



DESERT TORTOISE COUNCIL

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Via email only

Date: January 1, 2024

Attn: Ms. Carrie Abravanel
NEPA Rulemaking Comments
Office of NEPA Policy and Compliance (GC-54)
U.S. Department of Energy
1000 Independence Avenue SW.
Washington, DC 20585
DOE-NEPA-Rulemaking@hq.doe.gov

RE: National Environmental Policy Act considerations for programmatic categorical exclusions for miscellaneous energy developments (Docket: DOE-HQ-2023-0063; DOE NEPA Implementing Procedures, RIN 1990-AA48)

Dear Ms. Abravanel,

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 project. Given that the Department of Energy’s (DOE) decisions may affect animals and habitats known to be occupied by the federally listed, Threatened, Mojave desert tortoise (*Gopherus agassizii*) (synonymous with Agassiz’s desert tortoise) or the special status species, Sonoran desert tortoise (*Gopherus morafkai*) (synonymous with Morafka’s desert tortoise), our comments include recommendations intended to enhance protection of these species and their habitats during activities authorized by the DOE, which we recommend be considered in your assessment and decision making processes. Please accept, carefully review, and include in the relevant project file the Council’s following comments for the proposed action.

The following descriptions of three pertinent types of National Environmental Policy Act (NEPA) environmental documents are taken from the Federal Register Notice (Notice), dated November 16, 2023¹: “NEPA establishes three types of review for proposed actions—environmental impact statement [EIS], environmental assessment [EA], and categorical exclusion [CE]—each involving different levels of information and analysis. An environmental impact statement is a detailed analysis of reasonably foreseeable environmental effects prepared for a major Federal action significantly affecting the quality of the human environment (42 U.S.C. 4332(2)(C) and 40 CFR part 1502 and section 1508.1(j)). An environmental assessment is a concise public document prepared by a Federal agency to set forth the basis for its finding of no significant impact or its determination that an environmental impact statement is necessary (42 U.S.C. 4336(b)(2) and 40 CFR 1501.5, 1501.6, and 1508.1(h)). A categorical exclusion is a category of actions that the agency has determined, in its agency NEPA procedures, normally **does not have a significant effect on the human environment** [bold emphasis added] and therefore does not require preparation of an environmental assessment or environmental impact statement (40 CFR 1501.4, 1507.3(e)(2)(ii), and 1508.1(d)). DOE's procedures for applying categorical exclusions require the agency to consider whether extraordinary circumstances exist due to which a normally excluded action may have a significant environmental effect.”

It is our understanding that “significant effect” as used in the above bold language also applies to significant effects to the nonhuman environment, particularly Federally-listed, Threatened and Endangered Species protected under the Federal Endangered Species Act (FESA), and are not restricted to only the “human environment.”

The Notice indicates, “As another example [of best management practices], the changes proposed in this rulemaking specify conditions regarding siting proposed actions on previously disturbed or developed land and on land contiguous to previously disturbed and developed land. DOE defines previously disturbed or developed as ‘land that has been changed such that its functioning ecological processes have been and remain altered by human activity.’” Please be aware that the two species of tortoises considered in this letter are highly mobile species that may not thrive on “disturbed or developed land,” but they certainly enter and cross through such lands on their way to more suitable and intact habitats.

Averill-Murray et al. (2021) emphasized that “[m]aintaining an ecological network for the Mojave desert tortoise, with a system of core habitats (TCAs = Tortoise Conservation Areas) connected by linkages, is necessary to support demographically viable populations and long-term gene flow

¹ https://www.federalregister.gov/documents/2023/11/16/2023-25174/national-environmental-policy-act-implementing-procedures?mc_cid=0b8d39f162&mc_eid=7128f87340

within and between TCAs.” “Ignoring minor or temporary disturbance on the landscape could result in a cumulatively large impact that is not explicitly acknowledged (Goble, 2009); therefore, understanding and quantifying all surface disturbance on a given landscape is prudent.” Furthermore, “habitat linkages among TCAs must be **wide enough** [emphasis added] to sustain multiple home ranges or local clusters of resident tortoises (Beier and others, 2008; Morafka, 1994), while accounting for edge effects, in order to sustain regional tortoise populations.” Consequently, effective linkage habitats are not long narrow corridors. Any development within them has an edge effect (i.e., indirect impact) that extends from all sides into the linkage habitat further narrowing or impeding the use of the linkage habitat, depending on the extent of the edge effect.

Averill-Murray et al. (2021) further notes that “To help maintain tortoise inhabitation and permeability across all other non-conservation-designated tortoise habitat, all surface disturbance could be limited to less than 5-percent development per square kilometer because the 5-percent threshold for development is the point at which tortoise occupation drops precipitously (Carter and others, 2020a).” They caution that the upper threshold of 5 percent development per square kilometer may not maintain population sizes needed for demographic or functional connectivity; therefore, development thresholds should be lower than 5 percent.

The lifetime home range for the Mojave desert tortoise is more than 1.5 square miles (3.9 square kilometers) of habitat (Berry 1986) and, as previously mentioned, may make periodic forays of more than 7 miles (11 kilometers) at a time (Berry 1986).

Consequently, these lands are needed by tortoises to maintain connectivity among populations and to be able to move in response to climate change. Additional development in these disturbed areas may result in isolation of these populations and the associated adverse impacts of genetics, demographic, and environmental stochasticity that ultimately results in extirpation of these populations (USFWS 1994a, USFWS 2011, Averill-Murray et al. 2021).

The Notice then states, “In DOE's experience, the potential for certain types of actions to have significant impacts on the human environment is generally avoided when that action takes place within a previously disturbed or developed area, i.e., land that has been changed such that the former state of the area and its functioning ecological processes have been altered.” As given below, this has not been our experience with either species of desert tortoise, as many of us have worked as biological consultants on energy projects and have firsthand knowledge of impacts in even degraded habitats.

So, although we applaud DOE's intent to situate new development on degraded habitats, keep in mind that DOE and other federal land managers, such as the Bureau of Land Management (BLM) and military, also need to avoid the take of individual Mojave desert tortoises wherever they occur, regardless of habitat quality or intactness. They also need to implement actions that will contribute to the conservation and recovery of Mojave desert tortoises (please see Sections 2 and 3 of the FESA).

Nor can impacts associated with refurbishing and retrofitting existing transmission lines, for example, be contained within previously degraded habitats. In a recent letter to the BLM (Desert Tortoise Council 2023a) commenting on the GridLiance West Core Upgrades Project in Nye and Clark counties, Nevada, for the construction, operation, maintenance, and decommissioning of approximately 155 miles of a double-circuit 230-kV or 500-kV transmission system upgrade, we expressed our concern that different upgrades would result in different impacts. The project description revealed that a 230-kV system upgrade could result in a 150-foot-wide impact area while a 500-kV line could result in a 300-foot-wide impact, keeping in mind that the upgrades would be applied to existing transmission lines. We were also told that 38 living Mojave desert tortoises were found along the transmission lines. In our experience, even if tortoises were moved out of harm's way, which handling is a form of take, it would be impossible to avoid take of tortoises during construction, operation, maintenance, and decommissioning this project, and a CE could not authorize take associated with this type of development.

In another recent project (Desert Tortoise Council 2023b), BLM assessed impacts in an EIS for the Greenlink West Project comprised of new 525-kilovolt (kV), 345-kV, 230-kV, and 120-kV electric transmission facilities on private, state, and federal lands, running from North Las Vegas to Reno through Clark, Nye, Esmeralda, Mineral, Lyon, Storey, and Washoe counties. The EIS estimated that the project would result in 15,206 acres of "temporary" impacts associated with right-of-way (ROW) development and 4,834.6 acres of "permanent" impacts. Biologists observed a total of 11 live adult desert tortoises, 468 tortoise burrows, 31 tortoise carcasses, and miscellaneous tortoise signs at 19 locations. Like the GridLiance project described above, there is no way that such a project could be developed without significant impacts, so a CE would not apply.

In these two examples, we expect that DOE would agree with the Council that an EIS, not a CE, would be appropriate for these two projects. But a primary reason for referencing these two projects is because of the indirect, growth-inducing, synergistic, and cumulative impacts each of them will have if developed. It is noteworthy that these two projects are proposed in southern Nevada where an unprecedented amount of solar development has displaced thousands of tortoises on ten thousands of acres. When asked, the BLM admitted that the GridLiance project would have growth-inducing impacts that would predictably result in even more solar development in the region, with even more losses of tortoises and habitats. DOE cannot ignore the growth-inducing impacts of the construction, operation, and maintenance of new/additional transmission lines in existing ROWs when complying with NEPA.

The Council believes that growth-inducing impacts associated with transmission lines are connected actions as described in 40 CFR 1508.25(a)(1). Connected actions include actions that "[c]annot or will not proceed unless other actions are taken previously or simultaneously." Solar projects can only be placed along/near transmission lines as the transmission lines are the conduit to deliver the electricity they produce. But for the locations and capacities of transmission lines, there would be no large solar projects nearby. NEPA regulations require that connected actions be analyzed in the NEPA document. Thus, DOE should ensure that connected actions are included in its analysis of the proposed CEs. When this occurs, we believe DOE must conclude that the transmission line projects in the range of the tortoise would have several adverse impacts and would not qualify for a CE.

In addition, DOE cannot ignore that linear projects and associated disturbance result in far greater direct and indirect impacts to tortoises than any other type of project. Non-native, invasive species and edge-associated species often become dominant along the access roads of these linear features, which serve as corridors for weed dispersal (Boarman and Sazaki 2006, Brooks 2009, USFWS 2011). They degrade and fragment tortoise habitats, and non-native invasive species play a more dominant role in ecosystem dynamics. For instance, increases in plant cover due to the proliferation of non-natives have altered fire regimes throughout the Mojave Desert region (Brooks 1999, Brooks and Esque 2002, Esque et al. 2003, Brooks et al. 2004, USFWS 2011). Impacts to desert tortoise habitat and individuals occur both during initial construction as well as during long-term maintenance activities (Boarman 2002).

Additionally, utility corridors are often used by the public for off-highway vehicle and recreational access. LaRue and Dougherty (1998) evaluated results of over 230 biological opinions issued by our southern California and Nevada offices and found that 80 percent of the tortoises reported killed in these two states were found along utility corridors.

Utility towers also provide nesting substrate and hunting perches to avian predators, such as common ravens (USFWS 2011). Common ravens are known to prey on juvenile desert tortoises based on direct observations and circumstantial evidence, such as shell-skeletal remains with holes pecked in the carapace (Boarman 1993). The number of common ravens increased by 1,528% in the Mojave Desert since the 1960s (Boarman 1993). This increase in raven numbers is attributed to unintentional subsidies provided by humans.

In the Mojave Desert, common ravens are subsidized predators, because they benefit from resources associated with human activities that allow their populations to grow beyond their “natural” carrying capacity in the desert habitat. The use of anthropogenic nesting substrates such as the towers of transmission lines facilitates increased predation of juvenile tortoises, especially within about 0.4 kilometers (0.25 miles) of the raven nest (Boarman 2002; Kristan and Boarman 2003). The presence of roads may encourage such opportunistic species because road-killed animals are a reliable food source (Camp et al. 1993, Boarman and Sazaki 2006). Human subsidies include food from wildlife roadkill and other sources as well as perch, roost, and nest sites from power towers, telephone poles, light posts, billboards, fences, freeway or railroad overpasses, abandoned vehicles, and buildings (Boarman 1993). Subsidies allow ravens to survive in the desert during summer and winter when prey and water resources are typically inactive or scarce.

The access roads would act as a “population sink” for the various wildlife species in the nearby undeveloped land and become a subsidized food source of roadkill and road injury for common ravens. This ongoing food subsidy would result in two forms of increased predation by common ravens on tortoises (Holcomb et al. 2021), “hyper-predation” from breeding ravens and “spillover-predation” from non-breeding ravens (Kristan and Boarman 2003). Boarman (1993) concluded that the human-provided resource subsidies must be reduced to facilitate a smaller raven population in the desert and reduced predation on the tortoise.

It is essential that, in addition to direct impacts, DOE considers the growth-inducing, indirect, synergistic, and cumulative impacts associated with the types of energy projects it is considering to be covered by a programmatic CE. It is our observation that every solar project and transmission

line project developed within the listed population of the Mojave desert tortoise in California, Nevada, Arizona, and Utah has had a significant impact on this Threatened species, and that none of them could have been authorized under a CE. At the very least, an EA was appropriate, and in most cases, an EIS was required.

Furthermore, in desert tortoise habitats, we believe that, after DOE has reviewed the results of protocol tortoise surveys (USFWS 2019 for Mojave desert tortoise and Arizona Game and Fish Department 2010 for Sonoran desert tortoise) and determines that a CE is appropriate, it is prudent that DOE share this determination and the consultant's report(s) with the USFWS to see if they concur. In California, these results should also be shared with the appropriate region of the California Department of Fish and Wildlife (CDFW) to see if they concur with the CE determination, and to inform them of projects that may or may not affect the desert tortoise.

The Mojave desert tortoise is among the top 50 species on the list of the world's most endangered tortoises and freshwater turtles. The International Union for Conservation of Nature's (IUCN) Species Survival Commission, Tortoise and Freshwater Turtle Specialist Group, now considers the Mojave desert tortoise to be Critically Endangered (Berry et al. 2021), "... based on population reduction (decreasing density), habitat loss of over 80% over three generations (90 years), including past reductions and predicted future declines, as well as the effects of disease (upper respiratory tract disease/mycoplasmosis). *Gopherus agassizii* (sensu stricto) comprises tortoises in the most well-studied 30% of the larger range; this portion of the original range has seen the most human impacts and is where the largest past population losses have been documented. A recent rigorous rangewide population reassessment of *G. agassizii* (sensu stricto) has demonstrated continued adult population and density declines of about 90% over three generations (two in the past and one ongoing) in four of the five *G. agassizii* recovery units and inadequate recruitment with decreasing percentages of juveniles in all five recovery units."

This status, in part, prompted the Council to join Defenders of Wildlife and Desert Tortoise Preserve Committee (Defenders of Wildlife et al. 2020) to petition the California Fish and Game Commission in March 2020 to elevate the listing of the Mojave desert tortoise from Threatened to Endangered in California. The decision is still pending at the time of this writing.

We provide DOE with information in Appendix A on the status trends of the Mojave desert tortoise, which clearly demonstrates that this species is more imperiled now than when it was Federally-listed as Threatened in 1990 (USFWS 1990), despite establishment of critical habitat (USFWS 1994b), finalizing a Recovery Plan (1994a), and revising that Recovery Plan (USFWS 2011). The reason for significance of these impacts is that for most populations of Mojave desert tortoise, the current density of adult tortoises is below the population viability threshold (USFWS 1994a). This means that any additional impacts to these tortoise populations will continue the downward trajectory of tortoise density and substantial decline in juvenile tortoises (USFWS 2015, Allison and McLuckie 2018). Although the numbers of tortoises that are estimated to remain appear to be large, these numbers are deceiving as tortoise are "spread thin" throughout a large area. This substantially reduces the likelihood of finding a mate and successfully reproducing.

Added to this difficulty is the reduced availability of native forage required for adequate nutrition and water content/water balance because surface disturbance promotes the establishment of non-native invasive plants with reduced nutritional value and water content. These non-native plants outcompete native herbaceous plants (Jennings and Berry 2023). Combined with climate change, the spread and proliferation of non-native invasive plants provide a continuous fuel source for fires of large acreage and frequency (USFWS 1994a, Brooks 1998). Native desert plant species are not adapted to fires and are replaced by non-native species (Brooks and Esque 2002). With declining adults, little recruitment, increases in activities that result in surface disturbance and promote the growth of non-native invasive annual plants, and with the increases in fire frequency, intensity, and size, tortoises are doomed to extirpation. We remind DOE that survival and recovery of the tortoise is needed in all five recovery units throughout its range (USFWS 2011). Thus, total number of tortoises is not a reliable indicator of the status of the tortoise, including its ability to survive and recover.

DOE must be very careful that a programmatic CE does not further contribute to the ongoing decline of tortoises leading to local extinctions, which the best scientific data suggest is happening through most of the range (Allison and McLuckie 2018).

The Notice further indicates (bold emphasis added), “Any proposed use of **contiguous land** is subject to review against all the conditions relevant to the categorical exclusion, including the integral elements that require consideration of effects on threatened species, historic properties, and other environmentally sensitive resources.” Taken in context, DOE is proposing that lands adjacent to “disturbed or developed land” (i.e., “contiguous land”) serve as one of the categories for the programmatic CE.

It is important to note throughout the listed range of the Mojave desert tortoise in California, Nevada, Utah and Arizona – west and north of the Colorado River – that protocol presence-absence surveys (USFWS 2019) are an essential part of current management so that the Federal Lead Agency (usually the BLM) can ascertain if a given project *may affect* the desert tortoise or result in *adverse modification* of USFWS-designated critical habitat. The trigger to a may affect determination is ANY sign of the desert tortoise found within the surveyed action area, as defined in 50 Code of Federal Regulations 402.2, and in USFWS’s (2009) Desert Tortoise Field Manual as “all areas to be affected directly or indirectly by proposed development and not merely the immediate area involved in the action (50 CFR §402.02).”

Therefore, we caution the DOE in taking an approach of predetermining categories of projects based on location or type for which a CE would be programmatically applied. Rather, it is mandatory that the DOE and applicable Federal agencies ensure that protocol surveys for desert tortoises are performed by experienced biologists for ALL energy projects, including those on developed and disturbed lands, and that CEs be applied to only those projects on which no tortoise signs are found and knowledgeable agency biologists affirm that tortoises will not be directly, indirectly, cumulatively, or synergistically affected by projects funded, authorized, or carried out by their Federal agencies or by projects with growth-inducing impacts.

The Notice then lists “integral elements” requiring that, to fit within a categorical exclusion, the proposed action must not “...disturb hazardous substances, pollutants, or contaminants that preexist in the environment such that there would be uncontrolled or unpermitted releases; have the potential to cause significant impacts on environmentally sensitive resources” (others are listed, but these are the two that most likely affect the two desert tortoise species). Please note that mercury, arsenic, and other naturally occurring substances hazardous to humans and tortoises may remain quiescent in desert soils until mechanical disturbances of the soils cause them to be released into the air and/or transported along dry washes where they then become toxic when encountered by both humans and tortoises, particularly when tortoises ingest contaminated forage (Chaffe and Berry 2006).

The Notice explains “sensitive resources” as follows: “In appendix B, DOE defines ‘environmentally sensitive resource’ as a resource that has typically been identified as needing protection through Executive Order, statute, or regulation by Federal, state, or local government, or a federally recognized Indian tribe. Environmentally sensitive resources include historic properties, threatened and endangered species, floodplains, and wetlands, among others.”

We believe that we have herein presented DOE with convincing evidence concerning how significant direct, indirect, growth-inducing, synergistic, and cumulative impacts resulting from energy projects constructed to date have adversely affected animals and habitats within the listed range of the Mojave desert tortoise. Hence, most energy projects within the listed range of the tortoise will “...have the potential to cause significant impacts on environmentally sensitive resources.” This integral element also applies to the Sonoran desert tortoise, which is designated as a Sensitive species by the BLM throughout its range east of the Colorado River. BLM (2021b, 2021c, 2022) and USFWS (2015) are examples of formal Federal protections that apply to the Sonoran desert tortoise.

The Notice makes the following statement, which we think needs to be clarified: “Only if DOE determines that all the applicable conditions have been met may it issue a categorical exclusion determination.” How would this determination impact other Federal agencies, particularly the BLM, (and state agencies as described below) in their abilities under current management to issue a CE? Will DOE be setting an inferior standard that would result in violation of current management required by other federal agencies for tortoises and other species (see examples below)?

The Notice refers to the Technical Support Document as summarizing “...environmental assessments for the types of projects addressed in this proposed rulemaking and other information. The environmental assessments demonstrate how DOE and other Federal agencies evaluated potential environmental impacts of these projects and determined that they would not result in a significant environmental effect.” Given that CEs are written prior to the development of a particular energy project, are there monitoring data during construction, operations, maintenance, and decommissioning that demonstrate that issuance of the CE did not result in take of a listed species? In our experience, BLM projects where a CE is issued are not monitored because take is not supposed to occur. Therefore, in the absence of monitoring data, it is practically impossible to document if take actually occurred during the project.

In reviewing the Technical Support Document, we note that the following projects occurred in desert tortoise habitat, and that if they occurred, desert tortoises would have been adversely affected by all of them:

- Environmental Assessment for the Mead/Davis 230-kV Transmission Line Reconductor (DOE/EA-1595; WAPA, 2007) in Nevada: <https://www.energy.gov/nepa/ea-1595-meaddavis-230-kv-transmission-line-reconductor>. On page 54, we took the following screen shot of the EA available at the above link:

All projects, whether federally or privately funded, must comply with the take prohibitions of the ESA. Given the potential for the Proposed Action and the other actions to affect the Mojave desert tortoise, the Proposed Action may contribute to the long-term impacts to the species. With proper monitoring protocols and adherence to the USFWS mitigation measures, these cumulative impacts would be significantly minimized.

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It is our understanding that the Technical Support Document provides a list of DOE projects that could be authorized under a CE. If that is correct and our understanding is also correct that a CE cannot be issued when a Federally listed species may be significantly affected, as the statement in the EA confirms, how is this an appropriate example of a project for which issuance of a CE is warranted?

- Environmental Assessment for the Arica Solar Project and Victory Pass Solar Project (Bureau of Land Management, 2021): <https://eplanning.blm.gov/eplanning-ui/project/1502789/510>. This is a project on which the Council commented on September 17, 2021². It is noteworthy that, while the BLM prepared an EA for this project, the CDFW served as the State Lead Agency in the preparation of an EIR, the equivalent of an EIS under the California Environmental Quality Act (CEQA). In any case, the Council made the following comment on page 2 (Desert Tortoise Council 2021):

“Our primary concern with the proposed project is **the inclusion of desert tortoise critical habitat on the southern portions of the Victory Pass site within the impact footprint. To our knowledge, this sets a precedent within the California Desert Conservation Area Plan (CDCA Plan) area as the first solar project that would be developed in designated desert tortoise critical habitat.**”

Again, if the Technical Support Document is intended to provide examples of projects DOE believes should be subject to CE authorization, our concerns with the approach are heightened by this example.

Furthermore, we express our serious concern with the issuance of any CEs in designated tortoise critical habitat, and Areas of Critical Environmental Concern (ACECs) or National Conservation Lands (NCL), where these latter two designations are intended to promote conservation and

² <https://www.dropbox.com/scl/fi/yjdqa97tgbdq8zo46nbpx/Arica-and-Victory-Pass-Solar-Projects-EIR.9-17-2021.pdf?rlkey=yjbud89z7jxjeb2pq4zvy7pz3&dl=0>

recovery of desert tortoises. We assert that impacts associated with any energy development in designated TCAs such as these must require a level of scrutiny at the minimum of either an EA or EIS for DOE to have fully considered the significance of the impact, and that in a majority of the previous projects that we have reviewed, a CE would not have been appropriate.

- Environmental Assessment for Department of Energy Loan Guarantee to Sempra Generation for Construction of the Mesquite Solar Project in Maricopa County, AZ (DOE/EA-1796; DOE, 2011): <https://www.energy.gov/nepa/doeea-1796-sempra-mesquite-solar-energy-project-maricopa-county-arizona>. We read the following statement on page 3-43 of the EA provided at the above link:

“The USFWS indicated that although unlikely, **there is potential for desert tortoise on the project site**. Any desert tortoise in this area would be part of the Sonoran population, which is not federally listed and has no regulatory status (USFWS 2010). Desert tortoise is considered a species of concern by the state of Arizona but does not have regulatory status under Arizona law (AZGFD 2009a).” Even so, there is a Candidate Conservation Agreement among regulatory agencies in Arizona, including the USFWS, that protect tortoises with the goal of conserving the tortoise so it does not meet the definition of Threatened or Endangered and would not need to be listed under the FESA (USFWS et al. 2015). We note on page ES-1 of the same linked EA, DOE’s statement: “An EA is required under NEPA when a federal agency is proposing to fund a project **that could have an impact on the environment** [bold emphasis added]” and we note that the Mesquite project was analyzed in an EA. We offer DOE’s statement as supporting evidence that for this project, an EA not a CE, was the appropriate NEPA document as every proposed energy project “could have an impact on the environment.”

- Environmental Assessment for Construction, Operation, and Decommissioning of a Solar Photovoltaic System at Marine Air Ground Task Force Training Command Marine Corps Air Ground Combat Center Twentynine Palms, California (Department of the Navy and United States Marine Corps, 2015): <https://www.29palms.marines.mil/Portals/56/Docs/Environmental%20Affairs/Final-EA-and-FONSI-for-Solar-PV-System-2015.pdf>. The Marine Corps Base at 29 Palms is an example of a federal agency in the Mojave Desert that has a programmatic biological opinion listing dozens of protective measures (see pages ES-3 and ES-4 of the EA available at the above link). We read the following determination on page 2-10 in Table 2-1 with regard to impacts on tortoises:

“Wildlife and special status species, namely **the desert tortoise** and Mojave fringe-toed lizard, **would potentially be exposed to direct and indirect impacts**. However, with **implementation of Avoidance and Impact Minimization Measures and Special Conservation Measures (SCMs)** listed below, the Proposed Action/Alternative 1 is **not likely to incidentally take or otherwise adversely affect desert tortoises**.”

These measures include seeking, capturing, and relocating tortoises out of harm’s way – standard definitions of take – under the authority of the aforementioned programmatic biological opinion, which could not be implemented under a CE, which lack Federal take authorization.

In each of these examples, there are fatal flaws associated with issuing a CE for these projects, two of which *may affect* the Federally listed desert tortoise, one of which would result in *adverse modification* of designated critical habitat, and one of which would affect a non-listed, BLM-Sensitive species. We note that most of the examples of the NEPA documents in the Technical Support Document do not occur in tortoise habitats, and all of those that do would result in direct, indirect, growth-inducing, synergistic, and/or cumulative impacts, which warrants at a minimum, an EA, at a maximum, an EIS, and in no example provided should a CE be issued. So, we question if DOE's proposals are even appropriate for projects in tortoise habitats, and in most cases, they would result in violation of the FESA.

As such, we strongly recommend that proposed projects occurring in Mojave and Sonoran desert tortoise habitats in California, Nevada, Arizona, and Utah be extricated from the programmatic CE.

The Notice indicates that there was a previous Federal Register Notice dated November 15, 2022, which we are only now becoming aware of, when DOE decided "...to expand the scope of its categorical exclusion for upgrading and rebuilding powerlines, and to expand its categorical exclusion for solar photovoltaic systems to at least 200 acres within previously disturbed or developed areas." We believe for reasons given above that programmatically issuing CEs for "upgrading and rebuilding powerlines" and "for [developing] solar photovoltaic systems to at least 200 acres within previously disturbed or developed areas" will predictably result in unauthorized take of Mojave desert tortoises and impacts to the BLM-designated Sensitive Sonoran desert tortoise.

To reiterate our concern given above, we ask that the DOE clearly state that requisite surveys for desert tortoises and numerous other sensitive species (CDFG 2010 for the Federally-listed Swainson's hawk; CDFG 2012 for the BLM-Sensitive western burrowing owl; CDFW for special status plant populations; CDFW 2023 for the California-listed Mohave ground squirrel; and University of California Riverside 2005 for the Federally-listed Coachella Valley fringe-toed lizard, among others) be conducted by qualified biologists approved by USFWS and CDFW as part of the determination for issuing CEs in the Mojave and Sonoran desert.

Section II.B. of the Notice states, "Categorical exclusion B4.13 currently applies to upgrading or rebuilding 'approximately 20 miles in length or less' of existing powerlines and allows for minor relocations of small segments of powerlines. DOE proposes to remove the mileage limitation, add options for relocating within an existing right of way or within otherwise previously disturbed or developed lands, and add new conditions." We would argue that exempting upgrades or rebuilds of even 20 miles will predictably impact desert tortoises and adversely affect critical habitat in the Ord-Rodman and Superior-Cronese Critical Habitat Units, for example, both of which have large transmission lines running through them.

We note the following statement later in the Notice that supports our concern given above: "The potential significance of environmental impacts from upgrading or rebuilding powerlines **is more related to local environmental conditions than to the length of the powerlines**" (bold emphasis added). Later in the same paragraph, "...powerline upgrades and rebuilds **do not indicate a particular mileage limit that would mark a threshold for significant impacts.**" These statements seem to imply that it is okay to lift the 20-mile limit but fail to also realize that development along a one-mile section of a transmission line through critical habitat would predictably result in significant impacts.

The Notice already anticipates what the Council recognizes as a “slippery slope” or “moving target” in this planning process, which by the testimonies given, has been supported by the energy development industry but not likely the environmental community, for which no testimonies are given: “The Cross-Cutting Issues Group requested that DOE confirm that categorical exclusion B4.13 **covers all types of powerlines, including ‘gen-tie lines’** and ‘powerlines that feed into a federal electric transmission system (e.g., Tennessee Valley Authority)’ and **related project elements such as access roads** (bold emphasis added).” Within the range of the desert tortoise where solar development has increased exponentially over the past 10 years, every project has its own gen-tie line; there is absolutely no opportunity to use an existing gen-tie line to connect to a new solar field to an existing or new grid. However, as written, “all gen-tie” lines become their own category, likely trumping the need to remain within disturbed and developed areas.

Even more inexcusable, here in the Mojave Desert where one of the worst impacts to the desert tortoise is being crushed along roads and degradation of habitat in adjacent areas by off-highway vehicles, is the idea that all “access roads” because they are project related, would also be subject to the CE immunity. We provide Appendix B as a comprehensive bibliography of road impacts to desert tortoises, and why access roads, alone, would contribute to the significant impacts that undermine DOE’s ability to issue programmatic CEs without regard to significant impacts attributed to roads, not only during construction, but also afterward during operation and maintenance.

We recognize five major categories of primary road effects that typically result in significant impacts to the tortoise and 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).

The implication in the Notice is that issuance of the CE would exempt proponents from Federal requirements to implement current management standards; if take of the desert tortoise is not anticipated, then protective measures that characterize vital components of current management would no longer be required. There would be no need to monitor construction, and in the absence of biological monitors, there would not be anyone to ensure that trash is properly discarded by construction workers, that all impacts be contained within designated and staked boundaries, that pets and firearms not be brought into the workplace, that construction workers all receive environmental awareness programs, etc. These are the best management practices that currently characterize all energy projects in tortoise habitats in the Mojave Desert, even for half-mile transmission lines in occupied habitats.

Although the Notice states that “DOE proposes to add a condition that the proposed project would be in accordance with applicable requirements and would incorporate appropriate design and construction standards, control technologies, and best management practices,” it fails to explain how protective measures can be enforced for projects where there is no anticipated take. The condition does not reflect current management in the Mojave Desert on BLM lands where CEs are not subject to best management practices and Section 7 biological opinion terms and conditions because issuance of the CE implies that there is a no affect determination for the project. How can DOE enforce take preventative measures for CE projects where no take is anticipated?

There is also the question of existing requirements. In California, Southern California Gas Company, Pacific Gas and Electric, and Southern California Edison, to name a few of the major utility companies, each have programmatic biological opinions that obligate them to implement the protective measures listed above, and many more, including habitat compensation. How will DOE's issuance of programmatic CEs affect these existing Federal regulatory requirements, many of which are also programmatic and in effect for future decades?

The Notice indicates that "DOE proposes to change 'removal of a solar PV system to 'decommissioning.' Decommissioning encompasses recycling and other types of actions that occur when a facility is taken out of service. DOE also proposes to remove the acreage limitation for proposed projects." We expect that our concern may be unique to decommissioning solar fields in the Mojave Desert, but perhaps not (e.g., direct and indirect impacts to Federally-Threatened and Endangered kangaroo rats in the San Joaquin Valley during decommissioning). The current trend for developing solar photovoltaic systems in tortoise-occupied habitats is to remove the tortoises, mow the vegetation at the ground surface, allow the site to naturally regrow, and surround the site with a tortoise-permeable fence so that tortoises may repatriate, or at least continue to use the fenced area. If a CE is issued and no protective measures are identified for decommissioning, which current management requires under Federal Section 7 biological opinions, then any such tortoises within the fenced area will be subject to take at the time of decommissioning, which violates the supposition of a CE that no take will occur and the integral element that no significant impacts will occur.

In California, the Mojave desert tortoise and Mohave ground squirrel are among numerous species listed by the state under the California Endangered Species Act (CESA) as Threatened. We expect that there are other states with their respective endangered species acts that may be affected by DOE's decisions. According to information from the National Caucus of Environmental Legislators (<https://www.ncelenviro.org/articles/state-protections-for-endangered-species/>), "46 states have some version of endangered species law on record." Please be sure that DOE's decision document lists those states where, regardless of DOE's decisions, there will still be state mandates that need to be implemented by proponents of energy developments. Otherwise, we believe that DOE's record of decision could lead naïve energy developers to violate state endangered species laws unless applicable incidental take permits are acquired.

We read under Section III.H. of the Notice regarding Executive Order 13132, "DOE has examined this proposed rule and has determined that it would not preempt state law and would not have a substantial direct effect on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government." Please be sure that our concerns with respect to individual state endangered species laws protections have been considered by the DOE and communicated in your decision document with regards to this executive order.

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 DOE that may affect 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,



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

Desert Tortoise Council, Ecosystems Advisory Committee, Chairperson

cc. Martha Williams, Director, U.S. Fish and Wildlife Service, martha_williams@fws.gov
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Appendix A. Demographic Status and Trend of the Mojave Desert Tortoise (*Gopherus agassizii*)

We provide the following information on the status and trend of the listed population of the desert tortoise to assist the DOE with its analysis of the direct, indirect, synergistic, and cumulative impacts that a programmatic categorical exclusion may have on the Mojave desert tortoise.

BLM's implementation of a conservation strategy for the Mojave desert tortoise in its resource management plans through 2020 has resulted in the following changes in the status for the tortoise throughout its range and in Nevada from 2004 to 2014 (Table 1; USFWS 2015) and 2004 to 2020 (Table 2). There are 17 populations of Mojave desert tortoise described below that occur in the Critical Habitat Units (CHUs) and Tortoise Conservation Areas (TCAs); 14 are on lands managed by the BLM.

The Desert Tortoise Council (Council) has serious concerns about direct, indirect, and cumulative sources of human mortality for the Mojave desert tortoise given the status and trend of the species range-wide, within each of the five recovery units, and within the TCAs that comprise each recovery unit.

Densities of Adult Mojave Desert Tortoises: A few years after listing the Mojave desert tortoise under the Federal Endangered Species Act (FESA), the U.S. Fish and Wildlife Service (USFWS) published a Recovery Plan for the Mojave desert tortoise (USFWS 1994a). It contained a detailed population viability analysis. In this analysis, the minimum viable density of a Mojave desert tortoise population is 10 adult tortoises per mile² (3.9 adult tortoises per km²). This assumed a male-female ratio of 1:1 (USFWS 1994a, page C25) and certain areas of habitat with most of these areas geographically linked by adjacent borders or corridors of suitable tortoise habitat. Populations of Mojave desert tortoises with densities below this density are in danger of extinction (USFWS 1994a, page 32). The revised recovery plan (USFWS 2011) designated five recovery units for the Mojave desert tortoise that are intended to conserve the genetic, behavioral, and morphological diversity necessary for the recovery of the entire listed species (Allison and McLuckie 2018).

Range-wide, densities of adult Mojave desert tortoises declined more than 32% between 2004 and 2014 (Table 1) (USFWS 2015). At the recovery unit level, between 2004 and 2014, densities of adult desert tortoises declined, on average, in every recovery unit except the Northeastern Mojave (Table 1). Adult densities in the Northeastern Mojave Recovery Unit increased 3.1% per year (SE = 4.3%), while the other four recovery units declined at different annual rates: Colorado Desert (-4.5%, SE = 2.8%), Upper Virgin River (-3.2%, SE = 2.0%), Eastern Mojave (-11.2%, SE = 5.0%), and Western Mojave (-7.1%, SE = 3.3%) (Allison and McLuckie 2018). However, the small area and low starting density of the tortoises in the Northeastern Mojave Recovery Unit (lowest density of all Recovery Units) resulted in a small overall increase in the number of adult tortoises by 2014 (Allison and McLuckie 2018). In contrast, the much larger areas of the Eastern Mojave, Western Mojave, and Colorado Desert recovery units, plus the higher estimated initial densities in these areas, explained much of the estimated total loss of adult tortoises since 2004 (Allison and McLuckie 2018).

At the population level, represented by tortoises in the TCAs, densities of 10 of 17 monitored populations of the Mojave desert tortoise declined from 26% to 64% and 11 have densities less than 3.9 adult tortoises per km² (USFWS 2015).

Population Data on Mojave Desert Tortoise: The Mojave desert tortoise was listed as threatened under the FESA in 1990. The listing was warranted because of ongoing population declines throughout the range of the tortoise from multiple human-caused activities. Since the listing, the status of the species has changed. Population numbers (abundance) and densities continue to decline substantially (please see Tables 1 and 2).

Table 1. Summary of 10-year trend data for 5 Recovery Units and 17 CHUs/TCAs for the Mojave desert tortoise, *Gopherus agassizii* (=Agassiz’s desert tortoise). The table includes the area of each Recovery Unit and CHU/TCA, percent of total habitat for each Recovery Unit and CHU/TCA, density (number of breeding adults/km² and standard errors = SE), and the percent change in population density between 2004-2014. Populations below the viable level of 3.9 adults/km² (10 adults per mi²) (assumes a 1:1 sex ratio) and showing a decline from 2004 to 2014 are in red (Allison and McLuckie 2018, USFWS 2015).

Recovery Unit Designated CHU/TCA	Surveyed area (km ²)	% of total habitat area in Recovery Unit & CHU/TCA	2014 density/km ² (SE)	% 10-year change (2004– 2014)
Western Mojave, CA	6,294	24.51	2.8 (1.0)	-50.7 decline
Fremont-Kramer	2,347	9.14	2.6 (1.0)	-50.6 decline
Ord-Rodman	852	3.32	3.6 (1.4)	-56.5 decline
Superior-Cronese	3,094	12.05	2.4 (0.9)	-61.5 decline
Colorado Desert, CA	11,663	45.42	4.0 (1.4)	-36.25 decline
Chocolate Mtn AGR, CA	713	2.78	7.2 (2.8)	-29.77 decline
Chuckwalla, CA	2,818	10.97	3.3 (1.3)	-37.43 decline
Chemehuevi, CA	3,763	14.65	2.8 (1.1)	-64.70 decline
Fenner, CA	1,782	6.94	4.8 (1.9)	-52.86 decline
Joshua Tree, CA	1,152	4.49	3.7 (1.5)	+178.62 increase
Pinto Mtn, CA	508	1.98	2.4 (1.0)	-60.30 decline
Piute Valley, NV	927	3.61	5.3 (2.1)	+162.36 increase
Northeastern Mojave	4,160	16.2	4.5 (1.9)	+325.62 increase
Beaver Dam Slope, NV, UT, AZ	750	2.92	6.2 (2.4)	+370.33 increase
Coyote Spring, NV	960	3.74	4.0 (1.6)	+ 265.06 increase
Gold Butte, NV & AZ	1,607	6.26	2.7 (1.0)	+ 384.37 increase
Mormon Mesa, NV	844	3.29	6.4 (2.5)	+ 217.80 increase
Eastern Mojave, NV & CA	3,446	13.42	1.9 (0.7)	-67.26 decline
El Dorado Valley, NV	999	3.89	1.5 (0.6)	-61.14 decline
Ivanpah Valley, CA	2,447	9.53	2.3 (0.9)	-56.05 decline
Upper Virgin River	115	0.45	15.3 (6.0)	-26.57 decline
Red Cliffs Desert	115	0.45	15.3 (6.0)	-26.57 decline
Total amount of land	25,678	100.00		-32.18 decline

Density of Juvenile Mojave Desert Tortoises: Survey results indicate that the proportion of juvenile desert tortoises has been decreasing in all five recovery units since 2007 (Allison and McLuckie 2018). The probability of encountering a juvenile tortoise was consistently lowest in the Western Mojave Recovery Unit. Allison and McLuckie (2018) provided reasons for the decline in juvenile desert tortoises in all recovery units. These included decreased food availability for adult female tortoises resulting in reduced clutch size, decreased food availability resulting in increased mortality of juvenile tortoises, prey switching by coyotes from mammals to tortoises, and increased abundance of common ravens that typically prey on smaller desert tortoises.

Declining adult tortoise densities through 2014 have left the Eastern Mojave adult numbers at 33% (a 67% decline of their 2004 levels) (Allison and McLuckie 2018, USFWS 2015). Such steep declines in the density of adults are only sustainable if there are suitably large improvements in reproduction and juvenile growth and survival. However, the proportion of juveniles has not increased anywhere in the range of the Mojave desert tortoise since 2007, and in the Eastern Mojave Recovery Unit the proportion of juveniles in 2014 declined from 14 to 11 percent (a 21% decline) of their representation since 2007 (Allison and McLuckie 2018).

The USFWS and Utah Division of Wildlife Resources have continued to collect density data on the Mojave desert tortoise since 2014. The results are provided in Table 2 along with the analysis USFWS (2015) conducted for tortoise density data from 2004 through 2014. These data show that adult tortoise densities in most Recovery Units continued to decline in density since the data collection methodology was initiated in 2004. In addition, in the Northeastern Mojave Recovery Unit that had shown an overall increase in tortoise density between 2004 and 2014, subsequent data indicate a decline in density since 2014 (USFWS 2016, 2018, 2019, 2020, 2022a, 2022b).

Table 2. Summary of data for Agassiz’s desert tortoise, *Gopherus agassizii* (=Mojave desert tortoise) from 2004 to 2021 for the 5 Recovery Units and 17 CHUs/TCAs. The table includes the area of each Recovery Unit and CHU/TCA, percent of total habitat for each Recovery Unit and CHU/TCA, density (number of breeding adults/km² and standard errors = SE), and percent change in population density between 2004-2014 (USFWS 2015). Populations below the viable level of 3.9 breeding individuals/km² (10 breeding individuals per mi²) (assumes a 1:1 sex ratio) (USFWS 1994a, 2015) or showing a decline from 2004 to 2014 are in **red**.

Recovery Unit: Designated CHU/TCA &	% of total habitat area in Recovery Unit & CHU/TCA	2014 density/ km ² (SE)	% 10-year change (2004–2014)	2015 density/ km ²	2016 density/ km ²	2017 density/ km ²	2018 density/ km ²	2019 density/ km ²	2020 density/ km ²	2021 density/ km ²
Western Mojave, CA	24.51	2.8 (1.0)	–50.7 decline							
Fremont-Kramer	9.14	2.6 (1.0)	–50.6 decline	4.5	No data	4.1	No data	2.7	1.7	No data
Ord-Rodman	3.32	3.6 (1.4)	–56.5 decline	No data	No data	3.9	2.5/3.4*	2.1/2.5*	No data	1.9/2.5*
Superior-Cronese	12.05	2.4 (0.9)	–61.5 decline	2.6	3.6	1.7	No data	1.9	No data	No data
Colorado Desert, CA	45.42	4.0 (1.4)	–36.25 decline							
Chocolate Mtn AGR, CA	2.78	7.2 (2.8)	–29.77 decline	10.3	8.5	9.4	7.6	7.0	7.1	3.9
Chuckwalla, CA	10.97	3.3 (1.3)	–37.43 decline	No data	No data	4.3	No data	1.8	4.6	2.6
Chemehuevi, CA	14.65	2.8 (1.1)	–64.70 decline	No data	1.7	No data	2.9	No data	4.0	No data
Fenner, CA	6.94	4.8 (1.9)	–52.86 decline	No data	5.5	No data	6.0	2.8	No data	5.3
Joshua Tree, CA	4.49	3.7 (1.5)	+178.62 increase	No data	2.6	3.6	No data	3.1	3.9	No data

Recovery Unit: Designated CHU/TCA	% of total habitat area in Recovery Unit & CHU/TCA	2014 density/km ² (SE)	% 10- year change (2004– 2014)	2015	2016	2017	2018	2019	2020	2021
Pinto Mtn, CA	1.98	2.4 (1.0)	-60.30 decline	No data	2.1	2.3	No data	1.7	2.9	No data
Piute Valley, NV	3.61	5.3 (2.1)	+162.36 increase	No data	4.0	5.9	No data	No data	No data	3.9
Northeastern Mojave AZ, NV, & UT	16.2	4.5 (1.9)	+325.62 increase							
Beaver Dam Slope, NV, UT, & AZ	2.92	6.2 (2.4)	+370.33 increase	No data	5.6	1.3	5.1	2.0	No data	No data
Coyote Spring, NV	3.74	4.0 (1.6)	+ 265.06 increase	No data	4.2	No data	No data	3.2	No data	No data
Gold Butte, NV & AZ	6.26	2.7 (1.0)	+ 384.37 increase	No data	No data	1.9	2.3	No data	No data	2.4
Mormon Mesa, NV	3.29	6.4 (2.5)	+ 217.80 increase	No data	2.1	No data	3.6	No data	5.2	5.2
Eastern Mojave, NV & CA	13.42	1.9 (0.7)	-67.26 decline							
El Dorado Valley, NV	3.89	1.5 (0.6)	-61.14 decline	No data	2.7	5.6	No data	2.3	No data	No data
Ivanpah Valley, CA	9.53	2.3 (0.9)	-56.05 decline	1.9	No data	No data	3.7	2.6	No data	1.8

Recovery Unit: Designated CHU/TCA	% of total habitat area in Recovery Unit & CHU/TCA	2004 density/ km ²	2014 density/km ² (SE)	% 10- year change (2004– 2014)	2015	2016	2017	2018	2019	2020	2021
Upper Virgin River, UT & AZ	0.45		15.3 (6.0)	-26.57 decline							
Red Cliffs Desert**	0.45	29.1 (21.4- 39.6)**	15.3 (6.0)	-26.57 decline	15.0	No data	19.1	No data	17.2	No data	
Range-wide Area of CHUs - TCAs/Range- wide Change in Population Status	100.00			-32.18 decline							

*This density includes the adult tortoises translocated from the expansion of the MCAGCC, that is resident adult tortoises and translocated adult tortoises.

**Methodology for collecting density data initiated in 1999.

Abundance of Mojave Desert Tortoises: Allison and McLuckie (2018) noted that because the area available to tortoises (i.e., tortoise habitat and linkage areas between habitats) is decreasing, trends in tortoise density no longer capture the magnitude of decreases in abundance. Hence, they reported on the change in abundance or numbers of the Mojave desert tortoise in each recovery unit (Table 2). They noted that these estimates in abundance are likely higher than actual numbers of tortoises, and the changes in abundance (i.e., decrease in numbers) are likely lower than actual numbers because of their habitat calculation method. They used area estimates that removed only impervious surfaces created by development as cities in the desert expanded. They did not consider degradation and loss of habitat from other sources, such as the recent expansion of military operations (753.4 km² so far on Fort Irwin and the Marine Corps Air Ground Combat Center), intense or large scale fires (e.g., 576.2 km² of critical habitat that burned in 2005), development of utility-scale solar facilities (as of 2015, 194 km² have been permitted) (USFWS 2016), or other sources of degradation or loss of habitat (e.g., recreation, mining, grazing, infrastructure, etc.). Thus, the declines in abundance of Mojave desert tortoise are likely greater than those reported in Table 3.

Table 3. Estimated change in abundance of adult Mojave desert tortoises in each recovery unit between 2004 and 2014 (Allison and McLuckie 2018). Decreases in abundance are in red.

Recovery Unit	Modeled Habitat (km ²)	2004 Abundance	2014 Abundance	Change in Abundance	Percent Change in Abundance
Western Mojave	23,139	131,540	64,871	-66,668	-51%
Colorado Desert	18,024	103,675	66,097	-37,578	-36%
Northeastern Mojave	10,664	12,610	46,701	34,091	270%
Eastern Mojave	16,061	75,342	24,664	-50,679	-67%
Upper Virgin River	613	13,226	10,010	-3,216	-24%
Total	68,501	336,393	212,343	-124,050	-37%

Habitat Availability: Data on population density or abundance does not indicate population viability. The area of protected habitat or reserves for the subject species is a crucial part of the viability analysis along with data on density, abundance, and other population parameters. In the Desert Tortoise (Mojave Population) Recovery Plan (USFWS 1994a), the analysis of population viability included population density and size of reserves (i.e., areas managed for the desert tortoise) and population numbers (abundance) and size of reserves. The USFWS Recovery Plan reported that as population densities for the Mojave desert tortoise decline, reserve sizes must increase, and as population numbers (abundance) for the Mojave desert tortoise decline, reserve sizes must increase (USFWS 1994a). In 1994, reserve design (USFWS 1994a) and designation of critical habitat (USFWS 1994b) were based on the population viability analysis from numbers (abundance) and densities of populations of the Mojave desert tortoise in the early 1990s. Inherent in this analysis is that the lands be managed with reserve level protection (USFWS 1994a, page 36) or ecosystem protection as described in section 2(b) of the FESA, and that sources of mortality be reduced so recruitment exceeds mortality (that is, $\lambda > 1$) (USFWS 1994a, page C46).

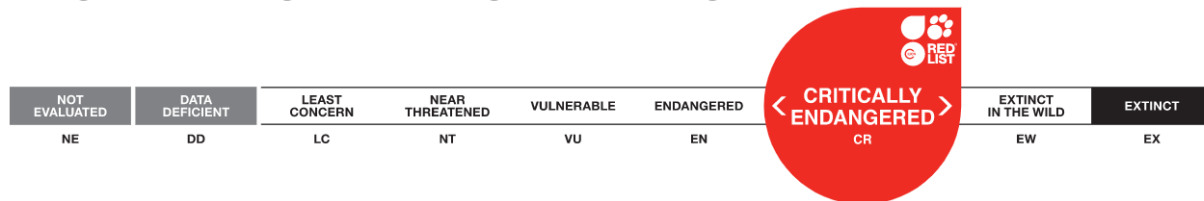
Habitat loss would also disrupt the prevailing population structure of this widely distributed species with geographically limited dispersal (isolation by resistance Dutcher et al. 2020).

Allison and McLuckie (2018) anticipate an additional impact of this habitat loss/degradation is decreasing resilience of local tortoise populations by reducing demographic connections to neighboring populations (Fahrig 2007). Military and commercial operations and infrastructure projects that reduce tortoise habitat in the desert are anticipated to continue (Allison and McLuckie 2018) as are other sources of habitat loss/degradation.

Allison and McLuckie (2018) reported that the life history of the Mojave desert tortoise puts it at greater risk from even slightly elevated adult mortality (Congdon et al. 1993; Doak et al. 1994), and recovery from population declines will require more than enhancing adult survivorship (Spencer et al. 2017). The negative population trends in most of the TCAs for the Mojave desert tortoise indicate that this species is on the path to extinction under current conditions (Allison and McLuckie 2018). They state that their results are a call to action to remove ongoing threats to tortoises from TCAs, and possibly to contemplate the role of human activities outside TCAs and their impact on tortoise populations inside them.

Densities, numbers, and habitat for the Mojave desert tortoise declined between 2004 and 2014 and densities continue to decline in most Recovery Units since 2014. As reported in the population viability analysis, to improve the status of the Mojave desert tortoise, reserves (area of protected habitat) must be established and managed. When densities of tortoises decline, the area of protected habitat must increase. When the abundance of tortoises declines, the area of protected habitat must increase. We note that the Desert Tortoise (Mojave Population) Recovery Plan was released in 1994 and its report on population viability and reserve design was reiterated in the 2011 Revised Recovery Plan as needing to be updated with current population data (USFWS 2011, p. 83). With lower population densities and abundance, a revised population viability analysis would show the need for greater areas of habitat to receive reserve level of management for the Mojave desert tortoise. In addition, we note that none of the recovery actions that are fundamental tenets of conservation biology has been implemented throughout most or all of the range of the Mojave desert tortoise.

IUCN Species Survival Commission: The Mojave desert tortoise is now on the list of the world’s most endangered tortoises and freshwater turtles. It is in the top 50 species. The International Union for Conservation of Nature’s (IUCN) Species Survival Commission, Tortoise and Freshwater Turtle Specialist Group, now considers Mojave desert tortoise to be Critically Endangered (Berry et al. 2021). As such, it is a “species that possess an extremely high risk of extinction as a result of rapid population declines of 80 to more than 90 percent over the previous 10 years (or three generations), a current population size of fewer than 50 individuals, or other factors.” It is one of three turtle and tortoise species in the United States to be critically endangered. This designation is more grave than endangered.



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