Project: Mission Blue
May – December 2011 Report

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Overview

In May 2011, California Garden Clubs, Inc. (CGCI) passed a resolution to fund a five-year project with the Golden Gate National Parks Conservancy to grow lupines to preserve Mission blue butterfly habitat. This project will work to not only save this endangered butterfly, but also to meet the secondary goals of fostering interest in gardening and plant nurseries, and promoting environmental awareness and community engagement.

It is with great honor and responsibility that we will use the donations entrusted to us. The following is a summary of the accomplishments in 2011. These accomplishments were made possible with the CGCI's generous donation of $2,000.

Policy

Project: Mission Blue is a collaborative effort between the Golden Gate National Parks Conservancy, the National Park Service (NPS), and the US Fish and Wildlife Service (USFWS). Over the year of 2011, these agencies came together to define the scope and associated adaptive strategies to conserve the Mission blue butterfly.

This project aims to combat the alarming decline of Mission blue butterflies by addressing the loss of this butterfly's host plant. Over the past decade, ecologists have recorded significant decline in the butterfly's host plant, silver lupine *(Lupinus albifrons)*, due to a fungal pathogen. By planting and increasing the numbers of two other host plants that are resistant to this pathogen, summer lupine *(Lupinus formosus)* and many colored lupine *(Lupinus variicolor)*, we hope to stabilize and increase habitat for these butterfly populations.

The USFWS granted permission to start the initiation of Project: Mission Blue, at two prime locations in the Golden Gate National Recreation Area: Wolfback Ridge in the Marin Headlands, and Milagra Ridge in Pacifica. These sites are ideal because of the availability of long-term butterfly and lupine monitoring data. With documented successful recovery it is our hope that these practices will be repeated in other locations across the park.

Seed Collection

The growing of lupines cannot happen without seeds. The lupine seeds collected have to be from the same watershed the plants will one day be planted in; this preserves the local genetic diversity and allows the lupine populations to be best adapted to their own particular microclimate.

Collection was performed by two different types of groups: high school youth from the Park Stewardship's summer youth programs, and college-age volunteers. Below is a table of the locations and seeds collected.

Seed Collection Table				
Species	Common Name	Collection Site	Planting Site	Amount
Lupinus variicolor	many colored lupine	Milagra Ridge	Milagra Ridge	176
Lupinus formosa	summer lupine	Alta Avenue	Wolfback Ridge	75
Lupinus formosa	summer lupine	Mori Point	Milagra Ridge	156
			TOTAL	**407**

Seed Propagation

The seeds were brought to two native plant nurseries in the park. Oceana Native Plant Nursery took the seeds to be planted at Milagra Ridge and the Marin Headlands Nursery took the seeds for Wolfback Ridge. Seeds were divided between the nurseries based on the location the seed would eventually be planted at and by the difficulty of germination. Summer lupine (*Lupinus formosa)* traditionally have been hard to grow in nurseries.

Both nurseries engaged volunteers ranging from college to high school age to run the nurseries. In this way we kept costs low and also developed opportunities to engage and educate the community about propagation techniques and habitat restoration. Below is a table of the success of the germination process.

Seed Germination Table					
Species	Common Name	Planting Site	Amount Collected	Success Rate	Amount Germinated
Lupinus variicolor	many colored lupine	Milagra Ridge	176	77%	136
Lupinus formosa	summer lupine	Wolfback Ridge	75	33%	25
Lupinus formosa	summer lupine	Milagra Ridge	156	0%	0
		TOTAL	**407**		**161**

Different propagation techniques were used in germinating the seeds. We found that summer lupine *(Lupinus formosa)* did significantly better staying in a soil seedling mix verses being transplanted to a traditional potting soil mix. This information will help increase propagation success in following years.
Lupine seeds develop a hard shell that blackens as it matures and prevents germination without scarification. Collecting the seeds after they ripen and

before they develop a hard black shell allows for higher immediate germination. Our understanding of how to determine the exact time of ripening to just before the hard coat develops, was refined this year, and will improve germination success for future years.

Educational Opportunities

In December, a special planting day for families was created to plant the 136 many colored lupines at Milagra Ridge. In addition to the planting, this event included educational lessons about biodiversity and endangered species, a butterfly kite making station, Mission blue butterfly temporary tattoo applications, and we even enacted a play about the Mission blue butterfly to highlight the amazing life history of this endangered species. Twenty two community members and staff came out on this day, and it was a great success.

At Wolfback Ridge, due to its challenging terrain, we recruited a group of college-age volunteers to plant the 25 lupines.

Monitoring

We developed monitoring protocol to track the success or failure of each lupine planting. Every lupine planted was marked by GPS and a flag. Monitoring of the lupines will continue every six months to monitor survivorship of the plantings. Cardboard was also put around the lupines planted at Wolfback Ridge to prevent the competition of invasive grass with the growing of the lupines.

In addition, all aspects of Project: Mission Blue will be photo monitored. An online photo database has been created for CGCI to stay updated with project activities. Contact Price Sheppy for permission to access photos at 1-415-561-3073.