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**Renewable Energy Development on Department of
Defense Installations in the Desert Southwest:
Identifying Impacts to Species at Risk – Publication**

Intent – This publication is formatted for the DoD Legacy Resources publication “Natural Selections” that is published approximately each quarter. This venue informs both military personnel and civilians of natural resource projects and studies being conducted on U.S. military installations everywhere. We briefly describe this renewable energy project with a background and synopsis of the project, its results, and final conclusions based on the data collected.

Publication –

Green Energy for Missions and Wildlife

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Recently the Department of Defense (DoD) has enacted mandates to achieve a net zero standard for energy consumption. This means that the military is to become energy neutral, producing energy equal to amount used by an installation. This presents potential conflict with natural resource missions within existing Integrated Natural Resource Management Plans (INRMP). Much of this new energy comes in the form of solar. As of the development of this study, there has been limited information on the interactions of wildlife with solar development. Here we designed a rigorous study that looked at three military installations across the Desert Southwest including both the Mohave and Sonoran Deserts. We were given permission to use solar facilities on Davis-Monthan Air Force Base (DMAFB), Yuma Proving Ground (YPG), and Edwards Air Force Base (EAFB). This study was designed to address three objectives and to provide management recommendations to mitigate and monitor potential impacts. The three objectives were:

- Quantify differences in reptile and small mammal communities between solar development and un-impacted sites.
- Identify the spatial extent of solar development impacts on wildlife communities.
- Evaluate the mitigation value of “soft-footprint” solar development when compared to “hard-footprint” development.

We trapped small mammals and reptiles systematically from winter 2015 through the mid-summer 2016 using Sherman live traps for small mammals (Figure 1A) and box traps along a drift fence for reptiles (Figure 1B). Our efforts resulted in 68,120 trap-nights capturing 10 species of small mammals and 1,440 trap-nights capturing 15 species of reptiles. Using these data we were able to evaluate how these species perceive a solar installation on the landscape. We documented that these species are likely displaced into the immediate surroundings of the solar facility. We documented high species diversity surrounding solar facility (Figure 2A, 2B) suggesting that there may be some benefit gleaned by inhabiting the area around a solar facility. Furthermore, the number of individuals also increased immediately beyond the solar facility (Figure 3A, 3B). We also noted that these species responded the same way at any type of footprint (soft or hard footprint designs).

Based on this study, we conclude that best management practices (BMP) to protect altered habitat for species be observed beginning with proposed conception of a solar facility. Some BMPs may include locating proposed solar facility in disturbed or previously disturbed areas. Another may be to relocate individuals within the project area to at least 400m beyond the facility prior to construction using humane trapping techniques. Designing fencing structures with low-to-the-ground opening may allow for species movement through the solar facility rather than exclusion. These BMPs may provide conservation alternatives to habitat destruction when considering and expanding solar facility across military landscapes and offering flexibility to military missions.



Figure 1. Sherman live trap (A) for small mammals and reptile box trap along a drift fence (B) used to conduct field work.

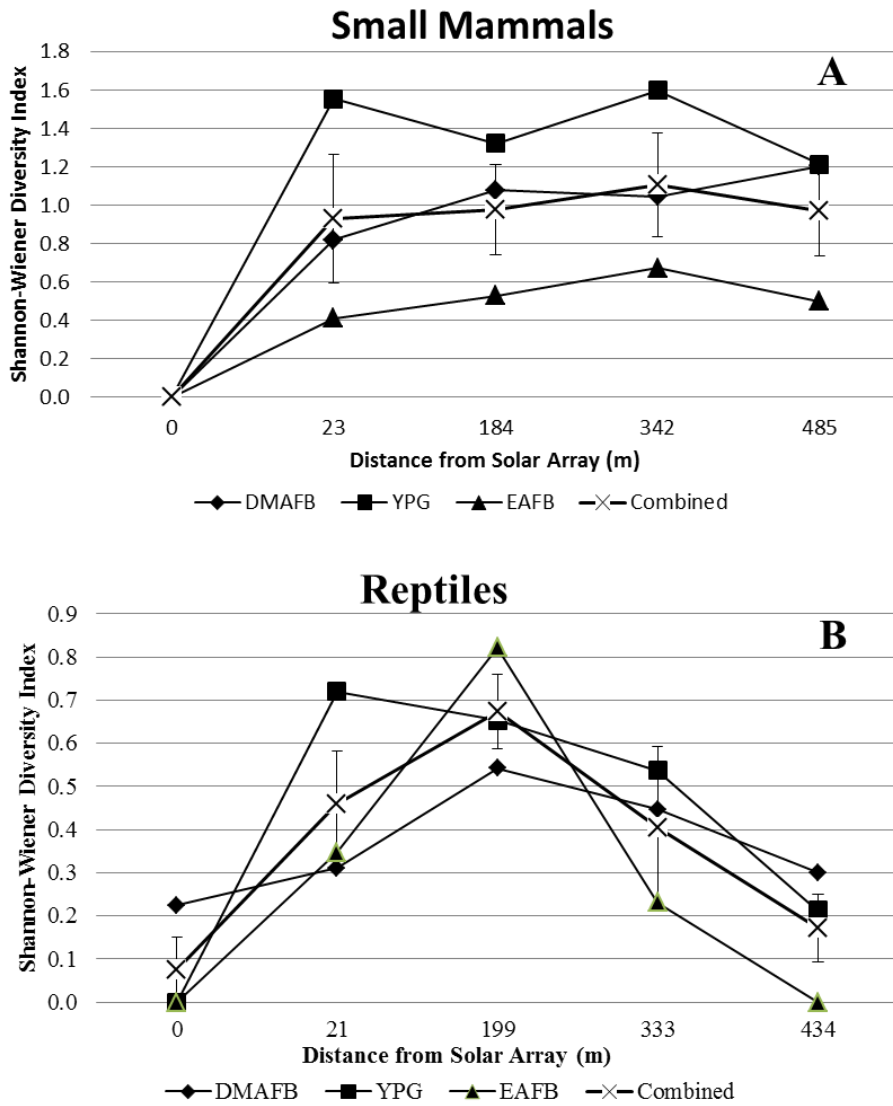


Figure 2. Diversity index of small mammals (A) and reptiles (B) at each of three military installations.

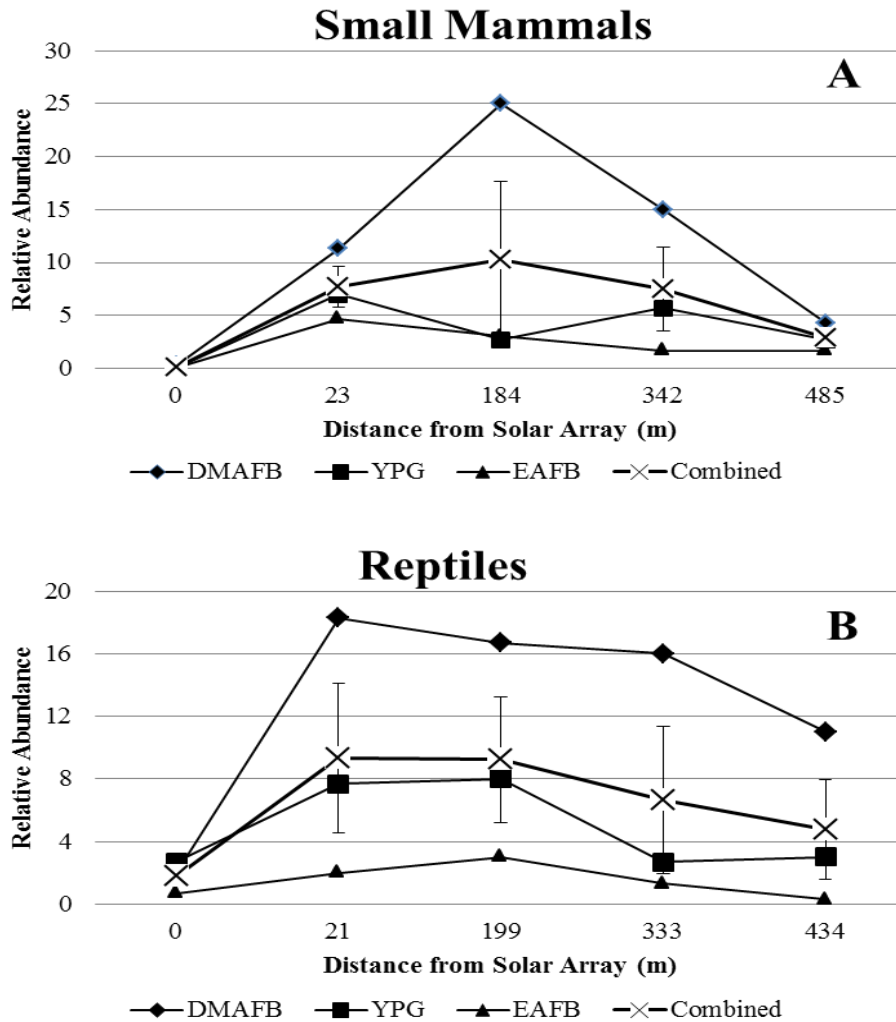


Figure 3. Relative abundance of small mammals (A) and reptiles (B) at each of three military installations