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September 8, 2014

SUBMITTED VIA REGULATIONS.GOV

Attn: Public Comments Processing
Attn: [FWS-HQ-ES-2014-0014-0001]
Division of Policy and Directives Management
U.S. Fish and Wildlife Service
4401 N. Fairfax Drive, MS 2042-PDM
Arlington, VA 22203

RE: Comments on Endangered and Threatened Wildlife and Plats: Pygmy three-toed sloth (*Bradypus pygmaeus*); 90-Day Finding on Petition

Dear Ms. Van Norman:

The Animal Welfare Institute (AWI) submits the following comments on the above-referenced U.S. Fish and Wildlife Service (hereafter FWS) decision to initiate a 12-month status review to determine if the pygmy three-toed sloth (*Bradypus pygmaeus*) requires an "endangered" designation under the U.S. Endangered Species Act (ESA).[1] The purpose of the status review is to determine if there is sufficient scientific evidence to classify *Bradypus pygmaeus* as "endangered" under the ESA.

Ultimately, listing *Bradypus pygmaeus* as endangered under the ESA will better provide for the species conservation by helping to prohibit the exploitation of *B. pygmaeus* for trade to the United States by raising the profile of the species, potentially providing funding to Panama to improve its management and if used as a tool to leverage better protection for pygmy three-toed sloths.

The ESA mandates that listing determinations be made solely on the best scientific and commercial data available.[2] The Act was amended to "prevent non-biological considerations from affecting listing decisions," including the economic costs associated with protecting species.[3] Moreover, in keeping with the overall purposes of the statute, even where the best available scientific evidence leaves some doubt as to the status of the species, FWS is required to "give the benefit of the doubt" to the species.[4]

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[1] *See* AWI, *Emergency Petition to List the Pygmy Three-toed Sloth (Bradypus pygmaeus) as Endangered Under the Endangered Species Act*, at 10, (November 15, 2013).
[2] 16 U.S.C § 1533(b)(1)(A).
[3] H.R. Conf. Rep. No. 97–835 at 19 (1982).
[4] Conner v. Burford, 858 F.2d 1441, 1454 (9th Cir. 1988).

This comment expands on the five-listing factors under section 4(a)(1) of the ESA requested by FWS and provides support for the determinations that: (1) degradation of the red mangrove forest is a serious threat to the species; (2) threats of removal have already been realized as exhibited by Dallas World Zoo's covert actions and the growing popularity of the species will only exacerbate these threats; (3) lack of protection from opportunistic hunting; (4) there is a lack of protection under Panama law; and (5) there are other natural or manmade factors, such as low levels of genetic diversity, which are exacerbating the future of the Pygmy three-toed sloth. This evidence makes clear that upon completing the status review, the FWS must publish a proposed rule to list the pygmy three-toed sloth as endangered under the ESA.

I. Biology, Range, and Population Trends

Members of *B. pygmaeus* (pygmy sloths) have only been recognized as a separate species since 2001. They are approximately 40 percent smaller in body mass and 15 percent shorter in body length compared to the brown-throated sloths (*Bradypus variegatus*) found on the mainland in Panama.[5] Adult pygmy sloths weigh 2.5 to 3.5 kilograms (5.5 to 7.7 lbs.) and measure 48 to 53 centimeters (19 to 21 in) including a tail length of 4.5 to 6.0 centimeters (1.8 to 2.4 in).[6] Pygmy sloths are smaller than any other studied population of *Bradypus variegatus* in Central or South America.

Discrete cranial characteristics separate pygmy sloths from all other species of the genus. Their external auditory meatus (ear canal) is conspicuously large for such a diminutive sloth. Pygmy sloths differ from populations of brown-throated sloth in having external carotid foramen through which the carotid artery normally passes; a small stylomastoid foramen at the posterior external base of the auditory bulla; a concave ventral edge of the stylohyoid; and slender and strongly falcate coronoid process of the mandible.[7] Pygmy sloths have eighteen teeth, ten in the upper jaw and eight in the lower. Two of the teeth in each jaw are incisor-like, although those in the upper jaw are small or may be absent. The incisor-like teeth in the lower jaw are compressed anteroposteriorly. Many of the features found in pygmy sloths are thought to be indicative of a relatively rapid evolution of a new species in an isolated, island habitat. Pygmy sloths are also 12–16 percent smaller in cranial dimensions compared to the mainland species (length: 6.75 to 7.22 centimeters (2.66 to 2.84 in); width: 3.88 to 4.57 centimeters (1.53 to 1.80 in).[8]

Externally, pygmy sloth may be separated from maned three-toed sloth (*B. torquatus*) by the lack of a black dorsal mane originating at the nape and by the presence of short, tan facial pelage with a black stripe lateral to the eye; and in adult males by possessing a dorsal speculum. Pygmy sloths may be separated from pale-throated sloths (*B. tridactylus*) by their tan facial and gular

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[5] *See* AWI, *Emergency Petition to List the Pygmy Three-toed Sloth (Bradypus pygmaeus) as Endangered Under the Endangered Species Act*, at 1, (November 15, 2013).
[6] Anderson RP and Handley CO, Jr. 2001. A new species of three-toed sloth (Mammalia: Xenarthra) from Panama, with a review of the genus Bradypus. Proceedings of the Biological Society of Washington 114: 1-33.
[7] *Id.*
[8] Anderson RP, Handley CO, Jr. 2002. "Dwarfism in insular sloths: biogeography, selection, and evolutionary rate". Evolution 56 (5): 1045–1058.

pelage and dark stripe lateral to the eye. The pygmy sloth differs externally from brown-throated sloth (*B. variegates*) by long hair projecting over the brow. This characteristic provoked C.O. Handley to refer to the pygmy sloth in the field as the "monk sloth."[9] No other sloth of the Bocas islands is hooded.

The pygmy sloths are confined to Isla Escudo and have nearly exclusively been found in red mangrove forests.[10] These forests comprise 1.67 hectares (4 acres) or 0.024% of the total island area. As noted in AWI's petition, *Bradypus pygmaeus* has been listed as Critically Endangered on the International Union for Conservation of Nature (IUCN) red list since 2006. The IUCN reports that the pygmy sloth population is less than 500 individuals. However, as the petition states, the most recent surveys conducted on Isla Escudo de Veraguas (Isla Escudo), a 5 km² island on the Mosquito Gulf coast of Panama that the sloth is confined to, identified only 79 individual sloths.[11] The pygmy sloths were located in five isolated patches of red mangrove forest, with no single population greater than 20 individuals.

II. Factors for Listing Determination

Threats to *Bradypus pygmaeus'* today are numerous. They include degradation and destruction habitat, opportunistic hunting for food by indigenous and local visitors, population isolation, increased genetic inbreeding and loss of genetic diversity, and minimal protection under Panamanian law (despite Isla Escudo being designated an Indigenous Reserve).[12]

a. Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

B. pygmaeus has been primarily recorded in the red mangrove forests surrounding the island.[13] Scientists have not recorded any *B. pygmaeus* presence in upland forest patches on the island.[14] A recent increase in logging on the island could be a contributing factor to the decline of the pygmy three-toed sloth as this species relies on the mangrove forest ecosystem for its survival. Data shows that the species primarily, if not exclusively, feeds on mangrove leaves and lives near these trees.[15] According to Kaviar et al. (2012), the pygmy three-toed sloth can only survive in the wild if its mangrove habitat is protected.

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[9] Anderson RP and Handley CO, Jr. 2001. A new species of three-toed sloth (Mammalia: Xenarthra) from Panama, with a review of the genus Bradypus. Proceedings of the Biological Society of Washington 114: 1-33.

[10] *See* AWI, *Emergency Petition to List the Pygmy Three-toed Sloth (Bradypus pygmaeus) as Endangered Under the Endangered Species Act*, at 3, 3 (Kaviar et al. map showing the distribution of all mangrove thicket locations found on Isla Escudo de Veraguas based on GPS data) (November 15, 2013).

[11] *Id* at 4, (November 15, 2013).

[12] *Id.* at 6-10.

[13] Anderson R., Moraes-Barros N, and Voirin B. 2011. Bradypus pygmaeus. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. <www.iucnredlist.org>. Downloaded on 01 October 2013.

[14] *Id.*

[15] *Id.* and *See* Kaviar S, Shockey J, Sundberg P. 2012. Observations on the Endemic Pygmy Three-Toed Sloth, Bradypus pygmaeus of Isla Escudo de Veraguas, Panama. PLoS ONE 7(11): 2012. Available at: http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0049854. PLoS ONE.; Superina M, Plese T, Moraes-Barros N, and Abba AM. 2010. The 2010 Sloth Red List Assessment. IUCN/SSC Anteater, Sloth and Armadillo Specialist Group. Edentata: 11(2)

As AWI's petition highlighted, the mangroves on Isla Escudo are spread out in particular areas and face threats from logging and land clearing activities. They are fragmented into five clumps (containing ten mangrove thickets) separated by non-mangrove, mixed forest or sea water.[16] Within these thickets, researchers noted many instances of anthropogenic cutting of mangroves that have interrupted the canopy layer between previously continuous mangrove forest habitats.[17] Of the total area they surveyed, it was estimated that 30 percent of Isla Escudo's total mangrove forest habitat had been lost to logging and land clearing activities. The pattern and severity of logging and clearing varied between the ten identified mangrove forest thickets and may be a factor in declining *B. pygmaeus* density.[18]

Kaviar et al. (2012) noted that the deforested areas appear to be the result of logging by local people using hand tools. They observed numerous felled trees with machete and saw marks. The largest mangrove trees appeared to have been selectively felled and in numerous thickets the largest mangroves trees observed had been cut, but remained decomposing on the ground. Often the roots and branches of these trees were stripped away and the mangrove trunks were left behind. Given that *Bradypus sp*. cannot move over ground,[19] to survive, protection of mangrove forests is required.[20]

b. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

An example of anthropogenic exploitation is exemplified in AWI's petition. The AWI Emergency Petition highlights the Dallas World Aquarium's (DWA) attempt to collect several endangered pygmy three-toed sloths with the intent to export them to the United States. As noted, a total of eight sloths were taken from the wild and placed in crates awaiting export. Based on the most recent population surveys during which 79 sloths were counted, this capture and export scheme could have removed over 10 percent of the known population of pygmy sloths from the wild. Sloth experts such as Dr. Jutta Heuer, from Halle Zoo, Germany, one of the world experts in sloth husbandry in Europe, noted that the species does not survive well in captivity. There is no verifiable record of the conception, birth, or survival of a pygmy sloth in captivity or of a captive pygmy sloth being released back into the wild.[21]

The DWA has also experienced significant mortality with imported three-toed sloths (i.e. death rate of >85 percent).[22] Very little is known about these sloths and their diet, much less whether they can breed in captivity, and under what circumstances.[23] In addition, zoo breeding programs are typically conducted under the auspices of a species management plan, which does not exist for the pygmy sloth. DWA also failed to consult with or subject its capture/export/captivity plan to review by those scientists working with pygmy sloths;

115-34. Available at: http://www.bioone.org/doi/full/10.5537/020.011.0202.
[16] *Id.* Kaviar et. al 2012
[17] *Id.*
[18] *Id.*
[19] *Id.*
[20] *Id.*
[21] *Supra* n. 1 at 8
[22] *See* Max Planck Institute for Ornithology letter to Association of Zoos & Aquariums
[23] *Id.*

Panamanian and international research entities, conservation organizations, and scientific associations involved in the study of sloths were all completely unaware of this planned export.[24] This includes the Smithsonian Tropical Research Institute, the IUCN, the Zoological Society of London, Conservation, Nature and Life (CONAVI), and the Max Planck Institute of Ornithology.

As AWI's petition stressed, the attempt to export these sloths may have already severely impacted the species. According to scientists and citizens who are knowledgeable about the incident, at least two of the captured sloths who were returned to the island may have died prior to or soon after release.[25] There were also three other sloths who were captured but not removed from the island because they did not adapt well to captivity (their fate is unknown and not verifiable).[26] If not protected under the ESA, DWA and/or another entity could attempt to capture and export pygmy sloths to the United States again without obtaining any permit from the USFWS or having its application for an import permit subject to USFWS and public review as would be required if designated as endangered under the ESA.

Another significant threat to *B. pygmaeus* is hunting and entertainment. Although Isla Escudo de Veraguas was deemed a protected area in 2009, the species is often hunted by seasonal visitors to the island.[27] Moreover, the increasing popularity of sloths as cute pets is leading to increased exploitation of sloths in the wild, regardless of conservation status, to satisfy popular demands to possess and interact with these species. Sloths are also increasing in popularity as pets, thus increasing their chances of being plucked from the wild for ownership and export. [28]

c. Disease or Predation

Predators of pygmy three-toed sloths have not been reported, although feral domestic cats have been seen on the island[29] and may pose a threat to the pygmy sloths as a result of predation or disease transmission.[30] In general, sloths avoid predation by their ability to hide well in trees.[31] Yet, this skill is threatened due to the already noted increase in logging of mangrove forests on Isla Escudo. Without the protection of the mangrove ecosystem the pygmy sloth cannot protect itself.

In addition to predation, recent observations have led researchers to suspect a high rate of death through disease, habitat loss, or natural causes in the population.[32] Kaviar et. al (2012) studied

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[24] *Id.*
[25] *Supra* n. 15
[26] *Id.*
[27] *Supra* n.8 Superina et al. 2010; *see* also Hance, J. 2012. Less than 100 pygmy sloths survive. Mongabay.com (May 24, 2012) available at: news.mongabay.com/2012/0523-hance-pygmy-sloths.html.
[28] *See* https://www.youtube.com/watch?v=yDW4xkocbE4, https://www.youtube.com/watch?v=wcw9ccS_3bo, *https://www.youtube.com/watch?v=jP4YXbiKYNE ; https://www.youtube.com/watch?v=Fiexc9vyF74*
[29] Anderson RP and Handley CO, Jr. 2001. A new species of three-toed sloth (Mammalia: Xenarthra) from Panama, with a review of the genus Bradypus. Proceedings of the Biological Society of Washington 114: 1-33.
[30] *Supra* n. 9
[31] *Supra* n. 18
[32] *Id.*

two carcasses of *B. pygmaeus*. Both were relatively fresh and "fully intact," leading the scientist to conclude that neither was killed through predation but likely disease, habitat loss, or natural causes in the population.[33] This high rate of death to an already vulnerable population is exacerbated by the lack of existing conservation regulations.

d. Inadequacy of Existing Regulatory Mechanisms

Pygmy sloths have been known to exist only since 2001, when they were formally described as a separate species, occurring only on Isla Escudo de Veraguas.[34] As a result, the capture and export of this species from Panama previously only required permits and certificates issued by Panamanian authorities.[35]

Although the sloth is technically living on a wildlife refuge that is contained within the Comarca Indigenous Reserve, there is no public evidence of regulations providing any specific protections for the island or the sloth's habitat and, even if these regulations do exist, it does not appear that they are adequately enforced by Panamanian wildlife protection authorities.[36]

In November 2013, the Convention on International Trade in Endangered Species (CITES) Secretariat determined that the omission of *B. pygmaeus* from Appendix II was an oversight dating back to 2007.[37] On November 20, 2013, the CITES Secretariat issued a notification (2013/052) indicating that *B. pygmaeus* had been added to the CITES Appendix II list.[38] As explained by the CITES Secretariat, the species should have been included on Appendix II in 2007 but was not included due to an oversight.

AWI notes that, even with this international designation, this does not obviate the increasing threats to this species or the need for its emergency listing under the ESA. An Appendix II listing does not prevent the export of the species to the United States or any other country; it only requires that additional findings be made by the Panamanian government prior to export. Furthermore, unlike an endangered designation under the ESA, an Appendix II listing alone would not trigger public participation in any potential decision by the U.S. Fish and Wildlife Service to issue a permit allowing the import of this species into the United States.

e. Other Natural or Manmade Factors

Researchers have concluded that as an "insular endemic species," *B. pygmaeus* may likely "be adapted to a relatively high rate of inbreeding and have diminished risk of deadly recessive allele expression." Studies suggest that the pygmy three-toed sloth is subject to low levels of genetic diversity[39] and this could lead to endogamic depression within the species if the already low

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[33] *Supra* n. 19 at 9.
[34] *Supra* n. 19.
[35] *See* AWI, *Emergency Petition to List the Pygmy Three-toed Sloth (Bradypus pygmaeus) as Endangered Under the Endangered Species Act*, at 5.
[36] *Id.*
[37] Pers. comm. with J. Barzdo, CITES Secretariat, 2013
[38] *See* CITES Notification to the Parties, No. 2013/052, Correction to Appendix II, Geneva, 20 November 2013, *available at* http://cites.org/sites/default/files/notif/E-Notif-2013-052.pdf (accessed September 4, 2014).
[39] *Supra* n. 15 Superina et al. 2010.

number of sloths in the population declines even further.[40] This loss of allele expression, they noted, would negatively affect the species ability to adapt to changes in its environment. Kaviar et. al (2012) also found that the death rate of this species is high.[41] This combination of factors threatens the already low population of *B. pygmaeus*.

II. Upcoming Studies on *B. pygmaeus*

There are very few scientists studying Pygmy three-toed sloths and many unanswered questions regarding their behavior, life-history, and population-trends. Biologist Sam Kaviar, whose research on the pygmy three-toed sloth was used extensively in AWI's petition, is returning to Isla Escudo this November. Kaviar's forthcoming research seeks to answer many of these issues, as well as address the evolutionary growth of *B. pygmaues* as a separate sloth species from that found on the mainland. Moreover, scientists with the Zoological Society of London have conducted independent research on the pygmy three-toed sloth. Although yet to be published, their research supports other published findings that the general population of the sloth is extremely low.

The pygmy three-toed sloth is at a high risk of extinction. Although further information on the species is necessary, the best science currently available clearly indicates that *Bradypus pygmaeus* is endangered under the ESA. As scientific studies continue, an "endangered" listing under the ESA will not only conserve the future of *B. pygmaeus*, but may provide better stability for researchers as they continue essential studies of the pygmy sloth. Indeed, among the benefits of an ESA listing are that it would draw global and regional attention to the species while providing an opportunity to US funding under Section 8 of the ESA to improve the conservation and management of the sloth and its habitat.

Conclusion

The pygmy three-toed sloth warrants listing as endangered under the ESA. The species has been listed as Critically Endangered on the IUCN Red List since 2006. The estimated population likely numbers fewer than 100 animals. There is an ongoing decline in the quality of habitat and area of occupancy due to habitat degradation and both logging of the mangrove forests and opportunistic hunting of the pygmy sloths are causing a major threat to the survival of the species. In addition, the sloth is subject to low levels of genetic diversity increasing the potential for inbreeding with a long-term adverse impact on productivity, heterozygosity, and allelic diversity. The combination of these factors presents an urgent need to protect and conserve this species.

Listing the sloth under the ESA would provide significant benefits to the species and help to promote pygmy three-toed sloth conservation to an international audience including scientific institutions and funding organizations. AWI's petition demonstrates that the species meets the statutory criteria for an endangered listing under the ESA: destruction of habitat, overutilization, disease, inadequacy of existing regulatory mechanisms, and other natural or manmade factors.

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[40] *Id.*
[41] *Supra* n. 22.

Thank you in advance for providing this opportunity to comment on this status review and for considering these comments. Please send any future correspondence or information about this proposed status upgrade to Tara Zuardo, Wildlife Attorney at tara@awionline.org or, by mail, at 900 Pennsylvania Ave SE, Washington, DC 20003. Also, should you have any questions or need clarification about anything in this letter, please contact me by email or by telephone at (202) 446-2148.

Sincerely,

Tara Zuardo
Wildlife Attorney