

Appendix E: BLM Wildlife Mitigation and Monitoring Plan

Wildlife Mitigation and Monitoring for Crescent Dunes Solar Energy Project

- During construction, all food and trash shall be placed in closed containers. Workers shall not feed wildlife or bring pets to the project site. Road-killed wildlife on the project site shall be reported to the Nevada Department of Wildlife and promptly removed.
- During all project phases, debris should not be allowed to accumulate under heliostat mirrors. Any debris found will be removed and appropriately disposed or recycled.
- At the end of each work day, excavation areas that may trap wildlife should be inspected for wildlife before backfilling. If backfilling is not feasible, all excavations shall be sloped at the ends to provide wildlife escape ramps or covered to completely prevent wildlife access.
- To reduce the likelihood of avian species frequenting horizontal surfaces of electrical components and transmission infrastructure for perching and nesting and to decrease the chances of electrocutions and collisions, transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC) Suggested Practices for Avian Protection on Power Lines (APLIC 2006). Deterrents shall be installed and maintained on horizontal surfaces to deter avian predators to decrease predation risks for the pale kangaroo mouse and dune scarabs present in the vicinity of the solar facility and transmission alignment (Slater and Smith 2008, Prather and Messmer 2010).
- Avian and wildlife mortality monitoring of transmission lines and power poles, at the central receiving tower, and around the solar heliostats shall be conducted under the same frequency guidelines as the monitoring for the evaporation ponds.
- TSE will provide basic training to their onsite workforce to increase awareness of and ability to identify sensitive wildlife species, such as golden eagles. A wildlife reporting system shall be put in place for TSE workforce to record wildlife species, their locations, activities, and use of facilities.
- All ground-disturbing activities will be conducted outside the migratory bird nesting season (March 15 – July 31). If ground-disturbing activities cannot be avoided during this time period, pre-construction nest surveys shall be conducted by a BLM-approved biologist with the following guidelines:
 - Surveys shall cover all potential nesting habitat in and within 300 feet of the area to be disturbed.
 - Surveys must be conducted between sunrise and 3 hours post-sunrise when birds are most active.
 - Surface-disturbing activity must be conducted within 10 days of surveys or additional surveys may be required to “re-clear” the area.

- If active nests are detected, a no-disturbance buffer zone (as determined by USFWS, NDOW, and BLM) will be established. Nest locations shall be mapped and submitted to the BLM as needed.

Evaporation Pond Mitigation

- To discourage all terrestrial wildlife, including small mammals, amphibians, and reptiles from accessing the ponds. Evaporation ponds will be fenced to the below mentioned standards unless the entirety of the project area is fenced to meet those standards.
 - The minimum standard fence around the project area shall be 8 feet high, the bottom 4 feet of which shall be composed of woven or mesh wire not greater than 2-inch mesh on the bottom 2 feet and a maximum of 8-inch mesh on the top. The bottom shall be placed tight to the ground to prevent animals from gaining access under the fence. The remainder of the fence above the woven or mesh wire shall be smooth or barbed wire with a spacing of 10 inches, 12 inches, 12 inches, and 14 inches beginning from the top of the woven or mesh wire. If cyclone or chain-link fence is to be used then the only conditions to be met are the 8-foot height and tight to the ground.
 - Gates shall remain closed when not in use.
 - Monthly inspections of fences shall be required and immediate maintenance must be completed to address any breaches in the fence.
- Ponds will be constructed with interior side slopes of 3:1 (horizontal:vertical) to discourage utilization of the ponds by avian species but to also allow escape ramps for wildlife (T. Kipke, NDOW, personal communication). Pond linings will have textured surfaces to aid wildlife in attaining traction during escape.
- Ponds will be designed and operated to maintain a minimum freeboard of 2 feet at all times.
- Anti-perching devices will be installed around the edge of ponds to prevent birds from accessing the water for drinking.
- Ponds will be surveyed for avian species *at least* once every two weeks starting with the first month of operation of the ponds, and once per week during expected high peak migration months (April – May, August – October). Monitoring at a higher frequency of visitations may also be coordinated with other pond monitoring Tonopah Solar Energy (TSE) may have in place.
 - If after 24 months of visits, no bird or wildlife issues are reported, monitoring may be reduced to monthly visits.
 - If after 12 months of monthly visits, no bird or wildlife deaths have occurred, visits may be reduced to quarterly surveys for one year.
 - After one year of quarterly visits with no wildlife deaths, visits may be reduced to 2 per year during peak migration months.
 - All reductions in survey effort remain contingent on no bird or wildlife deaths occurring. If bird or wildlife deaths occur, monitoring frequency will need to be increased again at a rate to be determined at the time of the incident.

- Surveyors need to be experienced with bird identification and survey techniques. A report of findings should be submitted to TSE, NDOW, and the BLM that includes dates, times, species seen, and activity. If bird mortality is discovered or other anomalies observed, guidance for responding to the situation would be sought from sources such as NDOW's Industrial Artificial Pond Program and/or the U.S. Fish and Wildlife Service.
- Visual deterrents shall be installed at all ponds. These deterrents should initially include suspended milar strips and at least one other visual type, like pyrotechnic-based deterrent (e.g. cracker shells). Evaluation of deterrents will be made during monthly surveys to determine effectiveness and to ensure they are still in working order. Non-functioning deterrents shall be replaced. If deterrents are evaluated as ineffective, alternative efforts and methods to deter birds shall be implemented as necessary to attain effectiveness.
- Water quality at the ponds should be monitored quarterly and should include Profile I parameters, salinity, and total sodium using the methods and standards that meet Nevada Department of Environmental Protection requirements (T. Kipke, NDOW, personal communication).

Golden Eagle Nest Monitoring (Pagel et al. 2010)

- Monitoring of the known golden eagle nest will be required during construction and at least 5 years post-construction.
 - Monitoring can and should be done from the main road.
 - At least 2 observation periods per season shall be completed between March – June. Observation periods will last at least 4 hours, or until nest occupancy can be confirmed. Observation periods will be at least 30 days apart.
 - Surveyors need to be experienced with raptor identification and survey techniques. A report of findings should be submitted to TSE, NDOW, and the BLM that includes dates, times, species seen, activity, etc.

Pale Kangaroo Mouse Habitat Research

In coordination with NDOW, the BLM has considered multiple options to mitigate for the loss of known pale kangaroo mouse habitat. Based on feasibility, effectiveness, and fiscal responsibility, it is the BLM Tonopah Field Office's determination that the most effective mitigation approach would be to establish a fund to further the data needs for supporting management decisions regarding the pale kangaroo mouse.

TSE will provide \$200,000 in funding for a phased study that will provide information to allow the BLM and NDOW to make timely, informed management and land use decisions related to the long-term management and conservation of the pale kangaroo mouse. TSE will place the first year's funding requirement of \$75,000 in a joint TSE/BLM account prior to the execution of the right-of-way grant and temporary use permit. The required funding balance will be paid over the

following 2 years in payments of \$62,500, for a grand total of \$200,000 over 3 years. Each payment will be placed in a joint TSE/BLM account annually to the date of the first payment. Fees incurred in setting up and maintaining this account and all interest accumulated by this account will be the responsibility and property of TSE. All disbursement of funds will be at the discretion of the BLM.

At a minimum, TSE's funding would contribute to the following phases: 1) compile and summarize existing information and data regarding the pale kangaroo mouse such that it can be used to develop methodologies for later habitat mapping, surveying, and sampling distribution; this would result in GIS-usable data, and 2) using information from phase one, conduct surveys to determine habitat needs, distribution, and relative abundance of the pale kangaroo mouse, with study efforts occurring primarily in the Lower Smoky Valley area identified in the EIS. These efforts must tie directly back to data needs for supporting management decisions.

Implementation of the research would need to be conducted by a governmental agency, an accredited college or university, or by a private party with accredited wildlife biologists in the field of small mammal biology. All interested groups must submit a detailed research proposal that includes objectives and research design to address the previously outlined phases and management needs (see *Management Needs* attachment), not academic interests of those submitting proposals. Each proposal will be reviewed by a technical review committee comprised of the BLM, the NDOW, and TSE. The Tonopah Field Office Authorizing Officer will make the final decision on which proposal will be awarded the contract. Subsequent research phases will be identified as data is collected and analyzed and may focus on fine-tuning pale kangaroo mouse distribution and abundance, long-term population monitoring, and genetics analyses. The synthesis of this data collection process will contribute to the BLM and NDOW's evaluation of the taxonomic status of the pale kangaroo mouse, and the rarity of and risk of the species needing further protection through listing under the ESA. Additional resources to contribute to this phased research will also be sought by the BLM and NDOW.

Pale Kangaroo Mouse (*Microdipodops pallidus*) Management Needs

The current state of knowledge regarding this species is sparse (see references). Managers need the information and perspective for making informed decisions in the rapidly changing land-use environment. This is particularly germane to assessing effects from developments with large footprints, such as renewable energy developments. The following outline is the BLM's and NDOW's recommendation for better positioning the agencies in making decisions on future projects that are sited within potential habitat of populations of the pale kangaroo mouse local to the Crescent Dunes Solar Energy Project. Mitigation funds donated by the Crescent Dunes Solar Energy Project would provide keystone funding for initiating the work needed to attain information for the management of the pale kangaroo mouse.

Information needs:

- An evaluation of habitat and soil associations of pale kangaroo mice to produce a map and GIS data that depicts the known and potential habitat of the species.
- A detail of the species' habitat requirements, including the differences in habitat quality, by using information from but not limited to the Natural Resources Conservation Service's soil surveys and ecological site descriptions.
- A determination of population abundance for the Lower Smoky Valley, Nye and Esmerelda Counties, Nevada.
- Recommendations that will aid in management and land-use decisions related to the long-term management and conservation of the species.
- Genetic analysis to evaluate the taxonomic status of the species.

Anticipated work:

- Multiple live-trapping seasons to determine local distribution and construct habitat requirements
- Development of a map and model to depict the potential distribution and habitat requirements of the species in Nevada that can be incorporated into a GIS
- A report of findings suitable for publication to include a discussion of habitat threats
- Collection of genetic material for future genetic analysis as funds are acquired

Desired Contractor:

- A firm, educational institution, government agency (such as USGS) or individual with expertise in small mammal biology in the desert southwest or with this species
- The lead researcher should have a PhD or demonstrable equivalent expertise to manage such a project

Anticipated costs:

- A multi-year study (approximately 3 field seasons and one year report preparation)
- A grand total of \$200,000 provided by TSE with an initial payment of \$75,000 and two additional payments of \$62,500 over the following 2 years.

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