Action Plan for North America

Sustainable Trade in Tarantulas

Commission for Environmental Cooperation

Please cite as:
CEC. 2017. *Sustainable Trade in Tarantulas: Action Plan for North America*. Montreal, Canada: Commission for Environmental Cooperation. 52 pp.

This report was prepared by Rick C. West and Ernest W.T. Cooper, of E. Cooper Environmental Consulting, for the Secretariat of the Commission for Environmental Cooperation (CEC). The information contained herein is the responsibility of the authors and does not necessarily reflect the views of the governments of Canada, Mexico or the United States of America.

Publication Details

Publication type: Project Publication
Publication date: May 2017
Original language: English
Review and quality assurance procedures:
Final Party review: April 2017
QA311
Project: 2015-2016/Strengthening conservation and sustainable production of selected CITES Appendix II species in North America

ISBN: 978-2-89700-198-8 (e-version); 978-2-89700-199-5 (print)
Disponible en français (sommaire de rapport) – ISBN: 978-2-89700-202-2 (e-version)
Disponible en español – ISBN: 978-2-89700-200-8 (e-version); 978-2-89700-201-5 (print)

Legal deposit – Bibliothèque et Archives nationales du Québec, 2017
Legal deposit – Library and Archives Canada, 2017

Cover photo: Mexican red-knee tarantula (*Brachypelma smithi*) by Rick C. West

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Action Plan for North America

Sustainable Trade in Tarantulas

Mexican orange-knee tarantula
(*Brachypelma hamorii*)

Rick C. West

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List of Abbreviations and Acronyms

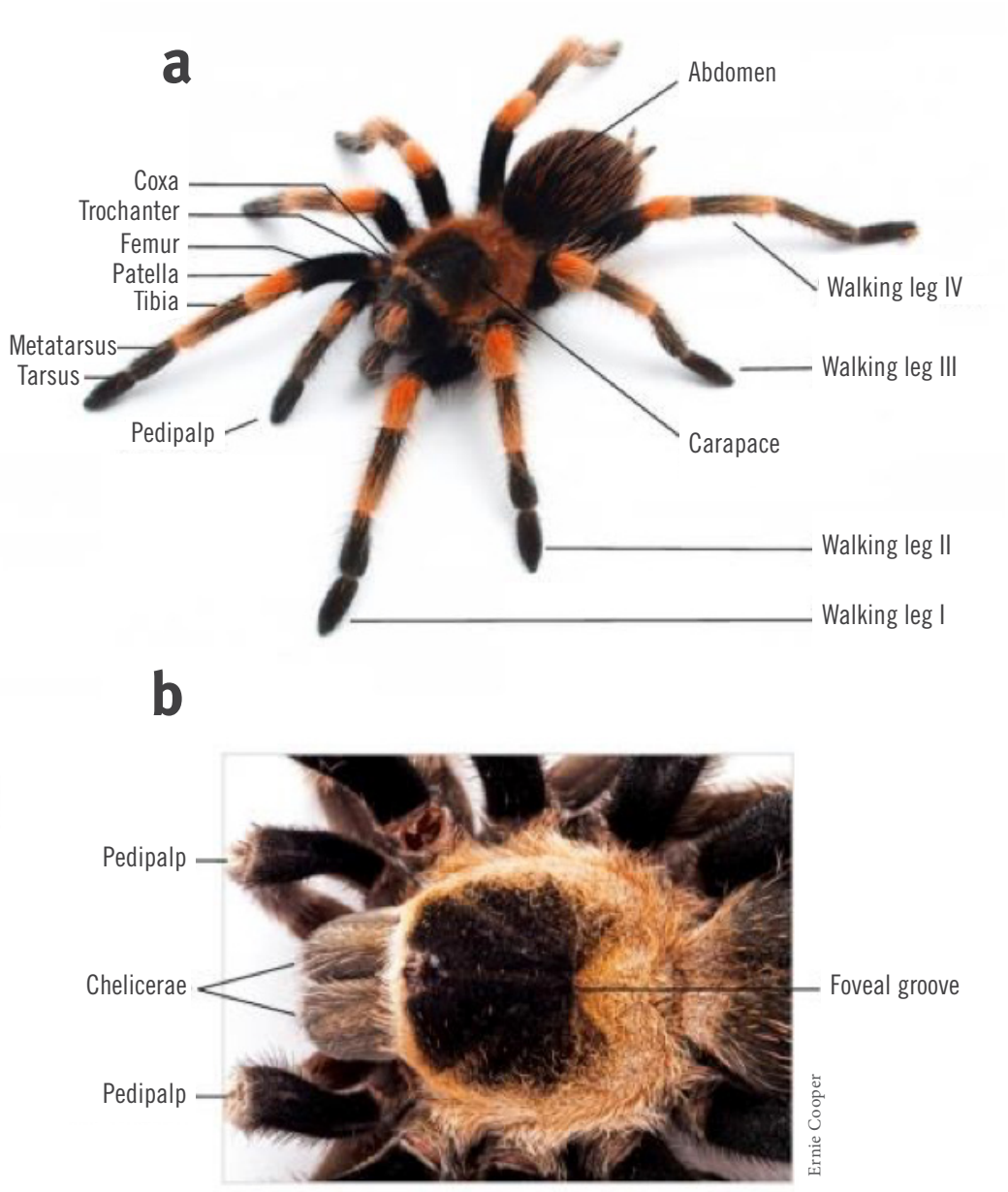
CEC	Commission for Environmental Cooperation
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
Conabio	*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad* (National Commission for the Knowledge and Use of Biodiversity; Mexico)
Conanp	*Comisión Nacional de Áreas Naturales Protegidas* (National Commission of Natural Protected Areas; Mexico)
DGVS	*Direccion General de Vida Silvestre* (General Directorate for Wildlife; Mexico)
DNA	deoxyribonucleic acid
DOF	*Diario Oficial Federal* (National Gazette; Mexico)
ECCC	Environment and Climate Change Canada (formerly Environment Canada)
ESA	Endangered Species Act (US)
EU	European Union
FDA	Food and Drug Administration (US)
IUCN	International Union for Conservation of Nature
LGVS	*Ley General de Vida Silvestre* (General Wildlife Law; Mexico)
NDF	non-detriment finding
NOM-059	Mexican Official Standard NOM059-SEMARNAT-2010 (Mexico)
PEP	*Program de Especies Prioritarias* (Priority Species Program, of Conanp; Mexico)
Profepa	*Procuraduría Federal de Protección al Ambiente* (Office of the Federal Attorney for Environmental Protection; Mexico)
SARA	Species at Risk Act (Canada)
Semarnat	*Secretaría de Medio Ambiente y Recursos Naturales* (Secretariat of Environment and Natural Resources; Mexico)
SUMA	*Sistema Nacional de Unidades de Manejo para la Conservación de la Vida Silvestre* (National System of Management Units for the Conservation of Wildlife; Mexico)
UMA	*Unidades de Manejo y Aprovechamiento Sustentable de Vida Silvestre* (Units for Management and Sustainable Exploitation of Wildlife; Mexico)
UNAM	*Universidad Nacional Autónoma de México* (National Autonomous University of Mexico)
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
US	United States
USFWS	United States Fish and Wildlife Service
WAPPRIITA	Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (Canada)
WAPTR	Wild Animal and Plant Trade Regulations (Canada)
WCS	Wildlife Conservation Society
WED	Wildlife Enforcement Directorate (of ECCC)

Glossary of Terms

The following definitions were adapted from Lawrence (2005). See illustrations in Figure 1.

Abdomen	Rounded posterior part of the body behind the cephalothorax.
Body length	Longitudinal measurement from the front of the chelicerae to the end of the abdomen.
Carapace	Hard upper shell that covers the cephalothorax.
Cephalothorax	Portion of the body formed by the fused head and thorax, separate from the abdomen.
Chelicerae	Paired appendages at the front of the carapace that have been modified into fangs for injecting venom.
Coxa	First segment of the leg, counting from the body.
Femur	Third segment of the leg, counting from the body.
Femora	Plural of femur.
Foveal groove	Cuticular indentation in the thoracic region of the carapace.
Metatarsi	Plural of metatarsus.
Metatarsus	Sixth segment of the leg, counting from the body.
Palps	Pedipalps.
Patella	Fourth segment of the leg, counting from the body.
Patellae	Plural of patella.
Pedipalps	Paired leg-like appendages immediately anterior to the walking legs. This term is often shortened to palps.
Pubescence	Short fine hairs.
Striations	Series of grooves or linear marks that radiate out from the foveal groove.
Tarsi	Plural of tarsus.
Tarsus	Seventh and last segment (the foot) of the leg, counting from the body.
Tibia	Fifth segment of the leg, counting from the body.
Tibiae	Plural of tibia.
Trochanter	Second segment of the leg, counting from the body.

Figure 1. **Basic body parts of a *Brachypelma* tarantula**



Note: Figure 1(a) shows a three-quarter view of a live sub-adult specimen of *B. smithi*. Figure 1(b) shows a dorsal view of the carapace of a dried adult specimen of *B. smithi* (courtesy of Ernie Cooper, 2016).

Abstract

This document is one of a set of five action plans that were prepared as part of a project by the Commission for Environmental Cooperation (CEC) to promote legal, sustainable and traceable trade in selected North American species that are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The five action plans were produced under the guidance of the CITES Authorities of Canada, Mexico and the United States.

Sixteen tarantula species, comprising one from the genus *Aphonopelma* and 15 from the genus *Brachypelma*, were selected as "priority tarantula species" and are the subject of this action plan. Information was compiled for the species as a group, including: the impact of trade on conservation and livelihoods; making CITES non-detriment findings (NDFs); and identification challenges for CITES enforcement. The 16 species were also assessed as to their distribution, conservation status, trade and commercial value. A total of 18 recommended actions are proposed, related to: improved cooperation among North American stakeholders involved in the trade chain; government policies that promote captive-breeding and sustainable trade in Mexico; biological and trade information; and conservation and enforcement. These actions were developed based on the information compiled for this document and from consultation with stakeholders. Consultation included a stakeholder workshop held on 25–26 October 2016 in Mexico City.

Executive Summary

This action plan presents 18 recommended actions for promoting sustainable trade in the priority tarantula species and provides an overview of the species' distribution, conservation status, and trade, and information relevant to their management. These actions focus on improving cooperation among North American stakeholders; developing and implementing policies that promote captive-breeding and sustainable trade in Mexico; increasing knowledge and understanding of tarantula biology and trade; and building enforcement capacity. The information found in this action plan was compiled via literature review, data analysis, and consultation with experts and stakeholders from Canada, Mexico and the United States. A stakeholder workshop was held in Mexico City on 25–26 October 2016.

This action plan is one of a set of five action plans that were prepared as part of a project by the Commission for Environmental Cooperation (CEC) to promote legal, sustainable and traceable trade in selected North American species that are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The five action plans were produced under the guidance of the CITES Authorities of Canada, Mexico and the United States.

Priority Species

Sixteen priority tarantula species were selected for this project, comprising one from the genus *Aphonopelma* and 15 from the genus *Brachypelma*. These species are native to Mexico, with one possible exception: a single female specimen of *Brachypelma aureoceps* was reported found in Florida, US. However, this location is considered to be a mistake in reporting, and in addition, *B. aureoceps* may not be a valid species. None of these species naturally occurs in Canada or the United States (possibly except for *B. aureoceps*, as noted).

The genus *Brachypelma* includes several colorful species that are highly sought after for the commercial pet trade. To date, no range and population studies have been conducted on any of the Mexican *Brachypelma* species, and published zoogeographical ranges are general in scope or are incomplete.

Only one species of *Brachypelma* (*B. smithi*) has been assessed by the International Union for Conservation of Nature (IUCN). That assessment was published in 1996 and may no longer reflect the status of the species.

Management and Conservation Overview

The sustainable use, conservation and management of native tarantulas is regulated in Mexico under the General Wildlife Law (*Ley General de Vida Silvestre*—LGVS). Under the LGVS, qualified persons may be permitted to collect a limited number of wild tarantulas to keep and breed in captivity. The resulting offspring may then be sold domestically or exported.

With some basic training, and the use of a suitable guide to identification, border enforcement officers would be able to identify sub-adult and adult tarantula specimens. Unfortunately, *Brachypelma* identification training has not been offered to wildlife enforcement officers in Canada, Mexico or the United States, and a suitable reference to *Brachypelma* identification is not currently available.

Trade Overview

Multinational tarantula dealers indicate that the market for live *Brachypelma* (and tarantulas in general) is increasing, both within Mexico and internationally. The international markets include Canada, the United States, the European Union (EU) and Asia. Currently, demand exceeds the legal supply, especially for the colorful "red-legged" species. Licensed *Brachypelma* breeders in Mexico report that they collectively produce, on average, between 11,000–14,000 juvenile tarantulas annually. All *Brachypelma* are sold and exported exclusively to Canadian and US tarantula dealers. Mexican breeders stated that they have requests for *Brachypelma* species from the EU, China and Japan that they cannot fill.

Tarantula breeders and keepers suggest that the illegal trade in *Brachypelma* species far exceeds the legal trade. They report that large numbers of live tarantulas are smuggled out of Mexico, mainly to the EU and Asia.

Recommended Actions

The following table provides a summary of the actions recommended for promoting the conservation of priority tarantula species in Mexico, and their legal, sustainable trade throughout North America. Completion of the recommended actions is subject to available funding.

No.	Goals	Actions
1	Ensure that progress on the recommendations in this action plan is reported and measurable.	**Measuring progress**: The governments of Canada, Mexico and the US should develop and implement a process for tracking and reporting on efforts to fulfill the recommendations of this action plan, such as a dedicated website or other method.
2	Support collaborative North American efforts directed at promoting sustainable, traceable trade and conservation of priority CITES Appendix II species.	(a) **Trinational collaboration**: The governments of Canada, Mexico and the United States should support and monitor collaborative efforts to promote sustainable, traceable trade and conservation of native species deemed to be of priority concern, including CITES Appendix II tarantulas. (b) **Funding strategy**: The governments of Canada, Mexico and the United States (to the extent possible, and in consideration of domestic priorities) should develop a long-term strategy for funding this action plan, emphasizing realization of the high-priority actions.
3	Develop and institute government policies that support tarantula conservation while promoting legal, sustainable trade.	(a) **Environmental impact studies**: The Government of Mexico should prioritize environmental impact studies on the Pacific coast of Mexico—the area of distribution of many tarantula species—and institute infrastructure and road construction projects that minimize habitat loss and degradation. (b) **Streamlining administration**: The Government of Mexico should promote domestic and international trade by streamlining administrative processing times, and respecting the permit issuance times prescribed by law.
4	Compile and distribute biological and trade information so that international authorities can make informed management decisions to ensure that trade in tarantulas is conducted at sustainable levels.	**IUCN Red List/NOM-059 workshop**: The Government of Mexico, in collaboration with the CEC, tarantula experts and IUCN Red List staff, should host a workshop to assess the Mexican *Brachypelma* for inclusion in the IUCN Red List and to update NOM-059-SEMARNAT-2010. Some species may be assessed as "Data Deficient," which would highlight the need for additional research.
5	Advance scientific knowledge about the biology and conservation of Mexican tarantulas; their exploitation; and domestic and international trade in tarantula specimens.	(a) **Tarantula field studies (phase 1)**: The Government of Mexico, in collaboration with academia and nongovernmental organizations, should support research on the populations, habitats, distribution, biology, national and international use, demand for and trade of the following species of highest priority, as well as on the impact of land use and habitat degradation on them: *Brachypelma auratum*, *B. baumgarteni*, *B. boehmei*, *B. emilia*, *B. klaasi*, *B. hamorii* and *B. smithi*. (b) **Tarantula field studies (phase 2)**: The Government of Mexico, in collaboration with academia and nongovernmental organizations, should support research on the populations, habitats, distribution, biology, national and international use, demand for and trade of the following species of secondary priority, as well as on the impact of land use and habitat degradation on them: *Aphonopelma pallidum*, *Brachypelma albiceps*, *B. epicureanum*, *B. kahlenbergi*, *B. schroederi*, *B. vagans* and *B. verdezi*.

No.	Goals	Actions
6	Establish policies and guidelines that support and promote captive-breeding and sustainable trade of Mexican tarantulas.	(a) **Trade traceability**: The Government of Mexico should collaborate with Mexican tarantula breeders to develop a system for certifying the origin of specimens used in UMA breeding programs. (b) **Commercial production guidelines**: Mexican tarantula breeders, in collaboration with the Government of Mexico, academia and nongovernmental organizations, should develop management guidelines for intensive and semi-intensive commercial production of tarantulas.
7	Promote the in-situ conservation of wild tarantula populations in Mexico.	(a) **Monitoring protocols and database**: Tarantula researchers, in collaboration with the Government of Mexico, nongovernmental organizations and local communities, should develop and implement standardized field protocols for monitoring tarantula populations, and establish a database for sharing data. (b) **Captive-release studies**: The Government of Mexico, in collaboration with academia and nongovernmental organizations, should support onsite studies designed to determine the feasibility and impact of introducing captive-bred tarantulas into the wild. This initiative should focus on the following species: Brachypelma auratum, *B. baumgarteni*, B. *boehmei*, *B. emilia*, *B. klaasi*, *B. hamorii* and *B. smithi*. (c) **Live-specimen handling guidelines**: Tarantula researchers and breeders should develop and follow guidelines for the capture, handling and transportation of wild tarantulas, so as to reduce unnecessary injury and death to wild tarantulas when being taken or studied (under permit) in their environment. (d) **Public education**: The Government of Mexico, in collaboration with the CEC, academia and nongovernmental organizations, should develop and initiate educational activities in key communities that are in contact with tarantula populations, so as to increase support for tarantula conservation and promote interest in establishing semi-intensive tarantula UMAs.
8	Provide enforcement officers with the information and resources necessary to identify tarantula specimens and enforce the laws that regulate tarantula trade.	(a) **Tarantula identification guide**: The governments of Canada, the United States and Mexico, via the CEC, should support the development and distribution of a guide to the identification of *Brachypelma* tarantulas. The guide should be designed to meet law enforcement needs and should be made available online for general use. Completion of the guide could lead to development of a pictorial identification smartphone "app." (b) **Expert database**: The governments of Canada, the United States and Mexico should develop and maintain a shared database of domestic and international experts who may be contacted to assist enforcement officers to identify tarantula specimens and respond to illegal trade activities. (c) **USFWS training**: The USFWS should provide training on *Brachypelma* identification to USFWS inspectors via the In-service training program. (d) **Tarantula trade workshop**: The governments of Canada, the United States and Mexico, via the CEC, should host a trinational workshop on the trade and identification of *Brachypelma* tarantulas. The workshop should bring together tarantula experts and enforcement staff from Canada, Mexico, the United States and the EU to provide training on *Brachypelma* identification, build links between North American and EU enforcement authorities, and stimulate collaborative enforcement actions to combat tarantula trafficking.

Golden red-rump tarantula
(*Brachypelma albiceps*)

Rick C. West

Background

In 2015, the governments of Canada, Mexico and the United States initiated a collaborative project through the Commission for Environmental Cooperation (CEC) to strengthen the conservation and sustainable trade of 56 North American taxa that are included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The project, aligned with the CEC strategic priority on sustainable consumption and production, aims to provide guidance in the form of five action plans for reducing illegal and/or unsustainable harvest and trade; improving biological knowledge to allow science-based management decisions; and promoting traceability, species conservation and livelihoods of stakeholders, throughout trade.

CITES came into force in 1975 and calls on the cooperation of the signatory countries to ensure that international trade does not threaten vulnerable specimens of wild animals and plants with extinction, and that trade is regulated and maintained at sustainable levels. To implement CITES, each Party to the Convention must designate one or more Management Authorities in charge of administering the permitting system, and one or more Scientific Authorities to advise them on the effects of trade on the conservation of species. Appendix II of CITES includes more than 34,000 species for which international trade is regulated to avoid over-exploitation and ensure their survival.

Process for Developing this Action Plan

The initial step in developing this action plan was a review of North American species listed in Appendix II of CITES, by the CEC project's Steering Committee, comprising CITES Authorities of Canada, Mexico and the United States. In total, 55 species and one genus were selected as "priority species" for the project. These species were selected because they are all native to North America and traded by more than one of the three North America countries. Furthermore, the Steering Committee determined that regional information exchange and collaboration would facilitate species conservation, CITES implementation, and trade legality, traceability and sustainability. These 56 taxa were organized into five groups: parrots, sharks, tarantulas, timber species (specific cacti and tropical hardwoods), and turtles and tortoises.

Then, a comprehensive review of the 56 taxa was developed to compile information on each species' conservation status, trade dynamics and commercial value. In addition, sustainable-use practices were documented, as was the impact of the species' trade on conservation, and the information needed for completing CITES non-detriment findings (NDFs).[1] Species-identification challenges for CITES enforcement were reviewed and opportunities for promoting sustainable trade and conservation were discussed.

On 25–26 October 2016, a stakeholder consultation was held in Mexico City to gather information and recommendations for actions to promote sustainable trade and conservation of the priority tarantula species. This document draws on the information from the comprehensive review, the stakeholder consultation, and consultations with CITES Authorities of Canada, Mexico and the United States.

This action plan includes information on sixteen priority tarantula species, comprising one from the genus *Aphonopelma* and 15 from the genus *Brachypelma*. The information was compiled for the species as a group, and included: the impact of trade on conservation and livelihoods; making of NDFs; and identification challenges for CITES enforcement. Information on the distribution, conservation status, trade and commercial pricing of the sixteen species was also collected. A total of 18 recommended actions are proposed, related to: improving cooperation among North American stakeholders involved in the trade chain; government policies that promote captive-breeding and sustainable trade in Mexico; biological and trade information; and conservation and enforcement, amongst others.

1. Articles III and IV of the Convention text state that export permits for species listed in Appendices I and II may only be issued after the Scientific Authority of the exporting country has concluded that the export will not be detrimental to the survival of the species. Such a result from the evaluation process is known as a "non-detriment finding." Resolution Conference 10.3 outlines the role of the Scientific Authority, and Resolution Conference 16.7 provides recommendations for the process of making non-detriment findings (CITES 1973, 1997, 2013).

Overview of the Priority Tarantula Species

Tarantulas (family *Theraphosidae*) are the world's largest spiders and are primarily found in tropical, semi-tropical, and desert regions around the world. Due to their colorful appearance, longevity (up to 30 years), and mainly docile nature in captivity, tarantula spiders are increasingly sold and kept as exotic pets throughout many countries in the world (Rojo 2004; West 2005). Mexico has the second-largest diversity of tarantula spiders in the world (second to Brazil), including 75% of the *Brachypelma* species—many of which are endemic (World Spider Catalog 2016).

Seventeen priority tarantula species, including two from the genus *Aphonopelma* and 15 from the genus *Brachypelma,* were originally selected for this project. However, *B. ruhnaui* (formerly *Brachypelmides ruhnaui*) and *A. albiceps* are now considered junior synonyms of *B. albiceps.* These taxonomic revisions are followed in this document. All the priority tarantulas that are the subject of this document are native to Mexico, with one exception: a single female specimen of *B. aureoceps* was reported found in the Dry Tortugas islands, Florida, US. However, this location is considered to be an error in reporting, and the actual distribution of this species is unknown (Smith 1994). In addition, it is possible that *B. aureoceps* is not a valid species.

Detailed species accounts, which include information on distribution, appearance, conservation status and trade, are provided in the *Priority Tarantula Species* section.

The genus *Brachypelma* includes a number of colorful species that are highly sought for the commercial pet trade (West 2005). To date, no range and population studies have been conducted on any of the Mexican *Brachypelma* species. Although zoogeographical ranges have been published for *Brachypelma* species of Mexico (Hijmensen 2012; Mendoza and Francke 2016; Rojo 2004; West 1996, 2005), these ranges are general in scope or incomplete. Furthermore, studies to determine the fragility, exact zoogeographical range and/or genome for each priority tarantula species has not been professionally conducted. However, genetic studies of some of the priority tarantula species are presently underway and should be published in late 2017 or 2018 (Mendoza, pers. comm.).

Only one species of *Brachypelma* (*B. smithi*) has been assessed by the International Union for Conservation of Nature (IUCN) (World Conservation Monitoring Centre 1996). That assessment was published in 1996 and may no longer reflect the current status of the species. The Chair of the IUCN Spider and Scorpion Specialist Group noted that there are plans to assess all the *Brachypelma*. However, IUCN work is strictly voluntary and currently the group has no one to carry out this work (Cardoso, in litt.).

North American Government Authorities and Legislation

This section provides a short overview of the national laws and regulations that are specifically referenced in this document, along with a review of the government agencies or departments that are charged with their implementation.

Canada

Environment and Climate Change Canada (ECCC) is the lead federal department for implementing CITES in Canada—including issuing permits, making non-detriment (and other) findings, and enforcement.

Border enforcement of CITES is the responsibility of the Wildlife Enforcement Directorate (WED) of ECCC under the authority of the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA) and the Wild Animal and Plant Trade Regulations (WAPTR). WED works in collaboration with the Canada Border Services Agency (CBSA).

The purpose of WAPPRIITA is to protect species of animals and plants by implementing CITES and regulating the species' international and interprovincial trade, responsibilities which include the following (Canada 1992):

- Prohibition of the import and export of CITES specimens except with a permit or where permitted by the regulations.
- Prohibition of the importation of an animal or plant that was taken in contravention of any foreign law.
- Prohibition of the possession of specimens which have been imported in contravention of the legislation.

WAPTR provides specific definitions, interpretations and exceptions that are necessary for implementing WAPPRIITA (Environment Canada 2003). The species of animals and plants that are listed in the Appendices of CITES are compiled in Schedule 1 of WAPTR (Canada 1996). Schedule 1 must be amended after any change to the CITES Appendices in order for the provisions of WAPPRITTA to apply to the change.

Mexico

The Secretariat of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*—Semarnat) is responsible for protecting, restoring, and conserving the ecosystems, natural resources and assets of Mexico; it is also responsible for promoting sustainable development. Semarnat is ultimately responsible for conserving native species and for implementing CITES (Reuter, in litt.; Semarnat 2017).

Semarnat meets its mandate through the activities of a number of sub-entities within the Secretariat, including the following (Reuter, in litt.):

- The General Directorate for Wildlife (*Dirección General de Vida Silvestre*—DGVS).
- The National Commission for the Knowledge and Use of Biodiversity (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*—Conabio).
- The Office of the Federal Attorney for Environmental Protection (*La Procuraduría Federal de Protección al Ambiente*—Profepa).
- The National Commission of Natural Protected Areas (*Comisión Nacional de Áreas Naturales Protegidas*—Conanp).

DGVS is responsible for the management of wildlife in the country and the implementation of the General Wildlife Law (*Ley General de Vida Silvestre*—LGVS) In addition, DGVS acts as the CITES Management Authority in Mexico and is responsible for issuing permits, keeping records and liaising with the CITES Secretariat. DGVS also manages the National System of Management Units for the Conservation of Wildlife (*Sistema Nacional de Unidades de Manejo para la Conservación de la Vida*

Silvestre—SUMA), which includes the approval of plans for the Units for Management and Sustainable Exploitation of Wildlife (*Unidades de Manejo y Aprovechamiento Sustentable de Vida Silvestre*—UMA). The purposes of UMA are the restoration, protection, maintenance, recovery, reproduction, repopulation, reintroduction and rehabilitation of wildlife; its sustainable use, recreational use and exhibition; and environmental education of the public (DOF 2000). Furthermore, DGVS can authorize the release of wildlife back into the wild, when appropriate. (Camarena Osorno, and Reuter, in litt.).

Conabio is responsible for promoting, coordinating, supporting and implementing activities to improve the knowledge of biological diversity, its conservation and its sustainable use. Conabio serves as the CITES Scientific Authority in Mexico and is responsible for makng non-detriment findings (NDFs) (Camarena Osorno, Reuter, in litt.).

Profepa is a decentralized administrative body of Semarnat that has technical and operational autonomy. Profepa was created to respond to and control environmental deterioration. One of Profepa's primary tasks is to enforce compliance with environmental regulations. It is also responsible for enforcing CITES in Mexico, under the authority of the LGVS (Camarena Osorno, and Reuter, in litt.).

Conanp is responsible for conserving species considered at risk under its Priority Species Program (*Program de Especies Prioritarias*—PEP) (Reuter, in litt.), and for managing 176 federally protected natural areas—including national parks, biosphere reserves, nature sanctuaries and natural monuments (Semarnat 2012).

The LGVS regulates the sustainable use, conservation, and management of native wild animals and plants. It regulates the protection of species or populations that are at risk, including both terrestrial and aquatic species (DOF 2000; Linder and Kaplan 1952; Mexico 2016). The LGVS establishes the national policy for wildlife protection and sustainable use via the SUMA program and the Mexican Official Standard NOM059-SEMARNAT-2010 (NOM-059) on Mexican species at risk. In addition, the LGVS regulates the creation of UMAs.

Article 55 of the LGVS implements CITES in Mexico. The LGVS also includes some provisions that are stricter than is required by the Convention.

The Regulations of the LGVS (*Reglamento de la Ley General de Vida Silvestre*—RLGVS) enable and implement the LGVS and provide the essential requirements for the integration of SUMA, and the inclusion, establishment, management and operation of the UMAs (DOF 2014).

NOM-059 is the "reference instrument" of the LGVS. It defines the criteria that must be met for a species to be considered "at risk," provides the criteria for reviewing the conservation status of native Mexican terrestrial and aquatic species of animals and plants, and categorizes those species that require special protection (DOF 2010). The exploitation of NOM-059 species is allowed only under a UMA framework, and hence a management plan approved by DGVS (Camarena Osorno, in litt.).

NOM-059 establishes four risk categories: Probably Extinct (in the wild), Endangered, Threatened, and Subject to Special Protection (DOF 2010). These categories are defined in Appendix A of this report.

United States

The US Fish and Wildlife Service (USFWS) is responsible for implementing the provisions of CITES—including permit issuance, making NDFs and other findings, and enforcement. The United States implements CITES via section 8A of the Endangered Species Act of 1973 (ESA) (USA 1973).

The goal of the ESA is to conserve endangered or threatened species throughout all (or a significant portion) of their range. This includes the conservation of the ecosystems on which these species depend (NOAA 2015). Under the ESA, species listed as Endangered (with limited exceptions) may not be imported or exported, possessed, sold or transported. They may not be taken within the United States or on the high seas (USA 1973). Generally, these same prohibitions and exceptions also apply to species listed as Threatened. However, for some species designated as Threatened a special rule may be implemented which provides prohibitions and exceptions that are tailored to the conservation needs of the particular species (USA 1971). Not all CITES-listed species are also ESA-listed, and not all ESA-listed species are afforded protection under CITES.

All fish or wildlife, including non-CITES tarantulas, that are imported into or exported from the United States must be declared to the USFWS via a special form (USFWS

FORM 3-177).[2] In addition, wildlife may normally only be imported or exported through specifically designated ports (USFWS 2016). Failure to comply with these requirements is a violation of the ESA and its implementing regulations.

In addition to the ESA, the Lacey Act makes it illegal to import, export, transport, sell, receive, acquire or purchase, in interstate or foreign commerce, any fish or wildlife that was taken, possessed, transported, or sold in violation of any foreign law. The Lacey Act also prohibits the import, export, transport, sale, receipt, acquisition or purchase, in interstate or foreign commerce, of any plant taken, possessed, transported or sold in violation of any foreign law that protects plants or that regulates certain activities associated with those plants (Cornell 2017). Importing tarantulas into the United States that were taken or exported in violation of a foreign law would be a violation of the Lacey Act (USA 1900, 1981; USFWS 2015).

Trade in Priority Tarantulas

This section provides an overview of the impact of trade in priority tarantula species on conservation and livelihoods. An overwhelming majority of the priority tarantulas in the legal trade consist of captive-bred juveniles (spiderlings).[3] Captive-bred adult specimens are much less common in trade. Wild-caught adults, illegally collected in Mexico, are also in trade. Illegal trade is a threat to wild populations, especially those that have a small distribution and/or are not readily available as captive-bred specimens.

Trade and Conservation

In Mexico, wild populations of *Brachypelma* tarantulas are in decline, due to both habitat loss and to large numbers being collected of some of the more colorful species. Collected tarantulas are usually either sold in traditional markets (*mercados*) such as the Sonora, Morelos and Acapulco Markets, or exported illegally for the commercial pet trade (Garcia 2016; Orozco, Tolentino, pers. comm.).

The sustainable use, conservation and management of native tarantulas in Mexico is regulated via the LGVS and its respective UMAs. Under the UMA program, qualified persons may be permitted to collect a limited number of wild tarantulas to keep and breed in captivity. The resulting offspring may then be sold domestically or exported.

Captive breeding allows for the production and sale or trade of spiderlings between breeders and hobbyists. Breeders in Mexico believe that captive breeding helps reduce the demand for tarantulas from the wild (Garcia, Orozco, Tolentino, pers. comm.). However, there are some inherent issues with this activity. For example, the genetic diversity of a captive population is finite. Eventually inbreeding, which is known to affect spiders, will occur. Upon application, Semarnat may allow licensed *Brachypelma* breeders to capture a limited number of wild adults to ensure the genetic diversity within their breeding colonies (Orozco, pers. comm.).

Two Mexican *Brachypelma* breeders, under the permission and supervision of Semarnat, plan to release 30% of their captive-produced *B. klaasi* and *B. smithi* offspring back into the known maternal habitat (Mendoza, Orozco, pers. comm.).[4] This is being done on a volunteer basis, and the breeders are forfeiting 30% of their potential sales to support reintroduction and in-situ conservation.

A conservation measure such as this has never been implemented with any of the *Brachypelma* species in Mexico, and should only be executed with due consideration. The release of offspring back into their natural habitat can only be done during the rainy season, when food is more readily available, and in the evening, when there is less chance of natural predation (West, pers. obs.).

2. "Fish or wildlife" is defined in section 3 of the ESA as any member of the animal kingdom, including any parts, products, eggs, or offspring, and including dead bodies or parts (USA 1973).
3. The term "spiderling" is a made-up word (not found in any dictionary) that is commonly used by hobbyists and breeders to refer to early instar developmental stages of a spider (West, pers. obs.).
4. A maternal habitat is the precise natural habitat location where the maternal female of the offspring was collected.

Mexican orange beauty tarantula
(*Brachypelma baumgarteni*)

Rick C. West

Further, the release of *Brachypelma* spiderlings into the wild should only take place under the permission and supervision of Semarnat, and only if the exact collection locality of the maternal female is known. Otherwise, such releases into the environment pose a genetic and pathogenic risk to established populations (Islas 2015; Pint 2011).

Although legal breeding and export presumably helps reduce the illegal taking of *Brachypelma* species from the wild in Mexico, tarantula breeders and keepers suggest that the illegal trade in *Brachypelma* species far exceeds the legal trade (Garcia, Orozco, Tolentino, pers. comm.). It is well known within the international tarantula trade community that "brown boxing" is one of the primary methods of illegally exporting tarantulas from Mexico: Large numbers of live tarantulas are individually sealed in padded containers and all are enclosed within a brown box. The box is then air-mailed out of Mexico, mainly to the European Union (EU) and Asia. The contents of the box are declared to be a gift, clothing, or some other non-live content that will not raise the suspicion of postal employees or regulatory authorities. Law enforcement officers routinely intercept parcels of live tarantulas being illegally exported via air transport or mail (Garcia, Orozco, pers. comm.; Shuster 2011; West, pers. obs.). Some of these parcels are intercepted and seized by Mexican authorities and the live specimens are turned over to the *Brachypelma* breeders or zoos rather than be destroyed. Confiscated adult specimens are then used as additional breeding stock for renewed genetic diversity (Mendoza, pers. comm.).

Breeders report that some *Brachypelma* species (including *B. annitha, B. baumgarten*i*, B. boehmei*, *B. hamorii* and *B. klaasi*) are not easily bred in captivity. Hence, these particular species are the target of illegal collection and export (Orozco, pers. comm.; West, pers. obs.).

Trade and Livelihoods

Multinational tarantula dealers indicate that the market for live *Brachypelma* (and tarantulas in general) is increasing, both within Mexico and internationally. The international markets include Canada, the United States, EU and Asia, with demands exceeding the legal supply, especially for the colorful "red-legged" species (Gamache, Garcia, MacNeil, Orozco, Tolentino, pers. comm.).

Both legal and illegal trade target the rarer and more colorful *Brachypelma* species. Some species, such as *B. auratum* and *B. schroederi*, command prices as high as US$400 for a single adult female in the international pet trade.

The legal trade of priority tarantula species provides an income for Mexican breeders who are permitted to breed native species and market the captive-bred offspring under the UMA program. Commercial production of tarantulas may be intensive (captive breeding) or semi-intensive (captive breeding linked to free-range management). Breeders note that they are providing a conservation service by offsetting the illegal over-harvesting and trade for the commercial pet trade.

Two licensed *Brachypelma* breeders in Mexico reported they collectively produce, on average, between 11,000 and14,000 spiderlings annually. Of these, all *Brachypelma* spiderlings are sold and exported exclusively to Canadian and US tarantula dealers. Both Mexican breeders stated that they have requests for *Brachypelma* species from the EU, China and Japan that they cannot fulfill (Garcia, Orozco, pers. comm.).

Major tarantula dealers within Canada, the United States, the EU and Asia re-sell and re-export specimens to either private individuals or other tarantula dealers (Gamache, MacNeil, pers. comm.). Tarantula dealers in Canada, the United States and the EU stated they also purchase *Brachypelma* spiderlings from occasional private breeders (hobbyists) within their country. Tracking private production is difficult because most private breeders do not keep records of their production (West, pers. obs., 2016). As spiderlings increase in size, their pricing goes up accordingly, with adults commanding the highest prices (West, pers. obs., 2016).

The care and maintenance of large numbers of newly hatched tarantula spiderlings is time-consuming and costly. This allows foreign dealers to demand low prices from Mexican breeders in return for purchasing large lots of spiderlings. The alternative is for the breeders to care for spiderlings for weeks or months, while selling them in smaller groups. Considering the number of spiderlings produced from a single egg sac, this would be both time-consuming and labor-intensive. One Mexican breeder stated he was upset to see foreign tarantula dealers resell certain *Brachypelma* species' spiderlings at a 400% price increase (Orozco, pers. comm.). Presumably, some of the increased prices are to cover the costs of CITES permits, transportation, rehousing supplies, staff salaries, food, water, heating, and loss from mortalities, as well as for profit.

Challenges to CITES Implementation

Non-detriment Findings

It is relatively straightforward for Canadian and US authorities to complete NDFs for exports of priority tarantulas, as none of these species naturally occurs in either country. Any exported spiderlings would undoubtedly be captive-bred. Similarly, exports of adults (or sub-adults) would not be considered detrimental as long as there was no indication that the specimens were in the country illegally.[5]

In Mexico, exports of captive-bred spiderlings from UMA-registered breeders would not be considered detrimental. Hypothetically, a breeder could collect egg sacs from the wild, hatch the eggs and falsely declare the resulting spiderlings as captive-bred.[6] However, each *Brachypelma* egg sac contains 200–500 eggs and only an estimated 0–5% of the resulting spiderlings will survive long enough in the wild to reproduce (West, pers. obs.). Therefore, collecting small numbers of egg sacs from the wild would have negligible impact on healthy populations. Illegal collection of egg sacs still needs to be strongly discouraged by enforcement authorities.

Currently, there are insufficient population data available for Mexican tarantulas. Without such information, it would be very difficult to make a finding that the export of adult or sub-adult specimens was not detrimental to the species survival in the wild, unless there was compelling information available to show that the specimens in question were captive-bred. Preliminary field studies indicate that *B. baumgarteni*, *B. boehmei* and *B. hamorii* have small zoögeographical ranges and are sensitive to habitat disruption. Therefore, at least these three species should not be considered for direct capture and export until more research has been conducted on their viability (Mendoza, pers. comm.). If sufficient scientifically robust data on wild populations are compiled, then it may be possible to make NDFs for the collection and export of wild specimens of these, and other, priority tarantula species.

Enforcement

Species of the priority tarantulas vary in their adult coloration and markings. For example, some species have dark-colored legs, while others have legs that display distinct bands of colors (Hijmensen 2012). These morphological differences are used to identify adult specimens. The differences between species can, however, be subtle and vary between specimens of the same species. Identification of those species that do not exhibit bright colors or bold patterns may be more difficult (West, pers. obs.).

Few hobbyists, breeders or even academics would be experienced enough to identify each species of priority tarantula on sight. However, with some basic training, and the use of a suitable guide to identification, border enforcement officers may be able to identify sub-adult and adult specimens. Unfortunately, training on *Brachypelma* identification has not been offered to wildlife enforcement officers in Canada, Mexico or the United States, and a good, up-to-date reference to *Brachypelma* identification is not currently available (Cooper, West pers. obs.; Herndon, in litt.). In 1995, the USFWS sponsored the production of a series of *Brachypelma* identification sheets for inclusion in the *CITES Identification Manual*—a publication that was distributed by the CITES Secretariat (CITES 1995; Kirkby et al. 1995). In 2011, the Secretariat discontinued the printed version of the identification manual and moved to an online "Wiki" version (CITES 2011).[7] As of July 2016, the identification sheets for *Brachypelma* had not

5. NDF and legal acquisition are separate findings that must be made by the CITES Management and Scientific Authorities of a Party. However, legal acquisition may also be a factor in making an NDF.
6. An egg sac is the protective pouch that a female spider spins out of silk to contain her eggs.
7. A "Wiki" is a website that is designed to allow users to contribute and edit its content (Merriam-Webster 2016).

Micha L. Rieser

Golden redrump tarantula (*Brachypelma albiceps*)

Rick C. West

Mexican orange-knee tarantula (*Brachypelma hamorii*)

been uploaded to the Secretariat's CITES Wiki, and the printed version was no longer available (CITES 2016b). In any case, the information in those pages would no longer be considered taxonomically current or adequate for law enforcement purposes (West, pers. obs.).

Most *Brachypelma* tarantulas in trade are spiderlings, meaning that they are in an early instar developmental stage.[8] Tarantulas go through many instar stages as they mature, molting their exoskeleton between each instar (Breene n.d.). Spiderlings will go through multiple instar molts before they start to take on some of the sub-adult and adult colors and markings. The possibility of identifying a spiderling depends on what instar the specimen is in. Spiderlings are typically impossible to identify, even to the genus level, until they are at least one year old (West, pers. obs.; Herndon, in litt.). However, the red-legged *Brachypelma* species start to show their color pattern when they are 2.5–5.0 centimeters in leg span. These are the species that are the most sought-after in trade, and the markings exhibited by specimens larger than 2.5 centimeters in leg span could be useful for verifying the species listed on a CITES permit (West, pers. obs.).

Spiderlings could potentially be identified to species via DNA analysis. This, however, would be problematic for a border control officer faced with a shipment of hundreds of spiderlings, possibly including multiple species. DNA analysis is not cost-effective or practical for routine inspections, and testing would cause unacceptable delays and likely result in the death of specimens within the shipment. DNA testing would also require housing and caring for the specimens for an extended period. Furthermore, spiderlings are very fragile, and manipulating them to get a DNA sample could result in the death of the sampled specimen (Cooper, West, pers. obs.; Herndon, in litt.; Longhorn 2002; Longhorn et al. 2006).

Brachypelma spiderlings in trade are unlikely to be misidentified by ethical breeders and dealers. A breeder would clearly know what species he was exporting, and, given that all *Brachypelma* species are listed in CITES Appendix II, there would be little reason for him to mis-declare a shipment. On the other hand, unethical breeders who do not want to go through the trouble of obtaining CITES permits, or do not want to draw attention to themselves from either the permitting office or law enforcement officials, might falsely declare their spiderlings to be non-CITES species. *Brachypelma* spiderlings are visually indistinguishable from spiderlings of the other Mexican tarantula genera, such as *Aphonopelma*, *Bonnetina*, *Citharacanthus*, *Cotztetlana*, *Crassicrus*, *Hemirrhagus, Magnacarina*, *Psalmopoeus* and *Schizopelma* (West, pers. obs.).

In Mexico, an unscrupulous person could collect *Brachypelma* egg sacs from the wild, hatch the eggs and declare the spiderlings as captive-bred for export. This likelihood could be minimized through routine inspections of licensed breeders and exporters. The incubation time for *Brachypelma* egg sacs (depending on the species) ranges from 70 to 95 days, and the incubation times for the different species are known. If inspectors checked tarantula breeders every 30–60 days, this would limit the opportunity to collect and artificially incubate egg sacs from the wild.[9] In addition, a captive female tarantula is not going to accept and care for another spider's egg sac (West, pers. obs.).

8. After the early instar developmental stages, a spider molts to the "antepenultimate" instar stage (two molts from sexual maturity), then the "penultimate" instar stage (one molt from sexual maturity), and lastly the "ultimate" instar stage (sexual maturity). Female tarantulas live longer than males and can molt several more times into "post-ultimate" life stages (West, pers. obs.).
9. After the early instar developmental stages, a spider molts to the "antepenultimate" instar stage (two molts from sexual maturity), then the "penultimate" instar stage (one molt from sexual maturity), and lastly the "ultimate" instar stage (sexual maturity). Female tarantulas live longer than males and can molt several more times into "post-ultimate" life stages (West, pers. obs.).

Priority Tarantula Species

This section provides description, distribution, conservation status and trade overview of each priority species. The physical descriptions provided below are based on the appearance of a "typical" specimen as found in its wild state. It is important to note, however, that individual specimens of the same species of tarantula vary in size, color and pattern. The morphological terms used to describe the different species in the following descriptions are defined in the Glossary and Figure 1.

The IUCN Red List Categories, and categories for species at risk in Mexico and the United States referenced in this section are defined in Appendix A.

Fero Bednar (Wildlife and Nature Photography) www.wnp.sk

Aphonopelma pallidum (F.O. Pickard-Cambridge, 1897)

Common names

Mexican grey tarantula (English)
Tarentule grise du Mexique (French)
Tarántula mexicana gris, tarántula mexicana rosa (Spanish)

Description

Adult males have a carapace covered with dull, rose-grey, downy, short hairs, and an abdomen that is covered with pale brown hair. The legs and palps are brown, with short red-brown hairs. Adult females are identical to the male in general size and color; however, the female's abdomen is covered with brown hairs interspersed with longer, scattered fiery-red hairs. Males have an average body length of 50 millimeters (mm); females average 55 mm (Smith 1994).

Distribution

Aphonopelma pallidum is endemic to Mexico. It is found mainly in the Mapini Basin region of southcentral Chihuahua State, and ranges into northern Durango State (iNaturalist 2014; Mendoza, pers. comm.).

Conservation status

Aphonopelma pallidum has not been assessed on the IUCN Red List. The species is listed as Threatened in Mexico (DOF 2010).

Trade

Aphonopelma pallidum is not found in the commercial pet trade (West, pers. obs.).

Rick C. West

Brachypelma albiceps (Pocock, 1903)

Common names

Golden red-rump tarantula (English)
Tarentule dorée à abdomen rouge (French)
Tarántula dorada de México (Spanish)

Description

Adult males and females are similar in size and coloration. Legs, palps, chelicerae and abdomen are covered with dark brown or black hairs. The carapace is covered in a sulfur-yellow pubescence. The abdomen is covered in longer, scattered fiery-red hairs. Males have an average body length of 50 millimeters (mm); females average 70 mm (West, pers. obs.).

Distribution

Brachypelma albiceps is endemic to Mexico and is found in southern Mexico State, Morelos State, eastern Michoacán State, northern Guerrero State and western Puebla State (Mendoza, pers. comm.; West, pers. obs.).

Conservation status

Brachypelma albiceps has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma albiceps is commercially traded almost exclusively as captive-bred live specimens for the pet trade. *Brachypelma ruhnaui* and *Aph. albiceps* are junior synonyms of *B. albiceps* (World Spider Catalog 2016), yet specimens of *B. albiceps* continue to be erroneously sold as *B. ruhnaui* or *Aph. albiceps* in the international commercial tarantula trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$20–$60 in Canada and the United States, US$4 in Mexico and US$9 in the EU. Adult males sell for approximately US$50 in Canada. Adult females sell for approximately US$250 in the United States and US$47 in the EU.

Data downloaded from the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) CITES Trade Database showed that during 2009–2014, Mexico exported 554 live specimens of *B. albiceps* to the United States and Canada. The United States exported six live specimens of *B. albiceps* to Taiwan, and Canada exported four live specimens to Chile (CITES 2016a).

Rick C. West

Brachypelma annitha (Tesmoingt, Cleton & Verdez, 1997)

Brachypelma annitha is a junior synonym of *B. smithi* and is no longer a valid name (Mendoza and Francke 2016).

See *B. smithi*.

Trade

Brachypelma annitha is commercially traded almost exclusively as captive-bred live specimens for the pet trade. Although *B. annitha* recently became a junior synonym of *B. smithi* (Mendoza and Francke 2016), specimens of *B. smithi* are erroneously sold as *B. annitha* in the international commercial tarantula trade. In addition, the similar-looking *B. hamorii* are also sold as either *B. annitha* or *B. smithi* (West, pers. obs.).

Captive-bred juveniles sell for approximately US$40–$75 in Canada and the United States, US$16 in Mexico and US$8 in the EU. Adult females sell for approximately US$108 in the EU.

Although adult specimens of *B. annitha* are found on the Internet in the tarantula hobby, data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014 there were no exports of *B. annitha* recorded from Mexico, Canada, the United States or the EU (CITES 2016a).

Rick C. West

Brachypelma auratum (Schmidt, 1992)

Common names

Mexican flame-knee tarantula (English)
Tarentule à genoux de feu du Mexique (French)
Tarántula rodillas de fuego, tarántula mexicana rodilla de llama, tarántula rodillas rojas (Spanish)

Description

Adult males and females are similar in size and coloration. The legs, palps, chelicerae, carapace and abdomen are covered in dark brown to black hairs. Additionally, the abdomen is covered in longer, scattered, pale reddish hairs. The carapace is fringed with buff-colored hairs. The legs have thin, light-colored rings between each segment, and the patellae (knees) of the palps and legs have a striking red-orange "flame" pattern. Males have an average body length of 60 millimeters (mm); females average 70 mm (West, pers. obs.).

Distribution

Brachypelma auratum is endemic to Mexico and occurs mainly north of the Sierra Madre del Sur and south of the Transverse Neovolcanic Ranges, mainly in the Balsas River Basin, from eastern Jalisco State, northern Colima State, northern Michoacán State and northwestern Guerrero State (Mendoza, pers. comm.).

Conservation status

Brachypelma auratum has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma auratum is commercially traded almost exclusively as captive-bred live specimens for the pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$25–$125 in Canada and the United States, US$10 in Mexico and US$4 in the EU. Adult females sell for approximately US$400 in Canada and US$54 in the EU.

Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported 222 live specimens of *B. auratum* to the United States and Canada. Canada exported 85 live specimens to the United States (CITES 2016a).

Brachypelma aureoceps (Chamberlin, 1917)

Common names

Florida golden chestnut tarantula (English)
Tarentule châtaigne dorée de Floride (French)
Tarántula dorada de Florida (Spanish)

Description

The single adult female known was covered entirely in thick, woolly, golden brown hairs. The legs and palps were covered in golden brown hairs, with dark smoky-colored hairs on the femora. The abdomen and legs were covered in longer, scattered yellowish hairs. The body length is 65 millimeters (Smith 1994).

The male of this species is unknown (World Spider Catalog 2016).

Distribution

B. aureoceps is known from a single female, described in 1917 and reportedly from the Dry Tortugas islands, Florida, US. To date, no further specimens have been found from this locale. The Dry Tortugas are outside the natural zoögeographical range of all known *Brachypelma* species, and this locale is considered dubious (Smith 1994).

Conservation status

Brachypelma aureoceps has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma aureoceps is not found in the commercial tarantula trade (West, pers. obs.).

Rick C. West

Brachypelma baumgarteni (Smith, 1993)

Common names

Mexican orange beauty tarantula (English)
Tarentule orange du Mexique (French)
Tarántula anaranjada, tarántula mexicana naranja (Spanish)

Description

Adult males and females are similar in size and coloration. The femora of the legs and palps, and the abdomen and carapace are covered in dark brown or black hairs. The remainder of the leg segments, the palps and the perimeter of the chelicerae are covered in golden or medium brown hairs. The patellae of the legs have a very distinct red-orange "flame" pattern, less so on the palps. The longer, scattered hairs on the abdomen and the carapace perimeter are buff-colored. Males have an average body length of 65 millimeters (mm); females average 75 mm (West, pers. obs.).

Distribution

Brachypelma baumgarteni is endemic to Mexico and has a very small distribution in the coastal region of the Sierra Madre del Sur range, west of the Balsas River Basin, in southeastern Michoacán State (Mendoza, pers. comm.).

Conservation status

Brachypelma baumgarteni has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma baumgarteni is commercially traded almost exclusively as captive-bred live specimens for the pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$35–$80 in Canada and the United States, US$17 in Mexico and US$27 in the EU. Adult males sell for approximately US$99 in the EU.

Although adult specimens of *B. baumgarteni* are found on the Internet in the tarantula hobby, data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014 there were no exports of *B. baumgarteni* from Mexico, Canada, the United States or the EU (CITES 2016a).

Rick C. West

Brachypelma boehmei (Schmidt & Klaas, 1993)

Common names

Mexican rust-leg tarantula (English)
Tarentule du Mexique à pattes rouille (French)
Tarántula de piernas oxidadas, tarántula mexicana pierna naranja oscuro (Spanish)

Description

Adult males and females are similar in size and coloration. The leg and palp femora, the tarsi (feet) and the abdomen are covered in dark brown to black hairs. The remaining sections of the legs and palps, and the chelicerae and carapace are covered in rusty orange (in females) to fiery red hairs (in males). The patellae have a red "flame" pattern, but it is not as distinct as in *B. baumgarteni.* Additionally, the legs and abdomen are covered in longer, scattered pale-colored hairs. Males have an average body length of 65 millimeters (mm); females average 75 mm (West, pers. obs.).

Distribution

Brachypelma boehmei is endemic to Mexico and has a very small distribution in the coastal region of the Sierra Madre del Sur range and east of the Balsas River Basin in western Guerrero State (Mendoza, pers. comm.; West, pers. obs.).

Conservation status

Brachypelma boehmei has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma boehmei is commercially traded almost exclusively as captive-bred live specimens for the pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$30–$45 in Canada and the United States, US$10 in Mexico and US$8 in the EU. Adult males sell for US$90 in the United States. Adult females sell for approximately US$100–$250 in Canada and the United States and for US$67 in the EU.

Rick C. West

Brachypelma emilia (White, 1856)

Common names

Mexican red-leg tarantula (English)
Tarentule du Mexique à pattes rouges (French)
Tarántula mexicana de piernas rojas, tarántula mexicana pierna roja (Spanish)

Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported 5,578 live specimens of *B. boehmei* to the United States and Canada. Canada exported 626 live specimens to the United States, 25 to Japan and four to Chile. The United States exported 275 live specimens to Canada, 12 to Taiwan and 20 to Japan (CITES 2016a).

Description

Adult males and females are similar in size and coloration. The carapace is covered in pale brown hairs, with a darker brown to black "V" pattern on the cephalic (head) region. The legs, palps, carapace and abdomen are covered in dark brown to black hairs. The tibiae of legs I and II and the tibiae and upper metatarsi of legs III and IV have distinctive rusty red hairs. Additionally, the abdomen is covered in longer, scattered pale reddish hairs. Males have an average body length of 60 millimeters (mm); females average 70 mm (West, pers. obs.).

Distribution

Brachypelma emilia is endemic to Mexico and occurs on the coastal plain west of the Sierra Madre Occidental, from southern Sonora State, Sinaloa State, northwestern Nayarit State and inland to western Durango State (Mendoza, pers. comm.; West, pers. obs.).

Conservation status

Brachypelma emilia has not been assessed on the IUCN Red List. The species is listed as Threatened in Mexico (DOF 2010).

Trade

Brachypelma emilia is commercially traded almost exclusively as captive-bred live specimens for the pet trade (West, pers. obs.).

Rick C. West

Brachypelma epicureanum (Chamberlin, 1925)

Common names

Yucatán rust-rump tarantula (English)
Tarentule à abdomen rouille du Yucatan (French)
Tarántula de trasero oxidado de Yucatán (Spanish)

Captive-bred juveniles sell for approximately US$30–$35 in Canada and the United States, US$10 in Mexico and US$13 in the EU. Adult females sell for approximately US$300 in the United States and for US$40 in the EU.

Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported 448 live specimens of *B. emilia* to the United States and Canada. Canada exported 60 live specimens to the United States and four to Chile. The United States exported 50 live specimens to Canada and 12 to Taiwan (CITES 2016a).

Description

Adult males and females are similar in size and coloration. The legs, palps, chelicerae, carapace and abdomen are covered in black to dark brown hairs. Additionally, the abdomen is covered in longer, scattered orange-red hairs, more so on males. This species looks very similar to *B. kahlenbergi* and *B. vagans*. Males have an average body length of 60 millimeters (mm); females average 70 mm (Mendoza, pers. comm.; West, pers. obs.).

Distribution

Brachypelma epicureanum is endemic to Mexico and occurs in northern Yucatán State (Mendoza, pers. comm.; West, pers. obs.).

Conservation status

Brachypelma epicureanum has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma epicureanum is commercially traded almost exclusively as captive-bred live specimens for the pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$13 in Mexico and US$22 in the EU.

Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported 20 live specimens of *B. epicureanum* to the United States. Canada exported 60 live specimens to the United States. The United States exported 50 live specimens to Canada and 12 to Taiwan (CITES 2016a).

Rick C. West

Brachypelma hamorii (Tesmoingt, Cleton & Verdez, 1997)

Common names

Mexican orange-knee tarantula (English)
Tarentule mexicaine à genoux orange (French)
Tarántula mexicana de rodillas anaranjadas (Spanish)

Description

Adult males and females are similar in size and coloration. *Brachypelma hamorii* is similar in size, coloration and pattern to *B. smithi*, but *B. hamorii* has a longitudinal, lighter-colored band of hairs on the chelicerae. The flame pattern on the patellae are not as colorful as in *B. smithi*, with diffused orange or black hairs around it. The lateral hairs throughout length of the legs are whitish, contrasting more with dark areas, while the same hairs on *B. smithi* are more yellowish. The carapace is covered in dark brown or black hairs, fringed with varying degrees of buff-orange hairs. Most non-red areas of the legs and abdomen are covered in black hairs, with longer buff-colored hairs. Males have an average body length of 60 millimeters (mm); females average 70 mm (Mendoza, pers. comm.; Mendoza and Francke 2016).

Distribution

Brachypelma hamorii is endemic to Mexico and occurs southwest of the Sierra Madre Occidental and south of the Transverse Neovolcanic ranges, from southeastern Jalisco State, through coastal Colima State, to the northwestern coastal region of Michoacán State (Mendoza, pers. comm.; Mendoza and Francke 2016).

Conservation status

Brachypelma hamorii has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

No commercial trade data was found for *Brachypelma hamorii*. Because of its similar-looking appearance, *B. hamorii* is erroneously sold as *B. smithi* or *B. annitha* in the commercial tarantula pet trade (West, pers. obs.).

Rick C. West

Brachypelma kahlenbergi (Rudloff, 2008)

Common names

New Mexican tarantula (English)
Nouvelle Tarentule mexicaine (French)
Nueva tarántula mexicana (Spanish)

Description

Adult males and females are similar in size and coloration. The legs, palps, chelicerae, carapace and abdomen are covered in black to dark brown hairs. The abdomen is additionally covered in longer, scattered orange-red hairs, more so on males. *Brachypelma kahlenbergi* looks very similar to *B. epicureanum* and *B. vagans*. Males have an average body length of 60 millimeters (mm); females average 70 mm (West, pers. obs.).

Distribution

Brachypelma kahlenbergi is endemic to Mexico and occurs east of the Sierra Madre Oriental in Veracruz State and ranges down into western Tabasco State and northern Chiapas State (Mendoza, pers. comm.).

Conservation status

Brachypelma kahlenbergi has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma kahlenbergi is commercially traded almost exclusively as captive-bred live specimens for the pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$65–$80 in Canada and the United States, US$20 in Mexico and US$5 in the EU. Adult females sell for approximately US$80 in the EU.

Although data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico did not export any *B. kahlenbergi*, recent Internet searches found live juveniles and adults for sale in the United States, Canada and EU (CITES 2016a).

Rick C. West

Brachypelma klaasi (Schmidt & Krause, 1994)

Common names

Mexican pink tarantula (English)
Tarentule rose mexicaine (French)
Tarántula mexicana rosada (Spanish)

Description

Adult males and females are similar in size and coloration. The femora of the legs and palps, and the tarsi, carapace, chelicerae and abdomen are covered in dark brown or black hairs. The remainder of the leg and palp segments are covered in rusty or reddish brown hairs. Additionally, the abdomen is covered in longer, scattered reddish brown hairs. Males have an average body length of 55 millimeters (mm); females average 70 mm (West, pers. obs.).

Distribution

Brachypelma klaasi is endemic to Mexico and occurs on the coastal side of the Sierra Madre Occidental range, in southeastern Jalisco State to western Colima State (Mendoza, pers. comm.; West, pers. obs.).

Conservation status

Brachypelma klaasi has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma klaasi is commercially traded almost exclusively as captive-bred live specimens for the pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$70–$75 in Canada and the United States, US$14 in Mexico and US$7 in the EU. Adult males sell for approximately US$33 and adult females sell for approximately US$80, in the EU.

Although data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico did not export any live specimens of *B. klaasi* to any country, recent Internet searches found live juveniles and adults for sale in Canada, the United States and the EU. In addition, Canada exported 34 live specimens to the United States (CITES 2016a).

Rick C. West

Brachypelma schroederi (Rudloff, 2003)

Common names

Mexican black velvet tarantula (English)
Tarentule de velours noir mexicaine (French)
Tarántula mexicana de terciopelo negro (Spanish)

Description

Adult males and females are similar in size and coloration. The legs, palps, chelicerae, carapace and abdomen are entirely covered in black hairs. Males have an average body length of 55 millimeters (mm); females average 65 mm (West, pers. obs.).

Distribution

Brachypelma schroederi is endemic to Mexico and occurs in the Central Valley region of Oaxaca State (Mendoza, pers. comm.).

Conservation status

Brachypelma schroederi has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma schroederi is commercially traded almost exclusively as captive-bred live specimens for the pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$30 in Canada and the United States, US$17 in Mexico and US$27 in the EU. Adult males sell for approximately US$250 in the United States and for US$28 in the EU. Adult females sell for approximately US$400 in the United States and for US$87 in the EU.

Although data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico did not export any live specimens of *B. schroederi* to any country, recent Internet searches found live juveniles and adults for sale in Canada, the United States and the EU. In addition, Canada exported 25 live captive-bred specimens to the United States (CITES 2016a).

Rick C. West

Brachypelma smithi (F.O. Pickard-Cambridge, 1897)

Common names

Mexican red-knee tarantula (English)
Tarentule à genoux rouges du Mexique (French)
Tarántula mexicana de rodillas rojas, tarántula de anillos rojos (Spanish)

Description

Adult males and females are similar in size and coloration. The legs have red-orange coloration on the patellae, tibiae and metatarsi, and there are orange-black starburst striations on the carapace. Although similar in color and pattern, *B. smithi* differs from *B. hamorii* by the absence of a longitudinal band of lighter, contrasting hairs on the chelicera. Additionally, the patellae flame pattern is more colorful than in *B. hamorii*, with brighter orange hairs. Longer hairs on the legs are yellowish throughout the length of the legs, while in *B. hamorii* the same are whitish, providing greater contrast with darker areas. The abdomen is covered in dark brown to black hairs, with scattered, longer buff-colored hairs. Males have an average body length of 60 millimeters (mm); females average 70 mm (Mendoza, pers. comm.; Mendoza and Francke 2016; West, pers. obs.).

Distribution

Brachypelma smithi is endemic to Mexico and occurs along the coastal side of the Sierra Madre del Sur, east of the Balsas River Basin, to the Acapulco region, Guerrero State (Mendoza, pers. comm.; Mendoza and Francke 2016; West, pers. obs.).

Conservation status

Brachypelma smithi is listed as Near Threatened on the IUCN Red List. However, at the time of writing this report, the status of *B. smithi* had not been updated since 1996, and this listing may not therefore accurately reflect the current conservation status of the species (World Conservation Monitoring Centre 1996). *Brachypelma smithi* is protected and listed as Threatened in Mexico (DOF 2010).

Trade

Brachypelma smithi is commercially traded almost exclusively as captive-bred live specimens for the pet trade. There may be some limited trade in dead specimens for display. Specimens of *B. smithi* are sometimes erroneously sold as *B. annitha* or *B. hamorii* in the international commercial tarantula pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$30–$35 in Canada and the United States, US$10 in Mexico and US$5 in the EU. Adult males sell for approximately US$95 in Canada and US$60 in the United States. Adult females sell for approximately US$250 in Canada and the United States, and US$60 in the EU.

Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported 5,451 live captive-bred specimens of *B. smithi* to the United States and Canada—1,905 specimens were exported to Canada and 3,546 specimens were exported to the United States. Canada exported 1,075 live captive-bred specimens to the United States, 75 live specimens to Japan and four live specimens to Chile. The United States exported live specimens to six different countries: 12 to Argentina, 6 to Guatemala, 125 to Canada, 80 to Japan, 60 to South Korea and 50 to Taiwan (CITES 2016a).

Rick C. West

Brachypelma vagans (Ausserer, 1875)

Common names

Mexican red-rump tarantula (English)
Tarentule à croupion rouge du Mexique (French)
Tarántula mexicana de cadera roja, tarántula de terciopelo, tarántula de trasero rojo (Spanish)

Description

Adult males and females are similar in size and coloration. The legs, palps, chelicerae, carapace and abdomen are covered in dark brown to black hairs. The abdomen is additionally covered in longer, scattered orange-red hairs—especially on males. *Brachypelma vagans* looks very similar to *B. epicureanum* and *B. kahlenbergi.* Males have an average body length of 60 millimeters (mm); females average 70 mm (West, pers. obs.).

Distribution

Brachypelma vagans is native to Belize, Guatemala and Mexico. In Mexico, the species occurs in southern Yucatán State, northeastern Chiapas State, and Quintana Roo State. In addition, there is a fairly widespread population of introduced *B. vagans* established in the St. Lucie County area of Florida, US (Edwards and Hibbard 2003; Mendoza, pers. comm.).

Conservation status

Brachypelma vagans has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma vagans is commercially traded primarily as captive-bred live specimens for the pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$10 in Canada and the United States, US$10 in Mexico and US$5 in the EU. Adult males sell for approximately US$50 in Canada and US$35 in the United States. Adult females sell for approximately US$100–$130 in Canada and the United States and for US$60 in the EU.

Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported 81 live captive-bred specimens of *B. vagans* to Canada. Canada exported 12 live specimens to the United States and four live specimens to Chile. The United States exported 50 live captive-bred specimens to Canada and 12 live specimens to Taiwan. In addition, the United States exported two wild-caught live specimens of *B. vagans* to Canada. The country of origin for the wild-caught *B. vagans* was not cited (CITES 2016a).

Rick C. West

Brachypelma verdezi (Schmidt, 2003)

Common names

Mexican rose-grey tarantula (English)
Tarentule rose-gris mexicaine (French)
Tarántula mexicana rosa-gris (Spanish)

Description

Adult males and females are similar in size and coloration. The legs, palps, chelicerae, and abdomen are covered in dark brown to black hairs. The female carapace is covered in pale brown hairs, with a darker brown to black "V" pattern on the cephalic (head) region. The male carapace is covered in dark brown hairs, with no "V" pattern on the cephalic region. The abdomen is additionally covered in longer, scattered, pale brown hairs—especially on males. Males have an average body length of 55 millimeters (mm); females average 65 mm (West, pers. obs.).

Distribution

Brachypelma verdezi is endemic to Mexico and primarily occurs in the Sierra Madre del Sur region around Chilpancingo, Guerrero State (Mendoza, pers. comm.).

Conservation status

Brachypelma verdezi has not been assessed on the IUCN Red List. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the capture or sale of native species—including tarantulas—without permits (DOF 2000, 2014).

Trade

Brachypelma verdezi is commercially traded almost exclusively as captive-bred live specimens for the pet trade (West, pers. obs.).

Captive-bred juveniles sell for approximately US$15–$30 in Canada and the United States, US$7 in Mexico and US$22 in the EU. Adult females sell for approximately US$80 in the EU.

Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported 60 live captive-bred specimens of *B. verdezi* to Canada. Canada exported four live captive-bred specimens to the United States (CITES 2016a).

Recommended Actions

The following actions are recommended for promoting the conservation of priority tarantula species in Mexico, and their legal, sustainable trade throughout North America. Completion of the recommended actions is subject to available funding. If the cost of an action can reasonably be considered to be part of normal government spending, then the cost is listed as n/a. If the cost will likely require additional and possibly external funding, then a very rough estimate of the cost is provided.

Measuring, reporting and following up on the recommendations provided in this action plan will be the responsibility of the governments of Canada, Mexico and the United States, in collaboration with academic institutions, nongovernmental organizations and/or individual experts. Given that the tarantula species that are the subject of this report are all native to Mexico, the government of Mexico will have special interest in tracking and reporting on progress.

No.	Goals	Actions	Cost (US$)	Timeline	Priority
1	Ensure that progress on the recommendations in this action plan is reported and measurable.	**Measuring progress**: The governments of Canada, Mexico and the US should develop and implement a process for tracking and reporting on efforts to fulfill the recommendations of this action plan, such as a dedicated website or other method.	n/a	2017	High
2	Support collaborative North American efforts directed at promoting sustainable, traceable trade and conservation of priority CITES Appendix II species.	(a) **Trinational collaboration**: The governments of Canada, Mexico and the United States should support and monitor collaborative efforts to promote sustainable, traceable trade and conservation of native species deemed to be of priority concern, including CITES Appendix II tarantulas.	n/a	2017 (ongoing)	High
		(b) **Funding strategy**: The governments of Canada, Mexico and the United States (to the extent possible, and in consideration of domestic priorities) should develop a long-term strategy for funding this action plan, emphasizing realization of the high-priority actions.	n/a	2018	High
3	Develop and institute government policies that support tarantula conservation while promoting legal, sustainable trade.	(a) **Environmental impact studies**: The Government of Mexico should prioritize environmental impact studies on the Pacific coast of Mexico—the area of distribution of many tarantula species—and institute infrastructure and road construction projects that minimize habitat loss and degradation.	n/a	2018 (ongoing)	High
		(b) **Streamlining administration**: The Government of Mexico should promote domestic and international trade by streamlining administrative processing times, and respecting the permit issuance times prescribed by law.	n/a	2018	Medium
4	Compile and distribute biological and trade information so that international authorities can make informed management decisions to ensure that trade in tarantulas is conducted at sustainable levels.	**IUCN Red List/NOM-059 workshop**: The Government of Mexico, in collaboration with the CEC, tarantula experts and IUCN Red List staff, should host a workshop to assess the Mexican Brachypelma for inclusion in the IUCN Red List and to update NOM-059-SEMARNAT-2010. Some species may be assessed as "Data Deficient," which would highlight the need for additional research.	40,000	2018	High

No.	Goals	Actions	Cost (US$)	Timeline	Priority
5	Advance scientific knowledge about the biology and conservation of Mexican tarantulas; their exploitation; and domestic and international trade in tarantula specimens.	(a) **Tarantula field studies (phase 1)**: The Government of Mexico, in collaboration with academia and nongovernmental organizations, should support research on the populations, habitats, distribution, biology, national and international use, demand for and trade of the following species of highest priority, as well as on the impact of land use and habitat degradation on them: *Brachypelma auratum*, *B. baumgarteni*, *B. boehmei, B. emilia*, *B. klaasi*, *B. hamorii* and *B. smithi*.	67,000	2019	High
		(b) **Tarantula field studies (phase 2)**: The Government of Mexico, in collaboration with academia and nongovernmental organizations, should support research on the populations, habitats, distribution, biology, national and international use, demand for and trade of the following species of secondary priority, as well as on the impact of land use and habitat degradation on them: *Aphonopelma pallidum*, *Brachypelma albiceps*, *B. epicureanum*, *B. kahlenbergi*, *B. schroederi*, *B. vagans* and *B. verdezi*.	95,000	2021	High
6	Establish policies and guidelines that support and promote captive-breeding and sustainable trade of Mexican tarantulas.	(a) **Trade traceability**: The Government of Mexico should collaborate with Mexican tarantula breeders to develop a system for certifying the origin of specimens used in UMA breeding programs.	10,000	2019	Medium
		(b) **Commercial production guidelines**: Mexican tarantula breeders, in collaboration with the government of Mexico, academia and nongovernmental organizations, should develop management guidelines for intensive and semi-intensive commercial production of tarantulas.	2,000	2017	Medium
7	Promote the in-situ conservation of wild tarantula populations in Mexico.	(a) **Monitoring protocols and database**: Tarantula researchers, in collaboration with the Government of Mexico, nongovernmental organizations and local communities, should develop and implement standardized field protocols for monitoring tarantula populations, and establish a database for sharing data.	2,000	2019	Medium
		(b) **Captive-release studies**: The Government of Mexico, in collaboration with academia and nongovernmental organizations, should support onsite studies designed to determine the feasibility and impact of introducing captive-bred tarantulas into the wild. This initiative should focus on the following species: *Brachypelma auratum*, *B. baumgarteni, B. boehmei*, *B. emilia*, *B. klaasi*, *B. hamorii* and *B. smithi*.	40,000	2019	Medium
		(c) **Live-specimen handling guidelines**: Tarantula researchers and breeders should develop and follow guidelines for the capture, handling and transportation of wild tarantulas, so as to reduce unnecessary injury and death to wild tarantulas when being taken or studied (under permit) in their environment.	2,000	2017	Medium
		(d) **Public education**: The Government of Mexico, in collaboration with the CEC, academia and nongovernmental organizations, should develop and initiate educational activities in key communities that are in contact with tarantula populations, so as to increase support for tarantula conservation and promote interest in establishing semi-intensive tarantula UMAs.	6,000 per location	2019	High

No.	Goals	Actions	Cost (US$)	Timeline	Priority
8	Provide enforcement officers with the information and resources necessary to identify tarantula specimens and enforce the laws that regulate tarantula trade.	(a) **Tarantula identification guide**: The governments of Canada, the United States and Mexico, via the CEC, should support the development and distribution of a guide to the identification of *Brachypelma* tarantulas. The guide should be designed to meet law enforcement needs and should be made available online for general use. Completion of the guide could lead to development of a pictorial identification smartphone "app."	60,000	2018	High
		(b) **Expert database**: The governments of Canada, the United States and Mexico should develop and maintain a shared database of domestic and international experts who may be contacted to assist enforcement officers to identify tarantula specimens and respond to illegal trade activities.	n/a	2017	High
		(c) **USFWS training**: The USFWS should provide training on *Brachypelma* identification to USFWS inspectors via the In-service training program.	n/a	2017	High
		(d) **Tarantula trade workshop**: The governments of Canada, the United States and Mexico, via the CEC, should host a trinational workshop on the trade and identification of *Brachypelma* tarantulas. The workshop should bring together tarantula experts and enforcement staff from Canada, Mexico, the United States and the EU to provide training on *Brachypelma* identification, build links between North American and EU enforcement authorities, and stimulate collaborative enforcement actions to combat tarantula trafficking.	50,000	2018	High

Acknowledgments

The authors would like to express their gratitude to the people listed below for their support and input in developing this action plan:

Adriana Suarez Blanch, University of British Columbia
Martin Gamache, Tarantula Canada
Bob Herndon, US Fish and Wildlife Service
Michael Iacomini, US Fish and Wildlife Service
Ken MacNeil, Ken the Bug Guy
Julie Perrault, Environment and Climate Change Canada
Adrian Reuter, WCSWildlife Conservation Society
Kyla Sims, copy editor
Alonso Tolentino, tarantula breeder
Matt Whiteman, copy editor

Participants in the workshop

Jorge Mendoza, *Universidad Nacional Autónoma de México*
Gerardo García, *Unidades de Manejo y Aprovechamiento Sustentable de Vida Silvestre – Aracnofilia*
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David Donaldson, **Catherine Hallmich**, **Gray Fraser**, **Douglas Kirk** and **Jacqueline Fortson**.

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Mexican rust-leg tarantula
(*Brachypelma boehmei*)

Marcin

Appendix A: **Categories of Risk**

Mexico

The legislated categories for species and populations at risk in Mexico, as summarized from the General Law of Wildlife of Mexico (*Ley General de Vida Silvestre*) (Mexico 2016), are as follows:

- **Probably Extinct (in the wild)**: Those species that no longer can be found in the wild and are only known to exist in captivity or outside Mexican territory.
- **Endangered (in danger of extinction)**: Those species whose ranges or population size have declined dramatically in Mexico, thereby threatening their survival, due to factors such as the destruction or drastic modification of habitat; unsustainable exploitation; disease; or predation.
- **Threatened**: Those species that could be in danger of extinction in the short or medium term, if the factors that threaten their survival continue unabated.
- **Subject to Special Protection**: Those species that could potentially be affected by factors that threaten their survival, and for which efforts are required to promote their recovery and conservation.

United States

The categories for species at risk established by the United States, as defined in section 3 of the ESA, are as follows (USA 1973):

- **Endangered**: Any species which is in danger of extinction throughout all or a significant portion of its range. Species of insects may be exempt if they are deemed by the Secretary to be pests whose protection would present an overwhelming risk to man.
- **Threatened**: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

IUCN Red List Categories

The Categories and Criteria of IUCN Red List are summarized as follows (IUCN 2012):

- **Extinct (EX)**: A taxon10 of which no living individuals exist.
- **Extinct in the Wild (EW)**: A taxon that is known to survive only in cultivation, in captivity or as a naturalized population (or populations) well outside its past range.
- **Critically Endangered (CR)**: A taxon that meets any of five established criteria (A to E) and is facing an extremely high risk of extinction in the wild. The criteria for Critically Endangered are based on population size, geographic range and/or at least a 50% probability of extinction in the within 10 years or three generations.
- **Endangered (EN)**: A taxon that meets any of five established criteria (A to E) and is facing a very high risk of extinction in the wild. The criteria for Endangered are based on population size, geographic ranges and/or at least a 20% probability of extinction in within 20 years or five generations.
- **Vulnerable (VU)**: A taxon that meets any of five established criteria (A to E) and is facing a high risk of extinction in the wild. The criteria for Vulnerable are based on population size, geographic ranges and/or at least a 10% probability of extinction in within 100 years.
- **Near Threatened (NT)**: A taxon that has been evaluated against the criteria and does not qualify as Critically Endangered, Endangered or Vulnerable—but is close to qualifying for or is likely to qualify for the category Threatened in the near future.
- **Least Concern (LC)**: A taxon that has been evaluated against the criteria and does not qualify as Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa
- **Data Deficient (DD)**: A taxon for which there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status.
- **Not Evaluated (NE)**: A taxon which has not yet been evaluated against the criteria.

11. The name applied to any taxonomic group in biological nomenclature (i.e., kingdom, phylum, class, order, family, genus, species, etc.) (Merriam-Webster 2016).

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