

#### DESERT TORTOISE COUNCIL

3807 Sierra Highway #6-4514 Acton, CA 93510

www.deserttortoise.org eac@deserttortoise.org

#### Via email and BLM NEPA eplanning portal

June 29, 2023

Attn: Tammy Pike, Nancy Favour
Lower Sonoran Field Office
Bureau of Land Management
2020 E. Bell Rd.
Phoenix, AZ 85022
BLM\_AZ\_LS\_AjoTravelMgmtPlan@blm.gov
tpike@blm.gov; nfavour@blm.gov

RE: Public Scoping for Ajo Travel Management Area Travel Management Plan and Environmental Assessment (DOI-BLM-AZ-P020-2023-0005-EA)

Dear Ms. Pike and Ms. Favour,

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.

As of June 2022, our mailing address has changed to:
Desert Tortoise Council
3807 Sierra Highway #6-4514
Acton, CA 93510.

Our email address has not changed. Both addresses are provided above in our letterhead for your use when providing future correspondence to us.

We appreciate this opportunity to provide comments on the above-referenced project. Given the location of the proposed project in habitats likely occupied by Sonoran desert tortoise (*Gopherus* 

*morafkai*) (synonymous with Morafka's desert tortoise), our comments pertain to enhancing protection of this species during activities funded, authorized, or carried out by the Bureau of Land Management (BLM), which we assume will be added to the Decision Record for this project as needed. Please accept, carefully review, and include in the relevant project file the Council's following comments and attachments for the proposed action.

#### **Description of Proposed Action**

According to the BLM National Environmental Policy Act (NEPA) ePlanning webpage, BLM's Lower Sonoran Field Office (LSFO) "proposes to designate a comprehensive network of motorized routes and trails for managing travel within the Ajo Travel Management Area (TMA). This Ajo Travel Management Area Travel Management Plan (TMP) is comprehensive in that it addresses access for recreational, traditional, casual, agricultural, commercial, and educational uses as well as access for resource management purposes. It also considers all modes and conditions of travel on public lands, including typical highway vehicles (low-clearance sedans and trucks), four-wheel drive (4WD) vehicles, motorcycles, utility terrain vehicles (UTVs), all-terrain vehicles (ATVs), bicycles, electric bicycles (e-bikes), equestrian, and foot travel."

BLM is requesting "feedback on whether there are additional routes that should be considered in this planning effort, which routes you use, what activities do these routes provide access for, if there are other areas you want to access, and any concerns you may have about resource impacts in the area. The public is encouraged to review the inventoried routes and make comments. A link to the inventoried routes is available on the Documents and Maps pages."

The Ajo TMA is located in western Pima County, Arizona. It is bordered on the north by Barry M. Goldwater Air Force Range, on the east by the Tohono O'odham Nation, on the south by Organ Pipe Cactus National Monument, and on the west by Cabeza Prieta National Wildlife Refuge (NWR).

#### Scoping Comments on the Proposed Ajo Travel Management Area Travel Management Plan and Environmental Assessment

The Council learned about this proposed action from a third party. We have serious concerns about BLM's unwillingness to comply with the Council's repeated written requests to BLM that the Council be considered an Affected Interest for any BLM proposed action that may affect species of desert tortoises or their habitats and as an Affected Interest, be notified of these proposed actions. Since 2016, we have included this request in dozens of comment letters we have sent to BLM on various proposed actions that may affect tortoises that BLM analyzed NEPA and other public comment processes. When BLM did not comply with our requests, in 2019 we sent certified letters reiterating this request to BLM district managers in southern California, southern Nevada, western and southern Arizona, and southwestern Utah (the range of the Mojave desert tortoise and Sonoran desert tortoise) and several field managers. When most BLM district and field offices continued to not honor our request to notify us of BLM proposed actions affecting tortoise/tortoise habitat, we copied our comment letters with this request to the BLM state directors of these four states and the BLM director and assistant directors to ensure our requests were received by upper

management. Our reasoning for this action was that upper management would then direct management and staff that they supervise at the state, district, and field office levels to honor the Council's request, and BLM would notify the Council of proposed actions affecting tortoises/tortoise habitat. Apparently, our reasoning was faulty for this BLM proposed action. We are not sure how to communicate the Council's request to the BLM field, district, and state offices in the range of tortoises to ensure the Council's involvement in BLM's proposed actions under NEPA and other public participation periods. We request BLM's assistance in this matter to ensure that this and future requests made by the Council are honored by BLM.

At the conclusion of this letter, we request again that the Council be considered an Affected Interest in this and all other actions by BLM that may affect species of tortoises in the southwestern United States (emphasis added). As the lead for the Ajo TMP, we kindly request that you honor our request, and that you communicate this information to the supervisor and the public affairs supervisor for your office for this and future projects funded, authorized, or carried out by BLM that may affect desert tortoises in the southwestern United States .

#### **Public Scoping**

Although BLM did not use the term "public scoping" in its press releases and NEPA ePlanning webpage for the development of the Ajo TMP and Draft EA, we consider this request for public input to be commensurate with the scoping phase for NEPA documents (i.e., environmental assessments and environmental impacts statements).

#### **Project Description**

According to BLM's webpage the for the Ajo **TMP** and Draft EA (https://eplanning.blm.gov/eplanning-ui/project/2024282/51), the BLM "Lower Sonoran Field Office (LSFO) proposes to designate a comprehensive network of motorized routes and trails for managing travel within the Ajo Travel Management Area (TMA). This Ajo Travel Management Plan (TMP) is comprehensive in that it addresses access for recreational, traditional, casual, agricultural, commercial, and educational uses as well as access for resource management purposes. It also considers all modes and conditions of travel on public lands, including typical highway vehicles (low-clearance sedans and trucks), four-wheel drive (4WD) vehicles, motorcycles, utility terrain vehicles (UTVs), all-terrain vehicles (ATVs), bicycles, electric bicycles (e-bikes), equestrian, and foot travel."

BLM is requesting the public's "feedback on whether there are additional routes that should be considered in this planning effort, which routes you use, what activities do these routes provide access for, if there are other areas you want to access, and any concerns you may have about resource impacts in the area. The public is encouraged to review the inventoried routes and make comments."

#### Define the Activities Authorized under the Ajo TMP

The uses BLM is authorizing under the TMP are "recreational, traditional, casual, agricultural, commercial, and educational uses as well as access for resource management purposes." We do not know what uses these terms include, especially recreational, casual, commercial, and we were unable to find a definition for these terms when applied to BLM managed land. Similarly, BLM says it "proposes to designate a comprehensive network of motorized routes and trails for

managing travel within the Ajo Travel Management Area." We are unsure whether the "trails" would include motorized use.

The Council requests that BLM clearly define and describe the uses it is authorizing in the Ajo TMP and Draft EA. The Ajo TMP should state that other uses that are not described and analyzed in this TMP and Draft EA would not be allowed. This clear information is needed so that BLM's decsionmaker and the public know what activities comprise the activities that would be allowed. The Council further requests that BLM not allow organized or competitive motorized events in the TMP. The long-term adverse impacts from these events to natural resources, including tortoises and tortoise habitat, are well documented (please see "Environmental Consequences" section and "Appendix A. Partial List of Research Papers on Impacts from Vehicle Use to Desert Ecosystems"), and do not comply with BLM's mandate under the Federal Land Policy and Management Act of 1976, as amended, that "management be on the basis of multiple use and sustained yield" and that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values," and "will provide food and habitat for fish and wildlife."

#### Comply with the Authorities of Land Management Entities for Adjacent Lands

The location of the proposed action is an island of about 177,000 acres of BLM-managed land surrounded by lands with management directives very different than those of BLM for multiple use and sustained yield of resources. Under the Organic Act of 1916 and other legislation and policies, the NPS is charged with managing Organ Pipe Cactus National Monument to protect and preserve unimpaired the natural and cultural resources and values of NPS lands. The US Fish and Wildlife Service (USFWS) is charged with managing Cabeza Prieta NWR to conserve, manage, and, where appropriate, restore fish, wildlife and plant resources and their habitats (National Wildlife Refuge System Administration Act of 1966, as amended). The U.S. Air Force is charged with managing the Barry M. Goldwater Air Force Range for the military mission of air-to-air and air-to-ground training that use live and inert practice ordnance. The Tohono O'odham Nation governs it lands according to its constitution.

Given these specific directives that differ from those of the BLM, BLM should ensure that the implementation and management of the Ajo TMP does not result in direct, indirect, or cumulative impacts to Organ Pipe Cactus National Monument, Cabeza Prieta NWR, the Goldwater Range, and the Tohono O'odham Nation that do not comply with their directives for management of lands/resources within their jurisdictions. For example, the Ajo TMP should not designate vehicle routes or trails that stop at the boundary with NPS or NWR lands because they are not authorized to continue on these lands. Such "dead end" routes and trails would likely lead to users continuing onto NPS and NWR lands and adversely impacting the resources these agencies are mandated to protect/conserve. Another likely result is the users would continue the route/trail parallel to the land management boundary or in a different direction on BLM land, thereby creating additional unauthorized routes/trails that result in additional impacts that were not analyzed in the Draft EA and whose use is not authorized.

Similarly, washes upstream from NPS and NWR lands should not be designated as vehicle routes or trails. Their use by vehicles would result in degradation of soils (e.g., compaction, erosion, etc.), degradation and loss of vegetation (coating plants with dust; physical damage to roots, leaves, and

stems/branches; crushing/destroying plants; introduction/spread of invasive plant species, wildfires caused by catalytic converters, etc.), that would adversely impact downstream areas on NPS and NWR lands.

#### **Analysis of Alternatives**

Several alternatives should be analyzed in the Ajo TMP and Draft EA including one or more alternatives that stress conservation of natural resources including the tortoise/tortoise habitat. Such an alternative would include but not be limited to eliminating redundant routes, ensuring a low density of authorized routes in areas in the TMA, closing routes in tortoise habitat/connectivity habitat, and restoring the habitat.

For the No Action Alternative, the Council requests that BLM use current aerial/satellite imagery to identify, record on GIS, and add to the administrative record the global network of existing routes in the Ajo TMA. Following this remote sensing exercise, BLM should ground-truth the routes using statistics to determine when ground truthing is adequate to verify the accuracy of BLM's map of existing routes. This is baseline data that BLM needs to help determine which routes are redundant or harmful to resources such as the tortoise/tortoise habitat before it can consider making informed management decisions on which routes should be designated as open, closed, or limited. We reiterate this need for several reasons including the requirement for cumulative effects analysis under NEPA and BLM's commitment to manage for the tortoise in the Sonoran Desert Tortoise Candidate Conservation Agreement (USFWS et al. 2015).

Please be sure that the TMP and Draft EA explains how this route inventory was (is being) derived and if it has (or will be) ground-truthed. Our experience is that that washes often appear on satellite imagery as routes when they are natural features. Although we strongly recommend that the final proposed route inventory be fully ground-truthed, if that is not possible, we ask that the proposed network be superimposed over U.S. Geological Survey (USGS) maps to see if any of the future open routes are located in washes. Given the importance of washes to tortoises (Zylstra and Steidl 2009), we ask that BLM avoid designating open or limited routes in washes. Further, we request that maps of the open, closed, and limited routes be displayed in maps in the Draft EA for each alternative.

#### **Enforcement of the TMP**

All action alternatives in the TMP/EA should include a description and analysis of the effective enforcement plan that BLM would implement to ensure that (1) the activities as described for each alternative would be implemented, unauthorized activities would be promptly halted, (2) the activities and their impacts to the environment are documented in BLM's geospatial tracking system, and (3) the impacts are fully mitigated, preferably by the offending person(s).

#### **Affected Environment**

The Ajo TMP and Draft EA should include data on tortoise survey results in the TMA and adjacent areas. We presume that BLM has completed recently an inventory of tortoise abundance within the TMP planning area. If these field data are unavailable, we request that BLM use available models of tortoise presence/habitat and overlay the proposed route networks for comparison/overlap. We ask that BLM be conscientious about minimizing the number of routes in those portions of the TMP that are known or to contain higher densities of tortoises/better quality

of tortoise habitat/higher likelihood of tortoise use, either based on field studies (preferred) or models (less preferred). Failure to provide these data would indicate that BLM lacks information of the demographic status of the tortoise in the 177,000 acres of the Ajo TMA, and is unable to demonstrate that BLM is managing for the tortoise on a landscape level, as it committed to in the Sonoran Desert Tortoise Candidate Conservation Agreement (USFWS et al. 2015).

#### **Environmental Consequences**

In this section of the Draft EA, BLM should analyze the direct, indirect and cumulative impacts of all the uses that it is specifically authorizing in the Ajo TMP. This analysis is needed to comply with NEPA, and so BLM's decisionmaker and the public know the direct, indirect, and cumulative impacts that would occur from the activities described the proposed action/alternatives, and that they have been analyzed adequately and accurately in the Draft EA.

The presence of roads even with low vehicle use has multiple adverse effects on the desert tortoise and its habitats. These include the mortality, collection, vandalism, deterioration/loss of habitat quantity and quality, increased competition and predation (including by humans), and the loss of naturalness or pristine qualities, all of which should be analyzed in the Draft EA. We request that the Draft EA fully divulge and assess these and other impacts associated with motorized and non-motorized vehicle use. To facilitate this request, we herein provide BLM with "Appendix A. Partial List of Research Papers on Impacts from Vehicle Use to Desert Ecosystems," which is a partial bibliography of impacts associated with vehicle use on arid lands. We expect the authors of the Draft EA to familiarize themselves with this literature to better understand the direct, indirect, and cumulative impacts so their analysis of impacts to the tortoise/tortoise habitat, including habitat for connectivity, is complete in the Draft EA. This would allow BLM to make informed management decisions to curtail these impacts before they occur.

Please include in the Draft EA the analyses the five major categories of primary road effects to the tortoise and other special status species: (1) wildlife mortality from collisions with vehicles; (2) hindrance/barrier to animal movements thereby reducing access to resources and mates; (3) degradation of habitat quality; (4) habitat loss caused by disturbance effects in the wider environment and from the physical occupation of land by the road; and (5) subdividing animal populations into smaller and more vulnerable fractions (Jaeger et al. 2005a, 2005b, Roedenbeck et al. 2007).

BLM's analysis of direct, indirect, and cumulative impacts from off-highway vehicle use (= vehicle use on unpaved roads and trails) to tortoises/tortoise habitat should include, but is not limited to, air quality, soils, nitrification, surface hydrology, climate change, vegetation, invasive species, and increased occurrence/intensity/size of wildfires. These impacts would include those from motorized and non-motorized vehicle use (e.g., impacts of mountain bikes [Lathrop 2003, Pickering et al. 2003, White et al. 2006, Vandeman 2014] and e-bikes). All these resource issues affect the tortoise either directly or indirectly.

The Draft EA should use the best available science in analyzing impacts of the proposed action to the tortoise/tortoise habitat and selecting open and limited routes.

In the Ajo TMP and Draft EA, BLM should clearly explain how these documents and the action alternatives comply with:

- the Council on Environmental Quality's (2023) "Guidance for Federal Departments and Agencies on Ecological Connectivity and Wildlife Corridors"
- all applicable BLM policies, handbooks, manuals, and instructional memorandums (e.g., NEPA Manual, Special Status Species Manual, Mitigation Manual/Policy/Handbook, Sensitive Species List for Arizona Manual and Instruction Memorandum, Instruction Memorandum on Habitat Connectivity, etc.)
- all relevant Executive Orders (e.g., greenhouse gas emissions, climate change, invasive species, etc.)
- 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.

As a signatory to the Sonoran Desert Candidate Conservation Agreement (USFWS et al. 2015), BLM committed to implementing:

- (1) BLM Manual 6840 (BLM 2008) that establishes specific procedures for managing the Sonoran desert tortoise as 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 are only effective if BLM knows where the direct and indirect impacts to the tortoise are occurring, especially at a landscape level. 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) from habitat fragmentation, new or more frequently used road (routes and trails) that bring invasive plant species, wildfires, etc. To conduct an accurate regional or cumulative effects analysis and comply with the Sonoran Desert Candidate Conservation Agreement, BLM needs to track these and other impacts to the tortoise at a landscape level using a geospatial tracking system for all management actions and projects authorized, funded, or carried out by BLM. We request that BLM add the Ajo TMP to its geospatial tracking system and continuously update the implementation of this TMP in its geospatial tracking system.

In the Sonoran Desert Candidate Conservation 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 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 Ajo TMP and Draft EA, how it will mitigate (avoid, minimize, and/or compensate) direct, indirect, and cumulative impacts associated with this TMP at a local and landscape level to achieve Sonoran desert management objectives.

#### **Mitigation and Monitoring**

As a mitigation measure, we strongly recommend that areas that provide habitat for the tortoise, including linkage habitat for connectivity between populations, routes and trails for vehicle use be closed. If this is not possible, the density and spacing of routes should not occur above the level recommended by scientific studies and these routes be designated as "limited" and closed seasonally during the active season for the tortoise.

We also strongly recommend that the TMP provide the management option for BLM to close all non-paved routes and trails during fire season to substantially reduce or eliminate the likelihood of human-caused wildfires in the Ajo TMA from fire sources such as catalytic converters, shooting, smoking, using fireworks, etc. The Sonoran desert and tortoise are not adapted to wildfire and the natural restoration time for lost soils and vegetation will take decades or long, if at all because of climate change and invasive plant species (Abella 2010).

The Ajo TMP and Draft EA should include appropriate mitigation and monitoring plans for all direct, indirect, and cumulative impacts to the tortoise and its habitats; the mitigation and monitoring plan should use the best available science with a commitment to implement the mitigation commensurate with impacts to the tortoise and its habitats. Mitigation and monitoring should include a fully-developed raven management plan; weed management plan; fire management plan; compensation plan for the degradation and loss of tortoise habitat that includes protection of the acquired, improved, and restored habitat in perpetuity for the tortoise from future development and human use; a plan to develop and implement an effective education program; a plan for effective law enforcement to prevent route proliferation (if not included in the description of the project) and habitat restoration plan for closed routes. These plans should be part of the TMP and Draft EA so that the public has an opportunity to provide input on the various plans

These mitigation and monitoring plans should include an implementation schedule that is tied to key actions associated with route designation, signing open routes, and restoration phases of the project so that mitigation occurs concurrently with or in advance of the impacts. The Council has found that installing bright red Carsonite signs on closed routes is not effective; in fact, some routes that would not have otherwise been obvious are subject to use because of these signs. The Council prefers that closed routes be physically eradicated using vertical mulching and other techniques that eliminate the routes, and that the TMP has a schedule and process for closing routes. We also ask that the BLM prioritize the closure of routes based on tortoise densities derived from field studies or modelling. The plans should specify success criteria, include a monitoring plan to collect data to determine whether success criteria have been met, and identify actions that would be

required if the mitigation measures do not meet the success criteria. Specific remedial measures, such as increased law enforcement, enhanced education, closure of problematic routes, etc. should be included in the plan.

#### **Cumulative Impacts Analysis**

Please see *Grand Canyon Trust v. F.A.A.*, 290 F.3d 339, 345-46 (D.C. Cir. 2002) in which the court decided that agencies must analyze the cumulative impacts of actions in environmental assessments.

In the cumulative effects analysis of the Draft EA, please ensure that the CEQs "Considering Cumulative Effects under the National Environmental Policy Act" (1997) is followed, including the eight principles, when analyzing cumulative effects of the proposed action to the affected resource issues. This CEQ document is referred to in BLM's National Environmental Policy Act Handbook (BLM 2008). CEQ (1997) 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 proposal 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, which contains 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 needs 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 each resource impacted by the proposed action including herbivores and omnivores.

Note that CEQ recognizes that synergistic and interactive impacts as well as cumulative impacts should be analyzed in the NEPA document for each resource issue. For the tortoise, principles 5 through 8 are especially important and should be addressed specifically in the Draft EA.

We request that the Draft EA include (1) these eight principles in its analysis of cumulative impacts for the resource issues identified in the NEPA document, and (2) effective science-based mitigation, monitoring, and adaptive management that protects the tortoise/tortoise habitat from the impacts of authorized uses under the Ajo TMP.

In addition, we request that BLM add the Ajo TMP and its impacts to a BLM database and geospatial tracking system for special status species, including Sonoran desert tortoises, that track cumulative impacts (e.g., surface disturbance, paved and unpaved routes, linear projects, invasive species occurrence, herbicide /pesticide use, wildfires, 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.

We appreciate this opportunity to provide comments on this proposed action 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 species of desert tortoises, and that any subsequent environmental documentation for this project 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 project.

Respectfully,

[022R)

Edward L. LaRue, Jr., M.S.

Desert Tortoise Council, Ecosystems Advisory Committee, Chairperson

Attachment: Appendix A. Partial List of Research Papers on Impacts from Vehicle Use to Desert Ecosystems

Cc: Raymond Suazo, Arizona State Director, Bureau of Land Management, <u>rsuazo@blm.gov</u>; azstatedirector@blm.gov

#### **Literature Cited**

- Abella, S.R. 2010. Disturbance and plant succession in the Mojave and Sonoran Deserts of the American Southwest. International Journal of Environmental Research and Public Health 7.4 (2010): 1248-1284. <a href="https://www.mdpi.com/1660-4601/7/4/1248">https://www.mdpi.com/1660-4601/7/4/1248</a>
- [BLM] U.S. Bureau of Land Management. 2008. H-1790-1 National Environmental Policy Act Handbook. National Environmental Policy Act Program, Office of the Assistant Director, Renewable Resources and Planning, Washington, D.C. January 2008.
- [CEQ] Council on Environmental Quality. 1997. Considering Cumulative Effects under the National Environmental Policy Act. <a href="https://ceq.doe.gov/publications/cumulative\_effects.html">https://ceq.doe.gov/publications/cumulative\_effects.html</a>
- [CEQ] Council on Environmental Quality. 2023. Guidance for Federal Departments and Agencies on Ecological Connectivity and Wildlife Corridors. March 21, 2023.

- https://www.whitehouse.gov/wp-content/uploads/2023/03/230318-Corridors-connectivity-guidance-memo-final-draft-formatted.pdf
- Jaeger, J. 2005a. Does the configuration of road networks influence the degree to which roads affect wildlife populations? International Conference on Ecology and Transportation 2005 Proceedings, Chapter 5 Integrating Transportation and Resource Conservation Planning Landscapes and Road Networks, pages 151-163. August 29, 2005.
- Jaeger, J., J. Bowman, J. Brennan, L. Fahrig, D. Bert, J. Bouchard, N. Charbonneau, K. Frank, B. Gruber, and K. Tluk von Toschanowitz. 2005b. Predicting when animal populations are at risk from roads: an interactive model of road avoidance behavior. Ecological Modelling 185 (2005) 329–348.
- Jennings, W.B., and K.H. Berry. 2015. Desert tortoises (*Gopherus agassizii*) are selective herbivores that track the flowering phenology of their preferred food plants. PLoS ONE 10(1): e0116716. <a href="https://doi.org/10.1371/journal.pone.0116716">https://doi.org/10.1371/journal.pone.0116716</a> Lathrop, J. 2003. Ecological impacts of mountain biking: a critical literature review. <a href="http://www.wildlandscpr.org/resourcelibrary/report">http://www.wildlandscpr.org/resourcelibrary/report</a>
- Pickering, C. M., W. Hill, D. Newsome, and Y. Leung. 2010. Comparing hiking, mountain biking and horse-riding impacts on vegetation and soils in Australia and the United States of America. Journal of Environmental Management 91 (2010) 551–562.
- Roedenbeck, I., L. Fahrig, C. Findlay, J. Houlahan, J. Jaeger, N. Klar, S. Kramer-Schadt, and E.van der Grift. 2007. The Rauischholzhausen Agenda for Road Ecology. Ecology and Society 12(1): 11. <a href="http://www.ecologyandsociety.org/vol12/iss1/art11/">http://www.ecologyandsociety.org/vol12/iss1/art11/</a>
- [USFWS et al.] U.S. Fish and Wildlife Service, Bureau of Land Management, Bureau of Reclamation, National Park Service, Department of Defense, Customs and Border Protection, U.S. Forest Service, Natural Resources Conservation Service, Arizona Game and Fish Department, and Arizona Department of Transportation. 2015. Candidate Conservation Agreement for the Sonoran Desert Tortoise (*Gopherus morafkai*) in Arizona. May 27, 2015. <a href="https://www.blm.gov/sites/blm.gov/files/policies/IMAZ-2016-004-a1.pdf">https://www.blm.gov/sites/blm.gov/files/policies/IMAZ-2016-004-a1.pdf</a>.
- Vandeman, M.J. 2014. The impacts of mountain biking on wildlife and people: A review of the literature. Journal of Science and Technology Vol. 4, No.7 (July 2014): 418-426. <a href="https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=7bfdd5b1cb3eab5c2ef5d03797b3df1c6db3497d">https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=7bfdd5b1cb3eab5c2ef5d03797b3df1c6db3497d</a>
- White, D.D., M.T. Waskey, G.P. Brodehl, and P.E. Foti. 2006. A Comparative Study of Impacts to Mountain Bike Trails in Five Common Ecological Regions of the Southwestern U.S. Journal of Park and Recreation Administration 24(12): 21-41. <a href="https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=7f26b68c7ba1c97a766a41119a332a4bc903104e">https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=7f26b68c7ba1c97a766a41119a332a4bc903104e</a>

Zylstra, E.R. and R.J. Steidl. 2009. Habitat Use by Sonoran Desert Tortoises. Journal of Wildlife Management 73(5):747-754.

https://wildlife.onlinelibrary.wiley.com/doi/abs/10.2193/2008-446

# Appendix A. Partial List of Research Papers on Impacts from Vehicle Use to Desert Ecosystems

- Aber, J.D., K.J. Nadelhoffer, P. Steudler, and J.M. Melillo.1989. Nitrogen Saturation in Northern Forest Ecosystems. BioScience 39(6):8-386
- Allen, E.B., Rao, L.E., Steers, R.J., Bytnerowicz, A., and Fenn, M.E., 2009, Impacts of atmospheric nitrogen deposition on vegetation and soils at Joshua Tree National Pages, in Webb, R.H., Fenstermaker, L.F., Heaton, J.S., Hughson, D.L., McDonald, E.V., and Miller, D.M. (eds.), The Mojave Desert: ecosystem processes and sustainability: Reno, University of Nevada Press, p. 78–100.
- Arnold, R. 2011. Focused desert tortoise survey, Lucerne Valley Desert View Ranch generating facility. APN 0435-083-39 & -435-132-01, San Bernardino County. RCA Associated, Hesperia, CA.
- Avery, H.W. 1997. Effects of cattle grazing on the desert tortoise, Gopherus agassizii: Nutritional and behavioral interactions. Pages 13-20 in J. Van Abbema (ed.), Proceedings of the International Conference on Conservation, Restoration, and Management of Tortoises and Turtles. New York Turtle and Tortoise Society, New York.
- Avery, H.W. 1998. Nutritional ecology of the desert tortoise (*Gopherus agassizii*) in relation to cattle grazing in the Mojave Desert. Ph.D. dissertation, University of California, Los Angeles.
- Beacon Solar. 2008. Application for Incidental Take of Threatened and Endangered Species. Application to California Department of Fish and Game by Beacon Solar, LLC, 700 Universe Boulevard, Juno Beach, FL.
- Beazley, K.F., T.V. Snaith, F. Mackinnin, and D. Colville. 2004. Road density and potential impacts on wildlife species such as American moose in mainland Nova Scotia. Proc. N.S. Inst. Sci. (2004)Volume 42, Part 2, pp. 339-357.
- Belnap, J. 1996. Soil surface disturbances in cold deserts: effects on nitrogenase activity in cyanobacterial-lichen soil crusts. Biol Fertil Soils (1996) 23:362-367.
- Berry, K.H. 1974. Desert tortoise relocation project: Status report for 1972. California Department of Transportation
- Berry, K.H. 1990. The status of the desert tortoise in California in 1989. Draft report. U.S. Bureau of Land Management, Riverside, California.
- Berry, K.H., and L.L. Nicholson. 1984b. A summary of human activities and their impacts on desert tortoise populations and habitat in California. Chapter 3 in K.H. Berry (ed.), The status of the desert tortoise (*Gopherus agassizii*) in the United States. Desert Tortoise Council Report to the U.S. Fish and Wildlife Service. Order No. 11310-0083-81.

- Berry, K.H., F.G. Hoover, and M. Walker. 1996. The effects of poaching desert tortoises in the western Mojave Desert; evaluation of landscape and local impacts. Proceedings of the Desert Tortoise Council Symposium 1996:45.
- Berry, K.H., K. Keith, and T. Bailey. 2008. Status of the desert tortoise in Red Rock Canyon State Park. California Fish and Game 94(2):98-118.
- Berry, K.H., J. L. Yee, A.A. Coble, W.M. Perry, and T.A. Shields. 2013. Multiple factors affect a population of Agassiz's desert tortoise (*Gopherus agassizii*) in the northwestern Mojave Desert. Herpetological Monographs, 27, 2013, 87–109.
- Berry, K.H., L.M. Lyren, J.L. Yee, and T.Y. Bailey. 2014. Protection benefits desert tortoise (*Gopherus agassizii*) abundance: the influence of three management strategies on a threatened species. Herpetological Monographs, 28 2014, 66–92.
- Berry, K.H., L.M. Lyren, J.S. Mack, L.A Brand, and D.A.Wood. 2016. Desert tortoise annotated bibliography, 1991–2015: U.S. Geological Survey Open-File Report 2016-1023, 312 p., <a href="http://dx.doi.org/10.3133/ofr20161023">http://dx.doi.org/10.3133/ofr20161023</a>.
- Boarman, W.I. 2002. Threats to desert tortoise populations: a critical review of the literature. Unpublished Report, prepared for the West Mojave Planning Team and the Bureau of Land Management. 86 pp.
- Boarman, W.I., and K.H Berry. 1995. Common ravens in the southwestern United States, 1968-92. In: Our Living Resources: A Report to the Nation on the Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecosystems. Edward T. LaRoe, Gaye S. Farris, Catherine E. Puckett, Peter D. Doran, and Michael J. Mac, editors. U.S. Department of the Interior, National Biological Service.
- Boarman, W.I., R.J. Camp, M. Hagan, W. Deal. 1995. Raven abundance at anthropogenic resources in the western Mojave Desert, California. Report to Edwards Air Force Base, California.
- Boarman, W.I., and M. Sazaki. 1996. Highway mortality in desert tortoises and small vertebrates: success of barrier fences and culverts. Proceedings: Florida Department of Transportation/Federal Highway Administration Transportation-Related Wildlife Mortality Seminar. Evink, G., Ziegler, D., Garrett, P. and Berry, J. (Eds). pp. 169–173.
- Boarman, W.I., and Sazaki, M., 2006, A highway's road-effect zone for desert tortoises (*Gopherus agassizii*): Journal of Arid Environments, v. 65, p. 94–101.
- Boarman, W.I., Sazaki, M., Jennings, B., 1997. The effects of roads, barrier fences and culverts on desert tortoise populations in California, USA. In: Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles An International Conference, pp. 54–58.

- Boarman, W.I., M.L. Beigel, G.C. Goodlett, and M. Sazaki. 1998. A passive integrated transponder system for tracking animal movements. Wildlife Society Bulletin 26, 886-891.
- Boarman, W.I., W.B. Kristan, W.C. Webb, and H.D. Chamblin. 2005. Raven ecology in the Mojave Desert at Edwards Air Force Base: final report. U.S. Geological Survey, Western Ecological Research Center, Sacramento, California.
- Boarman, W.I., and W.B. Kristan. 2006. Evaluation of evidence supporting the effectiveness of desert tortoise recovery actions. Scientific Investigations Report 2006–5143. U.S. Geological Survey, Western Ecological Research Center, Sacramento, CA.
- Boarman, W.I., Patten, M.A., Camp, R.J., and Collis, S.J., 2006, Ecology of a population of subsidized predators: common ravens in the central Mojave Desert, California: Journal of Arid Environments, v. 67, p. 248–261.
- Bouchard, J., A. T. Ford, F. Eigenbrod, and L. Fahrig. 2009. Behavioral response of northern leopard frogs (*Rana pipens*) to roads and traffic: implications for population persistence. Ecology and Society 14(2): 23. <a href="http://www.ecologyandsociety.org/vol14/iss2/art23/">http://www.ecologyandsociety.org/vol14/iss2/art23/</a>.
- Bratzel, S., and R. Tellermann. 2005. Mobilität und Verkehr. Informationen zur politischen Bildung 287(2):44-51.
- Brocke, R.H., J.P. O'Pezio, K.A. Gustafson. 1988 A forest management scheme mitigating impact of road networks on sensitive wildlife species. In: R.M. Degraaf and W.M. Healy (eds): Is forest fragmentation a management issue in the northeast? GTR-NE-140, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experimental Station, Radnor, PA: 13-17.
- Brocke, R.H., J.P. O'Pezio, K.A. Gustafson. 1988 A forest management scheme mitigating impact of road networks on sensitive wildlife species. In: R.M. Degraaf and W.M. Healy (eds): Is forest fragmentation a management issue in the northeast? GTR-NE-140, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experimental Station, Radnor, PA: 13-17.
- Brooks, M.L., 1995, Benefits of protective fencing to plant and rodent communities of the western Mojave Desert, California: Environmental Management, v. 19, p. 65–74.
- Brooks, M.L., 1999, Alien annual grasses and fire in the Mojave Desert: Madroño, v. 46, p. 13–19.
- Brooks, M.L., 2003, Effects of increased soil nitrogen on the dominance of alien annual plants in the Mojave Desert: Journal of Applied Ecology, v. 40, p. 344–353.

- Brooks, M.L., T.C. Esque, and J.R. Matchett. 2003. Current status and management of alien plants and fire in desert tortoise habitat. Desert Tortoise Council Symposium, February 21-23, 2003.
- Brooks, M.L. 2009, Spatial and temporal distribution of non-native plants in upland areas of the Mojave Desert, in Webb, R.H., Fenstermaker, L.F., Heaton, J.S., Hughson, D.L., McDonald, E.V., and Miller, D.M., eds., The Mojave Desert—Ecosystem processes and sustainability: Reno, University of Nevada Press, p. 101–124.
- Brooks, M.L. and K.H. Berry. 1999. Ecology and management of alien annual plants in the California deserts. Calif. Exotic Pest Plant Newsl. 7(3/4):4-6.
- Brooks, M.L., and Berry, K.H., 2006, Dominance and environmental correlates of alien annual plants in the Mojave Desert, USA: Journal of Arid Environments, v. 67, p. 100–124.
- Brooks, M.L., and Esque, T.C., 2002, Alien plants and fire in desert tortoise (*Gopherus agassizii*) habitat of the Mojave and Colorado Deserts: Chelonian Conservation and Biology, v. 4, p. 330–340.
- Brooks, M.L., C.M. D'Antonio, D.M. Richardson, J. B. Grace, J.E. Kelley, J. M. Ditomaso, R.J. Hobbs, M. Pellant, And D. Pyke. 2004. Effects of Invasive Alien Plants on Fire Regimes. Bioscience/ Vol. 54 No. 7: 677-688. July 2004.
- Brooks, M.L. and B. Lair. 2005. Ecological Effects of Vehicular Routes in a Desert Ecosystem. Report prepared for the United States Geological Survey, Recoverability and Vulnerability of Desert Ecosystems Program (<a href="http://geography.wr.usgs.gov/mojave/rvde">http://geography.wr.usgs.gov/mojave/rvde</a>).
- Brooks, M.L. and B. M. Lair.2009. Ecological effects of vehicular routes in a desert ecosystem. In: R.H. Webb, L.F. Fenstermaker, J.S. Heaton, D.L. Hughson, E.V. McDonald, and D.M. Miller (eds.). The Mojave Desert: Ecosystem Processes and Sustainability. University of Arizona Press. Tucson, AZ.
- Brooks, M.L., and Matchett, J.R. 2006. Spatial and temporal patterns of wildfires in the Mojave Desert, 1980–2004. Journal of Arid Environments Volume 67, Supplement, 2006, Pages 148-164.
- Brown, D.E., and R.A. Minnich. 1986. Fire and changes in creosote bush scrub of the western Sonoran desert, California. American Naturalist 116(2):411-422.
- Bureau of Land Management. U. S. Fish and Wildlife Service, and California Department of Fish and Game. 1989. Environmental assessment for selected control of the common raven to reduce desert tortoise predation in the Mojave Desert, California. Bureau ofLand Management, U. S. Fish and Wildlife Service, and California Department of Fish and Game.

- Bureau of Land Management. 1993. Final Rand Mountains–Fremont Valley Management Plan. A Sikes Act Plan. Bureau of Land Management, Ridgecrest Resource Area, California.
- Bureau of Land Management. 1998. The California Desert Conservation Area Plan 1980, as amended. U.S. Department of the Interior, Bureau of Land Management, California.
- Bureau of Land Management. 1999. Chapter Two Desert Tortoise (*Gopherus agassizii*). Working draft for West Mojave Plan. September 22, 1999. https://www.blm.gov/ca/pdfs/cdd\_pdfs/Ch2\_9-22-99.pdf
- Bureau of Land Management. 2002. Proposed Northern and Eastern Mojave Desert management plan Final Environmental Impact Statement Volumes 1 and 2. California Desert District, Riverside, CA.
- Bureau of Land Management, County of San Bernardino, and City of Barstow. 2005. Proposed West Mojave Plan Final Environmental Impact Report and Statement. BLM/CA/ES-2004-005 + 1790 -1600. Moreno Valley, CA.
- Bureau of Land Management. 2006. Record of decision for the West Mojave Plan. California Desert District, Moreno Valley, CA.
- Bureau of Land Management. 2018a. West Mojave Route Network Project Draft California Desert Conservation Plan Amendment and Supplemental Environmental Impact Statement for the California Desert District. BLM/CA/DOI-BLM-CA-D080-2018-0008-EIS. January 2018. Moreno Valley, CA.
- Bureau of Land Management. 2018b. Stoddard Valley OHV Area. BLM website accessed May 30, 2018. <a href="https://www.blm.gov/visit/stoddard-valley-ohv-area">https://www.blm.gov/visit/stoddard-valley-ohv-area</a>
- Burge, B.L. 1977. Daily and seasonal behavior, and areas utilized by the desert tortoise, Gopherus agassizii, in southern Nevada. Proceedings of the Desert Tortoise Council Symposium 1977:59-94.
- Bury, R.B., and Luckenbach, R.A., 2002, Comparison of desert tortoise (Gopherus agassizii) populations in an unused and off-road vehicle area in the Mojave Desert: Chelonian Conservation and Biology, v. 4, p. 457–463.
- Caid, N., P. Crist, R. Gilbert, and P. Wiederkehr. 2002. Environmentally sustainable transport: concept, goal and strategy—the OECD's EST Project. Proceedings of the Institution of Civil Engineers, Transport 153(4):219-226.
- California Turtle and Tortoise Club. 2002. Western Rand Mountains ACEC vehicle closure. https://tortoise.org/conservation/randacec.html
- Carr, L. W., and L. Fahrig. 2001. Effect of road traffic on two amphibian species of different vagility. Conservation Biology 15(4):1071-1078.

- Charis Corporation. 2005. Supplemental Final Environmental Impact Statement Proposed Addition of Maneuver Training Land at Fort Irwin, CA. August 2005. Prepared for the U.S. Army National Training Center, Fort Irwin, California.
- D'Antonio, C.M., and Vitousek, P.M., 1992, Biological invasions by exotic grasses, the grass-fire cycle, and global change: Annual Review of Ecology and Systematics, v. 23, p. 63–87.
- DeFalco, L.A., Detling, J.K., Tracy, C.R., and Warren, S.D., 2001, Physiological variation among native and exotic winter annual plants associated with microbiotic crusts in the Mojave Desert: Plant and Soil, v. 234, p. 1–14.
- Desert Gazette. 2018. El Paso Mountains. <a href="http://digital-desert.com/el-paso-mountains/">http://digital-desert.com/el-paso-mountains/</a> (accessed 2018-5-30)
- Doak, D., P. Kareiva, and B. Klepetka. 1994. Modeling population viability for the desert tortoise in the western Mojave Desert. Ecological Applications 4:446–460.
- Edwards T., A.E. Karl, M. Vaughn, P.C. Rosen, C.M. Torres, and R.W. Murphy. 2016. The desert tortoise trichotomy: Mexico hosts a third, new sister-species of tortoise in the *Gopherus morafkai–G. agassizii* group. ZooKeys 562: 131–158. doi: 10.3897/Zookeys. 562.6124.
- Esque, T.C. 1992. Diet selection of the desert tortoise in the northeast Mojave Desert FY 1991 update. Proceedings of the Desert Tortoise Council Symposium 1992:64-68.
- Esque, T.C. 1994. Diet and diet selection of the desert tortoise (Gopherus agassizii) in the northeastern Mojave Desert. Master's Thesis. Colorado State University, Fort Collins.
- Esque, T.C., Schwalbe, C.R., DeFalco, L.A., Duncan, R.B., and Hughes, T.J., 2003, Effects of desert wildfires on desert tortoise (*Gopherus agassizii*) and other small vertebrates: Southwestern Naturalist, v. 48, p. 103–111.
- Estrada, J. 2017. Events. Tortoise Tracks 37:2 page 1, Summer 2017.
- Fahrig, L., and T. Rytwinski. 2009. Effects of roads on animal abundance: an empirical review and synthesis. Ecology and Society 14(1): 21. [online] URL: <a href="http://www.ecologyandsociety.org/vol14/iss1/art21/">http://www.ecologyandsociety.org/vol14/iss1/art21/</a>
- Federal Highway Administration and California Department of Transportation. 2017. Olancha/Cartago Four-Lane Project on U.S. Highway 395 in Inyo County from 2.1 miles south of LA Aqueduct Bridge (#48-068R) to 0.2 mile south of Ash Creek Bridge (#48-11). Final Environmental Impact Report/ Environmental Assessment with Finding of No Significant Impact and Section 4(f) Evaluation.
- Forman, R. T. T. 2000. Estimate of the area affected ecologically by the road system in the United States. Conservation Biology 14(1):31-35.

- Forman, R. T. T., D. Sperling, J. A. Bissonette., A. P. Clevenger, C. D. Cutshal, V. H. Dale, L. Fahrig, R. France, C. R. Goldman, K. Haenue, J. A. Jones, F. J. Swanson, T. Turrentine, and T. C. Winter. 2002. Road ecology—science and solutions. Island Press, Washington, D.C., USA.
- Forman, R.T.T., D.S. Friedman, D. Fitzhenry, J.D. Martin, A.S. Chen, and L.E. Alexander. 1997. Ecological effects of roads: toward three summary indices and an overview of North America. In: Canter K (ed) Habitat fragmentation and infrastructure. Minister of Transport and Public Works and Water Management, Delft, Netherlands, p 40-54.
- Gelbard, J. L., and J. Belnap. 2003. Roads as conduits for exotic plant invasions in a semiarid landscape. Conservation Biology 17:420-432.
- Gibbs, J.P., and W.G. Shriver. 2002. Estimating the effects of road mortality on turtle populations. Conserv. Biol. 16, 1647–1652.
- Goodlett, G. O. and G. C. Goodlett. 1993. Studies of unauthorized off-highway vehicle activity in the Rand Mountains and Fremont Valley, Kern County, California. Proc. 1992 Desert Tort. Counc. Symp. 1993:163-187.
- Gucinski, H., M. Furniss, R. Ziermer, and M. Brookes. 2001. Forest Service roads: a synthesis of scientific information. Gen Tech Rep PNW-GTR-509.1, U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR.
- Henen, B.T. 1992. Desert tortoise diet and dietary deficiencies that may limit egg production at Goffs, California. Proceedings of the Desert Tortoise Council Symposium 1992:97.
- Hessing, Mark. Botanist for Fort Irwin. E-mail sent to Connie Rutherford, U.S. Fish and Wildlife Service, Ventura Office, regarding off-road vehicle activity on Coolgardie Mesa. June 3, 2006. Cited in: U.S. Fish and Wildlife Service 2008. Lane Mountain milk-vetch (Astragalus jaegerianus) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura, California. June 2008.
- Jaeger, J.A.G., L. Fahrig, and K.C. Ewald. 2005a. Does the configuration of road networks influence the degree to which roads affect wildlife populations? International Conference on Ecology and Transportation 2005 Proceedings, Chapter 5 Integrating Transportation and Resource Conservation Planning Landscapes and Road Networks, pages 151-163. August 29, 2005.
- Jaeger, J.A.G., J. Bowman, J. Brennan, L. Fahrig, D. Bert, J. Bouchard, N. Charbonneau, K. Frank, B. Gruber, K. Tluk von Toschanowitz. 2005b. Predicting when animal populations are at risk from roads: an interactive model of road avoidance behavior. Ecological Modelling 185 (2005) 329–348.

- Jalkotzy, M.G., P.I. Ross, and M.D. Nasserden. 1997. The effects of linear developments on wildlife: a review of selected scientific literature. Arc Wildlife Services Ltd, prepared for Canadian Association of Petroleum Producers, Calgary, Alberta.
- Jennings, B. 1992. Observations on the feeding habits and behavior of desert tortoises at the Desert Tortoise Natural Area, California. Proceeding of the Desert Tortoise Council Symposium 1992:69-81.
- Jennings, W. B. 1993. Foraging ecology of the desert tortoise (*Gopherus agassizii*) in the western Mojave desert. Master's thesis. Arlington, University of Texas: 101 pp.
- Jennings, W. B. 1997. Habitat use and food preferences of the desert tortoise, Gopherus agassizii, in the western Mojave Desert and impacts of off-road vehicles. In J. Van Abbema (ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles-An International Conference, pp. 42-45. New York Turtle and Tortoise Society, New York.
- Karraker, N.E., and J.P. Gibbs. 2011. Contrasting road effect signals in reproduction of long-versus short-lived amphibians. Hydrobiologia 664, 213–218.
- Kemp, P.R., and Brooks, M.L., 1998, Exotic species of California deserts: Fremontia, v. 26, p. 30–34.
- Kilgo, J.C., R.F. Labisky, and D.E. Fritzen. 1998. Influences of hunting on the behavior of white-tailed deer: implications for conservation of the Florida panther. Conservation Biology 12:1359-1364.
- Knight, R.L., and Kawashima, J.Y., 1993, Responses of raven and red-tailed hawk populations to linear right-of-ways: Journal of Wildlife Management, v. 57, p. 266–271.
- Knight, R.L., Camp, R.J., Boarman, W.I., and Knight, H.A.L., 1999, Predatory bird populations in the east Mojave Desert, California: Great Basin Naturalist, v. 59, p. 331–338.
- LaBerteaux, D.L. 2006. Mustard removal at the Desert Tortoise Research Natural Area, Kern County, California. Report to the Desert Tortoise Preserve Committee, Inc.
- LaRue, E. 1992. Distribution of desert tortoise sign adjacent to Highway 395, San Bernardino County, California. Proceedings of the 1992 Symposium of the Desert Tortoise Council.
- LaRue, E. 1994. Follow-up monitoring report for Stoddard Valley-to-Johnson Valley Point-to-Point Corridor Run. Unpublished report prepared on behalf of the American Motorcyclists Association for the Barstow Resource Area of the Bureau of Land Management.
- LaRue, E. 2008. Latest information on tortoises and other special-status species in Morongo Basin. Morongo Tortoise Update.7-18-2008. Circle Mountain Biological Consultants, Wrightwood, CA. <a href="http://www.yucca-valley.org/pdf/general\_plan/mb\_tortoise\_update\_july2008.pdf">http://www.yucca-valley.org/pdf/general\_plan/mb\_tortoise\_update\_july2008.pdf</a>

- LaRue, E. 2014. Mohave Ground Squirrel Trapping Results for Phacelia Wildflower Sanctuary, Los Angeles County, California. <a href="https://www.wildlife.ca.gov/Conservation/Mammals/Mohave-Ground-Squirrel/TAG/BlogPage/4/Month/4/Year/2018">https://www.wildlife.ca.gov/Conservation/Mammals/Mohave-Ground-Squirrel/TAG/BlogPage/4/Month/4/Year/2018</a>
- Lei, S. A. 2004. Soil compaction from human trampling, biking, and off-road motor vehicle activity in a blackbrush (*Coleogyne ramosissima*) shrubland. Western North American Naturalist 64:125-130.
- Loughran, C.L., J.R. Ennen, and J.E. Lovich. 2011. *Gopherus agassizii* (desert tortoise). Burrow collapse. Herpetological Review 42(4), 593.
- Lovich, J.E., and Bainbridge, D., 1999, Anthropogenic degradation of the southern California desert ecosystem and prospects for natural recovery and restoration: Environmental Management, v. 24, p. 309–326.
- Lovich, J.E., C.B. Yackulic, J. Freilich M. Agha, M. Austin, K.P. Meyer, T.R. Arundel, J. Hansen, M.S. Vamstad, S.A. Root. 2014. Climatic variation and tortoise survival: Has a desert species met its match? Biological Conservation 169 (2014) 214–224.
- McLellan, B.N., and D.M Shackleton, 1988. Grizzly bears and resource extraction industries: effects of roads on behavior, habitat use and demography. J. Appl. Ecol. 25, 451–460.
- McLuckie, A.M., M.R.M. Bennion, and R.A. Fridell. 2007. Tortoise mortality within the Red Cliffs Desert Reserve following the 2005 wildfire. Utah Division of Wildlife Resource Publication 07-05.
- Medica, P.A., R.B. Bury, and F.B. Turner. 1975. Growth of the desert tortoise (Gopherus agassizii) in Nevada. Copeia 1975:639-643.
- Minnich, J.E. 1970. Water and electrolyte balance of the desert iguana, *Dipsosaurus dorsalis*, in its native habitat. Comparative Biochemistry and Physiology 35:921-933.
- Minnich, J.E. 1979. Comparison of maintenance electrolyte budgets of free-living desert and gopher tortoises (*Gopherus agassizii* and *G. polyphemus*). Proceedings of the Desert Tortoise Council Symposium 1979 Pp.166-174.
- Murphy, R.W., Berry, K.H., Edwards, T., Leviton, A.E., Lathrop, A., and Riedle, J.D., 2011, The dazed and confused identity of Agassiz's land tortoise, *Gopherus agassizii* (Testudines, Testudinidae) with the description of a new species, and its consequences for conservation: ZooKeys, v. 113, p. 39–71.
- Nafus, M.G., T.D. Tuberville, K. A. Buhlmann, and B.D. Todd. 2013. Relative abundance and demographic structure of Agassiz's desert tortoise (*Gopherus agassizii*) along roads of varying size and traffic volume. Biological Conservation 162 (2013) 100–106.
- Nagy, K.A. 1972. Water and electrolyte budgets of a free-living desert lizard, *Sauromalus obesus*. Journal of Comparative Physiology 79:93-102.

- Nagy, K.A., and P.A. Medica. 1986. Physiological ecology of desert tortoises. Herpetologica 42:73-92.
- Nagy, K.A., Henen, B.T., and Vyas, D.B., 1998, Nutritional quality of native and introduced food plants of wild desert tortoises: Journal of Herpetology, v. 32, p. 260–267.
- Noss, R. F. 1993. Wildlife corridors. Pages 43-68 in D. S. Smith and P. C. Hellmund, editors. Ecology of Greenways. University of Minneapolis Press, Minneapolis, Minnesota.
- Noss, R. F. 1995. Maintaining ecological integrity in representative reserve networks. World Wildlife Fund, Canada.
- [OECD] Organization for Economic Co-operation and Development. 2002. OECD guidelines towards environmentally sustainable transport. OECD Publications, Paris, France.
- Oftedal, O.T. 2002. The nutritional ecology of the desert tortoise in the Mojave and Sonoran deserts. Pages 194-241 in T.R. Van Devender (ed.), The Sonoran Desert Tortoise; Natural History, Biology and Conservation. University of Arizona Press, Tucson, Arizona.
- Oftedal, O.T., L.S. Hillard, and D.J. Morafka. 2002. Selective spring foraging by juvenile desert tortoises (Gopherus agassizii) in the Mojave Desert—Evidence of an adaptive nutritional strategy: Chelonian Conservation and Biology, v. 4, p. 341–352.
- Oftedal, O.T. and M.E. Allen. 1996. Nutrition as a major facet of reptile conservation. Zoo Biology 15:491-497.
- Parendes, L.A., and J.A. Jones. 2000. Role of light availability and dispersal in exotic plant invasion along roads and streams in the H. J. Andrews Experimental Forest, Oregon. Conservation Biology 14:64.
- Rytwinski, T., and L. Fahrig. 2011. Reproductive rate and body size predict road impacts on mammal abundance. Ecol. Appl. 21, 589–600.
- Rytwinski, T., and L. Fahrig. 2012. Do species life history traits explain population responses to roads? A meta-analysis. Biol. Conserv. 147, 87–98.
- Roedenbeck, I.A., L. Fahrig, C. S. Findlay, J. E. Houlahan, J.A.G. Jaeger, N. Klar, S. Kramer-Schadt, and E. A. van der Grift. 2007. The Rauischholzhausen Agenda for Road Ecology. Ecology and Society 12(1): 11. http://www.ecologyandsociety.org/vol12/iss1/art11/
- Rudis, V.A. 1995. Regional forest fragmentation effects on bottomland hardwood community types and resource values. Landsc. Ecol. 10:291-307.

- Sanson, L. 2016. Marines seek plan to move tortoises from Johnson Valley. Hi-Desert Star September 8, 2016. <a href="http://www.hidesertstar.com/news/article\_c51696c6-7609-11e6-847d-03224974e42a.html">http://www.hidesertstar.com/news/article\_c51696c6-7609-11e6-847d-03224974e42a.html</a>
- Sazaki, M., W.I. Boarman, G. Goodlett, and T. Okamoto. 1995. Risk associated with long-distance movement by desert tortoises. Proceedings of the Desert Tortoise Council 1994 Symposium. pp. 33–48.
- W.H. Schlesinger, and C.S. Jones. 1984. The Comparative Importance of Overland Runoff and Mean Annual Rainfall to Shrub Communities of the Mojave Desert. Botanical Gazette 1984 145(1): 116-124.
- Sharifi, M.R., A.C. Gibson, and P.W. Rundel. 1997. Surface Dust Impacts on Gas Exchange in Mojave Desert Shrubs. Journal of Applied Ecology, 34(4)(Aug., 1997):837-846.
- Sherwood, B., D. Cutler, and J. A. Burton. 2002. Wildlife and roads—the ecological impact. Imperial College Press, London, UK.
- Spellerberg, I. F. 2002. Ecological effects of roads. Land Reconstruction and Management Series, Volume 2. Science Publishers, Enfield, UK.
- Tierra Madre Consultants. 1991. Biological assessment for Lancaster City and Planning Area: Relative density surveys for desert tortoises and cumulative human impact evaluations for Mohave ground squirrel habitat. Report prepared by Ed LaRue for City of Lancaster. Tierra Madre Consultants, Riverside, CA.
- Tracy, C.R., L.C. Zimmerman, C. Tracy, K.D. Bradley, and K. Castle. 2006. Rates of food passage in the digestive tract of young desert tortoises: Effects of body size and diet quality. Chelonian Conservation and Biology: December 2006, Vol. 5, No. 2, pp. 269-273.
- Tratz, W.M. 1978. Postfire vegetational recovery, productivity and herbivore utilization of a chaparral-desert ecotone. Master's Thesis. California State University, Los Angeles.
- Tratz, W.M., and R.J. Vogl. 1977. Postfire vegetational recovery, productivity and herbivore utilization of a chaparral-desert ecotone. Pages 426-430 in H.A. Mooney and C.E. Conrad (eds.), Proceedings of Symposium on Environmental Consequences of Fire and Fuel Management in Mediterranean Ecosystems. USDA Forest Service General Technical Report WO-3.
- Trombulak, S. C., and C. A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14:18–30.
- Turner, F.B., P. Hayden, B.L. Burge, and J.B. Roberson. 1986. Egg production by the desert tortoise (Gopherus agassizii) in California. Herpetologica 42:93-104.

- Turner, F.B., K.H. Berry, D.C. Randall, and G.C. White. 1987. Population ecology of the desert tortoise at Goffs, California, 1983-1986. Report to Southern California Edison Co., Rosemead, California.
- Turtle Conservation Coalition. 2018. Turtles in Trouble: The World's 25+ Most Endangered Tortoises and Freshwater Turtles. www.iucn-tftsg.org/trouble
- Umweltbundesalt (UBA). 2003. Reduzierung der Flächeninanspruchnahme durch Siedlung und Verkehr. Materialienband. Umweltbundesamt Texte 90/03, Berlin, Germany. Available online at: <a href="http://www.umweltdaten.de/publikationen/fpdf-l/2587.pdf">http://www.umweltdaten.de/publikationen/fpdf-l/2587.pdf</a>.
- Underhill, J. E., and P. G. Angold. 2000. Effects of roads on wildlife in an intensively modified landscape. Environmental Reviews 8:21-39.
- U.S. District Court. 2011. Order re: remedy. Case 3:06-cv04884-SI. Center for Biological Diversity, et al., Plaintiffs v. BLM. United States District Court for the Northern District of California, USA. As cited in Berry, K.H., L.M. Lyren, J.L. Yee, and T.Y. Bailey. 2014. Protection benefits desert tortoise (*Gopherus agassizii*) abundance: the influence of three management strategies on a threatened species. Herpetological Monographs, 28 2014, 66–92.
- U.S. Ecology. 1989. Proponent's Environmental Assessment. California Low-Level Radioactive Waste Disposal Site. Appendices K and M, Volume II.
- U.S. Fish and Wildlife Service. 1994a. Endangered and threatened wildlife and plants; determination of critical habitat for the Mojave population of the desert tortoise. Federal Register 55(26):5820-5866. Washington, D.C.
- U.S. Fish and Wildlife Service. 1994b. Desert tortoise (Mojave population) Recovery Plan. U.S. Fish and Wildlife Service, Region 1, Portland, Oregon. 73 pages plus appendices.
- U.S. Fish and Wildlife Service. 2008. Lane Mountain milk-vetch (*Astragalus jaegerianus*) 5-Year Review: Summary and Evaluation. Ventura Fish and Wildlife Office, Ventura, California.
- U.S. Fish and Wildlife Service. 2011a. 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.
- U.S. Fish and Wildlife Service. 2011b. Biological Opinion on Mojave Solar, LLC's Mojave Solar Project, San Bernardino County, California (8-8-11-F-3). Ventura Fish and Wildlife Office, Ventura, CA.
- U.S. Fish and Wildlife Service 2014a. 12-month finding on a petition to reclassify *Astragalus jaegerianus* as a threatened Species. 79 Federal Register 25084-25092, Friday, May 2, 2014.

- U.S. Fish and Wildlife Service. 2014b. Determination of threatened status for the western distinct population segment of the yellow-billed cuckoo (*Coccyzus americanus*); Final Rule. 79 Federal Register 59992-60038.
- U.S. Fish and Wildlife Service. 2014c. Designation of critical habitat for the western distinct population segment of the yellow-billed cuckoo; Proposed Rule. 29 Federal Register 48548-48652.
- U.S. Fish and Wildlife Service. 2015. Range-wide Monitoring of the Mojave Desert Tortoise (*Gopherus agassizii*): 2013 and 2014 Annual Reports. Report prepared by Linda Allison for the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada.
- van der Ree R., J. A. G. Jaeger, E. A. van der Grift, and A. P. Clevenger. 2011. Effects of roads and traffic on wildlife populations and landscape function: Road ecology is moving toward larger scales. Ecology and Society 16(1): 48. [online] URL: <a href="http://www.ecologyandsociety.org/vol16/iss1/art48/">http://www.ecologyandsociety.org/vol16/iss1/art48/</a>
- von Seckendorff Hoff, K., and Marlow, R.W. 2002. Impacts of vehicle road traffic on desert tortoise populations with consideration of conservation of tortoise habitat in southern Nevada. Chelonian Conservation and Biology 4:449–456.
- Zimmerman, L.C., Espinoza, R.E., and Barber, A.M., 2006a, The importance of physiological ecology in conservation biology: Integrative and Comparative Biology, v. 46, p. 1,191–1,205.