PETITION TO LIST THE
Spider Tortoise (*Pyxis arachnoides*)
UNDER THE ENDANGERED SPECIES ACT

Photograph: Turtle Survival Alliance- Spider Tortoise
Available from: http://www.turtlesurvival.org/component/taxonomy/term/summary/120/45

Petition Submitted to the U.S. Secretary of Interior
Acting through the U.S. Fish and Wildlife Service

September 27, 2013

Petitioners

Friends of Animals
777 Post Road, Suite 205
Darien, Connecticut 06820
203.656.1522

WildEarth Guardians
1536 Wynkoop Street, Suite 301
Denver, Colorado 80202
505.490.5141

INTRODUCTION

Friends of Animals and WildEarth Guardians request the Secretary of Interior ("Secretary"), acting through her delegate the U.S. Fish and Wildlife Service, to list the spider tortoise (*Pyxis arachnoides*) as "threatened" or "endangered" under the Endangered Species Act ("ESA") (16 U.S.C. §§ 1531-1544). The spider tortoise is a small, attractive tortoise endemic to Madagascar. It is a long-lived species with a low reproductive potential that makes adapting to habitat changes and other threats difficult.

The spider tortoise faces threats of extinction due to at least four factors identified in the ESA. First, the species is negatively impacted by habitat loss and fragmentation due to human development and deforestation. Second, the spider tortoise faces severe threats from utilization by humans, including local consumption, international trade in parts (in particular the liver, which is consumed in Asia), and the international pet trade. Third, existing regulatory mechanisms are inadequate to manage the habitat loss and commercial utilization that threaten the survival of the spider tortoise. Finally, because of its slow reproductive rate, the spider tortoise is particularly biologically vulnerable to habitat changes and exploitation. The rapid human population growth in the spider tortoise's range further exacerbates the current threats. Thus, federal protection under the ESA is vital to the survival of this species.

The International Union for Conservation of Nature ("IUCN")[1] listed the spider tortoise as "endangered" in 1996 and updated its categorization of the species to "critically endangered" in 2008 (Leuteritz and Walker 3). Since 1985, the spider tortoise has also been listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora ("CITES");[2] in 2005 it was up-listed from Appendix II to Appendix I to reflect that it is threatened with extinction. These listings indicate the serious threat of extinction that the spider tortoise faces, and the need for listing under the ESA to ensure its survival.[3]

PETITIONERS

Friends of Animals. Friends of Animals ("Friends") is a nonprofit, international animal advocacy organization incorporated in the state of New York in 1957. Friends seeks to free animals from cruelty and exploitation around the world, and to promote a respectful view of non-human, free-living and domestic animals. Friends engages in a variety of advocacy programs in support of these goals. Friends informs its members about animal advocacy issues as well as the

[1] The IUCN is the world's largest and oldest global environmental network. It is a democratic membership union with more than 1,200 government and non-governmental organization (NGO) members, and almost 11,000 volunteer scientists in some 160 countries. Its work is supported by over 1,000 professional staff in 45 offices and hundreds of partners around the world, *available at* http://www.iucn.org/about/>.

[2] CITES is an international agreement with member countries that voluntarily adhere to it. Although it binds members to implement the Convention, it does not take the place of national laws. Rather it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level, *available at* http://www.cites.org/eng/disc/what.php.

[3] Friends of Animals and WildEarth Guardians hereby incorporate all citations and references contained in the IUCN's Species Report and CITES reports for the spider tortoise into this petition by reference. If the Secretary does not have access to any of the incorporated citations or references, please contact us and we will provide copies.

organization's progress in addressing these issues through its magazine called Act'ionLine, its website, and other reports. Friends has published articles and information advocating for the protection of endangered species so that they can live unfettered in their natural habitats. Friends in particular has a long-standing commitment to protecting animals imperiled due to poaching to fuel the pet trade, sport-hunting, and other animal-exploitation markets. Friends has a long history in Africa, and is extremely active in protecting African-native species subject to human exploitation. Friends and its members have a substantial interest in the conservation of the spider tortoise and will be adversely affected if the Secretary declines to protect this species and its habitat under the ESA.

WildEarth Guardians. WildEarth Guardians ("Guardians") is a nonprofit environmental advocacy organization that works to protect wildlife, wild places, and wild waters in the United States and beyond. Guardians maintains offices in Denver, Santa Fe, Missoula, and satellites in Eugene, Laramie, Portland, San Diego, and Tuscon, and has more than 100,000 members and e-activists nationwide. WildEarth Guardians has an active endangered species program that works to protect imperiled species and their habitat.

ENDANGERED SPECIES ACT AND IMPLEMENTING REGULATIONS

The ESA, 16 U.S.C. §§ 1531 *et seq*., was enacted in 1973 "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species and threatened species." 16 U.S.C. § 1531(b). The protections of the ESA only apply to species that have been listed as endangered or threatened according to the provisions of the statute. The ESA delegates authority to determine whether a species should be listed as endangered or threatened to the Secretary of Interior, who has in turn delegated authority to the Director of the U.S. Fish & Wildlife Service. As defined in the ESA, an "endangered" species is one that is "in danger of extinction throughout all or a significant portion of its range." 16 U.S.C. § 1532(6); see also 16 U.S.C. § 1533(a)(1). A "threatened species" is one that "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532(20). The Service must evaluate whether a species is threatened or endangered as a result of any of the five listing factors set forth in 16 U.S.C. § 1533(a)(1):

> 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.

A taxon need only meet one of the listing criteria outlined in the ESA to qualify for federal listing. 50 C.F.R. § 424.11.

FWS is required to make these listing determinations "solely on the basis of the best scientific and commercial data available to [it] after conducting a review of the status of the species and after taking into account" existing efforts to protect the species. 16 U.S.C. § 1533(b)(1)(A); *see*

also 50 C.F.R. §§ 424.11(b), (f). In making a listing determination, the Secretary must give consideration to species which have been "identified as in danger of extinction, or likely to become so within the foreseeable future, by any State agency or by any agency of a foreign nation that is responsible for the conservation of fish or wildlife or plants." 16 U.S.C. § 1533(b)(1)(B)(ii). *See also* 50 C.F.R. § 424.11(e) (stating that the fact that a species has been identified by any State agency as being in danger of extinction may constitute evidence that the species is endangered or threatened). Listing may be done at the initiative of the Secretary or in response to a petition. 16 U.S.C. § 1533(b)(3)(A).

After receiving a petition to list a species, the Secretary is required to determine "whether the petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted." 16 U.S.C. § 1533(b)(3)(A). Such a finding is termed a "90-day finding." A "positive" 90-day finding leads to a status review and a determination whether the species will be listed, to be completed within twelve months. 16 U.S.C. §1533(b)(3)(B). A "negative" 90-day finding ends the listing process, and the ESA authorizes judicial review of such a finding. 16 U.S.C. § 1533(b)(3)(C)(ii).

The applicable regulations define "substantial information," for purposes of consideration of petitions, as "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted." 50 C.F.R. § 424.14(b)(1). The regulations further specify four factors to guide the Service's consideration on whether a particular listing petition provides "substantial" information:

i. Clearly indicates the administrative measure recommended and gives the scientific and any common name of the species involved;
ii. Contains detailed narrative justification for the recommended measure; describing, based on available information, past and present numbers and distribution of the species involved and any threats faced by the species;
iii. Provides information regarding the status of the species over all or significant portion of its range; and
iv. Is accompanied by appropriate supporting documentation in the form of bibliographic references, reprints of pertinent publications, copies of reports or letters from authorities, and maps

50 C.F.R. § 424.14(b)(2)(i)-(iv).

Both the language of the regulation itself (by setting the "reasonable person" standard for substantial information) and the relevant case law underscore the point that the ESA does not require "conclusive evidence of a high probability of species extinction" in order to support a positive 90-day finding. *Ctr. for Biological Diversity v. Morgenweck*, 351 F.Supp.2d 1137, 1140. *See also Moden v. U.S. Fish & Wildlife Serv.*, 281 F.Supp.2d 1193, 1203 (D.Or. 2003) (holding that the substantial information standard is defined in "non-stringent terms"). Rather, the courts have held that the ESA contemplates a "lesser standard by which a petitioner must simply show that the substantial information in the Petition demonstrates that listing of the species *may* be warranted" (emphasis added). *Morgenweck*, 351 F.Supp.2d at 1141 (quoting 16 U.S.C. § 1533(b)(3)(A)). *See also Ctr. for Biological Diversity v. Kempthorne*, No. C 06-04186 WHA,

2007 WL 163244, at *3 (holding that in issuing negative 90-day findings for two species of salamander, FWS "once again" erroneously applied "a more stringent standard" than that of the reasonable person).

CLASSIFICATION AND NOMENCLATURE

Common Name. *Pyxis arachnoides* is commonly referred to as the spider tortoise. This petition refers to the species as "spider tortoise" or "tortoise."

Taxonomy. The petitioned species is *Pyxis arachnoides* Bell 1827. The species' taxonomic classification is shown in Table 1.

Table 1. Taxonomy of *Pyxis arachnoides*[4]

Kingdom	Animalia – animals
Phylum	Chordata – chordates
Subphylum	Vertebrata – vertebrates
Class	Reptilia Laurenti – reptiles
Order	Testudines Linnaeus – turtles
Family	Testudinidae Batsch – tortoises
Genus	*Pyxis*– spider tortoises
Species	*Pyxis arachnoides* – common spider tortoise

SPECIES DESCRIPTION

The spider tortoise is named for the beautiful yellow spider web-like design that covers its shell (Figure 1). Underneath the yellow spider web-like design, the shell is dark brown. The plastron or underside of the tortoise is yellow. The head of the tortoise is dark brown with many yellow spots; the legs and tail are solid dark brown. The average shell length is 6 inches (McCloud 12-13). The head is dark and speckled with several yellow spots, and the legs and tail are brown. The tail of the male is longer and thicker than that of the female, and has a harder tip (CITES 2005 at 2).

[4] ITIS Report, *available at* www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=551954 [Accessed September 2013]. The Integrated Taxonomic Information System (ITIS) is a coalition of federal agencies formed to create scientifically credible taxonomic information for scientific use and the American public.

Figure 1. Full-grown Spider Tortoise.
Photograph by Christi Turner, http://www.bbc.co.uk/nature/19161652[5]

Habitat and Range. The spider tortoise's habitat is the arid region of the coastal areas of southwestern Madagascar, 10 to 50 kilometers inland from the coast and as far north as Morombe (Leuteritz and Walker 2). This tortoise is found in the area known as the Mikea Forest and also in sandy areas with communities of xerophytic spiny vegetation and low irregular rainfall dominated by *Didiereaceae* and *Euphorbia* or cactus-like plants, close to the coast (Leuteritz and Walker 2). Spider tortoises are habitat specialists, typically favoring areas of over 40% canopy cover (Walker and Rafeliarisoa 457).

Historically the species inhabited a continuous strip of 555 kilometers of coastline from Morombe to the Amboasary region (Figure 2); however, the range has become severely fragmented. As a result of habitat destruction and collection for international trade and domestic consumption, the species' range is thought to have declined by 71% (Walker and Rafeliarisoa 457).

[5] Barley, Shanta. "Last Stand of the Madagascan Spider Tortoise." *BBC Nature*. N.p., Sept. 3 2012. Available at http://www.bbc.co.uk/nature/19161652.

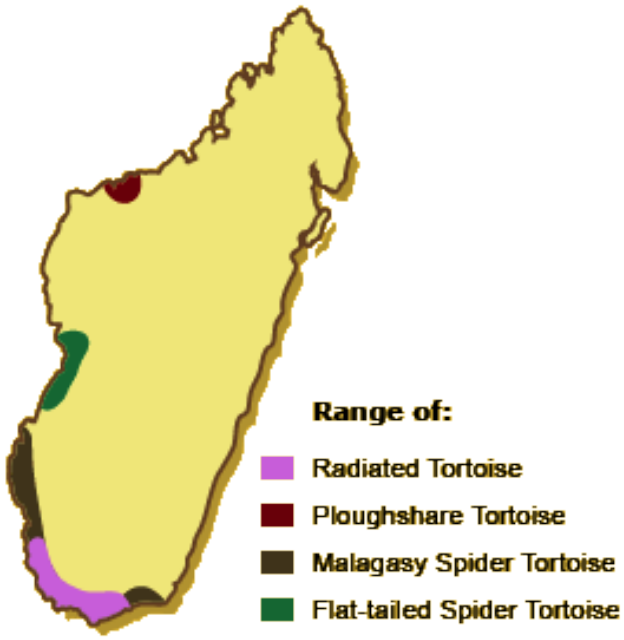

Figure 2. Tortoise habitat in Madagascar. Spider tortoise habitat is signified by the black color areas. Map by Wildlife Conservation Society.[6]

Behavior. The spider tortoise eats young leaves, grasses, the roots of succulents, and insects found inside of plants (CITES 4). It has also been known to eat cow dung that has insect larvae in it (Leuteritz and Walker 3). The tortoise is most active during the wet season, because plants are the most lush; the wet season in Madagascar is between November and April. In April, when the dry season begins, the spider tortoise buries itself in the sand and becomes dormant in an effort to conserve energy and moisture during the times when vegetation is sparse (Walker, Woods-Ballard, and Rix 5). The estimated life span of the tortoise is up to 70 years (Randriamahazo et al. 78).

Reproduction and Growth. The spider tortoise produces few offspring. In November, with the start of the wet season, the spider tortoise begins mating. According to current studies, the spider tortoise lays only one relatively large (25-30 x 33-35 mm; ~17 gram) egg in each clutch, with an average of 2.38 clutches per year and 75% hatch rate, which equates to 1.79 hatchlings per female per year (Randriamahazo et al. 79-81). In captivity, the spider tortoise has three clutches per year with a 25% chance that an individual tortoise will hatch from the clutch. This amounts to less than one hatched egg every year (Mattioli, Gili, and Andreone 70). The spider tortoise takes 12 years to become sexually mature, but the average age of reproduction is closer to 20 years of age (Leuteritz and Walker 2008 at 4).

Population Estimates and Trends. The first data that was collected on the spider tortoise population was anecdotal; Bour (1981) stated that the spider tortoise population was "localized but not rare." Reassessing this in 1995, Jesu and Schimmento estimated that the spider tortoise

[6] "Poaching Pets for Profit." Wild Explorations Home, *available at*: http://www.wildexplorations.com/madagascar/5-2-poaching.html.

population density was about 3 per hectare (*cited in* Walker, Woods-Ballard, and Rix 6). Then in 2008, Walker, Woods-Ballard, and Rix reported "densities of 4.63 and 2.08 tortoises per hectare in the wet and dry seasons respectively"(3). Also in 2008, Pedrono released a rough estimate of the total spider tortoise population as being 2-3 million (Leuteritz and Walker 3). This population has been decreasing significantly every year (Walker "Decline of Critically Endangered" 415). It was estimated in 2012 that the average population density of the spider tortoise shrunk to just over 2 per hectare (Barley 2). Walker and Rafeliarisoa (2012) estimated the population to be 664,980 (95% Confidence Interval, CI 492,680–897,550) (460). Fragmentation of the species' range suggests the current population could be less than 30% of the historical population (Walker and Rafeliarisoa 461). Scientists predict that the spider tortoise population will have been reduced "by at least 80% over the past two plus one future generations" (Leuteritz and Walker 2). Figure 3 below shows Walker and Rafeliarisoa's projection of the species' declines through the year 2150 (156).

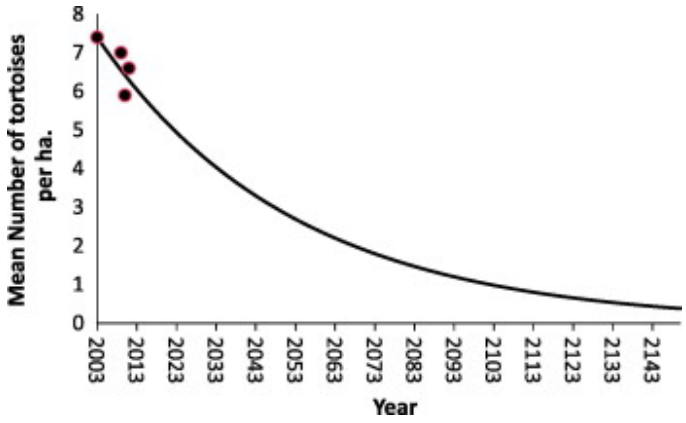

Figure 3. Results of the decline projection for the spider tortoise population within the coastal dry forest of the Anakao region. The solid line represents the projected decline through to the year 2150. The dots represent the true population density values for the tortoise population for years 2003, 2009, 2010 and 2011.

The spider tortoise could completely disappear from the wild within the next 60 to 80 years – less than the lifespan of an individual tortoise (Leuteritz and Walker 2). Because of the biological concerns and reproductive patterns explained above, the spider tortoise is more susceptible to extinction from fluctuations in ecosystems and large changes to habitats. "It is unlikely such a long-lived species, with such low reproductive potential, can adapt and display any form of resilience under such conditions" (Walker et al. "Effect of Habitat Degradation" 157). In addition to not being able to handle changes in the ecosystem, the spider tortoise cannot handle high levels of take, as it does not produce large amounts of offspring.

IDENTIFIED THREATS TO THE PETITIONED SPECIES: CRITERIA FOR LISTING

The spider tortoise meets at least four of the criteria for listing identified in ESA § 4 (16 U.S.C. §1533(a)(1)) (in bold):

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.

The spider tortoise has a restricted range and faces threats to its survival from loss of habitat, collection for local and international consumption, and collection for the pet trade. Existing regulatory mechanisms are inadequate to protect the spider tortoise, and the increasing human population growth in Madagascar further exacerbates threats to the species.

The present or threatened destruction, modification, or curtailment of habitat or range (Criteria A)

The spider tortoise has specific habitat requirements, favoring areas with 45% vegetation cover; juvenile animals having a higher preference for cover (Walker et al. "Effect of Habitat Degradation" 153). Unfortunately, agriculture, charcoal production, human-induced wildfires, and alien invasive plants have all contributed to the destruction of this habitat, and threaten the spider tortoise's survival (Leuteritz and Walker 4). Charcoal production involves clearing the natural vegetation so that the area is no longer suitable for the spider tortoise (Walker "Decline of Critically Endangered" 412). Additionally, the xerophytic vegetation areas and the Mikea forest are being cut or burned down to provide land for crop farming and cattle grazing (Figure 4). From 1970 to 2000, the spider tortoise lost approximately 28% of its spiny forest habitat. (Harper et al. 328-30; Figure 5).

Figure 4. Left: an area of Mikea forest cleared for cultivation. Right: feral goats grazing; a cause of habitat destruction and alteration. Photos by R. C. J. Walker (Walker 2009 at 1).

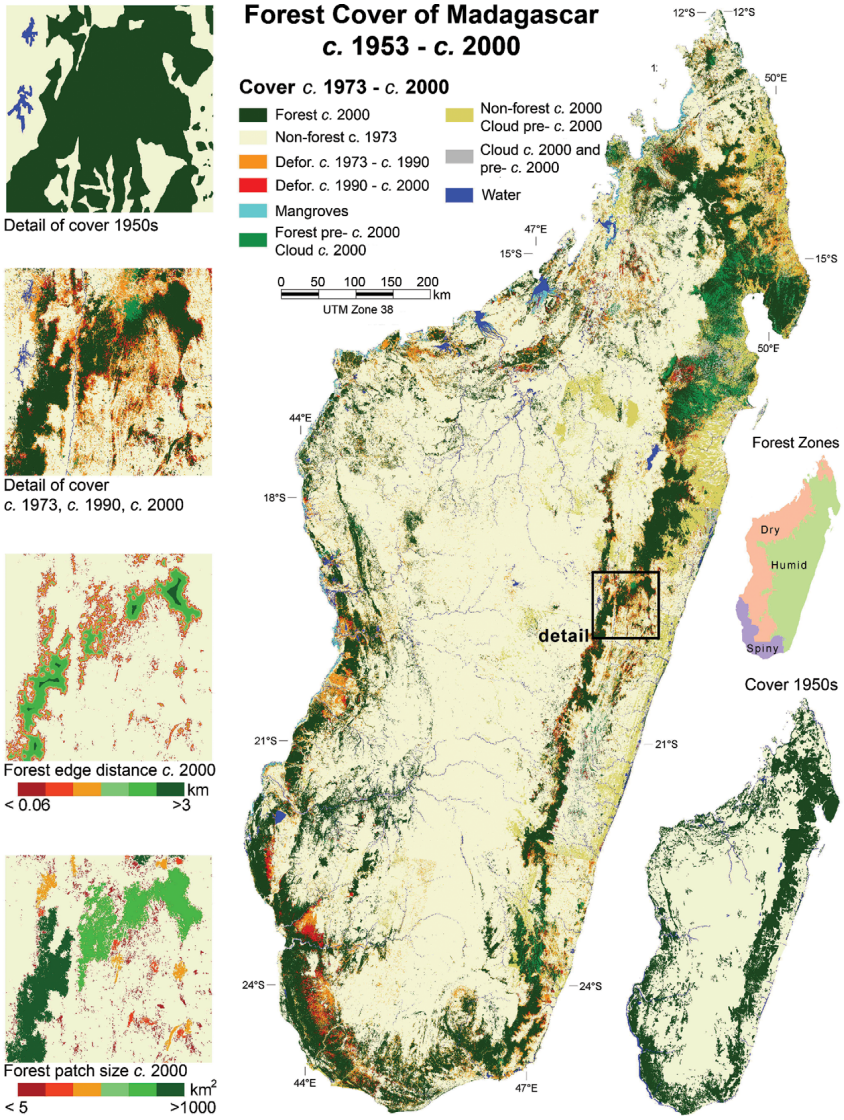

Figure 5. Madagascar forest cover from the 1950s to *c.* 2000. Forest cover changes from the 1970s to *c.* 2000 are shown in the main figure, and forest cover in the 1950s is shown in the lower-right inset (Harper et al. 328).

Another study of spider tortoise habitat documented a 7% reduction in vegetation cover between 2003 and 2009 (Walker et al. "Effect of Habitat Degradation" 155). Experts estimate that historic range of the spider tortoise's habitat has now been reduced by 71%. (Walker et al. "Effect of Habitat Degradation" 156, *internal citations omitted*; Figure 6).

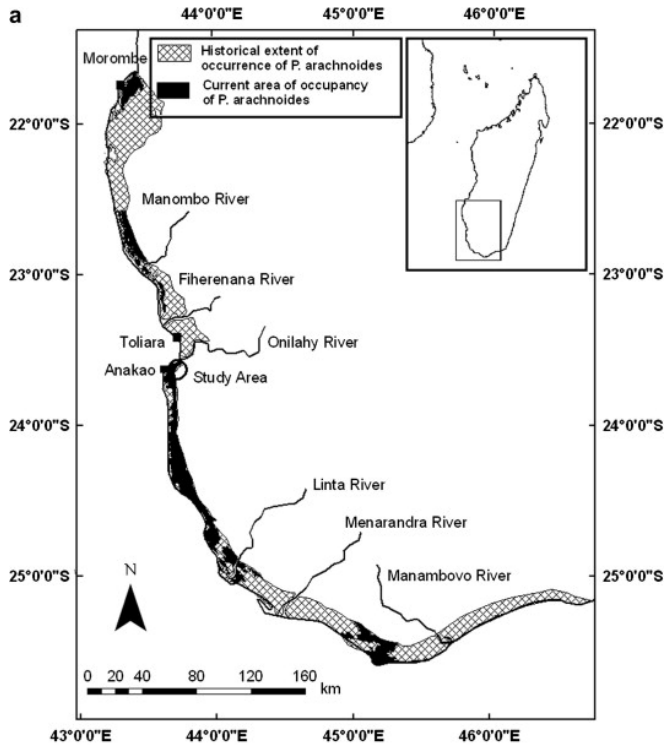

Figure 6. Study site within the core of spider tortoise coastal dry forest range, southwest Madagascar (Walker et al. "Effect of Habitat Degradation" 153).

Because the spider tortoise has specific habitat requirements, continued habitat destruction could cause its extinction. In a study of the spider tortoise using projection population matrix modeling, habit degradation was estimated to result in the "population declining by 1.4% annually, which unabated represents a 35% decline in population size during one generation and probable functional extinction within three generations" (Walker et al. "Effect of Habitat Degradation" 157, *internal citations omitted*).[7] It is not likely that the spider tortoise, a long lived species with low reproductive potential, can adapt to continued vegetation loss and population decline (Walker et al. "Effect of Habitat Degradation" 156). Thus, further protection is needed to prevent the extinction of the spider tortoise.

Overutilization for commercial, recreational, scientific, or educational purposes (Criteria B)

Commercial utilization is currently a significant threat to the spider tortoise. Spider tortoises are captured or killed for local consumption, for liver harvest in Asia, and for the pet trade internationally (CITES 2005 at 4-5). Considering the continuing demand for the species in the

[7] This study was done in an area that does not experience as much exploitation from consumption and pet trade, and the scientist noted that in other areas "these populations could become non-viable sooner than with our study site" (157).

exotic pet business, continuing illegal trade, and the likelihood of the species also being captured for food, experts estimate that a total of 5,000 spider tortoises are harvested per year (Randriamahazo et al. 84).

Consumption. Traditionally another species of tortoise, the radiated tortoise, was the preferred choice for local food trade and consumption; however, as the population of radiated tortoises has decreased, many people have switched to eating the spider tortoise (Leuteritz and Walker 4). The Mikea people of Madagascar bury the spider tortoise in heated sand for 20 minutes and then consume the heated innards straight from the shell (Sowter 1). Some Malagasy people are not aware of the differences between young radiated tortoises and adult spider tortoises (Randriamahazo et al. 59). Thus, it is likely that there is a higher take of adult spider tortoises that will continue to go undetected, unless an active interest is taken in the spider tortoise (Randriamahazo et al. 93).

On top of the local consumption of the spider tortoise, poachers have depleted spider tortoise populations for the sale of their livers in China. The Chinese will "puncture the shell, just to eat the liver out of this tortoise" (Goode 3).

Pet Trade. Spider tortoises are extremely threatened by the pet trade. The spider tortoise's small size and beautiful shell make it a desirable pet for many tortoise enthusiasts. A single spider tortoise can be sold for around $1,000 in the pet trade (M. Walker 1). The high commercial value of spider tortoises makes collecting them from the wild a lucrative business for many locals who otherwise have no income.

Spider tortoise export has considerably increased since the late 1990s and 2000 (IUCN 53; Randriamahazo et al. 84). From 1980 to 1999, a total of 218 spider tortoises were reported as exported from Madagascar, whereas in the years 2000 and 2001, the total was 3,096 individuals (Randriamahazo et al. 84). Over 99% of all spider tortoises recorded in global movements were recorded as wild caught or not specifically recorded as captive born, and of the wild caught specimens directly exported from Madagascar, 98.6% were declared to be exported for trade purposes (Randriamahazo et al. 84).

Apart from the legal trade, confiscations attest that there is also illegal trade. A trader in Comoros ordered 10,000 spider tortoises in the fall of 2001 (CITES 6). In June 2002, customs officials in La Réunion, a French Overseas Department, seized 218 spider tortoises from a fishing boat belonging to a Malagasy company based in Tuléar (Randriamahazo et al. 84; IUCN 2005 57). Participants at IUCN Population and Habitat Viability Assessment Workshop also confirmed that international traders attempt to export live animals illegally (Randriamahazo et al. 84).

Additionally, the spider tortoise does not inhabit its entire suitable habitat which is "a sure sign that collectors" have removed the tortoises "either for local consumption as food or collection on the black market to supply the pet trade" (M. Walker 2; Walker and Rafeliarisoa 415). The pet trade remains a problem, and a basic Internet search produced advertisements selling spider

tortoises as pets.[8] Even low levels of harvest could drive the species to extinction (Randriamahazo et al. 93).

The inadequacy of existing regulatory mechanisms (Criteria D)

The spider tortoise was listed on CITES Appendix I in 2005, and it is also listed on Schedule B of the European Unions Wildlife Regulations (Leuteritz and Walker 4-5).[9] Additionally, the spider tortoise is protected in Madagascar under national law, and its range falls within some protected areas (Leuteritz and Walker 4-5). Although these designations are important for flagging the extinction risks to this species, they are inadequate to protect the species. Unfortunately, once an individual purchases one of the tortoises, none of the existing laws make it illegal to possess that tortoise. Although CITES restricts trading the petitioned species, these regulatory mechanisms have not adequately protected the tortoise in the wild. Further, both international and national protections are frequently disregarded and enforcement in Madagascar, if any, is ineffective.

Because these regulations are not curtailing the pet trade, the current regulatory mechanisms are not adequately protecting the species. Many people are in possession of illegally obtained tortoises. Listing the species on the ESA could curtail the pet trade by making it illegal to buy, sell, or *possess* one of the petitioned species in the United States. 16 U.S.C. § 1538(a). Notably, the United States represents one of the largest markets in the world for wild-caught reptiles, which are imported into the U.S. primarily for the pet trade (Schlaepher et al. 257). Dr. James Deutsch, director for the Wildlife Conservation Society's Africa programs, states that "Madagascar's ancient tortoises and turtles are marching toward extinction unless an all-out effort is made to protect these living national treasures" (Wildlife Conservation Society 1). Listing under the ESA could be a crucial part of that effort.

Inadequacies of CITES. CITES was adopted in 1973 and implemented in 1975, and currently 178 countries are parties to CITES. CITES is an international agreement to which member countries voluntarily adhere. CITES aims to protect species from the detrimental effects of international trade by establishing an international legal framework for preventing and controlling trade. Although CITES binds members to implement the Convention, it does not take the place of national laws. Rather it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level.[10]

The species covered by CITES are listed in three Appendices. Appendix I includes species threatened with extinction, and trade in specimens of these species is permitted only in exceptional circumstances. All import, export, or re-export for CITES covered species must be

[8] Spider Tortoise, *available at*: http://www.popularpets.net/turtles/care-sheets/spider-tortoise.php; Malagasy Spider Tortoise, *available at*:http://www.theturtlesource.com/i.asp?id=225689790&p=Malagasy-Spider-Tortoise; Virtual Store: Madagascar Spider Tortoise, *available at*: http://www.eastbayvivarium.com/virtual/turtle/madagascarspider/MSTF01.html. [Accessed September 2013].

[9] The EC Wildlife Trade Regulations were adopted in the early 1990's and form the legal basis for implementation of CITES in the EU. EU Wildlife Trade Legislation *available at*: http://www.eu-wildlifetrade.org/html/en/wildlife_trade_regulations.asp [Accessed September 2013].

[10] Available at: http://www.cites.org/eng/disc/what.php. [Accessed September 2013].

authorized through a licensing system. Each Party to the Convention must designate one or more Management Authorities in charge of administering that licensing system and one or more Scientific Authorities to advise them on the effects of trade on the status of the species. In theory, Management Authorities should only issue an import or export permit if the trade will not be detrimental to the survival of the species.[11]

Although permits are not typically issued for species listed in Appendix I, illegal trapping and trading is rampant (Nijman, Todd, and Shepherd). Attempts made to regulate the take of CITES protected tortoises have not been successful, and as the adult population ages and dies off, the species are heading towards extinction (Nijman, Todd, and Shepherd 391; Walker et al. 2012 at 157). Despite CITES listing, there is consistent, open and substantial illegal trade in protected tortoises, and wild-caught individuals are exported under the disguise of being bred in captivity (Nijman, Todd, and Shepherd 392; Walker "Decline of Critically Endangered" 415). A study conducted in Thailand from 2006-2010 observed 475 Cites Appendix I listed tortoises for sale at a market, including 31 spider tortoises in January 2010 (Nijman, Todd, and Shepherd 394-95). The observation of large number of CITES Appendix I listed tortoises being captured and shipped in the pet trade indicates that law enforcement in Madagascar, and in the importing countries, is currently ineffective (Nijman, Todd, and Shepherd 401).

Although CITES is undoubtedly a positive force in the fight against the international trade of threatened and endangered tortoises, the current regulations are not effectively controlling the problem. Standing alone, these regulations are not able to ensure that the spider tortoise will not become extinct due to the legal and illegal pet trade. The ESA can curtail the pet trade by making it illegal to buy, sell, or *possess* one of the petitioned species in the United States. 16 U.S.C. § 1538(a).

Cites Designation Supports Listing under the ESA. Additionally, the fact that the IUCN considers the spider tortoise to be "critically endangered" supports a finding of "endangered" or "threatened" under the ESA. The IUCN categorizes a species as "critically endangered" when the best available evidence indicates that it meets specific criteria and is therefore considered to be facing an extremely high risk of extinction in the wild. The factors the IUCN uses to classify the spider tortoise as "critically endangered" are analogous to the factors used under the ESA.[12]

The ICUN categorized the spider tortoise as facing an extremely high risk of extinction and facing a reduction in population size ≥ 80% over any 10 year or three generation period based on the following criteria: (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat; and (d) actual or potential levels of exploitation (Leuteritz and Walker 2008). This indicates that the species meets the definition of "endangered" under the ESA, "in danger of extinction through all or a significant portion of its range" 16 U.S.C. § 1532(6), or "threatened" "any species which is likely to become an endangered species within the foreseeable future through all or a significant portion of its range." 16 U.S.C. § 1532(20). Further, the ICUN criteria of decline in area occupancy is analogous to ESA Criteria A (present or threatened destruction modification, or curtailment of its habitat), and ICUN criteria of actual or potential levels of

[11] Available at: http://www.cites.org/eng/disc/how.php. [Accessed September 2013].
[12] *See* IUCN Red-List Assessment Criteria, *available at* http://www.iucnredlist.org/static/categories_criteria_3_1#categories.

exploitation is analogous to ESA Criteria B (overutilization for commercial, recreational, scientific, or educational purposes). 16 U.S.C. § 1533(a)(1).

Inadequacies of Habitat Conservation. Within Madagascar, the spider tortoise range falls within two protected areas: Lac Tsimanampetsotsa National Park, and Cap Sainte Marie Special Reserve. Spider tortoise range also overlaps with three private land reservation areas: Berenty Private Reserve, the Site of Biological Interest – Hatokaliotsy, and the Site of Biological Interest– PK3 north of Tulear (Leuteritz and Walker 4-5). Currently, 73.5% of the spider tortoise habitat that is not protected by Malagasy regulations falls within existing or proposed protected areas under IUCN (Walker and Rafeliarisoa 461).

However, with the exception of the Mikea Forest National Park and the extension to Tsimanampesotsa National Park, all new protected areas are IUCN category III, V, and VI multiple-use protected areas. The categories will not protect the tortoise because they allow for the continuation of current interactions between people and the local landscape, which have a negative affect on conservation, and "if left unchecked, could result in near complete loss of natural habitats and areas of high biodiversity value" (Gardner 343-44).

Inadequacies of Malagasy Regulations and Enforcement. Since January 2009, Madagascar has been in the throes of a political crisis (World Bank 2013). The instability in Madagascar has left enforcement of national and international laws practically non-existent. CITES is implemented at the national level through national legislation, and parties must have political structure that allows implementation and enforcement of the Convention (Nijman and Shepherd 393). The political turmoil in Madagascar has pushed environmental regulations and enforcement to the bottom of the government's priority list. The substantial illegal flow of legally protected CITES listed species indicates a blatant disregard for law and authorities in Madagascar, as well as in importing countries (Nijman and Shepherd 210). Monetary gains and a generally low risk of prosecution promote the collection of endangered tortoises and other wildlife for the illegal pet trade (Nijman, Todd, and Shepherd 401). Madagascar has not established national or regional conservation plans for the spider tortoise.

The current listings have been inadequate to protect the spider tortoise, which scientists anticipate could face extinction within the next 60-80 years if additional regulations are not implemented (Leuteritz and Walker 2). Listing the spider tortoise as either "threatened" or "endangered" under the ESA would provide needed regulation to halt further exploitation of this species, particularly in the pet trade sector as the United States is a significant importer of these animals. For example, in 2000 the Management Authority of Madagascar recorded 902 permits to import the spider tortoise to the United States (CITES 5). In particular, the ESA would prohibit the import or export of spider tortoises to or from the U.S. *See* 16 U.S.C. § 1538(a)(1)(A). In addition, listing would encourage international efforts to protect the spider tortoise through financial and technical assistance in developing conservation programs, as well as through law enforcement assistance. S*ee* 16 U.S.C. § 1537.

Other natural or manmade factors affecting continued existence (Criteria E)

Biological Vulnerability. The spider tortoise produces few offspring. It takes 12 years for the spider tortoise to become sexually mature, but the average age of reproduction is closer to 20 years of age (Leuteritz and Walker 4). According to current estimates, a female spider tortoise in the wild has 1.79 hatchlings per year (Randriamahazo et al. 79-81). In captivity, the spider tortoise has less than one hatched egg every year (Mattioli, Gili, and Andreone 70). The fact that the spider tortoise has a long life span and produces few offspring makes it more prone to extinction. Lower reproduction rates (which keep the population of a species in equilibrium with its environment) and a greater investment in individual offspring (which reduces the mortality of individual offspring) are more efficient uses of available energy because little is wasted on offspring that are unlikely to live to reproduce and because maintenance of population at capacity prevents habitat degradation while allowing the species to exploit available resources. At the same time, lower reproduction rates make it more difficult both for the species to recover if its population becomes depressed and for it to adapt to a changed environment, because fewer offspring contain less genetic variability. Thus, the "fittedness" of a species, such as the spider tortoise, to a particular environment – which is advantageous during periods of stability – becomes a serious handicap when the habitat changes more rapidly than genes can be substituted in a population – and in species that reproduce slowly, genes are substituted slowly (Goble and Freyfogle 1059-60).

Madagascar's Rapid Growth. All of the threats to the spider tortoise listed above will significantly increase as Madagascar's human population expands. For the period of 2010 to 2015, United Nations Data places Madagascar's average population growth rate at 2.8% per year (United Nations 2013). With the growing population, villages and housing developments are moving farther into previously pristine nature areas, destroying spider tortoise habitat (Walker "Decline of Critically Endangered" 416). The destruction of land for development and agriculture will only continue and increase in intensity as the population of Madagascar grows. This growing population will increase the pressures on the spider tortoise from both local and international consumption and the pet trade. With more people living in Madagascar, more people will consume the spider tortoise annually for local food. On top of this increased need for food, there will also be an increased need for income. The high value of the spider tortoise on the pet trade market provides a large income for spider tortoise collectors. Thus, the increase in population will likely increase the amount of spider tortoise collections.

REQUESTED DESIGNATION

Petitioners respectfully request the U.S. Fish and Wildlife Service list the spider tortoise as "endangered" or "threatened" under the ESA. This listing action is warranted because there have been significant declines in distribution and abundance of the spider tortoise, and scientist have estimated that if trends continue the spider tortoise will go extinct in the next 60 to 80 years. The spider tortoise is threatened by four of the factors that require FWS to list a species as endangered under the ESA. Those four factors are: (1) the present or threatened destruction, modification, or curtailment of habitat or range; (2) the overutilization for commercial, recreational, scientific, or educational purposes; (3) the inadequacy of existing regulatory mechanisms; and (4) other natural or manmade factors affecting continued existence, including the biological vulnerability of the spider tortoise and the increasing human population growth in

Madagascar.

As such, petitioners request expeditious listing of the spider tortoise as a "threatened" or "endangered" species under the ESA. Listing of the spider tortoise under the ESA will prevent the spider tortoise from being sold in the United States. This will eliminate a large market for smugglers and exporters alike, thus reducing the international pet trading market's demand for the spider tortoise.

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