



March 20, 2019

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Re: Status and Trend of Agassiz's Desert Tortoise Populations

Dear Paul and Glen;

On behalf of Defenders of Wildlife (Defenders) and the Desert Tortoise Council (Council), we are writing to express concern over the decline in the status and trend of Agassiz's desert tortoise (*Gopherus agassizii*) populations throughout this species' range.

This letter provides background information on tortoise populations derived primarily from systematic surveys and published reports available from the U.S. Fish and Wildlife Service's Desert Tortoise Recovery Office (USFWS DTRO); various publications on desert tortoise recovery (i.e. Desert Tortoise Recovery Plan Assessment, and the 2018 publication on

Status and Trend Agassiz's Desert Tortoise Populations

Population Trends in Mojave Desert Tortoises). It also includes recommendations from our two organizations to address continued population declines of this species, particularly within the western Mojave Desert.

Defenders is a national conservation organization with 1.8 million members in the U.S., including 279,000 supporters in California. Defenders is dedicated to protecting all wild animals and plants in their natural communities. To this end, we employ science, public education and participation, media, legislative advocacy, litigation, and proactive on-the-ground solutions to impede the accelerating rate of species extinctions, associated loss of biological diversity, habitat alteration and loss.

The Council is a non-profit organization comprised of hundreds of professionals and laypersons who share a common concern for wild desert tortoises and a commitment to advancing the public's understanding of this species. Established in 1975 to promote conservation of tortoises in the deserts of the southwestern United States and Mexico, the Council regularly provides information to individuals, organizations and regulatory agencies on matters potentially affecting the desert tortoise within its geographical range.

Background

Line-distance sampling of adult Agassiz's desert tortoise populations within designated critical habitat units has been overseen by the USFWS DTRO since 2001, except for 2006 and for those units in Utah. In the latter state, Agassiz's desert tortoise populations within designated critical habitat units have been monitored by the Utah Division of Wildlife Resources since 1999, using the same methodology. The USFWS DTRO has published annual reports of the results of line-distance sampling throughout the range of the species through the USFWS DTRO website.¹

Below are key findings from recent published reports on the status and trend of Agassiz's desert tortoise populations:

1. U.S. Fish and Wildlife Service 2015.²

- Densities of adult desert tortoise populations have experienced large declines since 2004, with some critical habitat units declining over 50%.
- Over a 10-year period from 2004 to 2014, desert tortoise populations in critical habitat units lost an estimated 40,660 adults compared to the baseline population of 126,346 that were estimated in 2004, for an average loss of 32%.

¹ https://www.fws.gov/nevada/desert_tortoise/dtro/dtro_monitor.html

² U.S. Fish and Wildlife Service. 2015. Range-wide Monitoring of the Mojave Desert Tortoise (*Gopherus agassizii*): 2013 and 2014 Annual Reports. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada.

- Suitable habitat outside of critical habitat is likely more degraded due to lack of legal protection, resulting in the probability that population declines are greater than those reported within critical habitat. We believe that the federal designation of Agassiz's desert tortoise warrants elevating to endangered status rather than threatened.

2. U.S. Fish and Wildlife Service 2018.³

- Density of resident adult desert tortoises within specific critical habitat units in 2017 (Table 1) were derived from line-distance sampling (reported as number/km²): (Note: minimum density of viable populations is 3.9 adults/km²).⁴

Table 1. Density of resident adult desert tortoises within specific critical habitat units in 2017.

Critical Habitat Unit	Density	At minimum viable density in 2017 (Y/N)
Fremont-Kramer	4.1	Y
Ord-Rodman	3.2	N
Superior-Cronese	1.7	N
Chocolate Mountains	9.4	Y
Chuckwalla	4.3	Y
Joshua Tree	3.6	N
Pinto Mountains	2.3	N
Piute Valley	5.9	Y
Eldorado Valley	5.6	Y
Beaver Dam Slope	1.3	N
Gold Butte-Pakoon	1.9	N

3. Allison and McLuckie 2018.⁵

- The magnitude and rate of decline in adult desert tortoise abundance in four out of five recovery units demonstrates that aggressive implementation of recovery actions and evaluation of the individual direct, indirect and cumulative impacts of land use activities and projects and their role in driving population declines is needed immediately.
- The probability of observing a juvenile desert tortoise was consistently lower in the Western Mojave Recovery Unit, which implies limited recruitment of new tortoises.

³ U.S. Fish and Wildlife Service 2018. Range-wide Monitoring of the Mojave Desert Tortoise (*Gopherus agassizii*): 2017 Annual Reporting. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada.

⁴ Fish and Wildlife Service. 1994. Desert tortoise (Mojave population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. Page 32.

⁵ Allison, L., and A.M. McLuckie. 2018. Population trends in Mojave Desert Tortoises (*Gopherus agassizii*). *Herpetological Conservation and Biology* 13:433-42.

- The desert tortoise is undergoing large, continuing adult population declines, with some in critical habitat units declining by over 50% since line-distance sampling began in 2001.
- Between 2004 and 2014, densities of adult desert tortoises in the Western Mojave declined by 51%, and in the Eastern Mojave by 67%. Such precipitous declines may be sustainable if there were large commensurate increases in reproduction and juvenile survival, which has not occurred within these recovery units.
- Severe and ongoing decline in desert tortoise populations in four of five critical habitat units demonstrate the species is headed to extinction, which may be attributed to insufficient implementation of recovery actions, slow response to implemented actions intended to increase populations or restore habitat, or insufficient mitigation of ongoing and new impacts resulting from human activities and land uses.
- There is an immediate need to substantially reduce or eliminate activities that directly and indirectly cause/contribute to mortality and habitat loss within critical habitat units, as well as those occurring in suitable habitat outside of critical habitat units (e.g., linkage areas).

4. Tracy, C.R., et al. 2004.⁶

- Studies of distribution and abundance of desert tortoises reveal the species is moving away from recovery in portions of its range, indicating a need for aggressive recovery actions.
- Since desert tortoises are exposed to numerous complex threats, it is insufficient to implement actions focused on a single threat and then assume a population increase will occur. A recovery action removing one threat may not contribute to recovery because the adverse effects of other concurrent threats may diminish any benefits of the original action.
- Existing data support the theory that desert tortoises exist in metapopulations, whereas the recovery plan assumed populations were more evenly distributed over large areas. In contrast, metapopulation theory is that desert tortoises are distributed in patches based on habitat suitability, which are connected by linkages or corridors that allow individuals to move to and from patches. Since desert tortoises exist in metapopulations, habitat linkages between them need to be protected to sustain overall abundance and healthy populations across the landscape.
- Updated surveys in the Western Mojave corresponding with areas of desert tortoise decline revealed that more roads exist than were documented in 1987. A portion of the increase in roads is probably attributable to legal or illegal road creation from 1987-2001.

⁶ Tracy, C.R., et al. 2004. Desert Tortoise Recovery Plan Assessment. U.S. Fish and Wildlife Service Desert Tortoise Recovery Office, Reno, Nevada.
https://www.fws.gov/nevada/desert_tortoise/documents/dtrpac/dtrpac_report.pdf.

- Based on data analyses, the Desert Tortoise Recovery Plan Assessment Committee is considering recommending that the U.S. Fish and Wildlife Service elevate the desert tortoise in the Western Mojave Distinct Population Segment (DPS) to endangered as it is in danger of extinction in the foreseeable future. This DPS has all the elements of an endangered species [five criteria in section 4 of the Federal Endangered Species Act (ESA)]:
 - Loss of habitat
 - Over utilization for commercial, recreational, scientific, or educational purposes
 - Disease or predation
 - The inadequacy of existing regulatory mechanisms
 - Other natural or manmade factors

Discussion

Defenders and the Council fully appreciate the U.S. Fish and Wildlife Service and its hard-working staff involved in Agassiz's desert tortoise recovery. We particularly appreciate making line-distance sampling reports for Agassiz's desert tortoise available to the public, and the facilitation of tortoise recovery through establishing local Recovery Implementation Teams. We greatly appreciate your appointment of staff from both Defenders and the Council on several of those teams.

During the 30 years since the tortoise was listed, the USFWS has developed two recovery plans (1994 and 2011), designated critical habitat, established Recovery Implementation Teams and prepared recovery action plans and, with the financial support from other agencies, monitored the status of the species.

We recognize that while some recovery actions have been implemented, they have been relatively limited in extent or implemented as pilot projects. As a result, they have not resulted in an effective contribution to the recovery of the tortoise. Recovery implementation should occur at the Recovery Unit level through implementation of recovery actions within Critical Habitat Units and habitat linkages between them.

We recommend that the USFWS now increase its efforts on implementation of recovery actions through the following:

- Allocate a substantial portion of discretionary funding for recovery at the regional and field offices to direct implementation of recovery actions (also see "Recommendations" below).
- Allocate 50% of funding for annual line-distance sampling to implementing recovery actions, or approximately \$500,000.

- Implement multiple recovery actions in Critical Habitat Units and linkages simultaneously so that the most significant threats can be resolved in a timely, effective manner.

Since its emergency listing as endangered nearly 30 years ago in 1989, and final listing as threatened in 1990, recovery of the Agassiz's desert tortoise has proven elusive throughout its entire range, and under current conditions and management, its recovery throughout a large majority of its range appears impossible. Ongoing declines in density and number of adult populations; low recruitment of new individuals; and reduced survival of juveniles in four out of five Recovery Units indicate the species is heading toward extinction. Indeed, minimum viable populations occur in five of 11 Critical Habitat Units and six have populations below minimum viable density, with most continuing to experience ongoing annual population declines. As noted in the Background section of this letter, the status of the species in the Western Mojave Recovery Unit is of greatest concern, due to the extent and severity of multiple threats.

Among the most recent research publications on the effects of various threats on desert tortoise populations is *Modeling Agassiz's Desert Tortoise Population Response to Anthropogenic Stressors*.⁷ The authors modeled ongoing stressors (threats) within the Superior-Cronese Critical Habitat Unit in California, and the Gold Butte-Pakoon Critical Habitat Unit in Nevada. Threats more widely distributed in time and space within these areas significantly limited tortoise population growth more than threats that were patchily distributed or temporary.

Superior-Cronese Critical Habitat Unit: Modeled threats in the Superior-Cronese unit in the western Mojave Desert revealed the top three threats associated with population decline were 1) human presence, 2) subsidized predators, and 3) disease. The human presence model resulted in rapid and significant declines in the population. The modeled threats and their consequences in the Superior-Cronese unit were considered applicable to other units in the western Mojave, such as the Fremont-Kramer and Ord-Rodman Critical Habitat Units. The authors recommended that land managers should focus on “...*reducing human access and making it more remote, particularly in areas identified as having higher tortoise occurrence potential. The most effective ways that land managers can promote remoteness in the conservation area include closing and restoring routes and trails, limiting recreational permits, and increasing law enforcement to prevent illegal activities.*”

Gold Butte-Pakoon Critical Habitat Unit: In the Gold Butte-Pakoon unit, the top three modeled threats associated with population decline were 1) presence of livestock and feral burros, 2)

⁷ Tuma, M.W., et al. 2016. Modeling Agassiz's Desert Tortoise Population Response to Anthropogenic Stressors. *Journal of Wildlife Management* 80:414–429. (<https://wildlife.onlinelibrary.wiley.com/doi/pdf/10.1002/jwmg.1044>).

human presence, and 3) subsidized predators. Presence of livestock and feral burros resulted in the most significant tortoise population decline. The authors recommended that land managers should “...remove all livestock and feral burros from the conservation area, particularly in areas identified as having higher tortoise occurrence.” And “restore disturbed lands within the conservation area, including closed roads and routes, and areas damaged by illegal off-highway vehicle use, livestock grazing, and feral burros.”

Recommendations

1. Prioritization of recovery action projects. Desert tortoise recovery action projects are identified and prioritized through the Desert Tortoise Recovery Implementation Teams working in concert with the DTMOG. Proposed projects should be prioritized according to their contribution to desert tortoise recovery with priority given to those projects within critical habitat units experiencing severe and ongoing declines in adult, juvenile and hatchling populations. The current project prioritization process does not appear to take into account, or prioritize, recovery actions based severity of population declines.

2. Mortality investigations: Because desert tortoise demographic studies conducted on long-term plots have largely ended, information on specific causes of mortality are no longer collected except on an opportunistic basis. Current line-distance sampling procedures do not include collection of mortality data on dead individuals encountered on randomly-placed transects. We recommend that a mortality investigation procedure be established, separate from or integrated into the annual line-distance sampling, to document specific sources of mortality within each sampled critical habitat unit. This information is badly needed to help design and prioritize recovery projects intended to substantially reduce severe and ongoing decline, stabilize populations, and transition declining populations toward recovery.

3. Implement recovery action projects based on threats: Until line-distance sampling demonstrates that desert tortoise populations have stabilized, are increasing over multiple years of sampling, and adults have exceeded the minimum viable density of 3.9/km², priority recovery action projects should be generally limited to those designed to avoid or substantially reduce current sources of direct and indirect mortality in critical habitat units where ongoing population declines have been documented and remain below the viability threshold. Such recovery action projects can be prepared and implemented based on existing information, and adjusted based on new, focused mortality investigations identified above. For example, based on Tuma et al. (2016), the following recovery action projects should be developed and implemented as soon as possible:

Western Mojave Recovery Unit: Tuma et al. (2016) researched factors associated with population decline in the Superior-Cronese Critical Habitat Unit and the authors indicated the same factors apply to other critical habitat units in the western Mojave Desert.

The exceptions are Fremont-Kramer and Ord-Rodman Critical Habitat Units, where livestock grazing is an additional stressor unique to those units. Prominent land uses in the Superior-Cronese unit include off-highway vehicle use, utility development, military activities, mining, and agriculture. Tuma et al. (2016) stated, *“We recommend that land and wildlife managers focus their priorities for tortoise conservation on efforts that reduce threats that are wide in distribution, constant in occurrence, and cause an increase in mortality and habitat degradation.”*

The following recovery action projects in critical habitat units in the Western Mojave should be developed and implemented in an expedited manner:

Reducing human presence (all critical habitat units): The human presence threat model resulted in the most abrupt and significant decline in tortoise populations. Tuma et al. (2016) recommended, *“...land managers should focus on reducing human access to this conservation area, and making it more remote, particularly in areas identified as having higher tortoise occurrence potential. The most effective ways that land managers can promote remoteness in the conservation area include closing and restoring routes and trails, limiting recreational permits, and increasing law enforcement to prevent illegal activities.”*

- Restrict motorized vehicle use: Motorized vehicle use within all critical habitat units (totaling 979,878 acres) and desert tortoise habitat linkages within the Western Mojave Recovery Unit, should be limited to street-legal vehicles. This would require BLM to revise the West Mojave Plan amendment to the California Desert Conservation Area (CDCA) Plan, planned for release in April of 2019.
- Reduce miles of open routes: Miles of routes designated open to motorized vehicle use within critical habitat units and habitat linkages should be substantially reduced to minimize mortality and habitat loss.

Rationale for recommendations: The Revised Desert Tortoise Recovery Plan⁸ recommended that ***“Non-essential or redundant routes should be closed, especially within tortoise conservation areas*** (emphasis added). *Emergency closures of dirt roads and routes may also be needed to reduce human access and disturbance in areas where human-caused mortality of desert tortoises is a problem. Road closures are a particularly high priority in all recovery units except Upper Virgin River (moderate priority).”* (Revised Recovery Plan, p. 72).

⁸ U.S. Fish and Wildlife Service. 2011. Revised recovery plan for the Mojave population of the desert tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222 pp.

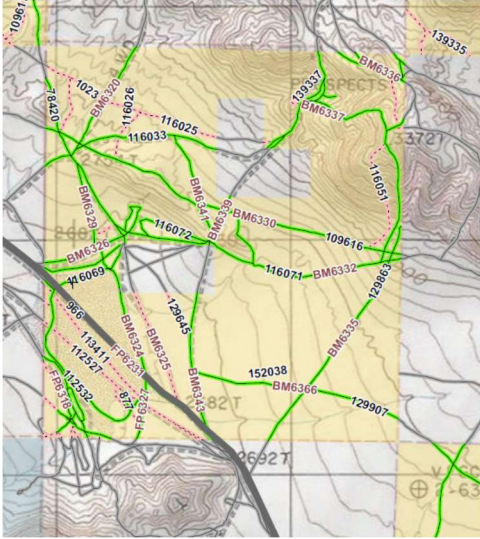
There is an ongoing, severe decline in adult Agassiz's desert tortoise populations throughout the Mojave Desert region. Over 75% of designated critical habitat units have desert tortoise densities below the viability threshold of 3.9 adults/km².

Berry et al. (2015)⁹ reported benefits of management on tortoises, finding that tortoise density in the protected Desert Tortoise Research Natural Area (DTRNA) was 14.8/km² compared to 2.4/km² in the adjacent unprotected Fremont Valley, which is within the Fremont-Kramer Critical Habitat Unit. Concurrently, the tortoise mortality rate in the protected DTRNA (2.8%/year) was found to be far lower than tortoise mortality occurring in the adjacent unprotected Fremont Valley (20.4%/year).

BLM's current planning in California Desert tortoise habitat (i.e., the Draft Supplemental Environmental Impact Statement for the West Mojave Plan to be released in April 2019), includes a proposed action that would designate 2,319 miles of routes open for motorized vehicle use in critical habitat designated for the desert tortoise. This compares with 2,353 miles that would be designated as open for vehicle travel under the No Action alternative (i.e., the existing situation). A recognized 34-mile difference between the BLM's proposed action and a No Action alternative, with many routes selected for continued vehicle use clearly non-essential and redundant to a minimal route network, will not meaningfully contribute to recovery of the desert tortoise.

BLM's proposed open route network on a specific public land section south of the Gravel Hills in the Superior-Cronese Critical Habitat Unit illustrates this point directly. Proposed closed routes are identified in red and open routes are shown in green and clearly illustrate this route density is not minimal or limited. Nor will designated closed routes disappear any time in the foreseeable future. Other portions of BLM's proposed vehicle route network within designated desert tortoise critical habitat units is similar.

⁹ Berry, K.H., et al. 2015. Protection Benefits Desert Tortoise (*Gopherus agassizii*) Abundance: The Influence of Three Management Strategies on a Threatened Species. Herpetological Monographs, 28 2014, 66–92. Published by the Herpetologists' League, Inc.



- Reduce subsidized predators (all critical habitat units): Tuma et al. (2016) found the threat to tortoises from subsidized predators was widely distributed because of proximity to Barstow, smaller outlying communities, ranches and single-family residences distributed throughout the area, and human presence associated with a dense network of roads and trails. The authors identified common raven and coyote as subsidized predators.

Federal agencies in the California portion of the Mojave Desert have been implementing the interagency Raven Monitoring and Removal Program for several years. This has resulted in agencies providing 1) education and outreach, 2) addressing tortoise predator subsidies, 3) removal of unoccupied common raven nests, 4) addressing communal raven roosting sites, 5) removal of predating ravens, and 6) identification of additional raven and coyote control methods through focused research. However, there has been significantly less recovery action implementation targeting mammal predator subsidies.

We recommend systematic control of subsidized predators that addresses both common ravens and coyotes. Control of common ravens should include ongoing removal of predating ravens and unoccupied nests, as well as modifying structures to preclude future nesting, and continued implementation of egg-oiling, which shows promise in reducing recruitment of young ravens into tortoise critical habitats. Arrangements should be made with electricity transmission utilities to remove unoccupied raven nests from utility alignments in a timely manner.

Rationale for recommendation: The Fremont-Kramer, Superior-Cronese and Ord-Rodman Critical Habitat Units are among the higher action implementation priority areas due to the high common raven and coyote numbers drawn to human population centers. BLM has found tortoise mortality from 1998 to 2002 in the region was very high

relative to subsidized predators.¹⁰ Allison and McLuckie¹¹ additionally have found that juvenile desert tortoise populations have been in decline in all five recovery units since monitoring began in 2007, indicating that hatchling tortoises are not being recruited into populations in sufficient numbers.

Although the study and control of subsidized predators (common ravens) in general are prioritized by Recovery Implementation Teams, associated actions on the ground are limited to specific management areas (i.e., California City, within and adjacent to the Mojave National Preserve, and in rural areas of the Colorado Desert Recovery Unit). Additional critical habitat unit areas have exhibited severe and abrupt declines related to subsidized predators that are not being addressed. From FY 2009-2013, a total of 42 predating ravens were removed within critical habitat units in California for a total cost of approximately \$40,000.¹²

- Remove livestock (Fremont-Kramer and Ord-Rodman Critical Habitat Units): Tuma et al. (2016) reported that livestock grazing in the Gold Butte-Pakoon Critical Habitat Unit was the highest ranked stressor in reducing the desert tortoise population. The authors recommended that all livestock (and feral burros) be removed, especially in habitat areas having higher potential to support desert tortoises. The same applies to the Fremont-Kramer and Ord-Rodman Critical Habitat Units in the Western Mojave Recovery Unit.

Grazing in the Fremont-Kramer Critical Habitat Unit currently occurs on 6,726 acres of the Cantil Common Allotment (sheep) and grazing in the Ord-Rodman Critical Habitat Unit occurs on 107,779 Ord Mountain Allotment (cattle) and 3,323 acres of the Shadow Mountain Allotment (sheep). BLM's Draft Supplemental Impact Statement for the West Mojave Plan proposes to continue livestock grazing on these two allotments under the proposed action, and under the same terms and conditions as the under the proposed action. Line-distance sampling of adult desert tortoise populations within the Fremont-Kramer Critical Habitat Unit documented that density is slightly above the minimum viable population density, but with a continued downward trend. It should also be noted that adult tortoise density in the Ord-Rodman Critical Habitat Unit is currently below the minimum viable population density.

Conclusion

Defenders and the Council provide these recommendations to address ongoing threats to Agassiz's desert tortoise. We realize our recommendations require a revisit of BLM's California

¹⁰ Bureau of Land Management. 2005. West Mojave Plan, Final Environmental Impact Report and Statement, Appendix L. Moreno Valley, CA.

¹¹ Allison, L., and A.M. McLuckie. 2018. Population trends in Mojave Desert Tortoises (*Gopherus agassizii*). *Herpetological Conservation and Biology* 13:433-42.

¹² Russell Scofield, Bureau of Land Management. 2013. Personal communication.

Desert Conservation Plan through the West Mojave Plan amendment process currently underway.

We are deeply concerned over the ongoing and steep declines in Agassiz's desert tortoise populations as documented in annual reports of line-distance sampling. We consider our recommendations as outlined herein critical to preventing the total collapse of Agassiz's desert tortoise populations, especially in those critical habitat units where adult tortoise density is below the minimum viable threshold.

Sincerely,



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