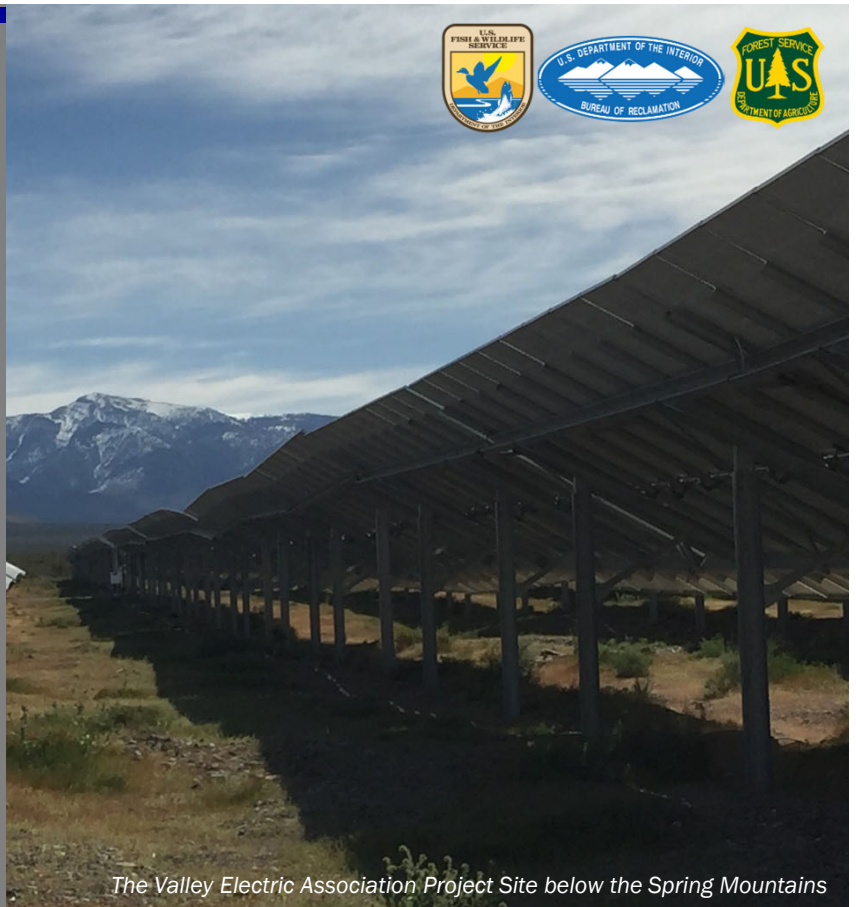
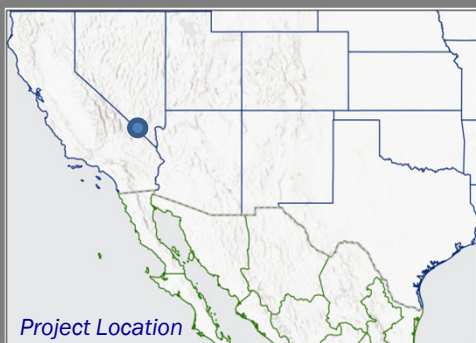


HABITAT CONNECTIONS

Wildlife-Friendly Solar Energy in the Mojave Desert



As communities realize that long-term dependence on fossil fuels for power generation is not sustainable, alternate methods of energy development, including solar, are expanding across the globe. Although solar power reduces carbon emissions, it is not without negative impacts. Large-scale solar facilities can severely degrade ecosystem conditions and the wildlife they support when they are built on previously undisturbed land that is biologically fragile. To explore options for minimizing these impacts, Valley Electric Association (VEA) and US Fish and Wildlife Service worked together to construct a wildlife-friendly solar power generation facility in the Mojave Desert near Pahrump, Nevada.



The Valley Electric Association Project Site below the Spring Mountains

KEY ISSUES ADDRESSED

The southwestern United States is important for solar development because of its ample solar energy and open land. However, undisturbed lands are home to many species that depend on large, unfragmented landscapes. Large-scale solar construction, including vegetation clearing and grading, directly disturbs habitat on an increasing scale as the number and size of facilities expand. Equipment and infrastructure can also cause direct wildlife mortality. Fence barriers around facilities cause habitat and migratory corridor fragmentation. Wildlife species particularly affected include the desert tortoise, desert bighorn sheep, and the Mohave ground squirrel. Solar panel arrays can also create an optical illusion of water, potentially attracting water birds that are unable to take off on dry land.

PROJECT GOALS

- Implement a pilot project to incorporate wildlife-friendly features into solar facilities to minimize negative effects on wildlife and their habitats while meeting growing demands for renewable energy
- Monitor the use of the site by wildlife, particularly the Mojave desert tortoise



POWER- GENERATING HABITAT

Modifying development protocols can provide energy for the public while maintaining functional habitat for wildlife.

LESSONS LEARNED

The relatively small footprint of this project allowed experimental assessments of how solar power generation facilities can reduce their impacts on wildlife. Tortoises were documented passing through the facility, indicating that fence openings were effective. Rattlesnakes, black-tailed jackrabbits, and kit foxes also used fence openings.

Elevated placement of solar panels allowed vegetation to persist at the site, although it was initially trampled during construction. Active re-vegetation and control of invasive weeds are recommended.

Mitigation techniques need to be tested at larger solar facilities to determine how well habitat quality can be maintained. Even at the small scale of this site, mitigation techniques did not eliminate wildlife impacts. Placing solar power generation facilities away from places with high conservation value or in previously disturbed areas is the best way to minimize impacts to wildlife.

NEXT STEPS

- Assess effects of solar panels on microclimate, including temperature and soil moisture
- Test translocation and restoration potential for native shrubs and forbs
- Increase abundance of native shrubs relative to non-native grasses

PROJECT HIGHLIGHTS

Innovative Solar Panel Placement: To maintain existing plants and topography, VEA clipped vegetation as needed instead of clearing the area for solar panels. To allow space for vegetation, the lower edge of solar panels was installed 42 inches above the ground, 18 inches above the industry standard. Spacing between arrays was increased from 14 feet to 20 feet to minimize the illusion of a lake and increase light reaching the ground.

Maintaining Habitat Connectivity: Openings of 10 inches wide by 7 inches tall were placed approximately every 260 feet along the perimeter fence (a total of 30 openings) to allow passage of small wildlife.

Reducing Vehicle Impacts: Maintenance vehicles are restricted to small utility vehicles with a maximum speed of 15 miles per hour. Staff also received desert tortoise awareness training.

Monitoring Desert Tortoise Use: Four tortoises were fitted with radio transmitters to monitor passage, movement, and long-term residency around the solar facility.

Partnerships: Working with VEA allowed FWS to use the site as a pilot project where they were able to collect data and information about impacts and mitigation strategies.

Collaborators

- Valley Electric Association
- US Fish and Wildlife Service
- HDR Consulting
- University of Nevada, Las Vegas
- Bombard Renewable Energy

Lead Author: Sierra Riker, Northern Arizona University, Oct 2019.
Case study support provided by US Fish and Wildlife Service, US Bureau of Reclamation, and US Forest Service.
Photos courtesy of US Fish and Wildlife Service

PROJECT RESOURCES

For more information on this project, contact Jennifer Wilkening: jennifer_wilkening@fws.gov

For additional project resources and case studies, visit the Collaborative Conservation and Adaptation Strategy Toolbox: WWW.DESERTLCC.ORG/RESOURCE/CCAST

