2.3 Harbison's Dun Skipper (*Euphyes vestris harbisoni*) – Category SL

Management Units with Known Occurrences

The Harbison's dun skipper is a rare species with a limited distribution in San Diego County and southern Orange County (Marschalek and Deutschman 2015). A 2013–2014 survey estimated the current San Diego County distribution to include the foothills in northern and southern San Diego County, extreme western Riverside County, and southern Orange County. In July 2009, there was a confirmed, but unpublished, sighting in La Mission, Baja California (Faulkner and Klein 2012). Unlike other subspecies, the Harbison's dun skipper is found in chaparral or riparian areas that have narrow canyons or drainages. Oak woodland is a preferred vegetation community due to the balance of sun and shade. The host plant, San Diego sedge (*Carex spissa*) is found in habitats with moving water or dry ravines, and is unlikely to be found in areas with pools of standing water (Marschalek and Deutschman 2015).

Male skippers will patrol canyons, but never far from the host plant. Females will perch on the host plant basking in the sun. Harbison's dun skippers are attracted to nectar sources such as, morning glory (*Calystegia macrostegia tenuifolia*), red thistle (*Cirsium occidentale*), loosestrife (*Lythrum californicum*), and less frequently golden yarrow (*Eriophyllum confertiflorum*) and black mustard (*Brassica nigra*). There are 20 known species of nectar sources, nearly all of which have white, purple, or pink flowers (Marschalek and Deutschman 2016). The skipper is a generalist feeder with a preference for milkweeds and thistle (Marschalek and Deutschman 2015).

Harbison's dun skippers have been detected in MUs 3, 4, 5, 6, and 11 (see Table of Occurrences). The 2003 and 2007 wildfires likely caused local extirpations of the Harbison's dun skipper, leading to significant gaps around the Poway area (Marschalek and Deutschman 2016). The San Pasqual Academy site in MU5 experienced a wildfire that reduced the oak canopy, a necessary habitat component for sedge plants surviving dry conditions. After the 2016 survey, based on habitat conditions and observations, it appears that the skipper has been extirpated from this site (see online map: http://arcg.is/2kTTLxw).

Management Categorization Rationale

Harbison's dun skipper should be managed as a Species Management Focus Category SL Species due to a high risk of loss from Conserved Lands in the MSPA (see Vol. 1, Table 2-4). The high risk of loss is due to the small number of existing occurrences, high annual fluctuation in occurrence sizes, low rate of dispersal, and high risk of threat (see Vol. 3, App. 1, Species Profiles).

The largest threat to the skipper comes from habitat loss, fragmentation, and decreased water quality (Faulkner and Klein 2012). Habitat loss and fragmentation can lead to reduced dispersal and gene flow, which is especially concerning in small populations like the Harbison's dun skipper (Marschalek and Deutschman 2015). Degradation of habitat can also occur from habitat alternations like bank stabilization and channelization via concrete channels. The loss of the inland riparian areas and drainages that this species requires is not well documented (Faulkner and Klein 2012). Additionally, these locations are often dumping grounds for trash, reducing water quality and diminishing the host plant's capacity to survive.

Additional threats come from wildfires, invasive plants, drought, the goldspotted oak borer, and grazing (Marschalek and Deutschman 2015). Fire can directly and indirectly impact the skipper. Fire followed by below-average rainfall could be problematic for the skipper since it can impede the ability of the San Diego sedge to regrow (Faulkner and Klein 2012). Fires can also lead to exotic and invasive plant species growth in riparian areas, such as giant cane (*Arundo* spp.) and cattails (*Typha* spp.), which could inhibit sedges from growing (Marschalek and Deutschman 2015). Drought threatens the skipper by making the leaves of the larval food plant dry and unusable, or by killing the plant. The goldspotted oak borer can have similar impacts on the skipper if an infected oak tree dies and the amount of shade on the understory sedge plants is reduced, thereby increasing water-stress of the plants.

In 1989, USFWS listed the Harbison's dun skipper as a Category 2 species in a notice of review (Marschalek and Deutschman 2016). A petition to list the Harbison's dun skipper was submitted in 1991. USFWS found that the petition did not include substantial information for listing (Marschalek and Deutschman 2015).

Management and Monitoring Approach

The overarching goal for Harbison's dun skipper is to protect, enhance, and restore occupied habitat, historically occupied habitat, and the landscape connections between them to create resilient, self-sustaining populations that provide for persistence over the long term (>100 years).

For the planning cycle of 2017–2021, the management and monitoring approach is the following:

(1) In conjunction with adult surveys and the marking study for Harbison's dun skipper (see Table of Occurrences), capture adult butterflies and collect nonlethal genetic samples (i.e., legs) to analyze population genetic structure, dispersal and connectivity between populations, and genetic diversity.

(2) Conduct a marking study of adults during the flight season to determine connectivity within habitat patches in a watershed.

(3) Develop habitat suitability models for Harbison's dun skipper, the host plant (San Diego sedge), and oak woodlands under current and future climate change scenarios, and conduct fire risk modeling with different management scenarios to identify potential fire and climate refugia.

(4) Prepare a 5-year Harbison's Dun Skipper Management Plan that includes the results from butterfly surveys and habitat assessments, genetic and marking studies, and climate and fire modeling to characterize habitat quality at occupied occurrences and unoccupied suitable habitat important for enhancing connectivity, expanding populations or that could serve as fire and climate refugia. Implement highest-priority management actions identified in the Harbison's Dun Skipper Management Plan and monitor effectiveness of implementation of highest-priority management actions.

(5) Implement high-priority MSP 2018 Wildfire Ignition Reduction Plan measures developed for Harbison's Dun Skipper to reduce the probability of ignition at most at-risk occurrences.

(6) Continue host plant (San Diego sedge), adult, larval, and hibernaculum surveys, and habitat assessments for Harbison's dun skipper that were

initiated in 2013 in the MSPA (see Table of Occurrences) to further document the butterfly's current distribution and population size, define habitat requirements, and assess habitat and threats at survey sites.

(7) For at least the first 3 years following a wildfire, monitor recovery of Harbison's dun skipper occurrences and habitat affected by fire and implement management actions identified by post-fire monitoring as necessary to protect and recover Harbison's dun skipper occurrences and habitat impacted by wildfire.

For details and the most up-to-date goals, objectives, and actions, go to the MSP Portal Harbison's Dun Skipper summary page: https://portal.sdmmp.com/view_species.php?taxaid=707282

Harbison's Dun Skipper References

Faulkner, D. K., and M. W. Klein. 2012. *Sensitive Butterflies of San Diego County, California*. San Diego, CA: FLITE Tours, Inc.

Marschalek, D., and D. Deutschman. 2015. *Initial Investigation of Critical Biological Uncertainties for Harbison's Dun Skipper (Euphyes Vestris Harbisoni) on Conserved Lands in San Diego County*. San Diego, CA.

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