Project: Mission Blue February 2013 – February 2014 Report

Overview

Project: Mission Blue is a progressive plan using adaptive management practices to combat the continual decline of Mission blue butterflies due to the loss of lupine patches and the decrease of lupine diversity. This project is a collaboration between the National Park Service, the Golden Gate National Parks Conservancy and the California Garden Clubs Incorporated. While this project will work to save the endangered butterfly it will also meet secondary goals such as furthering an interest in gardening and plant nurseries as well as promoting environmental awareness and community engagement. It also works to improve wildflower abundance and diversity in our open spaces.

The first year of the project in 2011 was dedicated to getting all of the participating bodies on board and setting up the necessary procedures. In 2012 we established test lupine patches to make sure our planting sites were appropriately placed on the landscape and monitored for lupine survivorship. We also performed education about the Mission blue butterfly in schools and to the public with butterfly walks and school field trips.

In 2013 we took the information we learned from our test plantings and established our new lupine patches. These patches were planted in the winter of 2013.

Each year we continue to increase the amount of lupines we can grow, and increase our public education. It is with a great sense of accomplishment that we present to you the 2014 Project: Mission Blue Report.

Monitoring Data

Each March since 2011 we have collected data on the survivorship of the lupines we planted. Lupines go dormant during the dry summer and start to grow again in the spring time, because of this we do our monitoring in March so that we do not incorrectly identify a dormant plant as one that is dead. The monitoring information that follows comes from the data that was collected in March 2013. This data was collected before the winter planting of 2013.

Creating Best Management Practices

On May 29 2013 a meeting was held to analyze monitoring data. Lupines at Wolfback Ridge performed better higher on the ridge tops. We believe this is due to less competition from invasive grasses. The 2013 plantings were moved to these more ideal locations.

Planting decisions for Milagra Ridge were also reached. The survivorship of the 2011 lupines in the rock quarry was very low. In 2012 we planted in new locations. These new locations had better survivorship. The new locations had less slope and richer soils. In past years we planted varied colored lupines at Milagra Ridge. While these lupines did well at Milagra, these lupines are the least preferred lupines for the Mission blue butterfly therefore we only grew summer lupines and silver lupines for Milagra Ridge.

San Francisco Parks and Recreation is also planting lupines for the Mission blue butterfly at Twin Peaks. They used a water holding polymer produce called SoilMost. They believe this product helps the lupines survive planting, yet no experiment has been done to prove this. We decided that in the 2013 planting season we would conduct an experiment to see if the lupine survivorship does improve with the use of this product.

In the 2012 planting season we reached the sustainable seed collecting capacity for the lupines. We want to plant more lupines so we found nearby natural sources of lupine seeds. Locations were identified and approved by the National Park for seed collection. They included San Bruno Mountain and Crystal Springs Reservoir. Seeds were then collected from these locations.

Growing Lupines

We have continued to work to find better ways of growing and keeping lupines alive in the plant nurseries. During the best management practice meeting in May, it was learned that San Bruno Mountain Watch's native plant nursery has grown lupines with a higher success rate. This is due to the warmer and drier conditions at this nursery. We partnered with this nursery to grow lupines for us. The lupines they grew were from lupine seeds collected from San Bruno Mountain.

In the lupine growing year of 2012 we witnessed the dieback of lupines at the Marin Headland Nursery. This dieback occurred after a winter storm. The lupines lost all of their foliage. Only some died and most recovered. During the planting season of 2013 we decided to start planting earlier in the season. By getting the lupines in the ground before any major winter storms, we hoped to minimize any dieback that would occur in the nursery. This year we started planting lupines in November of 2013.

Wolfback Ridge Update

Wolfback Ridge is a park site within the Golden Gate National Park. This ridge is just north of the Golden Gate Bridge and the Waldo tunnel runs through the ridge. This site was picked as an important location for Mission blue butterfly restoration because of the low numbers of Mission blue butterflies.

In 2011 we planted 25 summer lupines (*lupinus formosus*) across two ridges and one valley. Only 30% of these survived the first year, and 100% of the remaining lupines survived to the next year.

In 2012 we planted 171 lupines. Overall there was a 30% survivorship, but survivorship varied across the site. Certain locations had up to 50% survivorship while other locations had little to none. To learn more about individual locations see Appendix 1.

In 2013 we planted 132 lupines and planted in areas that had high survivorship from the past year. We noticed that lupines did better higher on the ridges. This may be because of a decrease in competition with the invasive grasses higher on the ridge.

Wolfback Ridge	2011	2012	2013
L. formosus	25	171	132
2011 Survival	30% - 7	N/A	N/A
2012 Survival	100% - 7	30% - 52	N/A

Milagra Ridge

Milagra Ridge is a park site within the Golden Gate National Parks. It is located in Pacifica California. It was picked as a Mission blue butterfly restoration site because it is one of the southernmost locations of Mission blue butterflies in the park, and the populations of butterflies has been on the decline.

In 2011 we planted 136 lupines in a site that used to be a rock quarry. The survivorship was very low so in 2012 we planted 248 lupines in two different areas that performed better. Survivorship varied across Milagra Ridge. To learn more about these locations see Appendix 2.

Milagra Ridge	2011	2012	2013
L. formosus	0	17	704
L. variicolor	136	231	0
L. albifrons	0	0	638
Total	136	248	1342
2012 Survival	10% - 13	77% - 192	N/A

In 2013 we planted 1,342 lupines and were able to create a corridor connecting three lupine patches known to have Mission blue butterflies.

Planning Ahead and Conclusion

This year at Milagra Ridge we have seen an increase in Mission Blue butterfly populations (Appendix 3.) As we continue to gather data we will begin to see what impact this project has on our butterfly populations. We will look more specifically at what conditions (such as soil, temperature, slope, and aspect) different lupine species prefer on our sites. This information will help us across the whole park.

It is truly inspiring and heartwarming to have been able to talk to all of the members of the California Garden Clubs over the years and to know that over \$8,000 has been raised in support of this program.

Appendix 1:

Wolfback Ridge

Lupines Planted in 2011 and 2012



Appendix 2:



Appendix 3:



Milagra Ridge Mission Blue Butterfly Monitoring