CACTUS SPRINGS AREA OF CRITICAL ENVIRONMENTAL CONCERN - PROTECTING VALUABLE RESOUCES IN INDIAN SPRINGS VALLEY, NEVADA

A Nomination to the U. S. Bureau of Land Management for Area of Critical Environmental Concern (ACEC) Status, Indian Springs Valley, Nevada

Submitted by Basin and Range Watch and Western Watersheds Project to:

Las Vegas Field Office, Bureau of Land Management 4701 N Torrey Pines Drive Las Vegas, NV, 89130

SUMMARY

This petition nominates public lands Priority One Desert Tortoise Connectivity Habitat in the Indian Springs Valley for status as an Area of Critical Environmental Concern (ACEC). The significant hydrological, biological, and cultural resources of Cactus Spring is also included. These lands are primarily located in Clark County, Nevada and the nomination is approximately 58,000 acres in extent. This nomination describes the significant environmental resources and values of these lands, and the need for special management attention. Based on current knowledge and data, the area highlighted in this nomination has been identified by the Fish and Wildlife Service as the most critical desert tortoise connectivity corridor in Southern Nevada. This connectivity corridor is located within the Indian Springs Valley which connects the Amargosa and Pahrump Valleys on the west and north sides of the Spring Mountains and connects them to the Las Vegas Valley on the east side. The region represents an important high Mojave Desert habitat and contains a variety of important native species found in the region. Mammoth fossils have been found at Cactus Spring.

The area has very low disturbance compared to other Mojave Desert regions and is located within the modeled Least Cost Connectivity Corridor which represents high value contiguous desert tortoise habitat that connects established desert tortoise conservation areas. This high value contiguous habitat maintains genetic and demographic connectivity between wilderness areas, national park lands, wildlife refuges and critical habitats.

Because an Energy Corridor has been established in the area, three large-scale solar energy applications have been submitted for the region so far. These are called Bonanza Solar, South Ridge Solar and Kawich Solar. Two transmission projects are also pending in the area. These are called Greenlink West and Gridliance. Greenlink West would be new and Gridliance is proposing to upgrade an existing 235 kV line. Gen-tie lines are proposed for the solar applications. Innovation Substation exists near Mercury to serve the Department of Energy facilities.

An Area of Critical Environmental Concern would be a long-term solution to maintain the ecological integrity of this connectivity corridor. The BLM established the Ivanpah Area of Critical Environmental Concern in 2014 with a Resource Management Plan Amendment for the Silver State South Solar Project approval in 2014 in the Southern Nevada BLM District and the BLM Southern Nevada District. The ACEC protects 31,857 acres of biological resources including an important connectivity corridor for the desert tortoise.

This proposal to preserve lands in Indian Springs Valley as an Area of Critical Environmental Concern is a response to the recent proposals to build large-scale photovoltaic facilities in the region. EDF Renewables seeks a 5,100 acre Right of Way with 2,500 acres of intensive development for their proposed Bonanza Solar Project just north of Cactus Springs, Nevada. Two other solar application seek to develop an additional 6,545 acre of this location which has high ecological value. This proposal is intended to be an alternative to approval of Right of Way Applications for existing and alternative additional energy proposals.

At this time, 36 acre-feet of water are for sale at Cactus Springs. Future water withdrawal could threaten riparian habitat and surface water. (see 28460 North US Highway 95, Sagle, NV 83860 - Land for Sale - 1,300 +/- Feet of US 95 Frontage - 49.75 +/- Acres (crexi.com))

The Indian Springs Valley contains important examples of rare, diverse botanical and wildlife resources. The Indian Springs Valley contains wilderness values and scenic visual significance. It is located next to protected federally designated conservation areas such as the Desert National Wildlife Refuge and visible from the US Forest Service Mt. Charleston Wilderness area and Spring Mountains National Recreation Area.

Proposed Map

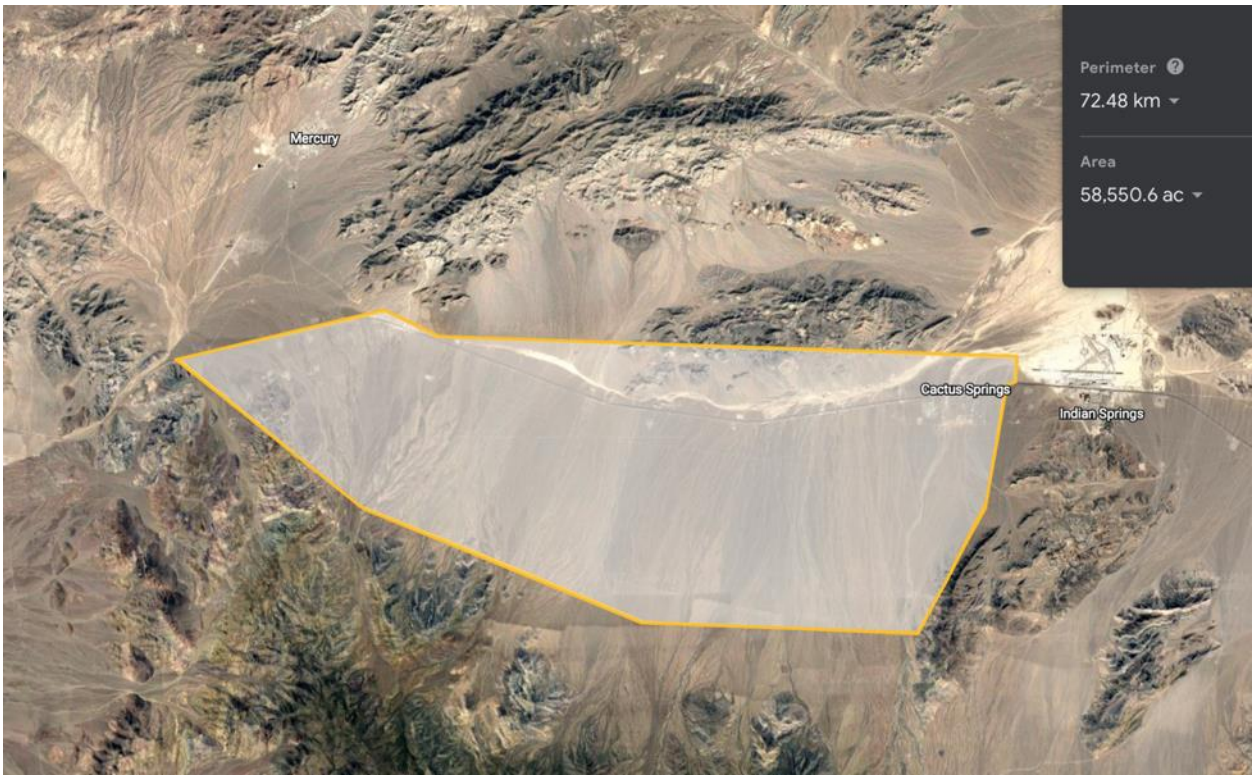

Figure. 1. Approximate proposed ACEC polygon drawn on Google Earth topography layer. The Cactus Springs private parcels should be excluded on this map. Indian Springs areas are also good tortoise connectivity habitat but we are excluding that area of public lands from our ACEC nomination due to high recreational overlap.

This ACEC nomination seeks to preserve the following resources.

Biological Resources of the Surrounding Desert Uplands and Alluvial Fans

Cactus Diversity

The nominated area has a high diversity and density of cactus and yuccas on the long sloping limestone rock alluvial fans sloping off the east side of the Spring Range. These include:

Mojave yucca (*Yucca schidigera*)

Golden cholla (*Cylindropuntia echinocarpa*)

Pencil cholla (*C. ramosissima*)

Beavertail cactus (*Opuntia basilaris*)

Calico cactus (*Echinocereus engelmannii*)

Cottontop cactus (*Echinocactus polycephalus*)

Parish club-cholla (*Grusonia parishii*)

Figure 2. Cactus and yucca diversity on the nominated site: (top left to bottom right) Calico cactus, Mojave yucca and golden cholla, pencil cholla, blooming Mojave yucca, cottontop cactus, beavertail cactus. Photos: Laura Cunningham.

Rare Parish Club-cholla Core Population

The stony alluvial fans south of US 95 in the nomination area hold a core population of Parish club-cholla (*Grusonia parishii*), a mat-forming cactus which may spread more than 3 feet in diameter. The cactus is well-protected with interlocking basally flattened spines to 2.6 inches in length. We encountered dozens of widely scattered individuals on this fan in the creosote-Mojave yucca plant community.

This species has a narrow range from east-central Nye County, Nevada south through the Indian Springs Valley, Pahrump Valley to the southern tip of Nevada, and adjacent California. A small disjunct population occurs in Riverside County, California. This population may be genetically distinct according to botanists we have talked with.

Figure 3. Parish club-cholla plant and detail of stems and spines, on the site of the proposed Bonanza Solar Project.

The loss of this significant population to energy development coupled with cumulative development of other club-cholla populations could lead to conservation organizations petitioning to list the species under the Endangered Species Act.

Figure 4. Range map of Parish club-cholla. From Ingram 2008.

Rare Plants

Utah vine milkweed (*Funastrum utahense*), also called (*Cynanchum utahense*), is present on the area of the proposed ACEC, and we have found flowering populations of this species in 2021 and 2022 after summer rains in two separate populations. This climbing, delicate, spreading milkweed spreads outward and can cover adjacent plants. Leaves are thread-like. The small yellow flowers attract pollinating moths in the evening hours.

This is a rare plant in California (California Rare Plant Rank: 4.2 -- limited distribution, CNDDB Calflora 2022). There are scattered collection records in Nevada from the area around Mercury and Indian Springs from the 1960s, as well as Gold Butte and Mud Spring in Nevada (see https://intermountainbiota.org/portal/collections/list.php?taxa=Cynanchum+utahense&usethes=1&taxontype=2&page=2). More observations center in St. George, Utah. The status of this species in Nevada needs further investigation.

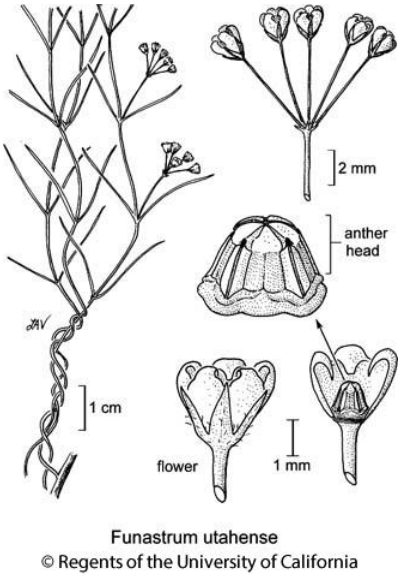

Figure 5. Illustration of Utah vine milkweed. From: https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=81803

Figure 6. ACEC proposed Area: Utah vine milkweed flowering in September 2022, with moths pollinating the small yellow flowers; August 2021 Utah vine milkweed climbing a galleta grass bunch. Photos: Laura Cunningham.

Mojave Desert Tortoise

The proposed ACEC is located in the Eastern Recovery Unit for the Mojave desert tortoise **(***Gopherus agassizii***)** in Indian Springs Valley, Nevada approximately 35 miles northwest of Las Vegas, Nevada, south of U.S. Highway 95 between 3 and 20 miles west of Indian Springs. The location is depicted on the Mercury SE 7.5' U.S. Geological Survey (USGS) Topographic Quadrangle.

The solar developer, EDF, hired the Ironwood Biological Consulting company to survey a 6,834-acre plot including their proposed Bonanza Solar site. They estimate that the desert tortoise density on the site is 1.8 desert tortoises per square mile (1.3 per square kilometer), consistent with population densities throughout the Eastern Recovery Unit. Ironwood also states they found tortoise sign as high as 4,700 feet in elevation and suggests this indicates that demographic and genetic connectivity likely also occurs outside of the corridor depicted in the U.S. Fish and Wildlife Service (USFWS) connectivity model. But Ironwood did not describe the habitat at this elevation and did not estimate a desert tortoise density for this elevation. The desert tortoise preferred elevation range is between 1,000 and 4,000 feet with the highest densities between 2,500 and 3,500 feet (Woodbury and Hardy 1948; Berry 1989).

Tortoises may occur on rocky hillsides and (albeit rarely) at elevations above 1,400 m (Luckenbach 1982), but the highest density populations in the Mojave Desert remain on the bajadas.

Ironwood found 23 live tortoises on their surveys in the Fall months of 2021. That has been one of the more drought-ridden years in history recording record breaking drought.

The 3,000-acre Yellow Pine Solar Project located in the South Pahrump Valley in Nevada is under construction at this time. The applicant moved the desert tortoises during the spring in a record-breaking drought. Their surveys grossly underestimated the desert tortoise density on the site. They predicted that 53 tortoises would be found on the site while 140 were actually found during clearance surveys. They also caused a large die-off because badgers were eating newly moved tortoises, most likely responding to drought conditions. Badgers killed and ate 33 of the moved tortoises.

Drought conditions induced by climate change could make the common practices and methods of desert tortoise translocation obsolete as it will just enable greater mortality from drought and predation.

On the Bonanza Site, historical density was likely higher considering the number of recent carcasses. Recent drought has caused predation on tortoises on this site by badgers and canids.

In 2010, Brightsource Energy publicly stated that only 25 desert tortoises would have to be moved off of the site for the 3,800-acre Ivanpah Solar Electric Generating System. As it turned out, over 150 were found and moved off the project site.

Ironwood's statistical analysis estimates that only 14 tortoises reside on the Bonanza site, but due to the bad timing of surveys and common underestimation of desert tortoise numbers on solar project proposals in the Mojave Desert, this could be a big undercount.

On the Bonanza Site, historical density was likely higher considering the number of recent carcasses. Recent drought has caused predation on tortoises on this site by badgers and canids. This indicates what could happen if the Bonanza Project is approved and biologists are allowed to move so many tortoises.

Ironwood found desert tortoise eggshells on the site indicating that the population is recovering. Population densities could increase in the coming years, but will not be able to do so if the habitat is flattened by industrial machinery for energy projects.

High Quality Habitat is Present

Desert tortoises are most commonly found within the desert scrub vegetation type, primarily in creosote bush scrub. Within these vegetation types, desert tortoises potentially can survive and reproduce where their basic habitat requirements are met. These requirements include a sufficient amount and quality of forage species; shelter sites for protection from predators and environmental extremes; suitable substrates for burrowing, nesting, and overwintering; various plants for shelter; and adequate area for movement, dispersal, and gene flow. Throughout most of the Mojave Desert region, desert tortoises occur most commonly on gently sloping terrain with soils ranging from sandy-gravel and with scattered shrubs, and where there is abundant inter-shrub space for growth of herbaceous plants. Throughout their range, however, desert tortoises can be found in steeper, rockier areas. All of these habitat characteristics are found across the proposed ACEC area.

The Cactus Springs to Mercury valley contains excellent tortoise habitat with diverse upland Mojave Desert shrublands at 3,600 feet elevation on undifferentiated Pleistocene-Holocene dolomite-limestone alluvium. Dominant shrubs by creosote (*Larrea tridentata*), bursage (*Ambrosia dumosa*), cheesebush (*A. salsola*), little-leaved rhatany (*Krameria erecta*), Mojave yucca, Nevada ephedra (*Ephedra nevadensis*), shadscale (*Atriplex confertifolia*), Fremont pepperbush (*Lepidium fremontii*), and many other shrubs. Fluffgrass (*Dasyochloa pulchella*) emerged in August across the alluvial flats after summer rains.

Figure 7. Little leaved rhatany, desert almond, and goldenbush.

Washes harbor luxuriant stands of big galleta grass (*Hilaria rigida*) during rainy summers. Paperbag bush (*Scutellaria mexicana*), desert almond (*Prunus fasciculata*), and Goldenbush (*Encelia* sp.) are also present.

Scattered uncommon honey mesquites (*Prosopis glandulosa*) grow in low washes and valley bottoms within the proposed ACEC boundary, and are concentrated in higher density around Cactus Springs.

Desert tortoise food plants are common here (see Abella et al. 2015). Big galleta grass (*Hilaria rigida,* formerly *Pleuraphis rigida*) is an important desert tortoise forage plant in the Eastern Mojave Desert according to personal communications (L. Cunningham) with Phil Medica. Big galleta grass is common in washes across the Cactus Springs to Mercury alluvial fans and large valley washes between the Spring Range and Spotted Hills, and provides high quality forage habitat for desert tortoise.

For example see Duda and Krzysik 1998:

> …summer thunderstorms initiate a high activity level in tortoises as they actively seek drinking water, and many even initiate mating behavior (Krzysik et al. 1995~). Tortoises may dig shallow depressions in the soil to collect drinking water (Medica et al. 1980). Tortoises even display nocturnal activity levels during summer thunderstorms, but are not known to be nocturnal at other times (P. Medica, personal communication). Following a summer estivation period, tortoises may become active again in the fall depending on the availability of summer annuals (dependent on summer thunderstorms) and the biomass of perennial grasses, especially big galleta grass (*Pleuraphis* [=*Hilaria*] *rigida*).

Figure 8. Big galleta grass in washes after monsoon rains in the proposed ACEC area on the north side of US 95.

Big galleta grass is an important desert tortoise plant food and high quality habitat component (see Esque et al. 2021, Nagy et al. 2020, Wilson and Stager 1992). Big galleta grass is common is this proposed SCEC, compared to other Mojave Desert scrub areas, and connects to a large galleta grass habitat area in the southeastern Amargosa Valley in Nevada. Big galleta grass could be an indicator species as to high-quality desert tortoise habitat in this region, and should be conserved.

Figure 9. Big galleta grass in washes after monsoonal rain events and flash floods. Looking north towards the Spotted Range. September 2022. Photo: Kevin Emmerich.

Figure 10. Big galleta grass in wash on the south side of US 95 in the proposed ACEC area.

Figure 11. Big galleta grass wash next to badland formations on the south side of US 95 within our ACEC nomination area. This photo is within the Kawich Solar Project application area. Photo: Laura Cunningham.

Figure 12. Low elevation valley large wash on the north side of US 95 has summer rain annual native grass sixweeks grama (*Bouteloua barbata*) patches growing with big galleta. This photo is within the Kawich Solar Project application area. This provides excellent desert tortoise forage. Photos: Laura Cunningham.

Spring and late summer-fall annual and perennial forbs are in evidence, and more thorough surveys would reveal a diversity of species. Wire lettuce (*Stephanomeria* sp.) is present on the proposed ACEC site, and this is a high-value forage plant for desert tortoises.

Figure 13. Wire lettuce (*Stephanomeria* sp.), desert marigold (*Baileya multiradiata*) and apricot mallow (*Sphaeralcea ambigua*)—all excellent desert tortoise forage plants, on the proposed ACEC area, September 2022 after summer rains. Photos: Laura Cunningham.

Crucial Desert Tortoise Connectivity Area

Least-cost corridor modeling identified potential habitat linkages between existing conservation areas that have the best chance of sustaining connectivity for desert tortoise populations. To identify these linkages, USFWS began with U.S. Geological Survey's (USGS) Mojave desert tortoise habitat potential model (Nussear et al. 2009), and developed a cost surface where higher habitat potential equaled a lower cost to the desert tortoise. The linkages of least-cost to the desert tortoise between pairs of conservation areas (Beier et al. 2008) represent priority areas for conservation of desert tortoise population connectivity and are characterized as "Priority 1" lands within the context of the SPEIS. (see https://solareis.anl.gov/documents/fpeis/maps/FWS_Connectivity_Explanation.pdf)

The BLM Solar Energy Program Western Solar Plan details protocols for placement of solar projects, including on tortoise connectivity corridors. These are defined as:

> The U.S. Fish and Wildlife Service (USFWS) has identified certain other areas that may be important for desert tortoise connectivity (i.e., priority desert connectivity habitat). Recovering desert tortoises throughout their range requires that conservation areas be connected by habitat linkages in which tortoises reside and reproduce. Such areas will need to be free of large-scale impediments from human activities. The BLM has excluded from the Solar Energy Program approximately 515,000 acres (2,084 km2) of land that coincides with priority desert tortoise connectivity habitat. (see the 2015 guidance at https://blmsolar.anl.gov/variance/process/factors/desert-tortoise/)

Applicants are required to undertake meetings with BLM if their proposals overlap with these tortoise connectivity areas, and undertake tortoise surveys, habitat analyses, connectivity studies, and any mitigation and monitoring measures that maintain and ensure functional connectivity corridors. The BLM Solar Energy Program, however, strongly discourages solar development in high priority connectivity habitat, such as the tortoise habitat that we have identified in this proposed ACEC:

> The BLM and USFWS will discourage applications in the highest priority areas, given the anticipated high conflict, higher survey costs, and high mitigation requirements. (*Id.*)

The BLM Southern Nevada District Office states in its Medium Priority determination worksheet letter for the Bonanza Solar Project that this area is <u>the most critical Desert Tortoise connectivity corridor in southern Nevada:</u>

- This project is located within Priority 1 Desert Tortoise Connectivity Habitat as designated in the Solar PEIS (2012). Based on current knowledge of tortoise connectivity in the Southern Nevada District Office, this project is located within the most critical Desert Tortoise connectivity corridor in southern Nevada. This connectivity corridor is within Indian Springs Valley which connects the Amargosa and Pahrump Valleys on the west side of the Spring Mountains to the Las Vegas Valley on the east side of the Spring Mountains. This project lies within one of the narrowest sections of Priority 1 Desert Tortoise Connectivity Habitat on the north side of the Spring Mountains. This corridor remains one of the most important linkages for recovery of the threatened desert tortoise.
- The project is proposed in relatively undisturbed desert tortoise habitat, located within the modeled least cost corridor, which represents high value contiguous habitat that connects desert tortoise conservation areas. This high value contiguous habitat is important to maintain genetic and demographic connectivity across the landscape between conservation areas (ACEC's, Critical Habitat, Refuges, Wilderness areas). BLM would need to thoroughly analyze potential impacts to the Least Cost Corridor to ensure the project would not be cutting off genetic connectivity of the surrounding tortoise populations.

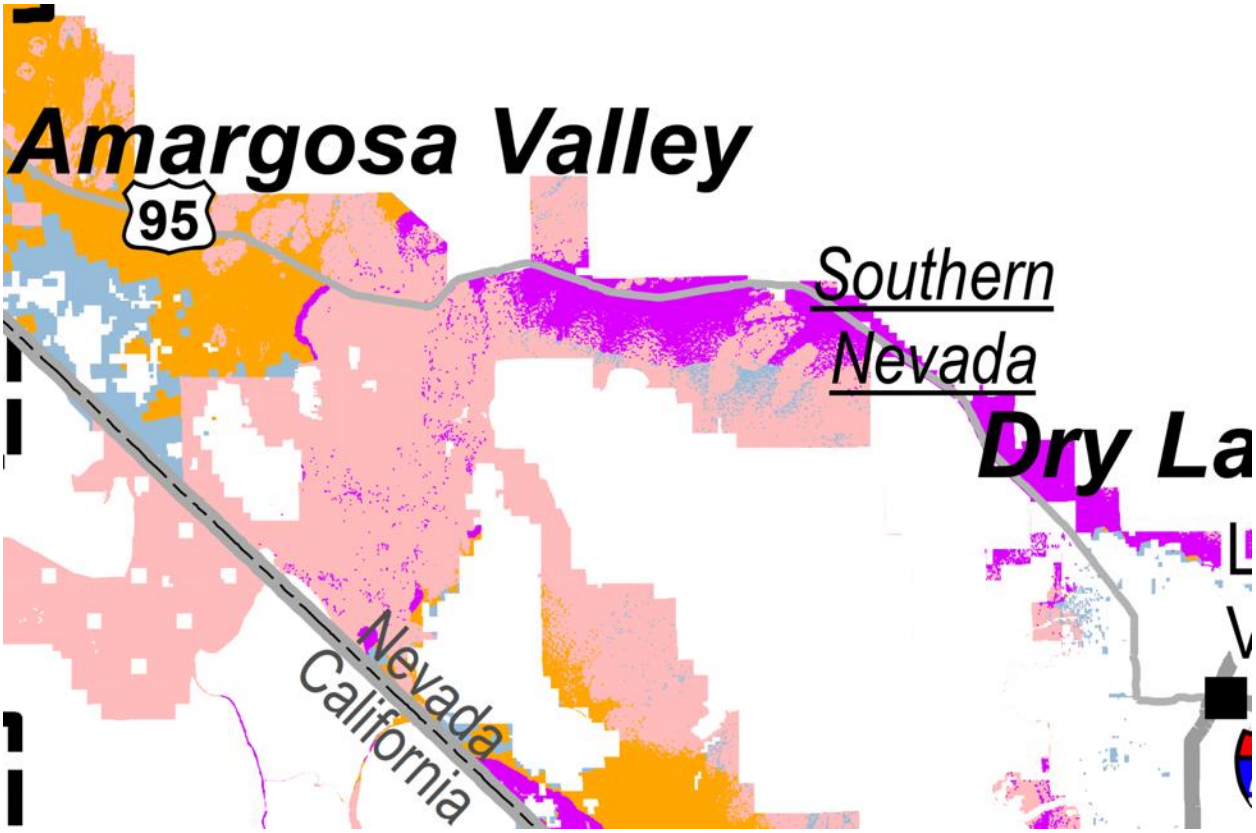

Figure 14. Detail of Priority Desert Tortoise Connectivity Habitat (in purple) identified by the U.S. Fish and Wildlife Service that Overlaps with Variance Lands in the Final Solar Programmatic Environmental Impact Statement. Map Prepared July 2012. (see https://solareis.anl.gov/documents/fpeis/maps/FWS_Desert_Tortoise_Connectivity.pdf)

This particular connectivity area is one of the few in southwestern Nevada, and is of high importance for this part of the recovery unit for Mojave desert tortoise.

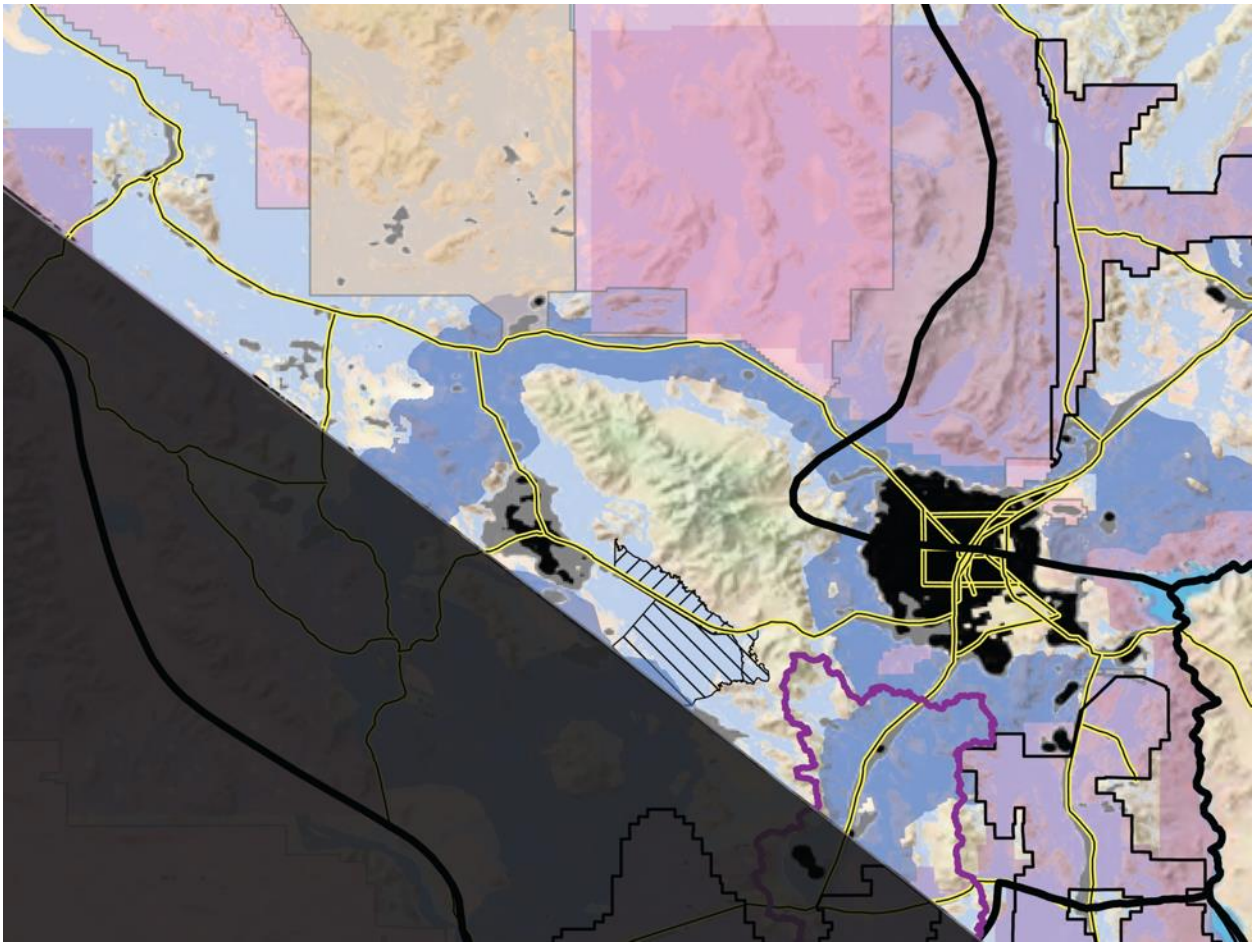

Figure 15. Detail of USFWS linkage model in dark blue through the Indian Springs Valley to Amargosa Valley, Nevada. Averill-Murray et al. (2021).

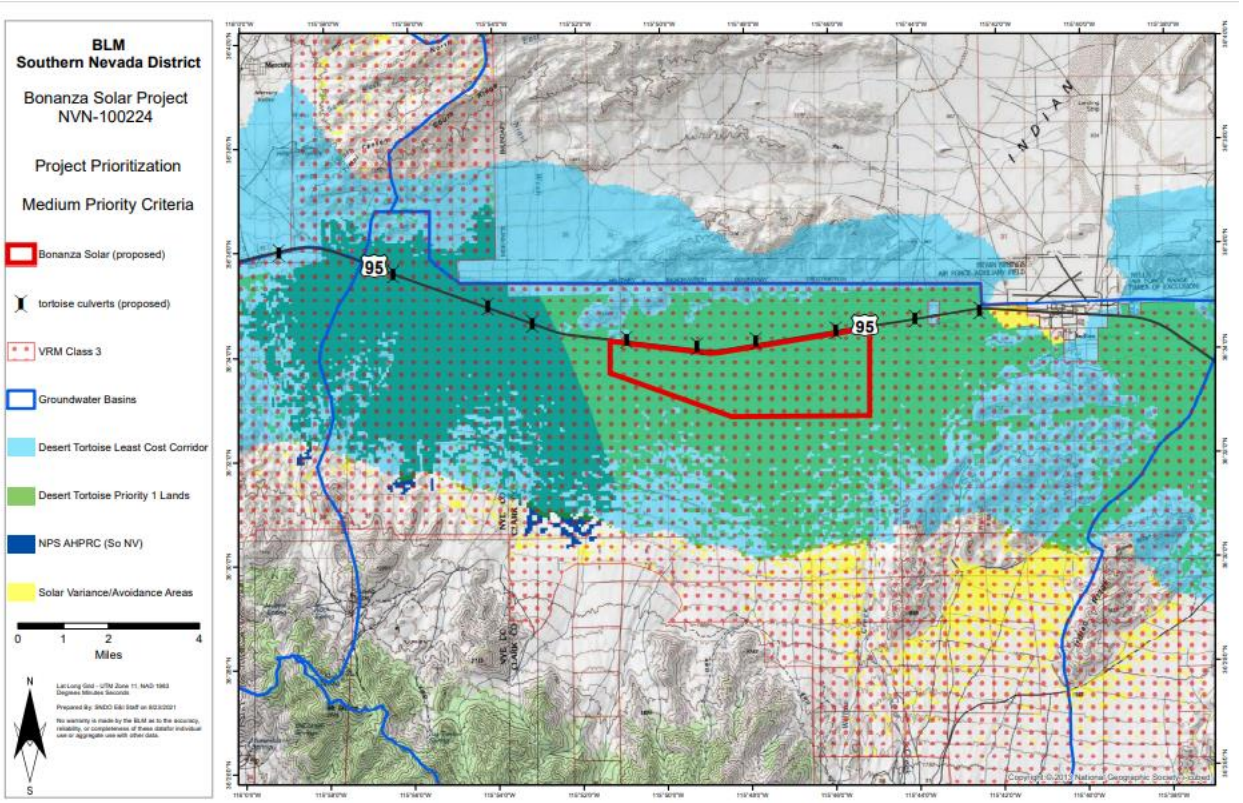

Figure 16. BLM Southern Nevada District map of the proposed Bonanza Solar Project overlapping the heart of the Priority 1 desert tortoise connectivity area.

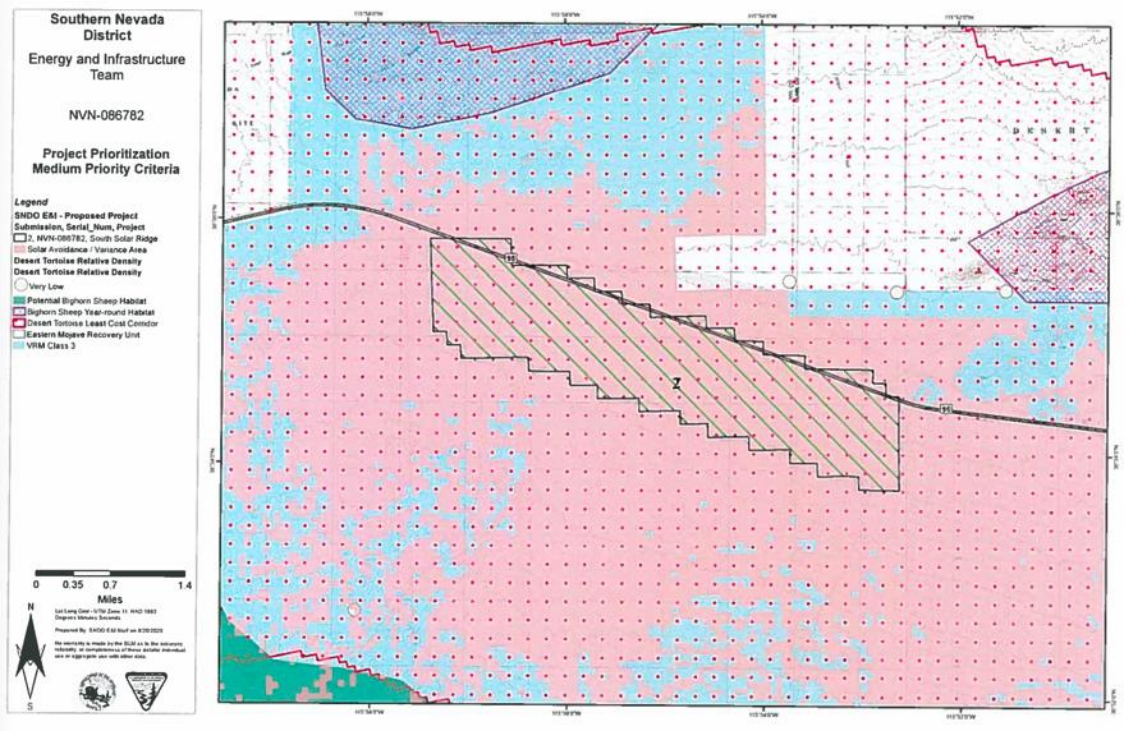

Figure 17. Proposed South Solar Ridge application map in the least cost tortoise corridor.

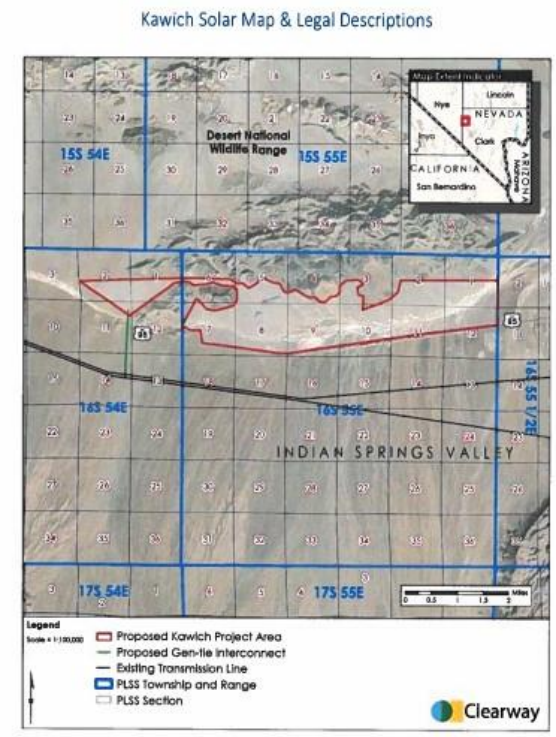

Figure 18. Proposed Kawich Solar Project in the tortoise least cost corridor.

This important connectivity function provided by Indian Springs Valley for desert tortoises cannot be replaced by mitigation measures. The habitat needs to be protected.

The 1994 Desert Tortoise Recovery Plan states that "Large blocks of habitat, containing large populations of the target species, are superior to small blocks of habitat containing small populations."

The Revised Desert Tortoise Recovery Plan (2011) indicates that most of the lands in our Ivanpah ACEC proposal have "high potential" to support desert tortoise populations.

Evidence Culverts are Used by Tortoises but Permeability is Low

The BLM Southern Nevada District Office states in its Medium Priority determination worksheet letter for the Bonanza Solar Project that desert tortoises have been observed in camera traps using the underpass culverts along US 95 that have been designed as tortoise connectivity passages.

This mitigation would be further degraded if solar energy projects were allowed on the north or south sides of the highway. The BLM Southern Nevada District Office states in its Medium Priority determination worksheet letter for the Bonanza Solar Project that this area is the most critical Desert Tortoise connectivity corridor in southern Nevada:

This project is located within Priority 1 Desert Tortoise Connectivity Habitat as designated in the Solar PEIS (2012) and would require substantial coordination with USFWS (including the Regional and Desert Tortoise Recovery Offices) and Nevada Department of Wildlife, and design of a study plan and additional analysis and data collection as part of the Variance Process. Based on current knowledge of tortoise connectivity in the Southern Nevada District Office, this project is located within the most critical Desert Tortoise connectivity corridor in southern Nevada. This project is located within the Eastern Mojave Recovery Unit as established by the USFWS Desert Tortoise Recovery Plan. A suitable translocation area for desert tortoises within the recovery unit would have to be identified if desert tortoises needed to be translocated from the project area. Immediately adjacent to and in the vicinity of the proposed project area, Nevada Department of Transportation (NDOT) has installed tortoise fence and modifications of 9 culverts as part of mitigation intended to preserve the connectivity for the desert tortoise (Biological Opinion number 08ENVS00-2014-F-0209). The multifaceted resource conflicts involving the Desert Tortoise, classified as Threatened by the USFWS and a BLM sensitive species, would involve extensive coordination and consultation.

Yet a study by Harju (2022) found permeability through the 10 box culverts on US 95 to be low. Therefore, more development projects on this habitat would further cumulatively impact this tortoise connectivity habitat. This supports our proposal to protect the maximum amount of this connectivity corridor as an ACEC without fragmentation.

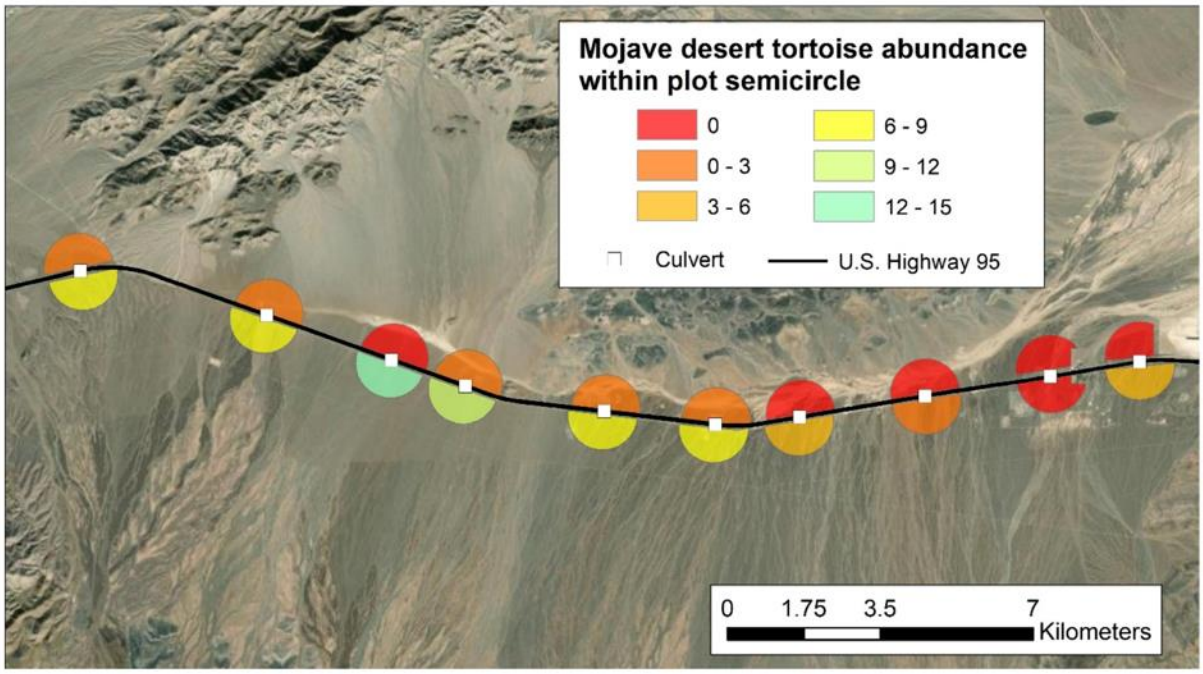

Figure 2. Derived $\widehat{N}$ Mojave desert tortoise abundance estimates for survey plots along U.S. Highway 95, southern Nevada.

Figure 19. Tortoise abundance estimates at box culverts along US 95 in the area of the ACEC nomination, Clark County and Nye County, NV. Harju (2022).

Climate Change Threats to the Tortoise

This Indian Springs-Cactus Springs Valley tortoise connectivity corridor is crucial to aiding the species in adapting to climate change impacts, providing connectivity with higher elevation and more northern habitat areas.

The tortoise population locally has been impacted by the recent drought. Increasing weather extremes exasperated by climate change may bring more droughts to the region. The removal of thousands of acres of

habitat for large-scale solar projects would be an additional cumulative impact. Preservation of large contiguous areas of high-quality tortoise habitat are needed to provide future conservation measures for this declining species.

Drought impacts are described by the recent 2022 tortoise survey report for the proposed Bonanza Solar Project:

> Tortoise density was estimated at 1.8 tortoises/km2, which is slightly above the average density of 1.5 tortoises/km2 in the Eastern Mojave Recovery Unit (USFWS 2020). Historical density was likely higher considering the number of recent carcasses (<1 year old) that were found. Sign of American badger and other canid predation were present across the protocol and focused intuitive survey areas. Recent drought is hypothesized to have contributed to the recent tortoise mortality in the area.
>
> There were 167 desert tortoise carcasses where 66 (49 adult, 17 sub-adult/juvenile) carcasses were estimated at < 1 years old. Desert tortoise scat, tortoise tracks, and pallets were additionally identified during the survey…. (see Ironwood Consulting 2022)

Mojave desert tortoise population is good here: Figures 3, 4, 6, and 7 in Ironwood Consulting (2022) show that there is a healthy, reproductive population of tortoises throughout the proposed site, and that areas to the south seem to support similar numbers of tortoises. The proposed Bonanza Solar Project survey conducted in October 2021 found 19 hatchlings and 76 adults (Appendix D, desert tortoise survey by Ironwood Consulting 2022). Tortoise density was estimated at 1.8 tortoises/km2, which is slightly above the average density of 1.5 tortoises/km2 in the Eastern Mojave Recovery Unit.

Figure 20. Tortoise burrows found in August 2021 on the site of the proposed Bonanza Solar project. On the left, the active burrow showed tortoise tracks, after August rains; on the right, a tortoise burrow in a caliche cliff in a wash. Photos: Laura Cunningham.

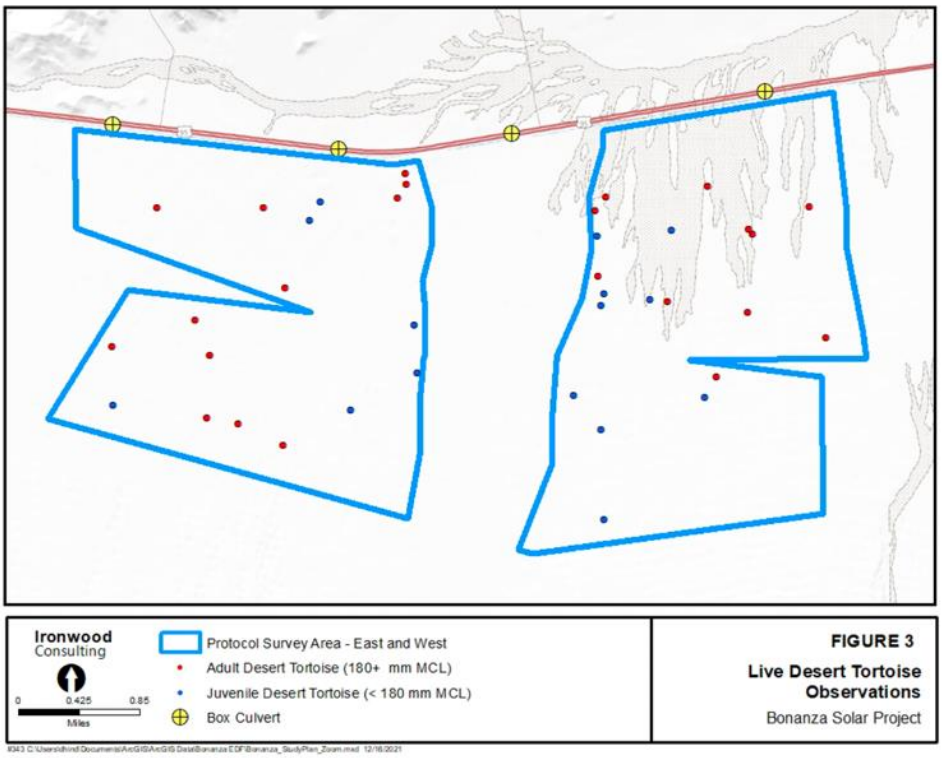

Figure 21. Live desert tortoise observations for Bonanza Solar Project application. Ironwood Consulting (2022).

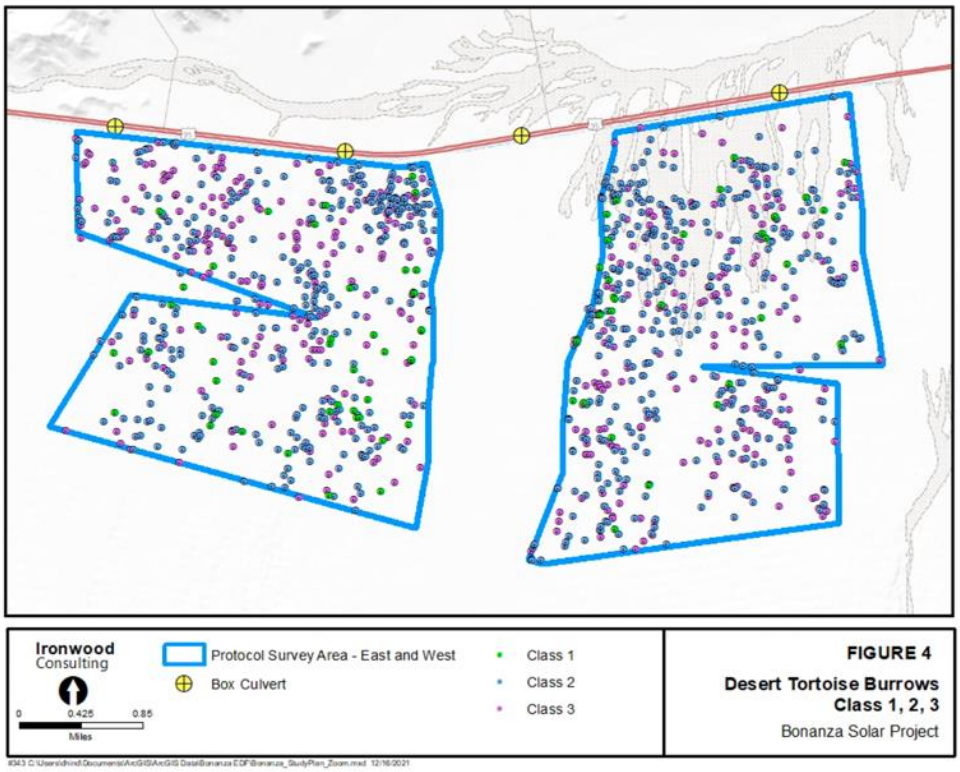

Figure 22. Desert tortoise burrow observations for Bonanza Solar Project application. Ironwood Consulting (2022).

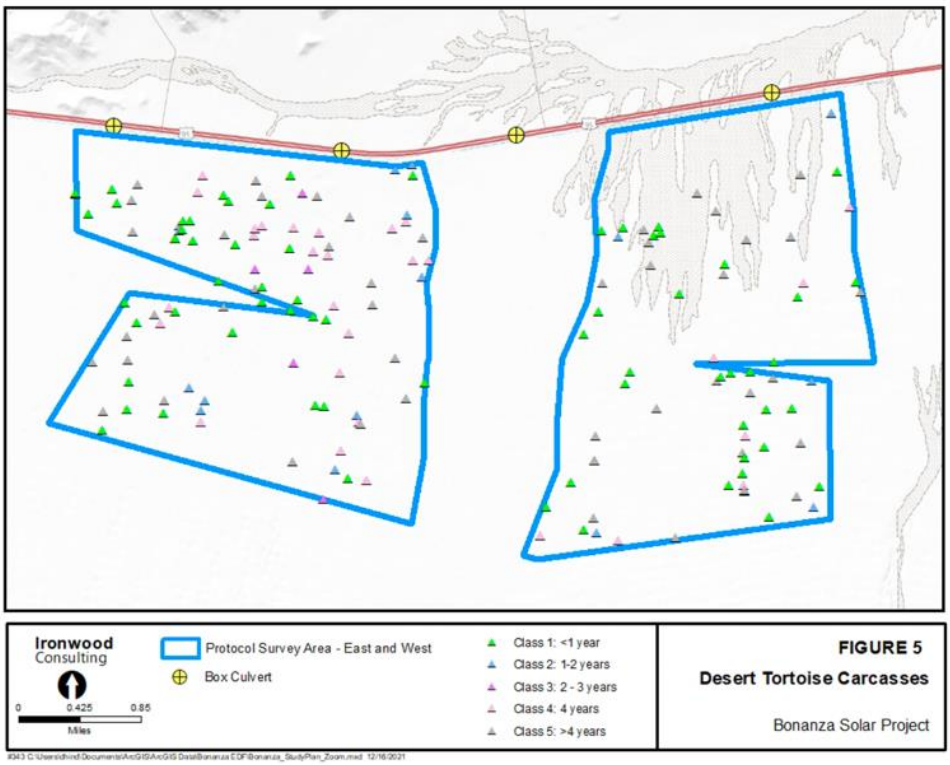

Figure 23. Desert tortoise carcass observations for Bonanza Solar Project application, likely representing recent drought impacts. Ironwood Consulting (2022).

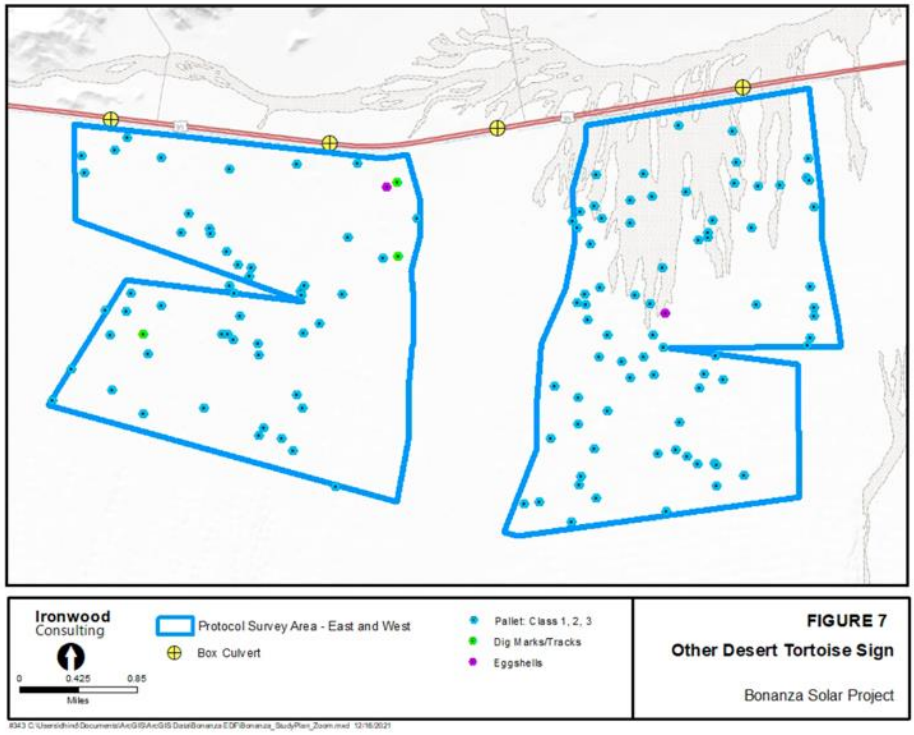

Figure 24. Desert tortoise sign observations, including eggshells, for Bonanza Solar Project application. Ironwood Consulting (2022).

Mojave Desert Tortoise Declines

Mojave desert tortoise abundance between 2004 and 2014 declined 67% in the Eastern recovery Unit (Allison and McLuckie 2018, USFWS 2019)—we support uplisting the species from federally threatened to endangered because of these widespread declines rangewide. An ACEC designation would help conserve relatively undisturbed habitat, connectivity, and populations of tortoise here.

Gila Monster (*Heloderma suspectum cinctum*)

The Gila monster is a fossorial species that is very difficult to locate but may be present in the ACEC nomination area. The valleys of Indian Springs and Cactus Springs to Mercury have a high probability of modeled suitable habitat for Gila monsters:

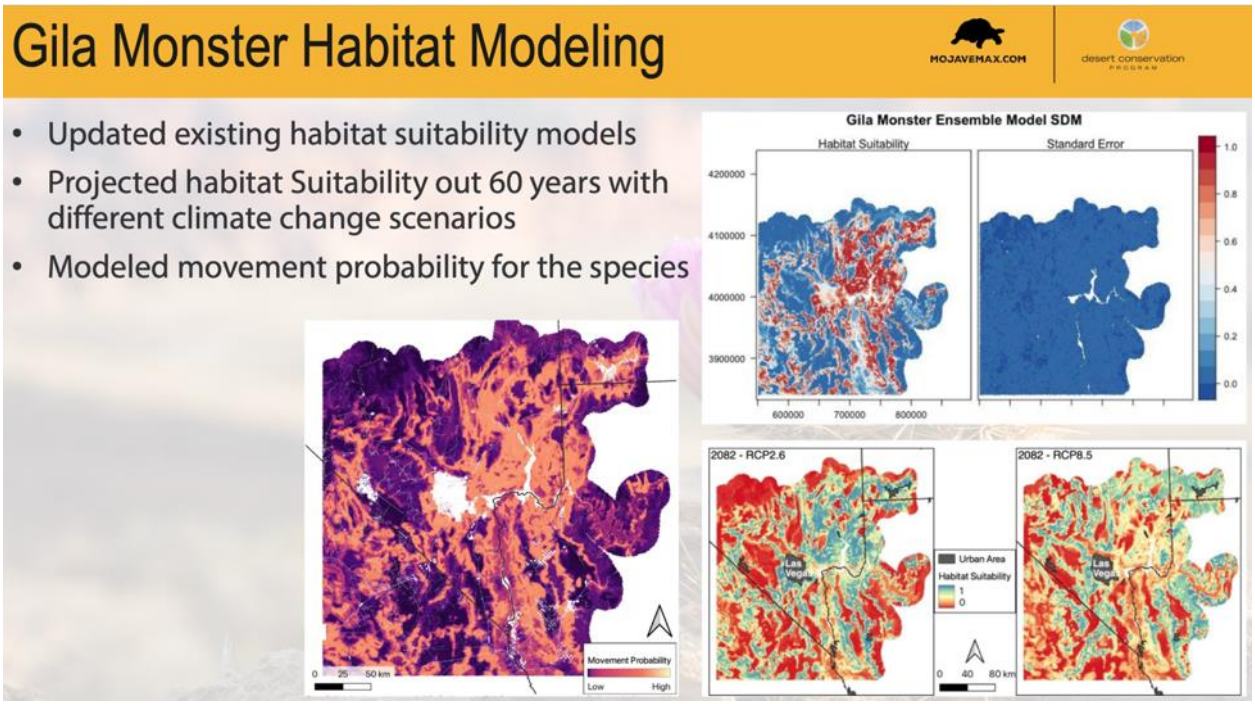

Figure 25. Gila monster habitat modeling in southern Nevada. From Cambrin 2022.

Dr. Daniel Beck of Central Washington University, who is the leading authority on the biology of helodermatid lizards had this to say about surveys:

> "As you know it is extremely difficult to make accurate population estimates of Gila monsters, especially in the Mojave Desert, where they are even less frequently active than in the Sonoran Desert. Some sites in the eastern Mojave desert contain population densities of up to 20 lizards/square mile. I know of sites in southern Nevada that contain fairly high densities as well, perhaps as high as 10-15/square mile (just an estimate). High densities are associated with sites that have relatively high topographical complexity (lots of topographical relief, boulders, burrows, and potential shelters for Gila monsters). Sandy areas bordering rocky outcrops are good habitat areas. I'd advise decision makers not to assume the absence of Gila monsters based on short-term surveys" (Daniel Beck, personal communication 2009).

Populations in this area could carry unique genetic traits that should be conserved.

Figure 26. Genetic diversity of southern Nevada Gila monsters. From Cambrin 2022.

A Biological Monitor on a construction project along US 95 in northern Clark County, NV, reported finding a Gila monster on the ground surface in a creosote flat in this region of Indian Springs-Cactus Springs during a rainstorm (personal comm. With Laura Cunningham 2005).

Spring Resources:

Cactus Springs, at 3,237 feet elevation, is a unique small spring mound with non-flowing surface water on land managed by the BLM, with adjacent private parcels. Historically there were two or more springs.

A dense honey mesquite woodland thrives here with a shallow groundwater table, as well as a stand of Fremont cottonwood (*Populus fremontii*) and fragrant sumac (*Rhus aromatica*). Four-wing saltbush (*Atriplex canescens*) grows densely on lowlands around the spring and spring mounds.

The riparian trees and mesquite thickets [provide a rare stopover for Neotropical migrant birds during spring and fall, including warblers. Phainopepla (*Phainopepla nitens*) are common here, feasting on the berries of mistletoe. Phainopepla is a covered species under the Clark County Multi-Species Habitat Conservation Plan (MSHCP).

Figure 27. Cactus Spring open water with marsh community of wire rush (*Juncus* spp.), goldenrod (*Solidago* sp.), and riparian trees of cottonwood and honey mesquite. Saltbush and creosote surround the spring. Photo: Laura Cunningham.

Figure 28. Old Fremont cottonwood at Cactus Spring. Photo: Laura Cunningham.

Figure 29. Fremont cottonwood, honey mesquite, and for-wing saltbush at Cactus Spring. Photo: Laura Cunningham.

Figure 30. Cactus Springs. Top left to bottom right: mistletoe berries on honey mesquite in winter; fragrant sumac and honey mesquite leaves; four-wing saltbush and honey mesquite; Fremont cottonwood with the Sheep Range in the distance. Photos: Laura Cunningham.

Figure 31. Phainopepla at Cactus Springs. Photo: Kevin Emmerich.

Under the Clark County Multi-Species Habitat Conservation Plan (MSHCP), the Bureau of Land Management agreed to restore mesquite woodlands outside of tortoise critical habitat (BLM 2005):

> Fragmented habitats such as mesquite/acacia woodlands, gypsum badlands, and sand dunes are often the site of intense recreational use and, subsequently, habitat degradation for sensitive species. Mesquite/acacia woodlands provide habitat for 11 MSHCP Covered Species and 5 High Priority Evaluation Species. Threats to mesquite/acacia habitat are dispersed recreation activities, off-highway vehicle (OHV) activities, illegal woodcutting, urbanization, and lowered water tables due to intense ground pumping.
>
> Restoration of these habitats can prevent habitat degradation by decreasing the recurrence of disturbances, speeding up recovery times, and de-fragmenting populations on a small-scale. The degradation of essential upland habitats for covered and/or evaluation species, outside of critical desert tortoise habitat (Section 7 funds), is a priority issue for the Southern Nevada Restoration Team (SNRT). SNRT is a joint effort among the National Park Service, Bureau of Land Management, U.S. Fish and Wildlife Refuges, and U.S. Forest Service. SNRT members cooperate to share and improve restoration techniques and resources such as native, local seed and live plants which were used for this funded project.
>
> …
>
> Goals and Objectives of the Project:
> • _Improve the physical and ecological properties of habitat for MSHCP species by restoring ecological attributes, such as water infiltration, forage production, surface hydrology, vegetative cover, dominant diversity of major vegetation components, and surface crusts; and
> • _Prevent further spread of exotic plant species.

At Cactus Spring, the BLM built a cord fence to limit vehicle access, and 22 honey mesquite saplings were planted in April 2004, as part of this restoration effort. We have found many of these mesquite plantings to have survived and grown into small trees. Solar energy development and concurrent high-voltage transmission development is a large new threat to Cactus Spring since 2005. An ACEC designation would help further fulfill the obligations under the MSHCP of conserving and restoring habitat for covered species, scenic landscapes, and cultural values.

Cultural Resources

Historic Trails Linking Springs

The region is homeland to the Western Shoshone, Southern Paiute, and Chemehuevi peoples and is significant because of the spring mounds and springs scattered on the valley floor: Cactus Spring and Indian Spring. These springs were crucial stopping points in travels across the desert.

During field visits we found what may be remnants of a cultural trail system between springs across the desert of southern Nevada linking Cactus Spring north to Beatty warm springs. An old road or trail located on the south side of US 95 lies in the proposed Bonanza Solar Project application. The trail may be part of an ancient system linking foot travel between Indian and Cactus Springs to the hot springs at Beatty. This requires more study.

Figure 32. Old trail no longer in use, through desert pavement on the site of the proposed Bonanza Solar Project. This trail points towards Cactus Spring. January 2021.

Figure 33. Old trail no longer in use, through desert pavement and bursage-creosote-galleta grass stands, on the site of the proposed Bonanza Solar Project. January 2021.

Figure 34. Old trail no longer in use, through desert pavement, on the site of the proposed Bonanza Solar Project. January 2021. Photo: Kevin Emmerich.

Figure 35. Historic road or trail located on the south side of US 95 in the proposed Bonanza Solar Project application. This trail section heads northwest from Cactus Springs (photo looking southeast towards the Sheep Range). Photo: Laura Cunningham.

Temple of Goddess Spirituality Cultural Landscape

A cultural landscape exists around the Temple of Goddess Spirituality (https://www.sekhmettemple.org), composed of intact Mojave Desert ecosystems and viewscapes that are important in providing a peaceful, natural setting for the temple and its artwork, theaters, trails, and buildings. The desert is a sacred landscape that is part of the temple experience.

From the website:

The project was founded when Genevieve Vaughan purchased land between the Mercury nuclear test site and Creech Air Force Base—threshold land to serve as an outpost of peace, and a promise kept to Sekhmet. In October of 1992 she gave the land back to the Shoshone Nation, marking 500 years for Indigenous survival despite colonialism, and engaged a long-term agreement to steward the land as temple grounds. Built by women in 1993, the temple seeks to model matricentric non-hierarchical leadership, sustainable stewardship, and a return to maternal values.

Paleontological Resources

A mammoth tusk and molar were found at Cactus Springs in 2015, which could be associated with Plio-Pleistocene lakebed formations associated with Tule Springs Fossil Beds National Monument deposits to the south (Woodworth et al. 2016).

Maxey and Jameson (1948) describe Pleistocene lake bed formations in Indian Springs Valley consisting of calcareous, fossiliferous massive silts and clay deposits capped by a thin veneer of alluvium. The highest Ice Age lake was in Indian Springs Valley. Freshwater shell fossils from Corn Creek indicate ephemeral playa lakes and swampy ephemeral pool deposits. Vertebrate fossils have been found associated with these Pleistocene lake bed deposits since the 1940s, and Tule Springs Fossil Beds national Monument was recognized as an important paleontological deposit.

Figure 36. Badlands of Plio-Pleistocene lakebed deposits, found in the proposed area ACEC area north of US 94. Photo: Kevin Emmerich.

Visual Resources

The proposed ACEC viewscape looks upon the scenic Spotted Range and Sheep Range (parts of which are in the Desert National Wildlife Refuge) and the Spring Range, the higher elevations of which are managed by the Humboldt-Toiyabe National Forest.

The area view-shed includes conservation and scenic features like the Mt. Charleston Wilderness Area, The Mt. Stirling Wilderness Area, Bonanza Peak, Cold Creek, the Desert National Wildlife Refuge, the Spotted Range, Cactus Springs and the Goddess Temple.

ACEC Designation and Management

This ACEC could be established through a revision of the Southern Nevada Resource Management Plan (RMP), or an amendment to the RMP for approval of a largescale solar project in Clark County. This ACEC nomination is, however, not meant to be used as mitigation for a utility-scale solar project approval in the area. This ACEC nomination is proposed to conserve a large, intact block of desert tortoise high-quality connectivity habitat, and other resource values.

We understand that the BLM designates ACEC's for both cultural and/or biological resources. Given the information briefly summarized herein, we strongly suggest that the new Cactus Springs Area of Critical Environmental Concern be designated to protect both cultural and biological resources identified herein.

We understand that designation of a new ACEC would require development of an associated ACEC management plan, and that interested parties may provide through both public input and volunteer efforts support of such a planning effort. Herein, we extend our commitment to assist the BLM by all legal means available to help provide further baseline information and future support to complete the new ACEC

management plan. No new large-scale renewable energy projects should occur in this ACEC, and we recommend a 0.5 % disturbance cap on this high-value habitat.

Future growth of southern Nevada population centers of Las Vegas and Indian Springs, Nevada, could bring more urbanization, recreation and off-road vehicles to the site, increasing the potential of take of wild tortoises and illegal release of captive tortoises on the site. Area of Critical Environmental Concern designation and management would help conserve the best contiguous tortoise habitat that is in lands more remote from development centers and high recreational use.

A utility corridor runs through the proposed ACEC valley and fan with existing transmission lines, as well as the small Innovation Substation serving Mercury, NV. This infrastructure is attracting solar energy applications, which are a threat to biological resources of desert tortoise, Parish club-cholla, and cultural resources. We recommend no new energy project applications be accepted in this section of the utility corridor.

Without the added protection provided by the ACEC designation, conflicting uses could lead to declines in the numbers or ranges of rare plant and animal species and compromise important, irreplaceable cultural resources.

An ACEC designation could further fulfill Clark County MSHCP requirements for protection of covered species and their habitats, as solar energy development and urbanization continue to burgeon.

Prudent management prescriptions that may apply to this ACEC include: (1) Exclusion of renewable energy projects, (2) Withdrawal of all lands within the expanded ACEC boundary from mineral entry, (3) Acquisition of private lands from willing sellers and designation of vehicle routes, (4) Botanical surveys for special status plants listed herein and incorporation of conservation measures for the plants and their habitat where new occurrences are identified, and (5) Adoption of other pertinent protection measures as necessary to protect sensitive biological and cultural resources.

Sincerely,

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