California Energy Commission
Public Interest Energy Research (PIER) Program
ENVIRONMENTAL AREA RESEARCH

Plant Population Viability and Restoration Potential for Rare Plants Near Solar Installations

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PIER Environmental Research
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Fact Sheet

The Issue

Having reliable sources of energy within the United States is critically important. Also crucial is identifying and developing clean energy from renewable sources, such as sunlight, wind, hydropower, and geothermal heat. California aims to serve at least 33 percent of electricity demand with renewable energy by 2020. Large-scale solar developments are needed to achieve this goal. Such developments, however, have large land and water requirements, and they can have negative impacts on ecosystems and vulnerable species, especially in the desert.

A large number of proposed, utility-scale solar developments in the Mojave and Sonoran deserts of California will significantly impact plants given special status by government agencies and other organizations. To advance conservation goals and make siting of renewable resources easier, there is a need to assess the size and viability of current plant populations, assess their habitat requirements, and provide information on the feasibility of establishing mitigation sites within suitable habitat.

Project Description

This project's primary objective is to provide information on the population viability of a number of special status plant species likely to be affected by utility-scale solar energy development in the Mojave and Colorado deserts. Population viability analysis—a modeling technique that is based upon ecological, life history, and demographic data—evaluates local population extinction risks under different intensities of impacts over time. Results from these types of models can be used to make recommendations for mitigation, management, and restoration of a broader suite of desert plant species potentially affected by solar energy development.

Mojave Desert wildflowers in California's Mojave National Preserve.
Image Credit: United States National Park Service

The project's goals are to:

- Identify and map two populations of six to eight target rare plants of conservation concern. For these populations, all significant life history stages will be identified for use in the population viability analyses.
- Make six field trips per year to collect demographic data for four consecutive years.

- Study seed bank characteristics by examining seed germination/dormancy rates, storage, and viability in the field and laboratory. This work will help to understand the potential for restoring these plant populations, and the data will be used in the population viability analyses.
- Interpret the plant population viability analyses based on comparative field and literature research, estimate plant population extinction probability based upon the population size and levels of disturbance, and provide management and mitigation recommendations.

PIER Program Objectives and Anticipated Benefits for California

Research is needed to help minimize the biological impacts of solar projects within the Mojave and Colorado deserts of California. Population viability information for desert rare plants is needed for managing resources and improving the planning tools used in the siting, design, permitting, and mitigation of solar energy projects. This project will contribute to state and federal conservation goals while promoting the timely permitting of renewable energy projects in California's desert regions. This research will help protect the state's fragile desert ecosystems while helping to implement solar energy projects.

As the state energy demand continues to increase, seeking alternative sources of renewable energy is vital. Through its focus on solar energy development, this project will help ensure that stable, secure, and reliable sources of energy can continue to be provided to California residents in an environmentally responsible manner.

Project Specifics

Grant Number: PIR-10-047
Recipient: BMP Ecosciences
City/County: Davis, Yolo County
Application: Regional
Assembly District: 8
Senate District: 5
Amount: $753,100
Term: November 2010 to March 2015
Co-funding Amount: $149,885

For more information, please contact:

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