Casey's June Beetle
(*Dinacoma Caseyi*)

5-Year Review:
Summary and Evaluation

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U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
Carlsbad, California

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5-YEAR REVIEW
Casey's June Beetle (*Dinacoma Caseyi*)

GENERAL INFORMATION

Species: Casey's June beetle, an invertebrate species
Date listed under the Endangered Species Act: September 22, 2011
Federal Register citation: Service 2011 (76 FR 58954–58997)
Classification: Endangered
Recovery Priority Number: 11C
Critical habitat: Service 2011 (76 FR 58954–58997)

Methodology Used to Complete the Review

In accordance with section 4(c)(2) of the Endangered Species Act (Act) of 1973, as amended, the purpose of a 5-year review is to assess each threatened species and endangered species to determine whether its status has changed, and it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service (Service) evaluated the biology and status of the Casey's June beetle as part of a Species Status Assessment (SSA) to inform this 5-year review.

The SSA report (Service 2024) represents our evaluation of the best available scientific information, including the resource needs and the current and future condition of the species. We developed three future scenarios that include a range of environmental and management conditions to discuss the viability of the species in the future. Independent peer reviewers and partner representatives reviewed the SSA report before we used it as the scientific basis to support our 5-year review analysis.

Federal Register Notice Announcing this Status Review: On August 17, 2023, we published a Federal Register notice announcing initiation of the 5-year review of this species, and the opening of a 60-day comment period to receive information (Service 2023, entire). No comments relative to the Casey's June beetle were received.

REVIEW ANALYSIS

Species Overview and Habitat

Casey's June beetle is a narrow endemic scarab beetle known only from the alluvial fans east of the Santa Rosa and San Jacinto Mountains of the Coachella Valley in the vicinity of Palm Springs, California. The species is between 0.56 to 0.70 inches [in; 1.4 to 1.8 centimeters (cm)] long (Evans and Hogue 2006, p. 111), with dusty brown or whitish coloring, and brown and cream longitudinal stripes on the elytra (wing covers and back) (Blaisdell 1930, p. 55; Bruyea 2006, p. 3). Pronounced sexual dimorphism is evident between the smaller, white-colored males and the larger, brown, wingless females. The majority of its life cycle is spent underground until it molts into an adult to breed in spring. The species lifespan is thought to be approximately

1 year (Hovore. 2003, p. 3; La Rue 2004, *in litt*.), with adults persisting for approximately 3 days (Harju 2021, p. 15).

Updated Information and Current Species Status

Distribution

A habitat suitability model was developed to quantify the species distribution including the amount and quality of suitable habitat. An occupancy-based GIS analysis was conducted that evaluated important habitat parameters (i.e., soil type, hydrology, and vegetation community) at all recorded observations, including new observations within the species core population along Tahquitz Creek and the confluence with Palm Canyon wash recorded since the last 5-year review in 2021 (Ronan *et al*. 2024, p. 26; Service 2024, p. 50, Appendix A). The current distribution is defined as suitable habitat within approximately 2,539 feet (ft) [774 meters (m)] of positive trap detections, the maximum male flight distance recorded (Service 2024, Table 7-4), and generally followed the elevation of the valley floor to the south and a maximum elevation of approximately 750 ft (229 m).

A total of 1,989 acres (ac) [805 hectares (ha)] of potentially suitable habitat was modeled to define the species current distribution of which 889 ac (360 ha) is considered high quality and 995 ac (403 ha) is of moderate quality (Service 2024, Figure 7-1). The modeling effort identified a much larger area of potential Casey's June beetle habitat compared to the estimate at listing [605 ac (245 ha)], though there has not been an actual increase in the amount of habitat (Service 2011, p. 58956). A substantial portion of newly defined suitable habitat occurs in the upper floodplain on Tribal land, that was not identified at listing; but includes the upstream portion of the floodplain and is important for the functionality of the alluvial fan ecosystem and beetle habitat throughout its range. The distribution of high-quality habitat generally mirrored the location of hydrological features. These results inform our understanding of the species current distribution but does not indicate that the species occupies all modeled habitat and some additional field investigations may be required.

Abundance

From 2016 to 2020, the Service conducted annual rangewide black light surveys for adult, male Casey's June beetle to characterize male population abundance and determine important environmental covariates across 18 trap locations in Palm Canyon Wash, Smoke Tree Ranch, and upper Tahquitz Creek, though not all traps were surveyed every year. Because capture numbers are correlated with survey effort, the data was standardized to include the sum of males captured during the 3 peak emergence survey dates per year (Service 2024, Table 7-3 and Figure 7-4). In 2019 all subsampled traps were surveyed, resulting in a total of 558 males captured in 9 traps, with the number captured per trap ranging from 3 to 148. Population density, number captured per survey area [4.6 ac (1.9 ha)], ranged from <1 to 37 males/ac (92 males/ha). These raw capture results provide a relative index of male abundance and density; but have not been corrected for detection probability (0.02-0.14) (Harju 2021, p. 11) and should not be interpreted as a population estimate.

Overall, there is spatiotemporal variability across the surveyed range, with some sites showing constant capture numbers while other sites are more variable. In general, higher capture numbers were recorded in the downstream portion of Palm Canyon Wash relative to upstream areas (Harju 2021, p. 13) and in the wash overall relative to the upland terrace at Smoke Tree Ranch. The highest capture rates were observed at the most downstream areas surveyed (Traps 9 and 10; Service 2024, Figure 7-3) with 95 to 280 males captured per year, and densities ranging from 20 to 60 males/ac (52 to 149 males/ha). This area corresponds to a curve in the Palm Canyon Wash channel associated with a large area of sediment deposition and mature desert riparian habitat. Upper Tahquitz Creek is substantially narrower and more disturbed than Palm Canyon Wash and densities are moderate ranging from 3 to 15 males/ac (8 to 36 males/ha). Lower abundance, less than 20 males captured per year, was observed at the traps furthest upstream (Traps 1, 2, and 3) in Palm Canyon Wash, and on the upland terrace (Traps 13 and 14) within Smoke Tree Ranch, with 4 or less males per acre (11 males/ha). These areas are typically not subject to flood control maintenance activities and are hydrologically disconnected from the active channel. Vegetation along upper Tahquitz Creek is a mix of ornamental plantings and native trees and shrubs. Smoke Tree Ranch is dominated by desert scrub.

Estimates of Male Movement

Males are primarily responsible for genetic mixing and dispersal within the one known extant population because they fly and can travel considerable distances. It is unlikely that the flightless females contribute to genetic mixing. The Service conducted a mark-recapture study in 2016 to 2022 to evaluate male Casey's June beetle flight distances and movements among traps. Individual traps in Palm Canyon Wash and upper Tahquitz Creek were positioned 1,640 ft (500 m) apart and marked beetles were released at 131ft (40 m), 328 ft (100 m), and 820 feet (250 m) intervals from the trap location. Individual traps in the lower Tahquitz Creek golf course were placed 820 ft (250 m) apart and marked beetles were released at 130 ft (40 m) and 328 ft (100 m). Their subsequent movements were recorded if they were observed at black light traps that same or subsequent evening. Recaptured males were documented to travel a median distance of 131 ft (40 m) to black light traps and up to a maximum documented distance of 2,539 ft (774 m) within a single evening, including all trap locations (Ronan *et al*. 2024, p. 67; Service 2024, Table 7-4). The flight distances of males recaptured at traps are a function of light attraction and capture probability and while they provide information about movement of individuals, they are not an absolute measure of dispersal. Unconstrained by the attraction to black light traps and habitat connectivity, males have the potential to move, at a minimum, these distances each night of their approximate 3-day lifespan searching for females. Based on the results of the same study, between 3.5 and 6.8 percent of the individuals captured and marked were recaptured in the same evening; these results suggest that the majority of the individuals either move outside of the sampling area or burrow back into the ground if released later in the evening.

Threats

The 2011 listing rule and 2021 5-year review discussed potential threats to Casey's June beetle from: (1) destruction, modification, and fragmentation of habitat; (2) loss of individuals due to soil disturbance; (3) increased intensity and frequency of catastrophic flood events;

(4) environmental affects resulting from climate change; and (5) loss of individuals due to attraction to artificial light sources (Service 2011, entire; 2021, pp. 4–7). In the SSA Report, we evaluated threats impacting Casey's June beetle and their habitat as a result of habitat loss and fragmentation (Factor A), altered hydrology (Factor A), soil disturbance (Factor A), artificial light sources (Factor A and E), drought and increased temperatures (Factor A and E) and the increased risk of wildfire (Factor A and E; Service 2024, pp. 30–49). Predation (Factor C) and pesticides (Factor E) are potential threats that were not carried forward in the analysis because they are not major drivers of population resiliency.

The level of threat analyzed in the 2021 5-year review is similar to the analysis completed in the SSA report and summarized in Table 1 below (Service 2021, pp. 4–7; 2024, pp. 30–48). Habitat loss and fragmentation continues to be the highest magnitude threat. Altered hydrology, artificial light, and the effects of climate change including drought, increased temperatures, and increased risk of wildfire are moderate magnitude threats that are on-going with moderate intensity that is likely to affect individuals and habitat across the species' range. Soil disturbance is a low magnitude threat overall, though localized impacts at homeless encampments can be high, particularly when they occur in the wash during the breeding season.

Table 1. Summary of current threats acting on Casey's June beetle.[1,2]

Threat	Scope	Likelihood	Immediacy	Intensity	Overall Magnitude
Habitat Loss and Fragmentation	High	Very likely	On-going	Severe	High
Altered Hydrology	Moderate	Very likely	On-going	Moderate[3]	Moderate
Soil disturbance	Localized	Very likely	On-going	Weak[3]	Low
Artificial Light	Moderate	Very likely	On-going	Moderate[3]	Moderate
Drought and Increased Temperatures	Pervasive	Very likely	On-going	Moderate[3]	Moderate
Increased Wildfire	Moderate	High	Imminent	Moderate-Strong	Moderate
Predation	Pervasive	Low	On-going	Weak[3]	Low
Pesticides	Localized	Low	On-going	Negligible[3]	Low

[1] Scope - spatial extent of threat within the context of the species' range (localized, moderate, high, or pervasive). Likelihood-probability that the stressor will impact the species in the foreseeable future [not likely (0 percent), low (1-25 percent), medium (26-50 percent), high (51-75 percent) or very likely (76-100 percent)]. Immediacy-time frame of the threat (ongoing, past, imminent, or future). Intensity-magnitude of the impact on the species (negligible, weak, moderate, strong, or severe).
[2] Service 2024, Table 6-2.
[3] Highlights threats with a high degree of uncertainty.

The main development since the last 5-year review is the finalization of the programmatic consultation addressing the Riverside County Flood Control and Water Conservation District operations and maintenance activities in Palm Canyon Wash, Tahquitz Creek, Whitewater River and at the Eagle Canyon Dam. The programmatic biological opinion includes conservation

measures to offset impacts to the beetle due to future sediment removal, and maintenance activities (e.g., water quality measures, worker education, working outside of the flight season, limiting permanent lighting, avoiding mature vegetation, burying woody vegetation to provide a food resource for beetle larvae, funding monitoring research, habitat mitigation, conservation acquisition and other recovery actions), thereby minimizing and mitigating future impacts (Service 2023, pp. 4–12).

Conservation

A total of 350 ac (142 ha) within the species current distribution is preserved within suitable habitat in perpetuity or are planned to be conserved through a conservation easement or deed restriction in the immediate future, compared to 267 ac (108 ha) reported in the last 5-year review (Service 2021, p. 7; 2024, p. 46). The Oswit Land Trust has secured the 125-ac (50 ha) Prescott Preserve located at the former Mesquite Golf course. The middle reach of Tahquitz Creek that flows through Prescott Preserve supports suitable habitat for Casey's June beetle that will be restored. Additionally, approximately 10 ac (4 ha) of the Tahquitz Creek Golf Resort is being removed from golf activities and will be restored for Casey's June beetle in association with the Coachella Valley Link Project. The habitat restoration is in the planning phases, and the conservation easement is nearing finalization therefore the area has been included in the acreage conserved.

Under the pressure of these threats, condition categories were developed in the SSA to describe current population resiliency. High resiliency indicates that all population needs are clearly met. Medium resiliency means some population needs may be minimally present and low resiliency means that one or more population needs were not met. The Palm Canyon Wash floodplain is considered to have moderate to high resiliency (Service 2024, p. 65). The population's habitat and demographic needs including the availability of suitable habitat, abundance, and connectivity are moderate to moderate/high condition. The population represents the current and historical core of the species distribution. The alluvial processes are still intact, though modified due to the existing flood levee system within the Palm Canyon Wash channel and Tahquitz Creek. In addition to the conservation described above, 821 ac (332 ha) or 41 percent of the species current distribution is identified as either Tribal Reserve or open space within the Tribal Habitat Conservation Plan (HELIX 2010, entire) and City of Palm Springs zoning designations. In total, the threat of habitat loss is reduced over approximately 60 percent of the species current distribution.

CONCLUSION

Casey's June beetle is currently distributed among a single population including 1,989 ac (805 ha) of potentially suitable habitat. The population represents the current and historical core of the species distribution. The amount and quality of suitable habitat, along with recent research on species abundance and estimates of male movement informed our assessment of current population resiliency in the SSA (Service 2024, pp. 64–65). We consider Casey's June beetle to have moderate to high population resiliency considering the current range and magnitude of threats acting on the species. However, there is still the need for habitat conservation and

monitoring is required to determine the effectiveness of proposed restoration efforts to ensure that the species will be viable in the future.

Based on the evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and analysis presented in the 2024 SSA, we believe that Casey's June beetle remains an endangered species (Service 2024, entire). We acknowledge that considerable conservation efforts have been implemented by our partners and that much of the upstream portion of the species range is being managed in a way that benefits the species long term conservation. Should the level of management and restoration be implemented as projected, downlisting may be considered in the future.

RECOMMENDATIONS FOR FUTURE ACTIONS

The recommended actions listed below are to be initiated over the next 5 years. Successful implementation of these actions will reduce threats to the Casey's June beetle and provide information to better understand the biological and physical factors limiting the population growth and distribution. We recognize that conservation of this species will require cooperation and coordination with partners to minimize impacts from current threats and aid with future restoration efforts.

1. Protect the existing population, occupied habitat, and suitable habitat through acquisition (for example, Traditional Section 6), conservation easements, management in perpetuity, and cooperative planning with stakeholders.

2. Continue to monitor and document potential threats where Casey's June beetle occurs.

3. Develop a comprehensive re-introduction and restoration plan including identifying current sites suitable for reintroduction or augmentation, prioritize areas for restoration, develop habitat restoration and creation techniques, and investigate techniques to translocate Casey's June beetle.

4. Expand the current distribution within unoccupied areas of Tahquitz Creek and Palm Canyon Wash by restoring areas that are currently dominated by grass and ornamental vegetation.

5. Coordinate with local partners and land managers to educate the public on the impacts of recreational activities on beetles during the mating season.

6. Initiate activities to abate threats related to unauthorized off-highway vehicle use in Palm Canyon Wash.

7. Continue research to further our understanding of life history strategies such as development requirements for immature stages to help better characterize potential habitat.

8. Develop research to better characterize the effects of flood events on the beetle.

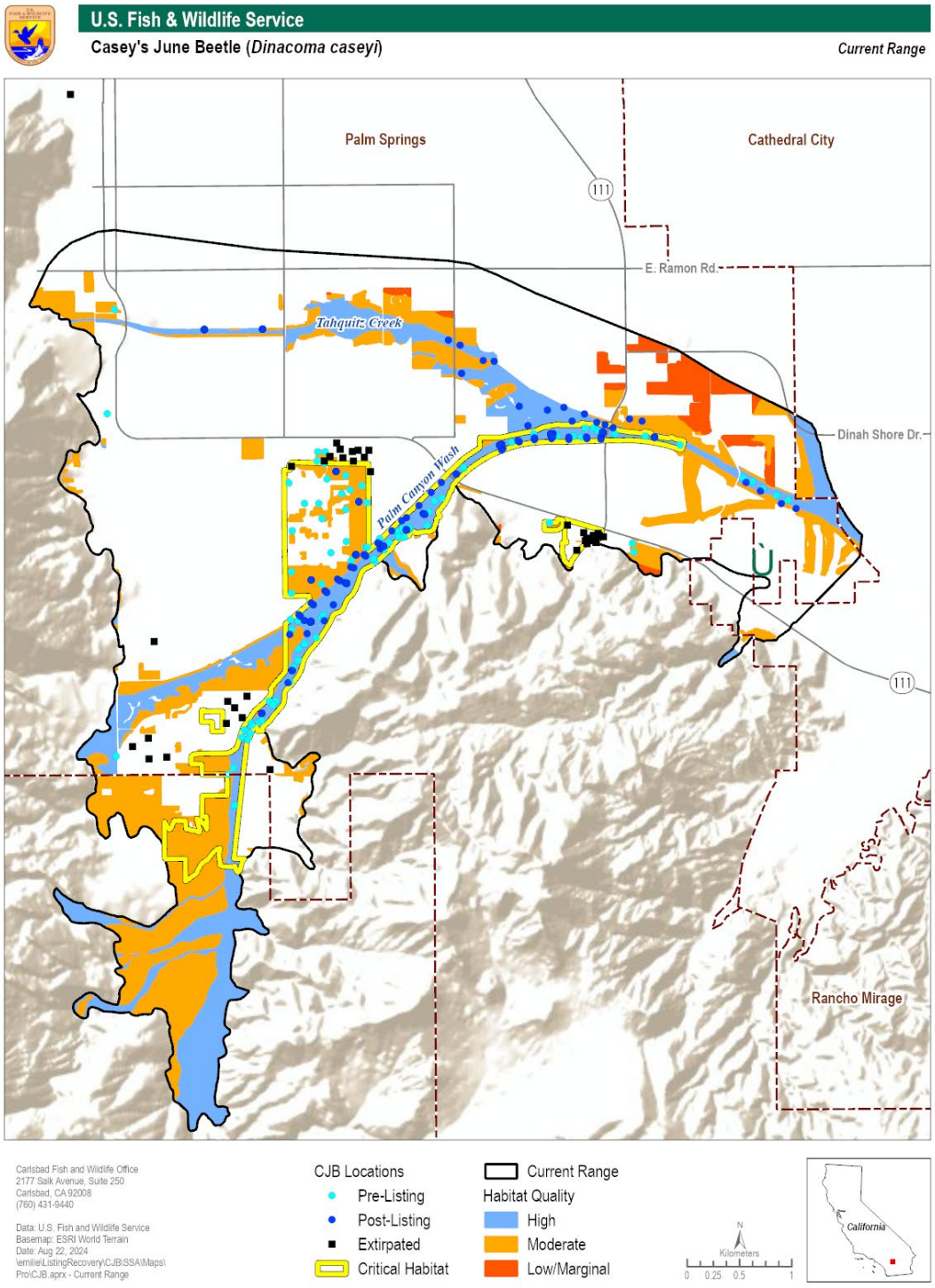

Figure 1. Map of Casey's June beetle's current range and distribution (1,989 ac; 805 ha) based on a habitat suitability model.[1]

[1] Low quality habitat currently provides marginal habitat and identifies areas for future habitat restoration.

REFERENCES

Blaisdell, F.E. 1930. Revision of the genus and species of Dinacoma with description of a new species (Coleoptera: Scarabaeidae). Pan-Pacific Entomologist 6: pp. 171–177.

Bruyea, G.P. 2006. Casey's June beetle (*Dinacoma caseyi*) Focused Survey and Technical Report for the Palm Springs MDP Line 41. Riverside County, California. Prepared for Helix Environmental Planning, Inc. 22 pp.

Evans, A.V. and J.N. Hougue. 2006. Field Guide to Beetles of California. California Natural History Guides.: University of California Press, 334 p.

Harju, S. 2021. Prepared for U.S. Fish and Wildlife Service, Palm Springs, California and Dudek, Encinitas, California. Casey's June Beetle Population Analyses, Factors affecting emergence and relative abundance. 20 pp.

[HELIX] HELIX Environmental Planning. 2010. Tribal Habitat Conservation Plan. Prepared for Agua Caliente Band of Cahuilla Indians. Dated August 2010. 606 pp.

Hovore, F. 2003. Prepared for Krieger & Stewart, Inc. Report of focused surveys for Casey's June beetle: Smoketree Ranch and vicinity. 10 pp.

La Rue, D. 2004. Dated 2004. Subject: Email from Delbert La Rue to David Wright.

Ronan, N.A., K.H. Osborne, and C.J Gregory. 2024. Determining and Measuring Environmental Influences on the Distribution and Abundance of Casey's June beetle (*Dinacoma caseyi*) 2015-2022. U.S. Fish and Wildlife Service. 152 pgs.

[Service] U.S. Fish and Wildlife Service. 2024. Species Status Assessment Report for Casey's June beetle (*Dinacoma caseyi*) Prepared by the Carlsbad Fish and Wildlife Office. 110 pgs.

[Service] U.S. Fish and Wildlife Service. 2023. Formal Section 7 Consultation for Emergency Authorization for Sediment Removal and Levee Repair in Palm Canyon Wash and Programmatic Consultation for Future Flood Control Facility Maintenance Activities in Palm Canyon Wash, Tahquitz Creek, Whitewater River, and Eagle Canyon Dam, City of Palm Springs and Cathedral City, Riverside County, California (SPL-2020-00101-JEM).

[Service] U.S. Fish and Wildlife Service. 2023. Endangered and Threatened Wildlife and Plants; Initiation of 5-year Status Reviews of 47 Species in California, Nevada, and the Klamath Basin of Oregon; August 17, 2023. Federal Register 88:56042–56044.

[Service] U.S. Fish and Wildlife Service. 2021. 5-year Review for Casey's June beetle (*Dinacoma caseyi*). Prepared by the Carlsbad Fish and Wildlife Office. 12 pgs.

[Service] U.S. Fish and Wildlife Service. 2011. Endangered and threatened wildlife and plants; Determination of Endangered Status for Casey's June beetle and Designation of Critical habitat; Final Rule. Federal Register 76:58954–58998.

FIELD OFFICE APPROVAL

Lead Field Supervisor, Fish and Wildlife Service

☒ Approved

SCOTT SOBIECH

Digitally signed by SCOTT SOBIECH
Date: 2024.08.26 08:26:19 -07'00'

Scott A. Sobiech
Field Supervisor