



HEADQUARTERS

120 Shelton McMurphey Blvd.
Suite 340
Eugene, OR 97401
(541) 485-2471
info@westernlaw.org

Defending the West

OFFICES

Oregon
Washington
New Mexico
Montana

westernlaw.org

WESTERN ENVIRONMENTAL LAW CENTER

May 22, 2024

SENT VIA E-MAIL AND U.S. FIRST CLASS MAIL (Delivery Confirmation)

Debra Haaland
Secretary, U.S. Department of the Interior
U.S. Dept. of the Interior
1849 C Street, N.W.
Washington, D.C. 20240
exsec@ios.doi.gov

Martha Williams
Director, U.S. Fish and Wildlife Service
1849 C Street N.W., Room 3358
Washington, D.C. 20240
Martha_Williams@fws.gov

Amy Lueders
Acting Deputy Director
Regional Director (Region 2), U.S. Fish and Wildlife Service, Southwest Region
Southwest Regional Office
500 Gold Avenue SW
Albuquerque, NM 87103-1306
RDLueders@fws.gov

Re: Sixty-day notice of intent to sue for 12-month “not warranted” finding for the Sonoran desert tortoise.

The Western Environmental Law Center (“WELC”) provides this sixty-day notice of intent to sue the U.S. Fish and Wildlife Service (“Service”) for its February 8, 2022 12-month finding that the Sonoran desert tortoise (*Gopherus morafkai*) is not warranted for listing as an endangered or threatened species under the Endangered Species Act (“ESA”). 87 Fed. Reg. 7,077 (Feb. 8, 2022).

This notice is provided by WELC on behalf of the Western Watersheds Project (“WWP”), WildEarth Guardians (“Guardians”), the Desert Tortoise Council, and the Tucson Herpetological Society.

These organizations have a strong interest in ensuring the long-term survival and recovery of the Sonoran desert tortoise in the wild and ensuring the Service utilizes the best available science and complies with the ESA when making important listing decisions.

In 2008, Guardians and WWP submitted a petition to list the Sonoran desert tortoise as a distinct population segment (“DPS”) under the ESA. The Service responded with a positive 90-day finding. 74 Fed. Reg. 44,335 (Aug. 28, 2009). In December 2010, the Service then issued a 12-month warranted but precluded finding based on its review of the best available science and ESA threat factors. 75 Fed. Reg. 78,094 (Dec. 14, 2010). At the time, the threats identified by the Service included (but were not limited to):

- On-going invasion of non-native plants species (including buffelgrass);
- Increased urbanization and population growth;
- Fragmentation of sub-populations that limited genetic exchange;
- Increased OHV (off-highway vehicle) use in occupied habitat;
- Mesquite and ironwood tree cutting in Mexico;
- Livestock grazing;
- Illegal collection, human depredation;
- Lack of adequate protections in land management plans;
- Climate change (severe drought) and increased fires; and
- Cumulative or synergistic effects (of all the above).

Following the Service’s 2010 warranted but precluded finding, the Service repeatedly reaffirmed the Sonoran desert tortoise’s warranted status in candidate notices of reviews (“CNORs”) in 2011, 2012, and 2013. 76 Fed. Reg. 66,370 (Oct. 26, 2011); 77 Fed. Reg. 69,994 (Nov. 21, 2012); 78 Fed. Reg. 70,104 (Nov. 22, 2013). The Service also recognized the Sonoran desert tortoise as a full species instead of a DPS in 2012 and increased its listing priority number to five from six to reflect its taxonomic significance. 77 Fed. Reg. at 69,994.

In 2014, the Service published an extensive species status assessment (“2014 SSA”) for the Sonoran desert tortoise that: (1) incorporated all available scientific literature produced on the species as of March 2013, including all available literature on threats facing the species; (2) recognized the Sonoran desert tortoise as a distinct species separate from the Mojave desert tortoise (as such, no need for a DPS listing); and (3) reaffirmed, once again, that the species was warranted for listing under the ESA.

On December 5, 2014, the Service issued yet another CNOR reaffirming its warranted finding and announcing the Service’s plans to start work on a proposed listing rule for the Sonoran desert tortoise. 79 Fed. Reg. 72,450 (Dec. 5, 2014).

In May, 2015, the Service signed a Candidate Conservation Agreement with Arizona and other cooperating agencies (three years later, in 2018, the Service also signed a Candidate Conservation Agreement with Assurances (“CCAA”) with the Arizona Electric Power Cooperative for its transmission system in areas occupied by Sonoran desert tortoises).

In September, 2015, the Service issued a new SSA (“2015 SSA”) for the Sonoran desert tortoise. The 2015 SSA included a new habitat model and related population viability analysis and threats assessment which was used to estimate new population numbers and predict future trends. In October, 2015, the Service then reversed its previous warranted findings and issued a not warranted determination on Guardians and WWP’s petition to list the Sonoran desert tortoise. 80 Fed. Reg. 60,321 (Oct. 6, 2015). For support, the Service relied on various findings, assumptions, and conclusions in the 2015 SSA, including a novel habitat model and population viability analysis.

In response, Guardians and WWP challenged the Service’s 2015 not warranted determination in federal court in Arizona in 2019 alleging, among other things, that the determination was not supported by the best available science about the population status and trends of the Sonoran desert tortoise or threats facing the species now and into the foreseeable future. *WildEarth Guardians v. Bernhardt*, CV-19-00441-TUC-CKJ (D. Arizona). This case was eventually resolved through settlement in 2020 after the Service agreed to withdraw and re-evaluate its 2015 not warranted determination and issue a new 12-month finding within 18 months. During this time, the species was returned to the candidate list under the 2010 warranted but precluded determination. 85 Fed. Reg. 73,164 (Nov. 16, 2020). As part of the settlement, the Service also agreed to review the best available science before issuing a new decision (including any additional monitoring surveys) and to review, evaluate, and make a determination on the legal status of Sonoran desert tortoises in the Black Mountains area of western Mohave County, Arizona.

In 2021, the Service prepared a third, revised SSA for the Sonoran desert tortoise (“2021 SSA”). Based on the findings of the 2021 SSA and a related 2022 species assessment form, the Service published its 2022 not warranted determination for the Sonoran desert tortoise on February 8, 2022. 87 Fed. Reg. at 7,077.

The Service concluded that while the species faces various threats, the magnitude of those threats is not such to warrant federal protection under the ESA. The Service said its review of the best available science, including the past, present, and future threats to the Sonoran desert tortoise, reveals it is not “in danger of extinction nor likely to become endangered within the foreseeable future throughout all or a significant portion of its range” and therefore “does not meet the definition of an endangered species or threatened species under the [ESA].” 87 Fed. Reg. at 7,079.

With this letter, the Service is hereby put on notice that the 2022 not warranted determination violates the ESA and is arbitrary and capricious for the following reasons:

(1) No rational explanation for change in position from “warranted but precluded” to “not warranted”

First, the Service failed to provide a valid, reasonable, and rational explanation for why it reversed its previous warranted finding and subsequent CNOR reaffirmations. As explained by the Ninth Circuit, an “[u]nexplained inconsistency between agency actions is a ‘reason for holding an interpretation to be arbitrary and capricious.’” *Organized Village of Kake v. US Dept. of Agriculture*, 795 F. 3d 956, 966 (9th Cir. 2015) (citation omitted). Agencies are entitled to change their policies but must provide “good reasons” for the new policy, and if it rests on “factual findings that contradict those which underlay its prior policy,” the agency “must include ‘a reasoned explanation . . . for disregarding facts and circumstances that underlay or were engendered by the prior policy.’” *Id.* A policy change violates the law if “the agency ignores or countermands its earlier factual findings without [providing a] reasoned explanation for doing so . . .” *Id.* (citation omitted).

Here, the Service changed its position on listing the Sonoran desert tortoise in the absence of any intervening or new scientific studies that would justify such a change. Nor was a reasonable explanation provided by the agency. Nor were any errors identified in the 2010, 2011, 2012, 2013, or 2014 CNOR reiterations of the species “warranted” status, or the 2014 SSA.

Indeed, the only potentially relevant intervening event was the 2015 Candidate Conservation Agreement and possibly the 2018 CCAA, but neither of these agreements was mentioned or provided as the reason for the change in position (and they are barely mentioned in the 2022 not warranted finding). The 2015 Candidate Conservation Agreement also includes purely voluntary compliance measures which can be terminated without notice or penalty and, as such, cannot be used to avoid listing.

The Service did introduce a habitat model and related population viability analysis in the 2015 SSA and updated that model and analysis in the 2021 SSA. But as explained below, these models and the related population viability analyses conflict with the best available science and need to be re-examined.

(2) Failure to adequately consider and analyze the five ESA threat factors

Second, the Service violated the ESA by failing to adequately consider and analyze all five threat factors from section 4(a) of the ESA, 16 U.S.C. § 1533(a), before issuing its 2022 not warranted determination.

Pursuant to section 4(a)(1) of the ESA and the Service’s implementing regulations, the Service is required to determine whether a species is threatened or endangered because of any of the following factors: (A) the present or threatened destruction, modification, or curtailment of the species’ range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; and (E)

other man-made factors affecting the species' continued existence. *Tucson Herpetological Soc'y v. Salazar*, 566 F.3d 870, 873 (9th Cir. 2009) (citing 16 U.S.C. § 1533(a)(1); 50 C.F.R. § 424.11(c)). These factors are listed in the disjunctive so any one or combination of them can be sufficient for a finding that a species qualifies as threatened or endangered.

In deciding not to list the Sonoran desert tortoise, the Service failed to carefully consider and adequately apply Section 4(a)(1)'s listing factors as required by the ESA and the Service's implementing regulations.

The Service, for example, erroneously discounted and did not adequately analyze the direct, indirect, and *cumulative* effects to Sonoran desert tortoise of the ongoing invasion of non-native plant species, including but not limited to buffelgrass (which is expanding into the highest value tortoise habitat in Arizona and increases the risk of extreme wildfire). Stinknet is also a concern.

The Service similarly discounted and failed to analyze the direct, indirect, and cumulative effects that increased urbanization and population growth in tortoise habitat, energy development, roads and increased road-densities (see Averill-Murray (2023) (attached)), fragmentation of sub-populations that limit genetic exchange, increased OHV use and other human activities, including target shooting, collection, and vehicle mortalities, mesquite and ironwood tree harvest in Mexico, livestock grazing, illegal collection, human depredation, lack of adequate protections in land management plans, climate change impacts, including increased drought and wildfires, and other threats may have on the Sonoran desert tortoise now and into the foreseeable future.

In applying the ESA's five listing factors, the Service also erroneously discounted and did not adequately consider the lack of existing regulatory mechanisms for the Sonoran desert tortoise, specifically the lack of meaningful and binding direction (or even guidance) in state wildlife and resource management plans, National Forest Plans, National Park Service management plans, and Bureau of Land Management ("BLM") resource management plans. Importantly, Candidate Conservation Agreements - like the 2015 agreement on the Sonoran desert tortoise - are considered "non-regulatory conservation actions." 79 Fed. Reg. 69,192 (Nov. 20, 2014).

There are also no "regulatory mechanisms" in place in Mexico to protect the species and the Service does not have any regulatory authority to ensure the species is properly managed and conserved in Mexico. Also missing from the not warranted finding is any evidence, data or analysis on the species actual numbers and trends in Mexico (there are no monitoring plots there) and/or how the threats may vary from those in Arizona. The Service's reliance on the population in Mexico in support of its listing decision is thus arbitrary and flawed.

Further, there are a number of threats that were previously identified and discussed by the Service in its earlier warranted but precluded determinations - threats that must be addressed before any listing determination can be made - but were not adequately carried forward and

addressed in the 2022 not warranted finding. These include: (1) disease and predation; (2) habitat fragmentation leading to increased isolation and less connectivity between subpopulations which can break down metapopulation dynamics; (3) inadequate regulatory mechanisms in both the United States and Mexico; (4) over-utilization; (5) livestock grazing; (6) cumulative or synergistic threats; and (7) activities occurring in Mexico, including desert plant and tree harvest. In terms of habitat loss, there are also a number of activities discussed in the 2014 warranted determination that are largely ignored or discounted in the 2022 not warranted finding, including renewable energy development and OHV use.

The Service also failed to adequately consider and analyze how climate change has impacted, is currently impacting, and will continue to directly, indirectly, and cumulatively impact the Sonoran desert tortoise and its habitat and either ignored or arbitrarily dismissed the best available science and peer review on such impacts.

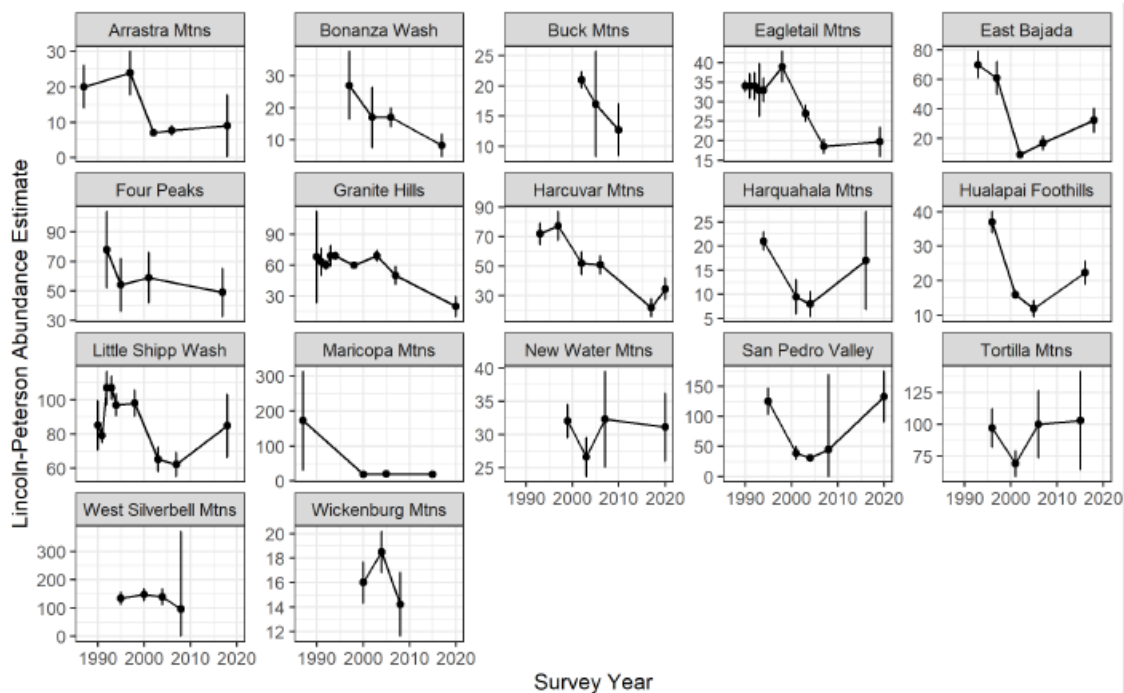
A number of scientific papers discuss these climate change concerns and, in particular, the related increase in fire and drought conditions and how they may adversely affect Sonoran desert tortoise numbers, demographics, and habitat.

Lovich (2023) (attached) documented high female desert tortoise mortality in the western Sonoran Desert during California's epic 2012-2016 drought. The authors noted that severe drought of more than two years, which will be more prevalent due to climate change, may compromise the tortoises' ability to survive in some circumstances. The authors also noted that low tortoise density and high mortality of females observed in the study "may reflect reduced survival of tortoises near the southern edge of their range due to climate change, including protracted and intensified droughts."

Sullivan (2021) – cited in the 2021 SSA – explained that drought conditions may be a factor in the complete lack of juvenile recruitment documented during his 10-year study of tortoises in the Union Hills area north of Phoenix. Despite documenting a large number of hatchlings (1-3 years of age), juvenile recruitment is lacking: "We have not observed any juvenile Sonoran desert tortoises since we began our study." Sullivan noted that when "monsoons are coupled with at least some winter rainfall (hatchlings are active throughout the winter, feeding and drinking regularly), we are able to observe them regularly, for up to three years. When drought occurs, we generally *lose all hatchlings*, and observe none until the next fall period when we begin to observe the next cohort." Sullivan also explained that this was the "primary concern" he had with the population. Sullivan (2021) explained that given "expected shifts in rainfall (most models indicate climate change will produce more variable rainfall patterns in the Sonoran Desert, with increasing drought prospects) . . . recruitment may be dramatically impacted in coming years. The anecdotal observations of zero recruitment for our population of Sonoran desert tortoises may be a sign of much more dire future trends." Review of the 2021 SSA and not warranted finding reveals the lack of juvenile recruitment in Sonoran desert tortoise populations is an important aspect of the problem that was simply overlooked by the Service (indeed, the studies relied on by the agency all simply assume – without any supporting evidence – a certain

level of recruitment).

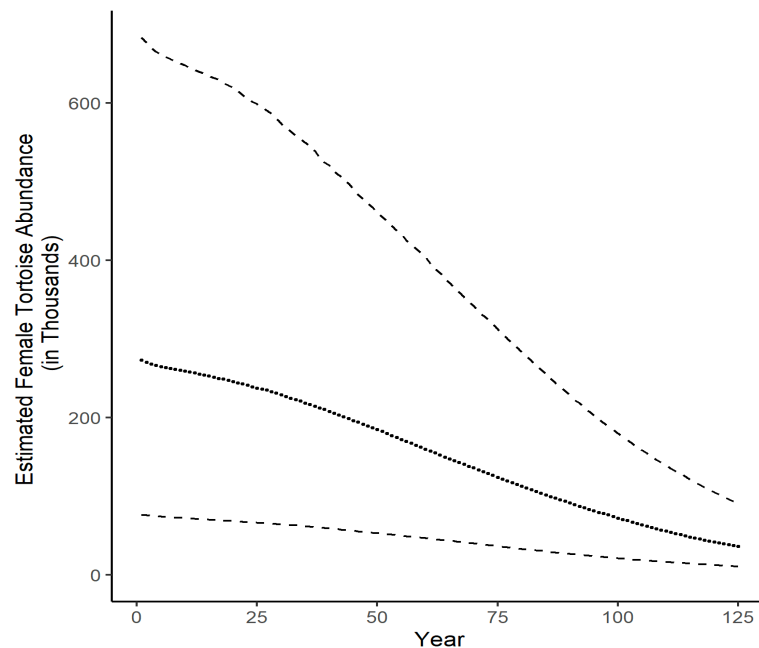
In other comments, Sullivan (2021b) noted an alarming negative or declining population trend in tortoise abundance from the late 1980s to 2020 in the 17 long-term monitoring plots discussed and referenced in the 2021 SSA (Figure 16). Over the past three decades, for example, 7 of the plots show decreasing populations in the most recent surveys and 10 of the 17 plots show fluctuating (up and down) populations but are ultimately declining. Two of the 17 fluctuate but are essentially the same in the earliest surveys as they are in the latest surveys. Sullivan explained that these “long-term negative trends in [Sonoran desert tortoise] densities across these sites are reason for concern.”



Zylstra and Steidl (2021) – which is cited by the agency in its not warranted finding – noted that if severe drought occurs and persists for 24 months or longer, many populations of Sonoran desert tortoises are likely (mean probability of decline is 83%) to experience significant declines given the adverse effects on survival of both juveniles and adults. The authors note that this is a “serious concern” in light of climate change projections for the desert southwest, which “indicate that drought severity, frequency, and duration are likely to increase over the next century.” The rates of population change for the Sonoran desert tortoise “and the probability of persistence over the next century will decline if drought frequency and severity increase.”

The Service’s own estimates in the 2021 SSA reveal significant declines in available habitat and population numbers are likely if severe drought conditions occur. The Service’s “high effects” scenario is frequently referred to as the climate change “business as usual” scenario suggesting it is

a likely outcome if society does not make concerted efforts to cut greenhouse gas emissions. Under this scenario, the Service admits that roughly 61% of all high suitability habitat (as defined by the agency) will be lost and the estimated median population is expected to decline in size by 86.8% over the next 125 years.



The best available science reveals that more severe and longer droughts are to be expected in the Sonoran desert tortoises' range now and into the foreseeable future. Not a single paper cited by the Service suggests otherwise.

A recent paper, Sinervo (2024) (attached), reviewed the most recent climate change projections (under various scenarios) and predicted significant changes to the population numbers and range of a number of desert species in the foreseeable future, including the Sonoran desert tortoise. The authors noted that the Sonoran desert tortoise is “at grave risk” of extinction by 2070 under the RCP 85 scenario with only 13% of the population remaining and still faces serious risks under the RCP 45 scenario with a 48% extinction risk. In response, Sinervo (2024) proposed urgent regional management strategies be developed for the Sonoran desert tortoise.

In 2023, the IUCN Red List published an assessment (attached) of the Sonoran desert tortoise and concluded, based on a number of factors, the species is “vulnerable” to extinction and “nearly qualifies as Endangered.” “Vulnerable” on the IUCN classification scheme means the species faces a high risk of extinction in the wild. The IUCN specifically noted a near 50% recent population decline in Arizona, and “[a]nticipated drought-related mortality and continued spread of invasive plants suggest that recent trends will likely continue into the future.”

Notably, a number of Sonoran desert tortoise subpopulations have already experienced significant die-offs due to drought, such as the Maricopa die off discussed in Averill-Murray (2000)

and Averill-Murray (2002), and there is an increased risk and severity of drought in the future.

In 2014, the Service cited and discussed a number of such papers on the dire threat climate change poses to the Sonoran desert tortoise, including Galbraith and Price (2009) which stated that the Sonoran desert tortoise is “highly vulnerable” to extinction from climate change. In November 2023, the Fifth National Climate Change Assessment was published. See <https://nca2023.globalchange.gov/chapter/28/> (last visited May, 2024) (attached). For the Southwest, the Assessment noted that the region is historically arid and marked by episodes of intense drought and precipitation and that climate change is expected to “exacerbate these conditions, as increasing temperatures are leading to hotter extreme heat events, drier soils, greater atmospheric evaporative demand, and reduced flows in major river basins such as the Colorado and Rio Grande.”

Williams (2020) (attached) documented the severe drought conditions in the Southwest from 2000-2018, noting that climate change exacerbated already severe conditions “on a trajectory consistent with the most severe past megadroughts.” Overpeck-Udall (2020) (attached) discusses increased aridification in the southwest due to climate change. The authors note that increased evapotranspiration due to climate change is creating an increasingly arid west, leading to more frequent, widespread, and severe drought. This is particularly pronounced in the already arid Southwest.

In 2021, NOAA’s Drought Task Force published a report on the 2020-2021 drought in the southwest (attached). One of the key findings: “The warm temperatures that helped to make this drought so intense and widespread will continue (and increase) until stringent climate mitigation is pursued and regional warming trends are reversed.” NOAA noted that continued warming of the southwest “due to greenhouse gas emissions will make even randomly occurring seasons of average to below average precipitation a potential drought trigger, and intensify droughts beyond what would be expected from rainfall or snowpack deficits alone.”

Williams (2020) and Overpeck-Udall (2020) also highlight that drought, and climate change impacts more broadly, are linked to more frequent, severe, and widespread wildfires. The best available science shows the Sonoran desert tortoise is vulnerable to direct mortality and indirect impacts, such as habitat conversion, from wildfire. The species’ risk from wildfire is projected to increase from the compounding impacts of climate change and the intrusion of more flammable non-native grasses, such as buffelgrass, in Sonoran desert tortoise habitat.

In the 2021 SSA and related not warranted finding, however, the Service downplays the threat from climate change and severe drought and does so without any supporting data or research. The Service concedes that climate change is a concern, noting that the climate change projections for the arid southwest indicate that drought frequency, severity, and duration “are likely to increase over the next century.” The Service also admits that drought has the most demonstrable effects on the Sonoran desert tortoise population and negatively affects reproduction, recruitment, and survival. Yet despite these concessions, the agency simply concludes that the likely effects from climate change will be relatively small based on its habitat

model and population viability analysis which, as explained below, conflicts with the best available science and must be reexamined.

(3) *Failure to utilize the best available science*

Third, the Service's not warranted finding conflicts with the best available science. Pursuant to Section 4(b)(1)(A), 16 U. S.C. § 1533(b)(1)(A), the Service's implementing regulations, and the Service's 2011 policy on scientific integrity, the Service must make all listing determinations "solely on the basis of the best scientific and commercial data available." This standard - often referred to as the "best available science" standard - does not require scientific certainty (assuming it even exists) or prohibit the Service from making listing decisions in the face of uncertainty or even scientific disagreement.

On the contrary, reliance upon the best available science, as opposed to requiring absolute scientific certainty, "is in keeping with congressional intent" that an agency "take preventative measures before a species is 'conclusively' headed for extinction." *Defenders of Wildlife v. Babbitt*, 958 F. Supp. 670, 679-80 (D.D.C.1997) (emphasis in original); see also *American Wildlands v. Norton*, 193 F. Supp. 2d 244, 251 (D.D.C.2002) (same). As such, contrary to the Service's listing decision, definitive conclusions are not required.

As explained by the Service when listing Canada lynx: "We agree that additional studies of lynx are necessary to better understand the dynamics and requirements of lynx populations in the contiguous United States . . . However, the [ESA] does not allow us to defer a listing decision based on the need for more research. Most scientists would agree that there is always a need for more research, but listing decisions cannot be postponed based on this premise when known threats to the species are present that may result in a species' trend toward extinction." 65 Fed. Reg. 16,052, 16,064 (March 24, 2000); see also 55 Fed. Reg. 26,114, 26,128 (June 26, 1990) (Northern spotted owl) (because the Service used "the best data available . . . [it was] not obligated to have data on all aspects of a species' biology prior to reaching a determination on listing."); 61 Fed. Reg. 25,813, 24,817 (May 23, 1996) (California red-legged frog) (deciding to list species even though many aspects of the species' status were "not completely understood"). A similar approach should have been applied with respect to the Sonoran desert tortoise.

Here, the Service's not warranted finding largely ignores and/or misinterprets and misconstrues the best available science on the existing Sonoran desert tortoise population in the wild (actual and trends, including lack of juvenile recruitment), the habitat needs of the species, and threats facing the Sonoran desert tortoise in Arizona and Mexico from climate change (as explained above), human development and access, drought, fire, and other cumulative stressors.

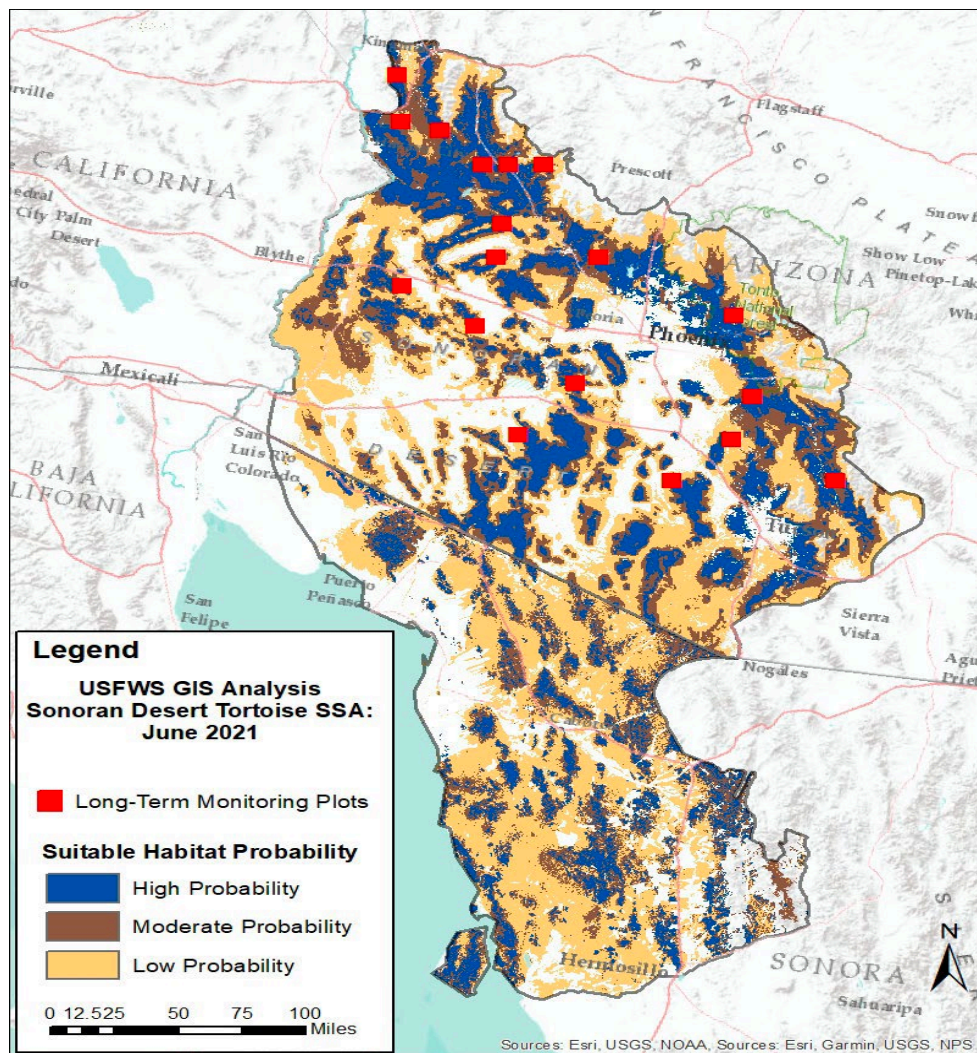
The Service's decision, for example, wrongly assumes that all Sonoran desert tortoises in Arizona exist as one single population (and wrongly assumes the same for Mexico). This is an assumption that has serious ramifications for the agency's threats assessment.

The best available science reveals Sonoran desert tortoises exist as a meta-population in

Arizona and Mexico with numerous subpopulations that are fragmented and isolated from each other but depend on some level of effective migration between them for long-term viability and genetic diversity. This population structure is critical to understanding the demography of and threats to Sonoran desert tortoises but was never analyzed or discussed in the final “not warranted” finding. This is true even in the short discussion on the threats posed by habitat fragmentation.

Further, the Service’s not warranted finding was premised on an SSA that includes a population viability analysis and habitat model to estimate population numbers and trends and measure the “redundancy and representation” of the species. But this analysis and model does not mirror reality, includes faulty assumptions (most notably about the existence of juvenile recruitment), is based on pure speculation, and conflicts with the best available science.

The Service’s habitat model categorizes currently available habitat for the Sonoran desert tortoise into three categories: high, moderate, or low.



Based on this model, the Service estimated there were roughly 11,938 square miles of “high” suitable habitat in Arizona and Mexico; 14,061 square miles of “moderate” suitable habitat in Arizona and Mexico; and 23,224 square miles of “low” suitable habitat in Arizona and Mexico. The Service then used this information to estimate the total population size for Sonoran desert tortoises in Arizona and Mexico. To do this, the agency extrapolated reported population densities from “high” suitable habitat areas (based on 17 long-term monitoring plots located in “high” suitability areas for which Lincoln-Peterson abundance estimates are available) and then “elicited” densities from these areas for the “moderate” and “low” habitat suitability classes. The Service estimated that high suitable habitat areas included 46 tortoises per square mile; moderate areas included 25 tortoises per square mile; and low areas included 6 tortoises per square mile. Based on this approach, the Service then estimated the total population of Sonoran desert tortoises to be 549,247 in Arizona and 273,013 in Mexico, for a total combined population of roughly 865,335 tortoises.

This habitat model and the population estimates and viability analysis which emerged from it, however – which influenced the Service’s entire listing decision and related threats assessment (including the anticipated climate change effects findings) – conflicts with the best available science for several reasons.

The best available peer-reviewed and published papers, for example, reveal there is no direct correlation between habitat quality and tortoise numbers. This assumption – which the agency heavily relies on to determine population estimates – is thus unsupported by the scientific literature. The Service’s density estimates in the habitat model are also problematic.

Notably, the Service arbitrarily used the “mean” (instead of “median”) densities from the 17 monitoring sites which significantly skewed the results and population estimates. The mean number is 46 tortoises per square mile but the median is only 23 tortoises per square mile. The choice to use the mean instead of the median is problematic because a few high-density sites increased the mean number but do not reflect the median amongst the sites. As explained in Sullivan (2021), in this situation it is the median number that more accurately reflects the likely densities at such sites – half of the sites had a density below 23 and half had a density above 23. Sullivan (2021) explains that “the median is the far more appropriate metric to estimate central tendency, and it is 23[,]” not 46.

Given that the more appropriate “median” value of 23 is half the value of 46 used by the Service to estimate densities at the “high” suitable sites, the entire habitat model and viability analysis (as well as the entire threats assessment) requires a “major reworking.”

This error also undermines the Service’s population estimates for *all* habitat classifications – including those for moderate and low sites. As Sullivan (2021) explains, the moderate habitat value of 25 tortoises per square mile was derived from the mean value of 46 (roughly 50% of the high value). For this reason, as explained by Sullivan (2021), the manner by which the Service generated the baseline population estimates to predict the number of tortoises across Arizona and

Mexico, “as well as the model,” must be “re-examined.”

Further, all of the long-term monitoring sites used for the habitat model population estimates were not random sampling sites for tortoises. Instead, the sites were all selected from “high” suitable habitat and, as Zylstra and Steidl (2021) notes, many were established in areas with known high densities of tortoises. Information from the sites was also cherry-picked. Sampling was taken from the “best” sites (instead of a random sampling) and samples from prior to 2000 were eliminated. This culling procedure yielded skewed results. For example, relatively high-density sites such as San Pedro, Tortilla, and Little Shipp Wash contributed three values to the density estimate while lower density sites like Bonanza Wash and Buck contributed just one value each.

Additionally, the habitat model used by the Service in its population viability analysis for the Sonoran desert tortoise is too coarse and unhelpful in assessing threats/impacts. The model also failed to include habitat characteristics that are important to Sonoran desert tortoises.

The availability of shelter sites, for instance, is considered the most critical factor for Sonoran desert tortoises but this parameter was not included in the habitat model. The Service relies on Zylstra and Steidl (2008) for its assumption about tortoise occupancy in areas with greater than 5 percent slope and how this criterion is the best predictor of occupancy. But, as explained by the authors and other experts during the peer review, this is only true *after* accounting for the number of potential shelter sites in such areas, which is many times more important than slope degree. The best available science, including Averill-Murray (2000), explains that while population densities vary, the most important feature is the availability of shelter sites. A number of other published papers agree with this finding. Yet the presence of shelter sites is not included in the coarse habitat suitability model used by the Service throughout the listing decision.

As previously explained, the model also incorrectly assumes there is “one” population of tortoises in Arizona and “one” population in Mexico, and that there is connectivity between subpopulations of tortoises (despite there being no evidence to support this assumption and despite the existence of a border wall and barrier). But this is not supported by the literature and constrains the agency’s ability to properly assess threats and trends to the species. The best available science reveals populations of tortoises exist as a meta-population and that many subpopulations are isolated and becoming increasingly fragmented from one another. This is true not only between tortoises in Arizona and Mexico (separated by a border wall and barrier) but also between subpopulations in Arizona.

Further, the Service’s habitat proxy model excludes a key dimension of redundancy and representation: demographic information on the Sonoran desert tortoise. As noted by one peer reviewer, Bob Steidl, using the distribution of habitat quantity and quality as measures of tortoise representation and redundancy is fine, but it misses a “key dimension” – demographic information on tortoises themselves. “It’s possible that there’s plenty of habitat, but no tortoises . . .” Using the habitat model to estimate abundance is thus “pure speculation” in the absence of actual demographic data to support the quality-related metrics.

The Service also has no data to characterize the reproductive rates and other early life stages (including juvenile recruitment) of the Sonoran desert tortoise. This information is critical to properly assess population viability, especially given the most recent concerns expressed in the scientific literature and in comments from tortoise experts (*see, e.g.*, Sullivan (2021)). The Service's findings are also contradicted by its own data and surveys on Sonoran desert tortoise occupancy in Arizona, including the 17 monitoring plots.

Under the ESA, scientific certainty is not required and the use of a proxy – including a habitat model – is acceptable in some situations. The Service, however, cannot infer from a lack of data or uncertainty that the population of Sonoran desert tortoises *remains viable* and in abundant numbers, which is what the agency did here. Without question, the habitat model used for the Service's population viability analysis is deeply flawed and fails to provide a “rational basis” to conclude the tortoise population is viable and not warranted for listing and not threatened by climate change or other stressors.

(4) Misapplication of the ESA's terms

Fourth, the Service's listing decision is premised on a misapplication of the terms “threatened” and “endangered” as used and applied in the ESA.

Pursuant to the ESA, a species is “threatened” if it 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). A species is “endangered” if it is “in danger of extinction throughout all or a significant portion of its range.” 16 U.S.C. § 1532(6). Construction of this language must be based on the best available science. *See Trout Unlimited v. Lohn*, 645 F.Supp. 2d 929, 947, 948 (D. Or. 2007); *Western Watersheds Project v. Foss*, 2005 WL 2002473, *15-17 (D. Id. 2005).

“Likely to become endangered” means “likely” to be “in danger of extinction.” *Lohn*, 645 F. Supp. 2d at 948. “[L]ikely’ clearly means something less than 100% certain, but how much less is not as clear.” *Id.* at 945. A reasonable construction of “likely” is at least a 50 percent chance (more likely than not). *Id.* at 949. In any case, the level of certainty relied upon by the Service must be based on consideration of the relevant statutory factors using the best available science. *Id.* at 947.

Likewise, “in danger of extinction” is not a fixed term, but its construction must be grounded in the best available science. *Id.* at 948. Certainly, “in danger of extinction” does not mean a “high risk of extinction.” *Western Watersheds Project*, 2005 WL 2002473, *17 (D. Id. 2005). “Instead, the required danger level for extinction necessarily depends on the applicable scientific viability assessments for the particular species.” *Lohn*, 645 F.Supp. at 948. For example, a one to five percent risk of extinction in 100 years can create a discernible risk of extinction. *Foss*, 2005 WL 2002473, *15 (citing *Center for Biological Diversity v. Lohn*, 296 F.Supp.2d 1223, 1232 (W.D.Wash.2003)).

The term “foreseeable future” must also be defined by reference to the best available science. *Foss*, 2005 WL 2002473, *15-17. As the Service recognized in a 2009 Solicitor Memorandum, “[t]he Secretary’s analysis of what constitutes the foreseeable future for a particular listing determination must be rooted in the best available data that allow predictions into the future, and the foreseeable future extends only so far as those predictions are reliable. ‘Reliable’ does not mean ‘certain’; it means sufficient to provide a reasonable degree of confidence in the prediction, in light of the conservation purposes of the Act.” M-Opinion 37021 at 13. What must be avoided is “speculation.” *Id.* at 8. The corollary is that the Service may not dismiss a risk of extinction that may be reasonably forecasted by science. *Foss*, 2005 WL 2002473, *15-17. It “defies common sense” to define “foreseeable future” to exclude the timeframe in which [the best available science] predict[s] extinction. *Id.* at 15. Prediction of the future is necessarily grounded in the “data and logic” of today. M-Opinion 37021 at 8. As one court reasoned, if a species will be endangered in the future if current circumstances continue, “it is clearly threatened today.” *Biodiversity Legal Found. v. Babbitt*, 943 F. Supp. 23, 25 n.5 (D.D.C. 1996).

With respect to the Sonoran desert tortoise, the Service failed to properly apply the ESA’s standards for “threatened” and “endangered” and the terms included therein when deciding not to list the species. This includes failing to properly define and analyze whether the Sonoran desert tortoise is likely to become endangered in the “foreseeable future” (and relying on a new regulatory definition of “foreseeable future,” 50 C.F.R. § 424.11(d), which raises the bar too high and conflicts with the statute).

The Service also arbitrarily limited its foreseeable future for Sonoran desert tortoises to the end of this century (2100) – or roughly 75 years. The Service likewise limited its climate change projections to only 75 years even though the best available climate change models and projections – including the Service’s own population viability scenarios in the SSA – extend beyond that timeframe to 125 years (and show considerable declines in abundance beyond 75 years). The population viability model undertaken in the 2015 SSA for the Sonoran desert tortoise goes out to 200 years (approximately 8 generations) but for “policy reasons” the Service based its not warranted finding on a shorter, three-generation timeframe. According to the best available science and the Service’s own policy, this is too short for a long-lived species like the Sonoran desert tortoise and conflicts with the ESA and how “foreseeable future” is to be interpreted.

(5) Failure to properly evaluate whether listing is appropriate in a “significant portion” of the species range

Fifth, the Service’s interpretation of “significant portion” and determination that the Sonoran desert tortoise is “not in danger of extinction in a significant portion of its range” is arbitrary and conflicts with the ESA.

Under the ESA and the Service’s implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so throughout all or “a significant portion of its range.” The evaluation of whether a portion of the species range is “significant” typically involves

a number of variables and factors, including (but not limited to) the size of the area, the percentage of the species' range, its biological and/or ecological importance, unique factors and habitat conditions, its importance for maintaining connectivity amongst subpopulations and facilitating genetic exchange, and whether its loss would result in the loss of a unique or critical function of the species. The focus of the analysis must be on the portion itself.

In 2014, the Service published a final rule interpreting the phrase "significant portion of its range." 79 Fed. Reg. 37,578 (July 1, 2014). The policy demands a high threshold for identifying a "significant portion." A portion of a species' range will only be deemed "significant" if its "contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range." *Id.* at 37,609. In other words, to qualify as a "significant portion" of a species' range, the loss of members in that portion must ultimately threaten the entire listable entity. Two district courts have held this interpretation of "significant portion of its range" to be unlawful. *See Desert Survivors v. U.S. Dept. of the Interior*, 321 F. Supp. 3d 1011 (N.D. Cal. 2018); *Center for Biological Diversity v. Jewell*, 248 F. Supp. 3d 946 (D. Ariz. 2017).

Here, the Service determined that no portions of the Sonoran desert tortoises' range qualify as a "significant portion," and even if they did, the species would not qualify for listing in that portion. This finding is arbitrary and conflicts with the ESA because the Service never developed a definition or standard for what "significant portion" means. In other words, there is no objective guidepost, bright-line standard, or test for what makes a portion significant or not. The Service also never explained how "significant portions" of the species' range were determined and analyzed, and no analysis is provided in the "not warranted" finding.

The Service also premised significance solely on whether there are "geographic concentrations" of potential threats in a portion of the species' range and never considered and evaluated other "significant" variables or factors. The Service places inappropriate weight on its finding that threats to the Sonoran desert tortoise are not "geographically concentrated." But this is not the test, as some threats like climate change may be widespread. The Service does not have the population data (only a coarse and unhelpful habitat proxy model) on tortoises necessary to make a "significance" finding. The Service's finding was made in the absence of any consideration of whether other, non-urban portions of the tortoises' range may be significant. The Service, for example, never evaluated whether the tortoises' Arizona and/or Mexico range is a "significant portion," even though the Service concedes the threats to the species differ in Mexico. The Service never evaluated whether certain mountain ranges and subpopulations within the Sonoran desert tortoises' range qualify as "significant." This includes but is not limited to areas facing more severe threats from non-native grass (including the invasion of buffelgrass) and climate change.

(6) *Arbitrary reliance on voluntary and speculative conservation measures*

Sixth, the Service's "not warranted" finding relies too heavily on largely voluntary and highly speculative actions that may or may not be taken by the State of Arizona and Mexican government.

Pursuant to section 4(b)(1)(A) of the ESA, 16 U. S.C. § 1533 (b)(1)(A), and the Service's implementing regulations, the Service must make listing determinations after "conducting a review of the status of the species and after taking into account those efforts, if any, being made by any State" to protect such species. The Service can rely on conservation efforts, including state-initiated efforts, so long as they are binding and current, not voluntary or future, and have a proven track record of success. See *Save Our Springs v. Babbitt*, 27 F. Supp. 2d 739, 748 (W.D. Tex. 1997); *Oregon Natural Res. Council v. Daley*, 6 F. Supp. 2d 1139, 1153 (D. Or. 1998); *Fed'n of Fly Fishers v. Daley*, 131 F. Supp. 2d 1158, 1165 (N.D. Cal. 2000); *Ctr. For Biological Diversity v. Morgenweck*, 351 F. Supp. 2d 1137, 1141 (D. Colo. 2004). A sufficient track record of success is two years. *Save Our Springs*, 27 F. Supp. 2d at 748. Any conservation effort relied upon by the Service must also have been submitted for public notice and comment. *Id.*; see also *Morgenweck*, 351 F. Supp. 2d at 1141.

Here, the Service's "not warranted" finding for the Sonoran desert tortoise inappropriately relies on non-binding efforts to conserve the species from the State of Arizona and purported "protected areas" in Mexico. The Service's decision to rely on efforts in Mexico is particularly egregious considering the veritable lack of necessary data, public lands, enforcement capacity, and binding accountability to the species' conservation in the region. The Service also fails to take into account and analyze the impacts to Sonoran desert tortoise conservation efforts from the existing and proposed barrier along the United States and Mexico border and associated on-the-ground enforcement activities.

(7) *No reliable data and no rational connection between facts found and decision made*

Seventh, the Service's "not warranted" and related findings are unsupported by reliable and meaningful data. Pursuant to the ESA and APA, the Service's findings - including listing decisions - must be supported by reliable and meaningful data and evidence, and there must be a rational connection between the facts found in the record and the ultimate choice made. *Defenders of Wildlife v. Babbitt*, 958 F. Supp. 670 (D.D.C. 1997).

Here, the Service's decision fails to utilize the best available science (as outlined above) and fails to provide biological data and support for its conclusion that the Sonoran desert tortoise is "not warranted" for listing. Data and evidence on the lack of juvenile recruitment, for instance, is missing from the decision or supporting SSA even though it was raised in comments by the public, by experts (including in Sullivan (2021)), and in the scientific literature. While the Service can "draw conclusions based on less than conclusive scientific evidence, it cannot base its conclusions on no evidence." *National Assoc. of Home Builders v. Norton*, 340 F.3d 835, 847 (9th Cir. 2003). There is also no rational connection between the facts found regarding the likely effects of climate change and severe drought on tortoises and the conclusion that the species is not likely to become endangered in the foreseeable future.

(8) *Failure to address the Black Mountains population*

Finally, the Service's decision to exclude desert tortoises in portions of the Black Mountains from its analysis is also arbitrary and contrary to the ESA. Guardians and WWP's original listing petition included tortoises in the Black Mountains area of western Mohave County, Arizona because they: (a) are isolated from and not protected by the Mojave desert tortoise DPS listing; (b) occur within the delineated Sonoran population range; and (c) the best available science revealed interbreeding occurs between Mojave desert tortoises and Sonoran desert tortoises in this geographic area.

Likewise, the Service's 2010 warranted but precluded determination and subsequent CNORs, as well as the Service's 2014 SSA, agreed and included tortoises in this area in its analysis and findings.

The Service's 2022 not warranted finding, however, excludes a portion of this population in the Black Mountains from the species range. The Service provides a short explanation for doing so, noting that the tortoises in a portion of this area have been determined to be Mojave desert tortoises and that some hybridization in other portions has occurred. But no explanation, details, guidance, or information is provided on the *legal status* of this population in light of this new finding. The Service, for instance, did not and is not proposing to amend the Mojave desert tortoises' listing status to include the Black Mountain population and the Service chose not to protect (or even analyze) this population when declining to list the Sonoran desert tortoise population.

Tortoises in the Black Mountains have thus fallen through the proverbial cracks, i.e., not protected as a Mojave desert tortoise or considered within the range of the Sonoran desert tortoise. This is arbitrary. The Service cannot have it both ways. If, as the Service maintains, tortoises in the Black Mountains are Mojave desert tortoises (*Gopherus agassizii*), then the Service must amend the original listing for this species and adjust the boundaries to include the Black Mountain population. If not, then the Service must carefully evaluate and analyze whether to list the Sonoran desert portion of this population (and at the very least include it in its analysis).

With this letter, therefore, the below listed organizations put the Service on notice of their intent to sue for violations of the ESA and inform the agencies of our intent to file a citizen suit under the ESA seeking the appropriate relief.

If you have any questions regarding this notice or would like to meet with representatives from the undersigned organizations regarding this notice and their concerns, please contact me at the e-mail address or number below.

Thank you.

Sincerely,

/s/ Matthew Bishop

Matthew Bishop
Western Environmental Law Center
103 Reeder's Alley
Helena, MT 59601
(406) 324-8011 (tel.)
bishop@westernlaw.org

/s/ David Woodsmall

David Woodsmall
Western Environmental Law Center
120 Shelton McMurphey Blvd., Suite 340
Eugene, OR 97401
(971) 285-3632
woodsmall@westernlaw.org

On behalf of:

Western Watersheds Project
Contact: Cyndi Tuell
cyndi@westernwatersheds.org

WildEarth Guardians
Contact: Lindsay Larris
llarris@wildearthguardians.org

Tucson Herpetological Society
Contact: Robert Villa
cascabel1985@gmail.com

Desert Tortoise Council
Contact: Mari Quillman
mquillman@ecorpconsulting.com