

2.2 Quino Checkerspot Butterfly (*Euphydryas editha quino*) – Category SL

Management Units with Known Occurrences

Quino checkerspot butterfly was historically one of the most widespread and abundant butterfly species in coastal southern California, distributed from Los Angeles County south into northern Baja California, Mexico, and east into the inland valleys south of the Tehachapi Mountains (Mattoni et al. 1997; USFWS 2003). The species began declining in the 1920s, with steep declines in the 1970s, and is now restricted to several localities in San Diego and Riverside Counties and northern Baja California. Quino checkerspot occur in open shrubland and native grassland that support larval host plants such as dwarf plantain (*Plantago erecta*) and white snapdragon (*Antirrhinum coulterianum*), and diverse nectar sources for adults.

USFWS designated the following Recovery Units for Quino Checkerspot in San Diego County in 2003: South Riverside/North San Diego Recovery Unit, Southwest San Diego Recovery Unit, and Southeast San Diego Recovery Unit (USFWS 2003). The Southwest San Diego Recovery Unit and the South Riverside/North San Diego Recovery Unit occur within the MSPA. Each Recovery Unit contains identified occurrence complexes defined as estimated occupied areas based on habitat within 1 kilometer (0.6 mile) of recent [not defined] Quino checkerspot detections (USFWS 2003). Quino often display a metapopulation structure, so it is important to conserve temporarily unoccupied habitat for population resilience (USFWS 2009).

Known locations of Quino checkerspot in San Diego County are best compiled in SANBIOS (2012) and are derived from surveys conducted by consultants, butterfly enthusiasts, and agency personnel. Annual monitoring of Quino checkerspot occurrences is conducted by USFWS at reference sites in Riverside and San Diego Counties to assess host plant phenology, presence and growth of larvae, and the timing of the adult flight season. However, surveys are not conducted regularly in San Diego County and no county-wide occurrence monitoring data exists for this species. Quino checkerspot occurrences are known to fluctuate widely from year to year (USFWS 2003). Therefore, size of occurrences is not provided in the MSP tables.

Quino checkerspot has been detected in MUs 2, 3, 4, 6, 9, and 11 (see Table of Occurrences and online map: <http://arcg.is/2iBlmnQ>). MU2 has only one detection, from 2008, on Mission Trails Regional Park. "From the perspective of judging

whether an occurrence has been extirpated, it is important to know that a normally robust occurrence may generate no adults at all in a given year if poor environmental conditions preclude an adult flight period" (USFWS 2003).

Quino checkerspot has been detected at numerous locations in MU3 in the Southwest San Diego Recovery Unit (see Table of Occurrences). This MU contains a critical movement corridor in the Otay Lakes/Rancho Jamul occurrence complex area (USFWS 2003, 2009), which is thought to connect occurrences between Mexico to the south, San Vicente and Alpine to the north, and Dulzura to the east.

Quino checkerspot is also known to occur in MU4 at six preserves: Goodan Canyon and Sycamore Ranch Preserve, Mission Trails Regional Park, Monte Vista Ranch, San Vicente Open Space Preserve, San Vicente Reservoir Cornerstone Lands, and Sycamore Estates. In addition, the USFWS Recovery Plan and the USFWS 5-Year Review for *Euphydryas editha quino* mention occurrences found in the Miramar area. Populations within MU4 fall into the "Possible Future Central San Diego Recovery Unit" and are considered important for the recovery of Quino checkerspot (USFWS 2003).

The most recent record of Quino checkerspot in MU6 is from 1982 at Lake Hodges. Part of the South Riverside/North San Diego Recovery Unit (USFWS 2003) falls within MU9. There are several recent occurrences of Quino in MU9 on BLM, Cleveland National Forest, and Vista Irrigation lands.

Management Categorization Rationale

Quino checkerspot should be managed as a Species Management Focus Category SL Species due to a high risk of loss from Conserved Lands in the MSPA and because managing the general vegetation community alone will not ensure persistence of the species (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 Quino checkerspot butterfly faces a number of threats to persistence including urbanization leading to habitat loss and fragmentation, invasive nonnative plants, altered fire regimes, and overgrazing (Mattoni et al. 1997; Longcore et al. 2003; USFWS 2003, 2009). Invasive plant species reduce bare ground important for larval insolation and reduce native species, resulting in a loss of host and nectaring plants. An altered fire regime may not only cause direct mortality; it can also

increase invasion of nonnative plants. Nitrogen deposition is also contributing to an increase in invasive annual grasses associated with the decline of this species.

Habitat fragmentation disrupts connectivity between occurrences such that there is a lack of recolonization following local extinction. Other threats include multiple years of drought causing high rates of larval mortality and occurrence extinctions. Quino checkerspot could be increasingly vulnerable to prolonged and intense droughts predicted by climate change models (Parmesan 1996; Preston et al. 2012). Due to a warming, drier climate, checkerspot butterflies have already experienced shifts north and up in elevation since the early 20th century, a pattern that could continue with climate change (Parmesan 1996). Other threats include direct mortality from roads and human use of preserves that cause trampling of larvae and host plants and compaction of soils.

Management and Monitoring Approach

The overarching goal for Quino checkerspot is to protect, enhance, and restore occupied habitat and 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) Develop habitat suitability models for Quino checkerspot, host plants, and nectaring plants under current and future climate change scenarios, and conduct fire risk modeling with different management scenarios to identify potential climate and fire refugia. The results of this modeling will be used to inform development of monitoring and management plans.
- (2) Develop a section for nectaring forbs and host plants in the MSP Seed Collection, Banking, and Bulking Plan to enhance and restore habitat and begin implementing the plan.
- (3) Develop an interim 5-year Quino Checkerspot Management Plan that focuses on habitat enhancement and restoration and fire management, and includes the information from the MSP Seed Collection, Banking, and Bulking Plan for Quino checkerspot, at known occupied and historically occupied sites. Implement highest-priority management actions for Quino

checkerspot on Conserved Lands and monitor effectiveness of implementation.

- (4) Prepare a long-term Quino checkerspot metapopulation monitoring plan to track population distribution, abundance, and phenology, and to assess habitats and threats at Quino checkerspot occurrences (see Table of Occurrences), historically occupied sites, and unoccupied high suitability sites across Conserved Lands in the MSPA.
- (5) Conduct pilot monitoring to evaluate monitoring methodology and sampling design and locations, and prepare recommendations for any adjustments to the monitoring plan
- (6) Support existing efforts by the wildlife agencies to collect eggs and captive rear larvae to use in reestablishing and augmenting wild populations; use results to finalize the Quino Checkerspot Management and Monitoring Plan. Support the wildlife agencies' efforts to translocate captive bred larvae to historically occupied habitat and monitor effectiveness of translocation.
- (7) Implement invasive plant control and other post-fire management actions as needed to ensure the recovery of Quino checkerspot at sites occupied within the last 10 years to facilitate habitat recovery, particularly forbs and host plants 3 years after wildfire events.
- (8) For at least the first 3 years following a wildfire, monitor recovery of Quino checkerspot occurrences and habitat affected by fire.
- (9) Finalize the management plan with results from the captive rearing and translocation projects and combine with the monitoring plan to create a comprehensive Quino Checkerspot Management and Monitoring Plan.

For details and the most up-to-date goals, objectives, and actions, go to the MSP Portal Quino Checkerspot Butterfly summary page: https://portal.sdmmp.com/view_species.php?taxaid=779299

Quino Checkerspot References

- Longcore, T., D. D. Murphy, D. H. Deutschman, R. Redak, and R. N. Fisher. 2003. *A Management and Monitoring Plan for Quino Checkerspot Butterfly (Euphydryas Editha Quino) and Its Habitats in San Diego County, Advisory Report to the County of San Diego*. San Diego, CA.
- Mattoni, R., G. F. Pratt, T. R. Longcore, J. F. Emmel, and J. N. George. 1997. The Endangered Quino Checkerspot Butterfly, *Euphydryas Editha Quino* (Lepidoptera : Nymphalidae). *Journal of Research on the Lepidoptera* 34:99–118.
- Parmesan, C. 1996. Climate and Species' Range. *Nature* 382:765–66. DOI10.1038/382765a0.
- Preston, K. L., R. A. Redak, M. F. Allen, and J. T. Rotenberry. 2012. Changing Distribution Patterns of an Endangered Butterfly: Linking Local Extinction Patterns and Variable Habitat Relationships. *Biological Conservation* 152. Elsevier Ltd: 280–90. DOI:10.1016/j.biocon.2012.03.011.
- SANBIOS. 2012. Sensitive Species Sightings Geodatabase. <http://catalog.opensandiego.org/opendata/resource/3118/sanbios-ecology/>.
- USFWS (U.S. Fish and Wildlife Service). 2003. *Recovery Plan for the Quino Checkerspot Butterfly (Euphydryas Editha Quino)*. Portland, OR.
- USFWS. 2009. *Quino Checkerspot Butterfly (Euphydryas Editha Quino) 5-Year Review Summary and Evaluation*. Carlsbad, California.