

Rare Butterfly Management Studies on Conserved Lands in San Diego County: Hermes copper (*Lycaena hermes*)

TASK 5:

HERMES COPPER ADULT MONITORING, ADULT AND EGG TRANSLOCATION 2014

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Table of Contents

Table of Contents.....	2
Tables	3
Figures.....	3
Executive Summary.....	4
Introduction	5
Methods.....	6
Results.....	7
Adult Surveys.....	7
Adult Releases	7
Egg Releases	7

Tables

Table 1. Dates of Hermes copper surveys at Hollenbeck Canyon Wildlife Area and Crestridge Ecological Reserve, two potential release sites. No Hermes copper adults were detected.	7
Table 2. Details relating to the translocated Hermes copper eggs.	9

Figures

Figure 1. Detections of Hermes copper butterflies on conserved lands, 2010-2013. Sampling locations where Hermes copper was not detected are represented by black diamonds. Small and large Hermes copper populations are indicated by different sized circles.	5
Figure 2. Photo of a translocated Hermes copper egg at Hollenbeck Canyon Wildlife Area. The original spiny redberry branch with egg is attached to a living spiny redberry shrub with a green twist-tie (right of egg) and sewing thread (left of egg).	8

Executive Summary

This document has been written to satisfy the reporting requirements for 2014 SOW Task 5, and summarizes the efforts related to the first year of a Hermes copper translocation project. Surveys conducted since 2008 show that Hermes copper occupies a small portion of the landscape in San Diego County, most local populations are small, and recovery following wildfires is slow. Because fire poses a threat to the species, translocating individuals to reestablish a population is a potential management tool.

In 2014, we translocated 11 adults (6 males and 5 females) to an unoccupied, but suitable patch of habitat at Hollenbeck Wildlife Area. Twelve eggs obtained from females at other sites were also translocated to this preserve, but to a different area. Egg monitoring in February-May 2015 and adult surveys in May-June 2015 will be conducted to assess reestablishment of a population in these areas.

Introduction

This work involves the continuation of research related to the Hermes copper butterfly; a rare endemic butterfly known only to occur in San Diego County and threatened with extinction. From 2010-2012 a total of 400 visits to approximately 40 sites were made to determine the distribution of the extent populations of the butterfly. Surveys confirm that the species' range is limited to a very small area (Figure 1). In addition, very few individuals occur at most of the occupied sites and the relative size of individual populations was very similar across all three years (high degree of concordance). Based on current scientific data, wildfire is a major threat to Hermes copper with very few recorded post-fire recolonizations. Because of infrequent recolonization, assisted dispersal achieved by translocation of individuals has been suggested as a potential management tool to mitigate wildfires impacts. Pilot studies for experimental releases to re-establish populations have been recommended for other species, such as the Laguna Mountains skipper butterfly (*Pyrgus ruralis lagunae*).

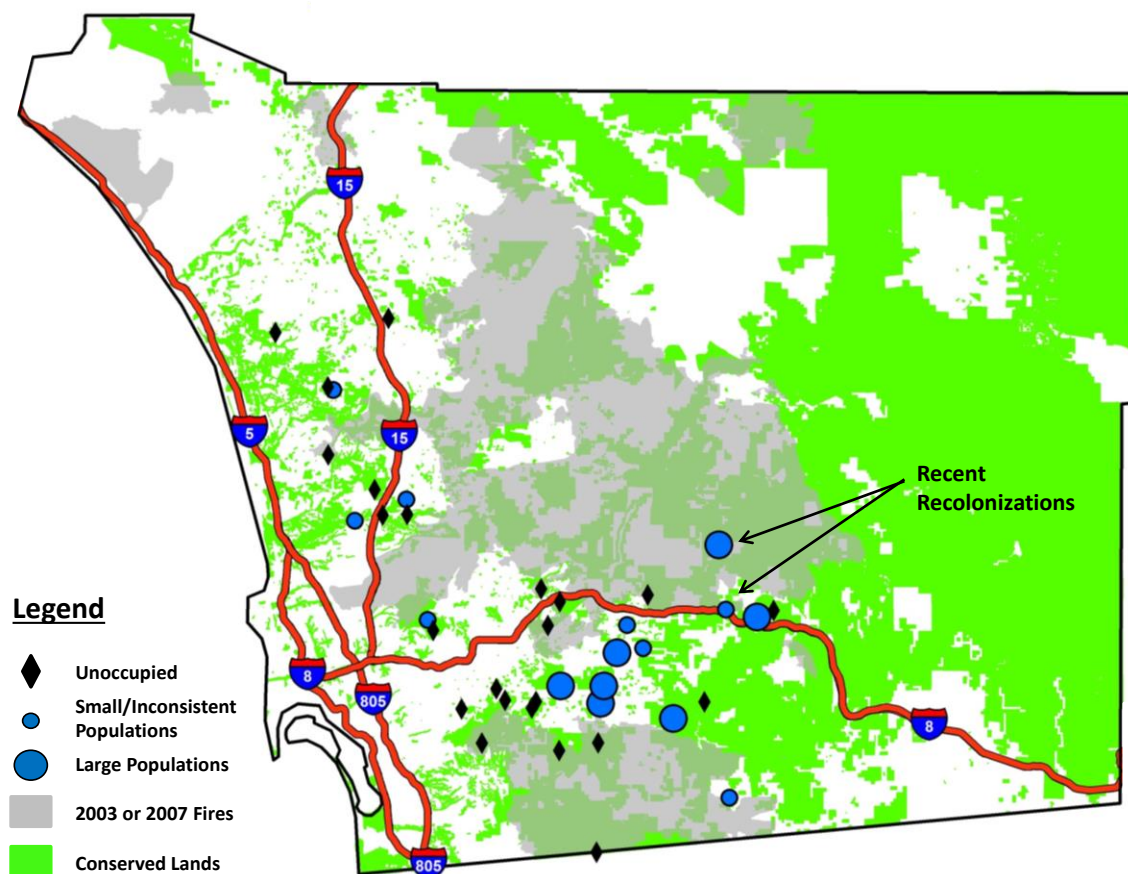


Figure 1. Detections of Hermes copper butterflies on conserved lands, 2010-2013. Sampling locations where Hermes copper was not detected are represented by black diamonds. Small and large Hermes copper populations are indicated by different sized circles.

The translocation of Hermes copper individuals into suitable habitat, maybe the most practical management solution for this species, but challenges exists. Over the past 2 years, we have been able to locate and revisit Hermes copper eggs at several field sites. This is a difficult task because the eggs are very small and sparse. Captive rearing experiments also provided the opportunity to observe larvae, including one larva that developed to the fourth and final larval instar. Unfortunately, pupation was not observed during the field or lab work. Therefore we initiated a pilot effort for the translocation of individuals to suitable unoccupied habitat.

Methods

This task included baseline monitoring of adults and the translocation of adults and eggs into the field to reestablish populations of Hermes copper at Hollenbeck Canyon Wildlife Area.

This task addressed:

1. Permits/Procedures
2. Delineation and prioritization of unoccupied and suitable habitat
3. Selection of one or several source population(s)
4. Development of a protocol that addresses the nature and number of individuals moved
5. Cooperation and support from multiple stakeholders including jurisdictions, the wildlife agencies, and NGOs

We consulted with local biologists and land managers throughout the permit and procedure development process.

Surveys were conducted during the 2014 flight season at the release site (Hollenbeck Canyon Wildlife Area), alternative release site (Crestridge Ecological Reserve), and source populations (San Diego National Wildlife Refuge-McGinty Mountain, Skyline Truck Trail, and Sycuan Peak Ecological Reserve). Visits to the release sites were to confirm that Hermes copper has not recolonized the area naturally. This is necessary because each flight season provides an opportunity for natural recolonization and we do not want to falsely conclude that our efforts were successful. Field visits to the source populations were to capture and mark adults to be released at the release site (Hollenbeck Canyon Wildlife Area).

Additional females were caged in order to obtain eggs for a second translocation method. After the females oviposited on branches of spiny redberry, a small section of redberry stem with an attached Hermes egg were attached to large host plants in the release site. The translocated eggs and adults occurred at two unoccupied suitable habitat patches at the same reserve.

Results

Adult Surveys

We did not detect Hermes copper adults at the potential release sites within Hollenbeck Canyon Wildlife Area and Crestridge Ecological Reserve during the 2014 flight season (Table 1). For this reason, either reserve could have served as the translocation site. Ultimately, Hollenbeck Canyon Wildlife Area was selected as the release site for two reasons:

- 1) The spiny redberry shrubs had more new growth compared to plants at Crestridge ER. The greater growth suggests more soil moisture and reduced impact from drought.
- 2) There are more California buckwheat plants at Hollenbeck Canyon. More nectar sources should increase the chances of retaining Hermes copper adults.

Table 1. Dates of Hermes copper surveys at Hollenbeck Canyon Wildlife Area and Crestridge Ecological Reserve, two potential release sites. No Hermes copper adults were detected.

Hollenbeck Canyon Wildlife Area	Crestridge Ecological Reserve
June 3	May 28
June 4	June 4
June 6	June 11
June 10	
June 11	

Surveys at the source populations yielded fewer Hermes copper adults compared to the previous three years. In addition, the flight season was relatively short. Most years we have observed their numbers slowly decline. However, in 2014 the numbers of Hermes copper adults dropped rapidly after reaching a maximum count.

Adult Releases

Due to the drought conditions, adult Hermes copper numbers were lower this year compared to the last three years. For this reason we did not or were unable to move the maximum number we requested for our permits. A total of 11 adults (6 males, 5 females) were released at Hollenbeck Canyon Wildlife Area. The translocated adults were not resighted, even 20 minutes following release. Based on previous marking studies, the females were not expected to be resighted after release. This was the case but it is still possible that they deposited eggs.

Egg Releases

On 14 July 2014, 12 Hermes copper eggs were translocated to Hollenbeck Canyon Wildlife Area. Eggs were originally obtained by caging female butterflies with clippings of redberry. After oviposition, the redberry clipping were cut to separate the eggs if possible. Occasionally, two eggs were too close together to safely cut so they could not be separated. These eggs

remained in the lab for captive rearing efforts. When possible, cutting occurred about 2 cm on each side of the egg to provide space for attachment to the living redberry shrubs. Again, some eggs were too close together and a distance of less than 2 cm was required. These smaller sections increased the difficulty of attachment. An additional egg (from Skyline Truck Trail II) was planned for relocation but was lost during the attachment process. When in the field, a small branch (about 1 cm in length) with an egg (from Sycuan Peak) was noticed to be poorly attached to the main branch. For fear of becoming completely detached, this egg was not translocated and will be used for the captive rearing efforts.

A four-inch plastic-coated green twist-tie and/or light brown sewing thread were used to attach the branch with an egg to living redberry shrubs (Figure 2). A lower branch extending into a relatively open area (free of other vegetation) was selected on shrubs which had relatively greater new growth for attachment. This was used as a sign of plant health and moisture availability. The eggs were oriented so that they are on the underside of the branch. This protocol attempts to mimic the natural location of eggs based on our previous observations.



Figure 2. Photo of a translocated Hermes copper egg at Hollenbeck Canyon Wildlife Area. The original spiny redberry branch with egg is attached to a living spiny redberry shrub with a green twist-tie (right of egg) and sewing thread (left of egg).

Table 2. Details relating to the translocated Hermes copper eggs.

Site of Female	Egg Location on Redberry Shrub	Latitude*	Longitude*
Skyline Truck Trail II	South side of redberry shrub	32.694005	-116.814998
Skyline Truck Trail II	North side of redberry shrub	32.694079	-116.815026
Skyline Truck Trail II	West side of redberry shrub	32.694053	-116.814846
Sycuan Peak	South side of redberry shrub	32.694071	-116.814769
Skyline Truck Trail II	South side of redberry shrub	32.694259	-116.814727
Skyline Truck Trail II	South-east side of redberry shrub	32.69429	-116.814666
Skyline Truck Trail II	West side of redberry shrub	32.694338	-116.8147
Skyline Truck Trail II	North side of redberry shrub	32.694348	-116.814864
Skyline Truck Trail II	West side of redberry shrub	32.694301	-116.814924
Skyline Truck Trail II	North-east side of redberry shrub	32.694545	-116.814377
Skyline Truck Trail II	North side of redberry shrub	32.694642	-116.814449
Skyline Truck Trail II	East side of redberry shrub	32.69463	-116.814468

*Datum is WGS 84

Of the 21 total eggs obtained from caged females, we have three eggs from Sycuan Peak and five eggs from Skyline Truck Trail II remaining for laboratory rearing (Task 2). Monitoring of the translocated eggs will start in the early spring to determine if larvae emerge (Task 6). Surveys in the adult release area will occur during the 2015 flight season (late May-late June) to assess if the released females deposited eggs (Task 6).