Mount Charleston blue butterfly
(Icaricia (Plebejus) shasta charlestonensis)

5-Year Review:
Summary and Evaluation

Photos of male (left) and female (right) Mount Charleston blue butterflies courtesy of Corey Kallstrom, U.S. Fish and Wildlife Service.

U.S. Fish and Wildlife Service
Pacific Southwest Region
Southern Nevada Fish and Wildlife Office
Las Vegas, Nevada
March 27, 2024

5-YEAR REVIEW

Species reviewed: Mount Charleston blue butterfly (*Icaricia* (*Plebejus*) *shasta charlestonensis*)

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5-YEAR REVIEW

Mount Charleston blue butterfly / *Icaricia shasta charlestonensis*

GENERAL INFORMATION

Species: *Icaricia (Plebejus) shasta charlestonensis*

Date listed: October 21, 2013

FR citation(s): 78 FR 57750. Genus revised from *Plebejus* to *Icaricia*, 80 FR 37404.

Classification: endangered species

Critical habitat: 80 FR 37404

Methodology used to complete the review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), 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 (USFWS), evaluated the biology and status of the Mount Charleston blue butterfly as part of a biological report (USFWS 2023a) to inform the Recovery Implementation Strategy (USFWS 2023b) and Recovery Plan (USFWS 2023c) for the species and subsequently this 5-year review. The biological report was peer and partner reviewed and used as the scientific basis to support the recovery criteria and 5-year review decision-making process. This 5-year review was conducted by the Southern Nevada Fish and Wildlife Office and the most current information was incorporated as available.

FR Notice citation announcing the species is under active review: 86 FR 27462

REVIEW ANALYSIS

In this section, we review the recovery plan downlisting and delisting criteria and summarize progress towards accomplishing them.

Recovery Plan:

USFWS. 2023. Recovery Plan for Mount Charleston blue butterfly (*Icaricia shasta charlestonensis*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. iv + 7 pp.

Recovery Criteria

Downlisting

a. Known occupied locations from the time of listing (i.e., Bonanza Trail[1], South Loop Trail, and Lee Canyon Ski Area) persist as known occupied or are replaced by other known occupied locations. (Factor E)
b. At least two additional known occupied locations are discovered, or habitat is augmented or established, and subsequently colonized so that it can be categorized as known occupied, bringing the total number of known occupied locations to at least five. This criterion will increase redundancy by replacing the majority of locations that have a historically documented and consistent butterfly presence (e.g., Foxtail, Lee Meadow, and Old Town) but which are now unoccupied. (Factors A and E)
c. Occupied (including newly established or discovered) sites are monitored and adaptively managed to ensure their protection into the future.
    i. A habitat improvement plan prescription (Thompson and Abella 2016) has been completed and is being implemented by the Forest Service, in cooperation with USFWS, to manage recreational uses, reduce or minimize impacts from feral horses, and enhance habitat for populations at the following locations located in the Lee Canyon area: Gary Abbott; Bristlecone Trail; and Bonanza Trail. (Factor A)
    ii. A habitat improvement plan prescription (Thompson and Abella 2016) has been completed and is being implemented by the Forest Service, in cooperation with the USFWS, to manage recreational uses, remove impacts from feral horses, and enhance and restore habitat for populations at the Lee Canyon Ski Area and Lower Parking locations. (Factor A)
d. Standards that protect the Mount Charleston blue butterfly and its habitat are incorporated into the Forest Service Land and Resource Plan for the Spring Mountains National Recreation Area. (Factor D)

Delisting

a. At least four additional known occupied locations are discovered, or habitat is augmented or established, and subsequently colonized at four additional locations so that it can be categorized as known occupied, bringing the total number of known occupied locations to at least seven. (Factors A and E). Having seven known occupied locations will provide sufficient redundancy to allow the species to withstand potential catastrophic events that could impact multiple populations, such as fire or extreme drought.
    i. At least five of the seven known occupied locations are within the estimated dispersal distance of another known occupied location. (Factors A and E)
b. Habitat at seven known occupied sites is managed successfully such that threats to habitat have been reduced or removed through active implementation of management plans to support Mount Charleston blue butterflies. (Factors A and E).

[1] The 2023 recovery plan inadvertently omits the word "Trail" in the first reference to this location of the recovery plan.

The recovery criteria for the Mount Charleston blue butterfly have not been met although some criteria have been completed (Table 1). The known occupied locations of Bonanza Trail, South Loop Trail and Lee Canyon locations have persisted as known occupied and five additional known occupied locations have been discovered, meeting two of four and one of two downlisting and delisting criteria respectively (USFWS 2013 p. 57752, 2023a p. 12). Plans have been prepared by the Forest Service, reviewed by the USFWS, to manage recreational uses, and reduce or minimize impacts from feral horses, and enhance habitat for populations in the Lee Canyon area which include Gary Abbott, Bristlecone Trail, and Bonanza Trail locations (USFWS 2022 entire, 2023d entire) but have not been implemented and completed.

TABLE 1. MOUNT CHARLESTON BLUE BUTTERFLY RECOVERY CRITERIA STATUS SUMMARY.

Recovery Criteria	Status	Summary Status Description
Downlisting	Not Met	
a.	Complete	Since the time of listing the Bonanza Trail, South Loop Trail, and Lee Canyon locations have persisted as known occupied. (Factor E)
b.	Complete	Two of two required additional known occupied locations have been discovered. (Factors A and E)
c. and d.	Incomplete	Plans by the Forest Service, reviewed by the USFWS, for actions that would reduce threats from recreation and feral horses and burros have been prepared but have not been implemented and completed. (Factor A)
d.	Incomplete	Standards that protect the Mount Charleston blue butterfly and its habitat have not been incorporated into the Forest Service Land and Resource Management Plan for the Spring Mountains National Recreation Area. (Factor D)
Delisting	Not Met	
a. and i.	Complete	Since the time of listing, four required additional known occupied locations have been discovered. At least five of the seven known occupied locations are within the estimated dispersal distance of another known occupied location. (Factors A and E)
b.	Incomplete	Threats to habitat have not been reduced or removed through active implementation of management plans. (Factors A and E)

The Forest Service has developed and received concurrence from the USFWS for an informal consultation on the Autecology Phase IV – Lee Canyon Butterfly Habitat Protection and Restoration Project to improve habitat at locations in Lee Canyon (USFWS 2023d entire). Project treatment units include areas near the Gary Abbott (Abbott), and Lee Canyon Ski Area (Snowmaking Pond and Chair 5) (USFWS 2023d p. 6). The project includes components to address impacts to habitat from recreation and enhance habitat (USFWS 2023d entire). The project has not been implemented and completed.

The Forest Service has developed the Spring Mountains Wild Horse and Burro Complex Herd Management Area Plan Project (HMAP), which includes the removal of feral (wild) horses (*Equus ferus*) and burros (*Equus asinus*) (WHBs) in Lee Canyon for which the USFWS issued a biological opinion on July 22, 2022 (USFWS 2022 entire). The project would establish and/or adjust the Appropriate Management Level for feral horses and burros in the Spring Mountains (USFWS 2023d pp. 5–7). The Forest Service and USFWS expect that after the removal of WHBs there will be a long-term positive effect to the reproduction, numbers, distribution, effect

on recovery, and critical habitat of Mount Charleston blue butterfly as a result of the proposed action reducing impacts of the threat (USFWS 2023d p. 29). The HMAP been completed but actions to remove WHBs from areas influencing Mount Charleston blue butterfly have not been implemented and completed.

Standards that protect the Mount Charleston blue butterfly and its habitat have not been developed and incorporated into the Forest Service Land and Resource Management Plan for the Spring Mountains National Recreation Area.

Updated Information and Current Species Status

In this section, we summarize new information and analyses of the Mount Charleston blue butterfly.

Biology and Habitat:

Since the Mount Charleston blue butterfly was listed, there have been discoveries of new habitat, including occupied areas, which increases the total number of locations to 18 (Table 2 and Figure 1). Four new locations include the McFarland and Bonanza Peaks Ridge (Thompson 2018 p. 2), Wallace Canyon Ridge (Thompson 2022 p. 5), Sisters South – West Ridge (Thompson 2022 p. 5), and Sisters North – Mack's Canyon, described as Mack's Canyon (north of the Sisters) in Gulley (2024b entire). Habitat within the Carpenter 1 Fire area of the South Loop Trail location has recovered, improved, and expanded (Thompson 2024 entire). Thompson (2022 pp. 20–21, 63–66, and 104) described a new patch of habitat, Griffith Peak – South Ridge, which we include with the Griffith Peak location. There are currently eight known occupied, seven presumed occupied, and three presumed extirpated locations. There has been a lack of detections at the Griffith Peak and North Loop Trail locations, and they may potentially be classified as presumed extirpated with more consistent surveys in the future. Three of the four new locations are outside of the three designated critical habitat units (CHU).

Recent genetic analysis with nuclear DNA by Tovar (2023) of Mount Charleston blue butterflies indicate structure among locations within the Spring Mountains. Note that these analysis contradict with those using mitochondrial DNA where no differentiation or structure was observed (Thompson 2022 p. 101, Tovar 2023 pp. 36–37). The South Loop Trail location was the most genetically differentiated likely as a result of its isolation from other locations in which movement to or from this location may be restricted by long distances between patches of habitat (Tovar 2023 p. 34 and 39) as well as phenological disparity due to elevational differences. Genetic data suggests that there are movements of individuals between locations in the Lee Canyon area including the Bonanza Trail, Lee Canyon Ski Area, and Sister South – West Ridge (Tovar 2023 p. 39).

Genetic structures and parameters support the inference that movements of Mount Charleston blue butterfly individuals, in the Upper Lee Canyon area, occurs primarily in a unidirectional manner from higher to lower elevation locations such that colonization or recolonization of the latter occurs from the former (Tovar 2023 pp. 41–42). This may also suggest that the reappearance of Mount Charleston blue butterflies in locations where it hasn't been observed for many years (presumed occupied) could largely be the result of immigration rather than from hold-over larvae in extended diapause.

Tovar (2023 p. 37) did not observe any evidence that there has been a loss of genetic diversity in the Mount Charleston blue butterfly. The likelihood for genetic intermixing among locations and

populations becomes most readily apparent during years, such as 2019, of high abundance when individuals are observed across broad areas and in areas where they haven't been observed in numerous years (Thompson 2022 p. 97).

TABLE 2. LOCATIONS AT WHICH THE MOUNT CHARLESTON BLUE BUTTERFLY HAS BEEN DETECTED SINCE 1928, AND THE STATUS OF THE BUTTERFLY AT THOSE LOCATIONS.

Location ID and Name [1]		First/Last Year Detected	Most Recent Survey Year [2]	Status [3]	Critical Habitat Unit
1	South Loop Trail	1928/2023	2023	Known occupied	**1**
2	Lee Canyon Ski Area	1963/2023	2023	Known occupied	**2**
3	Foxtail	1995/2021	2021	Known occupied	**2**
4	Gary Abbott	1995/2017	2021	Presumed occupied	**2**
5	Lower Parking	1995/2023	2023	Presumed occupied	**2**
6	North Loop Trail	1995/1995	2023	Presumed occupied	**3**
7	Lee Meadows	1965/2020	2021	Presumed occupied	**2**
8	Bristlecone Trail	1990/2021	2021	Known occupied	**2**
9	Bonanza Trail	1995/2021	2021	Known occupied	**2**
10	Upper Bristlecone Trailhead	1963/1922	2022	Known occupied	**2**
11	Cathedral Rock	1972/1972	2012	Presumed extirpated	
12	Old Town	1965/1972	2012	Presumed extirpated	
13	Deer Creek	1950/1950	2012	Presumed extirpated	
14	Griffith Peak	1995/1995	2023	Presumed occupied	**1**
15*	McFarland and Bonanza Peaks Ridge	2016/2021	2021	Known occupied	
16*	Wallace Canyon Ridge	2019/2021	2021	Presumed occupied	
17*	Sisters South – West Ridge	2020/2023	2023	Known occupied	**2**
18*	Sisters North – Mack's Canyon	2023/2023	2023	Presumed occupied	

* New location since listing.

[1] See Appendix A (USFWS 2023a) in the species biological report for cross-referencing location names with listing documents and background information.

[2] Survey effort may vary and may have been inadequate or improperly timed in some years to provide an indication of the species absence.

[3] Species status at each location is defined as follows: known occupied = locations where habitat is present and the Mount Charleston blue butterfly has been observed through formal surveys or informal observation within two successive years; presumed occupied = locations where habitat is present until it can be demonstrated as presumed extirpated as described below; and presumed extirpated = locations where the Mount Charleston blue butterfly has not been recorded through formal surveys or informal observation for more than 20 years and habitat (as defined in the critical habitat designation) is not present. Formal surveys following USFWS-approved protocol must have occurred for at least 6 consecutive years with no detections.

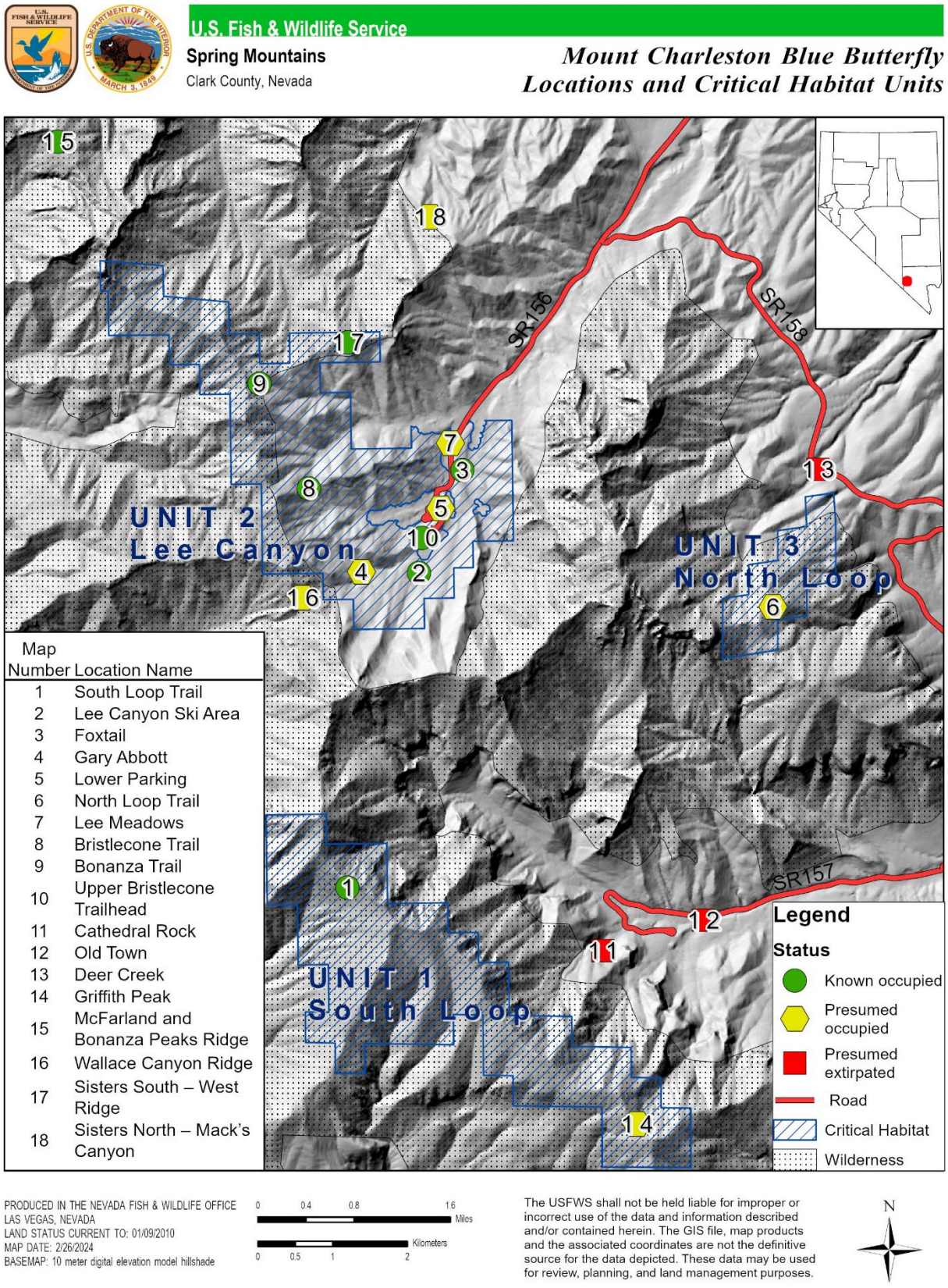

FIGURE 1. MOUNT CHARLESTON BLUE BUTTERFLY LOCATIONS, STATUS, AND CRITICAL HABITAT UNITS .

Threats Analysis (threats, conservation measures, and regulatory mechanisms):

The Mount Charleston blue butterfly and critical habitat are threatened by loss and degradation of habitat due to changes in natural fire regimes and succession (Factor A); implementation of recreational development projects and fuels reduction projects (Factor A and D); increases of nonnative plants (Factor A); and the exacerbation of other threats from the impacts of climate, which is anticipated to increase drought and extreme precipitation events change (Factor E) (USFWS 2015 pp. 37418–37419). In addition to these threats, feral horses present an additional threat by causing the loss and degradation of habitat (Factor A) resulting from trampling of host and nectar plants as well as the direct mortality of Mount Charleston blue butterfly where it is present (Boyd and Murphy 2008 p. 7 and 27, Andrew et al. 2013 p. 42, and 52–54, Thompson et al. 2014 pp. 150–152, and 281, Thompson 2018 pp. 7, 46, 47–48, and 69–70, 2022 pp. 58-59,103-105). Impacts from horses to Mount Charleston blue butterfly should not be occurring based on current management direction (Gulley 2022, USFS and BLM 2022 entire). The USFWS identified feral horses as a threat in addition to threats identified in the final listing rule for the Mount Charleston blue butterfly (USFWS 2015 p. 37420). Wild horse activities that may affect Mount Charleston blue butterfly locations are most prevalent within CHU 2. Table **3** summarizes historic wild horse activity that may affect Mount Charleston blue butterfly and critical habitat as reported by (Thompson 2022 p. 104).

TABLE 3. HISTORIC WILD HORSE ACTIVITY REPORTED BY THOMPSON (2022) FOR MOUNT CHARLESTON BLUE BUTTERFLY LOCATIONS AND CRITICAL HABITAT UNITS.

Number	Location Name	Historic Wild Horse and Burro Activity[1]	Critical Habitat
1	South Loop Trail	none* - low	1
2	Lee Canyon Ski Area	high	2
3	Foxtail	low	2
4	Gary Abbott	high	2
5	Lower Parking	medium	2
6	North Loop Trail	low	3
7	Lee Meadow	high	2
8	Bristlecone Trail	none* - low	2
9	Bonanza Trail	high	2
10	Upper Bristlecone Trailhead	none* - med.	2
11	Cathedral Rock		
12	Old Town		
13	Deer Creek		
14	Griffith Peak	none	1
15	McFarland and Bonanza Peaks	none* - med.	
16	Wallace Canyon Ridge	high	
17	Sisters South – West Ridge	none* - low	2
18	Sisters North – Mack's Canyon		

[1] Table 21 in Thompson 2022. * = No report of feral horse activity discussion of threats or habitats in text prior to Table 21 in Thompson 2022.

In our listing of the Mount Charleston blue butterfly we identified the potential for the exacerbation of threats by drought and extreme precipitation (Factor E) events potentially related to climate change (USFWS 2013 p. 57750, and 57771–57773). Extreme weather events have caused population extirpations and range shifts of other butterfly species (Parmesan et al. 2000 p. 444). Recent storm events in the Spring Mountains may have threatened areas occupied by Mount Charleston blue butterfly.

In August 2023, Tropical Storm Hillary caused record breaking rainfall, extreme wind events, and drastic temperature reductions in the Spring Mountains which may have influenced the Mount Charleston blue butterfly rangewide. Though the storm relieved aspects of drought effects in the Spring Mountains (Simeral and Bilotta 2023) (NRCS 2023 p. 9) there were other weather related phenomena that occurred which may influence the Mount Charleston blue butterfly.

Site specific information as it relates to the Mount Charleston blue butterfly is lacking; however, the extreme weather conditions and related events resulting from Tropical Storm Hilary occurred throughout the Spring Mountains and intensities were recorded. Extreme winds caused by Tropical Storm Hilary reached a maximum magnitude of 82 knots (82 miles/hour, 131 kilometer/hour) recorded 3 miles NE of Mount Charleston, bringing damaging winds and severe flash flooding (NOAA 2023). Precipitation from the storm was nearly double the 30-year normal (Figure 2). There was an astonishing record high of 9.7 inches of precipitation recorded at the Bristlecone Trail snow telemetry (SNOTEL) site between August 20-21, 2023 (Simeral and Bilotta 2023). Precipitation caused soil moisture to increase dramatically at all depths and was particularly notable at depths of 20 in (51 cm) and 40 in (102 cm) at the Kyle Canyon system for convection analysis and nowcasting (SCAN) site (Simeral and Bilotta 2023) (NRCS 2023 p. 13). Provisional data modeled projections indicate that temperatures may have decreased 10 °F rangewide during the week (8/17/2023 – 8/23/2023) when Tropical Storm Hilary occurred (NRCS 2023 p. 6 Source: Regional Climate Centers). An increasing frequency and magnitude of weather extreme events potentially influenced by climate change (Factor E) (Ummenhofer and Meehl 2017 entire, Robinson 2021 entire), such as Tropical Storm Hilary, could impact and threaten the Mount Charleston blue butterfly and its habitat. However, surveys were not performed in 2023 after the storm to determine the status of habitat but are planned for 2024 (Gulley 2024a entire).

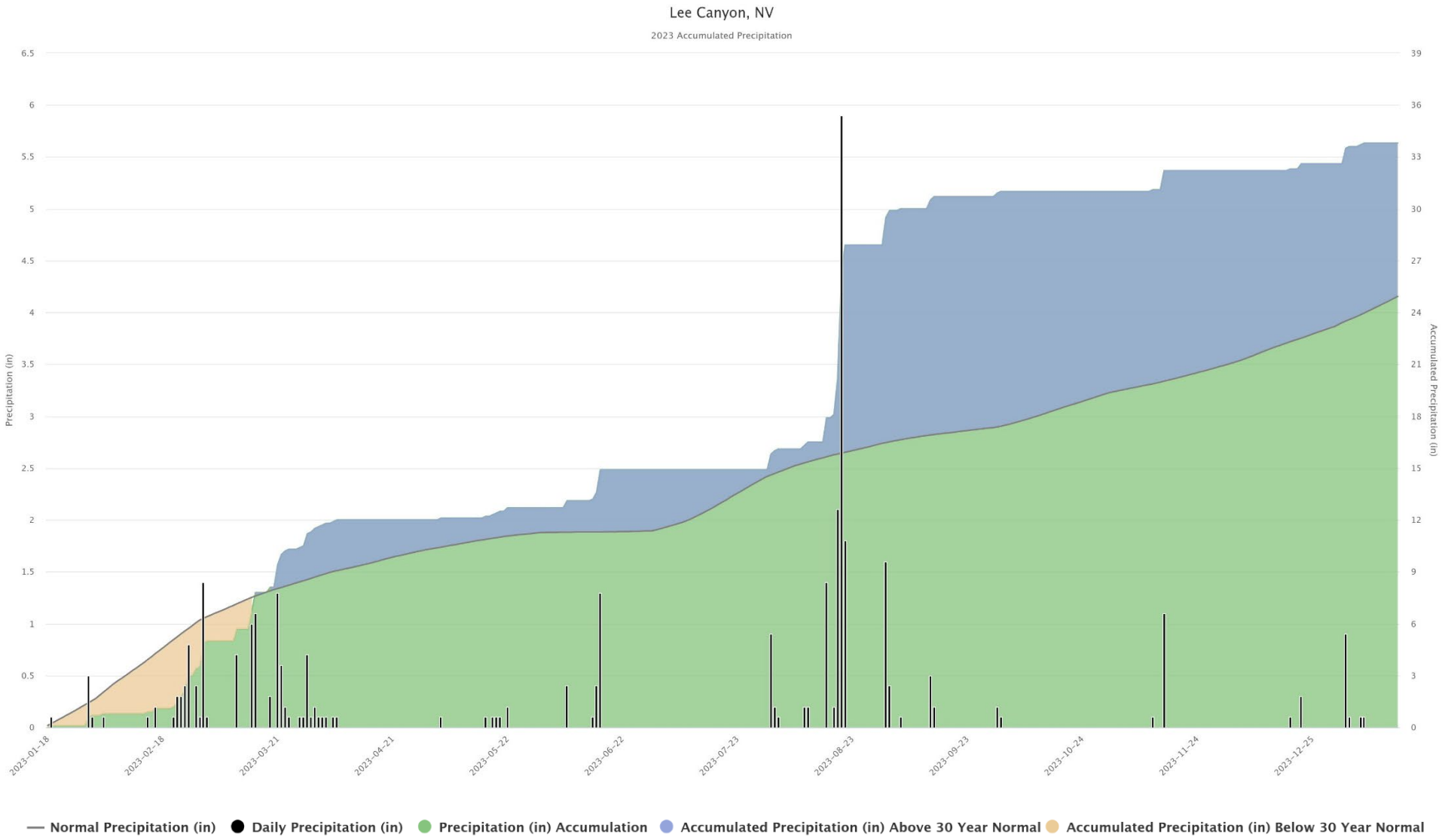

FIGURE 2. PRECIPITATION MEASURED IN LEE CANYON, NV DURING 2023. HIGH PLAINS REGIONAL CLIMATE CENTER. 2020. STATION TOOL. ACCESSED 18 JANUARY, 2024, HTTPS://HPRCC.UNL.EDU/MAPS.PHP?MAP=ACISCLIMATEMAPS.

Synthesis

The criteria for downlisting or delisting the Mount Charleston blue butterfly have not been fully met but progress has been made towards increasing knowledge of its population ecology and recovery. Our understanding of the Mount Charleston blue butterfly distributions, dispersal, and population dynamics and structure has improved from surveys and genetic analysis. The implementation and completion of plans to improve habitat, alleviate threats, and provide regulatory protection remain to be accomplished. It is recommended that the classification status of the Mount Charleston blue butterfly remain the same.

RESULTS

Recommended Classification:

___ Downlist to Threatened

___ Uplist to Endangered

___ Delist (*Indicate reasons for delisting per 50 CFR 424.11):*

___ *Extinction*

___ *Recovery*

___ *Original data for classification in error*

_X_ No change is needed

RECOMMENDATIONS FOR FUTURE ACTIONS

Recovery actions and activities in the recovery plan and implementation strategy (USFWS 2023b entire, 2023c pp. 4–5) are still applicable for the Mount Charleston blue butterfly. Implementation of projects to protect or improve habitat and reduce threats is the highest priority to recover the species. Surveys of locations to determine occupancy and status of threats and habitat should be performed at all locations. Where resources may be limited to conduct surveys, priority should be on those locations where occupancy is most uncertain.

In our assessment of potential threats associated with climate change, the USFWS acknowledged uncertainty and lack of site specific information related to climate change (Factor E) (USFWS 2013 p. 57759 and 57762). Given the significant impacts associated with Tropical Storm Hilary related weather events, and potential for more in the future, it is recommended that rangewide surveys occur to assess the potential impacts on habitat and individuals as it may relate to the species status.

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USFWS. 2023c. Recovery Plan for Mount Charleston blue butterfly (*Icaricia shasta charlestonensis*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. iv + 7 pp.

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U.S. FISH AND WILDLIFE SERVICE

5-YEAR REVIEW of *(Icaricia (Plebejus) shasta charlestonensis)*

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

___ Downlist to Threatened

___ Uplist to Endangered

___ Delist (Indicate reasons for delisting per 50 CFR 424.11):

___ Extinction

___ Recovery

___ Original data for classification in error

_X_ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable:

Not applicable

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

GLEN KNOWLES Digitally signed by GLEN KNOWLES Date: 2024.03.27 13:29:53 -07'00'

Approve _____ Date _____

The lead Field Office must ensure that other offices within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. The lead field office should document this coordination in the agency record.