Pseudoeurycea smithi	5664.2	890.44	5549.55	898.3	4751.17	926.37	4849.35
Pseudoeurycea tlahcuiloh	603.7	75.32	345.48	67.65	255.18		
Pseudoeurycea unguidentis	34270.94	6119.46	32670	6278.1	29698.84	5971.19	25116.58
Pseudoeurycea werleri	318.47	250.91	318.47	208.68	318.46	259.52	317.22
Ptychohyla acrochorda	4687.54	1080.21	4639.47	1201.24	4181.03		
Ptychohyla erythromma	23535.63	3331.5	21307.68	3634.2	16433.93	4177.3	10496.82
Ptychohyla euthysanota	11090.71	2385.02	10659.02				
Ptychohyla leonhardschultzei	17917.99	2477.91	16158.08	2529.12	13947.68	2703.68	7840.66
Ptychohyla macrotympanum	25529.47	4233.29	25147.21				
Ptychohyla zophodes	4611.77	731.25	4602.53	814.12	4319.18		
Lithobates berlandieri	4173.58	1913.35	4173.58				
Lithobates brownorum	23507.59	4370.8	23102.9	4227.38	21473.22		
Lithobates catesbeiana	21879.44	5552.04	21767				

Lithobates dunni	1098.04	397.86	1097.84	349.74	1091.57	469.76	1093.58
Lithobates forreri	23535.64	4003.28	23172.25				
Lithobates maculata	9841.45	1824.72	9601.87				
Lithobates megapoda	6075.88	1722.19	6072.75	1716.95	5905.45	1461.33	5942.01
Lithobates montezumae	17336.96	3903.19	17221.66	3935.36	16714.27		
Lithobates neovolcanica	3525.98	930.62	3524.78	897.77	3465.74		
Lithobates omiltemana	34499.74	5145.68	32086.31	5344.27	26465.31	6092.87	17639.49
Lithobates sierramadrensis	19629.49	3183.48	17988.93	3338.93	15194.08	3201.81	8986.43
Lithobates spectabilis	21039.88	4324.18	20998.19	4326.41	20307.2		
Lithobates vaillanti	17037.94	4725.06	16982.88				
Lithobates zweifeli	37324.91	6078.19	36326.93	6077.38	32016.7		
Rhinophrynus dorsalis	12920.79	4235.55	12920.06				
Scaphiopus couchi	3542.87	1871.25	3542.87				
Scinax staufferi	21199.98	6038.49	21179.87				
Smilisca baudini	42853.17	9830.87	42335.26				
Smilisca cyanosticta	6395.54	1504.04	6384.23				
Spea hammondi	20349.26	4094.64	20142.17				
Spea multiplicatus	17001.22	3453.07	16506.67				
Eleutherodactylus leprus	3077.53	1048.03	3077.53				
Thorius arboreus	1277.46	314.32	1274.85			299.3	1259.33
Thorius boreas	3757.61	817.82	3572.3			903.44	3238.98
Thorius dubitus	1130.09	350.07	1128.24	281.59	1117.21	353.36	1090.8
Thorius lunaris	7679.64	1512.72	7463.58	1457.4	7062.56	1449.88	6689.54
Thorius macdougalli	3898.6	579.69	3885.93	628.85	3620.82	551.07	3685.53
Thorius magnipes	3769.21	894.16	3700.98			904.16	3431.6
Thorius munificus	418.58	223.16	417.6	261.32	407.36	297.58	414.35
Thorius narismagnus	198.19	168.85	198.19			178.65	197.97
Thorius narisovalis	8090.15	1175.28	7962.75	1170.23	6988.01	1170.28	6624.49

Thorius omiltemi	3097.15	378.09	2433.03	401.08	2107.85	651.24	1156.04
Thorius pennatulus	3439.4	895.43	3382.9	895.35	3137.11	894.88	2822.19
Thorius pulmonaris	6358.35	1030.58	6120.35	1073.94	5419.3	1355.83	5026.16
Thorius schmidti	15411.21	2860.51	14472.03	3081.63	13330.32	3193.03	11313.66
Thorius spilogaster	9177.86	1855.57	8922.83	1823.98	8348.34	1789.44	8202.04
Thorius troglodytes	715.8	155.59	715.02			183.31	682.94
Tlalocohyla godmani	5704.03	1863.78	5703.59			1729.27	5327.44
Tlalocohyla loquax	14153.24	3994.23	14148.62				
Tlalocohyla picta	10280.35	3720.66	10280.33				
Tlalocohyla smithii	14678.88	2464.1	14197.1	2399.66	12315.17		
Trachycephalus venulosa	12508.26	4527.67	12508.26				
Abronia graminea	4428.39	1110.61	4427.71	982.1	4389.43	995.53	4414.74
Abronia lythrochila	4055.28	654	3570.35	624.51	3530.42		
Abronia martindelcampoi	3949.12	497.57	3309.17	606.79	3028.28	915.91	1530.19
Abronia mixteca	7904.49	1356.97	7581.12	1409.88	6761.79	1347.58	6790.54
Abronia oaxacae	9153.34	1347.34	8626.59	1442.92	8170.29	1960.98	6164.59
Abronia smithi	5141.4	1310.14	4888.65	1052.59	3512.19		
Abronia taeniata	5077.43	1231.86	5065.68	1138.7	4968.73	1184.25	5014.85
Adelphicos latifasciatum	29527.96	5041.44	28362.46	5201.13	26039.99		
Adelphicos nigrilatum	1908.85	295.46	1749.08	283.1	1752		
Adelphicos quadrivirgatum	27716.76	5523.28	27361.46				
Amastridium sapperi	220.29	195.3	220.29				
Ameiva festiva	15306.24	3793.1	15281.12				
Ameiva undulata	44034.52	9898.89	43094.56				
Anolis anisolepis	2871.59	459.61	2789.71	487.41	2721.82		
Anolis barkeri	5940.8	1577.09	5940.73	1754.81	5844.09	1464.79	5328.01
Anolis biporcatus	11056.84	2369.87	10870.1				
Anolis breedlovei	3050.51	651.38	2604.69	695.82	2279.45	559.06	1333.83

Anolis capito	37629.41	6909.53	36643.55				
Anolis compressicaudus	15099.63	2697.93	15084.92	2697.54	14547.11		
Anolis crassulus	3973.34	731.01	3723.78				
Anolis cuprinus	32469.28	6435.55	30596.42	6719.1	26665.58		
Anolis dollfusianus	2197.32	563.97	2147.21				
Anolis duellmani	1869.34	756.35	1858.31	926.37	1792.95		
Anolis dunni	13982.73	2260.57	12722.84	2418.18	9580.92		
Anolis hobartsmithi	708.53	287.35	708.48	209.52	586.68	162.89	708.15
Anolis isthmicus	1545.1	435.65	1540.86	616.98	1432.38		
Anolis laeviventris	16600.56	3068.07	16356.41				
Anolis lemurinus	21978.37	4712.6	21772.45				
Anolis liogaster	3628.65	457.17	2823.3	569.17	2462.88		
Anolis matudai	21185.32	3473.84	19290.64				
Anolis megapholidotus	36252.66	5451.69	33908.89	5425.55	27403.11		
Anolis microlepidotus	29607.59	4399.42	27756.44	4399.91	23705.79		
Anolis milleri	12345.37	2414.96	11884.28	2703.91	10495.06		
Anolis naufragus	1544.41	374.45	1536	419	1482.16	365.58	1515.22
Anolis nebuloides	10527.46	1511.31	9534.2	1505.99	8371.53		
Anolis nebulosus	17879.56	3334.56	17230.34	3487.67	14931.37		
Anolis omiltemanus	6015.94	940.31	5290.91	1131.6	4859.74		
Anolis parvicirculatus	4883.47	1251.25	4709.66	890.14	4510.57		
Anolis pentaprion	12995.84	3483.04	12994.11				
Anolis petersi	11790.21	2746.62	11777.17				
Anolis polyrhachis	27523.01	5417.68	26612.59				
Anolis pygmaeus	41153.28	8406.08	39951.93	8406.06	35710.31	8406.18	29578.38
Anolis quercorum	15127.28	3247.32	14813.06	3286.82	13758.15		
Anolis rodriguezi	15704.95	3709.27	15643.45				
Anolis schiedei	5414.49	1580.63	5335.7	1770.62	5173.77		

Anolis sericeus	30454.44	7352.66	30060.21		
Anolis serranoi	131.1	76.1	131.1		
Anolis subocularis	5475.76	1005.78	5399.56	854.02	4487.14
Anolis tropidonotus	13906.37	3036.48	13886.4		
Anolis uniformis	5960.48	1687.9	5958.36		
Aspidoscelis calidipes	7805.01	1295.49	7783.55	1365.05	6835.91
Aspidoscelis communis	11854.72	2122.97	11808.6	2333.44	11346.06
Aspidoscelis costata	12965.03	2142.02	12664.45	2162.4	10982.41
Aspidoscelis deppii	39016.66	7929.99	38198.58		
Aspidoscelis guttata	32656.64	6952.28	31885.04	6620.7	28833.14
Aspidoscelis lineattissima	12952.91	2460.48	12917.92	2608.51	12327.86
Aspidoscelis mexicana	7990.18	1461.51	7807.9	1420.69	7176.92
Aspidoscelis motaguae	22860.87	3496.58	22263.64		
Aspidoscelis parvisocia	3116.49	1348.93	3115.88	1359.61	2946.69
Aspidoscelis sacki	14086.35	2774.2	13917.87	2877.62	12683.05
Aspidoscelis septemvitatus	1707.83	1114.73	1707.83		
Atropoides mexicanus	28089.03	5097.44	27689.95		
Atropoides nummifer	8960.61	1590.37	8950.26		
Atropoides occiduus	1875.55	699.95	1861.08		
Atropoides olmec	11699.17	2604.7	11528.73	2771.22	11187.07
Atropoides olmec	10308.56	2254.19	10235.47	2361.16	9854.89
Barisia jonesi	499.93	72.12	497.2	101.3	482.71
Barisia planifrons	6693.47	994.97	6488.89	921.77	5776.72
Basiliscus vittatus	37102.15	8418.96	36327.16		
Bipes canaliculatus	4254.56	770.18	4252.4	806.49	4028.69
Boa constrictor	31236.44	7597.17	30765.64		
Bothriechis bicolor	4151.17	1083.21	3946.31		
Bothrops asper	21016.72	5472.84	20967.58		

Caiman crocodylus	1180.18	463.36	1180.18				
Celestus enneagrammus	4150.87	840.43	4150.44	956.15	3948.39		
Celestus legnotus	843.39	256.15	843.39	304.53	794.37		
Cerrophidion barbouri	15882.93	2025.74	13705.46	2196.7	10600.25	2870.63	6400.87
Cerrophidion godmani	16347.27	3265.13	15551.16				
Cerrophidion tzotzilorum	3094.51	588.76	2897.18	610.09	2931.19		
Chelydra serpentina	12054.63	4030.98	12044.89				
Chersodromus liebmani	3269.95	835.31	3264.13				
Claudius angustatus	4941.57	1858.84	4941.57				
Clelia clelia	29346.89	6287.44	29085.81				
Clelia scytalina	16183.96	3917.31	15914.33				
Coleonyx elegans	27210.83	6210.49	27007.86				
Coniophanes alvarezi	4701.69	968.89	4482.8	960.01	4388.32		
Coniophanes bipunctatus	28988.22	6362.66	28117.31				
Coniophanes fissidens	25532.67	5581.29	24871.07				
Coniophanes imperialis	26153.54	6977.85	25725.56				
Coniophanes piceivittis	35862.06	6621.01	34561.12				
Coniophanes quinquevittatus	13498.66	4107.41	13338.71				
Conophis lineatus	5147.58	1789.65	5146.18				
Conophis vittatus	30924.55	5746.4	30294.99	5800.99	27053.73		
Conopsis acuta	7105.44	1720.21	6982.7				
Conopsis biserialis	8598.27	1656.13	8297.83	1577.48	7378.2		
Conopsis lineata	17448.36	4078.73	17120.51	3887.33	16071.85		
Conopsis megalodon	12529.48	2247.95	11719.94	2309.07	10288.85		
Conopsis nasus	2744.08	949.96	2742.73	847.64	2731.51		
Corytophanes hernandezi	19724.6	4304.3	19659.61				
Corytophanes percarinatus	420.21	182.41	420.21				
Crocodylus acutus	17713.66	4856.66	17689.1			4856.65	14569.94

Crocodylus moreleti	14754.22	3802.49	14745.69				
Crotalus atrox	20278.75	3886.47	19081.25				
Crotalus intermedius	15639.48	2609.2	14999.32	2751.73	13891.12		
Crotalus molossus	27809.81	5281.9	27394.34				
Crotalus pusillus	11123.14	1721.55	10414.76	1676.78	8864.56	1630.08	5594.57
Crotalus ravus	14058.18	2537.3	13356.14	2426.59	12681.59		
Crotalus scutulatus	6936.57	1999.01	6931.39				
Crotalus simus	45304.35	8493.11	43653.88				
Crotalus triseriatus	11217.97	2495.94	11104.99	2528.52	10708.45		
Cryophis hallbergi	22639.72	4328.97	21597.39				
Ctenosaura acanthura	9727.1	3529.62	9727.1	3318.68	9727.1		
Ctenosaura clarki	1728.63	273.19	1728.37	273.29	1535.62	362.38	1152.01
Ctenosaura oaxacana	4013.75	845.82	3988.25	1239.45	3678.53	1124.67	2453.7
Ctenosaura pectinata	22440.28	4484.36	22029.49	4934.25	19754.77		
Ctenosaura similis	968.54	383.47	968.54				
Dendrophidion vinitor	8968.5	2019.4	8927.21				
Dermatemys mawii	14734.59	3396.21	14723.55				
Dermophis mexicanus	22045.03	5365.72	21580.99				
Dermophis oaxacae	30330.46	4838.94	29287.96				
Diadophis punctatus	26932.45	5631.5	26465.66				
Drymarchon melanurus	42387.18	9114.92	41597.2				
Drymobius chloroticus	27785.79	5154.62	26709.25				
Drymobius margaritiferus	38422.33	8255.08	37314.25				
Enulius flavitorques	45343.33	7024.75	43580.27				
Exiliboa placata	1459.33	278.43	1457.68	283.77	1291.59	273.5	1418.72
Ficimia olivacea	9004.13	3260.27	9004.13	3260.24	9004.13		
Ficimia publia	25840.89	4829.24	25195.3				
Ficimia streckeri	7544.63	2745.44	7544.63				

Ficimia variegata	15733.49	4617.68	15704.18	4737.8	15079.92
Geagras redimitus	56722.67	10071.35	53939.43	10301.62	46759.08
Geophis anocularis	929.32	238.93	916.47	305.41	736.33
Geophis blanchardi	11591.61	2038.57	11163.47	1947.06	10116.14
Geophis carinosus	3025.9	928.62	2894.9		
Geophis dubius	13212.79	2009.05	12722.97	2009.48	11847
Geophis duellmani	11816.82	2538.64	11457.17	2806.67	10216.9
Geophis dugesi	17515.45	3622.69	17400.78	3622.08	16271.19
Geophis immaculatus	5168.69	1330.38	4922.57		
Geophis multitorques	3264.75	987.21	3263.36	1094.49	3232.64
Geophis nasalis	7036.61	1426.33	6679.89		
Geophis petersi	1319.31	448.39	1319.26	397.56	1318.41
Geophis rhodogaster	1393.11	430.04	1177.71		
Geophis semidoliatus	1471.47	541.48	1471.47	537.65	1468.7
Gerrhonotus liocephalus	39123.6	7079.61	38069.95	6990.13	34527.19
Gerrhonotus ophiurus	32082.36	6808.63	31467.52	6807.99	29554.98
Heloderma horridum	22173.01	4270.85	21812.13		
Hemidactylus frenatus	30321.04	5918.9	29886.71		
Iguana iguana	29751.63	7149.78	29545.31		
Imantodes cenchoa	19807.53	4580.33	19755.3		
Imantodes gemmistratus	35244.53	7503.1	34786.74		
Kinosternon acutum	7480.62	2755.95	7480.62		
Kinosternon herrerai	7017.69	2656.3	6997.19	2525.59	6939.75
Kinosternon hirtipes	3335.93	1044.2	3334.13		
Kinosternon integrum	28911.68	5846.32	28631.6	5809.69	26887.41
Kinosternon leucostomum	11207.63	3012.47	11207.54		
Kinosternon scorpioides	27101.03	6662.31	26906.65		
Laemanctus longipes	18761.04	4392.66	18697.88		

Lampropeltis triangulum	37293.53	8539.37	36836.81				
Lepidophyma flavimaculatum	17498.14	3253.97	17464.73				
Lepidophyma pajapanense	526.58	354.17	526.58	283.96	526.58		
Lepidophyma smithi	8953.87	2036.22	8752.84				
Lepidophyma sylvaticum	264.19	112.68	264.19	101.97	264.19		
Lepidophyma tuxtlae	2427.89	867.67	2427.86	889.02	2360.04		
Leptodeira annulata	26048.38	6360.77	25799.82				
Leptodeira frenata	6073.86	1930.78	6073.86				
Leptodeira maculata	32539.49	5111.87	31199.56	5256.95	25530.92		
Leptodeira nigrofasciata	12818.4	2505.91	12362.77				
Leptodeira septentrionalis	42410.22	8458.07	40678.04				
Leptophis ahaetulla	13053.29	2863.99	13025.41				
Leptophis diplotropis	46185.35	7364.49	44620.01	7268.16	38879.41		
Leptophis mexicanus	24858.96	6636.11	24810.74				
Leptotyphlops goudoti	41619.71	7914.81	40896.62				
Leptotyphlops maximus	23688.59	3907.84	22981.86				
Loxocemus bicolor	12129.92	2593.78	11996.15				
Mabuya brachypoda	48965.01	9286.22	47459.06				
Manolepis putnami	16213.92	3046.76	15525.22	3142.14	13227.01		
Masticophis mentovarius	40957.53	8645.28	40091.45				
Mastigodryas melanolomus	34414.38	7228.22	33745.5				
Mesaspis gadovii	8469.1	1258.42	7071.37	1345.63	5776.76		
Mesaspis juarezi	3264.57	644.29	3261.08	612.96	3019.81	505.67	3199.49
Mesaspis moreleti	9564.97	2002.82	9227.51				
Mesaspis viridiflava	6566.95	936.63	6523.23	972.92	5743.38		
Micrurus browni	40467.43	7216.26	39072.95				
Micrurus diastema	18383.74	4289.08	18371.17				
Micrurus elegans	19677.84	3376.92	19637.97				

Micrurus ephippifer	23218.33	3736.48	22161.88	4416.03	20043.43	4102.49	14130.42
Micrurus laticollaris	23833.2	4278.08	23578.76	4615.44	21165.75		
Micrurus latifasciatus	15601.43	2975.19	14919.45				
Micrurus limbatus	414.1	311.22	414.1	231.94	414.1		
Micrurus nebularis	6681.85	1189.89	6506.14				
Micrurus nigrocinctus	6817.6	1300.43	6633.1				
Nerodia rhombifer	3895.8	2144.14	3895.8				
Ninia diademata	17925.6	4072.17	17800.04				
Ninia sebae	26640.86	6046.91	26313.78				
Ophryacus melanurus	16730.99	3277.05	16405.22	3276.84	15863.37	3276.45	13593.09
Ophryacus undulatus	30097.99	4933.25	28155.06	4865.8	25034.28	5220.07	18801.18
Oxybelis aeneus	45638.85	8964.12	44911.89				
Oxybelis fulgidus	27465.29	5618.5	26583.33				
Oxyrhopus petola	10519.75	2566.6	10519.75				
Pituophis emoryi	391.22	330.96	391.22				
Phrynosoma asio	7812.52	1408.98	7797.09				
Phrynosoma braconnieri	15933.88	3201.67	15672.84	2956.9	14803.27		
Phrynosoma orbiculare	4166.33	1160.11	4160.38	1194.48	4134.06		
Phrynosoma taurus	13868.61	2511.69	13729.19	2705.65	12388.36		
Phyllodactylus bordai	6923.37	1915.06	6889.92	1920.02	6106.33		
Phyllodactylus duellmani	1354.88	294.85	1354.62	323.37	1215.13		
Phyllodactylus lanei	13887.1	2828.05	13319.32	2957.49	10067.93		
Phyllodactylus muralis	4578.52	850.19	4561.27	1194.28	4262.28		
Phyllodactylus tuberculosus	18208.46	3432.58	17662.12				
Pituophis deppei	23813.97	5389.9	23397.71	5225.62	22218.71		
Pituophis lineaticollis	26844.31	4412.16	25477.66				
Plestiodon brevirostris	15994	2646.42	15193.38	2682.39	14040.09		
Plestiodon dugesi	4667.8	1241.43	4463.05	1158.04	3989.39	929.32	3687.46

Plestiodon lynxe	2826.19	945.22	2826.16	1065.67	2820.29		
Plestiodon ochoterenae	9826.08	1576.36	8866.68	1707.14	6856.47		
Plestiodon sumichrasti	16826.81	3728.13	16779.3				
Pliocercus bicolor	10064.79	3138.52	10047.64	3138.89	9753.13		
Pliocercus elapoides	38809.91	7322.28	38021.06				
Porthidium dunni	18825.13	3578.71	18326.76	4144.42	16699.85		
Pseudelaphe flavirufa	17664.94	5522.95	17664.6				
Pseudoficimia frontalis	52930.01	8972.13	51216.6	9094.66	44847.12		
Pseudoleptodeira latifasciata	30501.09	4867.22	29452.49	4945.13	24487.15		
Pseustes poecilonotus	28866.75	5373.89	28719.5				
Ramphotyphlops braminus	18165.99	3431.24	17863.88				
Rhadinaea bogertorum	3890.86	519	3873.58	581.25	3542.71		
Rhadinaea decorata	15729.89	3282.14	15683.66				
Rhadinaea forbesi	2671.8	798.68	2636.81	862.78	2488.96		
Rhadinaea fulvivittis	19121.75	2898.97	18349.78	3145.9	16539.04	2922.73	13955.18
Rhadinaea hesperia	26388.4	4019.28	25239.02	4215.76	21372.29		
Rhadinaea kanalchutchan	17922.94	2756.26	16970.71	2628.59	16109.53		
Rhadinaea lachrymans	23566.44	4079.36	22576.64				
Rhadinaea laureata	4750.81	1170.95	4572.67	1106.62	4080.43		
Rhadinaea macdougalli	52134.14	9650.96	50664.97	9651.04	45534.69		
Rhadinaea myersi	27214.78	4037.74	25484.68	4037.69	21547.1		
Rhadinaea omiltemana	7652.88	1130.91	6398.25				
Rhadinaea schistosa	65524.79	12438.07	63906.47	12438.06	58898.23		
Rhadinaea taeniata	23131.91	3574.62	21319.47	3566	18569.42		
Rhinoclemmys areolata	4811.58	1939.23	4811.58				
Rhinoclemmys pulcherrima	12357.04	2428.65	12136.98				
Rhinoclemmys rubida	3212.07	549.61	3201.18	625.93	2998.15		
Salvadora bairdi	14413.05	3308.61	14365.63	3162.73	14192.19		

Salvadora intermedia	25122.25	4583.74	24328.44	4499.08	21450.29		
Salvadora lemniscata	17745.88	3106.67	17086.52	3016.52	15000.14		
Salvadora mexicana	21626.11	3551.25	21255.15	3551.12	19064.82		
Scaphiodontophis annulatus	22596.3	4593.09	22079.92				
Sceloporus acanthinus	2250.18	718.09	2219.87				
Sceloporus adleri	2289.2	258.25	1690.12	258.72	1530.2		
Sceloporus aeneus	7854.78	1594.58	7818.62	1594.43	7421.59		
Sceloporus asper	46304.16	7297.49	43912.9	7297.35	37518.35		
Sceloporus bicanthalis	4826.64	1098.83	4796.21	1148.99	4743.16		
Sceloporus carinatus	9275.92	1519.9	8916.24				
Sceloporus cryptus	5228.42	851.05	5096.33	947.79	4611.71		
Sceloporus dugesi	2619.01	913.97	2618.36	890.96	2603.24		
Sceloporus edwardtaylori	1117.09	193.12	1115.73	362.81	1039.98		
Sceloporus formosus	20740.05	3357.08	19310.08	3310.94	17330.83		
Sceloporus gadoviae	10215.43	1972.06	10176.51	2017.93	9294.08		
Sceloporus grammicus	22814.29	3880.44	21596.58				
Sceloporus heterolepis	15421.13	2791.1	14501.03	2739.26	12464.19		
Sceloporus horridus	23632.61	4254.51	23193.7	4400.67	21207.47		
Sceloporus insignis	1509.56	186.82	1489.62	257.47	1304.01		
Sceloporus internasalis	6657.71	1761.12	6654.51	1647.88	6568.59		
Sceloporus jalapae	9023.51	2719.64	9018.06	2658.01	8837.45		
Sceloporus malachiticus	13474.29	2640.29	13202.01				
Sceloporus megalepidurus	7511.87	2118.68	7506.66	2021.83	7419.31	2050.14	7234.34
Sceloporus melanorhinus	31539.6	5266.1	30560.81				
Sceloporus mucronatus	24451.07	4471.12	23439.43	4415.31	21642.54		
Sceloporus ochoterenae	9940.46	1870.3	9383.64	1797.18	8084.82		
Sceloporus pyrocephalus	14632.95	2398.35	14567.79	2398.25	12924.91		
Sceloporus salvini	6643.94	1797.13	6640.14	1967.09	6462.7		

Sceloporus scalaris	5848.1	1797.25	5846.65		
Sceloporus serrifer	11045.54	2745.82	10889.82		
Sceloporus siniferus	31490.7	5633.55	30406.82		
Sceloporus smaragdinus	1804.84	623.6	1659.46		
Sceloporus smithi	6326.66	1208.95	6100.87	1463.17	5582.59
Sceloporus spinosus	14863.13	3350.57	14652.05	3272.36	14044.79
Sceloporus squamosus	2251.57	537.1	2185.19		
Sceloporus stejnegeri	9651.16	1388.51	7739.91	1501.31	5793.65
Sceloporus subpictus	3216.06	593.39	3179.14	590.37	3014.34
Sceloporus taeniocnemis	3632.74	634.58	3481.1		
Sceloporus torquatus	5868.36	1575.83	5834.23	1547.94	5663.32
Sceloporus utiformis	27945.52	4332.42	26573.38	4974.71	22705.33
Sceloporus variabilis	30577.57	7131.85	30061.6		
Scincella assata	20125.76	4013.78	19202.53		
Scincella cherriae	17574.38	3608.36	17412.9		
Scincella gemmingeri	16691.05	3441.81	16512.22	3800.52	15803.89
Scincella incerta	11366.8	2108.92	11134.09		
Scincella silvicola	8958.69	3032.57	8950.84	3038.36	8813.46
Senticolis triaspis	52740.37	8978.75	51253.03		
Sibon nebulata	37147.16	7138.78	35923.66		
Sphaerodactylus glaucus	34394.94	6991.35	33608.15		
Spilotes pullatus	28604.05	6574.74	28366.16		
Staurotypus salvini	4136.19	1209.94	4130.83		
Staurotypus triporcatus	5641.46	1907.5	5640.92		
Stenorrhina degenhardti	23306.43	4688.42	23240.17		
Stenorrhina freminvillei	36827.23	6926.3	35633.59		
Storeria dekayi	8467.18	2517.1	8443.55		
Storeria storerioides	25432.02	4092.21	23771.68	4165.45	20761.9

Symphimus leucostomus	22082.44	4174.11	20670.25	4734.62	17918.06		
Tantalophis discolor	15442.11	2412.55	14202.02	2486.12	12934.01	2847.74	10945.63
Tantilla bocourti	20003.55	3941.31	19731.75	3859.09	18813.28		
Tantilla flavilineata	18675.17	3933.85	18539.54	4038.57	17326.21	3802.19	13984.29
Tantilla jani	18868.1	3461.6	18424.7				
Tantilla rubra	24513.79	4951.7	23980.93				
Tantilla schistosa	11632.49	2503.19	11624				
Tantilla slavensi	136.69	125.04	136.69				
Tantilla striata	9186.47	1726.65	8557.27				
Tantillita lintoni	226.39	205.82	226.39				
Thamnophis chrysocephalus	21320.13	3198.97	19914.95	3084.11	17621.14		
Thamnophis conanti	2395.32	475.35	2344.51				
Thamnophis cyrtopsis	42737.06	7128.82	41539.6				
Thamnophis eques	10030.69	2430.36	9974.52				
Thamnophis fulvus	16579.36	2849.19	15812.43				
Thamnophis godmani	21736.72	3209.17	20326.56	3207.46	18681.24		
Thamnophis marcianus	1439.03	519.85	1438.07				
Thamnophis melanogaster	4854.05	1307.63	4806.21	1285.54	4638.5	1224.48	4125.73
Thamnophis proximus	13515.4	3943.65	13413.42				
Thamnophis pulchrilatus	25447.25	5030.49	24676.23	5200.53	23099.44		
Thamnophis scalaris	7443.07	1651.59	7368.72	1731.7	7159.62		
Thamnophis sumichrasti	8619.36	1999.98	8525	2081.3	8237.72		
Thamnophis validus	152.96	127.31	152.96	107.01	152.96		
Trachemys cataspila	5114.5	2243.25	5114.5				
Trachemys grayi	16157.16	3414.09	16057.62				
Trachemys venusta	11309.93	3224.06	11294.94				
Tretanorhinus nigroluteus	5810.37	2223.91	5810.37				
Trimorphodon biscutatus	34017.05	6181.28	33240.11				

Trimorphodon tau	25210.28	4563.69	24998.77	4651.36	23796.77		
Tropidodipsas fasciata	19697.69	3905.33	19139.28	3579.37	16842.81		
Tropidodipsas sartorii	30459.96	6573.22	30061.06				
Typhlops tenuis	17318.93	4488.58	17317.23				
Ungaliophis continentalis	2299.51	469.17	2121.82				
Urosaurus bicarinatus	29712.37	5299.64	29256.01	5409.29	25894.3		
Xenodon rabdocephalus	25513.83	5620.57	25406.5				
Xenosaurus grandis	23325.79	3906.61	22553.64			3853.99	16403.33
Xenosaurus rectocollaris	7342.54	1676.95	7163.3	1720.67	6686.95		