

Task 14: 2024 Harbison's Dun Skipper Adult Surveys

Hermes Copper Butterfly Surveys and Translocation Efforts
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Executive Summary

This report summarizes our butterfly survey efforts of 2024. Larval surveys for this project/task are planned for winter of 2024/2025.

The Harbison's dun skipper (*Euphyes vestris harbisoni*) has a very restricted distribution in southern California and northern Mexico and entomologists have expressed concern that threats will lead to the extirpation of populations. The larvae of this skipper feed only on San Diego sedge (*Carex spissa*) and are generally associated with riparian oak woodlands.

In 2024, surveys for Harbison's dun skipper adults were conducted to assess the annual adult population size. Surveys started in a relatively small geographic area where skippers were observed in past years, but expanded to surrounding areas if skippers were not detected. Due to the relatively consistent numbers of adults through the month of June, each site was surveyed two times. A total of 22 males and 11 females were counted, with adults detected at 7 of 18 sites.

The higher number of skippers observed in 2024 compared to 2023 was likely due to San Diego sedge plants becoming established following the heavy rains and streambed scouring during the 2022 – 2023 winter. To facilitate a shift to using larval surveys to monitor annual population sizes, larval surveys will be conducted during the winter of 2024-2025 to compare adult and larval counts. This process is planned to be repeated one more time, with adult surveys in 2025 and larval surveys in the winter of 2025-2026.

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Introduction

The Harbison's dun skipper (*Euphyes vestris harbisoni*) is restricted to southern Orange County, extreme western Riverside County, and San Diego County (Brown and McGuire 1983, Marschalek et al. 2019), with one record from Mexico (Marschalek et al. 2019). Entomologists have expressed concern that the skipper is rare and may be negatively impacted by habitat loss and degradation (Brown 1991, Glassberg 2001). In 1989, the United States Fish and Wildlife Service (USFWS) issued a notice of review, on which Harbison's dun skipper was listed as a Category 2 species (USFWS 1989).

Prior to our initial efforts in 2013, nearly all of the known information about this skipper was restricted to descriptions in two published papers (Brown 1982, Brown and McGuire 1983). These papers identified this subspecies as morphologically different from the other subspecies, and described its biology (life history and nectaring sources) and distribution. The larvae of this skipper feed only on San Diego sedge (*Carex spissa*) and are generally associated with oak woodlands. The known distribution of the skipper at that time included southern Orange County and San Diego County, with the skipper present in nearly all areas containing considerable numbers of the sedge. Brown and McGuire (1983) also mentioned that the skipper appears to be facing several threats related to urbanization and development. They recorded a local extirpation at Adobe Falls in San Diego due to development, pollution, and subsequent invasion of the riparian area by non-native plants.

Further information about the skipper was obtained by conducting surveys as part of a project funded by a CDFW Local Assistance Grant (Marschalek and Deutschman 2015) and a previous SANDAG contract (Marschalek and Deutschman 2016, 2017a,b). Based on these surveys for larvae and adults in 2013-2017, the current Harbison's dun skipper distribution includes the foothills in the northern and southern parts of San Diego County, extreme western Riverside County, and southern Orange County (Marschalek et al. 2019). In San Diego County, there appears to be a substantial gap near Poway due to local extirpations likely resulting from wildfires. It is unclear whether the skipper currently occupies Silverado Canyon, its northernmost location, following the 1987 Silverado Fire. Extirpation from Silverado Canyon would represent a substantial range contraction based on historic localities. To the south, the Harbison's dun skipper has been documented in northern Baja California, Mexico. There are a number of threats to the Harbison's dun skipper, including recent extirpations further reducing its distribution, habitat alteration/loss, wildfires, drought, climate change, grazing, and habitat degradation associated with the spread of the goldspotted oak borer (*Agrilus auroguttatus*).

Following surveys in 2021, the status of local populations in San Diego County was updated. Although the previous year (2020-2021 winter) had been relatively dry, there were a couple

winters (2018-2019, 2019-2020) that experienced greater precipitation compared to the extreme drought in 2015-2017 (Williams et al. 2020). The increased precipitation could have provided the opportunity for the skipper to increase population sizes and expand to new areas since the 2017 surveys. Adult Harbison's dun skippers were detected at 6 of 12 sites as well as the north side of Otay Mountain. Substantial changes to the specific locations of the sedge at some sites was unexpected and provided challenges with locating skippers, and recent fires likely caused extirpations at other sites. In 2022, a marking study demonstrated relatively small local population while a habitat preference analysis using GIS environmental variables found that warm but wetter areas were preferred over cooler (lowest and highest elevations in San Diego County) (Lyons and Marschalek 2022, Lyons 2023, Lyons et al. 2024). In 2023, only 9 males and 3 females were counted, with adults detected at 5 of 16 sites.

The objective of surveys in 2024 was to update the status of populations in San Diego County as well as gather adult counts to compare with larval counts that will occur during the winter of 2024-2025. By conducting both types of surveys, a link can be established to maintain some continuity in the long-term dataset (Magurran et al. 2010).

Methods

We conducted surveys for Harbison's dun skipper adults at 18 sites where we had previously detected adults or San Diego sedge (Marschalek et al. 2019, Lyons et al. 2024). Visual surveys consisted of systematic searches around San Diego sedge patches conducted during periods of appropriate weather (sunny or partly sunny, 24° to 35°C, and modest wind speeds). If skippers were not detected in the immediate area of past observations, a wider area was searched. Since adult numbers remain relatively consistent through the month of June, we planned only two surveys per site to include more sites. However, Hollenbeck Canyon Wildlife Area had a third survey, and different sections of Escondido Creek (Elfin Forest and Keithley Preserve) were surveyed resulting in one survey each. These surveys provide an index of population size and describe the adult flight season phenology, behavior, and nectar sources.

Results

A total of 33 Harbison's dun skipper adults (22 males and 11 females) were observed across 18 sites (Table 1). While local populations remain small, more Harbison's dun skipper adults were observed in 2024 compared to 2023. This includes seven adults at Crestridge Ecological Reserve on a single day compared to a *total* of 12 observation at all sites in 2023.

Table 1. Sites and dates for Harbison’s dun skipper adult surveys in 2024, including the highest daily count (Max Count) and notes about the site.

Site	HDS Maximum		Survey Dates		Notes
	Count				
Barrett Lake	0		13-Jun-24	2-Jul-24	
Barrett Lake North	2		13-Jun-24	2-Jul-24	
Blue Sky Ecological Reserve	0		6-Jun-24	20-Jun-24	<i>Carex spissa</i> abundant
Crestridge Ecological Reserve	7		12-Jun-24	26-Jun-24	
Elfin Forest (Visitor's Center)	0		7-Jun-24		Mostly new growth <i>Carex spissa</i> along stream
Hellhole Canyon County Park	4		3-Jun-24	17-Jun-24	
Hollenbeck Canyon Wildlife Area (NE)	1		12-Jun-24	15-Jun-24	27-Jun-24
Keithley Preserve (Elfin Forest)	0		21-Jun-24		
					<i>Carex spissa</i> along Escondido Creek
Lake Hodges	1 - 2		3-Jun-24	17-Jun-24	Little <i>Carex spissa</i> in main drainage, but still in side drainage
Old Ironside County Park	0		12-Jun-24	26-Jun-24	Scattered <i>Carex spissa</i>
Pamo Valley (Cleveland National Forest)	2		7-Jun-24	21-Jun-24	
Red Mountain	0		4-Jun-24	18-Jun-24	Overgrown area, no <i>Carex spissa</i> near the entrance point
Santa Margarita River Trail	0		4-Jun-24	18-Jun-24	Water high in stream, no <i>Carex spissa</i> at original survey location but some plants along path
SDNWR - Beaver Hollow	0		10-Jun-24	25-Jun-24	More overgrown than in 2023 and <i>Carex spissa</i> more abundant
SDNWR - Las Montanas South	0		15-Jun-24	27-Jun-24	Lots of <i>Carex spissa</i> plants, mostly new growth
Skye Valley Road (Cleveland National Forest)	2		13-Jun-24	2-Jul-24	
Sycamore Canyon/Goodan Ranch County Park	0		6-Jun-24	20-Jun-24	<i>Carex spissa</i> abundant
Sycuan Peak Ecological Reserve	1		10-Jun-24	25-Jun-24	<i>Carex spissa</i> in numerous locations along creek

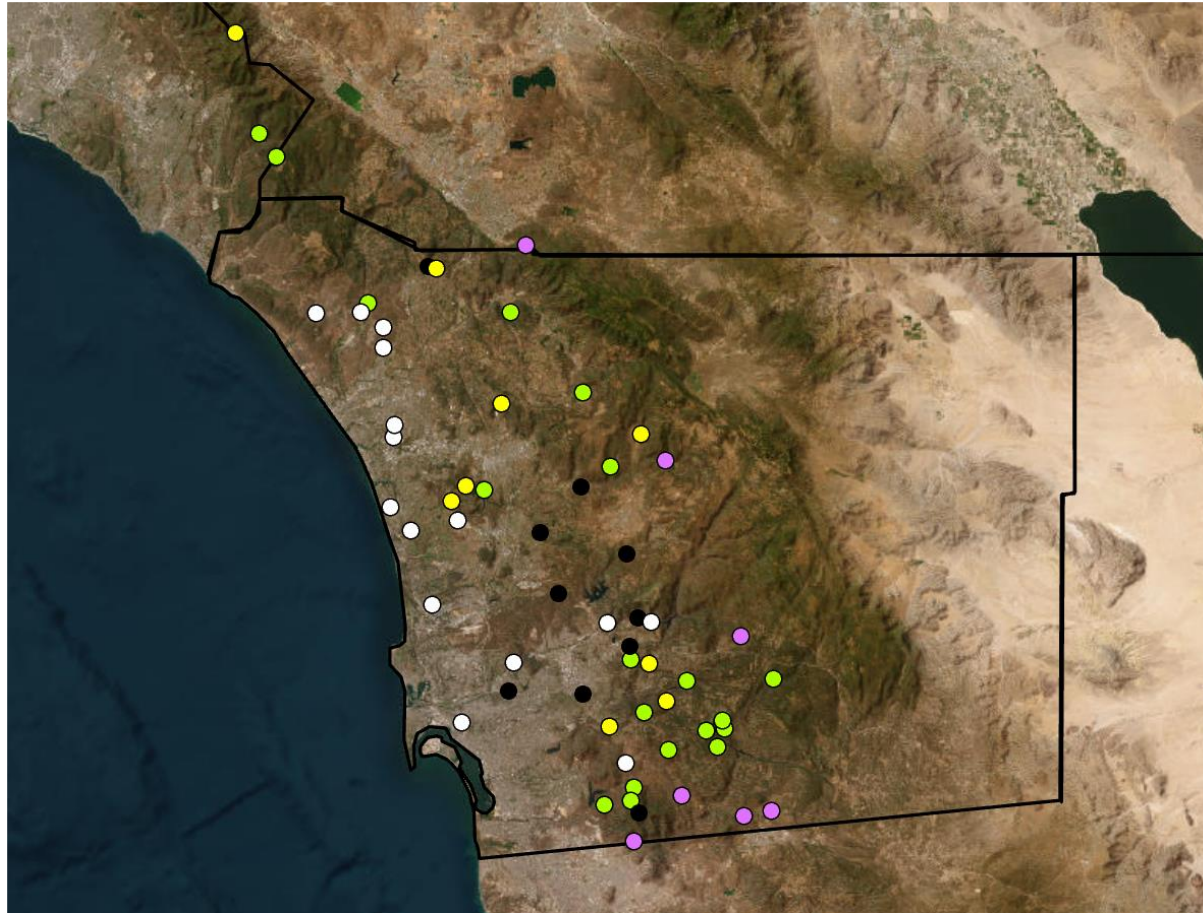


Figure 1. Harbison's dun skipper known distribution as of August 2024 (green = extant, yellow = probably extant but uncertainty exists, black = extirpated, purple = not surveyed, white = San Diego sedge without Harbison's dun skipper observation). For some sites, uncertain might exist due to hibernacula observed without a larva/adult or it has been several years have passed since the last survey. Some historical locations are on private property or have vague locality data so that the exact location cannot be determined.

There were other observations of Harbison's dun skipper adults in 2024. Several individuals were observed at Crestridge Ecological Reserve (observations by C. Beck) during a Hermes copper survey (Marschalek et al. 2024). This was along an old dirt road that is about 10m from a drainage where adults were reported above. Harbison's dun skipper adults were also observed at Hollenbeck Canyon Wildlife Area and Lawson Peak (both by J. Martin) during Hermes copper surveys. These two areas are not immediately adjacent to locations surveyed and reported in Table 1. The Hollenbeck Canyon observation is close to a woodland with San Diego sedge and about 550m from the canyon traditionally surveyed at this preserve. Up to four adults were observed up a side canyon from the Skye Valley Road site (observations by San Diego Monitoring and Management Program). Four adults were observed at Hellhole Canyon County Park, in a side drainage (observations by K. Preston)

Discussion

While local populations remain relatively small, the number of adults skipper observations were higher in 2024 compared to the previous few years. Comparing the two surveys at each site, counts were similar. The one exception was Crestridge Ecological Reserve, with skipper counts varying at different sedges patches. Harbison's dun skipper adults were observed at three locations while conducting surveys for the Hermes copper, likely due to the higher annual population sizes.

We continue to see a dynamic system, with San Diego sedge locations and conditions (e.g. number of plants) changing year to year. In addition, many locations are difficult to access during the Harbison's dun skipper flight season, due to rugged terrain, steep hills, distance, and poison oak. While additional areas at each site could be accessed, the time commitment at each site would increase substantially, reducing the number of sites visited during the flight season. To provide a more complete assessment of skipper distribution and local population sizes, we will be conducting larval surveys during the winter of 2024-2025. Surveys for adult skipper in 2025 and larvae again in winter of 2025-2026, will provide a transition from adult surveys to larval surveys.

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Appendix A: 2024 adult Harbison's dun skipper observations

Date	Site	Latitude	Longitude	Description
2-Jul-24	Barrett Lake North	32.71286	-116.70235	male
2-Jul-24	Barrett Lake North	32.71313	-116.70255	male
3-Jun-24	Hellhole Canyon County Park	33.21916	-116.92797	male
7-Jun-24	Pamo Valley	33.16174	-116.83957	male
7-Jun-24	Pamo Valley	33.16174	-116.83957	female
12-Jun-24	Crestridge Ecological Reserve	32.82847	-116.85677	hibernaculum
12-Jun-24	Crestridge Ecological Reserve	32.82622	-116.86056	male
12-Jun-24	Crestridge Ecological Reserve	32.82622	-116.86056	male
12-Jun-24	Crestridge Ecological Reserve	32.82622	-116.86056	male
12-Jun-24	Crestridge Ecological Reserve	32.82622	-116.86056	female
12-Jun-24	Crestridge Ecological Reserve	32.82723	-116.85971	male
13-Jun-24	Skye Valley Road	32.72683	-116.69427	male
13-Jun-24	Skye Valley Road	32.72683	-116.69427	female
13-Jun-24	Barrett Lake North	32.71254	-116.70220	male
13-Jun-24	Barrett Lake North	32.71254	-116.70220	male
17-Jun-24	Hellhole Canyon County Park	33.22116	-116.93279	male
17-Jun-24	Hellhole Canyon County Park	33.22116	-116.93279	male
17-Jun-24	Hellhole Canyon County Park	33.22116	-116.93279	female
17-Jun-24	Hellhole Canyon County Park	33.21944	-116.92793	male
17-Jun-24	Hellhole Canyon County Park	33.21944	-116.92793	male
17-Jun-24	Lake Hodges	33.08287	-117.11382	female
21-Jun-24	Pamo Valley	33.15773	-116.84086	male
21-Jun-24	Pamo Valley	33.15773	-116.84086	female
21-Jun-24	Pamo Valley	33.15773	-116.84086	male
25-Jun-24	Sycuan Peak Ecological Reserve	32.77237	-116.80947	male
26-Jun-24	Crestridge Ecological Reserve	32.82621	-116.806056	male
26-Jun-24	Crestridge Ecological Reserve	32.82621	-116.806056	male
26-Jun-24	Crestridge Ecological Reserve	32.82621	-116.806056	female
26-Jun-24	Crestridge Ecological Reserve	32.82621	-116.806056	female
26-Jun-24	Crestridge Ecological Reserve	32.82847	-116.85675	male
26-Jun-24	Crestridge Ecological Reserve	32.82847	-116.85675	female
26-Jun-24	Crestridge Ecological Reserve	32.82847	-116.85675	female
2-Jul-24	Skye Valley Road	32.72803	-116.69418	male
2-Jul-24	Skye Valley Road	32.72681	-116.69430	female

Other Harbison's dun skipper adult observations

Date	Site	Latitude	Longitude	Observer
4-Jun-24	Crestridge Ecological Reserve	32.826058	-116.860472	C Beck
7-Jun-24	Hollenbeck Canyon Wildlife Area	32.68955	-116.79311	J Martin
14-Jun-24	Cleveland National Forest	32.737872	-116.697539	SDMMP
17-Jun-24	Lawson Peak	32.72277	-116.72739	J Martin