

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Effects of fragmentation on the pollination of Joshua Tree by its yucca moth mutualists

Discipline: Natural

Type of Project: Research

Funding Agency: National Park Service

Other Partners/Cooperators: University of Idaho

Effective Dates: 2/13/2006 - 3/15/2008

Funding Amount: \$7,050.00

Investigators and Agency Representative:

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Project Abstract:

Yucca plants are at risk in Joshua Tree National Park (JOTR). A recent large-scale fire associated with invasion by exotic grasses and periderm herbivory by small mammals have caused elevated levels of mortality, and both problems are likely to continue or become more severe in the future.

Given this, we can expect population declines and increasing range fragmentation. Many studies show that the viability of fragmented plant populations is determined largely by pollinator effectiveness. For JOTR, this means that its viability depends on the effectiveness of the yucca moths. Studies show that some other yucca moths have much reduced flight ability, that self-pollination occasionally performed by moths (especially in small populations) leads to strong inbreeding depression that can cause local extinction, and that local coadaptation of flower shape and moth ovipositors can prevent moths from one population from successfully establishing in another population because of trait mismatch. For Joshua tree, we have virtually no data. The purpose of this project is to determine the range within which moths transport pollen, the reproductive cost to the plant of self-pollination, and the level of mismatch between moth and plant traits in different populations.

Outcomes with Completion Dates:

Progress Report - September 1, 2006

First Annual Report - February 20, 2007

Database and Maps Provided to Park Management - September 1, 2007

Keywords: climate change, pollination, yucca moth, Joshua tree, Joshua Tree National Park, University of Idaho

For Administrative Use Only:

Date Annual Report Received:

Date Final Report Received:

Publications, etc. on file: