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Via email and BLM NEPA eplanning

September 26, 2023

Angelica Rose
Bureau of Land Management
Kingman Field Office
2755 Mission Boulevard
Kingman, AZ 86401
adrose@blm.gov

RE: Palmerita Ranch Allotment No. 00094 Permit Issuance Environmental Assessment (DOI-
BLM-AZ-C010-2023-0023-EA)

Dear Ms. Rose,

The Desert Tortoise Council (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 desert tortoise species. Established in 1975 to promote conservation of tortoises in the deserts of the southwestern United States and Mexico, the Council routinely provides information and other forms of assistance to individuals, organizations, and regulatory agencies on matters potentially affecting desert tortoises within their geographic ranges.

Both our physical and email addresses are provided above in our letterhead for your use when providing future correspondence to us. When given a choice, we prefer to receive emails for future correspondence, as mail delivered via the U.S. Postal Service may take several days to be delivered. Email is an "environmentally friendlier way" of receiving correspondence and documents rather than "snail mail."

We appreciate this opportunity to provide comments on the above-referenced proposed action. Given the location of the proposed action in habitats known to be occupied by the Sonoran desert tortoise (*Gopherus morafkai*) (synonymous with Morafka's desert tortoise), our comments include recommendations intended to enhance protection of this species and its habitat during activities authorized by the Bureau of Land Management (BLM), which we recommend be implemented

when making a decision about the proposed action. Please accept, carefully review, and include in the relevant project file the Council's following comments for the proposed action.

Proposed Action

The purpose of this action is for BLM to respond to an application for renewal of a livestock grazing permit.

History of the Grazing Allotment

According to BLM's Palmerita Ranch Allotment No. 00094 Permit Issuance Environmental Assessment (Draft EA), the Palmerita allotment has not been utilized since 1996 despite the grazing authorization not expiring until 2001. The carrying capacity of the most recent permit was 99 cattle or 927 animal unit months (AUMs) with yearlong grazing use and seasonal rest for river areas.

Description of the Allotment

The Palmerita Allotment is about 52,898 acres of which 31,792 acres is BLM-administered land, 7,863 acres is other Federal lands, 1,886 acres is private land, and 11,357 acres is Arizona State Trust land acres managed by the Arizona State Land Department (ASLD) (Figure 1). It includes the Palmerita Ranch.

The area is comprised of the desert valley that lies between the Harcuvar Mountains to the south and the Santa Maria River to the north. The area sits just east of Alamo Lake. According to BLM's Rangeland Health Assessment for Palmerita Allotment (RHA) (BLM 2023), vegetation is comprised of Sonoran Desert Scrub with Mojave Desert Scrub influences. Typical species include Joshua tree (*Yucca brevifolia*), saguaro (*Carnegiea gigantea*), palo verde (*Parkinsonia microphylla*), creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), big galleta grass (*Hilaria rigida*), Mormon tea (*Ephedra trifurca*), and cholla (*Cylindropuntia* spp.). BLM's Rangeland Health Assessment also mentions the presence of non-native plant species including *Schismus* spp. and *Erodium cicutarium*. Average yearly precipitation ranges from 3-7 inches in the lowest elevations (~1,100 ft.) to 10-13 inches in the highest (~3,800 ft.). About half of the precipitation is received in the winter and with an equal amount received during erratic summer monsoons. The allotment is located in LaPaz, Yavapai, and Mohave counties, Arizona.

Alternatives Analyzed

BLM has proposed five alternatives: Alternative A - Grazing Permit Issued with Adaptive Management, Alternative B - Preexisting Grazing Authorization, Alternative C - Grazing Permitted with Year-round Upland Use with No River Use, Alternative D - Ephemeral Grazing with Seasonal Restrictions on the River Pasture, and Alternative E - No Grazing Permit Issued.

Alternative A: This is BLM's Proposed Action or Preferred Alternative. Livestock (622 Animal Unit Months = AUMs) would be allowed to graze in upland portions of the Palmerita allotment year-round, with supplemental fall-winter grazing (November 1 through February 28) of 305 AUMs in the riparian areas of the Big Sandy and Santa Maria rivers. A combination of seasonal grazing (i.e., fall-winter grazing in the

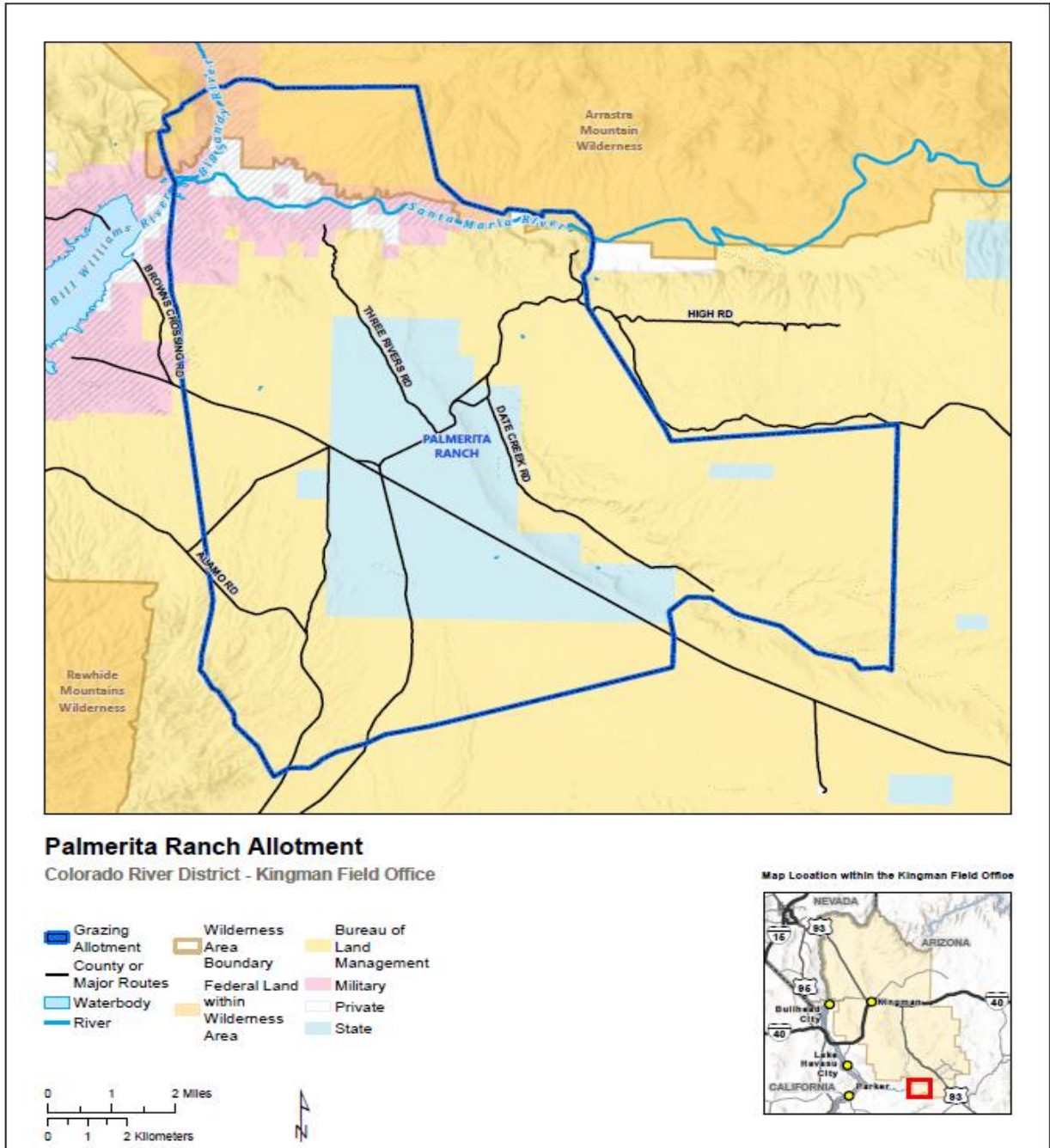


Figure 1. Map of Palmerita Allotment and land ownership within the allotment boundary.

riparian pasture), herding (to manage use within the prescribed utilization limits), and off-stream water development and mineral supplement placement (to draw livestock to different portions of the allotment and shift use areas over time) would be used to help manage grazing in riparian areas. If utilization of perennial forage species exceeds 40%, livestock would be moved to a new water or pasture in the uplands.

The permittee, along with the BLM, would reconstruct and maintain all existing range improvements on the Palmerita allotment and construct and maintain new improvements, as needed, for the life of the grazing permit. Reconstructed improvements include stock

tanks, wells (along with their associated loading chutes, traps, and pens), pipeline, fences, and repairing and adding gates as necessary. These range improvements would occur within the original construction footprint. New improvements would include construction and maintenance of – (1) a new fence to create a new pasture in the east area of the allotment to aid in livestock rotation and distribution; (2) gates in the riparian fence where the fence intersects off-highway vehicle (OHV) trails and roads. If ineffective in maintaining the integrity of the riparian fence, cattle guards would be installed; (3) temporary troughs with water hauled by trucks in the southern portion of the allotment, and (4) installing and operating a pump, pipeline, and trough at an existing well to provide water for cattle during the river’s season of use and draw them out of the floodplain. The reconstruction and maintenance of the pipeline would extend approximately 1,100 feet outside of the allotment to nearby Grapevine Spring.

Conservation Measures - The BLM and the permittee would minimize vegetation disturbance during reconstruction and/or maintenance of the existing range improvements. They will avoid removing vegetation during the general migratory bird-breeding season (February 15–August 31) around active bird nests.

Alternative B: BLM would renew the grazing permit with the same terms and conditions as for the last permit issued. Under BLM’s grazing regulations, a renewal with no changes to the last issued permit is the No Action Alternative. Year-round grazing of 314 AUMs would be authorized in the upland pasture. November through February grazing of 154 AUMs would be authorized in the upland and riparian pastures.

Alternative C: Grazing would be authorized year-round in the uplands to a maximum number of 99 livestock for a maximum of 622 AUMs. Reconstruction and maintenance of existing range improvements and construction and maintenance of new improvements would be authorized. No grazing would occur in the riparian pasture.

Alternative D: Grazing would be authorized when ephemeral forage is sufficient. No more than 40 percent of available ephemeral forage may be grazed and grazing may only be authorized when seeds are present on ephemeral forage species. Livestock would not utilize the riparian pasture during the growing season.

Alternative E: Livestock grazing would not be authorized on public lands within the Palmerita allotment for a term of 10 years. Upon expiration of the 10-year period, livestock grazing would be re-evaluated for approval of a grazing application.

Affected Environment

The Draft EA and Appendix E identified 6,615 acres of Category II Sonoran desert tortoise habitat as occurring in the allotment (Figure 2). Category II habitat is defined as having a goal “to maintain

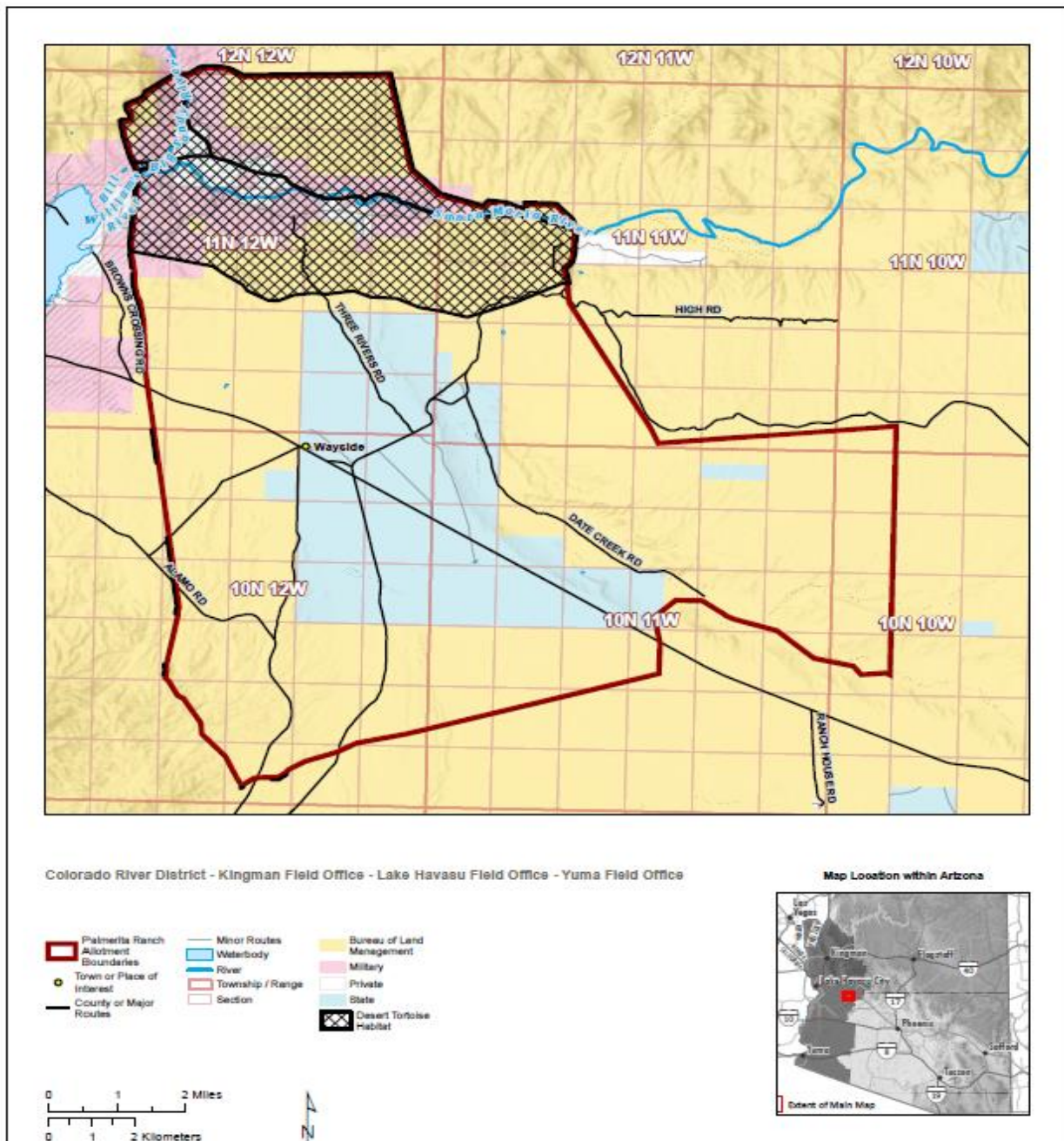


Figure 2. Location of Category II Sonoran desert tortoise habitat in the Palmerita Grazing Allotment, Arizona.

stable, viable populations and halt further declines in tortoise habitat values.” Category II habitat is: “1) Habitat that may be essential to the maintenance of viable populations; 2) Habitat where most conflicts are resolvable; and 3) Habitat that contains medium to high densities of tortoises or low densities contiguous with medium or high densities.”

Comments on the Draft EA

The Council does not believe BLM has provided a suitable range of alternatives. BLM's focus appears to be on developing alternatives to manage for riparian habitat by eliminating or reducing grazing impacts. BLM lacks the same alternatives to managing upland habitat. Please correct this perceived deficiency.

In developing other alternatives to manage upland area in the allotment and reduce grazing impacts, we remind BLM of its commitment to manage for the tortoise in the Sonoran Desert Tortoise Candidate Conservation Agreement (Agreement) (USFWS et al. 2015). As a signatory to this Agreement, BLM committed to implementing:

- (1) BLM Manual 6840 (BLM 2008) that establishes specific procedures for managing the Sonoran desert tortoise as it is a BLM sensitive species, with the goal of conserving the Sonoran desert tortoise and its habitat on BLM-managed lands in cooperation with other agencies;
- (2) landscape level conservation measures (e.g., identifying areas of potential conflict between agency mission and Sonoran desert tortoise habitat and identifying and reducing or otherwise mitigating dispersal barriers between Sonoran desert tortoise populations, etc.); and
- (3) local level conservation measures (e.g., considering the effects of actions on the Sonoran desert tortoise during the planning process, and avoiding or minimizing impacts, or implementing mitigation measures to offset impacts to tortoise populations and habitat where practical and feasible, avoid, where practicable, or otherwise minimize or mitigate adverse effects of actions that could result in isolation of known Sonoran desert tortoise populations and/or landscape-level fragmentation of Sonoran desert tortoise habitat, etc.).

These three measures may only be effectively implemented when BLM knows the status and trend of the tortoise populations on the lands it manages and where the direct and indirect impacts to the tortoise are occurring, especially at a landscape level, and thus affecting tortoise populations. The Council is concerned about projects and management decisions that contribute to degradation and loss of tortoise habitat (including habitat needed for connectivity among populations)(CEQ 2023) from habitat fragmentation, activities that introduce and spread non-native plant species, wildfires, etc., which result in a reduction in tortoises. To conduct an accurate regional or cumulative effects analysis and comply with the Agreement, BLM would need to track these and other impacts to the tortoise at a local and landscape level using a geospatial tracking system for all management actions and projects that it authorizes, funds, or implements. Issued grazing permits and their impacts to tortoise/tortoise habitats should be added to BLM's geospatial tracking system.

In the Agreement, BLM says, that through [its] Resource Management Plans (RMPs), BLM managers are directed to “[a]void, minimize or mitigate impacts associated with all BLM authorized activities including mineral material sales, rights-of-way, recreational use, travel management, and *livestock grazing* [emphasis added] through project design and modifications to allowable uses in order to achieve Sonoran desert tortoise management objectives” (USFWS et al. 2015). BLM should explain and analyze in the Draft EA how it will mitigate (avoid, minimize, and/or compensate) direct, indirect, and cumulative impacts associated with the alternatives in this Draft EA at a local and landscape level to achieve Sonoran desert management objectives. BLM

should also explain how it will comply with its Rangewide Plan (BLM 1988) and Compensation for the Desert Tortoise (Desert Tortoise MOG 1991) for this proposed action.

From the alternatives and supporting data presented in the Draft EA, the Council opposes implementation of all alternatives except the No Grazing Alternative. There is abundant research in the scientific literature that describes and analyzes the adverse effects of grazing on soils, native vegetation, and wildlife including desert tortoises, and on the beneficial impacts of grazing to non-native vegetation. Please see “Appendix A: Summary of Impacts from Livestock Grazing to the Sonoran Desert Tortoise and Its Habitat” attached to this letter. Unfortunately, BLM has not included the results of these analyses in the Draft EA with respect to the tortoise/tortoise habitat. Furthermore, we found no citations to support how BLM determined that the proposed number of AUMs in the upland areas of the allotment is justified, especially given BLM’s commitment in the Agreement to the tortoise.

Grazing results in several types of impacts to tortoise/tortoise habitat. Livestock “selectively remove biomass of some plants, grazing potentially can result in reductions in productivity, density, cover, and dominance of preferred forage species. In addition to impacts resulting from herbivory, livestock also can impact plant communities: (1) directly through trampling and other mechanical disturbances of the vegetation; (2) indirectly through impacts to soil resources that alter ecological processes such as hydrologic regimes, nutrient cycles, disturbance regimes, or competitive interactions (including those involving invasion by non-native species); and (3) through the effects of associated water developments and other range improvements. (Hall et al. 2005).

BLM provides the results for the three standards it uses to conduct its RHA for this allotment, one of which applies only to riparian areas. The results for upland areas in the Palmerita allotment were:

- for Standard 1 - Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform, the allotment – one of the four key areas did not “achieve” this standard;
- for Standard 3 - Desired Resource Condition Objective: Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained – two of the four key areas did not achieve this standard.

If the Palmerita allotment currently does not achieve range health standards, we question why BLM is proposing to authorize grazing after having no authorized grazing since 1996. This suggests that previous grazing management practices were damaging to the natural resources in the allotment and these resources have not recovered despite the absence of authorized grazing. Given the decades required for revegetation to occur (Abella 2010), it is not surprising that for Standard 3, vegetation communities of native species have not recovered. It may also suggest that other allowable uses within the allotment boundary are negatively impacting the rangeland health of the lands in this allotment. The Council requests that BLM provide data, analysis, and references that support its proposed action including the newly calculated AUMs and demonstrate how the proposed action will achieve rangeland health standards and successfully contribute to BLM implementing the three measures in the Agreement listed above.

BLM should consider the increasing adverse impacts of soil moisture depletion and drought/loss of vegetation (Stahle 2020, Hantson et al. 2021, Williams et al. 2022), non-native invasive plants,

the size and frequency of wildfires in an environment with vegetation not adapted to fire, and climate change that are occurring in the southwestern United States. BLM should also consider that ephemeral grazing systems may be particularly detrimental to the tortoise because their survival, reproduction, and growth depend on years of above average annual forage production (Medica et al. 1975). Jennings and Berry (2015) reported that Mojave desert tortoises are selective herbivores that alter their diet according to the temporal availability of preferred food plants, choose food plants non-randomly, and rely on key plants during different phenological periods of spring, many of which are rare in occurrence. Sonoran desert tortoises likely use a similar feeding strategy for survival. Please ensure that the analysis in the EA includes these numerous stressors to the tortoise and how they impact tortoise/tortoise habitat and feeding strategies of the tortoise.

The restoration, maintenance, and new construction of artificial watering sites in the allotment creates increased livestock densities near these watering sites and results in disturbance gradients called piospheres that extend several hundred meters from the watering sites. Brooks et al. (2006) reported that the absolute and proportional cover of non-native annual plants increased with proximity to these artificial watering sites, whereas cover and species richness of native annual plants decreased. Not all non-native plant species responded the same, with *Erodium cicutarium* and *Schismus* spp. increasing with proximity to watering sites. Because of this effect, BLM should regularly monitor the conditions of soils (e.g., compaction Standard 1) and vegetation composition and density (Standard 3) for native and non-native plant species in these piospheres to determine their change with respect to these ecological conditions and implement effective management to reduce the occurrence of non-native plants.

We strongly advise BLM to not authorize grazing in this allotment until it has conducted an analysis of these recent adverse effects to soils, native vegetation, and wildlife and the ability of desert environments to continue to support and sustain native natural resources including the tortoise. Similarly, BLM should not authorize ephemeral grazing until it has conducted an analysis of (1) the quantity, quality, and diversity of native annual and perennial herbaceous vegetation that must be present to support and sustain tortoise populations, (2) whether this vegetation occurs in the allotment, and (3) whether authorizing up to 40 percent utilization of grazing ephemeral forage would adversely affect the tortoise population from surviving, reproducing, and growing.

If BLM authorizes grazing in the Palmerita allotment, any construction, reconstruction, and maintenance activities should comply with the following documents or their most recent versions:

- Arizona Game and Fish Department. 2010. Desert Tortoise Survey Guidelines for Environmental Consultants
- Arizona Game and Fish Department. 2014. Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects
- Arizona Interagency Desert Tortoise Team. 2008. Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat. June 2008
- Bureau of Land Management. 2021. Instructional Memorandum on Mitigation (2021a), Mitigation Handbook (2021b), and Mitigation Manual (2021c)
- Bureau of Land Management 2022. Habitat Connectivity on Public Lands Instruction Memorandum 2023-005.

For example, if the proposed action is implemented, the Draft EA indicates that cattle guards may be installed and a pipeline would be constructed. We request that the Draft EA include requirements to avoid injury and mortality of tortoise such as designing, constructing, and

maintaining cattle guards so tortoises are not trapped in them when trying to cross them and trenching for pipeline construction and maintenance is covered so tortoise and other small wildlife are not able to access the trench and become trapped (e.g., require that trenches are covered and before filling, checked for wildlife and safely remove any wildlife present).

We have been experiencing a megadrought since 2000 in the southwestern United States (Stahle 2020, Williams et al. 2022), the worst long-term drought in more than 1200 years. Also documented has been a strong decline in vegetation cover, with the drier locations showing the strongest decline (Hantson et al. 2021). Dryland ecosystems may be more susceptible to changing climate than previously thought (Hantson et al. 2021). As noted by Archer and Predick (2008), vegetation in arid lands that live near their physiological limits are experiencing additional stressors from climate change.

Livestock production is a major producer of greenhouse gas (GHG) emissions and a significant contributor to climate change (IPCC 1990, Dijkstra et al. 2011, McGregor et al. 2021). The livestock sector is responsible for 18% of global anthropogenic greenhouse gas emissions, with enteric CH₄ of livestock being 25% of the livestock related greenhouse gases (Dijkstra et al. 2011). It appears that authorization of any grazing would result in greenhouse gas emissions. Please explain in the EA how an alternative that would authorize grazing, which would be approved by the federal government and occur on public land, complies with the President's Executive Order 14008 on "Tackling the Climate Crisis at Home and Abroad" (e.g., section 204, etc.).

Kauffman et al. (2022) recently reported that livestock grazed on public lands "influence climate change in three profound ways: (1) they are significant sources of greenhouse gases through enteric fermentation and manure deposition; (2) they defoliate native plants, trample vegetation and soils, and accelerate the spread of exotic species resulting in a shift in landscape function from carbon sinks to sources of greenhouse gases; and (3) they exacerbate the effects of climate change on ecosystems by creating warmer and drier conditions." Kauffman et al. (2022) calculated part of the social cost of livestock grazing and it far exceeded the grazing fees charged on public lands. They concluded that "[c]essation of grazing would decrease greenhouse gas emissions, improve soil and water resources, and would enhance/sustain native species biodiversity thus representing an important and cost-effective adaptive approach to climate change" (Kauffman et al. 2022).

Removing or reducing livestock across large areas of public land would alleviate a widely recognized and long-term stressor and make these lands less susceptible to the effects of climate change (Beschta et al. 2013). Where livestock use continues, or where significant densities of wild or feral ungulates occur, management should carefully document the ecological, social, and economic consequences (both costs and benefits) to better ensure management that minimizes ungulate impacts to plant and animal communities, soils, and water resources (Beschta et al. 2013).

We request that the EA analyze the effects of the grazing alternatives on climate change. This analysis should include: (1) effects to habitats within the allotment and adjacent areas affected by grazing that provide important habitat for the tortoise and connectivity habitat to other tortoise populations near the allotment; (2) how the grazing alternatives would affect the spread and proliferation of nonnative invasive plant species, both existing and new; (3) how this spread/proliferation would affect the Sonoran desert tortoise and its habitats (including its nutrition and the frequency, size, and intensity of fires); and (4) how the grazing alternatives may affect the likelihood of fires. We reiterate that if BLM uses science to form its decision, BLM would select

the No Grazing alternative as the costs of grazing on public lands far outweigh the benefits to the human environment.

Cumulative Effects Analysis

The Draft EA includes sections on cumulative impacts to vegetation resources and wildlife. However, we request that BLM modify its cumulative impacts analysis to follow CEQ's (1997) "Considering Cumulative Effects under the National Environmental Policy Act," including its eight principles (listed below), when analyzing cumulative effects of the proposed action and other alternatives to the tortoise and its habitats. CEQ states, "Determining the cumulative environmental consequences of an action requires delineating the cause-and-effect relationships between the multiple actions and the resources, ecosystems, and human communities of concern. The range of actions that must be considered includes not only the Project proposals but all connected and similar actions that could contribute to cumulative effects." The analysis "must describe the response of the resource to this environmental change." Cumulative impact analysis should "address the sustainability of resources, ecosystems, and human communities."

CEQ's guidance on how to analyze cumulative environmental consequences is given in the eight principles listed below:

1. Cumulative effects are caused by the aggregate of past, present, and reasonable future actions.

The effects of a proposed action on a given resource, ecosystem, and human community, include the present and future effects added to the effects that have taken place in the past. Such cumulative effects must also be added to the effects (past, present, and future) caused by all other actions that affect the same resource.

2. Cumulative effects are the total effect, including both direct and indirect effects, on a given resource, ecosystem, and human community of all actions taken, no matter who (federal, non-federal, or private) has taken the actions.

Individual effects from disparate activities may add up or interact to cause additional effects not apparent when looking at the individual effect at one time. The additional effects contributed by actions unrelated to the proposed action must be included in the analysis of cumulative effects.

3. Cumulative effects need to be analyzed in terms of the specific resource, ecosystem, and human community being affected.

Environmental effects are often evaluated from the perspective of the proposed action. Analyzing cumulative effects requires focusing on the resources, ecosystem, and human community that may be affected and developing an adequate understanding of how the resources are susceptible to effects.

4. It is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful.

For cumulative effects analysis to help the decision maker and inform interested parties, it must be limited through scoping to effects that can be evaluated meaningfully. The boundaries for evaluating cumulative effects should be expanded to the point at which the resource is no longer affected significantly or the effects are no longer of interest to the affected parties.

5. Cumulative effects on a given resource, ecosystem, and human community are rarely aligned with political or administrative boundaries.

Resources are typically demarcated according to agency responsibilities, county lines, grazing allotments, or other administrative boundaries. Because natural and sociocultural resources are not usually so aligned, each political entity actually manages only a piece of the affected resource or ecosystem. Cumulative effects analysis on natural systems must use natural ecological boundaries and analysis of human communities must use actual sociocultural boundaries to ensure including all effects.

6. Cumulative effects may result from the accumulation of similar effects or the synergistic interaction of different effects.

Repeated actions may cause effects to build up through simple addition (more and more of the same type of effect), and the same or different actions may produce effects that interact to produce cumulative effects greater than the sum of the effects.

7. Cumulative effects may last for many years beyond the life of the action that caused the effects.

Some actions cause damage lasting far longer than the life of the action itself (e.g., acid mine damage, radioactive waste contamination, species extinctions). Cumulative effects analysis need to apply the best science and forecasting techniques to assess potential catastrophic consequences in the future.

8. Each affected resource, ecosystem, and human community must be analyzed in terms of its capacity to accommodate additional effects, based on its own time and space parameters.

Analysts tend to think in terms of how the resource, ecosystem, and human community will be modified given the action's development needs. The most effective cumulative effects analysis focuses on what is needed to ensure long-term productivity or sustainability of the resource.

We request that the EA include these eight principles in its analysis of cumulative impacts to the Sonoran desert tortoise with an emphasis on principle 5 through 8 for the tortoise.

In addition, we request that BLM add this proposed action, if a permit is issued, and its impacts to a BLM database and geospatial tracking system for special status species, including Mojave and Sonoran desert tortoises, that track cumulative impacts (e.g., surface disturbance, paved and unpaved routes, linear projects, invasive species occurrence, herbicide /pesticide use, wildfires, grazing allotments, range improvements, etc.), management decisions, and effectiveness of mitigation for each project. Without such a tracking system, BLM is unable to analyze cumulative impacts to special status species (e.g., desert tortoises) with any degree of confidence. Without such a tracking system, BLM is unable to determine whether its management for the tortoise complies with its commitment in the Agreement that includes implementing landscape level conservation measures (USFWS et al. 2015, Section 9.1.1), local conservation measures (Section USFWS et al. 2015, 9.1.2), and Agency-Specific Species and Habitat Conservation Actions (USFWS et al. 2015, Section 9.2.1 for BLM). Please explain in the EA how the proposed action will adhere to these commitments in the Agreement.

Appendix C – Maps: Figures 3 through 5 show crosshatching on some area but we were unable to find this cross hatching in the legend. Consequently, we are not sure what the crosshatching means. Please add this information in the Final EA.

The legends for Figures 3 -5 indicate that some of the land in the northern portions of the allotment is military. Please include information which branch of the military manages this land, its purpose (i.e., what it is managed for) and whether the livestock grazing is compatible with this use.

We appreciate this opportunity to provide the above comments and trust they will help protect tortoises during any resulting authorized activities. Herein, we reiterate that the Desert Tortoise Council wants to be identified as an Affected Interest for this and all other projects funded, authorized, or carried out by the BLM that may affect desert tortoises, and that any subsequent environmental documentation for this proposed action is provided to us at the contact information listed above. Additionally, we ask that you respond in an email that you have received this comment letter so we can be sure our concerns have been registered with the appropriate personnel and office for this proposed action.

Respectfully,



Edward L. LaRue, Jr., M.S.
Chairperson, Ecosystems Advisory Committee

Attachment: Appendix A: Summary of Impacts from Livestock Grazing to the Sonoran Desert Tortoise and Its Habitat

Cc: Tracy Stone-Manning, Director, Bureau of Land Management, tstonemanning@blm.gov
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Appendix A: Summary of Impacts from Livestock Grazing to the Sonoran Desert Tortoise and Its Habitat (from The Nature Conservancy. 2005. The impacts of livestock grazing in the Sonoran Desert: a Literature review and synthesis. February 2005.)

Where livestock and desert tortoise habitat overlap, livestock can cause direct impacts to juvenile and adult tortoises by trampling and crushing individuals (Grover and DeFalco 1995, Howland and Rorabaugh 2002). Indirect impacts of livestock grazing to desert tortoise are primarily due to potential competition for forage. The desert tortoise is a generalist feeder that has been documented to consume 199 species of plants associated with the Arizona Upland Subdivision of the Sonoran Desert (Van Devender and others 2002). The desert tortoise, however, is on the physiological edge of survival in the desert and must maintain optimal levels of blood hydration, salt, and mineral levels through its diet (Oftedal 2002) or run the risk of dehydration, starvation, or liver and kidney disease (Dickinson and others 2002).

Where livestock and tortoise overlap in habitat, competition for nutritionally important forage species can be a threat, particularly in the spring after high winter rainfall years (Oftedal 2002). Major forage species in the Sonoran Desert include native grasses, desert vine (*Janusia gracilis*), and mallows, including desert rose mallow (*Hibiscus coulteri*), globe mallow (*Sphaeralcea ambigua*), and Indian mallow (*Albutilon* sp.). Competition with livestock for forage has the potential to impact desert tortoise nutritional condition and water balance. Spring forage availability is associated with female reproduction and hatchling emergence. As a result, ephemeral grazing systems may be particularly detrimental to desert tortoise because their growth and reproduction depends on years of above average annual forage production (Medica et al. 1975). In the eastern portions of the Sonoran Desert and especially within the Arizona Upland Subdivision, warm season plants, including C4 grasses, may usurp the dietary importance of winter annuals (Oftedal 2002).

Non-native plants including filaree (*Erodium cicutarium*), Malta starthistle (*Centaruea melitensis*), Mediterranean grass (*Schismus barbatus*), red brome (*Bromus rubens*), Sahara mustard (*Brassica tournefortii*), and Russian thistle (*Salsola tragus*) have been documented as generally a minor part of the diet, with only red brome and filaree at times reported as a major component (Oftedal 2002, Van Devender and others 2002). Although the nutrient value of some non-native plants that are used by desert tortoise are similar to native plants when compared within the same taxonomic groups and life forms, the presence of non-native plants that are invasive—and in particular alter fire regimes—may have an indirect effect on desert tortoise diet by causing a reduction in the abundance and richness of native forage plants (Van Devender and others 2002 and references therein). Therefore, a concern exists that desert tortoise nutrition and long-term condition may be compromised with shifts in plant communities from predominantly native species to increased abundance of invasive non-native species. For example, the replacement of C4 grasses by annual non-native C3 grasses may impact the nutritional status of tortoises given the lower protein and potassium excretion potential content of C3 desert grasses and the associated rapid decline in such content due to rapid phenological maturation (Oftedal 2002). Livestock grazing has been implicated as a cause of the occurrence and spread of many invasive non-native species.

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