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Via regulations.gov & email

February 20, 2025

Public Comments Processing
Attn: Docket No. FWS–R8–ES–2024–0160
U.S. Fish and Wildlife Service
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Re: Incidental Take Permit Application for the Desert Tortoise; Draft Habitat Conservation Plan and Draft Environmental Assessment; Overnight Solar Energy Project, San Bernardino County, CA (Docket No. FWS–R8–ES–2024–0160)

Dear Mr. Tung,

The Desert Tortoise Council (DTC) is a non-profit organization comprising 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 DTC routinely provides information and other forms of assistance to individuals, organizations, and regulatory agencies on matters potentially affecting desert tortoises within their geographic ranges.

The Desert Tortoise Preserve Committee (DTPC) is a non-profit organization formed in 1974 to promote the welfare of the desert tortoise in its native wild state. DTPC members share a deep concern for the continued preservation of the tortoise and its habitat in the southwestern deserts and are dedicated to the recovery and conservation of the desert tortoise and other rare and endangered species inhabiting the Mojave and western Sonoran deserts. The DTPC has a long track record of protecting desert tortoises and their habitat through land acquisition, preserve management, mitigation land banking, and educational outreach.

The Mohave Ground Squirrel Conservation Council (MGSCC) is a nonprofit organization established to assure the perpetual survival of viable populations of Mohave ground squirrels throughout their historical range and any future expansion areas. The Mohave ground squirrel, for the purposes of the MGSCC, means the mammal species known scientifically as *Xerospermophilus mohavensis*. Among our objectives pertinent to this letter is to support and to advocate for such legislative, policy, and conservation measures as will contribute to ensuring the continued survival of viable Mohave ground squirrel populations, the connectivity of these populations, and the maintenance of their habitats in a natural condition.

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."

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 DTC to join Defenders of Wildlife and DTPC (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. In its status review, California Department of Fish and Wildlife (CDFW) (2024a) stated: "At its public meeting on October 14, 2020, the Commission considered the petition, and based in part on the Department's [CDFW] petition evaluation and recommendation, found sufficient information exists to indicate the petitioned action may be warranted and accepted the petition for consideration. The Commission's decision initiated this status review to inform the Commission's decision on whether the change in status is warranted."

Importantly, in their April 2024 meeting (CDFW 2024b), the California Fish and Game Commission voted unanimously to accept the CDFW's petition evaluation and recommendation to uplist the tortoise from threatened to endangered under the California Endangered Species Act based on the scientific data provided on the species' status, declining trend, numerous threats, and lack of effective recovery implementation and land management. The Commission is expected to vote on uplisting the tortoise to endangered in the next few months.

The Mohave ground squirrel is currently designated as a threatened species by the California Fish and Game Commission. Defenders of Wildlife, MGSCC, DTPC, and Dr. Philip Leitner submitted a petition in December 2023 for the Mohave ground squirrel to be federally listed as a threatened species and for critical habitat to be designated. In January 2025, the USFWS accepted the petition and initiated a year-long status review of the species to see if listing is warranted.

Given that both the desert tortoise and Mohave ground squirrel may be affected by issuance of a 10(a)(1)(B) permit by the U.S. Fish and Wildlife Service (USFWS) for development of this project, these three environmental groups have joined together to submit the following comments.

Description of the Proposed Project and Alternatives

The USFWS received an application from Overnight Solar, LLC for an incidental take permit (ITP) under the Federal Endangered Species Act (FESA) to construct, operate and maintain, and decommission a photovoltaic (PV) solar facility and associated infrastructure on private land. The USFWS identified one action alternative (proposed Project) in addition to the No Action Alternative.

No Action Alternative: Under the No Action Alternative, the USFWS would not approve the Applicant's habitat conservation plan (HCP) and would not issue an ITP. The proposed Project would not be constructed, and no desert tortoise habitat would be lost, nor would individuals of the species be taken; likewise, no mitigation would occur that would minimize and mitigate the impacts of the taking to the maximum extent practicable.

Proposed Project Alternative: Under this action alternative, the USFWS would issue an ITP for the solar energy project. The proposed Project includes the construction of a PV solar facility and associated infrastructure to generate up to 150 megawatts (MW) of alternating current power within an approximately 595.4-acre solar array Project Area. The proposed Project also includes 150 MW of energy storage capacity in a battery energy storage system (BESS). The energy generated from this facility would be transferred via generation

interconnect (gen-tie) above-ground transmission lines in a corridor approximately 1.1 miles long, connecting the proposed PV facility to an existing gen-tie line associated with the Mojave Solar Facility and just south of the existing Alba Substation. From this point of interconnection, the existing gen-tie line carries electrical power output to the existing Southern California Edison (SCE) Sandlot Substation, which then interconnects to the 230-kilovolt (kV) SCE Kramer-Coolwater Transmission Line, and ultimately ties into the Kramer-Junction Substation where energy is delivered to the power grid (Figure 1).

Construction is expected to be completed in less than two years. Operations and maintenance would occur for 30 years, the anticipated lifespan of the solar facility. The ITP would allow for the incidental take of desert tortoises over a 45-year permit term. The Project Area/Project Site is the area where the Applicant proposes to site the solar facility and associated infrastructure [i.e., PV panels on a racking system with a maximum 20 foot height, above-ground power lines (BESS), substation, security fencing with tortoise exclusionary fencing, shade structures, gen-tie lines, and access roads up to 26-feet wide]. Project traffic would access the solar array portions of the Plan Area from Harper Lake Road via California State Route (SR) 58.

The Permit Area is defined as the area where the ITP would apply to covered activities (i.e., activities that may result in take of the tortoise) (e.g., Project Area/Project Site and translocation area, etc.). It includes the solar array area that covers approximately 595.4 acres and lies in the western part of San Bernardino County, just east of the Kern County boundary. The Permit Area is approximately 10 miles northwest of Hinkley, CA, 10 miles east of Kramer Junction, CA, and 6 miles north of the SR 58 and Harper Lake Road junction. It is located at the boundary of the Fremont-Kramer and Superior-Cronese critical habitat units of the tortoise in the Western Mojave Recovery Unit. Critical habitat for desert tortoise abuts the west side of the Project Site.

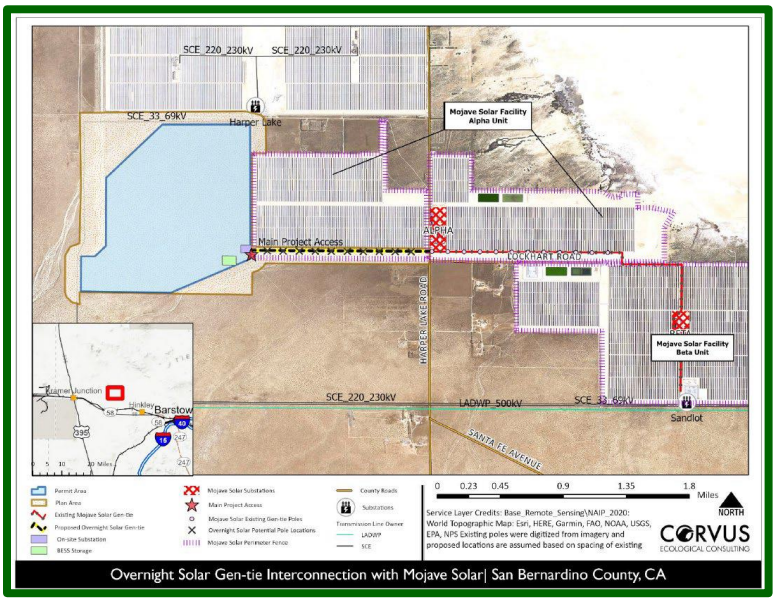


Figure 1. Location of the proposed Overnight Solar Project (blue), gen-tie line (black dashed & red lines), and access roads. Part of the Plan Area is indicated in tan stippling.

The Plan Area includes all areas where construction, operations and maintenance and decommissioning of the solar facilities, development and management of the mitigation lands, and proposed desert tortoise translocation areas could result in effects on the desert tortoise (i.e., activities in the Habitat Conservation Plan) and is larger than the Permit Area.

Alternative Considered but Eliminated from Detailed Analysis

Development of Northwest Wash with Long-distance Desert Tortoise Translocation Alternative – Under this alternative, 37 acres of occupied desert tortoise habitat in the northwest corner of the parcel would be permanently developed with solar panels. This would have an increased impact on desert tortoise compared to the proposed Project, as more individuals would be directly affected, and the impacts would be more severe. Desert tortoises encountered during clearance surveys would be captured and translocated to a long-distance recipient site approved by USFWS and CDFW.

Reduced Permit Term Alternative – Under the reduced permit term alternative, the ITP for the Project would have a shorter permit duration than the 45-year permit term under consideration for the proposed Project. Overnight Solar anticipates that the Project would operate for approximately 35 years. Construction and decommissioning would require additional time and thus the request for a 45-year permit term. Consequently, under a reduced permit term alternative, coverage for take and the required minimization measures would likely not extend for the duration of the Project's anticipated lifespan.

Whereas the following specific comments pertain to various documents associated with the proposed action, please be sure the San Bernardino County Planning Department and the Applicant are aware that USFWS Section 10(a)(1)(B) incidental take authorization cannot be implemented unless CDFW Section 2081 incidental take authorization is also obtained and implemented.

Comments on the Environmental Assessment

Figures delineating the Permit Area and Plan Area: Based on the information in the environmental assessment (EA) and in the Habitat Conservation Plan Handbook (USFWS and NMFS 2016), the Permit Area is where the incidental take authorization applies and the Plan Area or HCP area, is all areas that will be used for any activities described in the HCP, including covered activities and the conservation program. It includes all lands necessary for the HCP to be fully implemented. We believe that Figures 3 and 4 of the EA are incorrect in their delineation of the Plan Area and Permit Area. The figures show the Permit Area as limited to the construction areas of the Project and the proposed translocation area as in the Plan Area. The translocation area involves incidental take of tortoises – tortoises will be handled during their initial release at the translocation area and again during monitoring. Hence, the translocation area is in the Permit Area. The mitigation lands in Figure 3 appear to be located outside the Plan Area. Please correct these two figures to show that the proposed translocation area is in the Permit Area and the proposed mitigation lands are in the Plan Area. Please see our comments below on fencing the mitigation area under "Enhancement of the Mitigation Lands."

Federally Listed Species Covered by the Proposed Conservation Plan: This section lists the Mojave desert tortoise. No other species are named as covered species. On December 12, 2024, the USFWS proposed to list the Monarch butterfly (*Danaus plexippus*) as a threatened species and designate critical habitat under FESA. We request that the EA discuss whether the Applicant considered including the Monarch butterfly as a covered species. If they did and dismissed it, please provide their reason(s) for not including it as a covered species. If they did not consider it, do they want to add it as a covered species?

Mitigation Measures for Biological Resources: The Environmental Impact Report produced by San Bernardino County (County) in March 2024 includes mitigation measures to be implemented by the Applicant/Project Proponent that will reduce, and in some cases eliminate impacts to biological and other resources. In reviewing these measures, we were unable to find standard mitigation measures that the Bureau of Land Management (BLM) and USFWS typically require during the construction, operation and maintenance, and decommissioning of solar energy projects in tortoise habitat. These include but are not limited to:

- Integrated Weed Management Plan
- Bird and Bat Conservation Strategy Plan
- Mojave Desert Tortoise Translocation Plan
- Fencing Plan (Desert Tortoise Exclusion and Security)
- Nuisance Animal and Pest Control Plan
- Technical Drainage Plan
- Lighting Plan
- Raven/Predator Management Plan
- Nesting Bird Management Plan
- Worker Environmental Awareness Plan
- Spill Prevention, Control, and Countermeasures Plan
- Erosion and Sediment Control Plan/Surface Water Protection Plan
- Groundwater Monitoring and Reporting Plan
- Wind Erosion Plan
- Stormwater Pollution Prevention Plan
- Fire Management Plan
- Fire Prevention and Safety Plan
- Hazardous Materials and Waste Management Plan
- Trash Abatement Plan
- Traffic and Transportation Plan
- Grading Plan
- Signage and Flagging Plan
- Site Access Plan

For example, the Integrated Weed Management Plan is needed to ensure that the increased numbers of vehicles and equipment transported to the Project Site for construction, operations and maintenance, and decommissioning do not transport invasive, non-native plant propagules to tortoise habitat/critical habitat adjacent to/near the Project Site and become established.

Failure to develop and implement these plans effectively will result in indirect and cumulative impacts (e.g., heat island effects, subsidized predators, proliferation of non-native invasive plants, etc.) to the tortoise and tortoise habitats on land adjacent to the Project Site and would require additional mitigation to offset the impacts of the taking of tortoises on these adjacent lands. Please include these mitigation plans in the Final EA.

Although San Bernardino County did not include them, including these mitigation plans in the Final EA or a summary of their required results is needed so the decisionmaker can review them and determine the effectiveness of the proposed mitigation prior to signing the NEPA decision document and Findings document. Absent this information, the decisionmaker has no information on whether the mitigation plans will rise to the level of mitigating the impacts as described in the EA document and HCP for the proposed Project. Please include these documents or a summary of their required results in the Final EA.

We are especially concerned that the mitigation measures listed in this section of the EA do not include USFWS's standard mitigation measures in the Desert Tortoise (Mojave Population) Field Manual (*Gopherus Agassizii*) (USFWS 2009), including the requirement for qualified biologists to be present and provide direct supervision for field and clearance surveys. Direct supervision means that the qualified biologist has direct voice and sight contact with the desert tortoise monitor(s). Monitors assist qualified biologists during surveys and serve as apprentices to acquire experience. Monitors may not conduct field or clearance surveys or other specialized duties of the qualified biologist unless directly supervised by a qualified biologist (USFWS 2009).

The presence of a qualified biologist onsite would be required for clearing the location of the security and tortoise exclusion fencing. It is especially disturbing that San Bernardino County is not aware of these requirements by the USFWS since they have been in effect since shortly after the tortoise was listed as threatened in 1990 and refined in the Field Manual (USFWS 2009) issued more than 15 years ago. We request that the USFWS coordinate with the County to ensure that the supervisors and employees in the Land Use Services Department and county supervisors for the desert portion of San Bernardino County are aware of these requirements and that San Bernardino County coordinates with the USFWS when they receive a request for a project that would result in surface disturbance or change in zoning in the range of the tortoise.

Mitigation Measure BIO-12 includes best management practices to avoid erosion/runoff. "The Project will incorporate methods to control runoff, including a stormwater pollution prevention plan (SWPPP) to meet National Pollutant Discharge Elimination System (NPDES) regulations. Stormwater regulations are expected to substantially control adverse edge effects (e.g., erosion, sedimentation, habitat conversion) during and after construction, both adjacent to and downstream from the Project Area." The USFWS should ensure that the practices required by the County to avoid erosion and runoff do not result in conditions that inadvertently trap and/or drown tortoises especially smaller age classes. Also, please ensure that these facilities are designed and maintained so they do not provide a water subsidy for tortoise predators.

In Mitigation Measure BIO-13, the County requires the preparation of a revegetation plan as part of decommissioning. "The Decommissioning Plan will specify success criteria including, but not limited to, site preparation methods, installation specifications, maintenance requirements, and monitoring/report measures to ensure botanical thresholds are met such as adequate cover, density, and species richness. Standards of success will include at least a 50 percent revegetation success rate compared to baseline conditions and will include annual monitoring for 2 years."

We are not sure how the County determined a 50 percent standard of success for the revegetation of the Project Area. For other recent utility-scale solar energy projects, BLM established a success rate of 60 percent density of perennial vegetation when compared to a reference site (BLM 2024a), while at another solar project the success rate varied from 65 percent to 75 percent (BLM 2024b). We were unable to find citations from the scientific literature that support BLM's varying standards, which are higher than the County's. In addition, BLM did not provide supporting documentation from the scientific literature for its varying standards for revegetation plans in the Mojave Desert. The variation in the standards of success required for revegetation and absence of citations from the scientific literature suggests that this "standard of success" is not a standard but an arbitrary amount with no scientific support. We recommend that when USFWS is approving the revegetation plan for the proposed Project, it should demonstrate how the threshold for revegetation would restore the ecological structure, functions, and values (this is an established standard by other federal agencies) that were lost/degraded from the implementation of this Project, especially to the vegetation and wildlife, including the tortoise.

In setting a restoration threshold for revegetation, USFWS should include the needs of the target wildlife species and require restoration of topography, soils, and vegetation to meet the needs of those species. Vegetation needs (i.e., cover, density, and diversity) vary among wildlife species. If the target species for wildlife management is a coyote, the perennial plant density for this wide ranging apex predator is likely very different than for a ground-nesting bird, lizard, or small mammal. In addition, perennial vegetation, which is mostly woody vegetation in the Mojave Desert, provides cover for wildlife species. Herbaceous vegetation, which is mostly species of annual plants, provides much of the nutritional value and water for the diets of many herbivorous wildlife species who are not at the top of the food web but are prey for the wildlife above them on the food web (i.e., omnivores and carnivores).

The DTC, DTPC, and MGSCC contend that the standard should be determined using the needs of the species that are identified for management of the area after decommissioning. These species may include the tortoise, Mohave ground squirrel, and other special status species. Please provide information from the scientific literature on the needs of these identified wildlife species for plant species cover, density, and diversity to occupy the site. This should be the standard that the Applicant must meet in the revegetation plan.

Revegetation should include establishing annual native vegetation with a diversity of these species. To assist in this effort, the DTC, DTPC, and MGSCC suggest using a plant pallet and method for selection of appropriate plant species (e.g., Esque et al. 2021, Shyrock et al. 2022, etc.).

To aid in restoring the site to pre-project conditions, plant community measurements and photographs of sites that are to be restored should be taken pre-construction, post-construction, and after decommissioning. Aerial photography of the entire project site should be taken such that the species of woody perennials can be identified as well as their distribution, density, and cover. Photographs from the ground, especially looking upgradient will document the locations and depths of small washes/rills and other drainages that should be restored.

The revegetation plan should include the requirement to inoculate soils to establish mycorrhizal native species/soil crusts that have been shown to increase plant growth of Mojave Desert plant species (Chiquoine et al. 2016, Hernandez et al. 2023). To increase the likelihood of success the revegetation plan should include the latest information from the scientific literature on restoration of vegetation in the Mojave Desert from the scientific literature (e.g., currently Abella et al. 2015, Abella and Berry 2016, Abella et al. 2023, etc.) if USFWS wants these revegetation efforts to be successful.

In addition, two years is an insufficient monitoring time to determine success of the revegetation plan. Abella (2010) reported that the regeneration times for native vegetation for cover is on average 76 years while return to species composition is an estimated 215 years. We expect that this time would be reduced because of activities conducted by the Applicant to assist the restoration process. However, the monitoring times that the County is requiring for the revegetation part of this proposed Project are unsupported; that is, we found no references from the scientific literature in the EA that two years is sufficient time to successfully revegetate the Project Site. Please include this information in the USFWS's requirements for a revegetation plan.

Enhancement of the Mitigation Lands: "The Proponent's HCP mitigation for the incidental take of desert tortoises would be funding of the perpetual preservation of approximately 595.4 acres of known desert tortoise habitat to mitigate habitat disturbances resulting from Project development" (Figure 2).

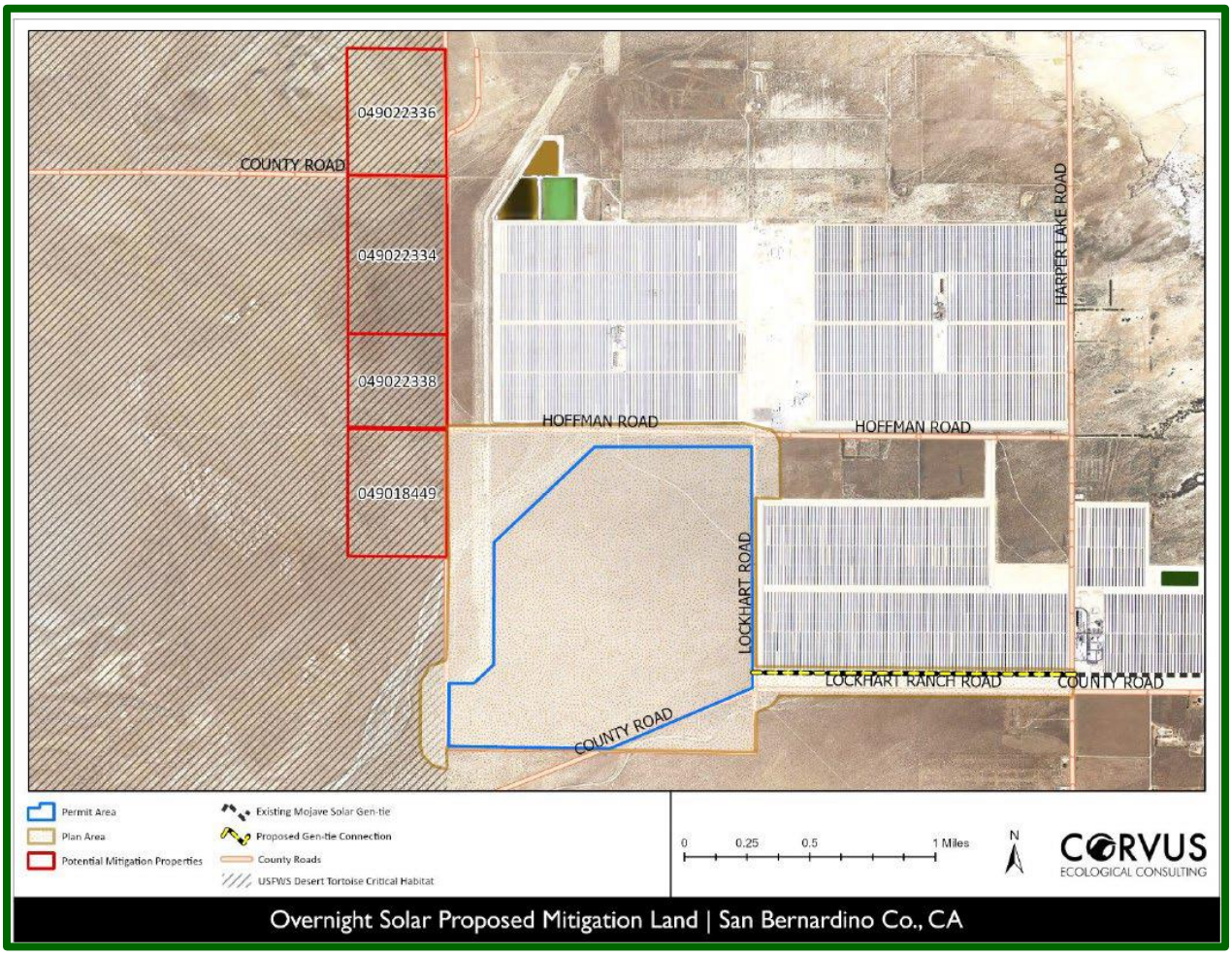


Figure 2. Proposed location of mitigation lands (red) to be managed for the tortoise and location of the proposed solar project (blue).

Because the land that is being developed is one large contiguous area, the DTC, DTPC, and MGSCC recommend that the land managed to mitigate the impacts of the taking be one large contiguous area. This is because the ecological value of two or more smaller areas of land to mitigate for these impacts would be less than for one larger area impacted by the Project. Hence, additional lands would be required to fully offset the impacts. USFWS (1994) stated that "[t]he utility of large reserves in preventing extinction is one of the best established tenets of conservation biology." The "size [of areas managed for tortoises] is not the only important consideration in determining the probability of success in preserving desert tortoise populations. Principles of reserve design dictate that the shape . . . is also very important." Management areas "should be designed to minimize perimeter relative to area."

Following the principles of reserve design, USFWS (1994) stated that for lands managed for the conservation of the tortoise:

- Reserves that are well-distributed across a species' native range will be more successful in preventing extinction than reserves confined to small portions of a species' range;
- Large blocks of habitat, containing large populations of the target species, are superior to small blocks of habitat containing small populations;
- Blocks of habitat that are close together are better than blocks far apart;
- Habitat that occurs in less fragmented, contiguous blocks is preferable to habitat that is fragmented;
- Habitat patches that minimize edge to area ratios are superior to those that do not;
- Interconnected blocks of habitat are better than isolated blocks, and linkages function better when the habitat within them is represented by protected, preferred habitat for the target species;
- Blocks of habitat that are roadless or otherwise inaccessible to humans are better than blocks containing roads and habitat blocks easily accessible to humans.

Please ensure that these tenets of conservation biology for reserve design are followed when determining the final size and location of the mitigation land and translocation area (also mitigation lands) managed in perpetuity for the tortoise. We note that the proposed mitigation land is long and narrow with a large edge to area ratio. Although we suspect these parcels are contiguous to BLM lands that are ostensibly managed as critical habitat, we expect their conservation management to be significantly more protective due to the lack of multiple uses on the mitigation parcels compared to public lands. This arrangement of proposed mitigation land does not comply with the 5th principle of reserve design stated above.

Additionally, we found no information about the land ownership for the potential mitigation lands indicated in Figure 2. Mitigation lands should not be located on BLM land because of their mandate under the Federal Land Policy Management Act (FLPMA) to manage lands for multiple use. Thus, BLM lands cannot be managed for the conservation benefit of the tortoise in perpetuity. Please add this land ownership information in the Final EA along with who will be responsible for implementing the management of these mitigation lands for the conservation benefit of the tortoise, what assurances would be used to provide for the management of the mitigation lands in perpetuity for the conservation of the tortoise, and whether the lands would be fenced. Fencing may result in incidental take, and if so, the mitigation lands or the location of the fence should be included in the Permit Area and the construction and maintenance of the fence a covered activity.

Equally important, we are concerned with the locations of the mitigation lands immediately adjacent to the proposed solar development with the potential for heat islands effects that are described on the next page to directly impact the mitigation parcels.

USFWS requires that "[w]ithin 18 months following permit issuance, the Applicant will provide documentation to the Service that they have completed the mitigation requirements to conserve 595.4 acres of desert tortoise habitat." The DTC, DTPC, and MGSCC request that the acquisition of lands or placement of a conservation easement on lands to be managed for the tortoise as mitigation for the lands impacted by the proposed Project occur prior to any surface disturbance at the Project Site. If this is not possible, then the securing of the mitigation lands and implementation of their management for the conservation of the tortoise should occur commensurate with the impacts of the taking as a result of the proposed Project. The USFWS has

no power to force the Applicant to implement this mitigation once the Project Site has been cleared and tortoise exclusion fence constructed. Revoking the incidental take permit 18 months after issuance would not halt the Applicant from completing the construction or operations and maintenance phases of the Project because the actions that would likely result in take of the tortoise have already occurred. Please revise this language to require the Applicant to secure and manage the mitigation lands prior to implementing actions that would result in impacts of the taking for covered species.

The issue of temporal loss of the structure, functions, and values of the lands to be developed at the Project Site should be included when calculating the mitigation needed to offset the impacts of the taking of the tortoise to the maximum extent practicable (see USFWS and NMFS 2016, specifically section 9.4.9 Timing of Mitigation). This impact is frequently ignored, but for a long-lived species with a low recruitment rate and lengthy time needed for habitat enhancement, time is crucial when evaluating the impacts of the taking to the tortoise population, especially with respect to the survival and recovery of the tortoise in the Fremont-Kramer and Superior-Cronese critical habitat units of the Western Mojave Recovery Unit. The Applicant should be required to mitigate this temporal loss/degradation of habitat that harms the tortoise through securing additional mitigation lands. Please determine the extent of this temporal loss and calculate the additional acreage of mitigation land that would be needed to offset the impacts from these indirect effects. We request that this analysis and calculations be included in the Final EA.

We were unable to find in the EA a discussion and analysis of the indirect impacts of the proposed Project and the resulting impacts of the taking from these indirect impacts. For example, construction and use of utility-scale PV solar facilities results in the creation of heat islands.

Heat Island Effects:
Vegetation and Soils: Utility-scale PV facilities have significant impacts on local air and ground temperatures. Utility-scale PV solar projects produce increased heat. PV panels create a black barrier between the ground and the atmosphere, which alters heat flux dynamics by restricting movement of warm air up into the atmosphere similar to a greenhouse effect (Barron-Gafford et al. 2016). PV solar panels raise ambient air temperatures by as much as 3-4 degrees Celsius (°C) in the summer, creating a "Photovoltaic Heat Island Effect." A PV "heat island" effect refers to the temperatures in and around PV solar facilities increasing from the ambient temperature due to replacement of native land cover with solar panels that absorb heat. This is similar to the "urban heat island" effect, where native cover is replaced with pavement and concrete buildings.

PV solar panels convert solar radiation into heat, which can alter the air flow, energy flux dynamics, and temperatures near the panels (Fthenakis and Yu, 2013; Barron-Gafford et al, 2016). Soils, vegetation, and wildlife may be affected by such changes and increases in temperature in and around utility-scale solar facilities.

Fthenakis and Yu (2013) found that annual average air temperature in the center of a solar project at heights approximately 2.5 meters (8 feet) above the ground can reach up to 1.9 °C (3.5 °F) above ambient temperature. This thermal energy dissipates and reaches ambient temperature at 5-18 meters (16-60 feet) above the ground. This same study found a prompt dissipation of thermal energy and decrease to ambient temperatures around the PV panels at 300 meters (984 feet) away (horizontal distance) from the perimeter of the solar farm and that access roads between solar fields

allowed for substantial cooling. Devitt et al. (2022) reported that large photovoltaic facilities similar to the proposed Overnight Solar Project raised the air and soil temperatures not only on the project site but significant heat was moving from the solar facility into the adjacent plant community, especially in the first 200–400 meters (656 to 1,312 feet) off the project site, and area of which would encompass all of the proposed mitigation parcels. This rise in temperature also impacts the availability of soil moisture and the ability of burrowing animals such as the tortoise in nearby areas to reduce their body temperatures at night to conserve energy and moisture. The impacts of elevated soil and air temperatures to areas adjacent to the proposed Project should be analyzed in the Final EA including impacts to the survival, growth, and recruitment of native vegetation if this area is to be managed for wildlife use including use by tortoises (e.g., translocation area and critical habitat, etc.) and potential impacts to the mitigation parcels.

PV facilities can also alter the energy balance by generating heat (Broadbent et al. 2019). Nighttime temperatures over photovoltaic plants are regularly 3 – 4 °C warmer than over wildlands, representing a "heat island" effect (Devitt et al. 2022). As the warmer air was displaced down gradient, the temperature front advanced into the creosote-bursage plant community with values 5 to 8 °C warmer at the 1-meter height. Similarly, Broadbent et al. (2019) found increased temperatures during the day, with an average 1.3 °C increase in air temperature in the solar field at a height of 1.5 meters (5 feet). The nighttime soil temperatures at the solar site were warmer than the reference site. The study demonstrated that shading from solar panels causes warmer soil temperatures at night.

Barron-Gafford et al. (2016) monitored three study sites [natural desert ecosystem, traditional built environment (parking lot with commercial buildings), and PV power plant], measuring air temperature at 2.5 meters (8 feet) off the ground. The average annual air temperature was greater at the PV power plant, increasing 2.5 °C during the day. Contrary to other studies, a delayed cooling of ambient temperatures was detected in the evenings, with average annual midnight temperatures increasing 3.5 °C, compared with the natural desert ecosystem. The authors hypothesized that by removing vegetation, heat-dissipating transpiration from vegetation is decreased, and compared to natural systems, the greater amount of exposed ground surfaces absorbs more solar radiation during the day, which may increase soil temperatures (Barron-Gafford et al. 2016). During the night, stored heat is reradiated, where warming under the panels may be due to the heat trapping of reradiated heat flux (Barron-Gafford et al. 2016).

The results of these studies indicate that PV solar projects increase air temperatures in the areas adjacent to the solar field – in some cases areas more than 1,000 feet from the solar field, increase soil temperatures, and reduce soil moisture, all of which may undermine the habitat quality of the proposed mitigation parcels.

Tortoises and Other Reptiles/Wildlife: How would these "heat island" effects affect the tortoise? Slade (2023) found that solar arrays significantly altered the surface-level thermal environment for tortoises and other reptilian species. Besides increased daytime temperatures when compared to undisturbed desert areas, Slade (2023) reported that solar arrays create a shade-warming effect; artificial shade under solar panels have significantly greater temperatures than natural shade. In addition, both fixed, shorter and the taller, sun-tracking panels of solar arrays exhibited warmer nighttime air temperatures than undisturbed sites (Slade 2023). The shade-warming effect from solar panels was most pronounced during the hottest, most thermally challenging months for reptiles.

These altered thermal environments could have unintended physiological and behavioral consequences for ectotherms such as the tortoise, given the tortoise's innate dependence on appropriate environmental temperatures for physiological function and activity. These negative consequences include extended exposure times of clutches of eggs at temperatures above thermal maximum for embryo development resulting in reproductive failure, an upward shift in their resting body temperatures that increase metabolic expenditure and water loss, negatively affecting energy balance (Nagy and Medica 1986, Sowell 2001) and therefore survival, among other physiological and behavioral concerns.

Tortoises are already living on the upper edge of their thermal limits and could be pushed closer toward extinction by an additional heating effect created by utility-scale solar arrays (Sinervo 2014). Thus, allowing federally protected species such as the tortoise access to certain areas inside solar arrays post-construction in the hopes that they can persist and move through their native home ranges beneath a newly-installed canopy of solar panels appears to be problematic based on the results of Slade's (2023) research.

Desert tortoises are herbivores with low and narrow thermal tolerance ranges relative to other desert reptiles (Berry et al. 2021, Zimmerman et al. 1994). As their environment warms and drought periods increase, their ability to meet their increasing energetic requirements may be thwarted by decreased periods of potential activity time (e.g., reduced time for foraging) and lack of plant food and water availability, pushing them to the brink of their physiological limits (Lovich and Ennen 2011). Under current climate change scenarios without a reduction in carbon dioxide emissions, models predict that Mojave desert tortoises could approach extinction by 2080. When a 0.4 to 0.75 ℃ increase in air temperatures created by a photovoltaic "heat island" is included, these models indicate an even more rapid decline (Slade 2023).

In addition, Slade (2023) reported that "species richness is lowest in a solar array and increases with distance into natural desert habitat" and "solar arrays decrease vertebrate species richness on their edge habitats." Thus "solar arrays have a deleterious effect on species richness, with extremely few species detected compared to adjacent and control habitats."

Similar changes to the below-ground thermal environment at a solar array could be similarly problematic to the tortoise and other wildlife species. Slade (2023) reported that soil temperatures directly influence the body temperatures of burrowing reptiles (e.g., desert tortoise). Any increase in underground temperatures could heighten water loss and resting metabolic rates for dormant reptiles and compromise their fitness and survival. This impact would be more severe for hatchling and juvenile tortoises than adults because of their small body size and larger surface to volume ratio. Thus, recruitment of young tortoises into the population would be adversely affected.

Desert tortoises, like most other turtles, exhibit temperature-dependent sex determination. Soil temperatures directly influence the incubation temperatures of tortoise nests, which affect hatchling survival and sex ratios (Slade 2023). Proper soil temperatures during incubation are critical to the survival of tortoises. With warmer ambient and soil temperatures produced by solar arrays, eggs laid in nests located in "heat island" effect areas of solar arrays would likely result in more hatchling female tortoises and fewer hatchling male tortoises. In addition, long-term exposure to higher temperatures results in deformities and high levels of clutch mortality (Spotila et al. 1994). Climate change would exacerbate this "heat island" impact on clutch survival and sex

determination. Because desert tortoises depend on the suitability and reliability of their thermal environment, this makes them extremely vulnerable to temperature increases imposed by climate change, a photovoltaic "heat island" effect, or both (Slade 2023). Parandhaman (2023) reported that temperature, precipitation, and soil conditions are very important factors in determining habitat suitability for the desert tortoise.

Karban et al. (2024) described wildlife responses to utility-scale solar energy disturbance with three response strategies: avoid, tolerate, and exploit. Avoidant species avoid the disturbance, partially or entirely, to forestall negative effects of utility-scale solar energy disturbance. These species are not persistent in solar energy areas and decline if disturbance cannot be avoided. Avoidant wildlife species typically have narrow or inflexible ecological niches that make them vulnerable to disturbance, such as specific habitat requirements and specialized diets. Karban classified tortoises as disturbance avoiders, possessing a number of traits (e.g., diet of diverse forb species, susceptibility to road mortality) that make them vulnerable to disturbance (Karban et al. 2024).

Based on these studies, impacts to vegetation, soils, and tortoises at solar facilities related to the PV "heat island" effect include increased air temperatures in areas adjacent to the solar field during the day and night as well as higher soil temperatures. Increased temperatures would impact the species composition of vegetation and wildlife at and in the vicinity of the solar facility, possibly including the proposed mitigation parcels, where temperatures could be too high and soil moisture too low for certain plant and animal species, including the tortoise to persist. Wildlife species would be displaced from these areas adjacent to solar fields as they are forced to vacate the area of increased temperatures and reduced availability of vegetation.

The above information is provided to inform the USFWS of the latest available science that we were unable to find in the EA. Please include this information, an analysis of these indirect impacts, and apply this analysis to the translocation area and mitigation lands identified in the Final EA to determine whether these areas would provide suitable habitat for the tortoise given the location of the translocation area immediately adjacent to (Figure 3) and the mitigation lands (Figure 2) near solar facilities. The location of the proposed translocation site next to the solar field may result in increased diurnal and nocturnal temperatures, decreased soil moisture, and decreased survival of vegetation in areas adjacent to the solar project by 650 to 1,300 feet. In the Final EA, please include this information in the analysis of indirect impacts to the tortoise and other special status species.

Translocation of Desert Tortoises: "[D]esert tortoise detected within the Project's exclusion fence will be allowed to pass through the perimeter fencing on their own volition and onto adjoining land owned by the Applicant . . . or captured and moved to approved translocation areas. This proposed translocation area is 178 acres." We found this wording vague with respect to whether tortoises would or would not be translocated. The information is confusing because it mentions moving tortoises to "approved translocation areas" (that is, more than one area), then follows with "[t]his proposed translocation area is 178 acres" – a single area (Figure 3).

Please include information on the land ownership of the translocation area(s) and how the translocation area(s) will be managed. We contend that translocation areas are mitigation areas to help offset the impacts of the taking. Therefore, all translocation areas for the tortoise should be managed in perpetuity for the benefit of the tortoise and a conservation easement or similar durable protection placed on the translocation areas. Please add this requirement to the Final EA.

USFWS states, that "details about the translocation of desert tortoise from the Project site will be provided in a Mojave Desert Tortoise Translocation Plan prepared for the Project, following USFWS guidance (USFWS. 2020)." We provide results from tortoise translocation studies subsequent to the USFWS's 2020 guidance and request that the results of these studies be used to update this guidance. Mack and Berry (2023) monitored translocated tortoise for 10 years. They reported that 17.7 percent of the tortoises survived, 65.8 percent died, 15.2 percent were missing, and 1.3 percent were removed from the study because they returned to the original site. Mortality was high during the first three years – more than 50 percent of the tortoises died primarily from predation. A similar result occurred from translocation of tortoises from the Yellow Pine Solar Project in southern Nevada post 2022. Although the translocation efforts by the Marine Corps at Twentynine Palms considered some of these factors, tortoise mortality from predation was high (Henen 2024). To minimize mortality to small tortoises, these animals have been brought into headstart facilities. The Marine Corps continues to monitor the translocated tortoises.

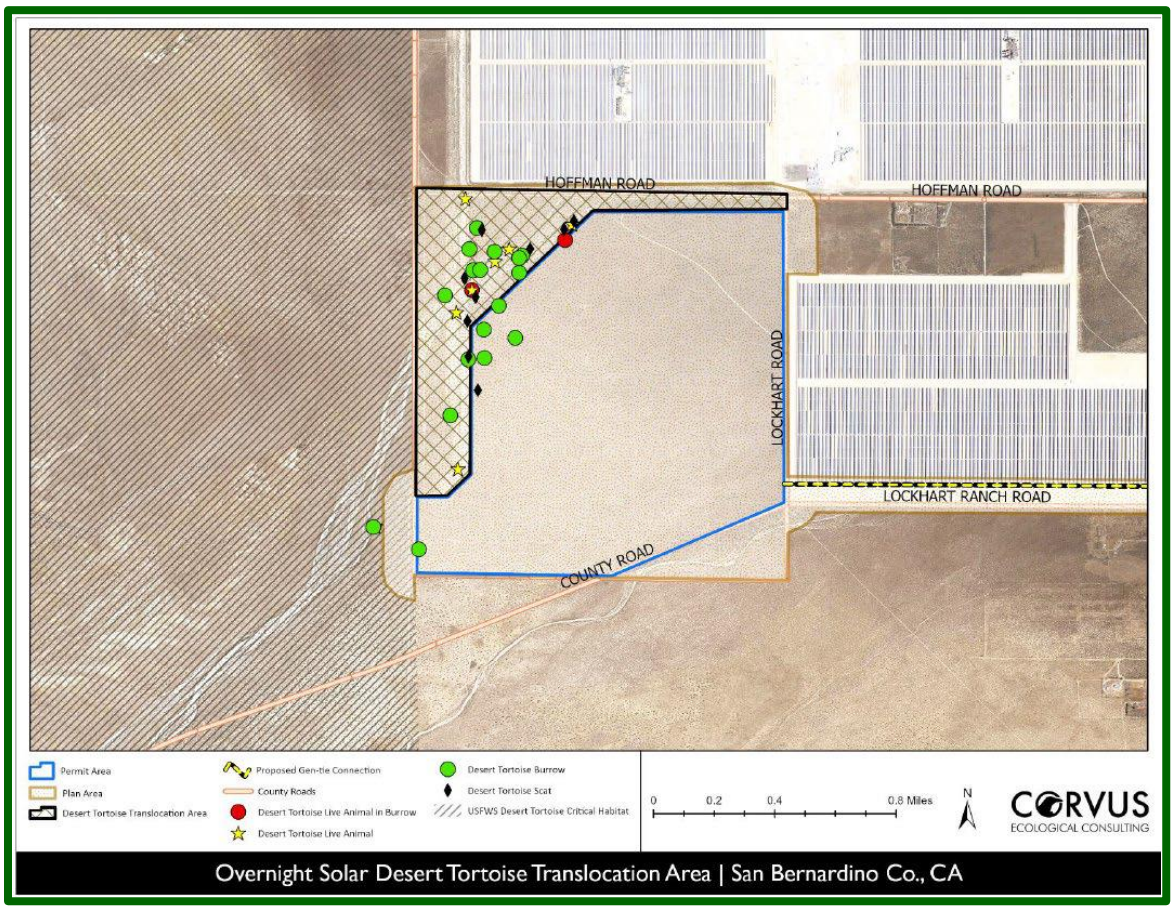


Figure 3. Location of translocation area (black hatched area) and tortoise burrows (green circles).

In addition, Mulder (2017) studied translocated tortoises during the first four years and learned that male translocated tortoises did not produce offspring with resident or translocated female tortoises. This absence of successful mating at the translocation site is concerning, because it means the genes from the male translocated tortoises were not added to the population at the translocation site. Thus, the perceived benefits of genetic diversity from translocation are not fully realized.

The "success" of translocation depends on a myriad of factors including the absence of drought, the ability of the translocation area to support additional tortoises (e.g., availability of native nutritious forage (Drake et al. 2016, etc.), social interactions between resident and translocated tortoises (Sullivan, 2015, Mulder et al. 2017, etc.), the distance translocated tortoises are moved (Dickson et al. 2019, Mack and Berry 2023), effective management of translocation lands to eliminate human-caused threats (Berry et al. 2014, Hromada et al. 2023), the time of year tortoises are moved (Mack and Berry 2023), their physiological/hydration state (Field et al. 2018, USFWS 2019), and elevated predation (Mack and Berry 2023, Henen 2024, etc.). Translocation sites should not be managed for multiple use or any use that does not provide for the conservation of the tortoise/tortoise habitat (Berry et al. 2014).

As mentioned above, recent information from studies by Devitt et al. (2022) and Slade (2024) show that areas near utility-scale solar energy projects do not provide suitable environments for tortoise habitat or for tortoises to persist in these areas. In the final selection of a translocation site for the tortoise, the USFWS should include the results of research presented above on "Heat Island Effects" to "Vegetation and Soils" and "Tortoises and Other Reptiles/Wildlife."

As a minimum, a translocation plan for the tortoise should address the following questions and provide effective solutions using the best available science:

- Where is the translocation site and what are the adjacent land ownership and uses (please include a map)?
- How far is the translocation site from the project area [translocation sites located close to the site from which tortoises are removed appear to contribute to higher tortoise survival than those that are farther away (Mack and Berry 2023)]?
- Who will manage the translocation site?
- How will it be managed because it is a mitigation site and no longer a multiple use site?
- Will tortoises be released in years with less than average rainfall?
- What time of year will tortoises be released?
- What are the results of tortoise surveys at the translocation site and of native vegetation surveys including annual vegetation at the translocation site?
- Are non-native invasive annual plants species present and if so, are they abundant?
- What other activities will be allowed to occur at the translocation site and adjacent areas (e.g., mining, grazing, OHV access, utility access, other activities that result in surface disturbance)?
- Are other indirect factors adversely affecting the environment at the translocation site (e.g., alteration of natural surface flows upgradient of the translocation site, alteration of soil and ambient temperatures because of proximity to solar energy projects, proximity to human activities creating edge effects that encroach into the translocation, location downwind from surface disturbance activities that result in dust deposition on vegetation that impede its physiological processes and reduce reproduction, etc.)
- How will management of the translocation site, a mitigation site, be implemented and effectively enforced?
- How and when will monitoring occur (monitoring schedule) and what environmental parameters besides tortoises will be monitored?
- How long will tortoises and environmental parameters be monitored – monitoring should occur for multiple years?

- When monitoring indicates a change in management is needed, when will this change occur (adaptive management)?
- Who will fund the translocation plan and for how long?
- Will the translocation plan include management of tortoise predators?
- How will small tortoises be managed and monitored?

The DTC, DTPC, and MGSCC contend the results of these studies and the inability to secure mitigation lands that are properly managed for the long-term management of translocation sites indicate that translocation of Mojave desert tortoises to date has not been an effective, successful mitigation method. Thus, avoidance of impacts to tortoises and tortoise habitat should be the preferred solution when projects that may result in the loss of tortoises are proposed. Translocation should be a last mitigation choice, not the first one.

If USFWS requires the translocation for the tortoise rather than selecting the no action alternative, the DTC and DTPC strongly recommend that the Desert Tortoise Recovery Office (DTRO) have final review and approval of the translocation plan. The DTRO, comprising biologists that are the species lead for the tortoise, oversees health assessments, develops translocation guidance for the tortoise, and analyzes its effectiveness. It has traditionally focused on the science of what is needed for survival and recovery of the tortoise. Consequently, we recommend that the DTRO review and approve this translocation plan for the tortoise and how it is implemented.

Predator Subsidy Management: "Overnight Solar will collect and dispose of animals killed on the site or Project access roads to reduce food subsidies." Although not intended, the wording of this measure could be interpreted to condone the killing of animals on the Project site or access roads. We suggest it be modified to say "Overnight Solar will collect and dispose of animals *accidentally* killed on the site or Project access roads to reduce food subsidies to predators of tortoises and other special status species."

"Overnight Solar will remove inactive common raven nests identified on the Project site and will notify USFWS of active common raven nests for egg-oiling or other management measures." Please modify this measure to say "Overnight Solar will remove inactive common raven nests identified on the Project site, *remove new raven nests that are under construction*, and will notify USFWS of active common raven nests for egg-oiling or other management measures."

"Overnight Solar will contribute to the Regional Raven Management Program in the amount of $105/acre of disturbance." Please see our comments below about modifying this wording under "Biological Resources Technical Report Overnight Solar Project, Page 54, BIO-9."

Mitigation for Incidental Take of Desert Tortoises: "Within 18 months following permit issuance, mitigation of the effects of incidental take will be achieved through the permanent preservation of 595.4 acres of suitable desert tortoise habitat. This may be in the form of PRM, purchase of credits at an approved conservation bank, or a combination of the two." Please see our earlier comments about the location, arrangement and management of these mitigation lands under "Enhancement of the Mitigation Lands."

Environmental Consequences, Air Quality: "Fugitive dust from construction may be a nuisance to those living and/or working in the vicinity of the Project. Fugitive dust emissions from proposed Project construction are expected to vary from day to day depending on the type of construction activity and weather conditions. Dust may affect existing local residents and travelers and could potentially be deposited on surfaces in close proximity to the Project. Fugitive dust from site preparation and construction is expected to be short-term and limited to the duration of construction."

Fugitive dust affects more than people. It also affects soils and vegetation and ultimately wildlife. Under the Air Quality resource issue and the Biological Resources resource issue, we were unable to find an analysis of the impacts of fugitive dust on soils and native vegetation.

Fugitive dust or anthropomorphic dust at its current levels is likely a recent phenomenon to the Mojave Desert. Because of their evolutionary history, this arid region appears to be more negatively affected by soil surface disturbances than regions such as the Great Plains that evolved with higher levels of surface disturbance (Belnap et al. 2001). Activities that are dust sources of anthropogenic dust include development projects (e.g. solar projects, commercial developments, etc.), off-highway vehicle (OHV) activities, military training, and mining. These activities produce dust by degrading soil crusts and exposing the soils to wind movement by suspension and saltation (Adams et al. 1982; Grantz et al. 1998; Padgett et al. 2007, Wijayratne et al. 2009).

Dust can disrupt physical and physiological processes in desert shrubs. Beatley (1965 cited in Sharifi et al. 1997) found that dust deposition in the Mojave Desert caused plant defoliation and shoot death in creosote bush (*Larrea tridentata*). Dust can interfere with plant growth by clogging pores and reducing light interception (Ferguson et al. 1999).

Other effects reported include a reduction in photosynthesis and increase in leaf temperature (Eller 1977, Thompson et al. 1984, Farmer 1993). Sharifi et al. (1997) discovered that dusty shrubs exhibited a 21 to 58 percent reduction in photosynthesis in the summer and a decrease in total shoot length. They also reported that dusty plants had reduced maximum leaf conductance, transpiration, and instantaneous water use efficiency.

With respect to the effects of dust on leaf temperature, Sharifi et al. (2009) determined that the temperatures of dusted leaves and photosynthetic stems were 3.6–5.4 ºF (2.0–3.0 ºC) higher than those of undusted plants, due to greater absorption of infra-red radiation. At high ambient summer temperatures of 104–113 ºF (40–45 ºC) in the western Mojave Desert, leaf temperatures of perennial shrubs approaching or exceeding 113 ºF (45 ºC) have the potential to cause significant heat stress and permanent tissue damage (Sharifi et al. 1997). Heavy dust on a leaf could also cover a significant percentage of the stomatal pores, thereby lowering leaf conductance and causing elevated leaf temperatures. These impacts may cause lower primary production in desert plants exposed to dust.

Because the areas next to/near the Project Site are proposed mitigation and translocation areas to be managed for tortoise conservation, the impacts of anthropomorphic dust from the Project Site may adversely affect the survival and growth of desert vegetation and the successful management of these mitigation and translocation lands for the conservation benefit of the tortoise. The impacts of fugitive dust to the survival, growth, and reproduction of native desert vegetation to the area surrounding the Project Site, including the mitigation and translocation lands identified in this EA, should be analyzed in the Final EA. The USFWS should use the results of this analysis to identify and require the implementation of effective actions to substantially reduce or eliminate the production of fugitive dust from the proposed Project during all phases of the Project.

Environmental Consequences, Biological Resources: "[P]rior to decommissioning the site, a final revegetation plan would be developed to meet San Bernardino County requirements applicable at the time of decommissioning." Please clarify who would develop the revegetation plan, who would be responsible for implementing it, and whether the Applicant will be required to post a bond sufficient to cover the entire cost of the revegetation plan. Please add that CDFW and USFWS are the agencies that would need to approve the revegetation plan in addition to San Bernardino County.

USFWS states, "Measures will minimize soil erosion and sedimentation through the development of a SWPPP as required by San Bernardino County." "Stormwater regulations are expected to substantially control adverse edge effects (e.g., erosion, sedimentation, habitat conversion) during and after construction, both adjacent to and downstream from the Project Area." We request that this one sentence description be expanded to include (1) an analysis of the typical types of features used to minimize soil erosion and sedimentation from surface water flow, and (2) how these features would be modified to ensure they do not inadvertently trap or drown tortoises of any age class for those features located adjacent to the Project area and outside the tortoise exclusion fenced area. Also, please ensure that these facilities are designed and maintained so they do not provide a water subsidy for tortoise predators.

Special Status Wildlife Species: "No special-status invertebrates, amphibian, or fish species are expected to occur in the Project Area due to a lack of habitat." Please see our comments above on the Monarch butterfly.

Desert Tortoises, Environmental Consequences: "Increased risk of injury or mortality to desert tortoises would also occur adjacent to the Project Area due to increased traffic driving to and from the site." This is an additional impact that would occur but not on the 595.4-acre solar array Project site. It would occur along the route(s) used to access and leave the Project site. This impact is not described or analyzed in the EA. Consequently, the impacts of this taking should be minimized and mitigated in addition to the impacts of the taking resulting from development of the 595.4-acre Project Site. The DTC, DTPC, and MGSCC request that appropriate mitigation be developed and implemented to minimize and mitigate the impacts of the taking from increased traffic caused by the Project. Such mitigation could include the construction and maintenance of tortoise exclusion fencing along the access routes to the Project site and securing additional lands to be managed in perpetuity for the conservation of the tortoise. Please discuss and analyze the appropriate mitigation for this additional impact and add it to the Project description in the Final EA.

"With the minimization measures, injury or mortality of desert tortoises during construction would be minimized to the extent practicable . . ." The USFWS describes measures that would be implemented to minimize impacts to special status wildlife species. However, we found no analysis or explanation that these measures are being implemented to the maximum extent practicable. In the preceding paragraph we described another source of mortality from project construction that would occur offsite and suggested a measure to minimize this take. Please address the tortoise exclusion fencing to minimize road kill that is discussed in the previous paragraph or implementation of other measures to minimize road kill from vehicles driving to and from the Project site during the construction phase. Then analyze whether the implementation of these measures would/would not be practicable. Our understanding is that the majority of Harper Lake Road is lined with desert tortoise exclusion fencing. If the party responsible is no longer required to maintain this exclusion fencing, the Applicant could implement this minimization measure.

In the sections that discuss impacts to the tortoise during the construction, operations and maintenance, and decommissioning phases, we were unable to find a description of the indirect impacts that would result from project implementation. Rather, we found only a discussion of direct sources of injury or mortality. Harm and harass were not addressed. We refer the USFWS to the information provided earlier in this comment letter on the "heat island" effects from utility-scale solar projects and their deleterious impacts from increased temperatures to soil moisture, vegetation, and tortoises. These impacts constitute harm that may occur outside the 595.4-acre Project site.

GM-5: Predator Subsidy Management: We question the absence of a standard requirement to develop a Predator Management Plan that includes designing and implementing project features that minimize food, water, perch, and nesting subsidies for common ravens. This section discusses minimizing water and food subsidies but we found no wording that nest and perch subsidies would be eliminated or substantially reduced. For example, we found no wording in the EA that the Applicant would use monopoles for the gen-tie line and other above-ground lines to reduce the likelihood of common ravens using these vertical structures for nest and/or perch sites. Nesting ravens have been documented to effectively prey on young tortoises with numerous carcasses of young tortoises found under raven nests (Boarman 2003). Hence, eliminating nesting substrates for ravens from the implementation the proposed Project by using monopoles instead of lattice towers and installing effective deterrents that prevent ravens from nesting or perching on buildings and other vertical structures associated with the proposed Project would be standard measures to minimize indirect impacts to the tortoise and other special status species from implementation of the proposed Project.

Please revise this section in the Final EA to analyze all direct and *indirect impacts* from implementation of the proposed Project, not just direct sources of mortality and injury. This analysis should have occurred in the HCP to determine the impacts of the taking and to develop and implement effective minimization and mitigation measures to minimize and mitigate the impacts of the taking (including impacts of the taking from indirect impacts) and should be available to include in the Final EA.

Minimization Measures—Other Special-Status Species and Migratory Birds: We have the same comments about the description and analysis of indirect impacts to Mohave ground squirrel, burrowing owl, American badger, and desert kit fox; that is, we were unable to find an analysis of indirect impacts. The EA only addresses direct impacts. Please provide this description and analysis of indirect impacts to other special status species in the Final EA

Translocation and Mitigation: "[A]dverse effects on desert tortoises from translocation are expected to be minimal . . ." We are unsure how the USFWS can make this statement when most translocation efforts have resulted in a high percentage of mortality for the translocated tortoise and the male tortoises that survive the translocation are not reproducing. When there is high mortality of tortoises that are translocated, these tortoises experience substantial adverse effects, not minimal effects. Please see the information provided above in this comment letter on "Translocation" including the data provided to support the statement that translocation of Mojave desert tortoises to date has not been an effective, successful mitigation method. The additional information that we have provided should be included in the Final EA.

Environmental Consequences, Mohave Ground Squirrel: The creation of elevated perching sites such as solar panels and electrical lines could increase the numbers of common ravens and raptors in the Project Area, increasing predation pressure on Mohave ground squirrels in the Project Area and surrounding areas." The EA describes this impact to the Mohave ground squirrel but does not include this description in the discussion on impacts to the Mojave desert tortoise. Please explain this discrepancy especially when there are several journal articles and reports on increased predation by common ravens on the tortoise that is attributed to anthropogenic subsidies of food, water, nest sites, and perch sites.

In the section that discusses impacts to the Mohave ground squirrel during the operation and maintenance phase of the Project, we found no discussion or analysis of the impacts of the "heat island" effect that extends to the Mohave ground squirrel's habitat adjacent to the Project Site and impacts to the ability of the Mohave ground squirrel to occupy and persist in this area of the "heat island effect." Please see the information on "heat island effects" that we provided above in this comment letter. Please add this discussion and analysis of the "heat island" effect to the Mohave ground squirrel and its habitat during the operation and maintenance phase of the Project to the Final EA.

Please add this discussion and analysis the "heat island effect" to the other special status species mentioned in the EA that may reside/actively use this habitat for feeding, breeding, or shelter.

Noise: This section of the EA describes and analyzes the impacts of noise generated during the construction of the Project to human receptors. "The nearest sensitive receptor to the Project Area is approximately 1 mile east of the Project Area" referring to a human receptor. However, occupied wildlife habitat is located immediately west and south of the Project site. Many species of birds and mammals (e.g., Mohave ground squirrel) rely on the acoustic environment for functions such as mate attraction, predator detection, and social communication (Le et al. 2019). Anthropogenic noise can strongly interfere with the reception of biologically relevant sounds, causing a variety of behavioral changes in response to the evolutionarily novel acoustic conditions created by humans. Please include an analysis of the impacts of noise generated by the Project to the behavior and survival of the Mohave ground squirrel, especially during the construction phase of the Project.

Environmental Consequences, Surface Water Resources: "Construction activities would require an NPDES General Construction Activities Stormwater Permit that the Proponent would obtain prior to construction. The NPDES permit requires a SWPPP and monitoring plan, which include erosion-control and sediment-control BMPs to control potential construction-related pollutants. These BMPs may include but are not limited to phasing grading, diverting runoff from disturbed areas…" Please see our comments above under "BIO-12" and apply them to the analysis and development of minimization and mitigation measures for the tortoise to prevent entrapment and/or drowning.

Cumulative Impacts:
Greenhouse Gas Emissions: "The Project would result in increased GHG emissions during construction; however, the Project would produce energy in a manner that displaces a much larger net amount of GHGs (e.g., CO2) that would have otherwise been produced from traditional nonrenewable energy sources." We believe the EA did not adequately discuss increased GHG emission from the loss of vegetation from the construction, operations and maintenance, and decommissioning of the Project, which should be remedied in the Final EA.

Studies around the world have shown that desert ecosystems act as important carbon sinks. For example, the California deserts account for nearly 10 percent of the state's carbon sequestration – below ground in soil and root systems, and above ground in biomass. Protecting this biome can contribute to securing carbon stores in the state (MDLT 2021). Given the current climate change conditions, there is an increasing need for carbon sequestration. Vascular plants are a primacy user of carbon. The proposed Project would result in the loss/degradation of a large area of plants that currently sequester carbon and the ability of these plants to sequester carbon in the future for decades or centuries. The duration of time lost to sequester carbon depends on the time required for revegetation to be successfully implemented following decommissioning to restore the same or greater biomass of native vegetation as it is being destroyed.

The proposed Project does not have a large footprint, but when combined with the numerous actions that other agencies (e.g., BLM and San Bernardino County) have authorized, are likely to authorize in the foreseeable future, and the unauthorized activities occurring on BLM land in the West Mojave Desert portion of the California Desert Conservation Area that destroy vegetation, this Project when combined with the other projects would be contributing to climate change and its worsening impacts to the human environment.

Consequently, USFWS should conduct a cumulative impacts analysis of the proposed Project with respect to climate change. Analyzing alternatives and implementing ones that avoid or minimize the reduction/loss of native vegetation is important to combat climate change; it is imperative that the proposed Project not result in the loss of native vegetation. Because the ongoing discretionary actions and those in the foreseeable future that have/would be approved by San Bernardino County and other local state and federal agencies that are likely contributing to climate change, these cumulative impacts should be addressed with respect to their effects on the Mojave desert tortoise at the population level, the Western Mojave Recovery Unit, and range-wide.

Past, Present and Reasonably Foreseeable Future Projects: "Past, present, and reasonably foreseeable future actions considered in the cumulative effects analysis for the Project included off-highway vehicle recreation, agricultural practices, land management, private development, private mining or grazing leases, and known renewable energy projects. Table 11 summarizes past, present, and reasonably foreseeable future development projects in the approximately 1,558,511-acre Cumulative Effects Study Area."

"[T]he Cumulative Effects Study Area, which for the purposes of this analysis is defined as a combination of the desert tortoise Fremont Kramer Critical Habitat Unit (513,816 acres), the Superior-Cronese Critical Habitat Unit (771,525 acres), and an additional 273,170 acres south of these Critical Habitat Units, which is physically bound by Interstate 15."

The cumulative effects analysis for the desert tortoise describes only direct impacts to the tortoise that result in mortality or injury and provides a partial list of the acreage of the projects. Unfortunately, the acreage provide for the projects is limited to the footprint of these projects. It does not describe or analyze the indirect impacts to the tortoise or to tortoise habitat including harm. It does not map the spatial arrangement/locations of the projects/land uses that have edge effect/indirect impacts that extend beyond the projects' footprints. For example, it has been our observation that much of the central and southern portions of the Fremont-Kramer Critical Habitat Unit have suffered significant air quality reductions as the direct result of the USFWS's issuance of a 10a permit to allow development of a biosolids waste facility located approximately eight miles south of the Proposed Project. There are days when the smell of this facility reach a dozen miles west to Highway 395, although the nearer effects to plant and wildlife remain unknown.

The Council on Environmental Quality (CEQ) states, "Determining the cumulative environmental consequences of an action requires delineating the cause-and-effect relationships between the multiple actions and the resources, ecosystems, and human communities of concern. The range of actions that must be considered includes not only the project 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* [emphasis added], ecosystems, and human communities."

CEQ provides eight principles of cumulative impacts analysis (CEQ 1997, Table 1-2). These are:

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 the resource.

Note that CEQ recognizes that synergistic and interactive impacts as well as cumulative impacts should be analyzed in the FEIS for the tortoise and other the resource issues.

There were several approved projects and activities that occur in this Cumulative Effects Study Area that were not listed, with the most noteworthy being the expansion of the Army's National Training Center at Fort Irwin in the Superior-Cronese tortoise conservation area (TCA) and the biosolids spreading fields mentioned above. Please revisit this list of development projects and expand it to include off-highway vehicle recreation, agricultural practices, land management practices, private development, private mining or grazing leases, military activities, and highway improvement projects, among others. Once the footprints of these projects have been mapped along with the extent of their indirect impacts, then USFWS has adequate information to begin its analysis of the cumulative effects of these projects combined with the current information the status and trend of the tortoise in the Fremont-Kramer and Superior-Cronese TCAs, Western Mojave Recovery Unit, and rangewide.

When considering climate change as an impact on Biological Resources, USFWS's analysis should periodically be revised because the last 20+ years of climate modeling have shown that climate change models are conservative and have underestimated the impacts of climate change to flora and fauna.

We were unable to find an analysis of the impacts that included the likelihood of the sustainability of the tortoise population. CEQ requires this analysis for the Project along with all the other projects and land uses that have been or are likely to be approved in the Fremont-Kramer and Superior-Cronese TCAs and Western Mojave Recovery Unit.

USFWS claims that when considering past, current, and future projects in the analysis area, the status of the tortoise population in the Western Mojave Recovery Unit, and the minimization and mitigation measures required, these cumulative actions "would not substantially change the condition or status of the desert tortoise." We were unable to find information to support this conclusion from citations from the scientific literature or published reports. However, if accepted as true, the USFWS is saying the Project would continue the status of the tortoise in these two TCAs and the Western Mojave Recovery Unit as having all tortoise populations that are below the threshold for viability (see Attachment B, Demographic Status and Trend of the Mojave Desert Tortoise including the Western Mojave Recovery Unit), that is, these tortoise populations are not sustainable.

We request that the Final EA (1) include these eight principles in its analysis of cumulative impacts to the Mojave desert tortoise; (2) ensure that synergistic and interactive impacts from the proposed Project are included in this analysis; (3) address the sustainability of the tortoise in/near the Fremont-Kramer and Superior-Cronese TCAs and in the Western Mojave Recovery Unit including the connectivity between populations in TCAs/CHUs and connectivity to tortoise habitats to the north; and (4) include effective science-based mitigation, monitoring, and adaptive management that protect desert tortoises and their habitats during implementation of the proposed Project.

In addition, we request that USFWS monitor the impacts to both tortoises and occupied habitats for each project authorized by an incidental take permit or consultation under section 7 of the FESA by including them in a database and geospatial tracking system that tracks cumulative impacts (e.g., surface disturbance, paved and unpaved routes, linear projects, invasive species occurrence, herbicide /pesticide use, wildfires, air quality, etc.), management decisions, and effectiveness of mitigation for each project. Without such a tracking system, USFWS is unable to analyze cumulative impacts to special status species (e.g., desert tortoises) with any degree of confidence.

Biological Resources Technical Report Overnight Solar Project

Page 30, Biological Survey Methods: "During spring 2024, biologists resurveyed the current project footprint and a 150-meter buffer . . ." This Report describes that a 150-meter buffer beyond the Project footprint was surveyed for tortoise and other special status species. Although we suspect this distance may be associated with burrowing owl survey guidance (CDFG 2012), please provide information in this document regarding how the 150 meters was selected to survey in addition to the Project footprint.

On page 13 of USFWS (2019), the agency says, "the "action area," which is defined by the implementing regulations for section 7(a)(2) of the Endangered Species Act (50 Code of Federal Regulations 402.02), as "areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. (Non-federal actions for which an Applicant has requested an incidental take permit under the authority of section 10(a)(1)(B) of the Endangered Species Act also require consideration of the effects within the action area.)"

Our understanding is that the action area for the Project should have been surveyed for the tortoise/tortoise sign. The "action area" is defined in 50 CFR 402.2 and the USFWS Desert Tortoise Field Manual (USFWS 2009) as "all areas to be affected directly or indirectly by proposed development and not merely the immediate area involved in the action area" (50 CFR 402.02). Thus, the action area where this 100% coverage survey should have occurred is larger than the Project footprint/Project Site. Please revise the information in this appendix to include the results of conducting USFWS protocol level surveys for tortoises/tortoise sign for the *action area* that would include the areas potentially affected by heat island effects and other indirect impacts to the tortoise, Mohave ground squirrel, and other special status species.

Page 36, Literature Review Results, Sensitive Species Results: Several species are listed as occurring or likely to occur at the project site and surrounding area. However, we found no mention of the Monarch butterfly. Because this species was recently proposed for listing as threatened by the USFWS and the project is in the range of this species, the technical report should provide information on what actions were implemented to determine whether this species is likely to use the project area for feeding, breeding, shelter, or movement. Please add this information to the technical report.

Page 46: There are "no wildlife corridors traversing the project site, as designated by the San Bernardino County General Plan, West Mojave Plan, or Desert Renewable Energy Conservation Plan (DRECP)." Although this information is helpful, it does not convey information about wildlife corridors that other agencies such as USFWS or CDFW may have identified. Please include this information in this revised technical report.

Page 50, Mitigation Measures and Design Considerations: We found mitigation measures that are to be implemented during the construction phase of the project. We found no mitigation measures to be implemented during the operations and maintenance phase or the decommissioning phase of the project for the tortoise. Please include these mitigation measures in the report (e.g., when the exclusion fence will be monitored, when it will be repaired, need for clearance surveys because of a breach in the exclusion fence, relocation plan for tortoises, invasive plant species management, etc.).

Page 52: "Biological Monitors shall perform a clearance survey (USFWS 2019) for desert tortoise within the exclusionary perimeter fencing." We searched USFWS 2019 and were unable to find that clearance surveys were mentioned. In USFWS (2009), USFWS says, "Direct supervision is always required for field and clearance surveys; direct supervision means that the Authorized Biologist has direct voice and sight contact with the desert Tortoise Monitor." Please correct this information in this technical report to say that biological monitor shall perform clearance surveys under the direct supervision of authorized biologists. This technical report should be revised to include the information in "Chapter 6. Clearance Survey Protocol for the Desert Tortoise -Mojave Population."

Page 52: "If the species is determined present within the project site, individual(s) shall be allowed to leave the site on their own . . ." Because the project site will be fenced and the location of the gen-tie line has already been fenced, we are unsure how individual tortoises would be allowed to leave the project site on their own. Please revise this wording to indicate that tortoise(s) would be relocated from the project site as part of the tortoise relocation/translocation plan.

Page 52: "Disturbance activities shall be monitored, as follows:

- Environmental awareness training (see BIO-2) shall include education on desert tortoise and Mohave ground squirrel, protective status, and avoidance measures to be implemented by all personnel, including looking under vehicles and equipment prior to moving. If desert tortoises or other protected species are encountered, such vehicles shall not be moved until they have voluntarily moved away from the vehicle and out of harm's way, or a qualified biologist has moved them.
- If a desert tortoise is present, a Biological Monitor shall be present during all disturbance activities in the vicinity of exclusionary fencing (if required) and shall have the authority to stop work as needed to avoid direct impacts to desert tortoises. Periodic biological inspections and maintenance shall be conducted during the construction period to ensure the integrity of exclusionary fencing (if required). Work may proceed within the excluded area when the Biological Monitor confirms all desert tortoises have left the excluded area.
- Should desert tortoises be found during construction activities, the Biological Monitor shall have the authority to stop work as needed to avoid direct impacts to tortoises, and further consultations with the USFWS and CDFW shall take place prior to relocating the desert tortoises."

Our understanding is that the entire Project site where construction will occur including the gen-tie line will be enclosed with tortoise exclusion fencing and clearance surveys conducted to remove all tortoises prior to initiating ground disturbance. If this is correct, we do not understand the second bullet. A tortoise Monitor or Authorized Biologist would likely be the one to find the tortoise inside the fenced project site during the construction phase and they would already be present. Perhaps this requirement should be reworded to clarify its intent. Might it be referring to a tortoise that was not found during the clearance surveys or entered the site through a breach in the exclusion fence? Or is it referring to the process of constructing the tortoise exclusion fence? Please clarify this bulleted item in the revised technical report.

In addition, the third bulleted item should be expanded to include the operations and maintenance and decommissioning phases of the project, not just the construction phase.

"Trash and food items shall be contained in closed containers and removed daily to reduce attractiveness to opportunistic predators of desert tortoise (e.g., ravens, coyotes, feral dogs)." Please change this to say "Trash and food items shall be contained *promptly* in closed containers . . ."

"Employees shall not bring pets to the construction site." Please add that "Employees shall not bring pets *or firearms* to the construction site."

Page 52: BIO-6 requires a translocation plan for the Mohave ground squirrel but we found no requirement for a similar plan for the Mojave desert tortoise.

Page 54: BIO-9 says, "To reduce the subsidies available to Common Ravens . . ." We recommend this language be modified to say, "BIO-9 To reduce the subsidies available to Common Ravens *and other tortoise predators* . . ."

"The Applicant will contribute $105/acre of disturbance to the Regional Raven Management Program." In "Common Raven Predation on the Desert Tortoise November 2010" (USFWS 2010) (an attached), the USFWS described how the per-acre contribution was calculated. This monetary amount per acre was calculated in 2010 using then-current financial data. These data likely lost their relevancy in 2011 and have not been relevant since then. Consequently, it is inappropriate for the USFWS to continue to use these data and this per-acre contribution amount in subsequent years.

Examples of using outdated /flawed data in calculating the per-acre contribution are described below. The "base annual salary for a GS-11 position within the region is approximately $64,000." By 2015, that same person's salary had increased to $74,000 and in 2020 their salary was almost $88,000. In 2025, their salary is $109,000. This is a 59% increase in salary in 15 years. However, the *cost* for employing a GS-11 person was much greater than the *salary* the employee receives. The salary of an employee does not include the costs of retirement, leave, insurance, and other benefits. This base annual salary did not consider the time of other persons who support a GS-11 employee including supervisors and support staff. The cost of the benefits could be as much as 50% more than the GS-11 salary of the person. Additional costs for supporting the employee that were not included in the calculation include office and field equipment, supplies, travel expenses (i.e., vehicles, fuel, lodging), etc. These and other costs should have been included in the *cost* of employing each person to perform the identified tasks rather than using the *salary* paid to the employee.

There were other flaws in the method used for calculating the per-acre contribution. The net investment return for the National Fish and Wildlife Service's (NFWF) Raven Management Fund (Fund) was assumed to range from 2% to 5% annually after assessing the NFWF's administrative fees and financial investment advisory fees. Although we have no knowledge of the rate of success for the Raven Management Fund because of the investments by NFWF, we are aware that investments in treasury securities for the last several years have yielded low interest rates – frequently below the 3% NFWF fee. Thus, the fees for managing this account may have exceeded the interest or profit from the investment and the Fund could have lost money.

At the end of each year, the USFWS should evaluate the accomplishments from implementing the activities of the Raven EA to determine whether the activities and the number and/or roles of staff should be adjusted – part of the adaptive management for implementation of the Raven EA. If additional staff, staff with different salary amounts, and/or additional/different activities are identified, this information should be used to recalculate the per-acre contribution for the next year.

These calculations should have been adjusted annually to produce a new per-acre contribution. It should be adjusted as a minimum to reflect the additional costs of labor, equipment and supplies, travel, fuel, etc. that have increased since the Fund's inception in 2010. The $105 per-acre contribution may have been applicable in 2010, but in 2011 and subsequent years, the USFWS should have recalculated it to reflect the changes mentioned above plus other relevant considerations.

The dollar had an average annual inflation rate of 2.49% per year between 2010 and today, producing a cumulative price increase of 44.68%. Thus, every year since 2010, the per-acre fee should have been raised by 2.49% so that the current per-acre fee should be $157 using the 2010 calculation. However, this figure for the annual inflation rate does not focus on the changes in the costs for the specific actions that would be implemented for offsetting indirect and regional impacts of proposed projects – raven surveys, removal, and outreach. These costs would include increases in costs for labor, travel, fuel, vehicle/equipment costs and maintenance, training, and outreach methods and materials. Thus, USFWS has been remiss in not updating annually the per-acre fee for the Regional Raven Management Fund.

We remind the USFWS that the FESA directs them to minimize and mitigate the impacts of the taking and not the amount of take. In addition, the USFWS recently revised the regulations for implementing Section 7 consultation, which USFWS must also complete before issuing an ITP. In this revision, USFWS has the authority, when preparing a biological opinion, to issue reasonable and prudent measures and terms and conditions that "include measures implemented inside or outside of the action area that avoid, reduce, or offset the impact of incidental take" and "that serve to minimize the impact of such taking on the species inside or outside the action area" as long as they do not "alter the basic design, location, scope, duration, or timing of the action" (50 CFR 402.14(1)(i)(2) and (3)).

Consequently, under FESA the USFWS has the authority to require appropriate measures such as the Raven Management Fund to reduce the impacts from anthropomorphic subsidies of tortoise predators and additional compensation of lands to offset impacts of the taking due to indirect effects (e.g., "heat island effects"). Implementing these additional measures would also demonstrate that the applicant for the incidental take permit has minimized and mitigated the impact of the taking to the maximum extent practicable. The DTC, DTPC, and MGSCC request that the USFWS implement actions to immediately revise the calculations for the Regional Raven Management Fund, apply this revision to this project, annually revise the data used in the calculations, and revise the formula, as needed, to calculate the Raven Management Fund per-acre contribution.

Overnight Solar Draft Habitat Conservation Plan

Page 3, Figure 1: We believe the Plan Area and Permit Area shown on this figure are incorrect. The mapped location of the Plan Area does not include the mitigation lands, and the mapped location of the Permit Area does not include the Translocation Area. Please refer to our comments on the EA under "Figures delineating the Permit Area and Plan Area."

Page 5, Plan Area Components: "Mitigation to offset project impacts to desert tortoise is still under consideration and will be completed within 18 months of permit issuance. If the mitigation is in part or in whole in the form of habitat acquisition, those mitigation lands will be included in the plan area once finalized. Any mitigation land would not be included in the permit area."

If the mitigation lands are to be fenced, the fenced area should be included in the permit area so that moving a tortoise temporarily out of the way during fence construction or maintenance would be permitted.

Please clarify whether "habitat acquisition" includes acquiring conservation easements or banking credits. We consider habitat acquisition to be different than these mechanisms of securing lands for conservation purposes.

Page 8, Species Proposed for Coverage: On December 12, 2024, the USFWS proposed to list the Monarch butterfly as a threatened species and designate critical habitat under FESA. Please add information on whether the Applicant considered the Monarch butterfly as a covered species.

"[I]ncidental take of MDT [Mojave desert tortoise] is reasonably certain to occur as a result of covered activities. These impacts include but are not limited to habitat modifications, vegetation loss, loss of breeding territory, increased vehicle traffic, addition of artificial substrates and materials, potential increases in subsidized predators, reduced biodiversity, reduced foraging opportunities, physical obstacles to movement, compacted soils, environmental contamination, direct encounters with vehicles and humans, and reduced groundwater retention." Please add elevated air and soil temperatures from heat island effects that reduce soil moisture and result in reduced plant cover and density, changes to the tortoise's ability to regulate water balance and other physiological effects, changes in behavior, and likely changes in sex determination of eggs.

Page 11, Stormwater Facilities: "Long shallow strip retention basins are proposed to capture possible '100-year,' 24-hour increase in runoff volume resulting from clearing of vegetation, compacting of soil, and limited impervious (paved or structural) improvements." We were unable to find a location for these stormwater facilities. If located outside the tortoise exclusion fence, please ensure that the facilities required by the County to avoid erosion and runoff do not result in conditions that inadvertently trap and/or drown tortoises especially smaller age classes. Also, please ensure that these facilities are designed and maintained so they do not provide a water subsidy for tortoise predators.

Page 17, Decommissioning Activities: "After materials removal, the site will be made available for other purposes." Please provide information on what the likely uses of the site would be after decommissioning. We request this information because it may affect the selection criteria of the translocation site that is immediately adjacent to the Project Site. A translocation site is a mitigation site and should be managed in perpetuity for the conservation of the tortoise. If future uses of the Project Site are known and are not compatible with having a tortoise mitigation site abutting it, that is the future uses may have edge effects that would result in take of tortoises in the adjacent translocation area, then tortoises would need to be translocated again to prevent mortality, injury, harm, or harassment. This translocation mitigation area would no longer be a functioning mitigation area. Please discuss this issue in the HCP and the Final EA.

Page 18, Translocation Recipient Sites: "Translocation of MDT to the approved recipient site is a covered activity of this HCP." The discussion in this section is for one recipient site and "Figure 3. Overnight Solar Mojave Desert Tortoise Translocation Area" delineates one recipient site. The title of this section is plural suggesting more than one site. Please clarify if there is more than one recipient site being considered for translocated tortoises, and if so, where the other site(s) is/are located.

Because the translocation of tortoises is a covered activity, the site receiving these tortoises should be in the Permit Area. Moving tortoise to the recipient site requires an ITP. Please see our comments above under Page 3, Figure 1 and correct this figure.

"To the extent possible, direct handing of MDTs will be avoided in favor of allowing MDT to exit the site on their own. This option offers lower impact and risk to the individual resident MDTs, as well as to the species, by avoiding handling, long-term tracking and transmitter hardware, and movement of animals to unfamiliar habitat." We surmise from this statement that the Applicant would not be required to monitor the tortoises in the translocation site to determine the success of the translocation effort. Not requiring the Applicant to implement effectiveness monitoring of the conservation strategy would violate the guidance in the HCP Handbook. It would also not provide the opportunity to hydrate translocated tortoises before they are released at the recipient site. As mentioned in our comments above on the EA, hydrating tortoises prior to their release has been reported to be a method that improves the survivorship of these animals (Field et al. 2007, Dickson et al. 2019). For these reasons, we request that the translocated tortoises be hydrated and monitored for a few years to determine the effectiveness of the translocation effort.

"Further details about the translocation areas and translocation of MDT from the project site will be provided in a Mojave Desert Tortoise Translocation Plan prepared for the project." "The translocation plan will be consistent with current USFWS guidelines and will be reviewed and approved prior by USFWS prior to any translocation activities."

Please see our comments above on "Translocation of Desert Tortoises" especially regarding whether the identified translocation area would be suitable habitat for the tortoise after construction of the proposed Project and adding the requirement that the review and approval of the translocation plan by the DTRO would be required.

Page 19, Mitigation Lands: "Mitigation to offset the effects of the taking will be achieved through the permanent conservation of 595.4 acres of MDT habitat, which is equal to the area of permanent disturbance for the proposed permit area." We strongly disagree with this statement. The 595.4 acres is the footprint of the Project. The area that would experience long-term disturbance is greater in area than the Project footprint. Similarly, the impacts of the taking would extend beyond the Project footprint from impacts including, but not limited to, heat island effects, subsidized predators, etc.

"Within 18 months following permit issuance, the applicant will provide documentation to the Service [USFWS] that they have completed the mitigation requirements to conserve 595.4 acres of MDT habitat." Please see our comments above under "Enhancement of the Mitigation Lands" for why this requirement should be modified so this mitigation occurs before or commensurate with the surface disturbance from the proposed Project and not after the surface disturbance has occurred.

Page 20-21, DT-3: Pre-Disturbance Surveys: "Then, during the desert tortoise active season, following fence installation and prior to ground disturbing activities in the project area, qualified biologists will conduct a protocol clearance survey (following USFWS guidance) within the fenced facility and translocate any desert tortoises out of the project area." Please add that the USFWS guidance that will be implemented is what is presented in "Chapter 6. Clearance Survey Protocol for the Desert Tortoise – Mojave Population" (USFWS 2009).

Page 21, Staging and Parking Areas: "Staging areas for construction materials and equipment will be within areas previously fenced and cleared of MDT." Please add that "Staging areas for construction materials and equipment will be within areas previously fenced *with tortoise exclusion fencing* and cleared of MDT."

Page 22, DT-9 Offsite Compensatory Mitigation: Please see our comments above under page 19 Mitigation Lands.

Page 23, GM-5 Predator Subsidy Management: Please see our comments on the EA under "Predator Subsidy Management" with respect to removal of new raven nests and under "Biological Resources Technical Report Overnight Solar Project, Page 54, BIO-9" regarding the Regional Raven Management Program in the amount of $105/acre of disturbance.

Page 28, Impacts Associated with Solar Facility Construction: At the top of page 28, the Applicant says, "This included assessing mechanisms of MDT 'take' for each activity; take is defined under the ESA as 'to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct'." However, when describing the impacts to the tortoise during construction, the description is limited to describing those impacts that would result in direct mortality or injury. "These initial activities pose the greatest risk of injury and mortality to MDT. After this stage, the threat of mortality is anticipated to be low, as all detected MDT will have been removed from the permit area during clearance surveys." It also assumes that take would only occur within the Project footprint.

The Applicant did not consider impacts from capture (that would occur from translocation) or harm (that would occur from excluding tortoises from the Project site and part or all of their former home ranges). For example, in their home ranges tortoises know where water collects for drinking during rainfall (Medica et al. 1980). Although the installation of shade structures along the tortoise exclusion fencing is intended to reduce mortality from tortoises pacing along the exclusion fence to access their previous home range areas and the pacing resulting in overheating, the shade structures may not eliminate all mortality for tortoises in a stressed physiological condition. Also, tortoises that are translocated during the first year tend to spend more time aboveground and move more making them more susceptible to predation (Mack and Berry 2023). This is harmful because the Project is altering their behavior and results in increased sources of mortality.

"Construction of the Overnight Solar facility will result in the loss of 595.4 acres of MDT habitat, including suitable breeding and foraging habitat and known burrow locations. Project construction may result in an increase in local predators (e.g., Common Ravens, coyotes) due to an increase in food, water, and perching/nest site subsidies. There may be diminished mating opportunities for MDT as habitat is fragmented by infrastructure and exclusion fencing." Although these impacts that are likely to result in increased mortality and loss of reproduction and recruitment are described in the HCP, we found no mitigation to offset the impacts of these forms of take in the HCP.

Page 29, Impacts Associated with O&M Activities: This section does not mention the impacts from the heat island effects from the operation of the solar arrays on tortoise and tortoise habitats in areas adjacent to the Project Site including the proposed translocation site and mitigation lands. Please see our comments above on the EA under "Heat Island Effects." These impacts would result in a loss of additional tortoise habitat, not from blading but from elevated temperatures such that tortoises would not be able to use the areas adjacent to the Project and survive. Please add these adverse effects to Table 2 in the HCP on page 30.

Page 29, Impacts Associated with Decommissioning: "Decommissioning of the proposed action will involve removal of all components and restoration of the solar facility portions of the permit area. Potential impacts at this stage are minimal until perimeter fencing is removed. Removing exclusion fencing will put construction crews in direct contact with open MDT habitat and resident populations of MDTs outside the perimeter fence." To reduce the likelihood of take of tortoises during decommissioning is to have the activities occur within the exclusion fencing similar to having the construction activities occur within the exclusion fencing. Once decommissioning activities inside the exclusion fence are completed, the last step of decommissioning would be to remove the exclusion fencing. Depending on the future use of the site after the solar facility is removed, the Applicant and USFWS may determine that it is better to retain and maintain the exclusion fence because the future use of the site is not compatible with tortoise conservation.

Page 29, Summary of Impacts: "In summary, the proposed action is reasonably certain to impact MDT in the permit area; take is most likely to occur during construction and is increasingly unlikely during O&M." For reasons state above, we strongly disagree with the conclusion that impacts to the tortoise are increasingly unlikely to occur during O&M. Please revise this section of the HCP to describe all the impacts that are reasonably certain to occur including those that we have presented and provide supporting information from the scientific literature. We have provided scientific references in our comments on the EA, Biological Resources Technical Report Overnight Solar Project, and HCP to assist the USFWS and the Applicant in this effort. After the Applicant and USFWS have revised the impacts of the taking to include the additional impacts that we have described in our comments on the EA and HCP, please revise the conservation strategy to reflect the need for additional mitigation to offset these increased impacts of the taking.

Page 30, Capture and Translocation of Mojave Desert Tortoises: "The potential for MDT injury or death during translocation will be minimized by following USFWS translocation guidance (USFWS, 2020) and through adherence to a project-specific agency approved translocation plan." Please see our comments above on the EA under "Heat Island Effects," "Translocation of Desert Tortoises," and on the HCP under "Page 18, Translocation Recipient Sites."

Page 31, Incidental Take: "Take has potential to occur in the forms of capturing and unintentionally killing or wounding MDT." As presented above, we disagree with this statement and believe that harm will also be a form of take that occurs during implementation of the HCP. Please see our comments on the EA under "Enhancement of Mitigation Lands," "Heat Island Effects," "Desert Tortoises, Environmental Consequences," and on the HCP under Page 28, "Impacts Associated with Solar Facility Construction" for more information on sources of harm from Project implementation.

Page 32, Total Requested Incidental Take: The number of tortoises requested for incidental take under the ITP does not reflect the additional sources of impacts of the take described above in our comment letter. Please revise this number using this additional information.

Pages 32 – 33, Biological Goals and Objectives: The HCP Handbook also says that "Objectives need to be:

- Specific
- Measurable
- Achievable
- Result-oriented
- Time-fixed"

The objectives of Goal 3 of the HCP include:

Objective 1: Preservation and management of mitigation lands acquired within the Western Mojave Recovery Unit comparable in quality and size to the habitat being impacted by the proposed action.

Objective 2: Translocate MDT from the permit area to conserved lands adjacent to the property and within suitable habitat for this species.

Please revise the objectives in Table 3 to comply with these requirements in the HCP Handbook. In addition, please ensure that mitigation lands acquired follow the principles of reserve design that the USFWS described (1994) – See our comments on the EA under Enhancement of Mitigation Lands.

In addition, please revise Table 3 to include the information on Heat Island Effects and Translocation to show that for Goal 3: Mitigate, to the maximum extent practicable, the effects of the proposed action and incidental take of MDT during construction, O&M, and decommissioning, this goal is not being met because the habitat being impacted by the proposed Project is larger than the Project footprint. The translocation lands would be subject to heat island effects during operation of the Project making them unlikely to be suitable habitat to support tortoises. Heat island effects may impact the mitigation land as well. Thus, the Applicant is not fully offsetting the impacts of the taking that would likely result from implementation of the proposed Project. Because these impacts of the taking were not included in the analysis of impacts in the HCP and EA, the Applicant is no longer fully offsetting the impacts of the taking. The Applicant has not demonstrated that they are mitigating impacts to the maximum extent practicable. Please revise the HCP and Final EA to include the additional impacts of the taking described herein and revise the mitigation to show that the Applicant would fully offset the impacts of the taking or demonstrate the impracticability of providing additional mitigation.

Page 34, Effectiveness Monitoring: This section does not discuss monitoring the effectiveness of the translocation. Please add information to the HCP. It is a measure to minimize mortality and injury to the tortoise and part of the conservation strategy.

“Within 18 months of permit issuance, the applicant will provide mitigation to cover the 595.4 acres disturbed by the project. The mitigation will involve the preservation of 595.4 acres of MDT habitat either through permittee responsible mitigation and/or purchase of credits from a conservation bank approved by USFWS.” Please see our comments above on page 22, DT-9 Offsite Compensatory Mitigation and page 19, Mitigation Lands.

Page 34, Adaptive Management Strategy: “[T]he implementation and effectiveness of minimization measures will be monitored by the designated ABs and FCRs.” The adaptive management strategy and its implementation also apply to the mitigation. Please add this requirement to the HCP.

Page 36, Listing of a New Species or Designation of New Critical Habitat: “The applicant and USFWS will coordinate to determine if consultation is necessary if a newly-listed species that is not covered by this HCP, but that may be affected by covered activities, becomes a candidate for listing, is proposed for listing, or is listed under the ESA during the permit term.” Although an ITP has not been issued and this is a draft HCP, the USFWS recently proposed to list the Monarch butterfly as threatened with critical habitat. In addition, the USFWS recently issued a positive 90-day finding on the Mohave ground squirrel. Please explain in the HCP how these two events are being addressed with the Applicant in this draft HCP.

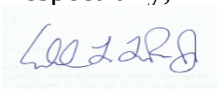
Pages 39 & 40, Security Deposit: We found the wording in this section to be unclear and inconsistent with the wording used earlier in the HCP. For example, "If a security deposit is provided . . ." is stated by the Applicant. However, we were unable to find this term used anywhere else in the HCP. A deposit usually means that less than the full cost of goods or services is paid. Consequently, the Applicant should not be paying a security deposit but paying the full cost of the minimization and mitigation as their financial assurance.

"Overnight Solar or an approved third-party entity must complete the required [mitigation] actions no later than 18 months after permit issuance." Please see our comments on the EA under "Enhancement of Mitigation Lands," "Mitigation for Incidental Take of Desert Tortoises," and on the HCP under page 19, "Mitigation Lands."

We appreciate this opportunity to provide the above comments and trust they will help protect tortoises and Mohave ground squirrels during any resulting authorized activities. Herein, we reiterate that the DTC, DTPC, and MGSCC want to be identified as an Affected Interest for this and all other projects funded, authorized, or carried out by the BLM that may affect desert tortoises and Mohave ground squirrels, and that any subsequent environmental documentation for this project is provided to us at the contact information listed above. Additionally, we request that you notify the DTC (eac@deserttortoise.org) and DTPC (roger.dale@tortoise-tracks.org) of any future proposed projects that the USFWS may authorize, fund, or carry out in the range of the desert tortoise in California.

Please 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.
DTC/MGSCC, Ecosystems Advisory Committee, Chairperson

Roger Dale
DTPC, President

Attachment A: Common Raven Predation on the Desert Tortoise – November 2010
Attachment B: Demographic Status and Trend of the Mojave Desert Tortoise including the Western Mojave Recovery Unit

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Attachment A: Common Raven Predation on the Desert Tortoise
November 2010

Summary:
Over the past few decades, common raven (*Corvus corax*; raven) populations have increased substantially and its distribution has expanded in the California desert, primarily in response to human-provided subsidies of food, water, and nest sites associated with a variety of land uses. Ravens are a known predator of the desert tortoise (*Gopherus agassizii*), a species listed as threatened under the federal Endangered Species Act (ESA) and the California ESA (CESA). A large number projects are currently proposed in the California deserts within the range of the desert tortoise. Due to the locations of these projects, associated infrastructure, and the increase in human activities that will occur if these projects are approved, a corresponding increase in raven presence and predation on desert tortoises is anticipated throughout the region. The direct, indirect, and cumulative impacts from these projects throughout the range of the desert tortoise have been and will continue to be substantial. As discussed below, conservation efforts at both the project and regional level will be required to address impacts to the desert tortoise from an increase in raven populations throughout the desert.

Offsetting Direct Impacts from Development Projects:
The Bureau of Land Management (BLM) addresses the increase of ravens and associated issues in each of the amendments to the California Desert Conservation Area Plan (CDCA). The CDCA plan amendments established that all new projects with the potential to increase raven populations would be required to implement mitigation measures to reduce or eliminate the opportunity for proliferation of ravens. The BLM's biological assessments and the U.S. Fish, and Wildlife Service's (USFWS) biological opinions for the CDCA plan amendments reiterate the need to address this species and its potential impacts on desert tortoise populations.

Pursuant to CESA, the California Department of Fish and Game (CDFG) issues incidental take permits for projects that may affect desert tortoises and their habitats. Permit conditions include mitigation measures designed to offset project impacts and typically require the development of a raven control plan and implementation of off-site measures to reduce the indirect and cumulative environmental effects of increased raven predation.

To address project-specific impacts on desert tortoises from ravens that may be attracted to project sites and associated features, (e.g., buildings, fences, and transmission lines, etc.), the Applicant should design their project to exclude ravens to the maximum extent practicable and implement measures to reduce raven predation on the desert tortoises at the local level. The Applicant should develop an on-site raven management plan to eliminate and/or minimize the availability of subsidies and the potential for ravens to occupy the project site during all phases of development and use, including construction, operation, and maintenance, and decommissioning. The USFWS developed a project-specific raven management plan template, which is provided in Appendix A of Attachment B. However, because it is not possible to completely exclude ravens from using project infrastructure (e.g., buildings, fences, solar structures, transmission lines and towers, etc.) as nesting, perching, and roosting substrates (during breeding as well as non-breeding seasons), a regional raven management plan was developed. Contributions to and implementation of the regional plan are intended to address the indirect and cumulative impacts associated with development projects and other land uses in the desert that facilitate the expansion of raven populations into desert tortoise habitats.

Offsetting Indirect and Cumulative Impacts from Development Projects:
To address the impacts from ravens on desert tortoises and their habitats, the USFWS together with several cooperating agencies, including the BLM, National Park Service, Department of Defense, and the Department of Agriculture completed an environmental assessment for the implementation of a regional plan to reduce predation by the common raven on the federally threatened desert tortoise in the California desert (Raven EA; USFWS *et al*. 2008). This document was prepared because the raven is a known predator of the desert tortoise and the Desert Tortoise (Mojave population) Recovery Plan identifies reducing predation on the species as an important recovery task.

The Raven EA outlines a large scale, adaptively managed program that is expected to be implemented in a phased approach in collaboration with the cooperating agencies and local partners. The plan includes five primary actions:

1) Reduction of human provided subsidies (i.e., food, water, sheltering and nesting sites, etc.)
2) Education and outreach
3) Raven nest removal
4) Raven removal
5) Evaluation of effectiveness and adaptive management

The latter three activities are accomplished first through the identification of offending ravens by surveyors (who also can remove nests) and then reporting those birds to the Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services (WS) who are contracted to remove the offending individuals. Offending ravens are birds that are known to prey on desert tortoises as determined by survey results. Effectiveness monitoring is incorporated into subsequent years of the survey effort; therefore, the survey effort should remain consistent or increase but should not decrease. After the first 3 years of implementation, removal may increase to include additional (i.e., non-breeding) ravens depending on the results of monitoring.

The Raven EA identifies three levels of effort pertaining to lethal removal of ravens, which can be increased or decreased following the third and sixth year of implementation based on monitoring results. Thus, the level of effort for this component will/could change every 3 years and reach a maximum level at year 6 (these are represented by levels 1-3 below). In addition, there is an understanding among agencies (e.g., BLM, CDFG, and USFWS) that every component of the plan may not be implemented each year. For example, an education and outreach program from one year may not need to be repeated annually.

To assess the potential cost to implement the regional raven management plan, the USFWS evaluated three primary aspects of the plan identified in the Raven EA [removal (conducted by WS), outreach and education, and monitoring surveys]. The following outlines the assumptions and cost estimates used to develop the budget outline:

- Removal: In 2010, a single year-round WS employee costs approximately $92,000. For the first 3 years of the plan, if seasonal workers were utilized only during raven breeding season, this cost would be reduced. In 2009, $30,000 covered one WS staff for approximately 2.5 months, including training. We anticipate that survey and removal efforts would be divided amongst the three desert tortoise recovery units in the California Desert. Assuming that the optimum use of a WS employee would be one per recovery unit, a minimum of three people is needed at the lowest level of effort (approximately $40,000/WS personnel during the breeding season). After 3 years, removal efforts would no longer be limited to raven breeding season, necessitating year-round personnel. We estimated that maximum effort would require no more than two WS staff per recovery unit.

- Outreach and education position: Outreach and education is an important component of the plan. Currently, the assumption is that two people can effectively implement the education and outreach program for the Raven EA. A base annual salary for a GS-11 position within the region is approximately $64,000. Education and outreach would also benefit from media support including pamphlets and radio and television broadcasts, which would increase the costs to administer this component of the plan.
- Monitoring survey team: The effort, and therefore cost, of the monitoring survey team is dependent on the level of implementation of the plan. Effectiveness monitoring is essential in determining the success of the plan, and whether additional efforts will be needed. The three levels of survey effort considered below are compatible with the three increasing levels of raven removal effort.

The table below estimates the annual cost of these activities at each of the three levels of implementation described in the Raven EA, beginning with level 1.

Table 1. Annual budget estimates for implementation of the Raven EA.

Primary Activities in the Raven EA	**Level 1**	**Level 2**	**Level 3**
Removal Staff	120,000	276,000	552,000
Outreach	128,000	128,000	128,000
Monitoring Survey Team	280,000	1,000,000	4,381,745
TOTAL	**$1,068,000**	**$1,404,000**	**$5,061,754**

In addition, there is a multitude of additional activities identified in the Raven EA that could be conducted in the desert to facilitate the reduction of raven subsidies. These include identification and cleanup of illegal dump sites, surveys of communities to identify business that do not adequately control their waste, and surveys of landfills and transfer stations. Depending on the required level of implementation necessary for effectiveness, funds to conduct these other activities may be available.

Calculating Project-Specific Contributions to the Regional Raven Management Plan:

As stated above, implementation of the regional raven management plan is necessary to address the indirect and cumulative impacts of development projects. Given the potential for ravens to use a variety of human-provided structures and sites for foraging, nesting, and shelter and because it is not possible to completely exclude ravens from using project infrastructure, which can extend across thousands of acres for each project; it is appropriate to calculate the contribution of each project to the regional raven management plan based on the total area required for the development of the facility and associated components. These funds would be used to carry out the primary actions described above.

With the assistance of the National Fish and Wildlife Foundation (NFWF), who will be holding and managing the funds to implement the regional raven management plan, the USFWS and CDFG calculated the equitable contribution for development projects that are expected to increase raven presence and predation on the desert tortoise. This was accomplished by utilizing modeling tools to determine a per-acre contribution for projects with permit terms of 20 or 30 years.

First, we estimated the developable (contributing) acreage within the implementation area of the Raven EA by reviewing state, federal, and county planning documents. Lands allocated for conservation or with otherwise "protected status", such as Department of Defense installations, congressionally designated Wilderness Areas, National Park Service units, State Parks, and lands managed by CDFG were excluded from developable acreage. For determining developable acreage on BLM lands, we included all of the current right-of-way applications for solar and wind projects, and assumed that no more than 1% of the Desert Wildlife Management Areas (DWMAs) would be developed pursuant to the CDCA plan and associated amendments (Table 2).

Table 2. Total estimated acres of potential development within the range of the desert tortoise in California.

Land Use Category	**Acreage**
Potentially developable acres in CDCA (desert tortoise habitat modeled .2-1, Nussear 2009)	2,453,600
1% of DWMAs	42,232
Solar project applications	450,000
Wind project applications	569,000
TOTAL	**3,514,832**

Since not all of these acres will actually be developed, we assumed that 35% of the total acreage in Table 2, or 1,230,191 acres, would be developed over the next 30 years. Then, based on the figures in Table 1, NFWF performed the following calculations: Since not all of these acres will actually be developed, we assumed that 35% of the total acreage in Table 2, or 1,230,191 acres, would be developed over the next 30 years. Then, based on the figures in Table 1, NFWF performed the following calculations:

- Calculated the year-by-year costs of raven removal, outreach, and survey activities;
- inflated those costs over the 20- or 30-year period for inflation, which was assumed at 3%;
- discounted the inflated cost stream to a "net present value" using an expected rate of return net of administrative/financial fees and expenses (analyzed discount rates of 2%, 3%, 4%, and 5%); and
- divided the net present value by the developable/contributing acreage of 1,230,191.

The resulting "per-acre" charge is what a developer would pay up-front in a single lump sum for its contribution to the regional raven management plan, with this charge being multiplied by the number of acres used or impacted by a project to arrive at the total payment amount for that project.

The various discount rates (2%, 3%, 4%, and 5%) are intended to reflect what net investment return might be earned on the mitigation funds as they await disbursement. The term "net" here refers to investment return after assessing the NFWF's administrative fees and financial institution investment advisory fees (likely to be roughly 3% in the aggregate). The USFWS, in consultation with the CDFG, determined a 3% discount rate would be appropriate for this type of program, based on an estimated 20 to 30 year implementation period. Table 3 below provides the resulting cost per acre contribution for development projects with permit terms of 20 and 30 years. If approvals are granted to extend the term of a project past the initial permit term (i.e., 20 or 30 years), the applicable state and/or federal agencies will re-evaluate the level of implementation of the regional raven management plan and assess whether the project is responsible for contributing additional funds to the account.

Table 3. Per-acre contribution for the implementation of the regional raven management plan.

Permitted Duration of Project	Per-acre Contribution
20 years	$ 64.00
30 years	$120.00

For energy-related projects that require transmission lines (including associated towers and substations) that are expected to remain in place in perpetuity to support the project, the contribution to the regional raven management plan will be $105 per acre impacted. The total contribution for a transmission line and its associated components will be determined according to the following acreages and formula:

Total contribution for transmission line and components = (1 + 2) x $105.00

1= # acres impacted by all associated substations

2= # acres impacted by the transmission line (determined by multiplying the width of the widest tower pad (acres) by the length of the transmission line)

Projects within and near currently occupied desert tortoise habitat or suitable desert tortoise habitat would contribute to the implementation of the regional raven management plan at the amounts specified above. Based on the methodology used for calculating the contribution, the total amount would be paid in full as part of the overall mitigation for the project. However, for projects that will be built in phases, the per-acre contribution may be paid as each phase is approved for construction pending agency agreement. For projects being mitigated through the NFWF program, the schedule of payments would be dictated by the terms of that program.

The total contributions for development projects within the California deserts will facilitate the ability for the resource and land management agencies to fully implement the actions identified in the regional raven management plan. Managing raven populations will play an important role in furthering the recovery of the desert tortoise.

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Appendix A. Common Raven (*Corvus corax*) Management Plan Template

(for all development projects within the range of the Mojave population of the desert tortoise)

Introduction

The purpose of the project-specific management plan is to address direct impacts to desert tortoises by eliminating and minimizing subsidies to the maximum extent practicable that are known to attract and be exploited by common ravens (ravens) during project construction, operation and maintenance, and decommissioning (i.e., removal of project facilities and infrastructure, reclamation of access roads, restoration of native vegetation). To address the indirect and cumulative effects of the project, the Applicant would participate in the regional raven management plan either through monetary or in-kind contributions coordinated by the Raven Management Work Group, and working group formed by the Desert Managers Group.

The project-specific management plan should be implemented throughout the life of the project and include management strategies to control and limit raven abundance in and around the project area. In situations where subsides such as structures for perching cannot be eliminated (i.e., power lines and towers) the Applicant will implement best management practices (BMPs) such as, reduction of available subsidies, raven monitoring, and raven nest removal. The project-specific plan is designed to avoid and minimize direct impacts resulting from the proposed project.

Potential subsidies to be considered for each project include but are not limited to:

- Availability of water from dust abatement activities, equipment cleaning and maintenance, evaporation and retention ponds, drainage areas or landscaping;
- Potential perching, roosting, or nesting sites;
- Food sources from soil disturbance and road kill (e.g., small mammals, insects, etc.); and
- Food sources and attractants from human and animal food and waste.

Plan Development

The project-specific raven management plan should address each of the following elements for each phase of project implementation:

- Identification of project design features and other measures to manage potential introduction of subsidies that may attract ravens to the area, including repellant devices to discourage nesting, perching, and roosting on project facilities such as transmission poles and towers; a refuse management system; a monitoring program; and a list of adaptive management options that would be applied if necessary, including the removal of all raven nests;
- Documentation of the effectiveness of project design features and BMPs;
- Identification of triggers that will prompt implementation of adaptive management procedures; and
- Regular reporting to document raven management measures that have been implemented and results of raven abundance and effectiveness monitoring throughout the life of the project.

The following are examples of elements that should be addressed at each stage of project implementation. This should not be considered a complete list, as there may be other elements that should be considered depending on the project.

Construction

Surface disturbance unearthing food sources

Ponding water

Human and animal food and waste management
Temporary nesting, perching, and roosting sites
Revegetation

Operation and Maintenance

Surface disturbance unearthing food sources
Ponding water
Human and animal food and waste management
Temporary and permanent nesting, perching, and roosting sites
Evaporation ponds
Landscaping

Decommissioning

Surface disturbance unearthing food sources
Ponding water
Human and animal food and waste management
Temporary and permanent nesting, perching, and roosting sites
Landscaping
Restoration, revegetation, and/or reclamation activities

Plan Implementation/Monitoring

Implementation and effectiveness monitoring of on-site efforts are critical to the understanding of the success and value of raven management activities. At a minimum, the plan should identify, address, and implement the following activities:

Construction

The project site should be monitored to ensure BMP compliance and document any raven use. The monitoring protocol should be rigorous enough to detect raven use. If a component of construction is identified as providing subsidies or attracting ravens, immediate steps should be taken to address the subsidies through an adaptive management program.

Operation

Raven nest removal should be conducted on all property structures for the life of the project. In the event that a nest is located with eggs, the nest will be removed following the completion of the nesting cycle unless, current implementation standards of the regional raven management plan allow for immediate removal. A raven abundance monitoring plan should be developed to verify the effectiveness of the BMPs and evaluate the need for adaptive management. The frequency and intensity of the monitoring plan will be related to the number of potential subsidies and the size of the proposed project. Monitoring stations will in most cases be associated with structures or elements where BMPs have been utilized or potential raven attractants are expected.

Decommissioning

The project site should be monitored to ensure BMP compliance and document any raven use. The monitoring protocol should be rigorous enough to detect raven use. If a component of decommissioning is identified as providing subsidies or attracting ravens, immediate steps should be taken to address the subsidies through an adaptive management program.

Adaptive Management

The Applicant should identify and describe adaptive management practices as they will be used to ensure effectiveness of accomplishing the purpose of the raven management plan. Project specific triggers will be established through coordination with the agencies. Lethal removal of ravens will only be utilized under special circumstance and will be commensurate with the level of implementation of the regional raven management plan.

Education

This component should outline worker education, at all phases of development, as it pertains to avoiding and reducing subsidies for ravens and to promoting desert tortoise awareness. It should address continued education for long-term employees and users of the site (i.e., customers, etc.).

Attachment B. Demographic Status and Trend of the Mojave Desert Tortoise including the Western Mojave Recovery Unit

Status of the Population of the Mojave Desert Tortoise: The Council provides the following information for resource and land management agencies so that these data may be included and analyzed in their project and land management documents and aid them in making management decisions that affect the Mojave desert tortoise (tortoise).

There are 17 populations of Mojave desert tortoise described below that occur in Critical Habitat Units (CHUs) and Tortoise Conservation Areas (TCAs); 14 are on lands managed by the BLM; 8 of these are in the California Desert Conservation Area (CDCA).

As the primary land management entity in the range of the Mojave desert tortoise, the Bureau of Land Management's (BLM's) implementation of a conservation strategy for the Mojave desert tortoise in the CDCA through implementation of its Resource Management Plan and Amendments through 2014 has resulted in the following changes in the status for the tortoise throughout its range and in California from 2004 to 2014 (**Table 1**, **Table 2**; USFWS 2015, Allison and McLuckie 2018). The Council believes these data show that BLM and others have failed to implement an effective conservation strategy for the Mojave desert tortoise as described in the recovery plan (both USFWS 1994a and 2011), and have contributed to tortoise declines in density and abundance between 2004 to 2014 (**Table 1, Table 2**; USFWS 2015, Allison and McLuckie 2018) with declines or no improvement in population density from 2015 to 2021 (**Table 3**; USFWS 2016, 2018, 2019, 2020, 2022a, 2022b).

Important points from these tables include the following:

Change in Status for the Mojave Desert Tortoise Range-wide
● Ten of 17 populations of the Mojave desert tortoise declined from 2004 to 2014.

● Eleven of 17 populations of the Mojave desert tortoise are below the population viability threshold. These 11 populations represent 89.7 percent of the range-wide habitat in CHUs/TCAs.

Change is Status for the Western Mojave Recovery Unit – California
● This recovery unit had a 51 percent decline in tortoise density and 51 percent decline in tortoise abundance from 2004 to 2014.

● Tortoises in this recovery unit have densities that are below viability.

Change in Status for the Superior-Cronese Tortoise Population in the Western Mojave Recovery Unit.
● The population in this recovery unit experienced declines in densities of 61 percent from 2004 to 2014.
● This population has densities less than needed for population viability (USFWS 1994a).

Table 1. Summary of 10-year trend data for the 5 Recovery Units and 17 CHUs/TCAs for Mojave 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/km^2 and standard errors = SE), and the percent change in population density between 2004 and 2014. Populations below the viable level of 3.9 breeding individuals/km^2 (10 breeding individuals per mi^2) (assumes a 1:1 sex ratio) or showing a decline from 2004 to 2014 are in red.

Recovery Unit: Designated Critical Habitat Unit[1]/Tortoise Conservation Area	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
Range-wide Area of CHUs - TCAs/Range-wide Change in Population Status	**25,678**	**100.00**		**–32.18 decline**

[1] U.S. Fish and Wildlife Service. 1994b. 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.

Table 2. 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%**

Table 3. Summary of data for Agassiz's desert tortoise, *Gopherus agassizii* (=Mojave desert tortoise) from 2004 to 2021 for the 5 Recovery Units and 17 Critical Habitat Units (CHUs)/Tortoise Conservation Areas (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/km^2 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/km^2 (10 breeding individuals per mi^2) (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	2004 density/ km^2	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
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
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	
Rangewide Area of CHUs - TCAs/Rangewide 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.

Change in Status for the Fremont-Kramer Tortoise Population in the Western Mojave Recovery Unit.

● The population in this recovery unit experienced declines in densities of 51 percent from 2004 to 2014

Change in Status for the Mojave Desert Tortoise in California

- Eight of 10 populations of the Mojave desert tortoise in California declined from 29 to 64 percent from 2004 to 2014 with implementation of tortoise conservation measures in the Northern and Eastern Colorado Desert (NECO), Northern and Eastern Mojave Desert (NEMO), and Western Mojave Desert (WEMO) Plans.
- Eight of 10 populations of the Mojave desert tortoise in California are below the population viability threshold. These eight populations represent 87.45 percent of the habitat in California that is in CHU/TCAs.
- The two viable populations of the Mojave desert tortoise in California are declining. If their rates of decline from 2004 to 2014 continue, these two populations will no longer be viable by about 2030.

Change in Status for the Mojave Desert Tortoise on BLM Land in California

- Eight of eight populations of Mojave desert tortoise on lands managed by the BLM in California declined from 2004 to 2014.
- Seven of eight populations of Mojave desert tortoise on lands managed by the BLM in California are no longer viable.

Change in Status for Mojave Desert Tortoise Populations in California that Are Moving toward Meeting Recovery Criteria

- The only population of Mojave desert tortoise in California that is not declining is on land managed by the National Park Service, which has increased 178 percent in 10 years.

Important points to note from the data from 2015 to 2021 in Table 3 are:

Change in Status for the Mojave Desert Tortoise in the Western Mojave Recovery Unit:

- Density of tortoises continues to decline in the Western Mojave Recovery Unit
- Density of tortoises continues to remain below the density needed for population viability from 2015 to 2021

Change in Status for the Mojave Desert Tortoise in the Colorado Desert Recovery Unit:

- The population that had the highest density in this recovery unit had a continuous reduction in density since 2018 and fell substantially in 2021 to the minimum density needed for population viability.

Change in Status for the Mojave Desert Tortoise in the Northeastern Mojave Recovery Unit:

- Two of the three population with densities greater than needed for population viability declined to level below the minimum viability threshold.
- The most recent data from three of the four populations in this recovery unit have densities below the minimum density needed for population viability.
- The population that had the highest density in this recovery unit declined since 2014.

Change in Status for the Mojave Desert Tortoise in the Eastern Mojave Recovery Unit:
- Both populations in this recovery unit have densities below the minimum density needed for population viability.

Change in Status for the Mojave Desert Tortoise in the Upper Virgin River Recovery Unit:
- The one population in this recovery unit is small and appears to have stable densities.

The Endangered Mojave Desert Tortoise: The Council believes that the Mojave desert tortoise meets the definition of an endangered species. In the FESA, Congress defined an "endangered species" as "any species which is in danger of extinction throughout all or a significant portion of its range…" In the California Endangered Species Act (CESA), the California legislature defined an "endangered species" as a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant, which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes (California Fish and Game Code § 2062). Because most of the populations of the Mojave desert tortoise were non-viable in 2014, most are declining, and the threats to the Mojave desert tortoise are numerous and have not been substantially reduced throughout the species' range, the Council believes the Mojave desert tortoise should be designated as an endangered species by the USFWS and California Fish and Game Commission. Despite claims by USFWS (Averill-Murray and Field 2023) that a large number of individuals of a listed species and an increasing population trend in part of the range of the species prohibits it from meeting the definitions of endangered, we are reminded that the tenants of conservation biology include numerous factors when determining population viability. The number of individuals present is one of a myriad of factors (e.g., species distribution and density, survival strategy, sex ratio, recruitment, genetics, threats including climate change, etc.) used to determine population viability. In addition, a review of all the available data does not show an increasing population trend (please see Tables 1 and 3).

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