[FR Doc. 2018–16266 Filed 7–30–18; 8:45 am]
BILLING CODE 6560–50–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–HQ–ES–2016–0076; 4500030115]

RIN 1018–BC82

Endangered and Threatened Wildlife and Plants; Endangered Species Status for Five Poecilotheria Tarantula Species From Sri Lanka

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine endangered species status under the Endangered Species Act of 1973, as amended, for the following five tarantula species from Sri Lanka: *Poecilotheria fasciata, P. ornata, P. smithi, P. subfusca,* and *P. vittata.* The effect of this regulation will be to add these species to the List of Endangered and Threatened Wildlife.

DATES: This rule becomes effective August 30, 2018.

ADDRESSES: This final rule is available on the internet at *http://www.regulations.gov* at docket number FWS–HQ–ES–2016–0076. Comments and materials we received, as well as supporting documentation we used in preparing this rule, are available for public inspection at *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Don Morgan, Chief, Branch of Delisting and Foreign Species, Ecological Services, U.S. Fish and Wildlife Service, MS: ES, 5275 Leesburg Pike, Falls Church, VA 22041–3803; telephone, 703–358–2171. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*), a species may be protected through listing as an endangered species or threatened species if it meets the definition of an ''endangered species'' or ''threatened species'' under the Act. Listing a species as an endangered or threatened species can only be completed by issuing a rule.

What this document does. This rule will add the following five tarantula species to the List of Endangered and Threatened Wildlife in title 50 of the Code of Federal Regulations (50 CFR 17.11(h)) as endangered species: *Poecilotheria fasciata, P. ornata, P. smithi, P. subfusca, and P. vittata.*

The basis for our action. Under the Act, we use the best available scientific and commercial data to determine whether a species meets the definition of a ''threatened species'' or an ''endangered species'' because of any one or more of the following five factors or the cumulative effects thereof: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence. We have determined on the basis of the best available scientific and commercial data that *P. fasciata, P. ornata, P. smithi, P. subfusca,* and *P. vittata* are in danger of extinction because of ongoing habitat loss and degradation and the cumulative effects of this and other threat factors. One species, *P. smithi,* is also in danger of extinction because of the effects of stochastic (random) processes.

Peer review and public comment. We sought comments from independent peer reviewers to ensure that our designation is based on scientifically sound data and analyses. We invited these peer reviewers to comment on our listing proposal. We also considered all comments and information received from the public during the comment period.

Previous Federal Action

We received a petition, dated October 29, 2010, from WildEarth Guardians requesting that the following 11 tarantula species in the genus *Poecilotheria* be listed under the Act as endangered or threatened: *Poecilotheria fasciata, P. formosa, P. hanumavilasumica, P. metallica, P. miranda, P. ornata, P. pederseni, P. rufilata, P. smithi, P. striata,* and *P. subfusca.* The petition identified itself as such and included the information as required by 50 CFR 424.14(a). We published a 90-day finding on December 3, 2013 (78 FR 72622), indicating that the petition presents substantial scientific and commercial information indicating that listing these 11 species may be warranted. At that time we also (1) notified the public that we were initiating a review of the status of these species to determine if listing them is warranted, (2) requested from the public scientific and commercial data and other information regarding the species, and (3) notified the public that at the conclusion of our review of the status of these species, we would issue a 12-month finding on the petition, as provided in section 4(b)(3)(B) of the Act. We published a 12-month finding and proposed rule for listing the five *Poecilotheria* species that are endemic to Sri Lanka (*Poecilotheria fasciata, P. ornata, P. pederseni, P. smithi,* and *P. subfusca*) on December 14, 2016 (81 FR 90297). In our 12-month finding and proposed rule we determined that these five species were in danger of extinction throughout their ranges and proposed listing them as endangered under the Act. We requested input from the public, range country, other interested parties, and peer reviewers during a 60-day public comment period that ended February 13, 2017.

Summary of Changes From the Proposed Rule

In preparing this final rule, we reviewed and fully considered comments from the public and peer reviewers on the proposed rule. This final rule incorporates minor changes to our proposed listing based on the comments we received (See: Summary of Comments and Recommendations).

Background

Taxonomy and Species Descriptions

Poecilotheria is a genus of arboreal spiders endemic to Sri Lanka and India. The genus belongs to the family *Theraphosidae,* often referred to as tarantulas, within the infraorder *Mygalomorphae.* As with most theraphosid genera, *Poecilotheria* is a poorly understood genus. The taxonomy has never been studied using modern DNA technology; therefore, species descriptions are based solely on morphological characteristics. Consequently, there have been several revisions, additions, and subtractions to the list of *Poecilotheria* species over the last 20 years (Nanayakkara 2014a, pp. 71–72; Gabriel *et al.* 2013, entire).

The World Spider Catalog (2017, unpaginated; 2016, unpaginated) currently recognizes 14 species of *Poecilotheria.* The Integrated Taxonomic Information System currently identifies 16 species in the genus, based on the 2011 version of the same catalog. Because the World Spider Catalog is the widely accepted authority on spider taxonomy, we consider the *Poecilotheria* species recognized by the most recent (2017) version of this catalog to be valid. Based on the World

Spider Catalog, all five of the species addressed in this rule are considered valid taxon, although *P. pederseni* is now considered a junior synonym to the currently accepted name *P. vittata.* Therefore, in the remainder of this document we refer to this species as *P. vittata.* Further, all five of these species have multiple common names (see WildEarth Guardians 2010, p. 4); thus, we refer to them by their scientific names throughout this document.

Poecilotheria species are among the largest spiders in the world, with body lengths of 4 to 9 centimeters (1.5 to 3.5 inches) and maximum adult leg spans varying from 15 to 25 centimeters (6 to 10 inches) (Nanayakkara 2014a, pp. 94–129; Molur *et al.* 2006, p. 23). They are known for their fast movements and potent venom that, in humans, typically causes extended muscle cramps and severe pain (Fuchs 2014, p. 75; Nanayakkara and Adikaram 2013, p. 53). They are hairy spiders and have striking coloration, with dorsal color patterns of gray, black, brown, and in one case, a metallic blue. Ventral coloration of either sex is typically more of the same with the exception of the first pair of legs, which in some species bear bright yellow to orange aposematic (warning) markings that are visible when the spider presents a defensive display. Mature spiders exhibit some sexual dimorphism with mature males having a more drab coloration and being significantly smaller than the adult females (Siliwal 2017, unpaginated; Nanayakkara 2014a, entire; Pocock 1899, pp. 84–86).

The primary characteristics used to distinguish *Poecilotheria* species are ventral leg markings (Gabriel 2010 p. 13, citing several authors). Some authors indicate that identification via leg markings is straightforward for most *Poecilotheria* species (Nanayakkara 2014a, pp. 74–75; Gabriel 2011a, p. 25). However, the apparent consistent leg patterns observed in adults of a species could also be a function of specimens being collected from a limited number of locations (Morra 2013, p. 129). During surveys, researchers found more variation than suggested by published species descriptions and indicated that identifying *Poecilotheria* species is not as straightforward as suggested by current descriptions (Molur *et al.* 2003, unpaginated). Immature spiders (juveniles) lack the variation in coloring found in adults. As a result, they are difficult to differentiate visually; genetic analysis may be the only way to reliably identify juveniles to species (Longhorn 2014a, unpaginated).

Captive Poecilotheria

Most captive individuals of *Poecilotheria* species are in the pet trade; few specimens of the species addressed in this rule are held in zoos (Species360 2017, unpaginated). *Poecilotheria* species are commonly bred in captivity by amateur hobbyists as well as vendors, and are available as captive-bred young in the pet trade in the United States, Europe, and elsewhere (see *Trade*). However, while rearing and keeping of captive individuals by hobbyists and vendors has provided information on life history of these species, we are not aware of any existing conservation programs for these species, including any in which specimens held or sold as pets contribute to the viability of these species within their native ranges in the wild.

Individuals of these species that are held or sold as pets hold limited conservation value to the species in the wild because they are not genetically managed for conservation purposes. Individuals in the pet trade descend from wild individuals from unknown locations, have undocumented lineages, come from limited stock (*e.g.,* see Gabriel 2012, p. 18), and are bred without knowledge or consideration of their genetics. They also likely include an unknown number of hybrid individuals resulting from intentional crosses, or unintentional crosses resulting from confusion and difficulty in species taxonomy and identification (Gabriel 2011a, pp. 25–26; Gabriel *et al.* 2005, p. 4; Gabriel 2003, pp. 89–90). Further, many are likely several generations removed from wild ancestors and thus may be adversely affected by inbreeding or maladapted to conditions in the wild. In short, captive individuals held or sold as pets do not adhere to the IUCN guidelines for reintroductions and other conservation translocations (IUCN 2013, entire). Further, we are not aware of any captive-breeding programs for *Poecilotheria* that adhere to IUCN guidelines.

Because (1) the purpose of our status assessments is to determine the status of the species in the wild, (2) we are not aware of any information indicating that captive individuals are contributing to the conservation of these species in the wild, and (3) captive individuals held or sold as pets have limited value for conservation programs or for reintroduction purposes, we place little weight on the status of captive individuals in our assessment of the status of the five *Poecilotheria* species addressed in this rule.

Tarantula General Biology

Tarantulas possess life-history traits markedly different from most spiders and other arthropods (Bond *et al.* 2006, p. 145). They are long-lived, have delayed sexual maturity, and most are habitat specialists that are extremely sedentary. They also have poor dispersal ability because their mode of travel is limited to walking, and they typically do not move far from the area in which they are born. As a result, the distribution of individuals tends to be highly clumped in suitable microhabitats (a smaller habitat within a larger habitat), populations are extremely genetically structured (genetically subdivided; gene frequencies differ across the population), and the group shows a high level of endemism (species restricted to a particular geographical location) (Ferreti *et al.* 2014, p. 2; Hedin *et al.* 2013, p. 509, citing several sources; Bond *et al.* 2006, pp. 145–146, citing several sources).

Tarantulas are primarily nocturnal and typically lead a hidden life, spending much of their time concealed inside burrows or crevices (retreats) that provide protection from predators and the elements (Foelix 2011, p. 14; Molur *et al.* 2003, unpaginated; Gallon 2000, unpaginated). They are very sensitive to vibrations and climatic conditions, and usually do not come out of their retreats in conditions like rains, wind, or excessive light, or when they detect movement outside their retreat (Molur *et al.* 2003, unpaginated). Tarantulas are generalist predators that sit and wait for passing prey near the entrance of their retreats (Gallon 2000, unpaginated). With the exception of reproductive males that wander in search of females during the breeding season, they leave their retreat only briefly for capturing prey, and quickly return to it at the slightest vibration or disturbance (Foelix 2011, p. 14; Stotley and Shillington 2009, pp. 1210–1211; Molur *et al.* 2003, unpaginated). Tarantulas generally inhabit a suitable retreat for extended periods and may use the same retreat for years (Stotley and Shilling 2009, pp. 1210–1211; Stradling 1994, p. 87). Most tarantulas are solitary, with one spider occupying a retreat (Gallon 2000, unpaginated).

The lifestyle of adult male tarantulas differs from that of adult females and juveniles. Females and juveniles are sedentary, spending most of their time in or near their retreat. Adult females are long-lived and continue to grow, molt, and reproduce for several years after reaching maturity (Ferreti *et al.* 2014, p. 2, citing several sources; Costa

and Perez-Miles 2002, p. 585, citing several sources; Gallon 2000, unpaginated). They are capable of producing one brood per year, although they do not always do so (Ferreti *et al.* 2014, p. 2; Stradling 1994, pp. 92–96). Males have shorter lifespans than females and, after reaching maturity, no longer molt and usually only live one or two breeding seasons (Costa and Perez-Miles 2002, p. 585, Gallon 2000, unpaginated). Further, on reaching maturity, males leave their retreats to wander in search of receptive females with which to mate (Stotley and Shillington 2009, pp. 1210–1211). Males appear to search the landscape for females randomly and, at short range, may be able to detect females through contact sex-pheromones on silk deposited by the female at the entrance of her retreat (Ferreti *et al.* 2013, pp. 88, 90; Janowski-Bell and Horner 1999, pp. 506, 509; Yanez *et al.* 1999, pp. 165–167; Stradling 1994, p. 96). Males may cover relatively large areas when searching for females. Males of a ground-dwelling temperate species (*Aphonopelma anax*) are reported covering search areas up to 29 ha (72 acres), though the mean size of areas searched is much smaller (1.1 ± 0.5 ha one year and 8.8 ± 2.5 ha another year) (Stotley and Shillington 2009, p. 1216).

When a male locates a receptive female, the two will mate in or near the entrance to the female's retreat. After mating, the female returns to her retreat where she eventually lays eggs within an egg-sac and tends the eggs until they hatch. Spiderlings reach maturity in one or more years (Gallon 2000, unpaginated).

Poecilotheria Biology

Limited information is available on *Poecilotheria* species in the wild. While they appear to be typical tarantulas in many respects, they differ from most tarantulas in that they are somewhat social (discussed below) and reside in trees rather than ground burrows (see Microhabitat).

Poecilotheria species are patchily distributed (Siliwal *et al.* 2008, p. 8) and prey on a variety of insects, including winged termites, beetles, grasshoppers, and moths, and occasionally small vertebrates (Das *et al.* 2012, entire; Molur *et al.* 2006, p. 31; Smith *et al.* 2001, p. 57).

We are not aware of any information regarding the reproductive success of wild *Poecilotheria* species. However, reproduction may be greatly reduced during droughts (Smith *et al.* 2001, pp. 46, 49). Additionally, given the apparently random searching for females by male tarantulas, successful mating of females likely depends on the density of males in the vicinity. In a study conducted on an arboreal tropical tarantula (*Avicularia avicularia* in Trinidad), less than half of adult females produced eggs in the same year despite the fact that they were in close proximity to each other and exhibited the same weight gain, possibly due to a failure to mate (Stradling 1994, p. 96).

Time to maturity in *Poecilotheria* species varies and is influenced by the temperature at which the young are raised and amount of food provided (Gabriel 2006, entire). Based on observations of captive *Poecilotheria,* males mature from spiderlings to adults in 11 to16 months (Gabriel 2011b, p. 101; Gabriel 2005, entire). Females mature in 14 to 48 months and generally live an additional 60 to 85 months after maturing (Cowper 2017, unpaginated; Weaver 2017, unpaginated; Gabriel 2012, p. 19; Government of Sri Lanka and Government of the United States 2000, p. 3), although they have been reported living up to 14 years (Gallon 2012, p. 69). Females lay about 50 to 100 eggs, 5 to 6 months after mating (Nanayakarra 2014a, p. 79; Gabriel 2011b, entire; Gabriel 2005, p. 101). In captivity, generation time appears to be roughly 2–3 years (see Gabriel 2011b, entire; Gabriel 2006, p. 96; Gabriel 2005, entire). While captive individuals provide some indication of potential growth, longevity, and reproductive capacity of wild individuals, these variables are likely to vary with conditions in the wild. *Poecilotheria* are ectotherms and, as such, their physiological and developmental processes including growth and reproduction are strongly influenced by body temperature and it is likely that captive-rearing of these species is primarily done under ideal environmental conditions for reproduction and growth.

Unlike most tarantulas, which are solitary, most *Poecilotheria* species display a degree of sociality. Adult females often share their retreat with their spiderlings. Eventually as the young mature, they disperse to find denning areas of their own. Occasionally young remain on their natal tree to breed, or three to four adult females will share the same retreat (Nanayakkara 2014a, pp. 74, 80). These semi-social behaviors are believed to be a response to a lack of availability of suitable habitat (trees) in which individuals can reside (Nanayakkara 2014a, pp. 74, 80; Gallon 2000, unpaginated).

Poecilotheria Habitat

Microhabitat

Poecilotheria occupy preexisting holes or crevices in trees or behind loose tree bark (Molur *et al.* 2006, p. 31; Samarawckrama *et al.* 2005; Molur *et al.* 2003 unpaginated; Kirk 1996, pp. 22–23). Individuals of some species are also occasionally found in grooves or crevices in or on other substrates such as rocks or buildings that are close to wooded areas (Samarawckrama *et al.* 2005, pp. 76, 83; Molur *et al.* 2003, unpaginated). In a survey in Sri Lanka, 89 percent (31) of *Poecilotheria* spiders were found in or on trees, while 11 percent (4) were found in or on buildings (Samarawckrama *et al.* 2005, p. 76). *Poecilotheria* species are said to have a preference for residing in old, established trees with naturally occurring burrows (Nanayakkara 2014a, p. 86). Some species also appear to prefer particular tree species (Nanayakkara 2014a, p. 84; Samarawckrama *et al.* 2005, p. 76).

Macrohabitat

Most *Poecilotheria* species occur in forested areas, although some occasionally occur in other treed habitats such as plantations (Nanayakkara 2014a, p. 86; Molur *et al.* 2006, p. 10; Molur et al 2003, entire; Smith *et al.* 2001, entire). *Poecilotheria* are less abundant in degraded forest (Molur *et al.* 2004, p. 1665). Less complex, degraded forests may contain fewer trees that provide adequate retreats for these species and less cover for protection from predators and the elements. Trees with broad, dense canopy cover likely provide *Poecilotheria* in hotter, dryer habitats protection from heat and desiccation (Siliwal 2008, pp. 12, 15). We provide additional, species-specific information on habitat below.

Sri Lanka

Sri Lanka is an island nation about 65,610 square kilometers (km^2) (25,332 square miles (mi^2)) in area (Weerakoon 2012, p. xvii), or about the size of West Virginia (Fig. 1). The variation in topography, soils, and rainfall on the island has resulted in a diversity of ecosystems with high levels of species endemism (Government of Sri Lanka (GOSL) 2014, pp. xiv–xv). Sri Lanka, together with the Western Ghats of India, is identified as a global biodiversity hotspot, and is among the eight ''hottest hotspots,'' (Myers *et al.* 2000, entire).

Sri Lanka consists of a mountainous region (central highlands), reaching 2,500 meters (8,202 feet) in elevation, in

the south-central part of the island surrounded by broad lowland plains (GOSL 2012, p. 2a–3–141) (Fig. 2). The country has a tropical climate characterized by two major monsoon periods: the southwest monsoon from May to September and the northeast monsoon from December to February (GOSL 2012, pp. 7–8).

Sri Lanka's central highlands create a rain shadow effect that gives rise to two pronounced climate zones—the wet zone and dry zone—and a less extensive intermediate zone between the two (Ministry of Environment–Sri Lanka (MOE) 2010, pp. 21–22) (Fig. 2). Small arid zones also occur on the northwestern and southeastern ends of the country (Nanayakkara 2014a, p. 22). Annual rainfall ranges from less than 1,000 millimeters (mm) (39.4 inches (in)) in the arid zone to over 5,000 mm (197 in) in the wet zone of the central highlands (Jayatillake *et al.* 2005, pp. 66–67). Mean annual temperature ranges from 27 degrees Celsius (°C) (80.6 degrees Fahrenheit (°F)) in the lowlands to 15 °C (59 ;°F) in the highlands (Eriyagama *et al.* 2010, p. 2).

The wet zone is located in the southwestern quarter of the island, where high annual rainfall is maintained throughout the year by rain received during both monsoons and during inter-monsoonal periods (MOE 2010, pp. 21–22) (Fig. 2). The wet zone is divided into low, mid, and montane regions based on altitude. The dry zone, in which most of the land area of Sri Lanka occurs, is spread over much of the lowland plains and is subjected to several months of drought (MOE 2010, pp. 21–22) (Fig. 2). Most of the rain in this zone comes from the northeast monsoon and inter-monsoonal rains (MOE 2010, pp. 21–22; Malgrem 2003, p. 1236). Characteristic forest types occur within each of the different climate zones.

Species-Specific Information

Each of the five species addressed in this finding is endemic to Sri Lanka and has a range restricted to a particular region and one or two of Sri Lanka's climate zones (Nanayakkara 2014a, pp. 84–85) (Fig. 1, Fig. 2). Due to their secretive and nocturnal habits, sensitivity to vibrations, and their occurrence in structurally complex habitat (forest), *Poecilotheria* species are difficult to detect (Molur *et al.* 2003, unpaginated). Therefore, reported ranges are possibly smaller than the actual ranges of these species. However, surveys for these species were conducted at many locations throughout the country during 2009–2012 by Nanayakkara *et al.* (2012, entire), and we consider the locations reported in Nanayakkara (2014a, entire) to reflect the best available information concerning the ranges of these species.

Historical ranges for the five species addressed in this rule are unknown. Further, information on species abundance or population dynamics is not available on any of the five species; therefore, population trends are unknown. However, based upon the multitude of threats acting on these species, especially extensive and ongoing habitat loss and degradation, experts believe populations are declining, and that these species are very likely to go extinct within the next two or three decades (Nanayakkara and Adikaram 2013, p. 54). We are not aware of any existing conservation programs for these species. All five species are categorized on the National Red List of Sri Lanka as Endangered or Critically Endangered based on their area of occupancy (Critically Endangered: less than 10 km^2; Endangered: less than 500 km^2) and distribution (Critically Endangered: severely fragmented or known to exist at only a single location; Endangered: severely fragmented or known to exist at no more than five locations), and the status (continuing decline, observed, inferred or projected, in the area, extent, or quality, or any combination of the three) of their habitat (MOE 2012, p. 55; IUCN 2001, entire).

For locations discussed in species-specific information below, see Fig. 1. For locations of the ranges of the different species, see Fig. 2.

BILLING CODE 4333–15–P

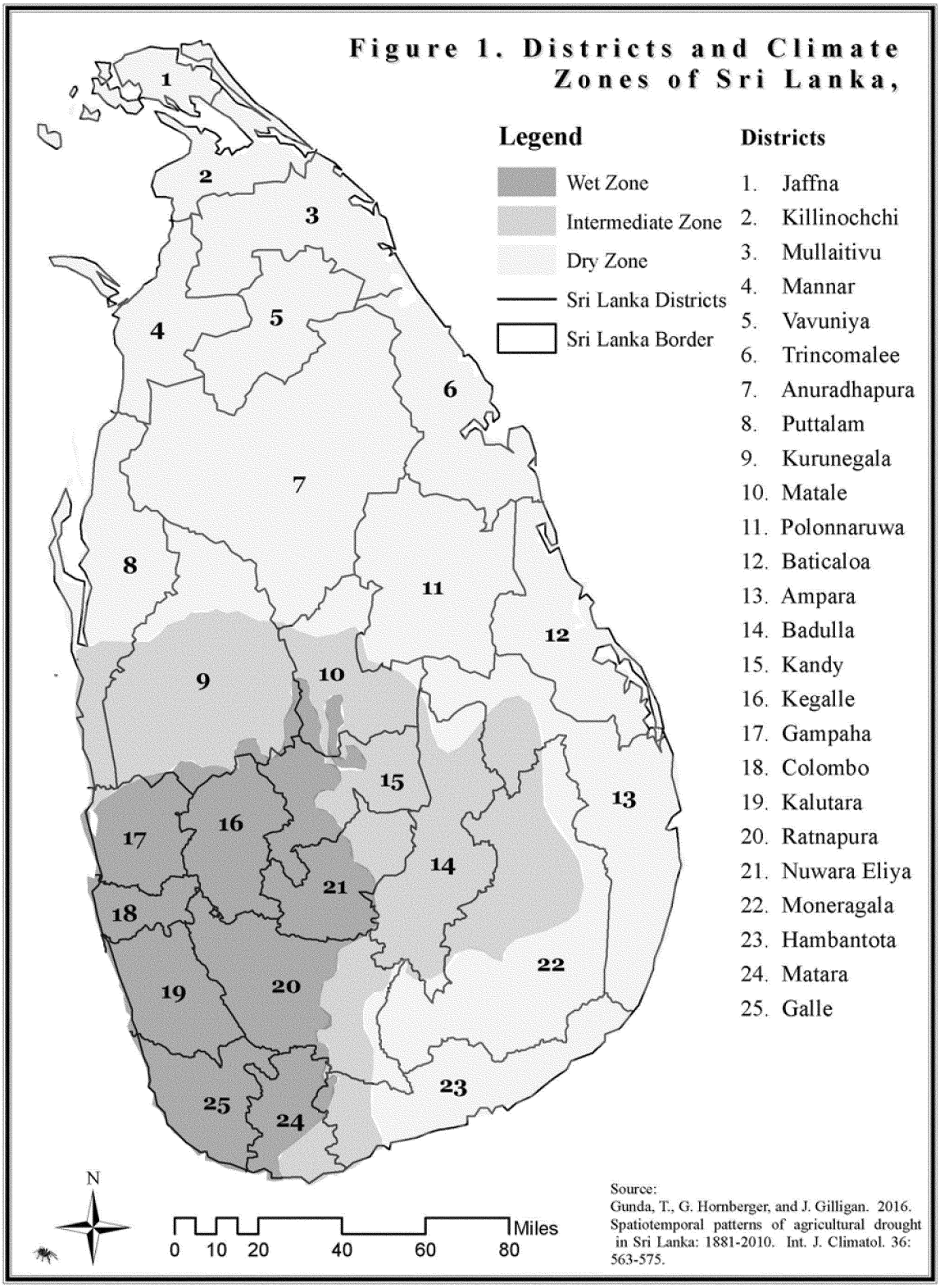
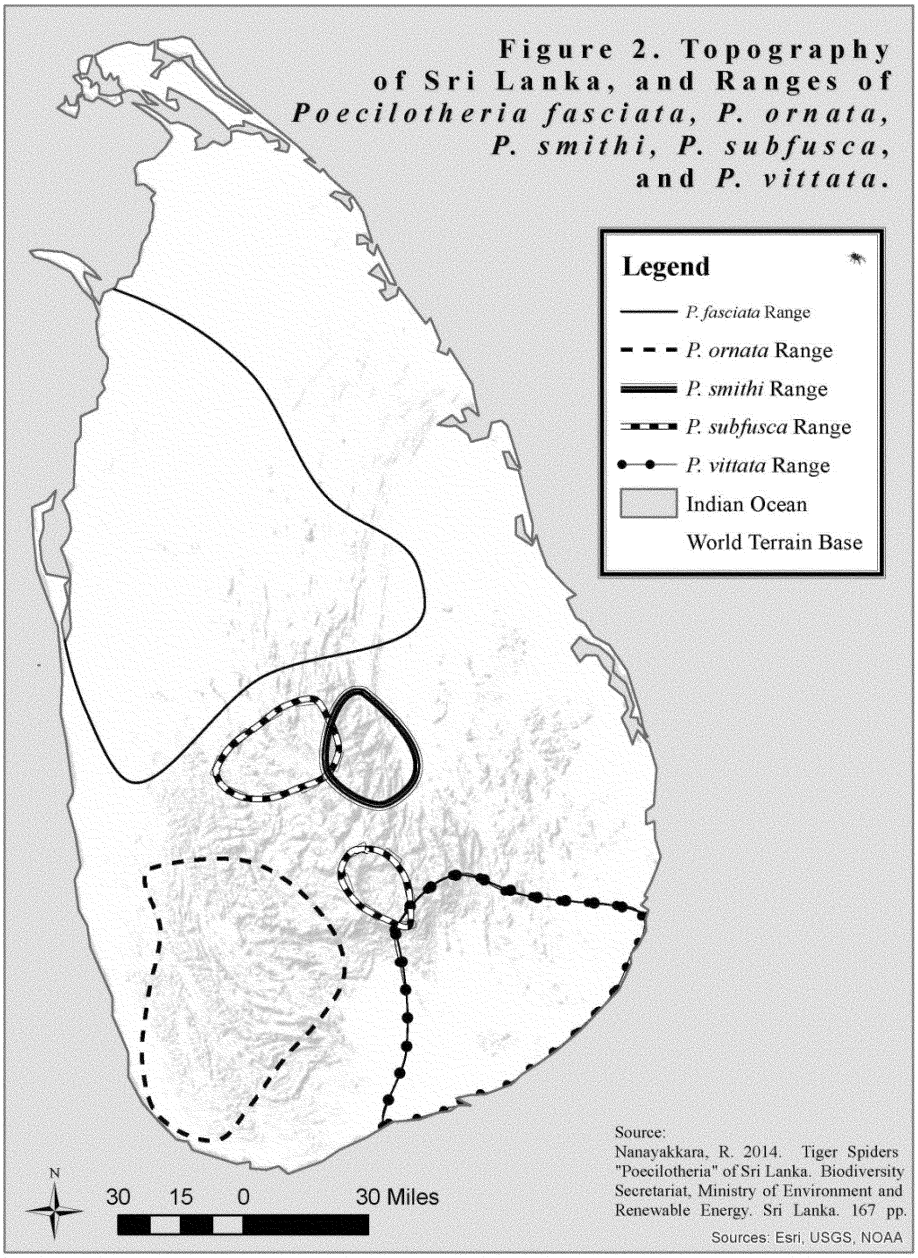


Figure 1. Districts and Climate Zones of Sri Lanka,
Legend
Wet Zone
Intermediate Zone
Dry Zone
Sri Lanka Districts
Sri Lanka Border
Districts
1. Jaffna
2. Killinochchi
3. Mullaitivu
4. Mannar
5. Vavuniya
6. Trincomalee
7. Anuradhapura
8. Puttalam
9. Kurunegala
10. Matale
11. Polonnaruwa
12. Baticaloa
13. Ampara
14. Badulla
15. Kandy
16. Kegalle
17. Gampaha
18. Colombo
19. Kalutara
20. Ratnapura
21. Nuwara Eliya
22. Moneragala
23. Hambantota
24. Matara
25. Galle
N
0 10 20 40 60 80 Miles
Source:
Gunda, T., G. Hornberger, and J. Gilligan. 2016. Spatiotemporal patterns of agricultural drought in Sri Lanka: 1881-2010. Int. J. Climatol. 36: 563-575.



BILLING CODE 4333–15–C

P. fasciata

Poecilotheria fasciata occurs in forests below 200-m elevation in Sri Lanka's dry and intermediate zones north of Colombo and is also sometimes found in coconut plantations in this region (Nanayakkara 2014a, p. 96; Nanayakkara 2014b, unpublished data; Smith *et al.* 2001, entire). The species has a broad but patchy distribution and is estimated to occupy less than 500 km^2 (193 mi^2) of its range (MOE 2012, p. 55; Smith *et al.* 2001, p. 48). The area, extent, or quality (or a combination thereof) of *P. fasciata*'s habitat is in continuing decline, and the species is categorized on the National Red List of Sri Lanka as Endangered (MOE 2012, p. 55).

The only detailed record of the species' occurrence is provided by Smith *et al.* (2001, entire), where *Poecilotheria fasciata* colonized a coconut plantation following a prolonged drought. While *P. fasciata* in dry and intermediate zone forests, including those surrounding the coconut plantation, were found to be emaciated and without spiderlings, those in the irrigated plantation were found to have spiderlings in their retreats and wider abdomens. Smith *et al.* argue that *P. fasciata* was able to colonize the plantation due to the occurrence of *P. fasciata* in the adjacent remnant forest, the presence of coconut trees that were infested with weevils and subsequently fed on by woodpeckers that created holes suitable for *P. fasciata* retreats, and plantation irrigation that resulted in an abundant prey base for the species. The *P. fasciata* population in the plantation was apparently established in the 1980s and persisted until at least 2000 (Smith *et al.* 2001, pp. 49, 52).

During recent surveys, *P. fasciata* were detected at nine locations—two in coconut plantations and seven in forest locations. Greater than 20 adults and 100 juveniles were found in coconut plantations, and greater than 30 adults and no juveniles were found in forest locations (Nanayakkara 2014b, unpublished data). Although no

juveniles were detected in forest habitats during these surveys, recent observations of *P. fasciata* juveniles in forest habitat have been reported (Nanayakkara 2014a, p. 96; Kumarasinghe *et al.* 2013, p. 10). Therefore, based on the observations of Smith *et al.* described above, it is possible that the lack of juveniles detected in forests during recent surveys was due to drought conditions during the survey period. As indicated above, island-wide surveys for *Poecilotheria* were conducted during 2009–2012, and droughts occurred in 2010 and 2012 in the region in which *P. fasciata* occurs (Integrated Regional Information Network 2012, unpaginated; Disaster Management Center, Sri Lanka 2010, p. 12). However, while juveniles were detected only in coconut plantations during these surveys, numbers found in coconut and forest habitat cannot be directly compared because surveys were designed for determining distribution rather than species abundance or density. For instance, juveniles may be more difficult to detect in forest habitat than in coconut plantations, or a greater area of coconut plantations may have been searched compared to forest habitat.

P. ornata

Poecilotheria ornata is found in the plains and hills of the lowland wet zone in southwestern Sri Lanka (Nanayakkara 2014a, pp. 112–113; Smith *et al.* 2002, p. 90). It is one of the few solitary species in the genus (Nanayakkara 2014a, p. 112). In recent surveys, 23 adults and no juveniles were detected at 4 locations (Nanayakkara 2014b, unpublished data). *Poecilotheria ornata* is estimated to occupy less than 500 km² (193 mi²) of its range (MOE 2012, p. 55), and the area, extent, or quality (or a combination thereof) of the species' habitat is in continuing decline. *Poecilotheria ornata* is categorized on the National Red List of Sri Lanka as Endangered (MOE 2012, p. 55).

P. smithi

Poecilotherai smithi is found in the central highlands, in Kandy and Matale districts (Nanayakkara *et al.* 2013, pp. 73–74). It was originally found in the wet zone at mid elevations (Kirk 1996, p. 23), although it is described as a montane species (Jacobi 2005, entire; Smith *et al.* 2002, p. 92). *Poecilotheria smithi* appears to be very rare (Nanayakkara *et al.* 2013, p. 73; Gabriel *et al.* 2005, p. 4) and is considered ''highly threatened'' (Nanayakkara *et al.* 2013, p. 73). The species was described in 1996, and, despite several efforts to locate the species during the past 20 years, few individuals have been found (Nanayakkara *et al.* 2013, pp. 73–74; Gabriel *et al.* 2005, pp. 6–7). In 2005, three adult females and four spiderlings were reported in the Haragama, Kandy district, an area described as severely impacted by several anthropogenic factors (Nanayakkara *et al.* 2013, p. 74; Gabriel *et al.* 2005, pp. 6–7). During surveys conducted in several areas of the country during 2003–2005, no *P. smithi* were found (Samarawckrama *et al.* 2005, entire). Finally, during recent surveys, the species was found at two locations with seven adults and nine juveniles detected (Nanayakkara 2014b, unpublished data). Prior to these recent surveys, the species was known only from the Haragama, Kandy district. However, the species was recently found about 31 km (19.3 mi) away from Haragama, in three trees within a 5-km² (1.9-mi²) area of highly disturbed habitat (Nanayakkara *et al.* 2013, p. 74).

Poecilotheria smithi was estimated to occupy less than 10 km² (3.9 mi²) of its range (MOE 2012, p. 55) but a recently reported location in Matale district increases the known area of occupancy by 5 km² (1.9 mi²). The area, extent, or quality (or a combination thereof) of the species' habitat is considered to be in continuing decline, and the species is categorized on the National Red List of Sri Lanka as Critically Endangered (MOE 2012, p. 55).

P. subfusca

Poecilotheria subfusca occurs in the wet zone of the central highlands of Sri Lanka, in two disjunct regions: the montane region above 1,500-m elevation in Nuwara Eliya and Badulla districts; and at 500 to 600 m (1,640 to 1,968 ft) elevation in Kegalla, Kandy, and Matale districts (Nanayakkara 2014a, pp. 101–102, 116; Smith *et al.* 2002, entire).

During recent surveys, *P. subfusca* was found at 10 locations, and a total of 25 adult and 56 juvenile *P. subfusca* were detected (Nanayakkara 2014b, unpublished data). The area of the range occupied by *P. subfusca* is less than 500 km² (193 mi²) (MOE 2012, p. 55). Further, the area, extent, or quality (or a combination thereof) of *P. subfusca*'s habitat is in continuing decline throughout its range, and the species is categorized on the National Red List of Sri Lanka as Endangered (MOE 2012, p. 55).

P. vittata

Poecilotheria vittata occurs in the arid, dry, and intermediate zones of Hambantota and Monaragala districts in southeastern Sri Lanka (Kekulandala and Goonatilake 2015, unpaginated; Nanayakkara 2014a, pp. 106–107). The species' preferred habitat is *Manilkara hexandra* (Palu) trees (Nanayakkara 2014a, p. 106), a dominant canopy tree species in Sri Lanka's dry forest (Gunarathne and Perera 2014, p. 15). In recent surveys, the species was found at 4 locations, and 15 adults and 7 juveniles of *P. vittata* were detected (Nanayakkara 2014b, unpublished data). *Poecilotheria vittata* is estimated to occupy less than 500 km² (193 mi²) of its range (MOE 2012, p. 55), and the area, extent, or quality (or a combination thereof) of the species' habitat is considered to be in continuing decline. *Poecilotheria vittata* is categorized on the National Red List of Sri Lanka as Endangered (MOE 2012, p. 55).

Summary of Biological Status and Threats

The Act directs us to determine whether any species is an endangered species or a threatened species because of any one or more of five factors or the cumulative effects thereof: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence. In this section, we summarize the biological condition of the species and its resources, and the influences on these to assess the species' overall viability and the risks to that viability.

Habitat Loss and Degradation

Habitat loss and degradation are considered primary factors negatively affecting *Poecilotheria* species (Nanayakkara and Adikaram 2013, pp. 53–54; MOE 2012, p. 55; Molur *et al.* 2008, pp. 1–2). Forest loss and degradation are likely to negatively impact the five species addressed in this rule in several ways. First, forest loss and degradation directly eliminate or reduce the availability of trees required by *Poecilotheria* species for reproduction, foraging, and protection (Samarawckrama *et al.* 2005, p. 76; Smith *et al.* 2002, entire). Second, due to the limited ability of *Poecilotheria* species to travel, as well as their sedentary habits, forest loss and degradation are also likely to result in direct mortality of individuals or populations, via physical trauma caused by the activities that result in forest loss and degradation, or the intentional killing of these spiders when they are encountered by humans during these activities (see *Intentional Killing*). Such mortality affects these species'

abundances and distributions, and also their genetic diversity. Tarantulas have highly structured populations (See *Tarantula General Biology*) and, consequently, the loss of a local population of a species—due to habitat loss or any other factor—equates to a loss of unique genetic diversity (Bond *et al.* 2006, p. 154, citing several sources). Finally, the loss of forest also often results in fragmented habitat. Due to the limited dispersal ability of these species, forest fragmentation is likely to isolate *Poecilotheria* populations, which increases their vulnerability to stochastic processes (see *Stochastic Processes*), and may also expose wandering males and dispersing juveniles to increased mortality from intentional killing or predation when they attempt to cross between forest fragments (Bond *et al.* 2006, p. 155) (see *Intentional Killing*).

Deforestation

Forests covered almost the entire island of Sri Lanka a few centuries ago (Mattsson *et al.* 2012, p. 31). However, extensive deforestation occurred during the British colonial period (1815–1948) as a result of forest-clearing for establishment of plantation crops such as tea and coffee, and also exploitation for timber, slash-and-burn agriculture (a method of agriculture in which natural vegetation is cut down and burned to clear the land for planting), and land settlement. In 1884, about midway through the British colonial period, closed-canopy (dense) forest covered 84 percent of the country and was reduced to 44 percent by 1956 (GOSL 2012, p. 2a-3–145; Nanayakkara 1996, in Mattson *et al.* 2012, p. 31). Deforestation continued after independence as the result of timber extraction, slash-and-burn agriculture, human settlements, national development projects, and encroachment (GOSL 2012, pp. 2a-3–144–145; Perera *et al.* 2012, p. 165). As a result, dense forest cover (canopy density greater than 70 percent) declined by half in about 50 years, to 22 percent in 2010 (GOSL 2012, pp. 51, 2a-3–145; Nanayakkara 1996, in Mattson *et al.* 2012, p. 31). Open-canopy forest (canopy density less than 70 percent) covered an additional 6.8 percent of the country in 2010 for an overall forest cover of 28.6 percent (GOSL 2012, p. 51).

The extent of deforestation differed in the three climate zones of the country. The impacts of anthropogenic factors on forests in the wetter regions of the island have been more extensive due to the higher density of the human population in these regions. The human population density in the wet zone is 650 people per km² (1,684 per mi²) compared to 170 people per km² (440 per km²) in the dry zone and 329 per km² (852 per mi²) nationally (GOSL 2012, p. 8). Currently about 13 percent of the wet zone, 15 percent of the intermediate zone, and 29 percent of the dry zone are densely forested (Table 1).

Recent information on forest cover in the different climate zones is provided in three reports (GOSL 2015, GOSL 2012, and FAO 2015a), all of which provide information from the Forest Department of Sri Lanka. One report (GOSL 2015) provides a map of the change in forest cover between 1992 and 2010 and a qualitative assessment of these changes. The others (GOSL 2012 and FAO 2015a) provide quantitative information on the area of forest cover by forest type for 1992, 1999, and 2010. These latter two reports differ slightly in their presentation of information but contain identical data on natural forest cover. However, the Forest Department of Sri Lanka used different rainfall criteria to separate dry and intermediate zone forests, and different altitude criteria to separate montane and submontane forests, in different years (see climate zone and forest definitions in FAO 2015a, p. 6; GOSL 2012, p. 51; FAO 2005, p. 7; FAO 2001, pp. 16, 53). Therefore, we combined the information on intermediate and dry zone forests, and the information on montane and submontane forests (see 81 FR 90307, Table 4). We discuss the information on forest cover from the various sources by climate zone below.

Wet Zone Forest

Wet zone forests in Sri Lanka are categorized as montane, submontane, or lowland forest, based on elevation. Very little wet zone forest remains in Sri Lanka. Currently, montane and submontane forests combined covers only about 733 km² (283 mi²) and is severely fragmented (GOSL 2012, pp. 51, 2a-3–142). The area remained relatively stable from 1992 to 2010 (81 FR 90307; GOSL 2012, p. 51). More recent evidence indicates these forests are currently declining: firewood collection, cutting of trees for other domestic purposes, and gem mining are ongoing in these forests, and large areas were recently illegally cleared for vegetable cultivation (Wijesundara 2012, p. 182). While these forests are protected in Sri Lanka, administering agencies do not have sufficient resources to prevent these activities (Wijesundara 2012, p. 182).

The area of lowland wet zone forests (lowland rainforest) declined from 1992 to 2010. Remaining lowland rainforests are severely fragmented, exist primarily as small, isolated patches, and declined by 13% (183 km²)(71 mi²)) during the 18-year period, though the rate of loss slowed considerably during the latter half of this period (81 FR 90307, Table 4; GOSL 2012, p. 2a-3–142; Lindstrom *et al.* 2012, p. 681). Changes in forest cover show low levels of deforestation throughout the lowland rainforest region from 1992 to 2010, and a deforestation ''hotspot'' on the border of Kalutara and Ratnapura districts, which is within the range of *P. ornata* (Fig. 1, Fig. 2) (GOSL 2015, unpaginated).

Dry and Intermediate Zone Forests

Dry and intermediate zone forests, which include most open-canopy forest (Mattsson *et al.* 2012, p. 30), declined by 8% (1,372 km² (530 mi²)) between 1992 and 2010 (81 FR 90307, Table 4). The rate of deforestation nationwide during this period was highest in Anuradhapura and Moneragala districts, in which large portions of the ranges of *P. fasciata* and *P. vittata* occur (see Fig. 1, Fig. 2) (GOSL 2015, unpaginated). Further, deforestation hotspots have been found in other districts where these species occur, including Puttalam and Hambantota (GOSL 2015, unpaginated). Natural regeneration of dry forest species is poor, and dry zone forests are heavily degraded as a result of activities such as frequent shifting cultivation and timber logging (Perera 2012, p. 165, citing several sources).

TABLE 1—THE TOTAL AREA OF SRI LANKA'S CLIMATE ZONES, AND THE COVERAGE OF DENSE FOREST (CANOPY COVER GREATER THAN 70 PERCENT) WITHIN EACH ZONE IN 2010, BASED ON INFORMATION PROVIDED IN 81 FR 90302, TABLE 2 AND GOSL 2012, P. 51

Climate zones of Sri Lanka	Area [1] (km^2)	Area covered with dense (canopy cover greater than 70 percent) closed-canopy forest in 2010 (km^2)	Proportion (percent) with dense forest [2]
Wet Zone	15,090	1,966	13
Intermediate Zone	7,873	1,179	15
Dry Zone	39,366	[3] 11,238	29
Arid Zone	3,281	.....	.....

[1] Calculated based on proportion of land area in each climate zone as provided in 81 FR 90302, Table 2, and a total land area of 65,610 km^2.
[2] Original extent of forest cover is unknown. However, each zone was likely close to 100% forested because dense forest covered 84% of the island in 1884, following several decades of deforestation.
[3] Figure is for dry monsoon forest and riverine forest. It does not include mangrove forests.

Forest Conservation Measures

Sri Lanka has taken steps in recent decades to conserve its forests, and these efforts have contributed to the slowing of deforestation in the country (GOSL 2012, pp. 54–55). In 1990, the country imposed a moratorium on logging in all natural forests, marked most reserve boundaries to stem encroachments, and implemented management plans for forest and wildlife reserves, which became legal requirements under the Forest Ordinance Amendment Act No. 65 of 2009 and the Fauna and Flora Ordinance Amendment Act No. 22 of 2009 (GOSL 2014, p. 26). The government also encourages community participation in forest and protected area management, has implemented programs to engage residents in community forestry to reduce encroachment of cash crops and tea in the wet zone and slash-and-burn agriculture in the dry zone, and encourages use of non-forest lands and private woodlots for meeting the demands for wood and wood products (GOSL 2014, p. 26). In addition to these efforts, between 12 percent (GOSL 2015, unpaginated) and 28 percent (GOSL 2014, pp. xvi, 23) of the country's land area is reported to be under protected area status.

Although considerable efforts have been undertaken in Sri Lanka in recent years to stop deforestation and forest degradation, these processes are ongoing (see Current and Future Forest Trends). The assessment of the status of natural forests during the Species Red List assessments in 2012 indicate that, despite advances in forest conservation in the country, many existing threats continue to impact forest habitats (GOSL 2014, p. 26). While laws and regulations are in place to address deforestation, several factors inhibit their implementation (GOSL 2012, pp. 55, 2a-3–148–150). For instance, lack of financial assistance for protected area management, increasing demand for land, and unplanned, after-the-fact legalization of land encroachments, result in further loss of the forest habitat of the five species addressed in this finding (GOSL 2014, p. 22; GOSL 2011, unpaginated). Also, government agencies have poor coordination with respect to forest conservation—conservation agencies are not always adequately consulted on initiatives to develop forested land (GOSL 2014, p. 22; MOE 2010, p. 31). Finally, many protected areas within the wet zone are small, degraded, and isolated (GOSL 2014, p. 31).

Current and Future Forest Trends

The current drivers of deforestation and forest degradation in Sri Lanka include a variety of factors such as small-scale encroachments, illicit timber harvesting, forest fires, destructive mining practices, and clearing of forest for developments, settlements, and agriculture (GOSL 2012, p. 12). These stressors are exacerbated by a large, dense human population that is projected to increase from 20.7 million in 2015 to 21.5 million in 2030 (United Nations 2015, p. 22). While the majority of remaining forested areas are protected, further population growth is likely to result in reduction of forested areas because (1) Sri Lanka already has a very high human density (329 people per km^2 (852 per mi^2)), (2) increases in the population will elevate an already high demand for land, and (3) little non-forested land is available for expansion of housing, development, cash crops, or subsistence agriculture (GOSL 2012, pp. 8, 14, 58). Most (72%) of the population of Sri Lanka is rural, dependence on agriculture for subsistence is widespread, and the rate of population growth is higher in rural areas. This results in an increasing demand in the country for land for subsistence (Lindstrom *et al.* 2012, p. 680; GOSL 2011, unpaginated).

The current drivers of deforestation and forest degradation are exacerbated by high economic returns from illicit land conversions, lack of alternative livelihood opportunities for those practicing slash-and-burn agriculture and, in the dry zone, poverty and the weak implementation of land-use policy (GOSL 2012, pp. 14–15). Further, in the 30 years prior to 2009, Sri Lanka was engaged in a civil war, which was fought primarily in the dry zone of the northern and eastern regions of the country, many areas of which were inaccessible. The war, along with a reduced rate of development in the country as a whole during this period, may have helped limit deforestation rates (GOSL 2012, pp. 48, 56–57).

Overall, deforestation and forest degradation in Sri Lanka are ongoing, although recent rates of deforestation are much lower than during the mid- to late-20th century—the rate of deforestation during 1992–2010 was 71 km^2 (27.4 mi^2) per year, compared to 400 km^2 (154 mi^2) per year during 1956–1992 (GOSL 2015, unpaginated). However, since the end of Sri Lanka's civil war in 2009, the government has been implementing an extensive 10-year development plan with the goal of transforming the country into a global economic and industrial hub (Buthpitiya 2013, p. ii; Central Bank of Sri Lanka 2012, p. 67; Ministry of Finance and Planning–Sri Lanka (MOFP) 2010, entire). The plan includes large infrastructure projects throughout the country (MOFP 2010, entire). Projects include, among other things, development of seaports, airports, expressways, railways, industrial parks, power plants, and water management systems that will allow for planned

expansion of agriculture, and many of these projects have already started (Buthpitiya 2013, pp. 5–6; Central Bank of Sri Lanka 2012, p. 67; MOFP 2010, entire). They also include projects located within the ranges of all five species addressed in this finding, although the plan does not provide the amount of area that will be impacted by these projects (Fig. 2 and MOFP 2010, pp. 63, 93, 101, 202–298). For example, a new dam project within the range of *P. smithi* will submerge one of the two sites at which the species is found (Nanayakkara 2017, unpaginated). The rate of loss of natural forest (primary forest and other naturally regenerated forest) increased from 60 km² (23 mi²) per year during 2000–2010 to 86 km² (33 mi²) per year during 2010–2015 (FAO 2015b, pp. 44, 50). As post-war reconstruction and development continues in Sri Lanka, deforestation and forest degradation can be expected to rise (GOSL 2012, p. 2a–3–146).

Coconut Plantations

Coconut is grown throughout Sri Lanka. Most (57 percent) of the area under coconut cultivation is in the intermediate and wet zones north of Colombo (MOE 2011, p. 14), which overlaps with the southern portion of the range of *P. fasciata.* As indicated above, *P. fasciata* are sometimes found in coconut plantations in Sri Lanka, although the extent to which coconut plantations contribute to sustaining viable populations of these species is unknown. The ability of coconut plantations to contribute to conservation of *P. fasciata* is limited because: (1) Tarantulas are poor dispersers (see *Tarantula General Biology*); (2) colonization of coconut plantations by the species appears to depend on the occurrence of occupied natural forest in relatively close proximity to coconut plantations (Smith *et al.* 2001, entire); and (3) very little natural forest remains in the coconut-growing region in which *P. fasciata* occurs (Fig. 2 and GOSL 2015, unpaginated; MOE 2014, p. 94).

The aerial extent of coconut cultivation in Sri Lanka has varied between about 3,630 and 4,200 km² (1,402 and 1,622 mi²) since 2005 (Central Bank of Sri Lanka 2014, Statistical Appendix, Table 13), with no clear directional trend. However, due to the rising human population and resulting escalating demand for land in Sri Lanka, plantations have become increasingly fragmented due to conversion of these lands to housing (GOSL 2014, pp. 26–27). As indicated above, due to their limited dispersal ability, forest fragmentation is likely to isolate *Poecilotheria* populations, which increases their vulnerability to stochastic processes (see *Stochastic Processes*), and may also expose wandering males and dispersing juveniles to increased mortality from intentional killing or predation when they attempt to cross between forest fragments (Bond *et al.* 2006, p. 155) (see *Intentional Killing*). Thus, even though *P. fasciata* uses coconut plantations to some extent, fragmentation of this habitat is likely to isolate populations and increase their vulnerability to stochastic processes, intentional killing, and predation.

Summary

Sri Lanka has lost most of its forest cover due to a variety of factors over the past several decades. Very little (1,966 km² (759 mi²)) wet zone forest—in which the ranges of *P. ornata, P. smithi,* and *P. subfusca* occur—remains in the country. The remainder is highly fragmented and continues to be deforested. Only about 35 percent (16,872 km² (6,514 mi²)) of dense and open canopy dry and intermediate zone forests—in which the ranges of *P. fasciata* and *P. vittata* occur—remain, deforestation in these forests is ongoing, and recent rates of deforestation in the country have been highest in regions constituting large portions of the ranges of these two species. Forest cover continues to decline at a rate of 86 km² (33 mi²) per year, and the rate of loss is higher in the dry zone than the wet zone. While the current rate of forest loss is much lower than in the previous century, the rate of loss of natural forest is increasing and is anticipated to increase in the future with the country's emphasis on development and the projected population increase of 800,000 people. While coconut plantations provide additional habitat for one species (*P. fasciata*) in some areas, these plantations are becoming increasingly fragmented due to demand for housing.

Tarantulas have sedentary habits, limited dispersal ability, and highly structured populations. Therefore, loss of habitat has likely resulted in direct loss of individuals or populations and, consequently, a reduction in the distribution and genetic diversity of these species. The distribution of these species is already limited—each currently occupies less than 500 km² (193 mi²) or, for *P. smithi,* less than 10 to 15 km² (3.9 to 5.8 mi²) of its range—and deforestation continues within the ranges of all five species discussed in this finding. Further, the limited distribution of these species is likely continuing to decline with ongoing loss of habitat. We conclude that habitat loss is likely currently having significant negative impacts on the viability of these species because: (1) These species have very small distributions; (2) little forest remains in Sri Lanka; (3) remaining habitat is fragmented; and (4) deforestation is ongoing within these species' ranges.

Pesticides

Pesticides are identified as a threat to *Poecilotheria* species in Sri Lanka (Nanayakkara 2014b, unpublished data; Gabriel 2014, unpaginated). The five species addressed in this finding could potentially be exposed to pesticides via pesticide drift into forests that are adjacent to crop-growing areas; by traveling over pesticide-treated land when dispersing between forest patches; or by consuming prey that have been exposed to pesticides. Populations of these species could potentially be directly affected by pesticides through increased mortality or through sublethal effects such as reduced fecundity, fertility, and offspring viability, and changes in sex ratio, behavior, and dispersal (Nash *et al.* 2010, p. 1694, citing several sources). *Poecilotheria* species may also be indirectly affected by pesticides if pesticides reduce or deplete available prey species.

Over 100 pesticide (herbicide, fungicide, and insecticide) active ingredients are registered for use in Sri Lanka. Among the most commonly used insecticides are carbofuran, diazinon, and chloropyrifos (Padmajani *et al.* 2014, pp. 11–12). These are broad-spectrum, neurotoxic insecticides, which tend to have very negative effects on nontarget organisms (Pekar 2013, p. 415). Further, sit-and-wait predators appear to be more sensitive to insecticide applications than web-making spiders (Pekar 1999, p. 1077).

The use of pesticides in Sri Lanka has been increasing steadily since the 1950s (Selvarajah and Thiruchelvam 2007, p. 381). Pesticide imports into Sri Lanka increased by 50 percent in 2011 compared to 2006 (Padmajani *et al.* 2014, p. 11). The level of misuse and overuse of pesticides in Sri Lanka is high. Depending on region and crop species, 33 to 60 percent of Sri Lankan farmers use greater amounts, higher concentrations, or more frequent applications of pesticides (or a combination of these) than is recommended (Padmajani *et al.* 2014, pp. 13, 31, citing several sources).

The susceptibility of spiders to the direct effects of different pesticides varies with pesticide type and formulation, spider species, development stage, sex, and abiotic and biotic conditions at the time of pesticide

application (Pekar 2013, pp. 416–417). Further, different classes of pesticides can cause different sublethal effects. For instance, activities such as movement, prey capture, reproduction, development, and defense are particularly disrupted by neurotoxic formulations because they are governed by complex neural interactions. However, spiders can potentially recover from sublethal effects over several days (Pekar 2013, p. 417), although the effects are complicated by the potential for cumulative effects of multiple applications across a season (Nash *et al.* 2010, p. 1694).

We are not aware of any information on the population-level effects of pesticides on *Poecilotheria* species. However, given the large proportion of Sri Lanka's human population that is reliant on farming, the high level of misuse and overuse of pesticides in the country, and the broad-spectrum and high level of toxicity of the insecticides commonly used in the country, it is likely that the species addressed in this finding are directly or indirectly negatively affected by pesticides to some extent. Therefore, while the population-level effects of pesticides on the five species addressed in this finding are uncertain, the effects of pesticides likely exacerbate the effects of other threats acting on these species.

Climate Change

The Intergovernmental Panel on Climate Change (IPCC) concluded that warming of the climate system is unequivocal (IPCC 2013, p. 4). Numerous long-term climate changes have been observed including changes in land surface temperatures, precipitation patterns, ocean temperature and salinity, sea ice extent, and sea level (IPCC 2013, pp. 4–12). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (*e.g.,* habitat fragmentation) (IPCC 2007, pp. 8–14, 18–19). However, a large fraction of terrestrial and freshwater species face increased extinction risk under projected climate change during and beyond the current century, especially as climate change interacts with habitat modification and other factors such as overexploitation, pollution, and invasive species (Settele *et al.* 2014, p. 275).

Maintenance of body temperature and water retention by spiders is critical to their survival. All spiders, including *Poecilotheria,* are ectotherms; therefore, their body temperature varies with that of their environment. While spiders keep body temperature within tolerable limits through behaviors such as moving into shade when temperatures rise (Pulz 1987, pp. 27, 34–35), they are susceptible to rapid fluctuations in body temperature and severe depletion of body water stores due to their relatively low body mass and high surface-to-volume ratio (Pulz 1987, p. 27).

Tropical ectotherms evolved in an environment of relatively low inter- and intra-annual climate variability, and already live near their upper thermal limits (Settele *et al.* 2014, p. 301; Deutsch *et al.* 2008, p. 6669). Their capacity to acclimate is generally low. They have small thermal safety margins, and small amounts of warming may decrease their ability to perform basic physiological functions such as development, growth, and reproduction (Deutsch *et al.* 2008, pp. 6668–6669, 6671). Evidence also indicates they may have low potential to increase their resistance to desiccation (drying out) (Schilthuizen and Kellerman 2014, p. 61, citing several sources).

The general trend in temperature in Sri Lanka over the past several decades is that of increasing temperature, although with considerable variation between locations in rates and magnitudes of change (De Costa 2008, p. 87; De Silva *et al.* 2007, p. 21, citing several sources). Over the six to ten decades prior to 2007, temperatures have increased within all climate zones of the country, although rates of increase vary from 0.065 °C (0.117 °F) per decade in Ratnapura (an increase of 0.65 °C (1.17 °F) during the 97-year period analyzed) in the lowland wet zone, to 0.195 °C (0.351 °F) per decade in Anuradhapura (an increase of 1.50 °C (2.70 °F) during the 77-year period analyzed) in the dry zone. In the montane region, temperatures increased at a rate of 0.141 °C (0.254 °F) per decade at Nuwara Eliya to 0.191 °C (0.344 °F) per decade at Badulla (increases of 1.09 and 1.47 °C (1.96 and 2.65 °F) during the 77-year period analyzed, respectively) (De Costa 2008, p. 68). The rate of warming has increased in more recent years—overall temperature in the country increased at a rate of 0.003 °C (0.005 °F) per year during 1896–1996, 0.016 °C (0.029 °F) per year during 1961–1990, and 0.025 °C (0.045 °F) per year during 1987–1996 (Eriyagama *et al.* 2010, p. 2, citing several sources). Depending on future climate scenarios, temperatures are projected to increase by 2.93 to 5.44 °C (5.27 to 9.49 °F) by the end of the current century in South Asia (Cruz *et al.* 2007, in Eriyagama *et al.* 2010, p. 6). Downscaled projections for Sri Lanka using regional climate models report increases of 2.0 to 4.0 °C (3.6 to 7.2 °F) by 2100, while statistical downscaling of global climate models report increases of 0.9 to 3 °C (1.62 to 5.4 °F) by 2100 and 1.2 to 1.3 °C (2.16 to 2.34 °F) by 2050 (Eriyagama *et al.* 2010, p. 6, citing several sources).

Trends in rainfall have been decreasing in Sri Lanka over the past several decades (see De Costa 2008, p. 87; De Silva *et al.* 2007, p. 21, citing several sources) although, according to the Climate Change Secretariat of Sri Lanka (2015, p. 19), there is no consensus on this fact. However, authors appear to agree that the intensity and frequency of extreme events such as droughts and floods have increased (Imbulana *et al.* 2016 and Ratnayake and Herath 2005, in Climate Change Secretariat of Sri Lanka 2015, p. 19).

Rainfall in Sri Lanka is highly variable from year to year, across seasons and across locations within any given year (Jayatillake *et al.* 2005, p. 70). Statistically significant declines in rainfall have been observed for the period 1869–2007 at Anuradhapura in the northern dry zone (12.92 mm (0.51 in) per decade), and Badulla, Kandy, and Nuwara Eliya (19.16, 30.50, and 51.60 mm (0.75, 1.20, and 2.03 in) per decade, respectively) in the central highlands (De Costa 2008, p. 77). Significant declines have also been observed in more recent decades at Kurunegala in western Sri Lanka's intermediate zone (120.57 mm (4.75 in) per decade during 1970–2007) and Ratnapura (41.02 mm (1.61 in) per decade during 1920–2007) (De Costa 2008, p. 77). Further, a significant trend of decreasing rainfall with increasing temperature exists at Anuradhapura, Kurunegala, and Nuwara Eliya (De Costa 2008, pp. 79–81). Patterns of future rainfall in the country are highly uncertain—studies provide variable and conflicting projections (Eriyagama *et al.* p. 6, citing several sources). However, an increased frequency of dry periods and droughts are expected (MOE 2010, p. 35).

While observed and projected changes in temperature and precipitation could potentially be within the tolerance limits of the *Poecilotheria* species addressed in this finding, it is possible that climate change could directly negatively affect these species through rising land surface temperatures, changes in the amount and pattern of precipitation, and increases in the frequency and intensity of extreme climate events such as heat waves or

droughts. It is also possible that climate change could indirectly negatively affect these species by adversely impacting populations of their insect prey, which are also tropical ectotherms. The only detailed observations of a Sri Lankan *Poecilotheria* species indicated that *P. fasciata* found in natural forest were emaciated and without spiderlings during an extended drought, while those found in an irrigated plantation had wider girths and spiderlings (see *Species-Specific Information*) (Smith *et al.* 2001, entire). The lack of reproduction in natural forest during drought may have been due to desiccation stress or lack of available prey, or both, as a result of low moisture levels.

While at least one of the species addressed in this finding (*P. fasciata*) appears to be vulnerable to drought, the responses of the five *Poecilotheria* species to observed and projected climate change in Sri Lanka are largely unknown. However, the climate in Sri Lanka has already changed considerably in all climate zones of the country, and continues to change at an increasing rate. These species evolved in specific, relatively stable climates and, because they are tropical ectotherms, may be sensitive to changing environmental conditions, particularly temperature and moisture (Deutsch *et al.* 2008, pp. 6668–6669; Schilthuizen and Kellerman 2014, pp. 59–61, citing several sources). Moreover, because they have poor dispersal ability, *Peocilotheria* are unlikely to be able to escape changing climate conditions via range shifts. Therefore, while population-level responses of the five species addressed in this finding to observed and projected changes in climate are not certain, the stress imposed on these species by increasing temperatures and changing patterns of precipitation is likely exacerbating the effects of other factors acting on these species such as stochastic events and habitat loss and degradation. This is especially the case for *P. fasciata* because (1) the frequency and intensity of droughts have increased and are expected to continue increasing, (2) the species fails to reproduce in natural forest during extended droughts, and (3) although *P. fasciata* is also known to inhabit irrigated coconut plantations, most populations have been found in natural forest.

Trade

Poecilotheria species are popular in trade due to their striking coloration and large size (Nanayakkara 2014a, p. 86; Molur *et al.* 2006, p. 23). In 2000, concerned about increasing trade in these species, Sri Lanka and the United States co-sponsored a proposal to include the genus in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Government of Sri Lanka and Government of the United States 2000, entire). However, at the 11th Conference of the Parties, the proposal was criticized as containing too little information on international trade and on the limits of the distribution of the genus. It was further noted that the genus was primarily threatened by habitat destruction, and was not protected by domestic legislation in India. Also, the delegation of Sri Lanka promised to list the genus in Appendix III if the proposal failed. No consensus was reached on the proposal and a vote failed to achieve the required two-thirds majority—there were 49 votes in favor, 30 against, and 27 abstentions—and the proposal was therefore rejected (Convention on International Trade in Endangered Species of Wild Fauna and Flora 2000, p. 50). None of the five species addressed in this rule are currently listed in the CITES Appendices (Convention on International Trade in Endangered Species of Wild Fauna and Flora 2017, p. 48).

Collection of *Poecilotheria* specimens from the wild could have significant negative impacts on *Poecilotheria* populations. Due to the patchy distributions and poor dispersal abilities of tarantulas, collection of several individuals from a single location could potentially reduce the abundance or distribution of a species, especially those with restricted distributions (Molur *et al.* 2006, p. 14; West *et al.* 2001, unpaginated). Further, because tarantula populations are highly structured, loss of individuals from a single location could result in significant loss of that species' genetic diversity (Bond 2006, p. 154). Collection of a relatively large number of individuals from a single population could also alter population demographics such that the survival of a species or population is more vulnerable to the effects of other factors, such as habitat loss.

Collection of species from the wild for trade often begins when a new species is described or when a rare species has been rediscovered. Alerted to a new or novel species, collectors arrive at the reported location and set out collecting the species from the wild (Molur *et al.* 2006, p. 15; Stuart *et al.* 2006, entire). For tarantulas, adult females may be especially vulnerable to collection pressures as collectors often attempt to capture females, which produce young that can be sold (Capannini 2003, p. 107). Collectors then sell the collected specimens or their offspring to hobbyists who captive-rear the species and provide the pet trade with captive-bred specimens (Gabriel 2014, unpaginated; Molur *et al.* 2006, p. 16). Thus, more individuals are likely to be captured from the wild during the period in which captive-breeding stocks are being established, in other words, prior to the species becoming broadly available in trade (Gabriel 2014, unpaginated).

All five of the endemic Sri Lankan species addressed in this rule are bred by hobbyists and vendors and are available in the pet trade as captive-bred individuals in the United States, Europe, and elsewhere (see Herndon 2014, *pers. comm.;* Elowsky 2014, unpaginated; Gabriel 2014, unpaginated; Longhorn 2014a, unpaginated; Longhorn 2014b, unpaginated; Mugleston 2014, unpaginated; Service 2012, *in litt.*). We are not aware of any information on numbers of these species in domestic trade within the United States or numbers solely in foreign trade outside the United States. The Service's Law Enforcement Management Information System contains information on U.S. international trade in three of these species—*P. fasciata, P. ornata,* and *P. vittata* (it does not currently collect information on *P. smithi* or *P. subfusca*). Four hundred individuals of these species were legally imported into, or exported or re-exported from, the United States during 2007–2012; 298 were imported into, and 106 were exported or re-exported from, the United States.

Captive-bred individuals appear to supply the majority of the current legal trade in these species in the United States. Of the 400 individuals legally imported into, or exported or re-exported from, the United States during 2007–2012, 392 (98 percent) were declared as captive-bred (Service 2012, *in litt.*). However, wild individuals of at least some of these species are still being collected (Nanayakkara 2014a, p. 86; Nanayakkara 2014b, unpublished data; Service 2012, *in litt.*). Two sources indicate that there is evidence of illegal smuggling from Sri Lanka, although they do not provide details (see Nanayakkara 2014, p. 85; Samarawckrama *et al.* 2005, p. 76). Further, of the 400 individuals of Sri Lankan *Poecilotheria* imported into, or exported or re-exported from, the United States during 2007–2012, 8 *P. vittata* were declared as wild-caught. It is possible that additional wild-caught individuals of the five species addressed in this rule were (or are) not included in this total because they are imported

into the United States illegally, or imported into other countries. For example, some wild-caught specimens are imported into Europe (Merzlak 2017, unpaginated; Corcoran, 2016, unpaginated), although specific information on this activity is not available.

Sri Lanka prohibits the commercial collection and exportation of all *Poecilotheria* species, under the Sri Lanka Flora and Fauna Protection (Amendment) Act, No. 22 of 2009, which is part of the Fauna and Flora Protection Ordinance No. 2 (1937) (DLA Piper 2015, p. 392; Government of Sri Lanka and Government of the United States 2000, p. 5). However, enforcement is weak and influenced by corruption (DLA Piper 2015, p. 392; GOSL 2012, p. 2a–3–149).

In sum, individuals of at least some of these species are currently being collected from the wild. However, the extent to which this activity is occurring is unknown, as is the extent to which these species have been, or are being, affected by collection. Based on the available information on U.S. imports, exports, and re-exports, a small amount of trade occurs in wild specimens of these species. However, it is likely that more wild specimens enter Europe or Asia than the United States due to the closer proximity of Sri Lanka to Europe and Asia and consequent increased ease of travel and transport of specimens. Further, even small amounts of collection of species with small populations can have a negative impact on these species. Given that collection of at least some of these species from the wild continues to occur, it is likely that collection for trade is exacerbating population effects of other factors negatively impacting these species, such as stochastic events, habitat loss, and habitat degradation.

Intentional Killing

Poecilotheria spiders are feared by humans in Sri Lanka and, as a result, are usually killed when encountered (Kekulandala and Goonatilake 2015, unpaginated; Nanayakkara 2014a, p. 86; Gabriel 2014, unpaginated; Smith *et al.* 2001, p. 49). Intentional killing of *Poecilotheria* spiders may negatively impact these five species by raising mortality rates in these species' populations to such an extent that populations decline or are more vulnerable to the effects of other factors, such as habitat loss. Adult male *Poecilotheria* are probably more vulnerable to being intentionally killed because they wander in search of females during the breeding season (see *Tarantula General Biology*) and thus are more likely to be encountered by people. Consequently, intentional killing could potentially reduce the density of males in an area. Because the mating of a female depends on a male finding her, and males search for females randomly, a reduction in the density of males could result in a reduction in the percent of females laying eggs in any given year (Stradling 1994, p. 96) and, consequently, a lower population growth rate.

We do not have any information on the number of individuals of these five species that are intentionally killed by people. However, in areas where these species occur, higher human densities are likely to result in higher human contact with these species and, consequently, higher numbers of spiders killed. The human population density in Sri Lanka is much higher in the wet zone (see *Habitat Loss and Degradation*). Therefore, it is likely that *P. ornata, P. smithi,* and *P. subfusca* are affected by intentional killing more than *P. fasciata* and *P. vittata.* Although we do not have any information indicating the numbers of individuals of these species that are intentionally killed each year, it is likely that such killing is exacerbating the negative effects of other factors on these species' populations, such as habitat loss and degradation.

Stochastic (Random) Events and Processes

Species endemic to small regions, or known from few, widely dispersed locations, are inherently more vulnerable to extinction than widespread species because of the higher risks from localized stochastic (random) events and processes, such as floods, fire, landslides, and drought (Brooks *et al.* 2008, pp. 455–456; Mangel and Tier 1994, entire; Pimm *et al.* 1988, p. 757). These problems can be further magnified when populations are very small, due to genetic bottlenecks (reduced genetic diversity resulting from fewer individuals contributing to the species' overall gene pool) and random demographic fluctuations (Lande 1988, pp. 1455–1458; Pimm *et al.* 1988, p. 757). Species with few populations, limited geographic area, and a small number of individuals face an increased likelihood of stochastic extinction due to changes in demography, the environment, genetics, or other factors, in a process described as an extinction vortex (a mutual reinforcement that occurs among biotic and abiotic processes that drives population size downward to extinction) (Gilpin and Soule´ 1986, pp. 24–25). The negative impacts associated with small population size and vulnerability to random demographic fluctuations or natural catastrophes can be further magnified by synergistic interactions with other threats.

P. smithi is known from very few widely dispersed locations and is likely very rare (see *Species-Specific Information*). Therefore, it is highly likely that *P. smithi* is extremely vulnerable to stochastic processes and that the species is highly likely negatively impacted by these processes. The remaining four species have narrow ranges within specific climate zones of Sri Lanka. It is unclear whether the range sizes of these four are so small that stochastic processes on their own are likely to have significant negative impacts on these species. However, stochastic processes may have negative impacts on these species in combination with other factors such as habitat loss, because habitat loss can further fragment and isolate populations.

Determinations

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, we determine whether a species meets the definition of a ''threatened species'' or an ''endangered species'' because of any one or more of the following five threat factors or the cumulative effects thereof: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence.

We have carefully assessed the best scientific and commercial information available on *P. fasciata, P. ornata, P. subfusca, P. smithi,* and *P. vittata.* While information on species abundance or population dynamics is not available on these species, the best available information indicates these species' populations have experienced extensive declines in the past and their populations continue to decline. Tarantulas have limited dispersal ability and sedentary habits; therefore, the loss of habitat (Factor A) likely results in direct loss of individuals or populations and, consequently, a reduction in the distribution of the species. As a result, the extensive loss of forest (71 percent in the dry zone, 85 percent in the intermediate zone, and 87 percent in the wet zone) has reduced the amount of habitat where the species may remain,

and their populations will likely continue to decline with ongoing deforestation. Further, because these species likely have highly structured populations, reductions in these species' populations have likely resulted in coincident loss of these species' unique genetic diversities, eroding the adaptive and evolutionary potential of these species (Bond 2006, p. 154).

All five Sri Lankan *Poecilotheria* species have restricted ranges within specific regions and climates of Sri Lanka and are currently estimated to occupy areas of less than 500 km² (193 mi²), and less than 10–15 km² (4–6 mi²) for *P. smithi.* Due to the life-history traits of tarantulas—restricted range, sedentary habits, poor dispersal ability, and structured populations—these species are vulnerable to habitat loss. Extensive habitat loss (Factor A) has already occurred in all the climate zones in which these species occur, and deforestation is ongoing in the country. Further, the cumulative effects of changing climate, intentional killing, pesticides, capture for the pet trade, and stochastic processes are likely significantly exacerbating the effects of habitat loss.

Therefore, for the following reasons we conclude populations of *P. fasciata, P. ornata, P. subfusca, P. smithi,* and *P. vittata* have been and continue to be significantly reduced to the extent that the viability of each of these five species is significantly compromised:

(1) These species are closely tied to their habitats, little of their forest habitat remains, deforestation is ongoing in these habitats, and these species are vulnerable to habitat loss;

(2) these species' have poor dispersal ability, are unlikely to be able to escape changing climate conditions via range shifts, and Sri Lanka's climate is changing at increasing rates;

(3) the cumulative effects of climate change, intentional killing, pesticides, capture for the pet trade, and stochastic processes are likely significantly exacerbating the effects of habitat loss; and

(4) *P. smithi* is known from few locations, is likely rare, and very likely vulnerable to stochastic processes.

The Act defines an endangered species in section 3(6) of the Act as any species that is ''in danger of extinction throughout all or a significant portion of its range'' and a threatened species in section 3(20) of the Act as any species that is ''likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.''

Based on the factors described above and their impacts on *P. fasciata, P. ornata, P. smithi, P. subfusca,* and *P. vittata,* we find the following factors to be threats to these species (*i.e.,* factors contributing to the risk of extinction of these species): Loss of habitat (Factor A; all five species), stochastic processes (Factor E; *P. smithi*), and the cumulative effects (Factor E; all five species) of these and other threats including climate change, intentional killing, pesticide use, and capture for the pet trade. Furthermore, despite laws in place to protect these five species and the forest and other habitat they depend on, these threats continue (Factor D), in part due to lack of resources and challenges to enforcement. We consider the risk of extinction of these five species to be high because these species are vulnerable to habitat loss, this process is ongoing, and these species have limited potential to recolonize reforested areas or move to more favorable climate. We find that *P. fasciata, P. ornata, P. smithi, P. subfusca,* and *P. vittata* are presently in danger of extinction throughout their ranges based on the likely severity and immediacy of threats currently impacting these species, and we are listing these five tarantula species as endangered in accordance with sections 3(6) and 4(a)(1) of the Act. We find that a threatened species status is not appropriate for these species because of their restricted ranges, limited distributions, and vulnerability to extinction and because the threats are ongoing throughout their ranges at a level that places these species in danger of extinction now, even without the worsening of the threats, that, as discussed above, is likely.

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. Because we have determined that *P. fasciata, P. ornata, P. smithi, P. subfusca,* and *P. vittata* are endangered throughout all of their ranges, we do not need to conduct an analysis of whether there is any significant portion of their ranges where these species are in danger of extinction or likely to become so in the foreseeable future. This is consistent with the Act because when we find that a species is currently in danger of extinction throughout all of its range (*i.e.,* meets the definition of an endangered species), the species is experiencing high-magnitude threats across its range or threats are so high in particular areas that they severely affect the species across its range. Therefore, the species is in danger of extinction throughout every portion of its range and an analysis of whether there is any significant portion of the range that may be in danger of extinction or likely to become so would not result in a different outcome.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition of conservation status, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in public awareness and conservation actions by Federal and State governments in the United States, foreign governments, private agencies and groups, and individuals.

Section 7(a) of the Act, as amended, and as implemented by regulations at 50 CFR part 402, requires Federal agencies to evaluate their actions that are to be conducted within the United States or upon the high seas, with respect to any species that is listed as an endangered or threatened species. Because *P. fasciata, P. ornata, P. smithi, P. subfusca,* and *P. vittata* are not native to the United States, no critical habitat is being designated with this rule. Regulations implementing the interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a proposed Federal action may adversely affect a listed species, the responsible Federal agency must enter into formal consultation with the Service. Currently, with respect to *P. fasciata, P. ornata, P. smithi, P. subfusca,* and *P. vittata,* no Federal activities are known that would require consultation.

Section 8(a) of the Act authorizes the provision of limited financial assistance for the development and management of programs that the Secretary of the Interior determines to be necessary or useful for the conservation of endangered or threatened species in foreign countries. Sections 8(b) and 8(c) of the Act authorize the Secretary to encourage conservation programs for foreign listed species, and to provide assistance for such programs, in the form of personnel and the training of personnel.

Section 9 of the Act and our implementing regulations at 50 CFR 17.21 set forth a series of general prohibitions that apply to all endangered wildlife. These

prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to ''take'' (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) endangered wildlife within the United States or upon the high seas. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. In addition, it is illegal for any person subject to the jurisdiction of the United States to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any listed species. Certain exceptions apply to employees of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. No permit is required for activities that do not constitute prohibited acts. Regulations governing permits for endangered species are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued for the following purposes: For scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. The Service may also register persons subject to the jurisdiction of the United States through its captive-bred-wildlife (CBW) program if certain established requirements are met under the CBW regulations. 50 CFR 17.21(g). Through a CBW registration, the Service may allow a registrant to conduct certain otherwise prohibited activities under certain circumstances to enhance the propagation or survival of the affected species: Take; export or re-import; deliver, receive, carry, transport or ship in interstate or foreign commerce, in the course of a commercial activity; or sell or offer for sale in interstate or foreign commerce. A CBW registration may authorize interstate purchase and sale only between entities that both hold a registration for the taxon concerned. The CBW program is available for species having a natural geographic distribution not including any part of the United States and other species that the Director has determined to be eligible by regulation. The individual specimens must have been born in captivity in the United States. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

Summary of Comments and Recommendations

In the proposed rule published on December 14, 2016 (81 FR 90297), we requested that all interested parties submit written comments on the proposal by February 13, 2017. We also contacted appropriate scientific experts and organizations, and other interested parties and invited them to comment on the proposal. We did not receive any requests for a public hearing. All substantive information provided during comment periods has either been incorporated directly into this final determination or is addressed below.

Peer Reviewer Comments

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinion from four knowledgeable individuals with scientific expertise that included familiarity with *Poecilotheria* species or other tarantulas, their habitats and biological needs, and stressors acting on their populations. We received responses from two of the peer reviewers from whom we requested comments. One did not review the rule but provided additional information regarding a threat to the habitat of *P. smithi,* and we have incorporated this information into this final rule. The second peer reviewer supported our determinations based on our assessment of some threats, but disagreed with our assessment of others. This peer reviewer also provided a technical correction pertaining to our physical description of *Poecilotheria* species, and we have incorporated this information into this final rule.

We reviewed all comments received from the peer reviewers for substantive and new information regarding the listing of the five species addressed in this rule. Peer reviewer comments are addressed in the following summary and incorporated into the final rule as appropriate.

(1) Comment: Citing the taxonomic revision done by Gabriel *et al.* (2013, entire), and the World Spider Catalog, the peer reviewer states that *P. vittata* is not endemic to Sri Lanka, but rather that *P. vittata* was synonymized with the Indian species *P. striata* and recently removed from this synonymy.

Our response: Gabriel *et al.* (2013, entire) not only remove *P. vittata* from synonymy with the Indian species *P. striata,* but also show *P. vittata* to be the senior synonym of *P. pederseni.* Further, the World Spider Catalog (2017, unpaginated) recognizes this synonymy, identifying *P. pederseni* as a synonym of *P. vittata.* Therefore, in this final rule we retain the taxonomy provided in our proposed rule.

(2) Comment: The peer reviewer indicated that our conclusions regarding the effects of climate change and pesticides on these species are speculative because no studies have been conducted on the effects of these factors on *Poecilotheria* species. The peer reviewer also indicates that *Poecilotheria* are unlikely to come in direct contact with pesticides because they live in forests, which are not generally sprayed, and are nocturnal so are not active when spraying occurs. The peer reviewer indicates that studies on spiders in agroecosystems show spiders that do not have direct contact with pesticides survive. However, the peer reviewer did not provide any new information or evidence supporting her assertions.

Our response: While no studies have been carried out specifically assessing the effects of stress factors on any *Poecilotheria* species, the Act requires that we make our determination of species status based on the best scientific and commercial data available at the time of our rulemaking. In conducting our assessment of the statuses of these species, we reviewed all relevant information available to us, including information submitted to us following the initiation of the 12-month status reviews for these species. We subsequently based our conclusions regarding the factors affecting these five species on the best available information. We acknowledged in our proposed rule that the population-level effects of climate change and pesticides on these species are uncertain. However, as indicated in our proposed rule, the best available information indicates that these stressors are likely negatively affecting these species, either directly or indirectly, to some extent. Consequently, it is reasonable to conclude, as we did in our proposed rule, that pesticides and climate change likely exacerbate the effects of other stressors acting on these species. Therefore, because we based our conclusions on the best available information, and the peer reviewer provided no evidence or new information for our review, we did not revise our conclusions regarding the effects of climate change or pesticides on these five species.

We cannot assess the studies to which the reviewer refers regarding the effects of pesticides on spiders because the reviewer did not provide copies of these studies or the citations for them. Further, while we agree that some

members of these species' populations are unlikely to have direct contact with pesticides, we do not agree that is the case for all members, particularly those inhabiting fragmented forests or remnant forest patches. As indicated in our proposed rule, these species could be exposed to pesticides via pesticide drift into forests that are adjacent to crop-growing areas, by traveling over pesticide treated land when dispersing between forest patches, or by consuming prey that have been exposed to pesticides (see *Pesticides*). Also, the most commonly used insecticides in Sri Lanka—carbofuran, chlorpyrifos, and diazinon—can remain active in the environment for days after application (Kamrin 1997, in Christensen *et al.* 2009, unpaginated; Karmin 1997, in Harper *et al.* 2009, unpaginated; U.S. National Library of Medicine 1995, in EXTOXNET 1996, unpaginated). Therefore, these five species could be directly and negatively affected by these pesticides after spraying occurs. They could also be indirectly affected by pesticides through consumption of contaminated prey, or reduction or depletion of prey populations. Taken together, and considering the extent of pesticide use and misuse in the country, it is likely that the five species addressed in this rule are directly or indirectly negatively affected by pesticides to some extent and that these effects likely exacerbate the effects of other threats acting on these species.

Public Comments

We received 115 public comments on the proposed listing of these species, most from people involved in the tarantula hobby as owners, breeders, or sellers. We reviewed all comments received from the public for substantive issues and new information regarding the listing of the five species addressed in this rule. Public comments are addressed in the following summary and incorporated into the final rule as appropriate. A few commenters provided new information on *Poecilotheria* biology or trade, and we have incorporated this information into the corresponding sections of this rule.

(1) Comment: Several commenters questioned certain information in our proposed rule. Several claimed that we inaccurately characterized the degree or effects (or both) of inbreeding or maladaptation in captive specimens of these species. Another questioned our assessment of the ability of these species to adapt to changing climate in Sri Lanka. Many of these commenters cited their own anecdotal observations of captive specimens to support their claims while the remaining commenters provided no new information. A few other commenters claimed, more generally, that we used outdated references or erroneous information, or misrepresented the findings of cited authors. However, these commenters also provided no new references or information supporting their claims.

Our Response: The Act requires that we use the best available scientific and commercial data to determine if a species meets the definition of a ''threatened species'' or an ''endangered species'' because of any one or a combination of the five factors found in section 4(a)(1) of the Act. This analysis includes an analysis of the extent to which captive-held members of a species create or contribute to threats to the species (for example, by fueling trade) or the extent to which captive-held members of a species remove or reduce threats to the species by contributing to the conservation of the species (for example, by providing specimens for population augmentation or reintroduction). In conducting our analysis, we reviewed all relevant information available to us on these species, including information submitted to us following the initiation of the 12-month status reviews for these species. We based our proposed rule, including the discussion and conclusions regarding captive *Poecilotheria,* on the best scientific and commercial data available to us at the time of our proposed rule. In addition, we reviewed all comments and information submitted by the public and peer reviewers during the public comment period for our proposed rule and base this final rule on the best available information.

Although some commenters provided anecdotal observations of captive specimens to support their assertions regarding the effects of inbreeding and maladaptation in captive specimens, or the ability of captive specimens to adapt to climate conditions, observations of health or survivability in captive conditions are not informative to predicting health or survivability in wild conditions because selection pressures in the wild differ greatly from those in captivity. Therefore, in this final rule we did not change any of our conclusions on these topics. However, we revised the section on Captive *Poecilotheria* to clarify the bases of our conclusions.

(2) Comment: A few commenters suggested that we did not consider the knowledge or efforts of hobbyists in our proposal.

Our Response: As required by the Act, we based our determinations on the best scientific and commercial information available. In doing so, we reviewed all information available to us on these species, including information submitted to us by the public following initiation of our 12-month status reviews for these species. This included information and dozens of articles from hobbyist publications. Further, we cited several of these sources in our proposal and retained these citations in this final rule.

(3) Comment: Some commenters believe that we inaccurately suggested in our proposed rule that *all* captive-bred specimens of these species have limited value to the conservation of these species—that all are inbred, maladapted to conditions in the wild, or hybridized—and that we did not acknowledge the knowledge and good practices of reputable breeders. A few suggest that genetic tests could determine which captives could potentially be useful for a conservation breeding program.

Our Response: We appreciate the level of knowledge and care taken by reputable hobbyists when breeding these species. However, we acknowledged the uncertainties pertaining to the levels of inbreeding and hybridization in pet trade specimens in our proposed rule by indicating that captive individuals of these species ''*may* be inbred or maladapted to conditions in the wild'' and ''likely include an *unknown number* of hybrids'' (see Captive *Poecilotheria*). Further, as indicated above, we have revised the section on captive *Poecilotheria* to clarify the bases of our conclusions. With respect to determining the genetic appropriateness of captive specimens for conservation via genetic testing, the Act requires us to make our decision based on the best available information at the time we make our decision, and we are not aware of any genetic studies on any individuals of these species, captive or wild. Even if such information existed, we have no information indicating that pet trade specimens are contributing to the conservation of these species in the wild, for instance, as part of a reintroduction program. Therefore, we have not changed our conclusions regarding captive specimens of these species.

(4) Comment: A few commenters assert that the extent of hybridization of these species in the pet trade is likely low because tarantula hobbyists are strongly opposed to hybridization of species, and because breeders can distinguish between species of adult specimens and take care not to cross-breed them.

Our Response: Again, we appreciate the level of knowledge and care taken by reputable hobbyists when breeding these species. However, because (1) genetic studies have not been conducted on any of these species, (2) evidence indicates that hybrids do occur in the hobby, (3) hybridization may not be visually apparent in captive individuals, and (4) the lineages of pet trade specimens of these species are not documented, the extent of hybridization in any particular captive specimen—be it high, low, or nonexistent—is unknown.

(5) Comment: Several commenters believe that captive-bred specimens in the pet trade are beneficial or necessary to the conservation of these species. They believe captive-bred specimens provide a safety net for these species to prevent extinction, increase public awareness, provide for education and research, supply zoos, and take the collection pressure off wild populations by fulling the demand for these species as pets. Two commenters assert that these species are not in danger of extinction because many exist in captivity.

Our Response: The goal of the Act is survival and recovery of endangered and threatened species and the ecosystems on which they depend. Therefore, when analyzing threats to a species, we focus our analysis on threats acting upon its survival in the wild, generally within the native range of the species. In our assessment of the status of a species, the extent to which captive-held members of a species create or contribute to threats to the species (for example, by fueling trade) or the extent to which captive-held members of a species remove or reduce threats to the species by contributing to the conservation of the species in the wild (for example, by providing specimens for population augmentation or reintroduction) is part of the analysis we conduct under section 4(a)(1) of the Act to determine if the species meets the definition of an endangered species or a threatened species. Further, the Act requires that we make our decision based on the best scientific and commercial data available at the time our decision is made. As indicated in our proposed rule, we are not aware of any existing conservation programs for these species or information indicating that pet trade specimens contribute to the viability of these species within their native ranges in the wild, and have clarified this in revisions to the Captive *Poecilotheria* section of this rule. We also determined that pet trade specimens likely hold limited value to the conservation of these species in the wild. However, we acknowledge that some pet trade specimens could potentially contribute to the conservation of these species in the wild if, for example, they became part of a genetically managed conservation breeding program. Persons seeking to engage in otherwise prohibited activities with endangered wildlife for scientific purposes or to enhance the propagation or survival of these species may seek authorization from the Service (see *Available Conservation Measures*).

We also have no information indicating that current or future education or research efforts are being conducted or planned with captive-bred pet trade specimens of these species for conservation purposes, or any evidence that populations in the wild are benefiting from current education or research efforts using captive-bred pet trade specimens. The best scientific and commercial data available indicate that as of September 2017 there were only 19 specimens in captivity in zoos worldwide (11 *P. fasciata,* 1 *P. ornata,* 2 *P. vitatta,* 5 *P. subfusca*) (Species360 2017, unpaginated).

With respect to trade, certain prohibitions, certain exceptions, and other conservation measures established through the Act are available for endangered species upon listing (see *Available Conservation Measures*). Therefore, they are provided by law to fulfill the purposes and policy of the Act. The effects of legal trade of a species on wild populations and market demand for that species is a complex phenomenon influenced by a variety of factors (Bulte and Damania 2005, entire; Fischer 2004, entire), and we are not aware of any evidence indicating that the pet trade of captive-bred specimens of these species are benefitting wild populations.

(6) Comment: One commenter expressed concern that listing these species as endangered would likely result in their extinction due to forcing breeders to stop breeding unless they apply for a permit. The commenter also indicated that specimens possessed by hobbyists that are unable to be used in repopulation efforts would not fall under the protections of the Act because they are ''unpure specimens''.

Our Response: As explained in response to comments below, captive breeding and many activities related to captive breeding are not prohibited under the Act. Persons seeking to engage in activities that are not prohibited under the Act do not need a permit under the Act. While we are not certain how this commenter defines ''unpure'', the protections of the Act apply to all members of these five species as explained in response to comments below. We recommend that breeding records be maintained to show parentage.

(7) Comment: Several commenters requested we exempt captive-bred specimens and their offspring from possession and interstate sales regulations, allowing ownership and interstate trade of these species to occur without obtaining a permit under the Act.

Our Response: Because we determined that all five of these species meet the definition of an ''endangered species'' under the Act, section 9(a)(1) of the Act and our implementing regulations at 50 CFR 17.21 set forth a series of general prohibitions that apply to all members of each of these species, whether captive or wild. The prohibitions cannot be revised through a regulation under section 4(d) of the Act, because such regulations apply to threatened species. The Act also does not allow for captive-bred specimens of these listed species to be assigned separate legal status from their wild counterparts. However, no permit is required for activities that do not constitute prohibited acts. As noted in response to comments below, the Act does not prohibit captive breeding of listed species and also does not prohibit a number of activities related to captive breeding, such as ownership. Furthermore, we may authorize otherwise prohibited activities for scientific purposes or to enhance the propagation or survival of these species, in accordance with the Act and our regulations (see *Available Conservation Measures*).

(8) Comment: Several commenters suggested that, rather than list these species as endangered species under the Act, we instead take another action such as: List them in a CITES Appendix, list them as threatened species with a section 4(d) rule that allows interstate trade, do not list them at all, or focus on ameliorating threats within these species' native ranges rather than on regulating domestic trade.

Our Response: When we receive a petition to list a species under the Act, we are required to make a determination as to whether that species meets the Act's definition of a threatened species or an endangered species. We are required to do this based solely on the best scientific and commercial data available, as it relates to the five listing factors in section 4(a)(1) of the Act. When we determine that a species meets the Act's definition of a threatened species or endangered species, we must list that species accordingly under the Act. We determined that these species

meet the definition of endangered species, and as such we must list them as endangered species. The Act and our regulations provide prohibitions and other conservation measures that apply to all endangered species as described above (see *Available Conservation Measures*). Because we found that listing these species as endangered is warranted, not listing them is not an option. We also cannot list them as threatened species with a section 4(d) rule because we found that they are endangered, not threatened species. Furthermore, because we found them warranted for listing, not listing them is not feasible. Finally, CITES has a different process and set of criteria for listing species in the CITES Appendices that is independent of listing under the Act. The portion of the comment suggesting a CITES listing is outside the scope of this agency action to consider whether these species should be listed as endangered species under the Act.

(9) Comment: One commenter asked how to acquire a permit for exemption from the prohibitions of the Act and how often permits need to be renewed.

Our Response: Information regarding permits for activities related to these five species can be obtained at our International Affairs program website at *https://www.fws.gov/international/.*

(10) Comment: Several commenters believe that trade in these species has little or no effect on wild populations and provided various reasons, including: They had never seen, or heard of others seeing, a wild-caught specimen; the captive stock is self-sustaining; wild-caught specimens are frowned upon in the hobby; and there is no financial incentive for the trade of wild-caught specimens. Others contend that listing and/or regulating trade in the United States is not necessary or useful because U.S. trade does not affect wild populations and because the primary threats to these species occur outside U.S. jurisdiction, in Sri Lanka.

Our Response: Evidence shows that wild-caught specimens of some of these species occur in trade (see *Trade*). Although the amount of trade in wild-caught specimens in the United States appears to be small, this does not mean trade, or U.S. trade, has no, or even little, effect on wild populations. As indicated in our proposed rule, collection of small numbers of individuals of these species could potentially have significant negative effects on wild populations of these species. With respect to U.S. jurisdiction and the regulation of trade, the Act requires the Service to determine if species qualify as endangered or threatened species regardless of whether a species is native to the United States. The protections of the Act include prohibitions on certain activities including import, export, take, and certain commercial activity in interstate or foreign commerce (see *Available Conservation Measures*). By regulating these activities, the Act helps to ensure that people under the jurisdiction of the United States do not contribute to the further decline of listed species.

(11) Comment: Several commenters raise concerns that listing would provide a disincentive to captive-breeding these species.

Our Response: It is not our intention to cause difficulties for breeders of these species or a decline in the pool of captive-held specimens. The Act does not prohibit or ''ban'' captive breeding of listed species. The Act also does not prohibit a number of activities related to captive breeding. For example, ownership, possession, or keeping of a listed species that was legally acquired and not taken in violation of the Act is not prohibited by the Act—nor is interstate transport of animals that are not for sale, not offered for sale, or not transported in the course of a commercial activity. Further, while the Act prohibits harassment of listed species (via the definition of ''take''), our regulations specify that, when captive animals are involved, harassment does not include generally accepted animal husbandry practices that meet or exceed AWA standards, breeding procedures, or provisions of veterinary care for confining, tranquilizing, or anesthetizing, when such practices, procedures, or provisions are not likely to result in injury (see the definition of harass at 50 CFR 17.3). In addition, activities that do not adversely affect these species, such as observations in behavioral research, are not considered take. Activities that are not prohibited by the Act do not require a permit under the Act.

The protections of the Act for endangered species include prohibitions on certain activities with any member of the listed species including import, export, take, and certain commercial activity in interstate or foreign commerce (see *Available Conservation Measures*). Permits may be issued to carry out otherwise prohibited activities, for scientific purposes or to enhance the propagation or survival of the species. For example, a permit could potentially be issued for import or export of captive-bred specimens if the activity were determined to enhance the propagation or survival of the species. Section 10(g) of the Act provides that any person claiming the benefit of any exemption or permit under the Act shall have the burden of proving that the exemption or permit is applicable, has been granted, and was valid and in force at the time of an alleged violation. While the Service may have information available to it that may assist in making required determinations prior to authorizing otherwise prohibited activities with listed species, the burden is on the applicant to provide necessary information for the Service to issue a permit.

Required Determinations

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*), need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of references cited in this rulemaking is available on the internet at *http://www.regulations.gov* in Docket No. FWS–HQ–ES–2016–0076 and upon request from the Branch of Foreign Species, Ecological Services (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this final rule are the staff members of the Branch of Foreign Species, Ecological Services, Falls Church, VA.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245; unless otherwise noted.

■ 2. In § 17.11(h), add the following entries to the List of Endangered and

Threatened Wildlife in alphabetical order under Arachnids:

■ a. Spider, ivory ornamental tiger;

■ b. Spider, ornate tiger;

■ c. Spider, Pedersen's tiger;

■ d. Spider, Smith's tiger; and

■ e. Spider, Sri Lanka ornamental tiger.

The additions read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* * *	* *	*	*	* *
ARACHNIDS				
* * *	* *	*	*	* *
Spider, ivory ornamental tiger	*Poecilotheria subfusca*	Wherever found	E	83 FR [*Insert* ***Federal Register*** *page where the document begins*], 7/31/2018.
* * *	* *	*	*	* *
Spider, ornate tiger	*Poecilotheria ornata*	Wherever found	E	83 FR [*Insert* ***Federal Register*** *page where the document begins*], 7/31/2018.
Spider, Pedersen's tiger	*Poecilotheria vittata*	Wherever found	E	83 FR [*Insert* ***Federal Register*** *page where the document begins*], 7/31/2018.
Spider, Smith's tiger	*Poecilotheria smithi*	Wherever found	E	83 FR [*Insert* ***Federal Register*** *page where the document begins*], 7/31/2018.
* * *	* *	*	*	* *
Spider, Sri Lanka ornamental tiger	*Poecilotheria fasciata*	Wherever found	E	83 FR [*Insert* ***Federal Register*** *page where the document begins*], 7/31/2018.
* * *	* *	*	*	* *

* * * * *

Dated: May 29, 2018.

James W. Kurth,

Deputy Director, U.S. Fish and Wildlife Service, Exercising the Authority of the Director, U.S. Fish and Wildlife Service.

[FR Doc. 2018–16359 Filed 7–30–18; 8:45 am]

BILLING CODE 4333–15–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 217

[Docket No. 170908887–8622–02]

RIN 0648–BH24

Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to U.S. Navy Pier Construction Activities at Naval Submarine Base New London

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: Upon application from the U.S. Navy (Navy), NMFS is issuing regulations under the Marine Mammal Protection Act for the taking of marine mammals incidental to the pier construction activities conducted at the Naval Submarine Base New London in Groton, Connecticut, over the course of five years (2020–2025). These regulations allow NMFS to issue a Letter of Authorization (LOA) for the incidental take of marine mammals during the specified construction activities carried out during the rule's period of effectiveness, set forth the permissible methods of taking, set forth other means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat, and set forth requirements pertaining to the monitoring and reporting of the incidental take.

DATES: Effective March 1, 2020 through February 28, 2025.

ADDRESSES: To obtain an electronic copy of the Navy's LOA application or other referenced documents, visit the internet at: *www.nmfs.noaa.gov/pr/permits/incidental/construction.htm.* In case of problems accessing these documents, please call the contact listed below (see **FOR FURTHER INFORMATION CONTACT**).

FOR FURTHER INFORMATION CONTACT: Shane Guan, Office of Protected Resources, NMFS; phone: (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Purpose and Need for Regulatory Action

This final rule establishes a framework under the authority of the MMPA (16 U.S.C. 1361 *et seq.*) to allow for the authorization of take of marine mammals incidental to the Navy's construction activities related to marine structure maintenance and pile replacement at a facility in Groton, Connecticut.

We received an application from the Navy requesting five-year regulations and authorization to take multiple species of marine mammals. Take would occur by Level A and Level B harassment incidental to impact and vibratory pile driving. Please see ''Background'' below for definitions of harassment.

Legal Authority for the Proposed Action

Section 101(a)(5)(A) of the MMPA (16 U.S.C. 1371(a)(5)(A)) directs the Secretary of Commerce to allow, upon request, the incidental, but not intentional taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region for up to five years if, after notice and public comment, the agency makes certain findings and issues regulations that set forth permissible methods of taking pursuant