Covered Species Analysis Report

Clark County Multiple Species Habitat Conservation Plan

Amendment 2023-WRA-2315K; D02

Clark County, Nevada

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1.0 INTRODUCTION

This report summarizes the list of plant and animal species evaluated and recommended for coverage under the proposed amendment to the Clark County Multiple Species Habitat Conservation Plan (MSHCP). The current MSHCP covers 78 species for take and considers an additional 158 species as evaluation and watch species. The goal of this analysis is to develop a list of species to be covered by the amended MSHCP that focuses on the species most at risk, most likely to be impacted by the covered activities during the life of the plan, and/or most likely to be listed under the federal Endangered Species Act (ESA). This will provide certainty and streamlined permitting for applicants and will allow more conservation dollars to be spent on conservation actions for those species most impacted and at risk.

The current list includes species for which impacts from future covered activities are unlikely, that are not considered at risk, and/or that are unlikely to occur in the revised Plan Area. The proposed Plan Area will encompass land below 4,000 feet in elevation. Approximately 50 percent of the species covered under the current plan occur at higher elevations in Clark County (County) (for example, the current list includes species that only occur in the Spring Mountains or Sheep Mountains). The Permittee anticipates that habitat for these species is unlikely to be impacted by covered activities in the MSHCP amendment. Furthermore, the majority of these upper elevation species' habitats occur on federal lands, which are subject to a separate permitting process under the ESA undertaken by the federal agencies. Approximately 4 percent of the species covered under the current permit occur in aquatic habitats, which are regulated through other federal and state programs. The types of activities that are covered by the MSHCP amendment are not likely to result in direct impacts to aquatic habitats. Further, activities that do result in direct impacts to aquatic habitats are also subject to a separate permitting process under the ESA that is undertaken by federal agencies. Thus, aquatic species will not be covered by the MSHCP amendment.

Table 1. Covered, Evaluation, and Watch List Species in the Current MSHCP

Category	Covered Species	Evaluation Species	Watch List Species	Total
Birds	8	7	15	30
Mammals	4	15	8	27
Amphibians	1	2	3	6
Reptiles	14	7	1	22
Fish	0	8	1	9
Invertebrates	10	34	10	54
Vascular Plants	4	21	10	35
Non-Vascular Plants	37	8	3	48
Total	***78***	***102***	***51***	***231***

Therefore, the Covered Species list is being re-evaluated so that the Permittee can more effectively administer meaningful conservation actions and focus the analysis and conservation on those species most at risk and affected by covered activities in the MSHCP amendment.

This document presents the results of the species list revision process and is intended to function as a working document that provides the foundation for discussion with the Permittees, regulatory agencies, and stakeholders about the species that will be proposed for coverage in the amended Section 10(a)(1)(B) application. This document focuses on 68 species requested for detailed review for inclusion by the County, and Attachment A provides a table prepared by the County of over 400 species reviewed and from which the 68 species were determined for inclusion in this analysis.

2.0 SPECIES REVISION PROCESS

The criteria for determining the Covered Species list were developed using a stepwise systematic approach for evaluating species based on the best available science and the following criteria.

2.1 Species Considered for Coverage

To identify the Covered Species, a broad list of plants and animals that occur in the Plan Area was prepared by the County. This analysis drew from a comprehensive list of over 400 species including 231 species addressed by the Clark County MSHCP, previous efforts (PBSandJ 2009; Southwest Ecology 2018a; Southwest Ecology 2018b; Nussear and Simandle 2020; Nussear 2020; WRA 2020; Nussear et al. 2024 and Simandle and Nussear 2025), and overall review of species potentially occurring in or near southern Nevada to systematically evaluate the inclusion of these species. The overall species reviewed are provided as Attachment A, source for the 68 species reviewed in this document. In addition, other species that merited consideration based on recent status or scientific information from a variety of sources were included in the revised evaluation matrix. Information used included but was not limited to:

- Species listed or proposed for listing as threatened or endangered under the federal ESA;
- Candidates for future listing as threatened or endangered under the federal ESA;
- Plant species fully protected by the State of Nevada (Nevada Administrative Code: NAC 527 including revisions);
- Mammals, birds, fish, amphibians, and reptiles listed as protected, endangered, or sensitive by the State of Nevada (Nevada Administrative Code: NAC 503);
- Nevada Division of Natural Heritage Plant and Animal Watch and Track Lists (NDNH 2024 and 2025);
- Nevada Division of Natural Heritage Climate Change Vulnerability Index 4.0 (NDNH 2024);
- Nevada State Wildlife Action Plan (NDOW 2022);
- U.S. Forest Service Region 4 Sensitive Species List (USFS 2016);
- Bureau of Land Management Nevada Sensitive Species Lists (2011, 2023);
- Great Basin Bird Observatory Nevada Comprehensive Bird Conservation Plan (2010);
- The Nature Conservancy's "Conservation Management Strategy for Nine Low Elevation Plants in Clark County" (2007);

- Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora list (2025);
- International Union for Conservation of Nature (IUCN) Red List of Threatened Species version 4 (2025); and
- For species occurring outside Clark County, their Federal and/or State status in adjacent states.

2.2 Criteria for Covered Species

Several criteria were applied to the list of special-status species that could occur in the amended Plan Area to determine which species should be covered by the MSHCP Amendment. Species recommended for coverage by the MSHCP Amendment should meet the criteria described below.

Range

The species is known to occur, or is likely to occur, within the Plan Area based on credible evidence, or the species is not currently known in the Plan Area but is expected in the Plan Area during the permit term (e.g., through range expansion, recovery actions, or reintroduction to historic range).

Status

The species meets at least one of the following status criteria:

- Listed under the federal ESA as threatened or endangered, proposed or candidate; or
- State listed as protected, fully protected, threatened, or endangered (not sensitive) under NAC 503 (wildlife) or 527 (flora); or
- Potentially or likely to be listed under state or federal statutes within the ESA section 10(a)(1)(B) permit term (assumed to be 50 years). Potential for listing during the permit term is based on current listing status, consultation with experts, evaluation of species population trends and threats, and best professional judgment.

Impacts

The species that meet the criteria described above and would likely be adversely affected by covered activities (i.e. at least a portion of the species distribution occurs on private land or land that will become private).

Data

Sufficient data on the species' life history, habitat requirements, and occurrence in the Plan Area should exist to adequately evaluate impacts on the species and to develop conservation measures to mitigate these impacts to levels specified by regulatory standards.

Recommending species for coverage in the MSHCP Amendment was based on additional factors including consultation with species experts, and regulatory agencies including the U.S. Fish and Wildlife Service (USFWS), the Nevada Department of Wildlife (NDOW), the Nevada Division of Forestry, and the Nevada Division of Natural Heritage (NDNH).

3.0 ANALYSIS

3.1 Species Range

The first criterion considered in the species revision process was species range. The species was included for evaluation based on review of historical and recent literature, agency records, species and habitat modeling efforts, contact with species experts, and available studies. If the species range was verified to occur in the Plan Area based on a reasonable interpretation of the information, the species was included for further evaluation. The likelihood of the species to be present was based on presence in suitable habitat types at a future time through such mechanisms as migration, reintroduction, or recovery within the Plan Area. Species that had unsubstantiated or unverified evidence supporting presence within the Plan Area were eliminated from consideration during this species revision process.

The Plan Area boundaries were modified from the current MSHCP boundaries to exclude areas above the 4,000-foot elevation contour and lands managed by the Department of Defense. The Permittees determined that they would not propose including covered activities above 4,000 feet. Further, much of the land above 4,000 feet in Clark County is already managed for conservation purposes by state and/or federal land management agencies. The majority of development in Clark County is concentrated in the Las Vegas Valley, most of which is below 2,800 feet. Therefore, species that occur exclusively in habitats above 4,000 feet are not likely to be adversely affected by the proposed actions, and providing those species with the additional protection that would be afforded by the MSHCP does not appear necessary. Those species found to have ranges entirely outside the revised boundary were excluded from further consideration in the amended MSHCP.

In addition to all of Clark County, the current MSHCP Plan Area includes Nevada Department of Transportation (NDOT) rights-of-way below 5,000 feet elevation in four counties outside Clark County. The MSHCP Amendment will not cover these NDOT rights-of-way.

3.2 Species Status

The second criterion used to re-evaluate the current species list was status under various federal and state agencies and evaluations. As part of the habitat conservation planning process the USFWS recommends that permit applicants include federally listed species that may be incidentally taken during the life of the permit. The USFWS also suggests including candidate species and other species based on the likelihood of listing, risk of take, availability of existing information, additional monetary costs, and additional time required to include them in the habitat conservation plan (HCP). According to the HCP Handbook, coverage of non-listed species should also be judged in terms of feasibility from the applicant's point of view, overall benefits to the species, and whether there is sufficient species information available for the Services to determine if covered activities may affect the species (U.S. Department of the Interior [USDOI], USFWS, U.S. Department of Commerce [USDOC], National Oceanic and Atmospheric Administration [NOAA] 2016).

All species that meet the other three criteria and are either federally listed or that are candidates for listing under ESA are recommended for coverage. The USFWS also recommends that a permit applicant consider including non-listed species that may become listed within the foreseeable

future and that could be incidentally taken during the life of the permit.

In addition to federal status, the evaluation process considered state status as well as future conservation efforts for non-listed species, specifically species with rapidly declining numbers or the potential for significant loss of habitat as a result of covered activities. Determining if a species is likely to be listed is based on numerous factors, including scientific literature, input from regulatory and land management agencies, and local/professional judgment. This determination included reviews and status analyses from a variety of relevant sources (see previous section *"Species Considered for Coverage"* and Table 2). Recommendations were based on a preponderance of evidence to conclude inclusion was necessary for a scientifically defensible conservation plan.

Table 2. Sources Consulted to Review Species Status

Agency/Organization	Source
MSHCP (2000)	[RECON] Regional Environmental Consultants, Inc. 2000. Final Clark County Multiple Species Habitat Conservation Plan and Environmental Impact Statement. Clark County Department of Comprehensive Planning, Las Vegas, NV.
U.S. Fish and Wildlife Service Endangered Species Act	[USFWS] U.S. Fish and Wildlife Service. 2026. Environmental Conservation Online System. Available at: https://ecos.fws.gov/ecp/.
U.S. Bureau of Land Management (Nevada)	[BLM] Bureau of Land Management. 2023. BLM Nevada Special Status Species List. September. 44pp.
U.S. Forest Service (Region 4)	U.S. Forest Service. 2016. Intermountain Region (R4) Threatened, Endangered, and Sensitive Species. 18 pp.
State of Nevada	Nevada Administrative Code (NAC) Chapter 503 – Hunting, Fishing and Trapping; Miscellaneous Protective Measures NAC Chapter 527 – Protection and Preservation of Timbered Lands, Trees and Flora
State of California	[CDFW] California Department of Fish and Wildlife, Natural Diversity Database. October 2025. Special Animals List. Periodic publication. 114 pp.
State of Arizona	Arizona Game and Fish Department. 2022. Arizona's State Wildlife Action Plan: 2012-2022. Arizona Game and Fish Department, Phoenix, Arizona. Arizona Game and Fish Department. 2025. Special Status Species. Heritage Data Management System. Arizona Game and Fish Department, Phoenix, Arizona. May.
State of Utah	Utah Wildlife Action Plan Core Team. 2025. 2025–2035 Utah Wildlife Action Plan: A Road Map for Managing Native Species and Their Habitats to Prevent Endangered Species Act Listings. DWR Publication 25-23. Salt Lake City: Utah Division of Wildlife Resources, Salt Lake City, Utah, USA.
NV Division of Natural Heritage	[NDNH]. Nevada Division of Natural Heritage. 2024. Plant and Animal Watch List. February. 11 pp. [NDNH]. Nevada Division of Natural Heritage. 2025. At-Risk Plant and Animal Tracking List. April. 40 pp.

NV State Wildlife Action Plan	[NDOW] Nevada Department of Wildlife. 2022. The 2022 Nevada State Wildlife Action Plan. Barnes, J., Davis, L., Kleiber, J., Newmark, J., Mack, L., and Hessenius, A. Reno, Nevada. 298 pp.
NV Climate Change Vulnerability Index	[NDNH] Nevada Division of Natural Heritage. 2012. NatureServe Climate Change Vulnerability Index (Release 2.01) Nevada Results as of January 30, 2012. 6 pp.
NatureServe Global and NV State Rank	NatureServe. 2026. NatureServe Explorer. Available at: https://explorer.natureserve.org/.
IUCN Red List	IUCN. 2025. The IUCN Red List of Threatened Species. Version 2025-2. https://www.iucnredlist.org.
CITES	[CITES] Convention on International Trade in Endangered Species of Wild Fauna and Flora. 2025. Appendices I, II, and III. United Nations Environment Programme. February 7. Available at: https://cites.org/eng/app/appendices.php

3.3 Impacts from Covered Activities

The potential impacts on the species from proposed covered activities in the amended MSHCP were assessed. The evaluation of impacts on a particular species or its habitat typically involves consideration of both biological impacts on species (e.g., breeding, feeding, sheltering) and physical impacts on habitat (e.g., habitat loss and degradation).

This analysis assumed that the covered activities under the amended MSHCP will be the same as the covered activities defined in the current MSHCP. These activities include residential and commercial development, utility and local transportation facilities and other capital improvements and operations activities, flood control, and parks and recreation. This analysis reflects a landscape-scale assessment of the habitats, ecosystems, and species that are likely to be affected and assumes that take will occur in the same habitat and ecosystems as authorized under the current permit, with the exception of the elevation limit (under 4,000 feet elevation).

An assessment of potential habitat for each Covered Species within Clark County that occur on lands managed for conservation purposes by federal and state land managers was conducted. If the species occurs entirely within areas currently under conservation protection, the species was not recommended for coverage because no impacts from covered activities would be expected.

The likelihood of impacts to a species was a necessary factor for inclusion in our recommendation.

3.4 Available Data

The fourth criterion used was the availability of data on the status and distribution of the subject species. For high-profile species such as desert tortoise, abundant and reliable data are often available. However, for many special-status species, data sufficient to characterize even the most basic attributes (habitat requirements, distribution, and life cycle) may be lacking. The amount and validity of data available on a given species had an influence on whether a species was considered for coverage. For example, if survey data or threat information was limited, uncertain, or conflicting for a given species, the likelihood of it being included as a Covered Species was low.

A review of the available scientific literature was conducted for all species considered in this revision process, and included information compiled to support the development of species distribution models (Southwest Ecology 2018a; Southwest Ecology 2018b; Nussear and Simandle 2020; Nussear 2020; WRA 2020; Nussear et al. 2024 and Simandle and Nussear 2025). The purpose of the review was to acquire the best available scientific information about each species' known habitat requirements, distribution, regional and range-wide potential threats, and existing or potential management actions that afford protection to the species. Available journal articles and agency reports were reviewed, and species experts were contacted to determine status and occurrence information, as well as to collect information about threats or potential impacts to the species. The intent of this review was to acquire enough information about each species to verify their occurrence within Clark County and to predict if potential impacts would result from proposed covered activities, without which the USFWS would be unable to make its required findings under Section 10 and Section 7. Species for which data availability was limited, inconclusive, nonexistent, or otherwise inadequate did not meet this criterion and were not recommended for coverage.

4.0 SPECIES RECOMMENDED FOR COVERAGE UNDER THE AMENDED MSHCP

A total of 68 species (Table 2) were evaluated as part of this process. Draft recommendations were submitted, and some species were recommended to be reviewed further prior to a final decision. In some cases, current taxonomy resulted in multiple species or subspecies being reviewed in comparison to one species in the current MSHCP. Table 2 represents the final recommendations. In total, 28 species are recommended for coverage under the amended MSHCP. Of these 28 species, 13 are currently Covered Species in the MSHCP, nine are Evaluation Species, two are Watch List Species, and one was not previously considered. The MSHCP Amendment would remove the remaining Covered Species from the list because they do not meet the criteria for coverage. The MSHCP Amendment would also eliminate the Evaluation Species and Watch List Species categories. A summary table of the results of this analysis are provided in Table 3.

Table 3. Animal and Plant Species Evaluated and Recommendations

Species	Recommended for Coverage	Not Recommended for Coverage
Arizona toad (*Anaxyrus microscaphus*)	X	
Mojave shovel-nosed snake (*Chionactis occipitalis occipitalis)*		X
Mojave Desert sidewinder *(Crotalus cerastes)*		X
Regal ringneck snake *(Diadophis punctatus)*		X*
Desert iguana *(Dipsosaurus dorsalis)*		X
Desert tortoise *(Gopherus agassizii)*	X	
Gila monster *(Heloderma suspectum)*	X	

Species	Recommended for Coverage	Not Recommended for Coverage
Spotted leaf-nosed snake *(Phyllorhynchus decurtatus)*		X
Common chuckwalla *(Sauromalus ater)*		X
Monarch butterfly *(Danaus plexippus*)	X	
MacNeill's saltbush sootywing skipper *(Hesperopsis gracielae)*		X
Mojave poppy bee (*Perdita meconis*)	X	
Golden eagle *(Aquila chrysaetos)*	X	
Bell's sparrow *(Artemisiospiza belli canescens)*		X*
Sagebrush sparrow *(Artemisiospiza nevadensis)*		X*
Burrowing owl *(Athene cunicularia)*	X	
Costa's hummingbird *(Calypte costae)*		X
Yellow-billed cuckoo *(Coccyzus americanus)*	X	
Gilded flicker *(Colaptes chrysoides)*	X*	
Southwestern willow flycatcher *(Empidonax traillii extimus)*	X	
Loggerhead shrike *(Lanius ludovicianus)*	X	
Sage thrasher *(Oreoscoptes montanus)*		X
Phainopepla *(Phainopepla nitens)*		X
Yuma Ridgway's rail *(Rallus obsoletus yumanensis)*	X	
Rufous hummingbird *(Selasphorus rufus)*		X
Brewer's sparrow *(Spizella breweri)*		X
Bendire's thrasher *(Toxostoma bendirei)*	X*	
Le Conte's thrasher *(Toxostoma lecontei)*	X*	
Bell's vireo *(Vireo bellii)*	X	
Desert pocket mouse *(Chaetodipus penicillatus)*	X*	
Desert kangaroo rat *(Dipodomys deserti)*		X

Species	Recommended for Coverage	Not Recommended for Coverage
Colorado River cotton rat *(Sigmodon arizonae plenus)*		X*
Townsend's big-eared bat *(Corynorhinus townsendii)*	X	
Botta's pocket gopher *(Thomomys bottae)*		X*
Pallid bat *(Antrozous pallidus)*		X
Spotted bat *(Euderma maculatum)*	X	
Silver-haired bat *(Lasionycteris noctivagans)*		X
Western red bat *(Lasiurus blossevillii)*		X
Western yellow bat *(Lasiurus xanthinus)*		X
Hoary bat *(Lasiurus cinereus)*		X
California leaf-nosed bat *(Macrotus californicus)*		X
Mexican free-tailed bat *(Tadarida brasiliensis)*		X
Kit fox *(Vulpes macrotis)*		X*
Sticky ringstem *(Anulocaulis leiosolenus var. leiosolenus)*	X	
Las Vegas bearpoppy *(Arctomecon californica)*	X	
White bearpoppy *(Arctomecon merriamii)*		X
Threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*)	X	
Straw milkvetch *(Astragalus lentiginosus* var. *stramineus)*		X
Halfring milkvetch (*Astragalus mohavensis* var. *hemigyrus)*		X
Mokiak milkvetch (*Astragalus mokiacensis)*		X
Alkali mariposa lily *(Calochortus striatus)*		X
Blue Diamond cholla *(Cylindropuntia multigeniculata)*	X	
Gold Butte moss *(Didymodon nevadensis)*		X
Silverleaf sunray *(Enceliopsis argophylla)*	X	

Species	Recommended for Coverage	Not Recommended for Coverage
Pahrump Valley buckwheat *(Eriogonum bifurcatum)*	X	
Las Vegas buckwheat *(Eriogonum corymbosum* var. *nilesii)*	X	
Sticky buckwheat *(Eriogonum viscidulum)*	X	
Catchfly gentian *(Eustoma exaltatum)*		X
Polished blazingstar *(Mentzelia polita)*		X*
Beaver Dam breadroot *(Pediomelum castoreum)*		X*
White margined beardtongue *(Penstemon albomarginatus)*	X	
Yellow two-toned beardtongue *(Penstemon bicolor ssp. bicolor)*		X
Rosy two-toned beardtongue *(Penstemon bicolor ssp. roseus)*		X
Death Valley beardtongue *(Penstemon fruticiformis ssp. amargosae)*		X
Clarke phacelia *(Phacelia filiae)*		X*
Parish phacelia *(Phacelia parishii)*		X
St. George blue-eyed grass *(Sisyrinchium radicatum)*		X*
Eastern Joshua tree *(Yucca jaegeriana)*	X	
Total	***28***	***40***
*Designated as "Further Review" in draft recommendations, and draft decisions were updated with additional information from agencies and/or experts.		

Based on the review outlined in this document, a total of 28 species are recommended for coverage under the amended MSHCP. These species are listed in Table 4 for ease of reference.

Table 4. Animal and Plant Species Recommended for Coverage in the Amended MSHCP

Animals	Plants
Arizona toad (*Anaxyrus microscaphus*)	Sticky ringstem *(Anulocaulis leiosolenus* var. *leiosolenus)*
Golden eagle *(Aquila chrysaetos)*	Las Vegas bearpoppy *(Arctomecon californica)*
Burrowing owl *(Athene cunicularia hypugea)*	Threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*)
Desert pocket mouse (*Chaetodipus penicillatus*)	Blue Diamond cholla *(Cylindropuntia multigeniculata)*

Yellow-billed cuckoo *(Coccyzus americanus)*	Silverleaf sunray *(Enceliopsis argophylla)*
Gilded flicker *(Colaptes chrysoides)*	Pahrump valley buckwheat *(Eriogonum bifurcatum)*
Townsend's big eared bat *(Corynorhinys townsendii)*	Las Vegas buckwheat *(Erigonom corymbosum* var. *nilesii)*
Monarch butterfly *(Danaus plexippus)*	Sticky buckwheat *(Erigonom viscidulum)*
Southwestern willow flycatcher *(Empidonax traillii extimus)*	White-margined beardtongue *(Penstemon albomarginatus)*
Spotted bat *(Eudema maculatum)*	Eastern Joshua tree *(Yucca jaegeriana)*
Desert tortoise *(Gopherus agassizii)*	
Gila monster *(Heloderma suspectum)*	
Loggerhead shrike *(Lanius ludovicianus)*	
Mojave poppy bee *(Perdita meconis)*	
Yuma Ridgway's rail (Rallus obsoletus yumanensis)	
Bendire's thrasher (Toxostoma bendirei)	
Le Conte's thrasher (Toxostoma lecontei)	
Bell's vireo (Vireo bellii)	

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ATTACHMENT A

SPECIES RECOMMENDATION SUMMARIES

1.0 MOHAVE (MOJAVE) SHOVEL-NOSED SNAKE (*CHIONACTIS OCCIPITALIS OCCIPITALIS*)

1.1 Species Overview

The Mohave shovel-nosed snake (*Chionactis occipitalis occipitalis*) is a nocturnal snake found in dry, sandy habitats that are relatively flat and low in elevation (Klauber 1951, Funk 1967, Stebbins 2003). This species can occur in sand dunes if there is sufficient vegetation cover and soil islands are present; they are rarely observed in sand dunes devoid of vegetation (Klauber 1951). During the day, individuals typically reside in burrows between shrub roots in firmer soils (Mosauer 1933). Four subspecies were previously recognized (Stebbins 2003) but recent taxonomic revisions have been proposed.

1.2 Range

Chionactis occipitalis occipitalis is distributed across the Mojave Desert of California, Nevada, and Arizona. Klauber first described the Nevada subspecies *Chionactis occipitalis talpina* (Nevada shovel-nosed snake) in Nye and Esmeralda counties in 1951. These snakes were later found in the Amargosa Desert of Nye County, Nevada, and across the border in Saline Valley, California (Elvin 1963). Those latter specimens were found only in rocky or vegetative desert, and none were found in sand dunes in the area (Elvin 1963). Surveys at the Nevada Test Site in the 1960s noted that these were among the most common snakes sampled and were frequently found in areas dominated by the *Grayia/Lycium* (spiny hopsage/wolfberry) and *Larrea/Ambrosia* (creosote bush/burro brush) plant alliances (Tanner and Jorgensen 1963).

Current subspecies likely to inhabit Clark County include *C. occipitalis talpina* and *C. occipitalis occipitalis* (Mojave shovel-nosed snake), although genetic differentiation between them is not well pronounced and the coloration differences used to classify them originally may be explained by temperature differences caused by elevational separation (Wood et al. 2008). More recent mitochondrial DNA studies have revealed the two subspecies within Nevada *C. occipitalis talpina* and *C. occipitalis occipitalis* are within the same clade and phenotypic subspecies (differentiation based upon species color or features) may not be supported in all cases (Wood et al. 2014). If these two subspecies are combined, Nevada, including Clark County, would contain only one subspecies of *C. occipitalis*.

1.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	None
State of Arizona	Species of Greatest Conservation Need
State of Utah	None
NV Division of Natural Heritage	Watch List
NV State Wildlife Action Plan	Species of Greatest Conservation Need

Agency/Organization	Status
NV Climate Change Vulnerability Index	Moderately vulnerable
NatureServe Global and NV State Rank	G5 S4
IUCN Red List	Least concern
CITES	None

Arizona populations of *Chionactis occipitalis* have been declining for 25 years. The status of Nevada populations has not been documented, but given the reasons for decline in Arizona (agriculture and urbanization), Nevada populations may experience similar trends. According to NatureServe (2025), the species has experienced a long-term decline of 10 to 30 percent, primarily near human population centers and agricultural zones, though short-term trends are relatively stable with no recent reports of widespread decline. Global abundance is estimated at 100,000 to more than 1,000,000 individuals, and the species is generally considered common throughout its range (NatureServe 2025).

In Arizona, habitat loss and alteration over the last 25 years have led to decreased population sizes and range for *C. occipitalis klauberi* (Tucson shovel-nosed snake) in the Tucson area, prompting a petition for listing under the Endangered Species Act (Wood et al. 2008). However, this subspecies has a much more restricted range than *C. occipitalis occipitalis*, and the northern and southern ends of its range are bounded by the large urban developments of Phoenix and Tucson. Listing was determined to not be warranted for *C. occipitalis klauberi* (79 FR 56730) following genetic research showing that this subspecies had a broader range than previously known (Wood et al. 2014).

1.4 Impact

Primary threats to *Chionactis occipitalis* are conversion of land to agriculture, development of alternative energy, off-highway vehicle (OHV) use, urbanization, and habitat fragmentation from land conversion including large-scale renewable energy (NDOW 2022).

A habitat suitability model prepared for Clark County (SWECO 2018) estimates that of the 1,572,461 acres of suitable Mojave shovel-nosed snake habitat within the MSHCP Amendment Plan Area, approximately 136,849 acres (8.7 percent) occur within the Impact Area. A total of 715,994 acres (45.5 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 81,308 acres (5.2 percent) of suitable habitat occur in the existing reserve, with an additional 140,847 acres (9.0 percent) in MSHCP Amendment Reserve System Additions.

Mojave shovel-nosed snake* *Chionactis occipitalis occipitalis*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,572,461	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	136,849	8.7%
Suitable Habitat in Lands Managed for Resource Conservation	715,994	45.5%
Suitable Habitat in the existing MSHCP Reserve System	81,308	5.2%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	140,847	9.0%

*SWECO 2018

1.5 Data

There is some taxonomic uncertainty surrounding this species. Cox et al. (2018) proposed synonymizing the genus *Chionactis* with *Sonora*, which has taxonomic priority; the current accepted scientific name is therefore *Sonora occipitalis* (NatureServe 2025). This change is accepted by Crother (2017). Additionally, new genetic research lends support that the two existing subspecies in Nevada, *C. occipitalis talpina* and *C. occipitalis occipitalis*, may not be substantiated (Wood et al. 2014), and only one subspecies may exist in Nevada with a broad range.

Data within Clark County and Nevada are limited, but the distribution for *Chionactis* as illustrated in the SWECO model indicates that this species is widespread in lower bajada and valley bottom habitats, as well as flat mesa tops that have a sand component (e.g., Mormon Mesa) throughout the western two-thirds of Clark County. The northeastern edge of this species' range may currently exist at the Overton Arm of Lake Mead and the main stem of the Virgin River, and this is supported by a lack of any credible locality records east of these features in Nevada. The SWECO Standard Error Map for this model highlights this area by indicating that Mormon Mesa has a high error due to a lack of verified locality points there. Similarly, there is an expansive area of potential habitat in the northwest corner of Clark County where locality records are sparse, and the Standard Error map illustrates high error in that region; however, *Chionactis* abundance is well documented just west of that area near Mercury, Nevada, as shown in recent habitat modeling efforts for the species (Inman et al. 2014) lending credibility to this area of otherwise sparse data in Clark County.

1.6 Recommendation

Not recommended for coverage. Based on information discussed in sections 1.2 through 1.5, we do not currently recommend this subspecies for coverage. This determination is made for the subspecies level and applies to the full species as well. This subspecies is wide ranging, and conservation and reserve areas contain a large portion of modeled high suitability habitat. There is also a lack of data documenting population declines within this portion of the species (or subspecies) range, therefore, we do not have data to support the potential for this species (or subspecies) to be a candidate for Federal ESA listing in the near future. A subspecies with a much narrower range in the Tucson area was determined not to warrant listing at the federal level.

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2.0 MOJAVE DESERT SIDEWINDER (*CROTALUS CERASTES CERASTES*)

2.1 Species Overview

Sidewinders are the most abundant rattlesnake in hot deserts (Lowe et al. 1989) and are widespread in Clark County wherever the habitat is appropriate. Sidewinders usually inhabit areas of loose windblown sand and are frequently associated with areas of sparse creosote bush vegetation with hummocks built up around them. They may also occur on open sand dunes, hardpan areas, and occasionally on rocky slopes, especially when there are expansive areas of loose windblown soils nearby. The sidewinder moves in a distinctive lateral undulation, which minimizes contact with hot desert surfaces and provides traction on loose sand. This species is primarily nocturnal and crepuscular, becoming active at night during hot summer months but shifting to diurnal activity during cooler seasons. Sidewinders are ambush predators that feed primarily on lizards and small rodents. Females give birth to live young, typically producing litters of 5 to 18 offspring. They are known to use mammal burrows for shelter and thermoregulation.

2.2 Range

Sidewinders range from southern Nevada and the southwest corner of Utah south to northeastern Baja California and northwestern Sonora, west to the base of the southern California mountain and east into south-central Arizona (Stebbins 2003). The Mojave Desert sidewinder (*Crotalus cerastes cerastes*) is one of three subspecies of sidewinder found in the U.S. This subspecies occurs in western and northwestern Arizona, the eastern Mojave Desert of California, southern Nevada, and southwestern Utah into the Dixie Valley near St. George, Utah. The Sonoran subspecies (*C. c. cercobombus*) occurs solely in Arizona and Sonora, Mexico. The Colorado Desert subspecies (*C. c. laterorepens*) occurs in southwest Arizona, southern California, and Baja Norte, Mexico (Lowe et al. 1989). The Mojave Desert sidewinder inhabits the greatest elevational range among the three subspecies from -76 meters (-250 feet) below sea level, found near Furnace Creek Ranch, California, to at least 1,371 meters (4,500 feet) at Quartz Spring, Lincoln County, Nevada (Klauber 1997).

2.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
State of California	None
State of Utah	None
NV Division of Natural Heritage	Watch List
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Moderately vulnerable
NatureServe Global and NV State Rank	G5TNR S3

Agency/Organization	Status
IUCN Red List	Least Concern
CITES	None

IUCN currently lists the global population as "Stable." Population trend for the sidewinder is unknown; baseline data are lacking for this species (NDOW 2022). Population studies of *C. c. cerastes* are rare and have not been conducted to sufficiently evaluate trends in this species (NDOW 2022). NatureServe (2026) similarly characterizes the long-term trend as unknown, while the short-term trend is described as relatively stable, meaning that extent of occurrence, area of occupancy, number of subpopulations, and population size are probably stable but not confirmed to be so. Global abundance is unknown but is presumed to exceed 100,000 individuals, and the species is locally common in suitable habitat (NatureServe 2026). NatureServe (2026) estimates between 81 and 300 element occurrences globally, many of which have good viability.

2.4 Impact

Impacts include loss of habitat and/or mortality, urbanization, road construction and road-related mortality, off highway vehicle use, and collecting. In Nevada, commercial collection of all reptiles including sidewinders was banned in 2017; however, this species likely still experiences pressure from poaching and legal hobby collection (NDOW 2022). The dependence on the flattest available landscapes and sandy soils puts renewable energy development in the greatest conflict with the distribution of the sidewinder at this time (NDOW 2022).

Habitat models prepared for Clark County (SWECO 2018) estimate that of the 2,380,771 acres of suitable Mojave Desert sidewinder habitat within the MSHCP Amendment Plan Area, approximately 183,465 acres (7.7 percent) occur within the Impact Area. A total of 1,227,184 acres (51.5 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 83,095 acres (3.5 percent) of suitable habitat occur in the existing reserve, with an additional 196,374 acres (8.2 percent) in MSHCP Amendment Reserve System Additions.

Mojave Desert sidewinder* *Crotalus cerastes*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	2,380,771	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	183,465	7.7%
Suitable Habitat in Lands Managed for Resource Conservation	1,227,184	51.5%
Suitable Habitat in the existing MSHCP Reserve System	83,095	3.5%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	196,374	8.2%

*SWECO 2018

2.5 Data

The sidewinder is a small rattlesnake that is difficult to detect, making it a challenging species to survey for. Rattlesnakes are also commonly persecuted, which presents additional challenges for conservation and management (NDOW 2022). NDOW (2022) identifies the development of survey methodology and the monitoring of population status and trend as explicit research needs for this species, reflecting the current absence of a reliable population baseline. Additional research needs identified by NDOW (2022) include assessing impacts from large-scale solar energy and other landscape development projects and developing best management practices for minimizing impacts, as well as mitigating roadway disturbance through adequately designed culvert crossings to maintain demographic and genetic connectivity.

2.6 Recommendation

Not recommended for coverage. Based on its wide distribution, presumed large population, and presumed slow rate of decline, this subspecies is unlikely to warrant threatened or endangered species protection in the foreseeable future. This determination is made for the subspecies level and applies to the full species as well.

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3.0 REGAL RINGNECK SNAKE (*DIADOPHIS PUNCTATUS REGALIS*)

3.1 Species Overview

The regal ringneck snake (*Diadophis punctatus regalis*) is a relatively small (up to 30 inches long) and slender snake. Regal ringneck snakes are secretive and slow moving, usually foraging in early morning and late evening. When disturbed, this snake recoils its tail revealing the bright underside. They also may emit a foul smell from the vent to discourage predators.

3.2 Range

Ringneck snakes occur throughout the northeastern and southeastern United States with a patchier distribution in the western states. They also occur in southeastern Canada and central and eastern Mexico (Stebbins 2003). The subspecies of ringneck snake within Clark County is the regal ringneck (*Diadophis punctatus regalis*). Regal ringneck snakes occupy mesic mountainous regions of Clark County and vicinity, including Lincoln and White Pine Counties. They have limited dispersal ability and tend to live in isolated populations in the Mojave Desert (Fontanella et al. 2008). Regal ringneck snakes are uncommon within their range in Nevada, western Arizona, and Utah, and this subspecies is uncommon and highly localized in Clark County, Nevada.

In Clark County, this species occurs in mountain and riparian habitats. They are generally found in moist or wet areas. They have been found in aspen, fir groves, and desert scrub, especially when associated with riparian habitats. In the Mojave Desert, they are restricted to cooler, higher elevation sites (Fontanella et al. 2008). The habitat model created for Clark County assigned higher rankings to vegetation within and above blackbrush (*Coleogyne ramosissima*) zones, wash features, and riparian and spring vegetation. As a result, canyons and washes within the major mountain ranges were predicted to contain the highest quality habitat for regal ringneck snakes.

3.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive[1]
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	Species of Special Concern
State of Arizona	None
State of Utah	None
NV Division of Natural Heritage	Watch List[1]
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Moderately vulnerable[1]
NatureServe Global and NV State Rank	G5TNR S4
IUCN Red List	Least concern[1]
CITES	None

[1] Designation is at the species level of ringneck snake, *Diadophis punctatus*

The regal ring-necked snake has no status under the Endangered Species Act and carries no NatureServe global rank at the subspecies level (ranked TNR — Taxon Not Ranked), though the parent species *Diadophis punctatus* holds a global rank of G5 (Secure) (NatureServe 2026). In Nevada, the species is ranked S3 (Vulnerable) and is designated Sensitive by BLM (NDOW 2022). In California, the subspecies is ranked S2 (Imperiled) by NatureServe (NatureServe 2026). No status has been assigned by USFWS, USFS, or under Nevada state protection (NDOW 2022).

Population trend in Nevada is unknown due to a lack of baseline data, though the trend is considered likely decreasing given ongoing climate change and habitat degradation (NDOW 2022). The species is rated Moderately Vulnerable under the Climate Change Vulnerability Index (NDOW 2022).

3.4 Impact

Widespread fires, development, and climate change represent the most significant threats to this species. Climate change could result in the drying of riparian habitat (NDOW 2022). There may be some threats from natural predators, and feral and free-ranging domestic species.

Habitat models prepared for Clark County (SWECO 2018) estimate that of the 4,409,887 acres of suitable regal ringneck snake habitat within the MSHCP Amendment Plan Area, approximately 227,577 acres (5.2 percent) occur within the Impact Area. A total of 2,777,045 acres (63.0 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 87,165 acres (2.0 percent) of suitable habitat occur in the existing reserve, with an additional 303,345 acres (6.9 percent) in MSHCP Amendment Reserve System Additions.

Regal ringneck snake* *Diadophis punctatus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	4,409,887	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	227,577	5.2%
Suitable Habitat in Lands Managed for Resource Conservation	2,777,045	63.0%
Suitable Habitat in the existing MSHCP Reserve System	87,165	2.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	303,345	6.9%

*SWECO 2018

3.5 Data

There are currently 13 subspecies of ringneck snake based on morphology, although molecular research does not support this number of subspecies and some subspecies may be combined. The regal ringneck subspecies is still considered a valid subspecies distinct from more coastal populations to the west and plains populations to the east.

There is no population level information available for this species. The 2022 Nevada Wildlife Action Plan identifies predictive modeling for this species as a priority research need.

NatureServe (2026) notes that ringneck snakes are secretive and may be easily overlooked or not recorded in areas where they do in fact occur, which contributes to the difficulty of surveying for this species. NatureServe further notes that data are limited, and that small colubrid snakes such as *Diadophis punctatus* generally have relatively small home ranges of less than 1 hectare, though individuals occasionally move distances of up to at

least 1.7 kilometers.

3.6 Recommendation

Not recommended for coverage. This species is not a Federal- or State-listed species and there is limited population data available. Although the range within Clark County is extremely localized, the subspecies is wide ranging. There is also not currently data to support population trends or management guidelines. Based on current knowledge, there is no indication the species is likely to become listed.

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4.0 DESERT IGUANA (*DIPSOSAURUS DORSALIS DORSALIS*)

4.1 Species Overview

Desert iguanas (*Dipsosaurus dorsalis dorsalis*) are primarily vegetarians and occupy low-elevation sites including lower bajadas and valley bottoms (Minnich and Shoemaker 1970, Norris 1953, Hulse 1992, Stebbins 2003). Populations can be dense in sandy washes and in areas of windblown sand with vegetation dominated by creosote bush (*Larrea tridentata*). Soil temperature and soil moisture may limit the geographic range of desert iguanas based on the constraints these factors play on the development of eggs placed in below ground nests (Muth 1980). Temperature is also important for digestion, which may also limit their distribution in cooler environments (Zimmerman and Tracy 1989).

There are five subspecies of desert iguana; two are endemic to islands in the Sea of Cortez, one occupies the cape region of Baja del Sur, Mexico and the other occurs in southern Sonoran and northwest Sinaloa. The fifth, *Dipsosaurus dorsalis dorsalis*, or northern desert iguana is the only subspecies found in the U.S.

4.2 Range

The northern desert iguana inhabits southern Nevada, southeastern California, and southwestern Arizona. It occurs throughout the Mojave and Sonoran deserts in appropriate habitat. In Nevada, it occurs in Clark and Nye counties (Norris 1953). Desert iguanas occur in an elevational range from below sea level in desert sinks to 1,524 meters (5,000 feet).

4.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive[1]
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	None
State of Arizona	None
State of Utah	None
NV Division of Natural Heritage	Watch List[1]
NV State Wildlife Action Plan	Species of Greatest Conservation Need[1]
NV Climate Change Vulnerability Index	Moderately vulnerable[1]
NatureServe Global and NV State Rank	G5 S3[1]
IUCN Red List	Least concern[1]
CITES	None

[1] Designation is at the species level of desert iguana, *Disosaurus dorsalis*

The desert iguana is considered globally secure, with a NatureServe global rank of G5 and a national rank of N5 for the United States (NatureServe 2026). However, the species is ranked S3 (Vulnerable) in Nevada, reflecting greater uncertainty about its status at the state level (NatureServe 2026; NDOW 2022). BLM in Nevada has designated the species as Sensitive, though it carries no status under the Endangered Species Act (NDOW 2022). IUCN currently lists the global population as Stable and estimates the population at over 100,000.

The global population is estimated to exceed 100,000 individuals, and the species is described as very common in northeastern Baja California and in creosote bush desert habitats in southeastern California and southwestern Arizona (NatureServe 2026). NatureServe estimates between 81 and 300 element occurrences globally, with many occurrences considered to have good viability and integrity (NatureServe 2026).

Population trend information is limited, particularly in Nevada. NDOW (2022) characterizes the trend as unknown due to a lack of baseline data, though suitable habitat has likely decreased. At the global scale, NatureServe (2026) describes the short-term trend as relatively stable, with less than 10 percent change, and the long-term trend as ranging from a decline of less than 30 percent to an increase of 25 percent. Localized declines in areas of occupancy and population size have occurred where habitats have been lost or degraded (NatureServe 2026).

Although commercial collection in Nevada was banned in 2017, population trends remain difficult to discern from existing reporting data alone, and no density or demographic surveys have been conducted to ascertain the latent impacts that collection may have had on the species (NDOW 2022).

4.4 Impact

Given that they inhabit sandy areas that tend to be in valley bottoms, widespread development of these areas (e.g., urbanization, and utility scale solar) may remove large portions of habitat. The species is closely tied to creosote bush, which are often surrounded by invasive grasses. The loss of shrub cover from altered fire regimes and conversion to annual plants is expected to reduce desert iguana's ability to thermoregulate using natural features of the landscape (NDOW 2022).

This species is desirable in the exotic pet trade and received commercial collection pressure in Nevada until the practice was ended in 2017 (NDOW 2022). While commercial collection may have exerted pressure on local populations historically, the quantitative impacts of these threats remain unknown.

Habitat models prepared for Clark County (SWECO 2018) estimate that of the 1,570,579 acres of suitable desert iguana habitat within the MSHCP Amendment Plan Area, approximately 162,112 acres (10.3 percent) occur within the Impact Area. A total of 765,502 acres (48.7 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 86,669 acres (5.5 percent) of suitable habitat occur in the existing reserve, with an additional 94,017 acres (6.0 percent) in MSHCP Amendment Reserve System Additions.

Desert iguana* *Dipsosaurus dorsalis*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,570,579	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	162,112	10.3%
Suitable Habitat in Lands Managed for Resource Conservation	765,502	48.7%
Suitable Habitat in the existing MSHCP Reserve System	86,669	5.5%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	94,017	6.0%

*SWECO 2018

4.5 Data

Population studies of desert iguana are rare and have not been conducted to sufficiently evaluate population status or trends in this species (NDOW 2022).

4.6 Recommendation

Not recommended for coverage. Based on its wide distribution, presumed large population, and presumed slow rate of decline, this subspecies is unlikely to warrant threatened or endangered species protection in the foreseeable future. This determination is for the subspecies and species level.

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5.0 DESERT TORTOISE (*GOPHERUS AGASSIZII*)

5.1 Species Overview

The Mojave desert tortoise (*Gopherus agassizii*) is a large, terrestrial reptile native to the Mojave and Colorado deserts of the southwestern United States, which includes those tortoises occurring north and west of the Colorado River in Arizona, California, Nevada, and Utah (USFWS 2011). The Mojave population was taxonomically elevated to full species status as *Gopherus agassizii*, while most tortoises east of the Colorado River are now recognized as *Gopherus morafkai*, the Sonoran desert tortoise (Murphy et al. 2011).

Desert tortoises are long-lived reptiles that take 13 to 20 years to reach sexual maturity, with a mean age at maturity of approximately 14 to 15 years depending on geographic location (Germano 1994). Maximum lifespan exceeds 50 years, though adults often survive only 20 to 25 years of adulthood. Annual adult survivorship is high (approximately 0.98), but survivorship from hatchling to adult is very low, averaging approximately 2 percent for healthy populations (USFWS 1994; NatureServe 2025). These life history characteristics, including low juvenile survival and slow population growth rates, make the species highly vulnerable to external threats (NatureServe 2025).

Tortoises are largely subterranean when inactive, spending approximately 98 percent of their total life span underground in burrows (NatureServe 2025). Adults are typically active from March through fall, with a total active period of about 4 to 5 months per year in the Mojave Desert. Tortoises are herbivores, foraging primarily on native winter and summer annuals, perennial grasses, cacti, and other vegetation.

5.2 Range

The range of *Gopherus agassizii* extends from Inyo County, California (north to Death Valley National Park and approximately 10 miles south of Lone Pine), through southern Nevada (Clark, Nye, and Lincoln counties, north to Yucca Mountain and Coyote Springs), and into extreme southwestern Utah (Washington County: Beaver Dam Slope and north St. George), south throughout most of the Mojave Desert to the eastern Colorado Desert of Los Angeles, Kern, San Bernardino, Riverside, and Imperial counties, California (Murphy et al. 2011). Recent records also document naturally reproducing populations more than 60 km south of Palm Springs and beyond the southern boundary of the Colorado Desert Recovery Unit, in the vicinity of Anza Borrego Desert State Park (USFWS 2022). The elevational range of the species is mainly below 1,677 meters (5,500 feet) but extends from below sea level in Death Valley to 2,225 meters (7,300 feet) (USFWS 2011; NatureServe 2025).

Desert tortoises occupy a variety of habitats, but are almost entirely confined to warm creosote bush (*Larrea tridentata*) scrub vegetation characteristic of the Upper Sonoran life zones of the Mojave and Colorado deserts. In the Mojave Desert, the species occurs in creosote scrub, creosote-bursage (*Ambrosia dumosa*) associations, shadscale (*Atriplex*) scrub, Joshua tree (*Yucca brevifolia*) parks, and mixed blackbrush scrub at higher elevations. Tortoises are most often associated with well-drained sandy loam soils on plains, alluvial fans, and bajadas, though they occasionally occur in dunes, rocky outcrops, and vegetated alkali flats (NatureServe 2025). In the warmer, lower-elevation Colorado Desert, tortoises are generally confined to creosote scrub and wash woodland habitats (USFWS 2011).

In Nevada, *G. agassizii* occurs across Clark, Nye, and Lincoln counties. Clark County contains portions of the Eastern Mojave and Northeastern Mojave Recovery Units, making it a key component of the overall survival and recovery of the species. Mojave desert tortoise habitat covers approximately 2,198 square miles, or 27 percent of the total County area. Approximately 999,680 acres of formally designated desert tortoise critical habitat occur in Clark County, representing approximately 16 percent of the species' range-wide total of critical habitat (Nussear et al. 2024). The types of habitats that Mojave desert tortoises occupy in Clark County are diverse and can be

characterized as valley bottoms, lower slopes, upper slopes, mountain slopes, and mountain passes, as further described in Nussear et al. (2024).

5.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	Threatened
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	Threatened (under ESA)
State of Nevada	Threatened
State of California	Endangered
State of Arizona	Species of Greatest Conservation Need
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	None
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed stable
NatureServe Global and NV State Rank	G2G3 S2
IUCN Red List	Critically Endangered
CITES	Appendix II Species

The Mojave desert tortoise is listed as Threatened under the U.S. Endangered Species Act, a status that has been in effect since April 2, 1990 (55 FR 12178). USFWS completed a 5-year review in 2022 and recommended no change to the current Threatened classification (USFWS 2022). California designated the species a candidate for Endangered status under the California Endangered Species Act in October 2020, although this uplisted designation does not carry additional regulatory protections (USFWS 2022).

Globally, NatureServe assigns *G. agassizii* a G2 (Imperiled) rank, reflecting a range that, while spanning portions of four U.S. states, has experienced severe historical and ongoing population declines (NatureServe 2025). The species is ranked S2 in Arizona and Utah, and S2S3 in California and Nevada (NatureServe 2025). The IUCN reclassified the species as Critically Endangered under their Red List criteria in 2021, citing the magnitude of population trends and the status of current threats (Berry et al. 2021). The species is also listed on Appendix II of the CITES (NatureServe 2025).

Population trend data indicate broad and continuing declines across most of the species' range. Between 2004 and 2014, the total number of adult tortoises declined by an estimated 124,050 individuals (37 percent) range-wide (USFWS 2022; Allison and McLuckie 2018). Populations declined on average in every Tortoise Conservation Area (TCA) except those in the Northeastern Mojave Recovery Unit and in Joshua Tree and Piute Valley in the Colorado Desert Recovery Unit. Mean density of adult tortoises in 11 of the 17 TCAs fell below 3.9/km2, which is considered the minimum viable density for the species (USFWS 2022). In Nevada specifically, populations in most TCAs showed positive trends between 2004 and 2014, contrasting with broader range-wide declines (Allison and McLuckie 2018; NDOW 2022).

The NatureServe short-term trend for *G. agassizii* is a decline of 30 to 70 percent, and the long-term trend reflects a decline of 70 to 90 percent (NatureServe 2025). The species has experienced severe historical declines throughout the 20th century. In California's western Mojave, populations may have declined nearly 90 percent

since 1940, and as much as 70 percent locally between 1976 and 1984. The Beaver Dam Slope population in Utah declined by approximately 80 percent from the 1940s to 1990 (NatureServe 2025). The global adult population was estimated at approximately 212,343 individuals in 2014, down from 336,393 in 2004 (Allison and McLuckie 2018).

5.4 Impact

Desert tortoises possess a combination of life history and reproductive characteristics that reduce the ability of populations to recover from external threats (USFWS 2011). While current research results can lead to predictions about how local tortoise abundance should be affected by the presence of threats, quantitative estimates of the magnitude of these threats, or of their relative importance, have not yet been fully developed for all threat categories; as a result, a single threat or subset of threats with discernible solutions that could be targeted to the exclusion of others has not been definitively identified for the species rangewide (USFWS 2011).

The primary threats to *G. agassizii* include habitat loss, habitat degradation and fragmentation, climate change, and direct mortality (NatureServe 2025). Habitat loss and modification remain significant across the species' range. Since the revised recovery plan was published in 2011, large areas of desert tortoise habitat have been developed or approved for utility-scale solar energy development. These developments, located outside of TCAs, collectively account for approximately 74,000 acres of desert tortoise habitat across recovery units (USFWS 2022). Solar energy development has increased dramatically within the Northeastern Mojave Recovery Unit in recent years. Invasive grass-fueled wildfires remain a persistent concern (USFWS 2022). New threats include the rapid increase in illegal cannabis farms in the Mojave Desert, particularly in southern California, where bulldozers scrape native vegetation and topsoil in designated critical habitat (USFWS 2022). Military training-land expansions have also displaced tortoises, including the translocation of approximately 650 tortoises from Fort Irwin and approximately 1,000 tortoises from the Marine Corps Air Ground Combat Center expansion at Twentynine Palms (USFWS 2022).

Research confirms that tortoises are essentially absent from habitat within 1 km of areas with greater than 10 percent development (Carter et al. 2020). All tortoise populations declined in TCAs with road densities (paved and unpaved) above 0.75 km/km2 (USFWS 2022). Additionally, predation by subsidized raven populations represents an ongoing threat to juvenile recruitment across much of the species' range, and upper respiratory tract disease (URTD) caused by *Mycoplasma agassizii* is present throughout the range (USFWS 2022).

Climate change is projected to substantially reduce and shift suitable desert tortoise habitat upslope. The climate in the southwestern United States from 2000 through 2021 was the driest 22-year period in over 1,200 years (Williams et al. 2022). Declining reproductive output across much of the Mojave desert tortoise's range, as estimated between 1990 and 2018, could have a negative population-level effect if precipitation is significantly reduced as predicted under some climate models (Mitchell et al. 2021).Bureau of Land Management Areas of Critical Environmental Concern, some National Park Service lands, other lands allocated for resource conservation (e.g., the Boulder City Conservation Easement), MSHCP conserved lands and management actions, as well as other similarly conserved lands provide an extensive network of habitats that are managed either directly or indirectly for desert tortoise conservation in Clark County.

Within Clark county, Nussear et al. (2024) modeled desert tortoise habitat suitability on the basis of winter precipitation, soil substrate, and maximum air temperature. Of the 1,539,043 acres of suitable desert tortoise habitat within the MSHCP Amendment Plan Area, approximately 102,374 acres (6.7 percent) occur within the Impact Area. A total of 821,703 acres (53.4 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 58,854 acres (3.8 percent) of suitable habitat occur in the existing reserve, with an additional 127,017 acres (8.3 percent) in MSHCP Amendment Reserve System Additions.

Desert tortoise* *Gopherus agassizii*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,539,043	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	102,374	6.7%
Suitable Habitat in Lands Managed for Resource Conservation	821,703	53.4%
Suitable Habitat in the existing MSHCP Reserve System	58,854	3.8%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	127,017	8.3%

*Nussear et al. 2024

5.5 Data

Desert tortoise population data collection was initiated in the period from 1978 to 1983. Several long-term data collection methodologies have since been utilized to monitor population trends in subsequent decades. After several research efforts attempting to find the most reliable population trend and abundance estimators determined limitations in the methodologies, a long-term monitoring effort was initiated in 2001 and continues today (USFWS 2022). Range-wide monitoring efforts have continued to fluctuate at suboptimal levels due to inconsistent funding (Allison and McLuckie 2018; USFWS 2022).

The Nevada Department of Wildlife (NDOW) 2022 State Wildlife Action Plan identifies *G. agassizii* as a Species of Greatest Conservation Need. In Nevada, populations in most TCAs showed positive trends between 2004 and 2014, in contrast to the broader range-wide declines (Allison and McLuckie 2018; NDOW 2022). The Beaver Dam Slope TCA in the Northeastern Mojave Recovery Unit showed particularly strong positive trends during that period. However, the overall status of desert tortoises in Nevada remains a conservation concern given the ongoing threats and the broader population context.

The Clark County Desert Conservation Program has conducted systematic desert tortoise surveys and monitoring as part of the existing MSHCP. Nussear et al. (2024) prepared updated covered species models for the DCP, providing revised habitat suitability models for desert tortoises in Clark County based on winter precipitation, soil substrate, and maximum air temperature.

5.6 Recommendation

The Mojave desert tortoise should be retained as a covered species under the Amended MSHCP. The species is Federal- and State-listed as threatened, and its range in Clark County constitutes an important component of the species' overall range. The species' broad distribution throughout Clark County under an elevation of 4,000 feet makes it vulnerable to the many human induced impacts occurring, or anticipated to occur, over the life of the permit throughout the County.

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6.0 GILA MONSTER (*HELODERMA SUSPECTUM*)

6.1 Species Overview

Gila monsters are large (350 to 500 mm in length) venomous lizards that range across portions of the Sonoran, Mojave, and Chihuahuan deserts in the U.S. and Mexico. In the U.S. they are distributed in Arizona, southern Nevada, portions of southeastern California near the Nevada border, and southwest Utah. Early studies recognized two subspecies (*Heloderma suspectum suspectum*, the reticulate variety found in Arizona and Mexico, and *Heloderma suspectum cinctum*, the banded variety found in Nevada and Utah), although recent genetic analysis refutes this subspecific split (NDOW 2022).

Gila monsters are brightly colored, yet cryptic, and have a short activity period of approximately 90 days from April to mid-June, with limited activity on only about one third of days during their activity season (Beck 1990). They are most commonly observed above ground during daylight hours in April and May. During summer months, longer movements are restricted, but they remain active crepuscularly and nocturnally and during monsoonal rains. They largely remain in burrows during winter, though occasional above-ground movement occurs during optimal temperatures (NDOW 2022). Gila monsters are strongly associated with burrows and deep caves, and as such are frequently found in rocky (e.g., sandstone) or mountainous terrain. They are secretive diurnal predators that feed largely on the eggs and young of desert vertebrates, foraging widely on sandy areas and bajadas in the desert scrub habitats surrounding their shelter sites.

6.2 Range

Within the United States, the Gila monster inhabits isolated locales within extreme southwestern Utah, southern Nevada (Clark, Lincoln, and Nye counties), southeastern California (within San Bernardino County), and southern and western Arizona (Stebbins 2003). Gila monsters can be found in many habitats between 2,500 and 5,000 feet but most commonly frequent the lower slopes of mountains and adjoining canyon bottoms and arroyos and are frequently associated with rocky terrain (Bogert and del Campo 1956, Funk 1966) in areas with natural shelters and caves (Beck and Jennings 2003, Gienger 2003). Common habitat for the Gila monster is characterized by complex rocky landscapes of upland desert scrub adjacent to suitable foraging sites harboring appropriate prey and nests thereof (Beck 1990, Gienger 2003). Most localities are also associated with desert wash, spring, and riparian areas, including those along the lower Colorado River drainage (Funk 1966, Lovich and Beaman 2007, NDOW 2007). Gila monsters winter at more elevated locations (i.e., on rocky slopes, in rocky outcrops, or below cliffs), often with other reptiles such as rattlesnakes and desert tortoises. Summer ranges, however, are located in adjacent lower valleys or alluvial fans (Jennings and Hayes 2004) where the prey base is larger. Data are lacking on reproduction and nest sites for this species (Jennings and Hayes 2004, WildEarth and Beck 2010). Home ranges in Nevada are larger than those of lizards in southwest Utah (Gienger 2003). Gila monsters are thought to be absent from areas with low summer precipitation (e.g., Organ Pipe National Monument in Arizona [Bogert and del Campo 1956]).

Approximately 25 percent of the Gila monster's entire range occurs in Clark County (Stebbins 2003), and Clark County is at the northern extent of the range. Distribution of the Gila monster within Clark County is generally coincident with the distribution of desert tortoise and common chuckwalla (*Sauromalus ater*); however, little information exists on detailed distribution and relative abundance in Nevada (NDOW 2007). Recent research conducted by NDOW indicates that Gila monsters are more common than expected in the McCullough Mountains.

6.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive[1]
U.S. Forest Service (Region 4)	None
State of Nevada	Protected
State of California	Species of Special Concern
State of Arizona	Species of Greatest Conservation Need
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Highly Vulnerable
NatureServe Global and NV State Rank	G4 S2
IUCN Red List	Near Threatened
CITES	Appendix II Species

[1] Designation is at the subspecies level of banded Gila monster, *Heloderma suspectum cinctum*

NNHP assigns a global rank of G4 (apparently secure) with a subspecies rank of T3 (vulnerable) and a state rank of S2 (imperiled) to the Gila monster (NNHP 2025). The IUCN Red List classifies the species as Near Threatened, and CITES lists it under Appendix II, which regulates commercial trade. The 2022 Nevada State Wildlife Action Plan (NDOW 2022) identifies the Gila monster as a Species of Greatest Conservation Need, and the Nevada Climate Change Vulnerability Index rates the species as Highly Vulnerable.

Gila monsters are rarely observed in nature, which makes it difficult to determine population trends. Most experts believe that populations are declining over most of the range, but the rate of decline is unknown (NatureServe 2026). WildEarth and Beck (2010) estimated that populations have declined from thousands to hundreds in Washington County, Utah; however, these estimates are not based on quantitative field surveys. Population genetic analysis by Wood and Vandergast (2023) suggests that Clark County populations are of sufficient size and diversity to stave off inbreeding and demographic decline, and these populations are of comparable size to that of protected Saguaro National Park.

The Gila monster was petitioned for listing under the ESA as a distinct population segment in Utah in 2010. The distinct population segment was considered to have substantial losses of individuals due to losses of habitat since census data were not available (WildEarth and Beck 2010). The USFWS denied review and consideration for listing, determining that there was insufficient scientific evidence in the petition to distinguish the Utah population as a DPS (USFWS 2011). Prior USFWS actions in 1982 included consideration of this species as a Category 2 candidate, as a broad inclusion of species for which listing may have been warranted; however, the Gila monster was later removed from this consideration as this categorization was discontinued due to lack of sufficient information to justify listing (USFWS 1996). The Gila monster has state-protected status in Nevada, Utah and Arizona, which prohibits collection for personal or commercial purposes (NDOW 2009).

6.4 Impact

Direct threats to the Gila monster, including those in Clark County, include illegal collection for commercial and

recreational purposes, and injury and mortality resulting from collisions with vehicles on paved and unpaved roads (AGFD 2002). Predation is also a threat to this species. As urbanization becomes more prevalent in previously uninhabited deserts, human and pet densities increase, as well as densities of subsidized predators (Esque et al. 2010). Pet encounters with wildlife are presumed to be a contributing factor in Gila monster declines (Jennings and Hayes 2004, WildEarth and Beck 2010). Additionally, the Gila monster has a venomous bite and has therefore been the target of unwarranted destruction by humans (NDOW 2009, WildEarth and Beck 2010). Gila monsters are at risk of genetic diversity loss resulting from habitat fragmentation and barriers to dispersal. Highway 160 and Interstate Highway 15 represent likely movement barriers for the Calico and Blue Diamond Hills population (Wood and Vandergast 2023).

The Gila monster is covered under the 1998 Conservation Agreement for the Spring Mountain Range. The Gila monster is included as a Covered Species in the Coyote Springs Investment Multiple-Species Habitat Conservation Plan (MSHCP) published in July 2008 and the corresponding ESA section 10(a)(1)(B) incidental take permit issued by the USFWS in October 2008 (Coyote Springs Investment Multiple-Species Habitat Conservation Plan 2008). The Coyote Springs Investment MSHCP area covers portions of Clark and Lincoln counties, north of the Clark County MSHCP area.

Suitable habitat for this species within Clark County was modeled based on elevation, distance to springs, land cover, and landform (Simandle and Nussear 2025). Modeled suitable habitat for the Gila monster covers approximately 1,021,803 acres within the MSHCP Amendment Plan Area. Of this total, the Impact Area encompasses 52,929 acres (5.2 percent). Lands managed for resource conservation contain 598,057 acres of suitable habitat, representing 58.5 percent of the total habitat within the Plan Area. The existing MSHCP Reserve System includes 8,141 acres (0.8 percent), and the MSHCP Amendment Reserve System Additions account for an additional 108,634 acres (10.6 percent) of suitable Gila monster habitat.

Gila monster* *Heloderma suspectum*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,021,803	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	52,929	5.2%
Suitable Habitat in Lands Managed for Resource Conservation	598,057	58.5%
Suitable Habitat in the existing MSHCP Reserve System	8,141	0.8%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	108,634	10.6%

*Simandle and Nussear 2025

6.5 Data

Gila monsters spend up to 98 percent of their lives underground (Beck 2005, Beck and Jennings 2003), which makes them difficult to observe and survey. Infrequent observations should not be interpreted as low likelihood of occurrence, as they are known to occur throughout Clark County.

There is taxonomic uncertainty regarding the validity of subspecific designations within *Heloderma suspectum*. Early studies recognized two subspecies: *H.s. suspectum*, the reticulate subspecies distributed in southern Arizona and northwestern Mexico, and *H.s. cinctum*, the banded subspecies distributed from southern Nevada and southwestern Utah south to central Arizona (Bogert and del Campo 1956). WildEarth and Beck (2010) argued for recognition of a unique distinct population segment in southwestern Utah, citing isolation and ecological distinction. Recent molecular analysis refutes the division of the species into subspecies (Douglas et al. 2010);

further study of subspecific validity is needed (Crother 2017), though population genetic structure remains relevant to conservation planning for Clark County.

The 2022 Nevada State Wildlife Action Plan (NDOW 2022) acknowledges the species but does not provide quantitative survey data for Clark County populations. Northeast Clark County provides a regional stronghold for this population and shows a higher degree of genetic diversity representing the historic intergrade between the Nevada and Utah populations (Wood and Vandergast 2023).

The Clark County Desert Conservation Program has supported survey and monitoring efforts for Gila monsters in Clark County. Habitat suitability modeling for this species within Clark County was conducted under the Desert Conservation Program and has been updated to reflect current landscape conditions (Simandle and Nussear 2025). Genetic sampling, also conducted under the Desert Conservation Program, assessed population structure and diversity of Gila monsters across Nevada, with results indicating that Clark County populations are demographically viable and of conservation significance (Wood and Vandergast 2023).

6.6 Recommendation

Recommended for coverage. In consideration of contemporary research and state-level attention to the species throughout its range, the Gila monster should be retained as a covered species under the new MSHCP. Clark County is at the northern extent of this species' range and also encompasses 25 percent of its range. There is reason to believe future attempts at listing may occur, and this species is considered sensitive in California, Utah, and Arizona. The species' broad distribution throughout Clark County under an elevation of 4,000 feet makes it vulnerable to the many human induced impacts occurring, or anticipated to occur, over the life of the permit throughout the County.

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7.0 SPOTTED LEAF-NOSED SNAKE (*PHYLLORHYNCHUS DECURTATUS*)

7.1 Species Overview

The spotted leaf-nosed snake is nocturnal and is active April through July (Stebbins 2003). The enlarged rostral scale may help this snake burrow through sand in search of prey (Stebbins 1954, Ernst et al. 2003). The snake is secretive and little is known of its biology and population status, likely due to its nocturnal habits. The snake eats primarily lizard eggs as well as small lizards.

7.2 Range

The spotted leaf-nosed snake typically inhabits sandy or gravelly habitats and has been associated with Creosote bush habitats typical of Mojave desert scrub and mixed Mojave desert scrub (Brattstrom 1953, Goldberg 1996, Stebbins 2003). It is usually found in bajadas and valley bottoms up to 4,000 feet in elevation (Stebbins 2003), and is rare in sandy flats, although in some areas it occupies sand dunes (Cowles 1941). This snake may burrow into loose soil or sand, and it hides under rocks or surface debris or in abandoned rodent burrows (Stebbins 1954, Ernst et al. 2003).

The range of this species extends from southern California, southern Nevada, southwestern Utah (one individual) (Cox and Tanner 1995), and central Arizona, to southern Baja California (Grismer 2002) and southern Sonora, Mexico, including certain islands in the Gulf of California; a record from San Joaquin County, California, is presumed not to represent a natural occurrence (McCleary and McDiarmid 1993). The elevational range extends from below sea level to about 1,220 meters (4,000 feet) (Stebbins 2003). Based on this description, the portion of the species' range within the Plan Area is estimated at less than 10 percent. This species is likely distributed throughout Clark County and the Plan Area where suitable habitat exists.

7.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	None
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	None
NV Division of Natural Heritage	None
NV State Wildlife Action Plan	None
NV Climate Change Vulnerability Index	Not Vulnerable/Presumed Stable
NatureServe Global and NV State Rank	G5 S4
IUCN Red List	Least concern
CITES	None

The spotted leaf-nosed snake holds a NatureServe global rank of G5 (Secure), indicating it is common and widespread and not at risk of extinction. The species has no special regulatory status under state or federal law. The IUCN last assessed the species in 2007, assigning it a status of Least Concern based on its wide distribution and presumed large population size (Frost et al. 2007). No population trend data are available for this species in Nevada.

7.4 Impact

Impacts include loss of habitat and/or mortality, urbanization, road construction and road-related mortality, off highway vehicle use, and collecting. In Nevada, commercial collection of reptiles, including the spotted leaf-nosed snake, was prohibited in 2017. No specific conservation actions for the spotted leaf-nosed snake in Nevada have been identified. Conservation management associated with the current MSHCP, as well as those occurring on public lands, likely benefit the spotted leaf-nosed snake along with other desert reptiles utilizing similar habitats.

Of the 1,915,410 acres of suitable spotted leaf-nosed snake habitat within the MSHCP Amendment Plan Area, approximately 166,459 acres (8.7 percent) occur within the Impact Area. A total of 914,012 acres (47.7 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 82,970 acres (4.3 percent) of suitable habitat occur in the existing reserve, with an additional 158,448 acres (8.3 percent) in MSHCP Amendment Reserve System Additions.

Spotted leaf-nosed snake* *Phyllorhynchus decurtatus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,915,410	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	166,459	8.7%
Suitable Habitat in Lands Managed for Resource Conservation	914,012	47.7%
Suitable Habitat in the existing MSHCP Reserve System	82,970	4.3%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	158,448	8.3%

*SWECO 2018

7.5 Data

The taxonomy of this species has been subject to revision. Previously, five subspecies were recognized: *P. d. arenicola*, *P. d. decurtatus*, *P. d. perkinsi*, *P. d. nubilis*, and *P. d. norrisi* (Smith and Langebartel 1951); however, McCleary and McDiarmid (1993) and Gardner and Mendelson (2004) determined these are geographically distinct populations but do not represent a subspecies-level classification. This taxonomic uncertainty, combined with the secretive and nocturnal habits of the species, contributes to the limited data available for population assessment.

No population or population-trend data for the leaf-nosed snake are available. No systematic studies or surveys for the leaf-nosed snake have been identified that would provide credible data upon which to base an analysis of take. The IUCN estimated a population of >100,000 individuals and a population decline of < 1 percent per year without citing any data (Frost et al. 2007).

7.6 Recommendation

Not recommended for coverage. The IUCN last evaluated the species in 2007 (Frost et al. 2007) and determined its status as Least Concern based on its wide distribution, presumed large population (>100,000 individuals), and because it is unlikely to be declining fast enough (a rate of <10 percent over 10 years) to qualify for listing in a more threatened category. Several subpopulations and many occurrences of this snake occur in protected areas,

and based on the ubiquitous nature of the described species natural history, habitat use, and wide distribution, it is unlikely to see an endangered or threatened species listing proposal.

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8.0 COMMON CHUCKWALLA (*SAUROMALUS ATER*)

8.1 Species Overview

The common chuckwalla is a large, flat-bodied lizard reaching up to 50 centimeters in length and up to one kilogram in weight, with a broad, round body and blunt-tipped tail (NDOW 2022). The species inhabits rocky desert, lava flows, hillsides, and outcrops where rock crevices provide opportunities for thermal regulation and predator escape. Creosote bush occurs throughout most of the range (Stebbins 2003, Hammerson 2007).

8.2 Range

The species occurs throughout the southwestern deserts in southern Nevada, southeastern California, southeastern Utah, western Arizona, and northwestern Mexico. Two genetically distinct clades occur in the Newberry Mountains/Goodsprings area and north of the Newberry Mountains (NDOW 2022). Clark County is near the northern extent of the range, and this species occurs on virtually all undisturbed rocky hillsides up to about 4,920 feet in elevation (Desert Conservation Program 2017).

8.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	None
State of Arizona	None
State of Utah	None
NV Division of Natural Heritage	Watch List
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Moderately Vulnerable
NatureServe Global and NV State Rank	G5 S3
IUCN Red List	Least Concern
CITES	None

The common chuckwalla is considered globally secure (G5) by NatureServe, reflecting its broad distribution across the deserts of southwestern North America and the presence of a large number of viable occurrences throughout much of its range, particularly in California, Arizona, and Sonora, Mexico (NatureServe 2026). The global abundance is estimated at 100,000 to more than 1,000,000 individuals, though comprehensive rangewide abundance data are lacking. The species holds a national status of N5 in the United States. At the state level, Nevada's population is ranked S3 (Vulnerable), reflecting greater uncertainty and localized concerns relative to the species' rangewide security (NatureServe 2026).

Population trend data are limited. NatureServe (2026) characterizes the short-term trend as relatively stable, with no more than 10 percent change, while the long-term trend ranges from a decline of less than 30 percent to an increase of 25 percent. Annual densities are variable and influenced by environmental conditions, with higher

densities documented following mild winters and summer rainfall events. During a seven-year study in the Colorado Desert of southwestern California, densities ranged from 15 to 30 individuals per hectare. Despite this variability, area of occupancy and overall population size appear relatively stable across most of the range.

In Nevada specifically, population trend is listed as unknown due to a lack of baseline monitoring data. The Nevada State Wildlife Action Plan (NDOW 2022) notes that some suitable habitat has been lost in southern Nevada due to ongoing development pressure, and the species is ranked as moderately vulnerable under the Climate Change Vulnerability Index. Commercial collection of chuckwallas in Nevada was a concern until the practice was prohibited in 2017, and the population may still be recovering from past collection pressure (NDOW 2022).

8.4 Impact

The species is vulnerable to overharvesting at easily accessible and well-known sites. The chuckwalla's relatively low reproductive rate, combined with its long-lived nature, make it difficult for a population to recover once numbers have substantially declined (NDOW 2022). The Nevada Wildlife Commission voted to ban commercial collection of reptiles in September 2017, including the chuckwalla. Only hobby collecting with a possession limit of two is permitted (NDOW 2022). The NDOW (2022) further identifies increased wildfire frequency from invasive grasses as an additional low-level threat, and notes that habitat disturbance, poaching, and harm from pets associated with urban development remain ongoing concerns.

Suitable habitat for this species within Clark County was modeled by Simandle and Nussear (2025). Of the 1,341,337 acres of suitable common chuckwalla habitat within the MSHCP Amendment Plan Area, approximately 53,528 acres (4.0 percent) occur within the Impact Area. A total of 917,328 acres (68.4 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 12,306 acres (0.9 percent) of suitable habitat occur in the existing reserve, with an additional 110,223 acres (8.2 percent) in MSHCP Amendment Reserve System Additions.

Common chuckwalla* *Sauromalus ater*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,341,337	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	53,528	4.0%
Suitable Habitat in Lands Managed for Resource Conservation	917,328	68.4%
Suitable Habitat in the existing MSHCP Reserve System	12,306	0.9%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	110,223	8.2%

*Simandle and Nussear 2025

8.5 Data

Abundance information is not available range-wide, but the total adult population size is estimated at more than 100,000 individuals. Populations may vary with environmental conditions (Hammerson 2007). The data gaps described for Nevada are considered applicable range-wide.

No targeted survey data for the common chuckwalla from other agencies operating in Nevada or Clark County were identified for this report. No dedicated surveys for this species have been conducted by the Clark County Desert Conservation Program.

8.6 Recommendation

Not recommended for coverage. The chuckwalla should not be included as a covered species. Only a small fraction of modeled high- and medium-quality chuckwalla habitat may be impacted by Plan activities. Furthermore, a large majority (80 percent, 825,500 acres) occurs on conserved lands (Simandle and Nussear 2025). Commercial collection in Nevada was eliminated by the Nevada Wildlife Commission in 2017.The species is not considered to be a Species of Conservation Concern/Need in California (Thomson et al. 2016; CDFW 2025) or Arizona (AGFD 2022, 2025). The chuckwalla has an extremely limited range in Utah and was recently added as a Utah Species of Concern (UDNR 2025). There is no current indication that the species is at risk of ESA listing, given its widespread relative abundance and the absence of documented significant rangewide threats.

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9.0 ARIZONA TOAD (ANAXYRUS MICROSCAPHUS)

9.1 Species Overview

The Arizona toad (*Anaxyrus microscaphus*) is a medium-sized bufonid toad, generally 51 to 76 mm in length, characterized by a low number of reddish-brown warts, absence of cranial crests, and oval, widely separated parotoid glands that are pale toward the front. The dorsum is gray to light brown. The species is the only toad in the arid southwestern United States restricted to riverine corridors and adjacent uplands, occupying a variety of biotic communities and elevations across its range (Oyler-McCance et al. 2024). After aestivating in late summer, the species emerges in late winter. Egg deposition occurs among gravel, leaves, or sticks, or on mud or clean sand, in flowing or shallow quiet waters of perennial or semipermanent streams or shallow ponds (Dahl et al. 2000). Adults are primarily nocturnal except during the breeding season, and are inactive in cold temperatures, active at ambient temperatures of approximately 22 to 35 degrees C (Stebbins 2003). Diet consists of invertebrates including snails, crickets, beetles, and ants, with occasional cannibalism of newly metamorphosed individuals; larvae are herbivorous, consuming algae, organic debris, and plant tissue (NatureServe 2026, NDOW 2022).

The taxonomy of *A. microscaphus* has been subject to revision. The species was formerly treated as a subspecies of *Bufo woodhousii* by some authors, and the genus *Anaxyrus* was split from *Bufo* by Frost et al. (2006), though many references continue to use *Bufo*. Gergus (1998) examined allozyme variation in the *microscaphus* complex and found discrete differences among the three subspecies (*microscaphus*, *californicus*, and *mexicanus*), concluding under the phylogenetic species concept that each should be recognized as a distinct species. The species is synonymized with *Bufo microscaphus* and *Bufo microscaphus microscaphus* in older literature (NatureServe 2026).

9.2 Range

The Arizona toad occurs in the southwestern United States in scattered locations across southwestern Utah, southern Nevada, Arizona, and western New Mexico (Price and Sullivan 1988, Sullivan 1993, Gergus 1998, Stebbins 2003, Brennan and Holycross 2006, Ryan et al. 2014). The species is found from the Colorado and Virgin River basins in southern Nevada and southwestern Utah southeast through the lower mountains of Arizona mostly below the Mogollon Rim into the Mogollon Plateau of west-central New Mexico (Nigro and Rorabaugh 2023). The species is presumed extirpated from its small historical distribution in California (Clark 2011).

Genomic analysis has revealed two genetically distinct groups within the species' range, divided by the Colorado River (Oyler-McCance et al. 2024). The northern group comprises populations in the Virgin River, Beaver Dam Wash, and Meadow Valley Wash drainages of Utah and Nevada, while the southern group encompasses populations in central and southeastern Arizona and New Mexico. Within the southern group, additional substructure exists between lower-elevation western drainages (Bill Williams, Verde, and Agua Fria rivers) and higher-elevation eastern drainages (Salt, Gila, Mimbres, and Rio Grande rivers), with connectivity among populations shown to be facilitated by mesic conditions at higher elevations (Oyler-McCance et al. 2024).

The species is associated with lotic aquatic systems and occupies a variety of riparian habitats from lowland desert washes to higher-elevation pine-oak zones. Habitat includes rocky stream courses, stream corridors bordered by willows and cottonwoods, irrigation ditches, flooded and irrigated fields, and reservoirs (Stebbins 2003, Price and Sullivan 1988, Schwaner and Sullivan 2005). The species depends on shallow, perennial river and stream reaches with sandy, open floodplain habitats, and this specificity renders it more sensitive to flow reductions or drying than most other toads in the region (Oyler-McCance et al. 2024). As smaller isolated wetlands have dried up due to drought and other factors, the species has shifted toward primarily occupying riverine habitat (Driver et al. 2023).

In Nevada, the Arizona toad is restricted to the Meadow Valley Wash, Beaver Dam Wash, and Virgin River drainages and was historically present in Las Vegas Valley, where it is now believed extirpated (NDOW 2022). The

species has a highly fragmented range within the state, and information on occupied habitats in Nevada is largely lacking (NDOW 2022).

9.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None[1]
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	None
State of Arizona	Species of Greatest Conservation Need
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4 S2
IUCN Red List	Least Concern
CITES	None

[1]The USFWS issued a positive 90-day finding on an ESA listing petition in 2015 (USFWS 2015); the species remains unlisted federally but is included in the USFWS Fiscal Year 2024-2028 National Domestic Listing Workplan and is slated for assessment in fiscal year 2026 (USFWS 2024).

The Arizona toad is currently ranked G4 (Apparently Secure) globally by NatureServe (NatureServe 2026), reflecting that while the species retains a broad distribution across the southwestern United States, populations have experienced declines in area of occupancy and abundance. The national status for the United States is N3N4. State rankings reflect greater concern at the regional level: Nevada and Utah are each ranked S2 (Imperiled), while Arizona and New Mexico are ranked S3 (Vulnerable) (NatureServe 2026; NDOW 2022). The species is listed as Sensitive by the BLM in Nevada (NDOW 2022) and is recognized as a Species of Greatest Conservation Concern in all four states where it occurs (Oyler-McCance et al. 2024). USFWS received a petition for listing under the Endangered Species Act in 2012 and issued a positive 90-day finding in 2015 indicating the petition may be warranted; the species is included in the USFWS FY23–27 National Domestic Listing Workplan and is slated for formal assessment in fiscal year 2026 (NatureServe 2026; Oyler-McCance et al. 2024).

Population trends for the Arizona toad are generally negative, though the rate and extent of decline vary by region. NatureServe (2026) estimates a long-term trend of 30 to 50 percent decline and a short-term trend of 10 to 30 percent decline. In Nevada, trend may be declining but the rate of decline is unknown; Stebbins (2003) estimated the species has disappeared from a majority of its historic range rangewide, though populations in Beaver Dam Wash and isolated springs in Meadow Valley Wash may be stable to increasing. In New Mexico, two sites occupied in 2014 were not detected in 2016 and were presumed extirpated (NatureServe 2026). In Arizona, an earlier survey indicated local declines but no obvious major trend (NatureServe 2026). Between 2013 and 2018, consecutive years of unseasonal flooding or drought in New Mexico were associated with no breeding activity or loss of entire cohorts, and similar patterns were observed in Arizona from 2020 to 2022 (Oyler-McCance et al. 2024).

9.4 Impacts

Threats to the Arizona toad include hybridization, riparian degradation, nonnative predators, disease, and altered

hydrology. Hybridization with Woodhouse's toad (*Anaxyrus woodhousii*) is exacerbated by human-altered habitats favoring lentic water (Sullivan 1986; Schwaner and Sullivan 2009). Riparian degradation occurs through water diversions, dams, channelization, urbanization, and recreational use (NDOW 2022). The Arizona toad is at risk of predation from nonnative predators, such as bullfrogs, predatory fish, and crayfish preying on eggs and tadpoles (NDOW 2022). Disease, notably chytridiomycosis (*Batrachochytrium dendrobatidis*), has been detected in the species (Ryan et al. 2014). Climate change threatens survivorship of this species by altering hydrology and increasing aridity (NDOW 2022).

Suitable habitat for this species within Clark County was modeled by Simandle and Nussear (2025). This effort predicted only low-suitability habitat for Arizona toad; no medium- or high-suitability habitat was predicted to occur in Clark County. Of the 28,158 acres of suitable Arizona toad habitat within the MSHCP Amendment Plan Area, approximately 5,329 acres (18.9 percent) occur within the Impact Area. A total of 13,324 acres (47.3 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 329 acres (1.2 percent) of suitable habitat occur in the existing reserve, with no suitable habitat occurring in MSHCP Amendment Reserve System Additions.

Arizona toad* *Anaxyrus microscaphus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	28,158	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	5,329	18.9%
Suitable Habitat in Lands Managed for Resource Conservation	13,324	47.3%
Suitable Habitat in the existing MSHCP Reserve System	329	1.2%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	0	0.0%

*Simandle and Nussear 2025

9.5 Data

Clark County Desert Conservation Program funded a two-year USGS project (2024 to 2025) to assess current status and identify potential habitat for the Arizona toad (Hossack and Stemp 2024, Stemp and Hossack 2026). Field crews used two primary detection methods: visual encounter surveys and environmental DNA (eDNA) sampling. eDNA filters were collected from sites with adequate water and analyzed at Washington State University for four target species: Arizona Toad, Woodhouse's Toad (*Anaxyrus woodhousii*), Red-spotted Toad (*Anaxyrus punctatus*), and American Bullfrog (*Lithobates catesbeianus*). Surveys were conducted April through July in both years, with 2025 surveys beginning approximately one month earlier than 2024 to better capture ephemeral water availability. In addition to presence/absence data, crews assessed individual toads for hybrid characteristics using a morphological scoring index and parotoid gland measurements. Over the two-year project, crews visited 270 potential sites, conducted 198 visual encounter surveys at 154 sites, and collected 295 eDNA filters from 131 sites.

No Arizona Toads were confirmed in Clark County via visual encounter surveys. However, eDNA methods detected Arizona Toad DNA at six sites within the county, all along the Virgin River between the Arizona state line and its confluence with the Muddy River at Lake Mead. This represents the first confirmed evidence of the species in Clark County in approximately 40 years. Three of these detections occurred on Clark County-owned or adjacent properties: Bunkerville East Riparian Reserve (2024), Mormon Mesa South Riparian Reserve (2025), and the Electric Avenue property (2025). An additional eDNA detection in Calico Basin at Red Rock Canyon National Conservation Area was considered inconclusive due to a single weakly positive filter at a site geographically isolated from other verified records (Hossack and Stemp 2024, Stemp and Hossack 2026).

Morphological evidence of potential Arizona Toad × Woodhouse's Toad hybridization was observed at multiple

locations, particularly at Las Vegas Wash near the Clark County Wetlands Reserve and at Riparian Reserve Bunkerville East. Several Woodhouse's Toads in these areas displayed hybrid-like traits including faint eyelid bars, squat parotoid glands, and prominent dorsolateral stripes. Hybrid scoring and parotoid gland ratios were positively correlated across all captured individuals. Because eDNA methods cannot distinguish hybridized from non-hybridized individuals (the assay targets maternally inherited mitochondrial DNA), the extent of hybridization in the study area remains uncertain. Genetic analysis of collected buccal swab samples would be needed to resolve this (Hossack and Stemp 2024, Stemp and Hossack 2026).

9.6 Recommendations

Recommended for coverage. In consideration of federal-level attention to the species throughout its range, the Arizona toad should be added as a covered species under the new MSHCP. Clark County is at the western extent of the species' range and may support an extant population. Modeled habitat in Clark County is predominantly of marginal quality, but quality is predicted to improve near the Muddy River at Moapa, as well as along the Meadow Valley Wash and Virgin River within the county.

Up to 18 percent of predicted habitat may be impacted by plan activities. Approximately 1.2 percent (329 acres) of predicted Arizona toad habitat is protected under the existing MSHCP Reserve System. Due to these considerations, the species is vulnerable to human-induced impacts occurring, or anticipated to occur, over the life of the permit throughout the County.

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10.0 MONARCH BUTTERFLY (*DANAUS PLEXIPPUS*)

10.1 Species Overview

This large, showy butterfly is found throughout the United States, southern Canada, and Central America. It also occurs in parts of South America and other continents. This species consists of two migratory populations in eastern and western North America, along with multiple resident populations within its native range. Migratory populations are referred to as *Danaus plexippus* ssp. *plexippus*, while the entire species is referred to as *Danaus plexippus*. Migratory monarchs are present in southern Nevada.

Adults are distinguished by orange and black wing veins, with white dots along wing margins. Larvae are black, yellow, and white in color, with long thorax filaments. Monarchs are obligate users of host plant milkweed (Asclepias sp.) for breeding and feeding. Larval monarchs sequester toxins from milkweed plants. Monarchs breed and forage during the summer months throughout the continental United States and begin their overwintering migration from August to October. Monarch butterflies typically arrive in mid-October to overwintering sites along the California coast and remain until late February or March (Jepsen et al. 2015).

10.2 Range

Western monarchs breed west of the Rockies and overwinter in tree groves in coastal California and northern Mexico. This species prefers overwintering habitat comprised of a relatively dense grove of trees with some understory, located near water and nectar sources and protected from the wind by topographic landforms or trees (Sakai and Calvert 1991). Winter roost sites are often on south, southwest, or west-facing slopes which may provide more favorable temperature regimes and wind protection (Leong et al. 2004). Monarchs may occur in Nevada during the summer breeding season, preferring moist areas such as meadows, riparian areas, springs and anthropogenic habitats containing milkweed and water sources. Nevada only supports breeding sites and is not known to support any overwintering sites.

10.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	Proposed Threatened
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	No Status
State of California	No Status
State of Arizona	No Status
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk[1]
NV State Wildlife Action Plan	Species of Greatest Conservation Need[1]
NV Climate Change Vulnerability Index	Not Evaluated
NatureServe Global and NV State Rank	G4 S3
IUCN Red List	Least Concern
CITES	None

[1] Designation is at the subspecies level of monarch butterfly, *Danaus plexippus plexippus*

The migratory monarch butterfly does not currently have protections at the federal level. A proposed rule to list the monarch butterfly as a threatened species with a 4(d) Rule and to designate critical habitat was published December 12, 2024 (89 FR 100662). The comment period, originally closing March 12, 2025, was reopened through May 19, 2025 (90 FR 12694). A final listing determination has not yet been made. The Nevada State Wildlife Action Plan (NDOW 2022) lists this species as a Species of Greatest Conservation Need, but this designation does not prescribe specific conservation actions nor prohibit take. The western migratory monarch butterfly population has undergone significant range-wide decline, an estimated 66 to 91 percent from 2012 to 2022 (Walker et al. 2022). The western overwintering population has been documented at more than 400 sites, but only 109 hosted this species in 2024. The western population has declined more than 74 percent since the late 1990s, from more than 1.2 million to fewer than 200,000 individuals (Western Association of Fish and Wildlife Agencies [WAFWA] 2019). The USFWS Species Status Assessment (USFWS 2024a) estimates a 60 to 68 percent probability of extinction for the western population within 10 years under current conditions, rising to 99 percent probability by year 60, with these risks increasing under projected future climate conditions. Both the eastern and western populations are more vulnerable to catastrophic events (e.g., extreme storms at overwintering habitat) due to current low population numbers (USFWS 2024a).

The WAFWA Western Monarch Butterfly Conservation Plan (2019 to 2069) established a near-term population target of 4.5 million wintering monarchs to ensure a self-sustaining population, underscoring the severity of current declines relative to conservation benchmarks (WAFWA 2019).

10.4 Impact

Direct threats to monarch butterfly, including those in Clark County, include habitat loss, pesticides, and drought (USFWS 2024b, NDOW 2022). Monarch butterflies occurring in Nevada are progeny of the western migratory population, which is subject to threats throughout its range. Habitat loss at the Pacific coastal overwintering sites has follow-on effects on Nevada populations.

Simandle and Nussear (2025) modeled suitable habitat for this species on the basis of winter precipitation, host plant suitability, and terrain. High-suitability habitat is predicted to occur in the South McCollough Mountains, north of the Muddy Mountains, and near the Muddy River at Overton. Medium-suitability habitat is widespread throughout Clark County (Simandle and Nussear 2025). Of the 419,895 acres of suitable monarch butterfly habitat within the MSHCP Amendment Plan Area, approximately 12,606 acres (3.0 percent) occur within the Impact Area. A total of 282,441 acres (67.3 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 2,837 acres (0.7 percent) of suitable habitat occur in the existing reserve, with an additional 20,825 acres (5.0 percent) in MSHCP Amendment Reserve System Additions.

Monarch butterfly* *Danaus plexippus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	419,895	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	12,606	3.0%
Suitable Habitat in Lands Managed for Resource Conservation	282,441	67.3%
Suitable Habitat in the existing MSHCP Reserve System	2,837	0.7%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	20,825	5.0%

*Simandle and Nussear 2025

10.5 Data

Monarch butterfly is understudied in Nevada, and the state population is not actively monitored or censused. No

systematic surveys for monarch butterfly have been conducted specifically within Clark County by state or federal agencies. Citizen science data are available from iNaturalist, which recorded 28 monarch observations in Clark County in 2024 (iNaturalist 2024).

Rare plant surveys conducted by Ironwood Consulting to identify potential habitat for monarch butterfly in Clark County recorded incidental observations of four distinct *Aclepias* species. Occurrences were located in the Spring Mountains, Pahrump Valley, Gold Butte and Muddy Mountains (Ironwood Consulting 2023).

10.6 Recommendation

Recommended for coverage. In consideration of the federal level of attention to the species throughout its range, the Monarch butterfly should be added as a covered species under the new MSHCP. Covered Plan activities will affect 3 percent of the medium- and high-suitability habitat for this species. A large majority of predicted medium- and high-suitability habitat (73 percent) occur in conserved areas. Due to these considerations, the species is vulnerable to human-induced impacts occurring, or anticipated to occur, over the life of the permit throughout the County.

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11.0 MACNEILL'S SALTBUSH SOOTYWING (*HESPEROPSIS GRACIELAE*)

11.1 Species Overview

MacNeill's sootywing is a small, dark brown skipper with a wingspread of 23 mm (Wiesenborn 2012). They live on the floodplains of the main stem and primary tributaries of the Lower Colorado River drainage. Adult MacNeill's sootywings fly from April through October with three generations in Nevada and two flights in southeastern California (Austin and Austin 1980).

11.2 Range

MacNeill's sootywing occurs along the Colorado River and its tributaries from extreme southwestern Utah through Clark County, Nevada, and is also present in Bill Williams, Gila, and Salt Rivers in Arizona, Coachella Valley in California, and Baja California Norte in Sonora Mexico (Wiesenborn 2012; NatureServe 2020).

This species only occurs in desert riparian habitats and inhabits floodplains of primary rivers. MacNeill's sootywing is dependent on quail brush as an oviposition, larval growth, and pupation substrate, but the host plant does not provide nectar for adults (Wiesenborn and Pratt 2008). Two important nectaring plants include *Heliotropium currasavicum* and *Sesuvium verrucosum* (Wiesenborn and Pratt 2008).

11.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	None
State of Arizona	None
State of Utah	Species of Greatest Information Need
NV Division of Natural Heritage	At Risk
NV Wildlife Action Plan	None
NV Climate Change Vulnerability Index	None
NatureServe Global and NV State Rank	G2? S1
IUCN Red List	None
CITES	None
Xerces Red List	None

Population trends for this species are unknown. NatureServe assigns MacNeill's sootywing a global rank of G2? (imperiled, rank uncertain) and a Nevada state rank of S1 (critically imperiled). The Nevada Natural Heritage Program lists this species as At Risk. The species has no current listing under the Endangered Species Act, CITES, or the IUCN Red List.

11.4 Impact

Modification through damming, inundation, and channelization of the Colorado River has likely destroyed much of this species natural habitat in Clark County. Conversion of vegetation from the preferred host plant, quail brush (*Atriplex lentiformis*), to non-native species such as tamarisk (*Tamarix ramosissima*) and other native plants such as arrow weed (*Pluchea sericea*), make potential habitats less suitable for the species. Other impacts include fire, livestock and feral horse grazing, OHV activity, and forms of habitat degradation (Braun 2015).

The species distribution model prepared for Clark County SWECO (2018) estimates that of the 224,499 acres of suitable MacNeill's saltbush sootywing skipper habitat within the MSHCP Amendment Plan Area, approximately 23,496 acres (10.5 percent) occur within the Impact Area. A total of 148,917 acres (66.3 percent) of suitable habitat are located within lands managed for resource conservation. Within the MSHCP Reserve System, 619 acres (0.3 percent) of suitable habitat occur in the existing reserve, with an additional 444 acres (0.2 percent) in MSHCP Amendment Reserve System Additions.

MacNeill's saltbush sootywing skipper* *Hesperopsis gracielae*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	224,499	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	23,496	10.5%
Suitable Habitat in Lands Managed for Resource Conservation	148,917	66.3%
Suitable Habitat in the existing MSHCP Reserve System	619	0.3%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	444	0.2%

*SWECO 2018

11.5 Data

Although population trends for this species remain unknown, recent surveys of ten conservation and wildlife areas along the Lower Colorado River Valley found evidence of sootywings at nine locations (Nelson and Wydoski 2021). Early life stages were associated with quailbush plants exhibiting statistically higher soil moisture at the plant base; plants where sootywings were detected averaged 63 percent soil moisture compared to 37 percent at plants where sootywings were absent. Soil moisture and appropriate densities of quailbush were identified as important attributes supporting MacNeill's sootywing populations, while plant size and nectar availability were not statistically significant factors (Nelson and Wydoski 2021).

Conservation areas should be within the floodplain of low-elevation desert riverine that either has or has had sootywings present. The plant community at the sites should provide ample shade by large trees and shrubs to accommodate an understory of appropriate food plants, and *Tamarix* spp. should be removed (Pratt and Wiesenborn 2011). In addition, removal of trespassing livestock and feral horses would likely be beneficial.

11.6 Recommendation

Not recommended for coverage. This species is not a Federal- or State-listed species, there is limited population data available for the species, and much of its potential habitat within Clark County is located in conservation areas. Based on current knowledge and data, although lacking, there is no indication the species is likely to become listed.

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12.0 MOJAVE POPPY BEE (*PERDITA MECONIS*)

12.1 Species Overview

The Mojave poppy bee (*Perdita meconis*) is a small, pollen-specialist bee strongly associated with flowers in the genera *Arctomecon* and *Argemone* in the eastern Mojave Desert. This diminutive bee is between 4.5 and 7 mm long, with a forewing length of 4-5 mm. This species features sexual dimorphism characterized by females with pale yellow head markings, and males with dark green heads. Mojave poppy bee is of conservation interest because its small home range and reliance on rare host plants (Center for Biological Diversity 2018). This species may remain dormant for up to three years, presumably as an adaptation to boom-and-bust cycles of host plant availability (WRA 2020).

12.2 Range

The Mojave poppy bee historically occurred across portions of southeastern California, southern Nevada, southern Arizona, and southwestern Utah, where its host plants in the genera *Arctomecon* and *Argemone* occur on gypsum-derived soils and other specialized substrates in the eastern Mojave Desert. The species is now extirpated from most of this historic range. In Nevada, the Mojave poppy bee is currently restricted to Clark County, where it is associated with gypsum outcrops and desert scrub habitats that support populations of its obligate host plants. Within Clark County, the species is known from seven sites corresponding to five distinct occurrences north of Lake Mead (Portman 2019). Survey data indicate that the current distribution extends from Sandy Valley on the western edge of Clark County through the Muddy Mountains and several isolated occurrences on the south shore of Lake Mead (U.S. Department of Agriculture 2024).

12.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None[1]
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	None
State of Arizona	None
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Not evaluated
NatureServe Global and NV State Rank	G2 S1
IUCN Red List	None
CITES	None

[1]*The USFWS found that this species listing may be warranted and have initiated a status review (USFWS 2023).*

NatureServe assigns the Mojave poppy bee a global rank of G2 (imperiled) and a Nevada state rank of S1 (critically imperiled), reflecting the species' extremely limited range and small number of known occurrences (NatureServe 2026). The Nevada State Wildlife Action Plan (NDOW 2022) identifies the species as a Species of Greatest Conservation Need. USFWS has identified this species as a candidate for listing under the Endangered Species Act and has initiated a status review (USFWS 2023). NDNH lists the species as At Risk. Population trends are not well quantified, but the restricted range and reliance on rare host plants suggest the species remains vulnerable to further decline.

12.4 Impact

The Mojave poppy bee faces threats from habitat degradation, habitat fragmentation, loss of pollinator mutualism, loss of genetic diversity, invasive species, and climate change. Habitat degradation and fragmentation occur as the result of cattle grazing, urbanization, off-highway vehicle recreation, and mining activities. Due to its small home range and reliance upon the genera *Arctomecon* and *Argemone*, the species is especially vulnerable to impacts to host plant populations. Its host plants are gypsophile or gypsovag species and are therefore imperiled by proposed gypsum mining developments. Gypsum soils are especially attractive to off highway vehicle recreation around Lake Mead National Recreation Area and are disproportionately impacted by this activity. Cattle grazing may diminish the pool of available floral resources, which reduces habitat value. Grazing may also directly remove host plants from the landscape (Center for Biological Diversity 2018, Portman 2019).Invasive species such as Africanized honeybee (*Apis mellifera ligustica*) pose a direct threat to Mojave poppy bee through competition for host plant pollen. Africanized honeybees may also transmit pathogens such as Varroa mites and Black Queen Cell virus (NatureServe 2026). Climate change may exacerbate the frequency of drought and arid conditions, leading to greater stochasticity of host plant availability (WRA 2020).

Simandle and Nussear (2025) modeled suitable habitat for the Mojave poppy bee on the basis of winter precipitation, host plant suitability, and terrain. High-suitability habitat is predicted to occur in northeastern Clark County, from Rainbow Gardens northeast to the southern periphery of the Virgin Mountains (Simandle and Nussear 2025). Suitable habitat for the Mojave poppy bee (*Perdita meconis*) within the MSHCP Amendment Plan Area totals approximately 303,529 acres. Of this, 6,519 acres (2.1 percent) fall within the Impact Area. Lands managed for resource conservation encompass 172,079 acres of suitable habitat, representing 56.7 percent of the total suitable habitat within the Plan Area. No suitable habitat occurs within the existing MSHCP Reserve System; however, the MSHCP Amendment Reserve System Additions include 50,171 acres (16.5 percent) of suitable habitat for this species.

Mojave poppy bee* *Perdita meconis*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	303,529	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	6,519	2.1%
Suitable Habitat in Lands Managed for Resource Conservation	172,079	56.7%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	50,171	16.5%

*Simandle and Nussear 2025

12.5 Data

The U.S Department of Agriculture (2024) conducted three years of range-wide surveys in Clark County, resulting in detections at multiple historic sites and new locations. These surveys demonstrate a high degree of population stochasticity and interannual variability, which complicates assessment of population status and trends.

12.6 Recommendations

Recommended for coverage. In consideration of federal level of attention to the species throughout its range, the Mojave poppy bee should be added as a covered species under the new MSHCP. This species is endemic to Clark County, and exceedingly vulnerable to anthropogenic threats. Due to these considerations, the species is vulnerable to human-induced impacts occurring, or anticipated to occur, over the life of the permit throughout the County.

12.7 References

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13.0 PALLID BAT (ANTROZOUS PALLIDUS)

13.1 Species Overview

The pallid bat (*Antrozous pallidus*) is a large vesper bat with a body mass of 20 to 35 g, a forearm length of 48 to 60 mm, a wingspan of 37 to 41 cm, and large ears 31 to 36 mm in length (NBWG 2024). Its pelage is light yellow washed in brown or gray, with pale cream to almost white ventral fur. The muzzle is pale pinkish yellow with a blunt, pig-snout-shaped nose. Membranes are dark brown to black. Female pallid bats are larger than males, and both sexes have scent glands on either side of the muzzle (NBWG 2024). This species is a member of the family Vespertilionidae (Hermanson and O'Shea 1983). They are a highly social species (Hall 1946). While their roosts may be in elevated locations to avoid terrestrial predators, their foraging flights are often 0.1 to 10 m above the ground as they course the habitat in search of many types of ground-dwelling invertebrates or small vertebrates (O'Shea and Vaughan 1977, Bell 1982). They frequently inhabit a variety of cover locations including crevices in rock faces and cliffs, similar sites in buildings and bridges, hollow trees, and mine shafts. Pallid bats are not thought to undertake large migrations but have reduced activity during winter months.

Feeding behavior in pallid bats seems to be quite flexible and opportunistic. Food species include, but are not limited to, sphinx moths (Hyles sp., and Manduca spp.), crickets (*Gryllus* spp.), beetles (Scarabidae and Cerambycidae), scorpions (Scorpione), and centipedes. They also eat small lizards (*Phrynosoma douglasi*), smaller bats, and pocket mice (*Perognathus* sp.) (Hermanson and O'Shea 1983). Pallid bats will also take flying insects but may not compete for these as well as other bat species that are more maneuverable in flight (Bell 1982).

Mating usually begins in October and continues through December, but ovulation is delayed until April, and the young stay in a colony that protects them from thermal extremes and potentially from falling into harmful locations (Hermanson and O'Shea 1983). Maternity colonies may contain up to several hundred individuals but generally fewer than fifty (Vaughan and O'Shea 1976, O'Shea and Vaughan 1977). Roosts are important resources for bats at any time of year. These bats often occupy deep vertical crevices during spring and autumn. In contrast, summer roosts are located in deep horizontal crevices where the ambient temperatures are about 30° C and the bats' temperatures are similar. During winter, the larger colonies may disperse into smaller groups. Winter activity seems to be restricted to temperatures above freezing for bats in Clark County, including the pallid bat (as low as 2° C; O'Farrell et al. 1967). While some bats are active throughout the winter in southern Nevada, pallid bats were active sporadically (O'Farrell et al. 1967).

13.2 Range

The pallid bat ranges from southern British Columbia and Montana to central Mexico and is also known from Cuba (Hermanson and O'Shea 1983). They are found throughout Nevada at low to middle elevations (420 to 2,580 m[1,377 to 8,464 ft]), inhabiting a variety of ecosystems from low salt desert scrub habitats, through mid-elevation shrublands containing creosote or sagebrush to higher elevation blackbrush and pinyon-juniper woodlands, and up to coniferous forest (NBWG 2024). There are two subspecies found in Nevada: *A. p. pallidus* and *A. p. minor* (Hermanson and O'Shea 1983). The pallid bat is the only species in its genus. The pallid bat is expected to have a wide distribution in Clark County below 6000 feet (O'Farrell et al. 1967). Over 140 localities have been identified in Clark County, with the majority near steeper terrain in the Spring Mountains and located in the northern extent of the County.

While pallid bats may be found in a variety of habitat types, a study in Clark County found that 88 percent of their activity was detected in riparian woodland habitats (Williams et al. 2006); however, they are known to be opportunistic and flexible in their use of foraging habitat (Bell 1982). Roost availability, prey abundance, and water availability are considered to be primary determinants of high-suitability bat habitat (Fenton 1997); however, their large size and ability to travel efficiently may indicate that pallid bats may use key habitat characteristics that are

comparatively far apart (Nowak 1991).

13.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Protected
State of Arizona	None
State of California	Species of Special Concern
State of Utah	None
NV Division of Natural Heritage	Watch List
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	None
NatureServe Global and NV State Rank	G4 S3
IUCN Red List	Least Concern
CITES	None

The population status of the pallid bat in Clark County, Nevada is not well known at a local level. The Nevada Bat Conservation Plan (NBWG 2024) notes that the pallid bat is common throughout Nevada and populations are presumed stable, with a state rank of S3 (vulnerable). Recent studies of bat population trends in the southern coastal region of California indicated that several bat species, including pallid bats, have experienced population declines and could be seriously threatened, particularly at lower elevations (Miner and Stokes 2005). Populations are expected to continue to decline in that region as urban expansion increases.

13.4 Impact

Threats to the pallid bat are mostly related to habitat disturbance. These include large-scale urbanization, mine closures and abatement, industrial-scale farming, recreation, prescribed fire, wildfire, and renewable energy developments. Large-scale urban development can destroy large areas of foraging and roosting habitats. Building transportation corridors often destroys riparian habitats or results in loss of cliff habitats used for roosts (Miner and Stokes 2005). Prescribed fire activities generally take into consideration sensitive wildlife; however, wildfires cannot be controlled.

Renewable energy development can threaten bat habitat in two primary ways. The first is direct habitat disturbance; solar arrays may be the most destructive to foraging areas for desert bats in Clark County, while wind farms have a smaller surface area disturbance. The second is direct impacts to bats through collisions or barotrauma from wind turbines (Cryan and Barclay 2009, Cryan 2011). Pallid bats may be most vulnerable to wind turbine strikes as they emerge from roosting sites at dusk, when they fly at heights within the danger zone of turbine blades; while foraging near the ground, they are less exposed to this risk (O'Shea and Vaughan 1977).

Recreational activity such as mine and cave exploration or rock climbing can cause disturbances to bat colonies (Bradley et al. 2006), especially during the breeding period. In areas outside Clark County, large-scale industrial

farming can alter prey availability over large areas, and industrial pest control may reduce prey items or indirectly harm bats through toxicity. Notably, die-offs from environmental contaminants have not been recorded for pallid bats (Clark 1981).

Within the MSHCP Amendment Plan Area, approximately 1,319,787 acres of suitable pallid bat habitat have been modeled (SWECO 2018). Of this total, approximately 66,076 acres (5.0 percent) occur within the MSHCP Amendment Impact Area and are subject to potential development impacts. In contrast, approximately 945,548 acres (71.6 percent) of suitable habitat occur within lands managed for resource conservation. An additional714 acres (0.1 percent) of suitable habitat occur within the existing MSHCP Reserve System while 25,957 acres (2.0 percent) of suitable habitat fall within the MSHCP Amendment Reserve System Additions.

Pallid bat* *Antrozous pallidus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,319,787	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	66,076	5.0%
Suitable Habitat in Lands Managed for Resource Conservation	945,548	71.6%
Suitable Habitat in the existing MSHCP Reserve System	714	0.1%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	25,957	2.0%

*SWECO 2018

13.5 Data

Pallid bat populations in Clark County are not comprehensively monitored, and targeted survey data for the species within the county remain limited. Acoustic detection methods can confirm presence but have inherent limitations in estimating population size or trends. A habitat model prediction (Nussear 2016) indicates a large proportion of high and moderately suitable habitat in Clark County is within the Spring Mountain range and other high-elevation sites in conservation areas. In a comparison with the overall Mojave Desert, Clark County was noted as having the highest densities of locality points for the pallid bat.

Acoustic surveys by SWCA (2025) detected pallid bat at 38 survey locations throughout Clark County in 2022 and 2024, making it one of the more widely detected species across the survey area. Detection locations included sites within Riparian Reserve Units along the Muddy River and the Bunkerville area, as well as more upland and cliff-adjacent sites such as Arrow Canyon, the Virgin Mountains, and the Spring Mountain Ranch State Park area (SWCA 2025). Pallid bat was also recorded at four of five survey points within the Riparian Reserve Units (Muddy River, Bunkerville South, and Riverside subunits) during acoustic monitoring conducted from 2021 to 2023; it was not detected within the Boulder City Conservation Easement during those surveys (SWCA 2024).

13.6 Recommendation

Not recommended for coverage. Pallid bat is not recommended for coverage under the MSHCP because it is a wide-ranging species with limited population trend data in the region, and conservation areas encompass the higher elevation lands within Clark County known or with high potential to support this species. It is not currently federally listed as endangered or threatened, and it is not anticipated that the species has potential to be listed within the lifetime of the new MSHCP permit.

Pallid bat is a protected species by the State of Nevada. In addition, State and Federal agencies have numerous conservation measures to ensure the long-term conservation of bat species in general and would likely apply to pallid bats. Conservation measures in effect for bats in general include, but are not limited to applicable cave and

mine closures, preparation of Avian/Bat Protection plans for wind facilities, white-nose syndrome (WNS) awareness and prevention protocols, etc. The above measures afford the species adequate protection such that it does not need to be included as a covered species.

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14.0 TOWNSEND'S BIG-EARED BAT (*CORYNORHINUS TOWNSENDII*)

14.1 Species Overview

Townsend's big-eared bat, or western big-eared bat, is a medium-sized bat (80 to 100 mm in length, 7 to 12 g) with large ears (approximately 38 mm) and a wingspan of 24 to 28 cm that inhabits most of the western United States, north through British Columbia, Canada, and south into Mexico. The ears are flexible and may curl around the head when roosting. Small bilateral horseshoe-shaped lumps (enlarged sebaceous perirhinal glands) occur on either side of the snout, lending the nickname "lump-nosed bat" (NBWG 2024). They migrate only short distances (< 30 km) between seasons (Kunz and Martin 1982, Dobkin et al. 1995) and typically roost in large open caves and other suitable areas (e.g., abandoned mines, tunnels, and buildings). They inhabit a wide variety of habitats from pine woodlands to desert scrub ecosystems but are not common in extreme desert habitats (Kunz and Martin 1982, Pierson and Rainey 1998, Marzurek 2004).

This species roosts in abandoned buildings, bridges, and culverts, with most utilizing areas with exposed cavity-forming rock and with historic mining. This may suggest that there is a dependence on caves and mines (Sherwin et al. 2000). Females form small maternity colonies, typically with a few dozen to over 2,500 individuals in Nevada, and males are solitary during this time. Mating typically occurs in the fall and winter. Females store sperm and embryos are fertilized in the spring, with one pup produced in late spring or early summer. Young fly within three weeks and are weaned by six weeks (Kunz and Martin 1982). Townsend's big-eared bats are slow-flying clutter specialists with low wing-loading that facilitates prey pursuit through vegetation. Echolocation calls are quiet and low intensity, emitted through both the nose and mouth, which reduces detection probability with acoustic recording devices (NBWG 2024).

14.2 Range

Townsend's big-eared bat has a broad range in western North America, from southern Canada to southern Mexico (Kunz and Martin 1982). They have significant populations in all Rocky Mountain states (Arizona, Colorado, Utah, Wyoming, Idaho, and Montana) as well as Texas, South Dakota, Kansas, northwest Arkansas, southern Missouri, and west through California, Oregon, and Washington.

The habitats in Nevada where Townsend's big-eared bats occur include juniper-mountain mahogany, sagebrush, desert scrub (Rahn 2000), agricultural areas, and occasionally urban areas. Suitable roosting habitat is a limiting factor in their distribution (Bradley et al. 2006, Dalquest 1947, 1948; Graham 1966, Pearson et al. 1952, Kunz and Martin 1982, Pierson et al. 1991, Dobkin et al. 1995). In Clark County, Townsend's big-eared bats have been observed near the eastern end of Lake Mead and in the Newberry Mountains (RECON 2000), physically captured and acoustically recorded in the upper Muddy River (Williams et al. 2006) and multiple other locations throughout Clark County (SWCA 2025). Passive acoustic surveys conducted in 2022 and 2024 detected Townsend's big-eared bat at a total of 29 survey locations across Clark County, foraging across a broad elevational gradient within warm desert riparian, montane riparian, and mixed woodland habitats (SWCA 2025). Townsend's big-eared bats feed almost exclusively on moths and prefer to forage within edge habitats between forested and open areas; given that they may fly up to 30 miles (48 km) between roosting and foraging areas in a single night, lower-elevation detections without nearby known roost resources likely represent foraging activity (SWCA 2025).

14.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation Species
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	Sensitive
State of Nevada	Protected
State of California	Species of Special Concern
State of Arizona	Species of Greatest Conservation Need
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4 S2
IUCN Red List (v 2025-2)	Least Concern
CITES	None

Townsend's big-eared bat is thought to be declining in abundance throughout its range, with several recent studies documenting decreases in overall population status and abandonment of traditional roost sites (Gruver and Keinath 2006). Declines have been documented statewide in Nevada (Bradley et al. 2006). In Nevada, Townsend's big-eared bats have declined by up to 50 percent in some portions of the state, with population declines attributed to chronic roost disturbance, hard mine closures, and closures without bat-compatible gates (NBWG 2024). Protection of caves and mines through gating and seasonal cave closures has stabilized some populations. Maternity colony sizes in Nevada range from a couple dozen females to over 2,500, and hibernacula counts range from a few individuals to over 500 (NBWG 2024). Mines are used more than caves as roosts in Nevada, which is unlike other states where caves are preferred (NBWG 2024). In Nevada, this species has been documented foraging as far as 38 km from its day roost (Ives et al. in press, cited in NBWG 2024).

14.4 Impact

Townsend's big-eared bats are highly sensitive to roost disturbance. In addition to urbanization, activities that can result in significant disturbance or loss of habitat include mine reclamation, renewed mining, water impoundments, recreational caving, rock climbing, loss of building roosts, and bridge replacement (Kunz and Martin 1982, Pierson et al. 1999). There is some evidence that predation from rats could be suppressing certain populations (Fellers 2000). Pesticide use, through limiting the availability of prey, as well as timber harvesting, is also likely to negatively impact the species (Piaggio 2005).

White nose syndrome (WNS), caused by the fungus (*Pseudogymnoascus destructans*) has the potential to impact the species (Gargas et al. 2009). Although incidence of WNS has not been reported in Nevada, this disease has the potential to affect all hibernating bat species, including Townsend's big-eared bats. In addition, renewable energy in the form of wind turbines can have a negative effect on migrating bats through collisions. The taller the turbine, the more they can be affected (Barclay et al. 2007).

Simandle and Nussear (2025) modeled Townsend's big-eared bat habitat suitability on the basis of winter precipitation, minimum temperature and terrain slope. High-suitability habitat is predicted to occur in the Spring Mountains, Birdsprings Range, Las Vegas Range, Sheep Range, and Muddy Mountains. Medium-quality habitat is broadly distributed in the region (Simandle and Nussear 2025). Suitable habitat for Townsend's big-eared bat within the MSHCP Amendment Plan Area totals approximately 884,587 acres. Of this, 22,104 acres (2.5 percent) fall within the Impact Area. The majority of suitable habitat (608,424 acres, or 68.8 percent of the total) occurs on lands managed for resource conservation. The existing MSHCP Reserve System contains a comparatively small proportion of suitable habitat at 3,980 acres (0.4 percent), while the MSHCP Amendment Reserve System Additions contribute an additional 85,800 acres, representing 9.7 percent of total suitable habitat within the Plan Area.

Townsend's big-eared bat* *Corynorhinus townsendii*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	884,587	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	22,104	2.5%
Suitable Habitat in Lands Managed for Resource Conservation	608,424	68.8%
Suitable Habitat in the existing MSHCP Reserve System	3,980	0.4%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	85,800	9.7%

*Simandle and Nussear 2025

14.5 Data

There is little trend data available for Clark County. Recent surveys along the Colorado River Corridor indicate the species is rare; however, those surveys may not have overlapped with the typical foraging habitat for this species (Williams et al. 2006).

Acoustic surveys conducted in 2022 and 2024 detected Townsend's big-eared bat at 29 survey locations within Clark County (SWCA 2025). Detections were primarily concentrated within lower-elevation warm desert riparian corridors along the Muddy River and at ephemeral springs located in mid-elevation foothills within pinyon-juniper woodland; acoustic detections at mid-elevation locations were likely associated with foraging or movement between roost and foraging locations (SWCA 2025). The species was also detected at two survey points within the Muddy River Riparian Reserve Unit (MR-02 and MR-04) during surveys conducted in 2022 (SWCA 2024).

14.6 Recommendation

Recommended for coverage. Townsend's big-eared bat is recommended for coverage because of range-wide population trends. Potential threats may cause these trends to continue and increase vulnerability of the species to becoming listed during the life of the permit. A large portion of modeled high suitability habitat is within conservation areas; however, there is modeled high and moderate suitability habitats which are proposed to be impacted by covered activities.

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15.0 SPOTTED BAT (*EUDERMA MACULATUM*)

15.1 Species Overview

The spotted bat is a medium-sized vesper bat and one of the most visually distinctive bat species in North America. Three large white spots on a blackish dorsum, one over each shoulder and one over the rump, inspired the species' common name. The ears are pinkish-red and the largest of any North American bat species (NBWG 2024). Weight ranges from 9 to 18 g, forearm length 41 to 55 mm, ear length 32 to 50 mm, and wingspan 33 to 36 cm (NBWG 2024). Spotted bats locate relatively large prey over relatively long distances (Woodsworth et al. 1981). They forage primarily on moths with body lengths of 5 to 12 mm (Gervais 2016). Data suggest that female spotted bats roost singly and do not form nursery colonies (Chambers et al. 2011). Colony sizes have been recorded at 1 to 30 individuals (NBWG 2024). The species has a slow reproductive rate, producing one pup per year, which affects population recovery (NBWG 2024). Spotted bats use crevices in tall, sheer cliffs that have little vegetation and foraging takes place in adjacent open habitats (Chambers et al. 2011; Gervais 2016). They are a cliff-roosting species and may fly up to 50 miles (80 km) in a single night from a day roost to foraging sites, though feeding sites are often within 6 miles (10 km) of the roost (Luce and Keinath 2007).

15.2 Range

Spotted bats are distributed in the western United States from central Mexico to British Columbia (Chambers et al. 2011). In the United States, the range extends from Montana through Texas. Within Nevada, the spotted bat occurs in a wide variety of habitats from low desert scrub to high-elevation coniferous forests, across an elevational range of approximately 540 to 2,130 m (1,771 to 6,986 ft) (NBWG 2024). Of the documented occurrences of the spotted bat in Nevada, 35 occur in Reno and Las Vegas. All but one of these observations were made in buildings, suggesting that metropolitan areas can provide suitable habitat in the absence of cliffs and rocky areas (Geluso 2000).

15.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Watch List
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	Sensitive
State of Nevada	Protected
State of California	Species of Special Concern
State of Arizona	Species of Greatest Conservation Need
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4 S2
IUCN Red List	Least Concern
CITES	None

The spotted bat is considered widely distributed but rare across its western North American range. NatureServe assigns it a global rank of G4 (Apparently Secure), reflecting a widespread but patchy distribution, an unknown but presumably not small population size, and the absence of major range-wide threats (NatureServe 2026). Within Nevada, the species is ranked S2 (Imperiled), indicating greater concern at the state level (NDOW 2022, NBWG 2024).

Little quantitative information is available on population size, either range-wide or within Nevada. NatureServe estimates the global adult population at somewhere between 2,500 and 100,000 individuals, but notes that the total is unknown and that the species was historically thought to be exceptionally rare (NatureServe 2026). That perception has been revised somewhat as surveys using modern acoustic detection methods have demonstrated the species to be more widespread and numerous than previously believed, though it remains relatively uncommon (NDOW 2022, NBWG 2024). Capture rates across studies conducted in Nevada, California, and Arizona ranged from 0 to 4 percent of total bat captures, which may reflect either true rarity or the difficulty of capturing a species that tends to fly high and is infrequently taken in standard mist nets (NBWG 2024).

Presence-absence studies in New Mexico by Geluso (2006, 2017) documented continued occupancy at 11 of 13 historically known sites, suggesting local populations have persisted over time, though no population size estimates were generated (NBWG 2024). No Nevada-specific population data are available (NBWG 2024).

Population trend information is similarly limited. NatureServe characterizes the long-term trend as uncertain but notes that distribution and abundance have likely not changed greatly from historical conditions; the short-term trend (over approximately 10 years or three generations) is assessed as relatively stable, with no more than 10 percent change (NatureServe 2026). The Nevada State Wildlife Action Plan likewise designates the trend as presumed stable, with distribution and abundance considered likely to have remained stable in recent years (NDOW 2022). The Climate Change Vulnerability Index rating for the species is also presumed stable (NDOW 2022).

15.4 Impact

Habitat alteration poses one of the main threats to spotted bats. They are vulnerable to loss and reduction of wet meadows and other foraging areas. This can result from livestock grazing, water diversion, and changes in land use such as conversion of habitats (Luce and Keinath 2007). Pollution and contamination of water sources may result in ingestion of pollutants and/or the reduction of the abundance of prey species (Gervais 2016). In addition, WNS, caused by the fungus (*Pseudogymnoascus destructans*), has the potential to impact this species (Gervais 2016). Roost loss or modification in cliffs or rock features due to recreational rock climbing, mining, and urban or energy development also poses a threat to spotted bats (NBWG 2024). The use of pesticides that target lepidopterans may reduce prey availability and adversely affect spotted bats (NBWG 2024).

Simandle and Nussear (2025) modeled spotted bat habitat suitability on the basis of minimum temperature, suitable soils, vegetative cover and winter temperature. High-suitability habitat is predicted to occur near the Virgin River, the Muddy River, and the Meadow Valley Wash in northeastern Clark County. Patches of suitable habitat are also found in and around the City of Las Vegas (Simandle and Nussear 2025). Suitable habitat for the spotted bat within the MSHCP Amendment Plan Area totals approximately 255,552 acres. Of this, 21,176 acres (8.3 percent) fall within the Impact Area. Lands managed for resource conservation contain 50,114 acres of suitable habitat, representing 19.6 percent of the total. The existing MSHCP Reserve System encompasses 2,653 acres (1.0 percent) of suitable habitat, and the MSHCP Amendment Reserve System Additions contribute an additional 6,793 acres, or 2.7 percent of total suitable habitat within the Plan Area.

Spotted bat* *Euderma maculatum*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	255,552	n/a

Suitable Habitat in the MSHCP Amendment Impact Area	21,176	8.3%
Suitable Habitat in Lands Managed for Resource Conservation	50,114	19.6%
Suitable Habitat in the existing MSHCP Reserve System	2,653	1.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	6,793	2.7%

*Simandle and Nussear 2025

15.5 Data

There is little population data available on local and range scales for the spotted bat. Little is known about the life history and ecology of this species (Luce and Keinath 2007). Because spotted bat echolocation calls are low frequency (near 7 to 10 kHz), they can be missed by acoustic detectors if audio settings are not adjusted correctly, or misidentified as non-bat noise during acoustic vetting (NBWG 2024), which adds difficulty to interpreting survey results for this species.

SWCA Environmental Consultants conducted passive acoustic surveys in 2022 and 2024 on behalf of the Clark County Desert Conservation Program. These surveys detected the spotted bat at 14 locations across north-central Clark County, including survey locations within and adjacent to the Overton Wildlife Management Area, the Muddy River drainage, the Warm Springs area, Bitter Spring, and the Gold Butte area (SWCA 2025). Detection habitats included warm desert riparian woodland, emergent marsh, and agricultural fields (primarily alfalfa). Spotted bat recordings, including feeding trills, were obtained at survey sites MO-1, BI-1, BI-2, GB-4, OW-2, OW-3, and OW-4, suggesting repeated foraging activity and/or multiple individuals at these locations across several detector-nights (SWCA 2025). At two survey locations (BR-1 and MU-1), low detection rates suggest the bats were passing through or exhibiting lower-intensity use (SWCA 2025). The majority of detections within Clark County are associated with the Overton Wildlife Management Area and adjacent riparian corridors along the Muddy River (SWCA 2025).

15.6 Recommendation

Recommended for coverage. The spotted bat is recommended to be covered under the MSHCP because of its Nevada State Protected status. It is not federally listed and there is an absence of population data at a local and range-wide distribution level to indicate population trends. Impacts are likely to be few as most suitable habitat is likely within the mountain areas and conserved lands. In addition, State and Federal agencies have numerous conservation measures to ensure the long-term conservation of bat species in general which would likely apply to spotted bats. Conservation measures in effect for bats in general include, but are not limited to applicable cave and mine closures, preparation of Avian/Bat Protection plans for wind energy facilities, and WNS awareness and prevention protocols.

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16.0 SILVER-HAIRED BAT (*LASIONYCTERIS NOCTIVAGANS*)

16.1 Species Overview

The silver-haired bat is a medium-sized vesper bat weighing 8 to 12 g, with a forearm length of 37 to 44 mm, a wingspan of 27 to 31 cm, and overall body length ranging from 8 to 10 cm (NBWG 2024). Predominantly black in color with silver to white-tipped hairs on their back and tails, silver-haired bats are the only black bat in North America and are easily distinguishable from other Nevada bat species. Wings are short and broad with black membranes. Ears are short, round, and naked with a broad blunt tragus (NBWG 2024). Although no subspecies are recognized, two distinct populations in eastern and western portions of their range have been suggested based on small but significant differences in mitochondrial DNA (NBWG 2024). Silver-haired bats rank among the most common bats in North American forests, particularly in coniferous or mixed coniferous and deciduous forest types, especially in areas of old growth. Solitary by nature, they roost under loose bark, in dead trees or snags, in hollow cavities created by heart rot, and in cavities previously used by birds and squirrels (Bentley 2017). They form maternity colonies almost exclusively in tree cavities or small hollows. Because silver-haired bats are dependent upon roosts in old growth areas, managing forests for diverse age structure and maintaining forested corridors are important to the conservation of this species (BCI 2017).

16.2 Range

The silver-haired bat is found from southern Alaska, throughout southern Canada, and most of the United States into the San Carlos Mountains of northeastern Mexico, absent only from the southeast and southwestern coasts of the United States (Bentley 2017). The species is most commonly found in boreal or coniferous and deciduous forest near bodies of water, such as rivers, lakes, streams, estuaries, or ponds.

Silver-haired bats are widely distributed in Nevada but are confined primarily to forested habitats and, more specifically, to riparian habitats in southern Nevada (Bradley et al. 2006). This species was observed occupying closed mine shafts at nine of 13 sites surveyed in central Nevada (Morrison and Fox 2009), and has been documented flying near Searchlight, Nevada, which also has several active and abandoned mine sites (Tetra Tech 2009).

The species has been observed in Desert Riparian and Mixed Conifer ecosystems in Clark County (Bradley et al. 1965). Historical localities for silver-haired bats in the County are sparsely distributed, with records associated with the Spring Mountains, Corn Creek, the Sheep Mountains, Moapa Valley riparian areas, Searchlight, and two observations within the Las Vegas metropolitan area. Early records include observations in the Sheep Mountains at 8,500 ft elevation and Corn Creek Ranch (now the Desert National Wildlife Refuge) at 3,000 ft elevation (Hall 1946 in Nussear 2017). Most historical locations have been in the northern part of the County (Nussear 2017). The species has been detected acoustically in Las Vegas Wash (Eckberg and Foster 2010) and at other locations in Clark County (Bradley et al. 2006), though its overall distribution within the County is poorly understood (Bradley et al. 2006).

16.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Protected Mammal

Agency/Organization	Status
State of Arizona	None
State of California	None
State of Utah	No Status
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4 S3
IUCN Red List	Least Concern
CITES	No Status

NatureServe updated the global rank for this species from G3G4 to G4 (Apparently Secure) as of 2025, reflecting its broad range across North America (NatureServe 2025). However, the species is recognized as experiencing a long-term population decline of 30 to 50 percent and a short-term decline of 10 to 30 percent, driven primarily by wind turbine mortality and habitat loss (NatureServe 2025). The Nevada State Wildlife Action Plan (NDOW 2022) lists the silver-haired bat as a Species of Greatest Conservation Need, and Nevada Division of Natural Heritage designates it as At Risk. Population status in Nevada remains unknown; both declines and increases in abundance have been observed in Canada and the northern United States, and studies on site-specific trends are equivocal (NBWG 2024). The Nevada Climate Change Vulnerability Index rates the species as Presumed Stable (NatureServe 2025). The species is listed as Least Concern on the IUCN Red List and has no CITES status.

16.4 Impact

The primary threat to *L. noctivagans* range-wide is loss of roosting habitat due to logging practices that fail to accommodate the roosting needs of this species (e.g., removal of clusters of large snags). Loss of temporary roosts within migration corridors is also a concern. Additional threats include loss of foraging habitat in riparian areas, and reduction of prey base due to broadcast application of pesticides (Western Bat Working Group 2017). Wind energy mortality is a significant and growing threat: an estimated 149,000 to 308,000 silver-haired bats were killed at wind energy facilities in the United States and Canada between 2000 and 2011, representing approximately 18 percent of total bat fatalities at those facilities (Arnett and Baerwald 2013). Silver-haired bats are among the species most frequently killed at wind turbines and are particularly vulnerable due to their migratory tree-roosting behavior (NBWG 2024). Annual bat mortality at wind facilities in the U.S. likely exceeds 400,000 individuals and may threaten some species with extinction as wind energy capacity continues to expand (Green et al. 2021).

Because this species roosts in both trees and in caves, mines, and man-made structures, it is sensitive to changes in tree densities (e.g., as affected by forest fires, urbanization, or other disturbances that reduce tree cover), as well as to disturbances of caves, mines, and abandoned structures used for roosting. The species also forages in riparian areas in Clark County and travels between roost and foraging sites, exposing it to potential mortality from wind turbine blade collisions and barotrauma if such facilities were constructed in Clark County (Baerwald et al. 2008, Cryan and Barclay 2009 in Nussear 2017).

Suitable habitat for the silver-haired bat within the MSHCP Amendment Plan Area totals approximately 1,596,464 acres. Of this, 111,816 acres (7.0 percent) fall within the Impact Area. The majority of suitable habitat (987,292 acres, or 61.8 percent of the total) occurs on lands managed for resource conservation. The existing MSHCP Reserve System contains 25,280 acres (1.6 percent) of suitable habitat, while the MSHCP Amendment Reserve System Additions contribute an additional 19,282 acres, representing 1.2 percent of total suitable habitat within the Plan Area (SWECO 2018).

Silver-haired bat* *Lasionycteris noctivagans*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,596,464	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	111,816	7.0%
Suitable Habitat in Lands Managed for Resource Conservation	987,292	61.8%
Suitable Habitat in the existing MSHCP Reserve System	25,280	1.6%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	19,282	1.2%

*SWECO 2018

16.5 Data

Relatively few records in the scientific literature exist for this species in Clark County and its overall status within the county is poorly understood (Bradley et al. 2006). Conservation strategies and research needs for this species require broad scope and adequate scale to capture its full range and distribution, necessitating cooperation across administrative, state, and international boundaries (NBWG 2024). Information on migration routes, fidelity to migratory routes, overwintering locations, and maternity roosts is particularly needed to mitigate and plan for the impacts of wind energy development. Tree roost selection and preferences also need to be better understood, particularly given the threat posed by shifting fire severity and frequency throughout the species' range (NBWG 2024).

Although silver-haired bats are generally considered migratory, the Nevada Bat Conservation Plan (NBWG 2024) notes that the species is regularly documented overwintering in Nevada, particularly in rock crevices at higher elevations, and may engage in winter foraging during warm spells. Acoustic detections during warm winter conditions have been recorded in the state. The 2024 Plan also notes strong sex-ratio skewing during summer trapping in Nevada, with males predominating at some sites (e.g., 59 males and no females captured in one night at Stoneberger Basin, Toquima Range in August 2017), suggesting complex seasonal habitat partitioning between sexes.

Acoustic surveys conducted in Clark County from 2021 through 2023 recorded silver-haired bats at four locations within the MSHCP Reserve System: Bunkerville South (BS-11), Muddy River (MR-02 and MR-04), and Riverside (RS-09) (SWCA 2024). Highest activity at those sites was observed at MR-04 and BS-11, both within warm desert riparian habitat. Sporadic detections were also recorded during broader acoustic surveys conducted in Clark County in 2022 and 2024 (SWCA 2025). These detections occurred near Arrow Canyon Dam, Bowman Reservoir, Corn Creek, Moapa Valley, Searchlight, Spring Mountain Ranch State Park, the Virgin Mountains, and Warm Springs. Most detections occurred in low-elevation warm desert riparian woodland or mid-elevation mixed oak conifer woodland (SWCA 2025). Across all survey years, the species was absent from drier upland Mojave desert scrub sites, consistent with its dependence on riparian corridors and forested habitats in southern Nevada.

16.6 Recommendation

Not Recommended for Coverage. While the species retains a broad distribution, its conservation outlook has materially changed since this assessment was originally drafted. NatureServe updated the global rank from G3G4 to G4 (Apparently Secure) as of 2025, reflecting a large range; however, the species is recognized as experiencing a long-term decline of 30 to 50 percent and a short-term decline of 10 to 30 percent, driven primarily by wind turbine mortality and habitat loss (NatureServe 2025). Notwithstanding these trends, existing regulatory and conservation frameworks make an ESA listing highly unlikely in the near term. State and federal agencies have numerous conservation measures in place to ensure the long-term conservation of bat species generally, which would likely apply to silver-haired bats. These measures include, but are not limited to: applicable cave and mine

closures, preparation of Avian/Bat Protection Plans for wind facilities, and WNS awareness and prevention protocols, etc. These measures afford the species adequate protection such that it does not need to be included as a covered species.

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17.0 HOARY BAT (*LASIURUS CINEREUS*)

17.1 Species Overview

The hoary bat is a large vesper bat weighing 20 to 38 g with a forearm length of 50 to 57 mm and a wingspan of 40 to 43 cm (NBWG 2024). The fur is long and soft, and each hair transitions in color from dark brown or black at the base to cream to mahogany brown to white at the tip, giving the species its distinctive frosted (or hoary) appearance. This species is uniformly colored except for a yellow-brown collar circling under the chin and behind the ears; dense fur extends to the tip of the tail and along the undersides of the wings. It has a white shoulder patch and yellowish throat patch, and wings that are long and narrow with black membranes (Shump and Shump 1982). Ears are large, rounded, and primarily yellow but bordered with black skin, and the tragus is short and blunt (NBWG 2024). It is a solitary bat and roosts in tree foliage (Carter et al. 2003). They forage over riparian areas with nearby trees to provide roosts (Szewczak et al. 1998, Hagen and Sabo 2014). They forage after sunset and have been found active at and after midnight in desert areas and juniper habitat (Bell 1980). This species feeds primarily on butterflies and moths, especially moths, but also includes grasshoppers, locusts, crickets, and beetles (Valdez and Cryan 2013). Males and females come together to mate in the fall (Shump and Shump 1982, Cryan 2003). Females typically give birth between mid-May and late June; most have twins, but litters of one to four pups are possible (NBWG 2024).

17.2 Range

The hoary bat is found from northern Canada to Argentina and Chile in South America, making it the most widespread of all American bats (Shump and Shump 1982). They are also found on several islands, including Hawaii, Iceland, and Bermuda, among others. In the United States they are most common in parts of the Midwest and in the Pacific Northwest. The species is known to winter in California and Mexico but is also found in more northern locations in winter (Shump and Shump 1982, Cryan 2003). Males and females are geographically separated during the warm season with males found typically in the western U.S., and females in the east, with evidence of separation in some regions during winter where more males are found in Mexico, and relatively even distributions of sexes wintering in California (Cryan 2003). It is thought that females exhibit more movement than males, as they search for adequate conditions to give birth (Cryan 2003).

This species occurs infrequently in southern Nevada and appears to pass through during its annual migration. They have been observed migrating through lowland riparian woodlands frequented by other species when foraging (Williams et al. 2006). They also occur in southwestern Utah near St. George (Hardy 1941). In Nevada, most female captures have been documented during spring (April and May) and fall (August through October) migration, and most male captures have been May through August, consistent with males occupying mountainous regions of western North America in summer while females migrate farther distances (NBWG 2024).

17.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	No Status
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	Protected
State of Arizona	Species of Greatest Conservation Need
State of California	None

Agency/Organization	Status
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Increase Likely
NatureServe Global and NV State Rank	G3G4 S2
IUCN Red List	Least Concern
CITES	No Status

The global conservation status of the hoary bat is ranked G3 (Vulnerable) by NatureServe, reflecting a species with a large range but facing significant and accelerating population pressures (NatureServe 2022). The total adult population size is unknown but has been estimated at approximately 2.5 million individuals in North America as of 2014; due to high estimated rates of decline, the population was considered likely below 2 million by 2022 (NatureServe 2022). In Nevada, the species is ranked S2S3 (imperiled to vulnerable), and population status in the state is currently unknown (NBWG 2024; NDOW 2022).

NatureServe (2022) characterizes both the long-term and short-term population trajectory as declining. Long-term decline is estimated at 30 to 70 percent, driven primarily by historical deforestation and ongoing wind turbine mortality. Short-term decline over a 10-year window is estimated at approximately 33 percent, based on installed wind power capacity as of 2022. Projections using population modeling suggest that wind energy facilities, if expansion continues as anticipated, could cause a 90 percent decline in hoary bat populations within 50 years (Frick et al. 2017).

In Canada, COSEWIC designated the hoary bat as Endangered in May 2023, citing declines in carcass counts at wind facilities suggesting losses exceeding 50 percent over three generations, and population viability modeling indicating at least a 20 percent probability of extinction by 2050 (NatureServe 2022). Population declines have also been documented in Oregon (NBWG 2024).

17.4 Impact

There are no known predators of importance to this species (Shump and Shump 1982); however, as solitary foliage-roosters, this species likely falls prey to birds, opossums, and domestic cats similar to other bats in the same guild. A high proportion of hoary bats are found to be rabid (Shump and Shump 1982). This species is apparently most likely to inhabit Desert Riparian Ecosystems when they are found (Hardy 1941, Szewczak et al. 1998, Williams et al. 2006, Hagen and Sabo 2014). Most impacts would likely occur in reductions in foraging area or nearby roosts, and the use of pesticide threatens both bats and their insect prey. The hoary bat may be especially at risk from loss of roosting habitat due to timber harvest and loss of riparian habitats (NBWG 2024).

Wind energy development is now recognized as the primary direct threat to this species. The hoary bat is the bat species most frequently killed at wind energy facilities in North America (Arnett et al. 2008, Cryan 2011). Annual total bat mortality at U.S. wind facilities likely exceeds 400,000 individuals, and population viability modeling indicates the hoary bat faces a long-term decline of 30 to 50 percent within a decade under current wind energy expansion trajectories (Frick et al. 2017). Fatalities have been documented in Nevada at the Spring Valley Wind Farm near Ely (NBWG 2024). Collision with energy-associated structures and barotrauma are both documented mortality mechanisms (Arnett et al. 2008, Baerwald et al. 2008, Cryan and Barclay 2009, Cryan 2011).

Habitat modeling conducted by SWECO (2018), estimated that highest suitable habitat or core habitat was focused on the Spring and Sheep Ranges and along riparian corridors of the Virgin and Muddy Rivers. Approximately 642,869 acres of suitable hoary bat habitat occur within the MSHCP Amendment Plan Area. Of this total, 30,234

acres (4.7 percent) are within the MSHCP Amendment Impact Area. The vast majority of suitable habitat (530,812 acres, or 82.6 percent) occurs within lands managed for resource conservation. Suitable habitat within the existing MSHCP Reserve System is minimal at 452 acres (0.1 percent), while an additional 8,208 acres (1.3 percent) of suitable habitat occur within proposed MSHCP Amendment Reserve System Additions.

Hoary bat* *Lasiurus cinereus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	642,869	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	30,234	4.7%
Suitable Habitat in Lands Managed for Resource Conservation	530,812	82.6%
Suitable Habitat in the existing MSHCP Reserve System	452	0.1%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	8,208	1.3%

*SWECO 2018

17.5 Data

This species migrates seasonally, and little is known about its wintering sites and the prevalence of hibernation. Surveying for this species presents challenges due to its migratory and solitary nature, and population-level data are lacking. As noted by Carter et al. (2003), standardized population monitoring for solitary foliage-roosting bats is hindered by inconsistent reporting and the inability to determine the proportion of total populations sampled, rendering capture data incomparable across studies.

Acoustic monitoring conducted by SWCA (2025) in 2022 and 2024 detected hoary bat at nine locations distributed across Clark County, including sites in the Spring Mountains (SM-2), Virgin Mountains (VM-2), Arrow Canyon (AC-1), Bitter Spring (BI-1, BI-2), Summit Spring (GB-1), Connoly Spring (GB-2), Laughlin (LA-1), Red Rock Canyon (RR-1), and Searchlight (SE-1). Detections were broadly distributed across a range of habitat types and elevations, suggesting the species moves widely across the landscape during migration. The Overton Wildlife Management Area and surrounding agricultural areas along the Muddy River drainage likely support dense aggregations of prey insects that attract hoary bats during transit (SWCA 2025). Hoary bat was not detected in surveys of the Riparian Reserve Units and Boulder City Conservation Easement conducted between 2021 and 2023 (SWCA 2024).

17.6 Recommendation

Not recommended for coverage. The paucity of data specific to hoary bats in Clark County suggests this species is most likely migratory in the area and not a resident. In addition, most current literature and researchers consider the species well distributed. There are no demonstrable or apparent immediate or significant long-range threats documented and the states and federal agencies do not consider the species at risk of population declines to such an extent to warrant protection. The Clark County population is not likely to be impacted by the proposed actions in the MSHCP (i.e., riparian forests will not be lost), and the mountain ranges with predicted high-suitability habitat are in conservation lands. In addition, State and Federal agencies have numerous conservation measures to ensure the long-term conservation of bat species in general which would likely apply to hoary bats. Conservation measures in effect for bats in general include, but are not limited to: applicable cave and mine closures, preparation of Avian/Bat Protection plans for wind facilities, WNS awareness and prevention protocols, etc. The above measures afford the species adequate protection such that it does not need to be included as a covered species.

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18.0 WESTERN RED BAT (*LASIURUS FRANTZII*)

18.1 Species Overview

Western red bat (*Lasiurus frantzii*) (W. Peters, 1870) was previously considered the western subspecies (*Lasiurus borealis teliotis*) of the eastern red bat (L. borealis) but are now recognized as two species (Baker et al. 1988, Morales and Bickham 1995, Baird et al. 2015). The western red bat has rusty-red dorsal coloration, noticeably fewer frosted dorsal hairs, and a bare posterior margin of the uropatagium.

Western red bats are considered to be a foliage- or tree-dependent species with respect to roosting habits (Cryan 2003). Among their favored roosting habitats are riparian gallery forests, orchards, and urban areas with decorative fan palms (Carter et al. 2003, Ellison et al. 2003, LCR MSCP 2004, Pierson et al. 2006). Foraging may occur along sandbars or other open country and edges. Previously thought to migrate south in winter, several individuals have since been documented hibernating in ground leaf litter in west-central Nevada (NDOW 2022, NBWG 2024). Recent advances in acoustic sampling have proven to be much better at providing occurrence data than the historical use of mist nets for these solitary bats (Williams 2001).

18.2 Range

The range of the western red bat extends from northern California, western and southern Nevada, and Utah south through Arizona, and New Mexico, , continuing throughout Mexico, Central America, and into northern South America (NatureServe 2026). In Nevada, current records indicate the species is distributed between 420 to 2,010 m (1,377 to 6,593 ft) in elevation (NBWG 2024).

In Clark County, Williams (2001) found that red bats were the sixth-most abundant species detected while using mist nets, harp traps, and acoustic sampling to study bats along the Muddy River in Moapa Valley. Western red bats have also been recorded acoustically along the Las Vegas Wash. The Nevada Bat Conservation Plan cites six locations in the south and western portion of the state, including two in Clark County (Bradley et al. 2006).

Based on the wide-ranging distribution of this species, it is likely to be found throughout Nevada and Clark County in particular where suitable roosting habitat (riparian forest galleries and urban landscaping with stands of trees and palms) and foraging habitat (grasslands and riparian areas) exists.

18.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Protected
State of Arizona	Species of Greatest Conservation Need
State of California	Species of Conservation Concern
State of Utah	Species of Greatest Information Need
NV Division of Natural Heritage	At Risk

Agency/Organization	Status
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4 S2
IUCN Red List (v 2025-2)	Least Concern
CITES	None

Western red bats are considered rare in Nevada, with a NatureServe state rank of S2 (imperiled), and are most often observed in western and southern Nevada (Bradley et al. 2006, NBWG 2024). The NatureServe global rank of G4 indicates the species is apparently secure globally but faces some level of concern. NatureServe (2026) notes a long-term population decline of 10 to 50 percent rangewide, largely attributed to loss of mature lowland riparian forest.

18.4 Impact

Threats often cited for the western red bat and for many bat species include habitat loss (Pierson et al. 2006), WNS, collision with wind turbines (Hayes 2013, Johnson and Erickson 2011), pesticides (impacts to prey base and bioaccumulation), and predation by birds of prey, roadrunners, opossums, and domestic cats (Shump and Shump 1982). Available habitat, including trees for roosting, does not appear to be a limiting factor for the species and may facilitate range expansion in the desert, particularly as urbanization increases the availability of ornamental trees and palms. Additional threats identified in the Nevada State Wildlife Action Plan (NDOW 2022, NBWG 2024) and NatureServe (2026) include: loss and degradation of riparian habitat due to logging, groundwater pumping, and channelization; drought, which reduces water sources critical for foraging and roosting; controlled burns that destroy leaf litter used for cool-season roosting; and the widespread use of insecticides, which reduces prey base and may cause secondary poisoning. NatureServe (2026) notes that more than 90 percent of historical primary riparian habitat in California has been lost or degraded.

Based on the SWECO (2018) habitat model, western red bat suitable habitat within the MSHCP Amendment Plan Area totals approximately 786,788 acres. Of this, approximately 51,682 acres (6.6 percent) occur within the MSHCP Amendment Impact Area. Approximately 555,584 acres (70.6 percent) of suitable habitat are located within lands managed for resource conservation, and 714 acres (0.1 percent) fall within the existing MSHCP Reserve System. An additional 8,238 acres (1.0 percent) of suitable habitat occur within the MSHCP Amendment Reserve System Additions.

Western red bat* *Lasiurus blossevillii*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	786,788	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	51,682	6.6%
Suitable Habitat in Lands Managed for Resource Conservation	555,584	70.6%
Suitable Habitat in the existing MSHCP Reserve System	714	0.1%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	8,238	1.0%

*SWECO 2018

18.5 Data

The seasonal behavior of western red bats is not fully understood. The species was previously considered a seasonal migrant in Nevada; however, recent studies indicate it may be a year-round resident in the Fallon and Moapa areas (NBWG 2024). Most researchers cite the lack of systematic survey and monitoring data as an obstacle to determining population numbers and trends for red bats (Stephenson and Calcarone 1999, Carter et al. 2003, Ellison et al. 2003). Western red bats have also demonstrated an ability to adapt to new roosting opportunities, such as ornamental trees, which may work to their advantage (Carter et al. 2003).

The seasonal behavior of western red bats is not fully understood. Previously considered a seasonal migrant in Nevada, recent studies indicate the species may be a year-round resident in the Fallon and Moapa areas (NBWG 2024). Individuals have been documented foraging on occasion during the winter in the San Francisco Bay area (WBWG 2017).

The Clark County Desert Conservation Program has conducted passive acoustic bat surveys through SWCA Environmental Consultants. Western red bat was acoustically detected at three locations in Clark County during passive bat acoustic surveys conducted by SWCA in 2022 and 2024. All detections were within warm desert riparian woodland habitat (SWCA 2025). Western red bat was not detected during acoustic bat surveys conducted at the Riparian Reserve Units and Boulder City Conservation Easement in 2021 through 2023 (SWCA 2024).

18.6 Recommendation

Not recommended for coverage. Most current literature and researchers consider the species well distributed and potentially even expanding its range. There are no demonstrable nor apparent immediate or significant long-range threats documented and the states and federal agencies do not consider the species at risk of population declines to such an extent to warrant protection. WNS poses a significant risk to bats in general and colonial hibernating bats specifically; however, western red bats are solitary or small group roosters and are not considered a vulnerable species. The Clark County population is not likely to be impacted by the proposed actions in the MSHCP (i.e., riparian forests will not be lost) and could see benefits if fan and date palms and other ornamental trees are included in landscaping plans.

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19.0 WESTERN YELLOW BAT (*LASIURUS XANTHINUS*)

19.1 Species Overview

The Nevada Bat Conservation Plan (NBWG 2024) describes the species as a medium to large vesper bat with a forearm length of 45 to 50 mm and a wingspan of 33 to 36 cm. The fur is pale yellow except for a light brown tint around the eyes and a darker ring around the short, triangular ears; the ears, muzzle, and forearms are reddish-brown, while the wing membranes are dark except for lighter areas around the phalanges. Ears are shorter than those of many other species, but longer than they are wide. The upper portion of the uropatagium is densely haired and bright yellow, while the lower portion is nearly hairless. This species is not morphologically distinguishable from the southern yellow bat, and where their ranges overlap, genetic confirmation is required for species identification (NBWG 2024). The western yellow bat was classified as a subspecies of the southern yellow bat (*L. ega xanthinus*) but was taxonomically split to the species level (Baker et al. 1988). The ranges of the two species do not overlap.

While most references indicate a lack of detailed information on life history and status, most also indicate it is a common and/or widely distributed species (Wilson and Ruff 1999, Ortiz and Barrow 2014, Williams et al. 2006, Bradley et al. 2006, Marty and Unnasch 2015, Arroyo-Cabrales and Álvarez-Castañeda 2017). Some populations may be migratory although some individuals appear to be present year-round, even in the northernmost portion of the range (Bradley et al. 2006). Activity has been observed year-round in both the southern and northern portions of the range. Western yellow bats are not known to hibernate; however, acoustic data in Nevada suggest they may engage in bouts of torpor throughout the winter (O'Farrell et al. 2004, NBWG 2024). The diet includes Coleoptera (beetles), Diptera (flies, mosquitos, and gnats), Hemiptera (aphids cicadas, stinkbugs), Homoptera (leafhoppers, scales), Lepidoptera (butterflies and moths), and Orthoptera (grasshoppers, crickets, and locusts) (O'Farrell et al. 2004, Marty and Unnasch 2015).

The western yellow bat is a fast, maneuverable edge specialist with a high wing aspect ratio and low wing loading ratio. Its echolocation calls have a characteristic frequency of 30 to 35 kHz; call sequences may resemble those of western red bats but are typically approximately 10 kHz lower (NBWG 2024). Reproductive information for this species is limited; the closely related eastern yellow bat is believed to mate in the fall, and pregnant females have been observed between April and June. One to four young are born between June and July (Kurta and Lehr 1995, NBWG 2024).

19.2 Range

Most references describe the species from California, Arizona, New Mexico, Texas, and Mexico, and do not include Nevada in the range of distribution for the species (Arroyo-Cabrales and Álvarez-Castañeda 2017, Texas Parks and Wildlife 2026, Simmons 2005); however, the first record of western yellow bat for Nevada was found at the Moapa Valley National Wildlife Refuge in Clark County in January 1999, and year-round residence and an active breeding colony were verified through 2006 (O'Farrell et al. 2004, Williams et al. 2006). This record represents the northernmost distribution of the species and is considered a range expansion most likely attributable to the increase in decorative palms within and surrounding urban development in the southwestern United States. Barbour and Davis (1969) suggested that this species may be increasing in range and abundance in the U.S.

Capture sites are often associated with water features (e.g., stock tanks, ponds, streams, and rivers) in open grassy areas and scrub; canyon and riparian areas and palm groves are also frequently used (O'Farrell et al. 2004, Arroyo-Cabrales and Álvarez-Castañeda 2017, Bradley et al. 2006). Roosting and foraging appear to be concentrated within California fan palm groves throughout the upper Moapa Valley (Clark County) and are also known from the Las Vegas area.

19.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	None
U.S. Forest Service (Region 4)	None
State of Nevada	Protected
State of California	Species of Special Concern
State of Arizona	Species of Greatest Conservation Need
State of Utah	None
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Not Included
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4G5 S1
IUCN Red List	Least Concern
CITES	Not Included

NatureServe assigns the western yellow bat a global rank of G4G5, indicating the species is apparently secure to secure globally, and a Nevada state rank of S1, indicating it is critically imperiled in the state due to its very restricted range (NatureServe 2026). The IUCN Red List classifies the species as Least Concern, and it is not included under CITES. NDNH lists the western yellow bat as At Risk. The Nevada Climate Change Vulnerability Index considers the species Presumed Stable. Most reports and authors suggest the population remains well distributed in the southwestern United States and northern Mexico and is stable to increasing based on the expansion of landscaped urban areas (Wilson and Ruff 1999, Ortiz and Barrow 2014, Williams et al. 2006, Bradley et al. 2006). The range expansion into Clark County in the late 1990s is likely associated with the planting of fan and date palms and is considered an indicator of continued suitable conditions for range stability.

19.4 Impact

The association of western yellow bats with ornamental palms in Clark County makes the cosmetic trimming of palm trees one of the primary threats to the species in the region. Known and likely predators of the western yellow bat include both urban-adapted and native species, including domestic cats, dogs, rats, barn owls, birds of prey, roadrunners, and opossums. The use of pesticides threatens both bats and their insect prey. Wind energy facilities represent an additional mortality source; relatively low numbers of this species have been found dead near wind turbines, and estimated range-wide mortality from wind energy in the United States and Canada was approximately 600 to 1,300 individuals during the period 2000 to 2011, a figure expected to increase with ongoing wind energy expansion (NatureServe 2026).

WNS is a fungal disease and is estimated to have killed over six million bats in the eastern United States since 2006. WNS affects primarily hibernating colonial roosting bats; the western yellow bat is not known to roost in colonies and WNS is not anticipated to be a major threat to this species. In March 2016, a case of WNS was confirmed in a little brown bat (*Myotis lucifugus*) 30 miles east of Seattle, Washington. Based on the role of all bats in the ecosystem as insect predators and their economic importance to agriculture as pollinators, the California

Department of Fish and Wildlife (CDFW) and other local, state, and federal government agriculture and wildlife agencies have established methods and mechanisms to monitor this threat (CDFW 2025).

Of the 787,777 acres of suitable habitat modeled within the MSHCP Amendment Plan Area (USGS 2018), approximately 30,556 acres (3.9 percent) occur within the MSHCP Amendment Impact Area. Approximately 374,667 acres (47.6 percent) of suitable habitat fall within lands managed for resource conservation, and 96,705 acres (12.3 percent) are within the MSHCP Amendment Reserve System Additions. Only 108 acres (0.0 percent) of suitable habitat occur within the existing MSHCP Reserve System.

Western yellow bat* *Lasiurus xanthinus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	787,777	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	30,556	3.9%
Suitable Habitat in Lands Managed for Resource Conservation	374,667	47.6%
Suitable Habitat in the existing MSHCP Reserve System	108	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	96,705	12.3%

*USGS 2018

19.5 Data

Systematic population surveys have not been conducted nor have habitat suitability models been developed for the western yellow bat; therefore, little is known about the status and trend of the population range-wide or in Clark County. It is likely that with the development of sophisticated acoustic detection techniques, bats in general will be detected in additional locations and their ranges better understood.

Habitat use by western yellow bats has been documented along the Las Vegas Wash, extending the known occupied area within Clark County beyond the Moapa Valley (Eckberg and Foster 2011, NBWG 2024).

Acoustic bat surveys conducted at Clark County MSHCP Reserve System properties between 2021 and 2023 detected western yellow bat at all three Riparian Reserve Units surveyed: Bunkerville South, Muddy River, and Riverside (SWCA 2024). County-wide acoustic monitoring conducted by SWCA (2025) in 2022 and 2024 detected western yellow bat sporadically in the Overton Wildlife Management Area. This location supports dense aggregations of prey insects along the Muddy River drainage and surrounding agricultural areas (SWCA 2025).

19.6 Recommendation

Not recommended for coverage. Most current literature and researchers consider the species well distributed and potentially even expanding its range. There are no demonstrable or apparent immediate or significant long-range threats documented and the states and federal agencies generally do not consider the species at risk of population declines sufficient to warrant protection. WNS poses a significant risk to bats in general and colony roosting bats specifically; however, western yellow bats are solitary or small group roosters and are not considered a vulnerable species. The Clark County population is considered the northernmost extent of the population, is not likely to be impacted by the proposed actions in the MSHCP, and could see benefits if fan and date palms and other trees are included in landscaping plans.

In addition, state and federal agencies have numerous conservation measures to ensure the long-term conservation of bat species in general, which would likely apply to western yellow bats.

Conservation measures in effect for bats in general include, but are not limited to: applicable cave and mine closures, preparation of Avian/Bat Protection plans for wind facilities, WNS awareness and prevention protocols, etc. The above measures afford the species adequate protection such that it does not need to be included as a covered species.

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20.0 CALIFORNIA LEAF-NOSED BAT (*MACROTUS CALIFORNICUS*)

20.1 Species Overview

The California leaf-nosed bat (*Macrotus californicus*; Grinnell 1918) was originally described as its own species and later classified as a subspecies of Waterhouse's leaf-nosed bat (*Macrotus waterhousii californicus*). Genetic and morphological differences and the lack of interbreeding where their range overlapped with Waterhouse's leaf-nosed bat led Davis and Baker (1974) to determine California leaf-nosed bats were a distinct species. The most distinguishing characteristics of the California leaf-nosed bat are its leaf-shaped nose and large ears, the latter of which sets it apart from the other two species of leaf-nosed bats found in the U.S. (the lesser long-nosed bat [*Leptonycteris yerbabuenae*] and Mexican long-tongued bat [*Choeronycteris mexicana*]).

California leaf-nosed bats roost in caves, buildings, and mines, and regulate their temperature by selecting different depths to roost (Bradley et al. 2006; Bradshaw 1961). They forage on large flying and flightless insects in desert wash vegetation but will take fruit when available. Prey is taken while hovering close to the ground or by gleaning from vegetation near the ground, although it also takes prey in flight (Hinman and Snow 2003; Bradley et al. 2006; Hoffmeister 1986).

It is not known to migrate or hibernate, although seasonal local movements between roosts occur. Summer colonies range from six to several hundred individuals, while winter colonies may contain 100 to over 1,000 individuals. In Nevada, this species is active year-round and does not enter torpor; it relies on geothermally heated cave and mine features for maternity colonies and overwintering (NDOW 2022). Maturity is reached the first autumn in females and the following year in males; maximum life expectancy in the wild is reported as 20 to 30 years (NDOW 2022). This species uses a lek-based mating system in which males vocalize and fan their wings to attract females, with competition among males occurring near maternity roost sites (NDOW 2022).

20.2 Range

The California leaf-nosed bat's range is known primarily from desert regions in Baja California, Sonora, northern Sinaloa and southwest Chihuahua as well as southeastern California, southern Nevada, and northwestern, central, and southwestern Arizona (Kays and Wilson 2002; Bradshaw 1961; IUCN 2017). All known Nevada records are from Clark County, which represents the northern extent of the species' global range (NDOW 2022). It has been documented along the Muddy River in Moapa Valley as well as the Las Vegas Wash (Williams et al. 2006, O'Farrell Biological Consulting 2006) and roosts have been found in the Lake Mead National Recreation Area (Brown 2006).

This species is strongly associated with desert riparian washes and adjacent desert scrub habitats between 3 to 6 miles from their roost during summer and 0.5 mile from their roost in winter (Brown et al. 1993; Brown 2005). Their elevation ranges from 210 to 690 meters (Bradley et al. 2006).

20.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Protected

Agency/Organization	Status
State of Arizona	Species of Greatest Conservation Need
State of Utah	None
State of California	Species of Special Concern
NV Division of Natural Heritage	At Risk
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G3G4 S2
IUCN Red List	Least Concern
CITES	None

NatureServe assigns the California leaf-nosed bat a global rank of G3G4 (vulnerable to apparently secure) and a Nevada state rank of S2 (imperiled), reflecting the species' restricted distribution within the state and the small number of known populations. NatureServe (2026) estimates a long-term global population decline of 10 to 30 percent, with the California range now restricted primarily to mountain ranges bordering the Colorado River basin, with loss of desert riparian habitat in southern California cited as a contributing factor.

20.4 Impact

Primary threats to the California leaf-nosed bat include disturbance caused by recreational caving, mine closures, renewed mining, and water impoundments (several known roosts were inundated by the creation of Lake Mead and Lake Mohave) (Bradley et al. 2006). Destruction of desert wash riparian vegetation also likely impacts this species (Brown 2005). The Nevada State Wildlife Action Plan identifies recreational disturbance at geothermal cave and mine roosts and renewed mining activity as high-priority threats for the Nevada population (NDOW 2022). The lek-based mating system of this species, in which males aggregate near maternity colonies to compete for females, creates additional vulnerability: disruption at roost sites during the mating and pup-rearing season can affect both reproductive success and colony persistence (NDOW 2022). Due to the apparent rarity of their specific roost requirements, this species tends to congregate in a small number of large colonies rather than several small ones; therefore, the loss of one colony can have a significant impact on a local population (Brown 2006).

Within the MSHCP Amendment Plan Area, suitable habitat for the California leaf-nosed bat totals 837,522 acres. Of this, 68,079 acres (8.1 percent) occur within the MSHCP Amendment Impact Area. Approximately 515,498 acres (61.6 percent) of suitable habitat occur within lands managed for resource conservation, and 22,011 acres (2.6 percent) occur within the existing MSHCP Reserve System. An additional 18,131 acres (2.2 percent) of suitable habitat are located within MSHCP Amendment Reserve System Additions (SWECO 2018).

California leaf-nosed bat* *Macrotus californicus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	837,522	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	68,079	8.1%
Suitable Habitat in Lands Managed for Resource Conservation	515,498	61.6%
Suitable Habitat in the existing MSHCP Reserve System	22,011	2.6%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	18,131	2.2%

*SWECO 2018

20.5 Data

These bats are rarely netted over water or in flyways and are generally not detected using acoustic bat detectors; surveys for California leaf-nosed bats are most effective when conducted at roosts using exit counts or other estimation methods (Hinman and Snow 2003). These types of surveys require knowledge of the locations of active roost sites, which are limited in number in Nevada. The distribution and status of this species in Nevada remain poorly understood, with survey and inventory work identified as a priority research need (NDOW 2022, NBWG 2024).

Acoustic monitoring conducted by SWCA in 2022 and 2024 detected California leaf-nosed bat in 2024 (but not in 2022) at two locations: Red Bluff Spring, which supports cliff-roosting habitat with isolated surface water, and the Overton Wildlife Management Area alfalfa fields, which supports dense aggregations of prey insects along the Muddy River drainage and surrounding agricultural areas (SWCA 2025). The species was not detected during SWCA's earlier 2021 to 2023 bat acoustic recording analysis in Clark County (SWCA 2024), which deployed detectors at Muddy River, Bunkerville South, Riverside, and Boulder City Conservation Easement survey points.

20.6 Recommendation

Not recommended for coverage. Although its foraging and roosting habitats are limited, this species is widely distributed and is thought to have a large population. While disturbances at roosts have a negative impact on this species, the creation of roosts by mining has presumably increased the availability of suitable roosts, although the degree to which this has affected the overall population is unknown (IUCN 2017, NatureServe 2026). Although this species is considered sensitive or a species of concern by several agencies or states, there are no demonstrable or significant long-range threats nor is the rate of decline sufficient to warrant coverage. State and Federal agencies have numerous conservation measures to ensure the long-term conservation of bat species in general, which would likely apply to California leaf-nosed bats. Conservation measures in effect for bats in general include, but are not limited to: applicable cave and mine closures, preparation of Avian/Bat Protection plans for wind facilities, WNS awareness and prevention protocols. The above measures afford the species adequate protection such that it does not need to be included as a covered species.

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21.0 MEXICAN FREE-TAILED BAT (*TADARIDA BRASILIENSIS*)

21.1 Species Overview

Mexican free-tailed bat, also known as the Brazilian free-tailed bat, is a relatively small bat with the end of the tail extending freely beyond the uropatagium (webbing between the rear legs) (Wilkins 1989). This species is brown in color, and darker dorsally than ventrally (Wilkins 1989). They are a migratory species and move southward in winter in North America (Herreid 1967). Males and females typically roost separately, with large maternal colonies comprising up to millions of individuals in some large caves. Males may migrate farther north than females, and these bats are also known to roost in man-made structures (Wilkins 1989). In laboratory conditions, they select roosting areas with ambient temperatures of up to 35 ºC (Herreid 1967), but can be found roosting in structures and caves with temperatures up to 40ºC (Wilkins 1989). They are an insectivorous species eating primarily moths, beetles, flying ants, midges, and mosquitoes (Kunz et al. 1995). A maternity colony of one million individuals could consume up to 8.4 metric tons of insects per night (Kasso and Balakrishnan 2013).

21.2 Range

Mexican free-tailed bat is among the most widely distributed mammal species in the Western Hemisphere, occurring generally from southern Oregon to North Carolina in its northern extent, and continuously through Mexico and Central America, through western South America to a wider distribution again in the temperate regions of central South America (Wilkins 1989). This species occupies a broad range of habitats and roosts in caves, rock crevices, and man-made structures such as buildings and bridges. They aggregate in large numbers while roosting and are frequently seen exiting roosts simultaneously for foraging bouts of up to four hours (Wilkins 1989).

In Nevada, the Mexican free-tailed bat is considered the most abundant bat species in the state. Most research has been conducted at large roosts in Texas; considerably less is known about Nevada and California populations, which appear to differ from eastern populations in migration patterns, genetics, and breeding phenology (NBWG 2024). In Clark County, point distributions and predicted habitat provided in the Species Distribution Model (SWECO 2018) indicate distributions in mountainous areas in the Spring and Sheep ranges, as well as likely foraging areas occurring along the Las Vegas Wash, the Moapa Valley and Muddy and Virgin river systems, throughout the Overton arm of Lake Mead National Recreation Area, and in the Colorado River drainage in the southernmost extent of the County.

21.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Protected
State of Arizona	Species of Greatest Conservation Need
State of California	None
State of Utah	None
NV Division of Natural Heritage	

Agency/Organization	Status
NV Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	
IUCN Red List (v 2025-2)	Least Concern
CITES	None

IUCN considers this species as one of Least Concern due to its wide distribution, large overall population size, and lack of evidence for widespread decline (Barquez et al 2015).

According to the 2024 Nevada Bat Conservation Plan (NBWG 2024), global populations of this species are declining (Clark Jr. 2001, Medellín et al. 2017); however, populations in the U.S. are expanding northward (McCracken et al. 2018, Ommundsen et al. 2017). The Mexican free-tailed bat is considered the most abundant bat in Nevada and the most economically valuable bat species in the U.S. Of eight Mexican free-tailed bat colonies analyzed for population trends in the United States (each with at least four years of data), two showed positive population trends, six had no trend, and none had a negative trend. In Nevada, one of the largest Mexican free-tailed bat colonies near Ely had at least a temporary negative population trend due to a disturbance involving an artificial cave entrance (Bradley et al. 2006). Nevada populations of Mexican free-tailed bats are stated to potentially be below historical levels (Bradley et al. 2006), but no quantitative data were provided to support this suggestion.

21.4 Impact

The Mexican free-tailed bat faces threats from disturbance at roosts, pollution, development, and vandalism. Population declines in some areas have been attributed to the historic use of DDT and to guano mining disturbance in Mexico (Wiederholt et al. 2013). Natural predators include falcons, hawks, owls, skunks, raccoons, several species of snakes, and other carnivores (Wilkins 1989).

Disturbance to and closure of roosting habitat represent significant threats to this species. Because Mexican free-tailed bats may fly long distances to foraging areas, structures interfering with flyways, and loss of foraging habitat would also negatively affect the species. For example, wind turbines pose a significant and well-documented mortality risk; the species is highly vulnerable to turbine strikes, with up to 85 percent of bat fatalities consisting of Mexican free-tailed bats at some facilities (Arnett et al. 2008). They are among the most frequently recorded bat species at energy development facilities in the southern U.S. (Cryan and Barclay 2009).

WNS has not been reported in Nevada, and this disease affects only hibernating bat species, which does not include the Mexican free-tailed bat. Accordingly, the species is not currently at risk of decline from known diseases that are likely to threaten Clark County populations.

Based on the MSHCP Amendment Species Distribution Model, there are approximately 919,972 acres of suitable habitat for the Mexican free-tailed bat within the Plan Area. Of this, 57,579 acres (6.3 percent) occur within the MSHCP Amendment Impact Area. A substantial proportion of suitable habitat, 632,463 acres (68.7 percent), occurs within lands managed for resource conservation. An additional 714 acres (0.1 percent) of suitable habitat falls within the existing MSHCP Reserve System, and 13,993 acres (1.5 percent) occur within the MSHCP Amendment Reserve System Additions.

Mexican free-tailed bat* *Tadarida brasiliensis*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	919,972	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	57,579	6.3%
Suitable Habitat in Lands Managed for Resource Conservation	632,463	68.7%
Suitable Habitat in the existing MSHCP Reserve System	714	0.1%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	13,993	1.5%

21.5 Data

The Mexican free-tailed bat is commonly accepted as among the most common bats in North America (Kunz and Reynolds 2003). Recent genetic analyses of migrating populations indicated that earlier hypotheses of distinctions among migratory populations (see Wilkins 1989) were not supported by the genetic data, and that, consistent with many migratory and widely dispersing species, only a single genetic population was supported (Russell and McCracken 2006). An effective population size for the species was estimated at 28.4 million females (Russell 2003).

In a study along the Muddy River drainage near Moapa in Clark County Nevada, Mexican free-tailed bats were equally common in each of the four habitat types surveyed and were the most frequently detected species using acoustic surveys (Williams et al. 2006). Mexican free-tailed bats were observed foraging at altitudes of as high as 300 m above ground surface in Clark County, Nevada (Griffin and Thompson 1982).

Recent passive acoustic surveys conducted throughout Clark County further confirm the widespread occurrence of Mexican free-tailed bat across the County. Between 2021 and 2023, acoustic detectors deployed at five Riparian Reserve Unit locations (within the Muddy River, Bunkerville South, and Riverside subunits) and five Boulder City Conservation Easement locations recorded Mexican free-tailed bat at all surveyed sites (SWCA 2024). It was among the most commonly detected species at every location, and the Muddy River survey point MR-02, positioned adjacent to desert riparian habitat along the river bank, yielded the highest overall bat activity in the project area. A broader county-wide acoustic survey effort conducted in 2022 and 2024, targeting spotted bat and Townsend's big-eared bat occurrence across 60 sites recorded Mexican free-tailed bat at the greatest number of detection locations of any species, documented at sites spanning desert riparian corridors, agricultural areas, cliff-adjacent springs, and upland Mojave desert scrub throughout Clark County (SWCA 2025). The highest bat activity overall, including for this species, was documented at survey locations within warm desert riparian habitat in the Muddy River floodplain in north-central Clark County, and at locations adjacent to alfalfa fields and irrigation canals within the Overton Wildlife Management Area (SWCA 2025).

21.6 Recommendation

Not recommended for coverage. The Mexican free-tailed bat is not recommended for coverage under the MSHCP, as it is not federally listed and there is no evidence of population decline in Clark County. This species is wide-ranging in the United States and is distributed from coast to coast. In addition, a large proportion of modeled suitable habitat in Clark County occurs within conservation lands, including 478,039 acres of high-suitability habitat and 1,089,953 acres of medium-suitability habitat.

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22.0 DESERT POCKET MOUSE (*CHAETODIPUS PENICILLATUS*)

22.1 Species Overview

The desert pocket mouse (*Chaetodipus penicillatus*) is a medium-sized heteromyid rodent characterized by fur-lined cheek pouches, a long tufted tail, and coarse grayish-brown to yellowish-gray pelage often sprinkled with black (NDOW 2022). Adults measure approximately 22 centimeters in total length and weigh around 23 grams (NatureServe 2026). The species is strictly nocturnal and not migratory. Activity peaks during the breeding season (April through August) and is reduced during the hottest and driest months, when individuals may become torpid for several days at a time (Mantooth and Best 2005; NDOW 2022). The species is solitary and home ranges are typically small, generally less than 0.5 acre for both adults and juveniles (NatureServe 2026). Annual population turnover is nearly complete, with few individuals surviving beyond one year in the wild (NDOW 2022). The species is granivorous, feeding primarily on seeds of mesquite, creosote bush, and broomweed, and stores food in underground burrows (Mantooth and Best 2005).

22.2 Range

Desert pocket mice occur in the Mojave and Sonoran Deserts in the southwestern United States into most of Sonora, Mexico, in deserts and other arid regions (Mantooth and Best 2005). In the United States, its range extends from southeastern California east to southwestern New Mexico, and north to the southern portion of Nevada. It is commonly associated with creosote bush (*Larrea tridentata*) and saltbush (*Atriplex* sp.) and with sandy soils and washes.

There are six subspecies of desert pocket mouse (Jezkova et al. 2009). Subspecies *Chaetodipus penicillatus sobrinus* occurs throughout Clark County, neighboring southwest Utah, and extreme northwest Arizona (Jezkova et al. 2009, Micone 2002). The elevation range for this subspecies is 36 to 1,585 m.

In Clark County, desert pocket mice are closely associated with riparian and wash habitats featuring loose, sandy or silty soils and moderate to dense shrub cover with some open interspace. In recent studies, the species was consistently captured in sandy or silty lowlands, floodplains, and shorelines adjacent to permanent or ephemeral water sources, in areas supporting shrubs such as quailbush, tamarisk, arrowweed, and mesquite (BEC 2021). The species was not detected in areas with sparse vegetation or gravelly to rocky substrates, which are instead occupied by the similar long-tailed pocket mouse (*Chaetodipus formosus*) (BEC 2021).

22.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	Species of Greatest Conservation Need
State of California	None
State of Utah	None

Agency/Organization	Status
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Moderately Vulnerable
NatureServe Global and NV State Rank	G5 S1S2
IUCN Red List	Least Concern
CITES	None

The desert pocket mouse holds a global conservation rank of G5 (Secure) from NatureServe, reflecting that rangewide it is widespread in the Sonoran Desert of the southwestern United States and northwestern Mexico with no major rangewide threats currently identified (NatureServe Explorer 2026). Nevada state rank is S1S2 (Critically Imperiled to Imperiled), a ranking reflected consistently across both the NatureServe Explorer record and the 2022 Nevada State Wildlife Action Plan (NDOW 2022). The Climate Change Vulnerability Index rates the species as moderately vulnerable. No state or federal listing status applies, but the species has been identified.

Genomic analysis conducted in 2023 confirmed that the three Clark County populations represent genetically distinct units, with approximately 37 percent of genetic variation distributed among the three groups (BEC 2023). The populations show significant structuring consistent with long-term geographic isolation — likely spanning thousands of years — resulting from the desiccation of the pluvial lake systems that previously connected them. All three populations belong to the subspecies *C. p. sobrinus*, with the Laughlin population representing a probable introgression zone with *C. p. penicillatus* from the south.

Historical effective population size (Ne) estimates show dramatic declines across all three Clark County populations. The Muddy/Virgin population, historically the largest, had Ne values estimated as high as approximately 4,000 in the distant past, declining to roughly 200 in recent generations. The Las Vegas Wetlands and Laughlin populations declined to values below 100. These figures are at or below thresholds generally considered adequate for long-term viability, historically set at Ne of 50, though more recent literature suggests values of 100 or more may be necessary (BEC 2023). Neutrality tests (Tajima's D and Fu's Fs) indicate the Muddy/Virgin population has undergone recent demographic expansion following a bottleneck, which may reflect some recovery, but the other populations show patterns consistent with stasis or continued decline.

The NDOW 2022 State Wildlife Action Plan characterizes the population trend as unknown, noting that populations are disjunct, suitable habitat is typically fragmented, and these factors potentially contribute to declining populations (NDOW 2022). The genomic data support this assessment: the three populations have been effectively isolated for an extended period with little to no gene flow among them, and effective population sizes are declining. The low genetic diversity resulting from this isolation also increases susceptibility to disease and reduces adaptive potential in the face of climate change (BEC 2023).

22.4 Impact

Threats to desert pocket mouse habitats include conversion of habitat through urban and suburban development, invasive species, off-highway vehicle use, and recreational activities. Off-highway vehicle activity can result in structural damage to shrubs and soil disturbance can lead to accelerated erosion, reducing habitat suitability for desert pocket mouse (NDOW 2022). In addition, off-highway use can result in direct mortality. Habitat within the lower Colorado drainage system is highly fragmented, which reduces resilience to disturbance and increases the potential for local extirpation. Populations may exist within urban areas, but with limited dispersal habitats, they are isolated from surrounding populations (Micone 2002). Desert pocket mice forage within and between shrubs

indicating that conversion of habitat may have a negative effect on the density of the species (Micone 2002).

A landscape genomics study conducted by BEC (2023) identified multiple potential threats to long-term population viability. Habitat conversion through urban development or encroachment of invasive plant species reduces the riparian shrub habitat the species requires. Invasive plants displace native shrubs and form dense monocultures lacking the shrub interspace needed for foraging. Increased anthropogenic water extraction threatens the groundwater and soil moisture that sustains riparian vegetation. The continued aridification of the Mojave Desert due to climate change will further degrade habitat quality and extent. Additionally, because the three populations have low genetic diversity due to their prolonged isolation, individuals may be at heightened risk from novel diseases. Habitat connectivity within each population's range, rather than between populations, is the most feasible avenue for improving population resilience, given the significant distances separating the three groups (BEC 2023).

Simandle and Nussear (2025) modeled desert pocket mouse habitat suitability on the basis of average minimum temperature, winter precipitation variability, soil properties and vegetation. High-suitability habitat is predicted to occur associated with North American warm desert scrub and grassland and developed areas (Simandle and Nussear 2025). Based on the habitat suitability model, approximately 29,659 acres (10.8 percent) of suitable habitat within the MSHCP Amendment Plan Area may be impacted by plan activities, and approximately 60,462 acres (22.0 percent) occur on lands managed for resource conservation. Approximately 2,681 acres (1.0 percent) of modeled habitat are protected within the existing MSHCP Reserve System, and 1,162 acres (0.4 percent) are within the MSHCP Amendment Reserve System Additions.

Desert pocket mouse* *Chaetodipus penicillatus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	274,564	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	29,659	10.8%
Suitable Habitat in Lands Managed for Resource Conservation	60,462	22.0%
Suitable Habitat in the existing MSHCP Reserve System	2,681	1.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	1,162	0.4%

*Simandle and Nussear 2025

22.5 Data

The two species, desert pocket mouse and the long-tailed pocket mouse (*Chaetodipus formosus*), are morphologically similar and can only be reliably differentiated by cranial measurements, which has historically complicated the accuracy of occurrence records (BEC 2021).

Regarding subspecies taxonomy, earlier work recognized a single Mojave Desert subspecies (*C. p. sobrinus*) (Lee et al. 1996). Subsequent genetic analysis identified a separation between the Mojave and Sonoran ecotone along the Colorado River (Wood et al. 2013), effectively restricting the recognized range of *C. p. sobrinus* to an area almost entirely within Clark County. A 2023 landscape genomics study confirmed the presence of three genetically distinct, geographically isolated populations of *C. p. sobrinus* within Clark County: the Muddy/Virgin Rivers population, the Las Vegas Wetlands population, and the Laughlin population (BEC 2023). The Laughlin population represents a zone of introgression between *C. p. sobrinus* and *C. p. penicillatus* extending south into Arizona (BEC 2023). All three populations were found to have undergone recent decline from historic highs approximating 4,000 individuals, putting them at risk of losing long-term viability. Nevertheless, the populations appear to have undergone recent expansion (BEC 2023).

22.6 Recommendation

Recommended for coverage. *Chaetodipus penicillatus* is considered stable across its range but the subspecies that occurs in Clark County, *Chaetodipus penicillatus sobrinus*, may be impacted by covered activities under the MSHCP. Habitat suitability models predict covered activities under the MSHCP amendment will directly impact up to 12 percent of high- and medium-suitability habitat (Simandle and Nussear 2025). This may be an underestimation of impact to the species due to the presence of populations in areas proposed for impact. *C.p. sobrinus* has an extremely limited range and almost entirely restricted to Clark County (BEC 2023). Based upon a limited range focused within the MSHCP Area, it is recommended *C.p. sobrinus* be covered under the MSHCP. This subspecies was initially designated for further review to determine whether information was available to indicate a broader range or population size. Following discussions with NDOW, in which they concurred with the existing data, this species was recommended for coverage under the MSHCP.

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23.0 DESERT KANGAROO RAT (*DIPODOMYS DESERTI DESERTI*)

23.1 Species Overview

The desert kangaroo rat (*Dipodomys deserti deserti*) is one of the largest and most specialized species of kangaroo rat in the United States (Best et al. 1989). It occurs in the lowest, hottest, and most arid regions of the Great Basin, Mojave Desert, and Sonoran Desert (Nader 1978). It is found almost entirely in areas of accumulated, wind-blown sand but may be found in silty, flour-like soil (Grinnell 1937). In the Mojave Desert, this species' distribution is correlated with low shrub cover and low mean precipitation/mean temperature ratios of creosote (*Larrea tridentata*) communities (Beatley 1976). This species' correlation with sand dune habitats may be a result of food sources (e.g., seeds) accumulating in these areas through wind action (Munger et al. 1983). In Nevada, the dominant vegetation on the sand dunes includes greasewood (*Sarcobatus vermiculatus*), four-winged saltbush (*Atriplex canescens*) (Kotler 1984), and sagebrush (*Artemisia* sp.) (Eisenberg 1963). There are four subspecies of the desert kangaroo rat, with *D. deserti deserti* being the most widely distributed and the one found in much of Nevada (Best et al. 1989).

The species is active year-round and does not hibernate; although primarily nocturnal, individuals are frequently observed during daylight hours maintaining burrows (NDOW 2022). This species may form loose colonies of six to 12 burrows, each inhabited by one individual or a female with young (Ketcham 1940). Colonies are often abandoned, which may be a result of kangaroo rats following food sources (Knox Jones 1968). Densities vary seasonally from 0.5 to 3.04 per hectare (Grinnell 1937; Knox Jones 1968). Diet includes a variety of seeds, including those of creosote bush and lupines (*Lupinus* sp.); sagebrush (*Artemisia* sp.) and saltbush (*Atriplex* sp.) leaves; and flowers of sand Aliciella (*Aliciella leptomeria*) (Hall 1946).

23.2 Range

The desert kangaroo rat is found in arid regions of northeastern Baja California and northwestern Sonora, southern and western Arizona, southeastern California, southern and western Nevada, and extreme southwest Utah (Best et al. 1989). NatureServe estimates the global range extent at 200,000 to 2,500,000 km², with a GBIF-based analysis of occurrence records from 2000 to 2025 yielding an estimate of approximately 528,078 km² (NatureServe 2025). In the Mojave Desert of Nevada, desert kangaroo rats may comprise only one percent of the rodent fauna (Beatley 1976). The species occupies an elevational range of approximately -60 m (Death Valley) to 1,710 m (Huntoon Valley, Mineral County, Nevada) (Best et al. 1989). Nevada's populations are patchily distributed, with higher densities in the western and southern portions of the state; scattered occurrences are also recorded across much of the Great Basin and Mojave Desert regions within Nevada (NDOW 2022).

Within Clark County, this species is known from Boulder City, Mesquite St. Thomas Gap, and surrounding areas in Gold Butte, Corn Creek, and Nellis Sand Dunes. Field surveys conducted in Clark County between 2018 and 2020 confirmed the species is restricted to areas with substantial wind-driven sand deposits; in the Boulder City Conservation Easement, suitable habitat was found only in a small area along the northern boundary, where two individuals were captured; in the Riparian Reserve Units along the Muddy and Virgin Rivers, the species was not detected, as the sandy substrate in those areas was of riverine rather than aeolian origin (BEC 2019; BEC 2020).

23.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation Species
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	None
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
State of California	None
State of Utah	None
NV Division of Natural Heritage	Watch List[1]
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G5 S2[1]
IUCN Red List	Least Concern
CITES	No Status

[1] Designation is at the species level of desert kangaroo rat, *Dipodomys deserti*

IUCN (2017) lists its population trend as stable and classifies this species as "Least Concern." NatureServe's most recent global status review (July 2025) affirms a G5 (Secure) global rank, with an estimated range extent of approximately 528,078 km² and more than 300 occurrences across the range, most with good viability. Nevada's state rank of S2S3 reflects uncertainty about local population status; the species faces a long-term decline estimated at 10 to 30 percent due to historical habitat loss, and short-term trends remain unknown. NatureServe identifies long-term population monitoring as a priority research need (NatureServe 2025).

23.4 Impact

Vehicle collisions along roads and off-highway vehicles in sand dunes are a major source of mortality for desert kangaroo rats; in southeastern California, populations are almost eliminated along a wide swath adjacent to roadways (Huey 1941). Habitat loss from urban and suburban development, including activities covered under the MSHCP, and the spread of non-native plant species, which result in increased vegetation density and reduced habitat suitability for this species, are also potential impacts (Wildlife Action Plan Team 2012). Extreme drought is considered a high-severity threat, as prolonged dry conditions reduce seed production and can cause local colony die-offs (NDOW 2022). Large-scale renewable energy development poses a medium-level threat by reducing and fragmenting habitat and population connectivity; invasive annual grasses also pose a medium-level threat by converting native habitat through increased fire cycles (NDOW 2022).

Based on USGS GAP habitat modeling (USGS 2018), the desert kangaroo rat has approximately 675,594.6 acres (14.2 percent) of suitable habitat within the MSHCP Amendment Plan Area. Of this, approximately 50,565.3 acres (1.1 percent of the Plan Area) falls within the MSHCP Amendment Impact Area. Approximately 252,631.7 acres (5.3 percent) of suitable habitat occurs within lands managed for resource conservation, and 9,212.8 acres (0.2 percent) is within the existing MSHCP Reserve System. The MSHCP Amendment Reserve System Additions include approximately 51,191.3 acres (1.1 percent) of suitable habitat for this species.

Desert kangaroo rat* *Dipodomys deserti*	Acres	Percent of Total within Plan Area
Suitable Habitat in the MSHCP Amendment Plan Area	675,594.6	14.2%
Suitable Habitat in the MSHCP Amendment Impact Area	50,565.3	1.1%
Suitable Habitat in Lands Managed for Resource Conservation	252,631.7	5.3%
Suitable Habitat in the existing MSHCP Reserve System	9,212.8	0.2%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	51,191.3	1.1%

*USGS 2018

23.5 Data

No targeted surveys for the desert kangaroo rat have been conducted by the Clark County Desert Conservation Program beyond the field surveys referenced in the Range section above. Field surveys conducted in Clark County between 2018 and 2020 used standard small mammal trapping protocols; the species was detected in wind-deposited sand habitats at the Boulder City Conservation Easement but was absent from riverine sandy substrates in the Riparian Reserve Units along the Muddy and Virgin Rivers (BEC 2019, BEC 2020). Current habitat models based on USGS GAP data (USGS 2018) are believed to overestimate the amount of suitable habitat within Clark County, as the models do not distinguish between aeolian and riverine sandy substrates.

23.6 Recommendation

Not recommended for coverage. This species is widely distributed throughout the southwestern United States and northwestern Mexico, and data is lacking on population trends. Current habitat models are believed to overestimate the amount of suitable habitat within Clark County. Most state and federal agencies do not consider the species to be at risk of a significant population decline, and while the species may be impacted by the proposed actions in the MSHCP, the long-term survival of this species is not likely to be affected. This species is not anticipated to become federally listed in the lifetime of the new MSHCP permit.

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24.0 COLORADO RIVER COTTON RAT (*SIGMODON ARIZONAE PLENUS*)

24.1 Species Overview

The Colorado River cotton rat (*Sigmodon arizonae plenus*) (Goldman 1928) is one of two subspecies of the Arizona cotton rat (*Sigmodon arizonae*) (Sevringhaus and Hoffmeister 1978; Zimmerman 1970). Previously, Colorado River cotton rats were considered a subspecies of hispid cotton rats (*Sigmodon hispidus*). In the literature, they are referred to by all of the above names. Prior to 1970, many references to *S. hispidus,* and specifically *S. h. plenus*, the subspecies that used to encompass both this species and Yuma hispid cotton rats (currently known as *S. h. eremicus*), may have been Colorado River cotton rats.

Cotton rats have adapted to rapidly changing environments with high reproductive output (Bolster 1998), which could have resulted in rapid re-colonization prior to the construction of dams along the Colorado River (Neiswenter 2016).

24.2 Range

The Colorado River cotton rat occurs in Arizona, California, and Nevada in moist riverside habitats along the Colorado River floodplain. Until 2011, the Arizona cotton rat was assumed extirpated from Nevada, when a Colorado River cotton rat was captured in the Big Bend Conservation Area near Laughlin, Nevada, marking the first confirmed occurrence in the state since 1961. Subsequent trapping events have confirmed a resident population in the area (Hill 2011 and 2012).

The distribution of cotton rats occurs in ephemeral bodies of water and as such, is patchy in nature (Neiswenter 2016). The Arizona cotton rat can occur in arid scrub habitat to canals and banks of small streams (Bolster 1998). Generally, cotton rats have been documented occurring at historically documented locations (Neiswenter 2016).

24.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	None
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	Species of Greatest Conservation Need
State of California	Species of Special Concern
State of Utah	None
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	None
NV Climate Change Vulnerability Index	None
NatureServe Global and NV State Rank	G5T2T3 S1

Agency/Organization	Status
IUCN Red List (v 2025-2)	None
CITES	None

* As recently as 1994 the US Fish and Wildlife Service classified this subspecies as a Category 2 Candidate, which is defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1994). The USFWS subsequently revised their policy on Candidate Species and current annual reviews do not include the C2 category.

NatureServe (2026) assigns the Colorado River cotton rat a global conservation status of G5T2T3 (rounded to T2, Imperiled), reflecting that while the parent species is secure globally, this subspecies is considered imperiled across its range. The global status was last reviewed in January 1997 and is flagged by NatureServe as needing review. At the national level, the subspecies is ranked N2N3 in the United States. State rankings indicate particular concern in Nevada (S1, Critically Imperiled) and California (S1S2, Critically Imperiled to Imperiled), with a somewhat less precarious but still imperiled status in Arizona (S2). The subspecies is endemic to the United States, occurring only in Arizona, California, and Nevada, and carries no federal listing status under the Endangered Species Act.

The NatureServe record contains no information on historical population changes, survey results, or trajectory assessments, and the global status review date of nearly three decades ago limits the currency of the ranking (NatureServe 2026).

24.4 Impact

The primary threat for cotton rats is the destruction, modification, and fragmentation of wetland and riparian habitats along the Colorado River (Bolster 1998). The channelization of the Colorado River has resulted in the elimination of annual floods and the desertification of riparian habitat. Conversion of habitat to urbanized, recreational, and agricultural areas has also resulted in loss of suitable habitat.

The Colorado River cotton rat is covered under the Lower Colorado River Multi-Species Conservation Plan (LCRMSCP), which provides a framework for addressing impacts to this subspecies within the lower Colorado River corridor.

No habitat suitability model was available for the Colorado River cotton rat.

24.5 Data

Data on habitat use and population trends of cotton rats have generally focused on hispid cotton rats (*Sigmodon hispidus*). As a result, information concerning the Colorado River cotton rat is limited.

A 2020 riparian small mammal survey of the Muddy River and Virgin River Riparian Reserve Units in Clark County confirmed 11 small mammal species across 3,720 trap-nights in riparian habitats; the Colorado River cotton rat was not detected during that effort (BEC 2020). The absence of the species from the Virgin River survey area is consistent with the known distribution of this subspecies, which is primarily restricted to the floodplain of the lower Colorado River and its direct tributaries.

24.6 Recommendation

Not recommended for coverage. This subspecies was initially flagged for further review because more research was needed to document its occurrence in Clark County, population trends within its known range, and life history information. This species was previously a candidate for listing under the Endangered Species Act. Following

discussions with Nevada Department of Fish and Wildlife, this subspecies is not recommended for coverage. The distribution within Clark County is restricted to the extreme southern portion along the Colorado River and this species is included in the LCRMSCP. The restricted range of the subspecies within the MSHCP Area and protection under a separate habitat conservation plan limit the potential for covered activities to impact this species. In addition, impacts to this subspecies not covered by the LCRMSCP will likely be mitigated for through the Section 7 consultation process. This subspecies is not recommended for coverage under the MSHCP.

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25.0 BOTTA'S POCKET GOPHER (*THOMOMYS BOTTAE*)

25.1 Species Overview

Botta's pocket gopher is a widely distributed, fossorial species with numerous recognized subspecies (Jones and Baxter 2004). Some of these subspecies are narrowly distributed and have conservation designations; however, the subspecies occurring in Nevada that are recommended for Conservation Priority, *T. b. abstrusus* and *T. b. curtatus* (NDOW 2022), do not occur in Clark County below 4,000 feet of elevation. Multiple subspecies may occur within the MSHCP Area including *T.b. centralis and T. b. phelleocus*, and none are designated a Conservation Priority (NDOW 2022); therefore, consideration for inclusion in the MSHCP was performed at the species level, *Thomomys bottae*.

Botta's pocket gophers occur in a wide range of habitats from valleys to desert ranges and above the timberline (Jones and Baxter 2004), but are primarily found in areas that support burrowing, such as sandy or gravelly soils (Zeveloff 1988); their numbers are reduced in areas with shallow or unfriable soils (Grinnell 1926, Howard and Childs 1959, Jones and Baxter 2004). Botta's pocket gophers are often found in areas with alluvial soils that can support grasses and forbs for forage (Linsdale 1938, Fitch and Bentley 1949, Smallwood and Morrison 1999), and burrow production is linked to forage availability and periods of heavy rainfall (Bandoli 1981). In the Mojave, they occupy nearly all vegetation communities that have sufficient food and friable soils (Smith and Patton 1988). Botta's pocket gophers are not often found in extremely rocky terrain but can occur in meadows at high elevations (Zeveloff 1988). They can occur in increased densities in agricultural areas and are documented to occupy alfalfa fields, among other crops (Lay 1978, Smith and Patton 1980, Jones and Baxter 2004).

25.2 Range

Botta's pocket gopher ranges from southern Oregon through California to Mexico including the Baja peninsula, east across central and southern Nevada and Utah to southwestern Colorado. On the easternmost extent of their range, they occur in most of New Mexico west of the Pecos River, southward into west Texas, Coahuila, Chihuahua, Nuevo Leon, Sinaloa, and Sonora, Mexico (Jones and Baxter 2004). Elevation ranges for the species have been reported from sea level up to 4,200 m (Howard and Childs 1959, Jones and Baxter 2004). Within Nevada, Botta's pocket gopher is broadly distributed across the state.

25.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Arizona	None
State of Utah	None
State of California	None
State of Nevada	None
NV Division of Natural Heritage	At Risk
NV Wildlife Action Plan	Species of Greatest Conservation Need[1,2]

Agency/Organization	Status
NV Climate Change Vulnerability Index	Moderately Vulnerable
NatureServe Global and NV State Rank	G5 SNR
IUCN Red List	Least Concern
CITES	None

[1] Fish Springs pocket gopher (*Thomomys bottae abstrusus*)

[2] Eastgate Pocket Gopher (*Thomomys bottae lucrificus*)

Information on population trends in Botta's pocket gopher in Clark County is sparse. One study documented declining populations with off highway vehicle use (Vollmer et al. 1977). NatureServe (2026) assigns the species a global rank of G5 (Secure), and its status in Nevada carries no rank (SNR), indicating insufficient data to assign a state-level rank.

25.4 Impact

Botta's pocket gophers are widespread and occupy a wide range of ecological niches (Jones and Baxter 2004); as a result, direct impacts are unlikely to pose a significant threat to populations in rural areas. Pocket gophers may be prone to population fragmentation in urban settings because they are unlikely to traverse impermeable ground such as highways. Heavily urbanized areas may become depleted of pocket gophers; however, parklands within those areas can support the species. One example is Sunset Park in Henderson, Nevada, which supports robust populations of pocket gophers. Pocket gophers are often considered a pest in agricultural areas, and control measures such as trapping and rodenticide are commonly employed.

According to habitat modeling conducted for the MSHCP Amendment (SWECO 2018), suitable habitat for Botta's pocket gopher totals approximately 1,866,634 acres within the MSHCP Amendment Plan Area. Of this, 141,738 acres (7.6 percent) occur within the MSHCP Amendment Impact Area. Approximately 1,069,537 acres (57.3 percent) of suitable habitat occur within lands managed for resource conservation. Within the existing MSHCP Reserve System, 74,569 acres (4.0 percent) of suitable habitat are present, and an additional 92,339 acres (4.9 percent) occur within MSHCP Amendment Reserve System Additions.

Botta's pocket gopher* *Thomomys bottae*	Acres	Percent of Total Habitat within Plan Area
Suitable Habitat in the MSHCP Amendment Plan Area	1,866,634	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	141,738	7.6%
Suitable Habitat in Lands Managed for Resource Conservation	1,069,537	57.3%
Suitable Habitat in the existing MSHCP Reserve System	74,569	4.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	92,339	4.9%

*SWECO 2018

25.5 Data

Botta's pocket gopher is often locally abundant where suitable friable soils and forage are present, even within urban settings, making it difficult to assess broader population trends from localized survey data alone. The species' fossorial habits also reduce detectability in standard small mammal surveys, and formal population monitoring in Clark County is limited.

Surveys conducted by BEC Environmental, Inc. for the Clark County Desert Conservation Program provide recent occurrence records for Botta's pocket gopher within the MSHCP Plan Area. Biologists documented the species by

recording sign (e.g., burrow mounds) rather than targeting live capture. During the 2019 desert upland small mammal survey conducted in the Eldorado Valley, *Thomomys bottae* was assessed as potentially but not likely to be present in the BCCE, with preferred habitat not expected to be present in the survey area. Biologists did not observe sign of the species (e.g., mounds) during any trapping events, and habitat conducive to the species (soft, friable soils supporting desert grasslands or agricultural fields) was not observed within the BCCE (BEC 2019). During 2020 small mammal surveys conducted across 601 acres of riparian habitat along the Muddy and Virgin Rivers in Clark County, sign of *Thomomys bottae* was recorded at four sites: Riverside, Bunkerville East, Bunkerville West, and on the golf course adjacent to Mesquite West. All positive-sign locations were in areas of soft soil, and Riverside and both Bunkerville sites were adjacent to agricultural lands, consistent with known habitat affinities of the species (BEC 2020).

25.6 Recommendation

Not recommended for coverage. Botta's pocket gopher (*Thomomys bottae*) is widespread and is not considered a conservation priority at the species level. Narrowly distributed endemic subspecies, *T. b. abstrusus* and *T. b. curtatus,* do not occur in Clark County below 4,000 feet of elevation and are not anticipated to be present within the MSHCP Plan Area. It is unlikely that subspecies of Botta's pocket gopher within the MSHCP will become listed over the life of the MSHCP. Nonetheless, further review was initially requested to ensure no narrowly endemic subspecies are present within the MSHCP Plan Area. No additional information on subspecies within the MSHCP Plan Area was found, and discussions with NDOW did not reveal further data indicating potential subspecies or species decline within the Plan Area. This species is not recommended for coverage under the MSHCP.

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26.0 KIT FOX (*VULPES MACROTIS*)

26.1 Species Overview

The kit fox (*Vulpes macrotis*) is a small desert fox and the smallest canid in North America. It is nocturnal and crepuscular, typically sheltering in burrows during the heat of the day. The kit fox is an opportunistic predator; its primary prey are kangaroo rats and other small nocturnal rodents, though it also consumes insects, lizards, and rabbits (Meaney et al. 2006, Cypher and List 2014). Kit foxes are monogamous and typically mate for life, using dens throughout the year for shelter, thermoregulation, and pup rearing (O'Farrell 1987). Litter sizes typically range from three to six pups, with pups dispersing in late summer or early fall (McGrew 1979).

26.2 Range

Kit foxes occur in southeastern Oregon, Utah, Nevada, southern California, Arizona, New Mexico, southwestern Colorado, western Texas, and northern Mexico. The species inhabits shrub-steppe and arid and semiarid desert habitats, typically in areas with relatively flat terrain and loose, sandy soils that facilitate den construction (Wilson and Ruff 1999, McGrew 1979, O'Farrell 1987). All habitats from rolling grasslands and scrub (ideally less than 10 percent gradient slope) below 5,700 feet are considered suitable (Cypher and List 2014). In Nevada, kit foxes can be found throughout the state where suitable habitat occurs. In southern Nevada, kit foxes are distributed throughout Clark County where appropriate habitat is present. Clark County constitutes a relatively small portion of the overall range (less than 1 percent).

26.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	None
U.S. Forest Service (Region 4)	None
State of Nevada	Fur-Bearing Mammal
State of Arizona	None
State of California	Vulnerable
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	Watch List
NV State Wildlife Action Plan	Not Included
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
NatureServe Global and NV State Rank	G4 S3
IUCN Red List (v 2025-2)	Least Concern
CITES	Not Listed

*In California *V. m. mutica* is listed as Endangered under the State and Federal Endangered Species Acts

The population trend is likely stable in Nevada (Cypher and List 2014); however, elsewhere in its range the species is in decline (Meaney et al. 2006, Cypher and List 2014). Declines in kit fox populations in California, Oregon, and Colorado are likely correlated to the conversion of rangelands to irrigated agriculture. In Nevada, the scarcity of water and the lack of widespread irrigated agricultural conversions may be limiting that loss (Cypher and List 2014, Meaney et al. 2006). NatureServe (2026) assessed a long-term population decline of 10 to 50 percent, attributed primarily to habitat loss and declines in prairie dog abundance, with a further short-term decline of 10 to 30 percent continuing at the time of assessment. The global NatureServe status is G4 (Apparently Secure), with

Nevada ranked S3 (Vulnerable) (NatureServe 2026).

26.4 Impact

Threats throughout the range and in Clark County include the direct and indirect impacts of predators (Ralls and White 1995), rodent control and loss of habitat to urbanization and agriculture (Meaney et al. 2006, Cypher and List 2014). Road mortality and habitat fragmentation also represent significant threats; kit foxes actively avoid areas with regular off-highway vehicle use, effectively reducing available habitat (Jones et al. 2016). Increasing exploitation of human food sources (e.g., trash) further elevates exposure to mange and road mortality (Newsome et al. 2010). In California, a mange outbreak resulted in the loss of animals, with over 450 reported cases near Bakersfield (Cypher et al. 2017, Loredo et al. 2020, Rudd et al. 2020). In addition, rabies, parvovirus, sylvatic plague, hepatitis and distemper have been documented in the genus (Cypher and List 2014, McCue and O'Farrell 1988, Standley et al. 1992).

Based on USGS (2018) habitat suitability modeling, approximately 3,936,793 acres of suitable kit fox habitat occur within the MSHCP Amendment Plan Area. Of this, 226,336 acres (5.7 percent) fall within the MSHCP Amendment Impact Area. Approximately 2,274,276 acres (57.8 percent) of suitable habitat occur within lands managed for resource conservation. Within the existing MSHCP Reserve System, 87,271 acres (2.2 percent) of suitable habitat are present, and an additional 284,314 acres (7.2 percent) are included in the MSHCP Amendment Reserve System Additions.

Kit fox* *Vulpes macrotis*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	3,936,793	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	226,336	5.7%
Suitable Habitat in Lands Managed for Resource Conservation	2,274,276	57.8%
Suitable Habitat in the existing MSHCP Reserve System	87,271	2.2%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	284,314	7.2%

*USGS 2018

26.5 Data

The taxonomy of kit fox presents some uncertainty relative to closely related taxa. Dragoo et al. (1990) and Dragoo and Wayne (2003) considered swift fox (*Vulpes velox*) and kit fox (*Vulpes macrotis*) as conspecific. Mercure et al. (1993) described swift and kit fox as separate species and argued that the genetic differences between the two were comparable to those of the genera *Vulpes* and *Alopex*, and therefore they should be recognized at the species level (Wozencraft 2005). *V. velox* and *V. macrotis* do interbreed where their ranges overlap in New Mexico and Texas (Rohwer and Kilgore 1973). Hall (1981) suggested the gene flow occurring among populations in the contact area precluded recognition of *V. macrotis* as a distinct species and instead identified it as one of 10 subtaxa in *V. velox*.

Subspecific designations for kit foxes are also not fully resolved (Cypher and List 2014). As many as eight subspecies have been recognized (McGrew 1979), although analyses by Dragoo et al. (1990) did not find support for any subspecific differentiation. Although more subspecific clarification is needed (Cypher and List 2014), most available data suggest that kit foxes in the San Joaquin Valley of California likely warrant subspecific designation (*V. m. mutica*), due to geographic isolation, and that all other kit foxes might be included within a second subspecies, *V. m. macrotis* (Waithman and Roest 1977, Mercure et al. 1993).

No targeted surveys for kit fox have been conducted under the Clark County Desert Conservation Program. No additional agency survey data for this species in Nevada or Clark County were identified in available literature.

26.6 Recommendation

Not recommended for coverage. This species was designated for further review to investigate the current research into subspecies and determine if there is potential for a unique Nevada subspecies. Following discussions with researchers including Bryan Cypher in California and Nevada Department of Fish and Wildlife, it is our understanding that the division of a Nevada subspecies is not currently supported by genetic or other data. Based on this understanding, kit fox is not recommended for coverage because it is a wide-ranging species and the population appears stable in the region.

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27.0 BELL'S (SALTBUSH) SPARROW (*ARTEMISIOSPIZA BELLI CANESCENS*); SAGEBRUSH SPARROW (*ARTEMISIOSPIZA NEVADENSIS*)

27.1 Species Overview

The sage sparrow (*Amphispiza belli*) was recently reclassified under a new genus, *Artemisiospiza*, and split into two species: Bell's sparrow (*Artemisiospiza belli*) with four subspecies and the monotypic sagebrush sparrow (*Artemisiospiza nevadensis*). This reclassification was based on mitochondrial DNA, morphology, and ecological niche modeling (Chesser et al. 2013). Bell's sparrow has four recognized subspecies; the subspecies *A.b. canescens*, known as the Mojave Desert Bell's sparrow, occurs in the Mojave Desert region and may warrant separation as a distinct species based on recent research. Both species occupy arid shrubland habitats, with Bell's sparrow associated primarily with chaparral and saltbush desert scrub, and sagebrush sparrow associated with sagebrush (*Artemisia*) and saltbush (*Atriplex*) desert scrub.

27.2 Range

Bell's sparrow (*Artemisiospiza belli*) breeds in chaparral and saltbush desert scrub from western California, the San Joaquin Valley, and Mojave Desert south to central Baja California and winters throughout the breeding range, in the Salton Sea region, and western Arizona. Some range maps (Martin and Carlson 1998; Retter 2013) show the Bell's sparrow subspecies *A.b. canescens* breeding and wintering into western and southern Nevada.

The sagebrush sparrow (*Artemisiospiza nevadensis*) breeds in sagebrush (*Artemisia*) and saltbush (*Atriplex*) desert scrub throughout much of the Great Basin from eastern Washington and Oregon, Montana, and western Wyoming south into Nevada. During migration and in winter it is found in open areas and arid plains with sparse brush, as well as grasslands, from southern California, central Nevada, southwestern Utah, northern Arizona, and central New Mexico south into Baja California, Sonora, Chihuahua, and western Texas (Chesser et al. 2013).

Occurrence records within Clark County appear to be for the former nominate species, sage sparrow (*Amphispiza belli*) and show a scattered, low-density population throughout the county. Although the breeding and/or wintering status of these birds is unknown, SWECO (2018) reports that half of these observations were recorded between March and May and presumably indicate breeding records. Great Basin Bird Observatory staff (SWECO 2018) reports that the "sage sparrow" (not specifying *A. belli canescens* or *A. nevadensis*) breeds in saltbush scrub near the Corn Creek facility of the Desert National Wildlife Refuge northwest of Las Vegas.

27.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	Delisted[1]
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive[2]
U.S. Forest Service (Region 4)	No status
State of Nevada	None
State of Arizona	None

Agency/Organization	Status
State of California	Species of Special Concern[2]
NV Division of Natural Heritage	At Risk
NV Wildlife Action Plan (2022)	Species of Greatest Conservation Need[3]
NV Climate Change Vulnerability Index	Moderately Vulnerable[3]
NatureServe Global and NV State Rank	G5 S3[2], G5 S3B[3]
IUCN Red List (v 2025-2)	Least Concern
CITES	No status

[1] Applies to San Clemente subspecies of Bell's sparrow (ssp. *clementeae*).
[2] Applies to sagebrush sparrow
[3] Applies to Bell's sparrow

Both species hold a global NatureServe rank of G5 (Secure), indicating globally widespread and abundant populations. While populations of both species appear to be experiencing a long-term decline of 10 to 30 percent, the short-term population trend (2012 to 2022) for the sagebrush sparrow is reported as relatively stable (NatureServe 2025; Fink et al. 2023). The global population of the sagebrush sparrow is estimated at 3.5 to 8.2 million individuals (Rosenberg et al. 2019).

The former species, sage sparrow (*Amphispiza belli*), was considered a Conservation Priority species by the Nevada Comprehensive Bird Conservation Plan due to historical, and possibly recent, range-wide population declines and habitat threats (GBBO 2010). Sagebrush sparrow is also considered a Species of Conservation Priority by the Nevada State Wildlife Action Plan because its sagebrush habitat is at risk of large-scale conversion and loss and the species may be moderately vulnerable to climate change (NDOW 2022). The plan recommends protecting large expanses of high-suitability sagebrush and mixed xeric shrub habitat from wildfire, cheatgrass invasion, heavy off highway vehicle use, and urban and suburban development (NDOW 2022).

27.4 Impact

Bell's and sagebrush sparrows are dependent on large patches of habitat and are therefore susceptible to loss and fragmentation of chaparral, sagebrush, and saltbush desert scrub habitats, depending on the species. Invasive plant species such as cheatgrass may outcompete native species and provide fuel for the spread of wildfires that contribute to habitat decline. Per the 2022 Nevada State Wildlife Action Plan, increased wildfire frequency and intensity in sagebrush shrublands is rated as a high direct threat to the sagebrush sparrow, fueling a cycle that favors conversion of shrubland to non-native invasive grassland. Large-scale solar energy development poses a localized threat through loss of foraging habitat, and livestock grazing practices that facilitate the spread of invasive annual grasses are also a concern (NDOW 2022). This species is particularly common in lowland sagebrush and salt desert environments, making it potentially more susceptible to long-term drought than other sagebrush species that occur at higher elevations (NDOW 2022).

Modeled suitable habitat for Bell's sparrow (subspecies *A.b. canescens*) covers approximately 963,806 acres within the MSHCP Amendment Plan Area (USGS 2018). Of this total, approximately 22,553 acres (2.3 percent) occur within the MSHCP Amendment Impact Area. Approximately 644,062 acres (66.8 percent) of suitable Bell's sparrow habitat lie within lands managed for resource conservation, while 923 acres (0.1 percent) occur within the existing MSHCP Reserve System and 64,515 acres (6.7 percent) fall within proposed MSHCP Amendment Reserve System additions.

Bell's sparrow* *Artemisiospiza belli canescens*	Acres	Percent of Total Habitat within Plan Area
Suitable Habitat in the MSHCP Amendment Plan Area	963,806	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	22,553	2.3%
Suitable Habitat in Lands Managed for Resource Conservation	644,062	66.8%
Suitable Habitat in the existing MSHCP Reserve System	923	0.1%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	64,515	6.7%

*USGS 2018

For sagebrush sparrow, modeled suitable habitat totals approximately 620,711 acres within the MSHCP Amendment Plan Area (SWECO 2018). Of this total, approximately 69,010 acres (11.1 percent) occur within the MSHCP Amendment Impact Area. Approximately 293,023 acres (47.2 percent) of suitable sagebrush sparrow habitat lie within lands managed for resource conservation, while 43,009 acres (6.9 percent) occur within the existing MSHCP Reserve System and 7,440 acres (1.2 percent) fall within proposed MSHCP Amendment Reserve System additions.

Sagebrush sparrow* *Artemisiospiza nevadensis*	Acres	Percent of Total Habitat within Plan Area
Suitable Habitat in the MSHCP Amendment Plan Area	620,711	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	69,010	11.1%
Suitable Habitat in Lands Managed for Resource Conservation	293,023	47.2%
Suitable Habitat in the existing MSHCP Reserve System	43,009	6.9%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	7,440	1.2%

*SWECO 2018

27.5 Data

A significant challenge in assessing the status of these species within Clark County is the difficulty in distinguishing Bell's sparrow subspecies *A.b. canescens* from sagebrush sparrow (*A. nevadensis*) in the field and in historic occurrence data. As a result, most existing county occurrence records refer to the former nominate species, sage sparrow (*Amphispiza belli*), without identifying which of the two currently recognized species was observed. This taxonomic uncertainty makes it difficult to determine the relative occurrence, distribution, and breeding status of each species within the county. No targeted surveys for Bell's sparrow or sagebrush sparrow have been conducted under the Clark County Desert Conservation Program.

27.6 Recommendation

Not Recommended for Coverage. Habitat and range for both species within Clark County is poorly understood, partially due to confusion in differentiating *A.b. canescens* and *A. nevadensis* in the field and in historic occurrence data. Regardless, both species are rare breeding and uncommon wintering birds within Clark County; the county appears to be at the edge of the range for both species. Further review of both species was recommended to determine which species is present within the MSHCP Plan Area, if covered activities will impact each species, and whether data are present on population trends. No additional information was uncovered to provide further data on the species to indicate a broader range within Clark County or potential for future listing under the Endangered Species Act, thus, neither species is recommended for coverage under the MSHCP.

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28.0 WESTERN BURROWING OWL (*ATHENE CUNICULARIA HYPUGAEA*)

28.1 Species Overview

The western burrowing owl is a small, long-legged, short-tailed, and mostly diurnal species found in open desert and grassland habitats (NDOW 2022). It favors open, arid, treeless landscapes with low vegetation and occurs across a range of lower-elevation habitat types, including sagebrush scrub, sagebrush steppe, salt desert scrub, and the grasslands of the Great Basin and Mojave deserts. The species also adapts well to human-modified environments and frequently nests near roadsides, airports, golf courses, parking lots, and agricultural fields.

Although burrowing owls rely on underground refugia, they do not dig their own burrows and instead depend on those created by other animals (Floyd et al. 2007). In the northern part of their range, they rely heavily on prairie dog (*Cynomys* spp.) colonies, while in the south they use burrows made by ground squirrels, skunks, and foxes. In the Mojave and Sonoran deserts, they also occupy desert tortoise (*Gopherus agassizii*) burrows (Klute et al. 2003; McDonald et al. 2004).

Movement patterns vary geographically: northern populations are migratory, while southern U.S. and northern Mexico populations include both residents and winter visitors, and farther south into Mexico and Central America only wintering owls are present.

28.2 Range

The western burrowing owl ranges from southern Manitoba and British Columbia south through the western United States into Central America. In southern Nevada, the species breeds locally, with some individuals remaining year-round while most migrate to the southern U.S. and Mexico for winter (Haug et al. 1993).

In Clark County, owl distribution closely overlaps that of the desert tortoise due to shared use of burrows. Although densities are generally low in desert scrub, higher numbers occur in areas such as Gold Butte, Piute Valley, the eastern slopes of Eldorado Valley, and the western side of Lake Mohave (Crowe and Longshore 2010b). Northern and central Nevada populations are migratory, arriving in February and March and departing by September to October. Unlike most owls, the species is active during the day and continues foraging into evening hours.

Burrowing owls have also been known to breed in isolated desert patches within urban landscapes, and the USFWS Urban Burrowing Owl Monitoring Project reported a relatively high number of breeding burrowing owls in northern Las Vegas Valley with some even nesting in man-made structures, (Manville 2009).

28.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	Species of Greatest Conservation Need

State of California	State Candidate Endangered, Species of Special Concern[1]
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	Watch List
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4T4 S3
IUCN Red List	Least Concern[1]
CITES	Appendix ii[1]

[1] Listed as *Athene cunicularia*

The western burrowing owl is assigned a global conservation status of G4T4 (Apparently Secure subspecies) by NatureServe, based on a review last updated in April 2016 (NatureServe 2026). The species has no listing under the Endangered Species Act, but is designated as a Species of Conservation Concern (SC) by USFWS and as Sensitive by the BLM in Nevada (NDOW 2022). In Nevada, the species carries a state conservation status of S3B (Vulnerable, breeding) and is a Protected Bird under NAC 503.050.1 (NDOW 2022).

Population trends for the western burrowing owl have been consistently negative across much of its range. NatureServe (2026) characterizes the long-term trend as a decline of 50 to 90 percent rangewide, with rangewide population estimates not available but habitat loss documented as substantial across the central plains and California. The short-term trend is characterized as a decline of 10 to 50 percent, with no western state or province reporting increasing populations (NatureServe 2026).

At a national level, the Partners in Flight Landbird Conservation Plan estimated a 35 percent decline in burrowing owl populations across the United States between 1970 and 2014 (Rosenberg et al. 2016). Results from Breeding Bird Surveys for the Great Basin and Sonoran and Mojave desert regions covering the periods 1966 to 2019 and 1993 to 2019 are described as inconclusive for Nevada specifically (Sauer et al. 2019).

Over the past century, population declines exceeding 50 percent have been estimated for British Columbia, Alberta, California, Nevada, Colorado, and New Mexico (NatureServe 2026). In California, 60 percent of known breeding groups disappeared between the 1980s and 1990s, and the proportion of census area occupied by owls declined 50 percent between 1981 and 1991 (NatureServe 2026). The species has been extirpated from four coastal California counties and from Minnesota by 1992 (NatureServe 2026). In Canadian provinces, declines have been severe: Saskatchewan's Operation Burrowing Owl documented an 87 percent decline in site occupancy and an 88 percent decline in the number of pairs between 1988 and 1997, and Alberta's estimated population dropped approximately 47 percent between 1978 and 1990 (NatureServe 2026).

Population trend for the western burrowing owl in Nevada is currently listed as unknown (NDOW 2022). Surveys in the state are normally limited to presence-absence surveys conducted in connection with pre-clearance for proposed projects during the NEPA process. Information is lacking about how habitat loss, urban conversion, and control or extermination of colonial burrowing mammals affect the species in Nevada, and little is known about migration patterns or wintering habitat of Nevada populations (NDOW 2022).

In Nevada, burrowing owl populations in northern and central portions of the state are migratory, arriving on breeding grounds in February through March and departing by September through October. Southern Nevada supports both year-round resident and wintering owl populations (NDOW 2022). The species is distributed statewide in low-elevation sites with low slope gradients, occurring in a variety of treeless habitat types including sagebrush scrub, sagebrush steppe, salt desert scrub, and grasslands of the Great Basin and Mojave deserts (NDOW 2022).

28.4 Impact

Major threats include habitat loss and fragmentation from agriculture, urbanization, and reductions in burrow-providing mammals (Millsap and Bear 2000, Desmond et al. 2000). More recent pressures stem from large-scale solar and wind development and off-highway vehicle disturbance. These activities result in direct loss of habitat by surface disturbance and compaction. Additional threats include rodent control programs, rodenticides, predation by domestic animals, vehicle collisions, and pesticide exposure (NDOW 2022).

Suitable habitat for the burrowing owl (*Athene cunicularia*) within the MSHCP Amendment Plan Area totals 1,656,382 acres. Of this, 160,620 acres (9.7 percent) fall within the Impact Area. Lands managed for resource conservation account for 637,421 acres (38.5 percent) of total suitable habitat, while the existing MSHCP Reserve System encompasses 77,420 acres (4.7 percent). The MSHCP Amendment Reserve System Additions contribute an additional 88,908 acres (5.4 percent) of suitable habitat for this species.

Burrowing owl* *Athene cunicularia*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,656,382	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	160,620	9.7%
Suitable Habitat in Lands Managed for Resource Conservation	637,421	38.5%
Suitable Habitat in the existing MSHCP Reserve System	77,420	4.7%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	88,908	5.4%

*Nussear et al. 2024

28.5 Data

Existing habitat models for Clark County are broad in scale and limited by sampling bias, particularly toward southern areas. Survey data suggest the species may be more widely distributed than models indicate, including areas north and northwest of Las Vegas.

Urban monitoring efforts in Las Vegas and Pahrump show that owls can successfully nest in developed areas, though publicly available data are limited. In Nevada, breeding typically begins in late February to March, with clutches of 2 to 12 eggs laid from April to mid-May.

The Clark County Desert Conservation Program conducted avian surveys in 2021 and 2022 (SWCA 2021, 2022). These surveys documented low burrowing owl detection rates but found suitable burrows in many surveyed areas, including locations outside predicted habitat. Low detections may also reflect drought conditions, which strongly influence owl occurrence.

28.6 Recommendation

Recommended for coverage. The species shows evidence of decline in northern portions of its range and may face increased listing risk during the permit period. Its tendency to occur along urban edges increases vulnerability to covered activities.

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29.0 GOLDEN EAGLE (*AQUILA CHRYSAETOS*)

29.1 Species Overview

The golden eagle is one of North America's largest raptors, with a circumpolar distribution across the northern hemisphere (Bent 1961). They generally occupy relatively open areas that are not densely forested. Golden eagles in the hot desert regions of the southwestern United States are among the least known populations in North America, and recent efforts have been undertaken to improve understanding of their status, life histories, and ecology on a continental basis.

Golden eagle nesting areas are frequently in remote mountainous areas, although a few are surprisingly close to human activity and urban development (NDOW 2022). Key limiting factors for golden eagle populations are prey densities and availability of nest sites near suitable prey populations (GBBO 2010). The known golden eagle nests in Clark County are all on cliff substrate; tree nests have also been documented occasionally on ponderosa pine, juniper, and quaking aspen, as well as on power poles (NDOW 2022).

29.2 Range

Golden eagles have a broad, nearly global distribution. Currently, golden eagle populations in North America are most robust west of the Great Plains with additional populations in northeastern Canada and isolated locations in the eastern United States (Kochert et al. 2002, DeLong 2004). The species generally favors relatively open landscapes including grasslands, shrublands, and mountainous terrain, avoiding densely forested areas.

In Clark County, golden eagles have been documented foraging across most habitat types. Mojave Desert scrub habitats in the valley bottoms and outwash plains comprise a great deal of the foraging areas, as do mountain slopes and peaks (Nussear 2020). Known adjacent nests in Clark County are considerably further apart than reported in the literature (Nussear 2020).

29.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Watch List
U.S. Fish and Wildlife Service Endangered Species Act	No Status
Bald and Golden Eagle Protection Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	Sensitive
State of Arizona	Species of Greatest Conservation Need
State of California	State Fully Protected
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	Watch List
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G5 S4
IUCN Red List	Least Concern
CITES	Appendix ii

The golden eagle is federally protected by the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Lacey Act.

The species is considered globally secure, with a NatureServe Global Status of G5, reflecting its wide distribution throughout the Northern Hemisphere. The global population was estimated at approximately 170,000 individuals, with roughly half occurring in the United States and Canada (Rich et al. 2004). In North America, an earlier estimate placed the population at approximately 70,000 individuals, including perhaps 20,000 breeding pairs in the western United States (NatureServe 2026). In Nevada, the species holds an S4 state rank (NatureServe 2026; NDOW 2022).

Despite its globally secure status, population trends at finer scales present a more complicated picture. Range wide, Breeding Bird Survey data from 1993 to 2019 showed no significant change, though nonsignificant downward trends were detected in Nevada and the broader Great Basin, Mojave, and Sonoran Desert regions during the same period (Sauer et al. 2019). NatureServe (2026) notes that after several decades of relative stability, golden eagle numbers may again be declining in the West, particularly in the sage-steppe region (GBBO 2010). In eastern North America, the species may also be decreasing in the northeastern United States (Bednarz et al. 1990), and declines have been noted in parts of the Canadian range (Kirk et al. 1995).

In Nevada specifically, trends are presumed stable but remain poorly characterized due to the absence of large-scale breeding population monitoring. Localized territory monitoring conducted from 2015 to 2021 documented annual territory occupancy exceeding 97 percent, but also steep declines in breeding success and productivity (NDOW 2022). A west-wide survival analysis found that while populations are broadly stable, 74 percent of mortalities are attributable to anthropogenic causes, and additional mortality could render populations unsustainable (Millsap et al. 2022). Estimated mean annual survival rates range from 0.69 in first-year eagles to 0.89 in adults; Nevada-specific satellite tracking data from 2014 to 2021 produced similar estimates, with first-year survival at 0.68 and survival after the third year at 0.85 (NDOW 2022). These data suggest a stable adult breeding population but with very limited juvenile survival and recruitment, raising concerns about long-term population replacement (NDOW 2022).

In a 2025 petition finding, the U.S. Fish and Wildlife Service determined that listing the eastern population of the golden eagle under the Endangered Species Act was not warranted, concluding that the best available information indicates populations are stable rangewide and within the eastern portion of the range (USFWS 2025).

29.4 Impact

Primary direct impacts to golden eagles include electrocution due to small gauge power lines (Benson 1982) and their large wingspans, vehicular collisions while consuming roadkill, secondary poisoning due to lead shot and rodenticides in the environment, reduction of prey habitat (GBBO 2010), and loss of habitat due to renewable energy development and urban expansion. Wind turbine strikes may be a future concern in Clark County (Nussear 2020).

Nussear et al. (2024) modeled golden eagle foraging habitat suitability on the basis of vegetation, spring maximum temperature, and topography. High-suitability habitat is predicted to occur in association with North American Warm Desert Scrub and Grassland, and Western North American Cool and Semi-Desert Scrub (Nussear et al. 2024). Suitable habitat for the golden eagle (*Aquila chrysaetos*) within the MSHCP Amendment Plan Area totals 450,388 acres. Of this, 8,473 acres (1.9 percent) fall within the Impact Area. Lands managed for resource conservation account for 302,852 acres (67.2 percent) of total suitable habitat, while the existing MSHCP Reserve System encompasses just 425 acres (0.1 percent). The MSHCP Amendment Reserve System Additions contribute an additional 29,097 acres (6.5 percent) of suitable habitat for this species.

Golden eagle* *Aquila chrysaetos*	Acres	Percent of Total Habitat within Plan Area
Suitable Habitat in the MSHCP Amendment Plan Area	450,388	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	8,473	1.9%
Suitable Habitat in Lands Managed for Resource Conservation	302,852	67.2%
Suitable Habitat in the existing MSHCP Reserve System	425	0.1%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	29,097	6.5%

*Nussear et al. 2024

29.5 Data

Golden eagle population monitoring is challenging due to the species' wide-ranging behavior, use of remote terrain, and large home ranges. Several large-scale efforts to determine population trends across the nation have been undertaken in recent years; however, estimates obtained through these efforts tend to have wide margins of error.

Golden eagle populations tend to roughly follow 10-year cycles (Nielson et al. 2013). Nielson et al. (2013) found no evidence of population trends or changes in juvenile numbers in four Bird Conservation Regions in the western United States. Population declines are suspected in the west, but the trend remains inconclusive in Nevada (NDOW 2022).

Localized territory monitoring in Nevada from 2015 to 2021 indicated annual territory occupancy greater than 97 percent, but with steep declines in breeding success and productivity (NDOW 2022). Satellite tracking data from Nevada (2014 to 2021) estimated first-year survival at 0.68 and after-third-year survival at 0.85; 74 percent of mortalities were attributed to anthropogenic causes (Millsap et al. 2022, as cited in NDOW 2022). In a 90-day petition finding, USFWS (2025) determined that listing the eastern population of golden eagle was not warranted, noting that populations are stable rangewide (NatureServe 2026).

SWCA conducted focused surveys for golden eagle in Clark County in 2021 and 2022 (SWCA 2021, 2022). In 2021, 14 golden eagle detections were made across 10 sites. Four detections occurred in the MSHCP Amendment Reserve System, two within the Boulder City Conservation Easement and two in proposed reserve system additions. All other detections were within federally managed lands. These detections formed a diagonal band across southern Clark County from Pahrump Valley to the Colorado River, with sporadic detections in the northern and central portions of Clark County (SWCA 2021). Of the 18 total detections, 12 (67 percent) were within predicted foraging habitat; given the highly mobile nature of the species and an average detection distance of 1,976 m, telemetry was recommended to further refine foraging habitat use in the county (SWCA 2021). In 2022, golden eagles were detected 12 times in Clark County across 30 surveyed sites (SWCA 2022). Four of the 12 detections involved two individuals soaring together. All detected individuals were in flight; no active foraging behavior was observed during any detection. Nine of the 11 detections within the county (82 percent) were within predicted foraging habitat, with six detections (55 percent) in habitat modeled as optimal and three (27 percent) in suitable habitat; two detections were outside predicted foraging habitat. Detections were concentrated in the vicinity of the Spring Mountains and Sheep Mountains, with one individual observed performing undulating, territorial flight in habitat modeled as suitable for foraging. The average estimated distance from observer to eagle was 2,693 m (range 150 to10,000 m), underscoring the difficulty of accurately locating individuals from ground-based counts. Signs of potential prey (leporid mammals) were recorded in 12 subplots classified as unsuitable foraging habitat, suggesting that golden eagles may forage over a broader area than currently predicted. SWCA (2022) recommended that telemetry and prey-base surveys be considered in future efforts to more accurately characterize foraging habitat use in Clark County.

29.6 Recommendation

Recommended for coverage. The golden eagle should be included as a Covered Species. This recommendation is made due to growing concern for golden eagle populations in the western United States, its relative rarity in Clark County, its protection under the Bald and Golden Eagle Protection Act, and the challenges in obtaining permits for the species.

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30.0 COSTA'S HUMMINGBIRD (*CALYPTE COSTAE*)

30.1 Species Overview

In Nevada, Costa's Hummingbird is a Mojave Desert species that occurs in Joshua tree, mesquite/acacia, riparian, spring, and scrub habitat (GBBO 2010). Costa's is associated with desert habitats adjacent to sources of water and the flowering plants found there. It is considered the most arid-adapted hummingbird in North America and is associated with desert washes, dry chaparral, and scrub or woodland habitats near Joshua tree, cholla cactus, ocotillo, chuparosa, and wolfberry (NDOW 2022).Because they are so small and have high energy requirements, they may rely on torpor to survive when energy reserves are low (Lasiewski 1963). As a highly temperature-dependent species their range is likely shaped by climate extremes.

30.2 Range

Costa's occurs primarily in Southern California, Nevada, and Northern Mexico, with a small portion of the range extending into New Mexico, Utah, and Arizona (Baltosser and Scott 1996, BirdLife International 2016). In Southern Nevada and Clark County, Costa's breeds widely and occurs year-round in limited areas. The species is largely confined to lower elevations (below 4,000 feet), likely due to temperature sensitivity.

30.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	No Status
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	No Status
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of California	None
State of Utah	None
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Increase Likely
NatureServe Global and NV State Rank	G5 S3B
IUCN Red List	Least Concern
CITES	Appendix ii

The IUCN lists the range-wide population as stable (BirdLife International 2016), while some sources indicate slight declines (Baltosser and Scott 1996, Latta et al. 1999, Rich et al. 2004). The Breeding Bird Survey detected a slight population decline from 1966 to 2019 (Sauer et al. 2019). Population trend in Nevada is currently considered unknown; Breeding Bird Survey results have not yielded significant or consistent trends for this species across spatial scales, and the surveys do not sample Costa's Hummingbird effectively (NDOW 2022, Sauer et al. 2019). NatureServe estimates the global breeding range at 200,000 to 2,500,000 km² and the global adult population at approximately 3,000,000 individuals (NatureServe 2026). Nevada's NatureServe rank is S3B (Vulnerable, breeding only). NatureServe characterizes the short-term trend (past 10 years or three generations) as Relatively Stable (≤10 percent change), though the long-term trend remains uncertain (NatureServe 2026). No species-specific surveys

have been conducted in Nevada, and habitat suitability modeling for the Intermountain West has been identified as a key research need (NDOW 2022).

30.4 Impact

No research or data identify specific threats to the species (GBBO 2010, BirdLife International 2016, Latta et al. 1999). The 2022 Nevada State Wildlife Action Plan rates direct threats to Costa's Hummingbird in Nevada as Low, citing housing and urban expansion, conversion of native landscapes, large-scale solar energy development, and altered fire regimes as the primary concerns (NDOW 2022). NatureServe also rates the global threat level as Low, noting that most desert scrub habitat remains largely intact, although coastal scrub habitat used by this species has been nearly eliminated in the United States (NatureServe 2026). In Clark County potential threats include water diversions and groundwater pumping that may affect flowering plants around riparian and spring areas, invasive plants that compete with preferred food plants, and habitat destruction or degradation from fire or grazing that reduces the abundance of blooming plants during critical periods (Wethington et al. 2009).

Suitable habitat for Costa's hummingbird (GBBO 2013) within the MSHCP Amendment Plan Area totals 2,295,756 acres. Of this, 170,623 acres (7.4 percent) fall within the Impact Area. Lands managed for resource conservation account for 1,296,156 acres (56.5 percent) of total suitable habitat, while the existing MSHCP Reserve System encompasses 81,951 acres (3.6 percent). The MSHCP Amendment Reserve System Additions contribute an additional 162,004 acres (7.1 percent) of suitable habitat for this species.

Costa's hummingbird* *Calypte costae*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	2,295,756	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	170,623	7.4%
Suitable Habitat in Lands Managed for Resource Conservation	1,296,156	56.5%
Suitable Habitat in the existing MSHCP Reserve System	81,951	3.6%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	162,004	7.1%

*GBBO 2013

30.5 Data

Costa's Hummingbird was not detected during 2020 MSHCP avian point-count surveys on Clark County reserve properties, consistent with the species' preference for upland Mojave Desert scrub over the riparian habitats targeted by those surveys (SWCA 2020). In 2021, one individual was recorded within 100 m of a point-count location at the Boulder City Conservation Easement during breeding bird surveys, representing the first detection of this species on Clark County reserve properties (SWCA 2021). The BCCE is dominated by Mojave Desert scrub co-dominated by creosote bush and burrobush. In 2022, one Costa's Hummingbird was recorded at the Muddy River Riparian Reserve Unit during breeding bird point-count surveys, but was not recorded within 100 m of a point-count station (SWCA 2022). No Costa's Hummingbirds were detected at the BCCE during 2022 surveys. No Costa's Hummingbirds were detected at any Clark County reserve properties during 2023 or 2024 point-count surveys (SWCA 2023, 2024). In 2025, no Costa's Hummingbirds were detected at any survey location (SWCA 2025). Although the BCCE continues to support Mojave Desert scrub habitat most consistent with this species' requirements, detections remain sporadic across survey years, reflecting the low local densities typical of Costa's Hummingbird in Clark County.

30.6 Recommendation

Not recommended for coverage. Our recommendation is based on the species' wide range, likely large population,

and lack of evidence of threats or population declines.

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31.0 YELLOW-BILLED CUCKOO (*COCCYZUS AMERICANUS*)

31.1 Species Overview

The yellow-billed cuckoo is a Neotropical migrant that is widespread throughout North America but is less common in the western United States due to losses in breeding habitat. This insectivorous bird requires riparian habitats with a dense understory. In the southwestern U.S., yellow-billed cuckoos prefer to nest in low-elevation riparian habitat consisting of open woodlands with an understory of dense vegetation. Yellow-billed cuckoos depend on large tracts of riparian forest and show a strong preference for nesting in areas with at least 24.7 acres (10 hectares) of contiguous forest (Wiggins 2005). Optimal habitat patches are generally greater than 200 acres (81 hectares) in extent, with dense canopy closure and high foliage volume of willows (*Salix* sp.) and cottonwoods (*Populus* sp.) (USFWS 2014). This migrant winters primarily in South America east of the Andes (Hughes 2015).

31.2 Range

In the U.S., the western Distinct Population Segment that is listed covers parts of Arizona, California, Colorado, Idaho, Nevada, New Mexico, Texas, Utah, Wyoming, Montana, Oregon, and Washington.

Within Nevada, the USFWS (2020) concluded that fewer than 10 breeding pairs occur statewide. The historical status of the species in Nevada is poorly documented, with evidence of past nesting along the lower Truckee and Carson Rivers in western Nevada and along the Colorado and Virgin Rivers in southern Nevada (NDOW 2022). Very little cuckoo habitat remains within Clark County today due to conversion of the land for agriculture and urban development. This very rare summer resident in southern Nevada has two known confirmed breeding locations in Clark County (McKernan and Braden 2001, Floyd et al. 2007). They are reported from two of the seven Important Bird Areas of Clark County: Moapa Valley and Virgin River (McIvor 2005). Modeled habitat for this species within the county (Boykin et al. 2008) identified potential habitat within the Desert Riparian and Mesquite Acacia, and Mojave Desert Scrub bordering the former two ecosystems. The USFWS designated critical habitat for the western distinct population segment of yellow-billed cuckoo, but none was designated in Nevada.

31.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	Threatened
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	Threatened
State of Nevada	Threatened
State of Arizona	Species of Greatest Conservation Need
State of California	State Endangered
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Moderately Vulnerable
NatureServe Global and NV State Rank	G5 S1B
IUCN Red List	Least Concern
CITES	No Status

The western distinct population segment of the yellow-billed cuckoo is listed under the ESA. Critical habitat was proposed in 2014; as of this writing a recovery plan has not been published. The three critical habitat units in Clark County total approximately 13,000 acres (the Virgin River Unit is partially within Arizona).

Western populations of yellow-billed cuckoos are in decline (Hughes 2015) and cuckoo population numbers are extremely limited in Clark County. The Breeding Bird Survey has not been able to detect this species adequately enough to determine trends within the Mojave and Sonoran Desert region (Sauer et al. 2019). At the rangewide level, the western yellow-billed cuckoo (subspecies *C. a. occidentalis*) has experienced severe population declines across its range. NatureServe assigns the species a global rank of G5 (Secure) for the full species; however, the western DPS is ranked S1B in Nevada, reflecting critically imperiled breeding status in the state. An estimated 59 percent population decline was recorded between 1970 and 2014 (Rosenberg et al. 2016). Survey data compiled by the USFWS (2020) estimated the current total breeding population at only 680 to 1,025 pairs across the entire western range including northwestern Mexico, representing a decline of several orders of magnitude from historical levels. A petition to delist the western DPS was reviewed in 2020 and the USFWS found that delisting was not warranted at that time (USFWS 2020).

31.4 Impact

Ecosystem-level threats include habitat fragmentation and loss (Nevada Partners in Flight 1999). The primary threats facing the yellow-billed cuckoo include the destruction, fragmentation, and modification of riparian habitat, and pesticide use. Principal causes of riparian habitat loss are conversion to agricultural and other uses, dams and river flow management, stream channelization and stabilization, and livestock grazing (Wiggins 2005). Available breeding habitat for cuckoos has also been substantially reduced in area and quality by groundwater pumping and the replacement of native riparian habitats by invasive nonnative plants, particularly tamarisk. Pesticides are a potential threat to this species, as population declines have been noted in areas where heavy pesticide use is common in agricultural areas bordering cuckoo habitat (Wiggins 2005). Prey scarcity (linked at least in part to pesticide use) may also play a role in declines even where suitable habitat remains.

Much of the cattle grazing privileges purchased by Clark County after the desert tortoise listing have reduced the impacts to many historic breeding areas. This has made these sites more suitable for yellow-billed cuckoo nesting. The Nevada Department of Wildlife (NDOW) is also working with private landowners and federal agencies to manage grazing in areas that contain populations of yellow-billed cuckoos (NDOW 2003).

Southern Nevada Water Authority owns 1,218 acres that support one of the two recent breeding sites for yellow-billed cuckoo in Clark County. The primary purpose of this acquisition was to protect the endangered Moapa dace (*Moapa coriacea*) and its habitat, and to restore and manage the area as an ecological reserve (Curtis 2006). The Virgin River Conservation Partnership has been established to coordinate conservation and water development issues in the lower Virgin River Valley.

Simandle and Nussear (2025) modeled yellow-billed cuckoo habitat suitability on the basis of winter precipitation, absolute minimum temperature, and shrub cover. High-suitability habitat is predicted to occur near the Meadow Valley Wash, the Muddy River, and Virgin River. Additional patches of high-suitability habitat are predicted to occur around the City of Las Vegas and adjacent areas of Las Vegas Wash as it joins Lake Mead (Simandle and Nussear 2025). Approximately 91,111 acres of modeled suitable habitat exists within the amended MSHCP Plan Area. It is estimated that 9.4 percent (8,576 acres) may be impacted by covered activities, and 9.9 percent (8,981 acres) occurs on conserved lands. Less than one percent (712 acres) of modeled suitable habitat are is within the amended MSHCP Reserve System.

Yellow-billed cuckoo* *Coccyzus americanus*	Acres	Percent of Total Habitat within Plan Area
Suitable Habitat in the MSHCP Amendment Plan Area	91,111	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	8,576	9.4%
Suitable Habitat in Lands Managed for Resource Conservation	8,981	9.9%
Suitable Habitat in the existing MSHCP Reserve System	587	0.6%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	125	0.1%

*Simandle and Nussear 2025

31.5 Data

Yellow-billed cuckoo monitoring is conducted annually on the MSHCP Riparian Reserve Units (Muddy River, Mesquite, Bunkerville East, Bunkerville West, Riverside, Mormon Mesa, and Morman Mesa South) and the Boulder City Conservation Easement. These surveys have resulted in sporadic detections between 2020 and 2025 (SWCA 2025). In 2025, four cuckoo detections were recorded: one at the Riverside subunit, one at the Muddy River subunit (the first detection recorded in the mesquite bosque adjacent to Parcel F), and two incidental detections at Mesquite West and Mormon Mesa. No possible or probable breeding territories were identified based on the single detections per subunit (SWCA 2025).

Annual surveys for the yellow-billed cuckoo are also conducted along Las Vegas Wash in Clark County. Survey efforts are led by the Southern Nevada Water Authority (SNWA) Las Vegas Wash Project Coordination Team. A yellow-billed cuckoo was recorded for the first time during the 2022 to 2023 survey year (Year 18 of the study), representing one of five species newly detected at the site that year (GBBO 2024). In 2024, one yellow-billed cuckoo was detected in a native-dominated riparian patch upstream of Historic Lateral Weir. Although this constitutes a single-period detection (insufficient to indicate breeding), the Las Vegas Wash study area has recorded probable breeding territories in 2017 and 2023 and possible breeding territories in 2019, 2020, and 2021, making it among the most consistently productive cuckoo survey sites in the state. Only approximately 5 to 10 yellow-billed cuckoos are detected statewide each year, and the Wash site accounts for a meaningful proportion of those detections (Van Dooremolen et al. 2025).

31.6 Recommendation

Recommended for coverage. The yellow-billed cuckoo should be included as a covered species. Its rarity, current listing as federally threatened, the predicted impacts to riparian habitat, and the presence of three critical habitat units in the MSHCP Area justify the need for its long-term conservation (coverage) via the conservation measures implemented in the MSHCP.

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32.0 GILDED FLICKER (*COLAPTES CHRYSOIDES*)

32.1 Species Overview

Gilded flicker is a large, ground-foraging woodpecker that is a year-round resident in desert scrub habitats of the Sonoran and Mojave desert, desert riparian habitats with well-developed, tree-lined corridors, and suburban areas with appropriate vegetation, including housing developments, golf courses, and parks. These areas also require the presence of cacti such as saguaros (*Carnegiea gigantea*), Joshua trees (*Yucca brevifolia*), or other tall trees such as Fremont cottonwoods (*Populus fremontii*) in which they excavate nesting cavities. Large open areas including bare ground, lawns, or golf courses are also required, as these provide foraging habitat where the birds feed on ground-dwelling invertebrates (Turner 2006).

32.2 Range

Gilded flickers range from southern Nevada and the Mojave desert in eastern California south through Arizona and into Baja California, Sonora, and Sinaloa, Mexico (Ridgely et al. 2003). The Nevada population is restricted to Clark County, where the species is found primarily in a small area north and northwest of Searchlight surrounding the southern side of the Highland Mountain Range. Joshua trees dominate the habitat in this range and likely provide nesting locations for the species.

32.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	No Status
U.S. Fish and Wildlife Service Endangered Species Act	No Status
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	No Status
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of Arizona	Species of Greatest Conservation Need
State of California	State Endangered
State of Utah	None
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4 S1
IUCN Red List	Least Concern
CITES	No Status

Long-term data from the Breeding Bird Survey indicated that Gilded Flicker breeding populations in Arizona declined by 1.18 percent per year between 1968 and 2015 (Sauer et al. 2019). Over a 45-year period (1970 to 2014), Breeding Bird Survey data indicated that the U.S. population declined by an estimated 54 percent (Rosenberg et al. 2016). Partners in Flight placed the species on its Yellow Watch List for the United States (Rosenberg et al. 2016). More recently, NatureServe (2024) assessed the global status of the gilded flicker as G4 (Apparently Secure), noting that while the long-term population decline from 1970 to 2014 was approximately 54 percent, eBird data indicate a short-term increase of approximately 13.5 percent rangewide from 2011 to 2021

(Fink et al. 2023). The global population is estimated at 192,000 to 240,000 individuals in the U.S. (Rosenberg et al. 2016, 2019). The species remains listed as S1 (Critically Imperiled) in Nevada due to its restricted range in the state (NatureServe 2024; NDOW 2022). No trend data exist for the Nevada population specifically, and rangewide Breeding Bird Survey results indicate nonsignificant declines across the Sonoran and Mojave deserts (Sauer et al. 2019).

The IUCN (BirdLife International 2012) lists the gilded flicker as Least Concern due to its large population, large range, and slow rate of population decline.

32.4 Impact

Primary threats to this species include habitat loss due to the effects of climate change on Joshua trees, solar and wind development, and invasive plants resulting in loss of habitat and increase in wildland fires capable of affecting habitats at a landscape scale (Brooks and Esque 2002). The species may be able to adapt to some habitat changes given its ability to occupy suburban areas, parks, and golf courses; however, Corman and Wise-Gervais (2005) found Gilded Flickers tend to avoid populated urban and rural neighborhoods, even those where saguaros were included in residential landscaping (e.g., during the Arizona Breeding Bird Atlas, the species was notably absent in highly developed survey blocks in the greater Phoenix and adjacent agricultural areas).

The Gilded Flicker is a keystone species; it excavates nest cavities used by numerous secondary cavity-nesting species, and population declines could therefore have broader community and ecosystem-level effects (Moore 2017).

Of the 144,339 acres of suitable gilded flicker habitat within the MSHCP Amendment Plan Area, approximately 1,742 acres (1.2 percent) are located within the Impact Area. The majority of suitable habitat, approximately 120,557 acres (83.5 percent), occurs within lands managed for resource conservation. An additional 6,466 acres (4.5 percent) of suitable habitat are located within the MSHCP Amendment Reserve System Additions, while no suitable habitat (0.0 percent) is present within the existing MSHCP Reserve System (Nussear et al. 2024).

Gilded flicker* *Colaptes chrysoides*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	144,339	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	1,742	1.2%
Suitable Habitat in Lands Managed for Resource Conservation	120,557	83.5%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	6,466	4.5%

*Nussear et al. 2024

32.5 Data

The Nevada State Wildlife Action Plan lists the gilded flicker as a Species of Conservation Priority because of its restricted range within the state and its declining population trends range-wide (NDOW 2022). The plan recommendations include protecting current known habitat from development and heavy recreational use, aggressively fighting fires threatening known habitat, and conducting research to determine habitat requirements, seasonal movements, and population size (GBBO 2010).

The Lower Colorado River Multi-Species Conservation Plan (LCR MSCP 2004) lists the gilded flicker as a covered species. Conservation measures under this plan include creating, maintaining, and adaptively managing 4,050

acres of cottonwood-willow habitat, installing artificial snags to provide nesting habitat, and avoiding and minimizing impacts of covered activities on habitat, minimizing disturbance during the breeding season, and conducting research to better identify threats and habitat requirements.

Prior to Nussear et al. (2023), modeling efforts (GBBO 2015) predicted potential habitat for the species throughout Clark County, mostly in foothill regions of the mountain ranges. Nussear et al. (2023) predicted a core area of suitable habitat concentrated in the south of the County. IUCN (BirdLife International 2012) lists the species as Least Concern due to its large population, large range, and slow rate of population decline.

SWCA conducted focused surveys for gilded flicker in Clark County in 2021 and 2022 (SWCA 2021, 2022). In 2021, a total of six gilded flicker detections were made across three sites: McCullough Mountain, Highland Range and Bird Springs. Four of the six detections occurred at McCullough Mountain, which had the largest and densest Joshua trees of any site surveyed. A pair of gilded flickers was detected at the Highland Range site, representing the highest level of breeding evidence recorded. One detection occurred at the Bird Springs site outside of predicted habitat, suggesting the species' range in Clark County may extend beyond currently modeled areas.

In 2022, SWCA conducted focused area searches at ten sites selected for gilded flicker within Clark County, and recorded 21 gilded flicker detections during area searches and 23 incidental detections, for a total of 44 confirmed detections. Twenty-five of these detections were more than 2.5 km from existing detection locations and were clustered near the Lucy Gray, Crescent Peak, and Middle Piute Valley sites. Breeding was confirmed at the New York Mountains site, where an active nest with young was observed and an adult was seen carrying food; at the Crescent Peak site, an adult was observed visiting a probable nest cavity. An old nest cavity of a size suitable for a flicker species was also found in a Joshua tree just outside the McCullough Spring subplot, indicating that gilded flickers formerly occupied that site. Mean elevation of sightings ranged from 3,425 feet to 4,694 feet in elevation (SWCA 2022).

32.6 Recommendation

Recommended for coverage. Our recommendation is based on the long-term range-wide population decline and the potential loss of Joshua trees, its primary nesting habitat, from climate change and development. Although there are indications of population declines, this species may also be expanding its range and become more common within the MSHCP Area. This trend may increase the potential for covered activities to impact this species over the lifetime of the MSHCP; therefore, the gilded flicker is recommended for coverage under the MSHCP.

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33.0 SOUTHWESTERN WILLOW FLYCATCHER (*EMPIDONAX TRALLII EXTIMUS*)

33.1 Species Overview

The southwestern willow flycatcher (*Empidonax trallii extimus*) is one of four subspecies (*E. t. brewsteri, E. t. adastus, and E. t. trallii*) of the willow flycatcher currently recognized (Hubbard 1987, Unitt 1987), though Browning (1993) posits a fifth subspecies (*E. t. campestris*) in the central and Midwestern U.S. Recent research (Paxton 2000) concluded that *E. t. extimus* is genetically distinct from the other willow flycatcher subspecies, and most authors have accepted its taxonomic status (Aldrich 1951, Bailey and Niedrach 1965, Behle and Higgins 1959, Hubbard 1987, Phillips et al. 1964, Oberholser 1974, Monson and Phillips 1981, Unitt 1987, Schlorff 1990, Browning 1993, USFWS 1995).

The *E. t. extimus* subspecies is a neotropical migratory generalist inhabiting riparian habitat (USFWS 1995, Durst et al. 2008). It breeds primarily in riparian woodlands composed of cottonwood and willow gallery forests but also breeds in areas of introduced salt cedar (*Tamarix* spp.) (Durst et al. 2008). The southwestern willow flycatcher migrates off the breeding grounds in North America to Mexico and Central and South America in the fall and winter months.

Critical Habitat is designated for the species on the Virgin and Muddy Rivers in Clark County (USFWS 2013).

33.2 Range

The southwestern willow flycatcher breeds in the southern portions of California, Nevada, Arizona, Utah, Colorado, west Texas, and northern Mexico, and winters in southern Mexico, Central America, and northern South America (USFWS 2002). In Clark County, the southwestern willow flycatcher is known to breed in and migrate through riparian habitats along the Colorado River, Virgin River above Lake Mead, Muddy River, Las Vegas Wash, and in the Meadow Valley Wash (GBBO 2010).

Three of the four subspecies of willow flycatcher (*E. t. extimus, E. t. adastus, and E. t. brewsterii*) are known to breed in Nevada, but only the southwestern willow flycatcher breeds in Clark County (GBBO 2010).

33.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	Endangered
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	Endangered
State of Nevada	Endangered
State of Arizona	Species of Greatest Conservation Need
State of California	Endangered
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk

Agency/Organization	Status
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G5T2 S1B
IUCN Red List (v 2025-2)	Not Listed
CITES	Not Listed

The Nevada State Wildlife Action Plan (NDOW 2022) identifies the southwestern willow flycatcher as a Species of Greatest Conservation Need and notes that brood parasitism by brown-headed cowbird, livestock grazing in riparian areas, water diversion, channelization, and climate change are primary threats to the species statewide. NatureServe (2026) assigns the southwestern willow flycatcher a global conservation status of G5T2 (Imperiled subspecies), reflecting a long-term rangewide decline estimated at 50 to 90 percent, driven primarily by riparian habitat loss and degradation. The subspecies has disappeared from 142 of 288 historical breeding sites since the early 1990s, and only 6 of 173 known sites support more than 50 territories (NatureServe 2026). In 2024, the USFWS initiated a 5-year status review of the southwestern willow flycatcher under the Endangered Species Act (NatureServe 2026).

33.4 Impact

Threats throughout the range and Clark County include loss and modification of riparian vegetation, reduction or elimination of surface and subsurface water due to diversion and groundwater pumping, changes in flood and fire regimes due to dams and stream channelization, livestock grazing, establishment of non-native plants, and brood parasitism by the brown-headed cowbird (*Molothrus ater*) (USFWS 1995 and 2002, SWCA 2020).

Simandle and Nussear (2025) modeled southwestern willow flycatcher habitat suitability on the basis of winter precipitation, minimum temperature, soil properties and degree of habitat fragmentation. The largest blocks of high-suitability habitat are predicted to occur near the Meadow Valley Wash, the Muddy River, and Virgin River. Additional patches are found in Northwest Las Vegas Valley, Indian Valley, Pahrump, Sandy Valley, and along the Colorado River near Bullhead City and the Mohave Valley (Simandle and Nussear 2025). Of the 194,330 acres of suitable southwestern willow flycatcher habitat within the MSHCP Amendment Plan Area, approximately 28,677 acres (14.8 percent) fall within the MSHCP Amendment Impact Area. A total of 73,829 acres (38.0 percent) of suitable habitat occur within lands managed for resource conservation, providing a substantial base of protected habitat. Within the existing MSHCP Reserve System, 1,968 acres (1.0 percent) of suitable habitat are conserved, with an additional 653 acres (0.3 percent) within the MSHCP Amendment Reserve System Additions (Simandle and Nussear 2025).Of the 194,330 acres of suitable southwestern willow flycatcher habitat within the MSHCP Amendment Plan Area, approximately 28,677 acres (14.8 percent) fall within the MSHCP Amendment Impact Area. A total of 73,829 acres (38.0 percent) of suitable habitat occur within lands managed for resource conservation, providing a substantial base of protected habitat. Within the existing MSHCP Reserve System, 1,968 acres (1.0 percent) of suitable habitat are conserved, with an additional 653 acres (0.3 percent) within the MSHCP Amendment Reserve System Additions (Simandle and Nussear 2025).

Of the 194,330 acres of suitable southwestern willow flycatcher habitat within the MSHCP Amendment Plan Area, approximately 28,677 acres (14.8 percent) fall within the MSHCP Amendment Impact Area. A total of 73,829 acres (38.0 percent) of suitable habitat occur within lands managed for resource conservation, providing a substantial base of protected habitat. Within the existing MSHCP Reserve System, 1,968 acres (1.0 percent) of suitable habitat are conserved, with an additional 653 acres (0.3 percent) within the MSHCP Amendment Reserve System Additions (Simandle and Nussear 2025).

Southwestern willow flycatcher* *Empidonax traillii extimus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	194,330	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	28,677	14.8%
Suitable Habitat in Lands Managed for Resource Conservation	73,829	38.0%
Suitable Habitat in the existing MSHCP Reserve System	1,968	1.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	653	0.3%

*Simandle and Nussear 2025

33.5 Data

There are 288 breeding sites and 1,299 territories known throughout the range with 19 sites and up to 97 territories known in Clark County, Nevada (Swett 1999 and USFWS 2014). The Lower Colorado River Recovery Units (USFWS 2002) are the farthest from reaching their numerical reclassification goals; both units remain approximately 75 percent short of recovery goals, and territory numbers have changed little within these three recovery units since completion of the recovery plan in 2002 (USFWS 2014). Recent survey efforts have declined, making population estimates less precise; nonetheless, the southwestern willow flycatcher population appears to be stable to declining (USFWS 2014).

Since 2020, annual monitoring has been conducted for willow flycatcher across all Riparian Reserve Units managed by the Clark County Desert Conservation Program. Annual detections ranged from 18 to 28 flycatchers across the Mesquite West, Bunkerville, Riverside, and Mormon Mesa reserves. These surveys targeted nestlings as well as adult birds. During the survey period, annual fledgling success ranged from 1 to 26 birds. In 2025, 26 adult willow flycatchers were detected, including 23 at monitored sites (Mesquite West and Mormon Mesa Parcel 5-A) and three at survey-only or point-count locations. Eight nesting pairs were documented at Mesquite West, with 10 confirmed nesting attempts producing 8 fledglings (SWCA 2025).

In 2020, the Clark County Desert Conservation Program began a brown-headed cowbird control program aimed at reducing brood parasitism of southwestern willow flycatcher. In prior years, rates of brood parasitism ranged from 33 to 67 percent with an average of 50 percent. Parasitism dropped with the implementation of cowbird control, declining to an all-time low of 8 percent in 2023, and remained low at 9 percent in 2024 and 13 percent in 2025 (SWCA 2025). Over the five-year combined-method cowbird control period (2021 to 2025), the average parasitism rate was 20 percent, compared to 55 percent in the five years prior. Nest success averaged 53 percent during the netting period versus 16 percent before. Prior to control, female southwestern willow flycatchers experienced an average annual fecundity of less than 1.0 young per female. Following implementation of cowbird control, (2021 to 2025), fecundity averaged 1.61 young per female, with statistical tests confirming that nest success, productivity, and fecundity were all significantly higher during the cowbird control period (SWCA 2025).

Annual southwestern willow flycatcher surveys have also been conducted along the Las Vegas Wash (Wash) since 1998, with the Southern Nevada Water Authority as the lead agency under the Las Vegas Wash Coordination Committee (LVWCC; van Dooremolen et al. 2024). In 2024, field personnel identified three resident southwestern willow flycatchers comprising two territories, both located in passively established, native-dominated riparian habitat above Historic Lateral Weir on the Wash. One pair nested successfully, producing one confirmed fledgling; only the second confirmed fledgling in 27 years of surveys at the site. The female laid a second clutch, but that nest failed. No brood parasitism or depredation was observed in 2024, in contrast to prior years. A second territory was established by a lone male but was abandoned by early July. Just 12 of the 143 adult willow flycatchers detected over 27 years of surveys along the Las Vegas Wash have been residents that established breeding territories, and 10 of those have occurred in the past four years, reflecting the maturation and improvement of native riparian

habitat above Historic Lateral Weir following its reconstruction in 2018 (Van Dooremolen et al. 2024).

33.6 Recommendation

Recommended for Coverage. We recommend the southwestern willow flycatcher be covered in the MSHCP based on the current federal and state endangered species designations, continued population declines rangewide and the potential for MSHCP covered activities to impact the species.

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34.0 LOGGERHEAD SHRIKE (*LANIUS LUDOVICIANUS*)

34.1 Species Overview

The loggerhead shrike is a medium-sized songbird that inhabits open to semi-open habitats where they perch on prominent plants, power wires and poles, and fence posts to watch for prey (Dawson 1923, Rotenberry and Wiens 1980, Dechant et al. 2002). Prey items include insects, small reptiles, small birds, and small mammals such as kangaroo rats (Dawson 1923, Bent 1965, Kridelbaugh 1983, Yosef 1996). Loggerhead shrikes impale their prey on sharp features such as yucca leaves, mesquite spines, creosote bush twigs, and barbed wire across the American southwest.

34.2 Range

Loggerhead shrikes have a broad distribution across central and southern Canada, most of the United States and Mexico (Dawson 1923, Pruitt 2000, DeChant et al. 2002, Sibley 2003). They prefer open habitat with sufficient perching and prey handling structures (Brooks and Temple 1990). In the desert southwest, the species occupies a variety of habitat types, including shadscale in east and central Nevada (Medin 1990), sagebrush habitats in the Great Basin (McAdoo et al. 2004), Mojave Desert creosote/bursage in the West Mojave (Brooks 1999) and southwestern Clark County (Ironwood 2012), and mixed Mojave Desert scrub in Southern Nevada (Blake 1984).

In Clark County, the loggerhead shrike is widespread and common. Loggerhead shrikes are seasonal visitors to lower mountain slopes of semi-open woodlands, and year-round residents of desert shrub communities on lower bajadas and valley bottoms (Blake 1984). Suitable environments to support shrikes include open desert to woodlands, pastures, fencerows or shelterbelts of agricultural fields, orchards, riparian areas, ranches, suburban areas, roadsides, cemeteries, and golf courses (Prescott and Collister 1993, Dechant et al. 2002). Loggerhead shrikes are found throughout desert shrub communities dominated by creosote bush (*Larrea tridentata*), burro brush (*Ambrosia dumosa*), sagebrush (*Artemisia* spp.) or saltbush (*Atriplex* spp.) interspersed by Joshua trees, catclaw, or mesquite. Shrikes inhabit areas of low slope and high horizontal and vertical structural diversity (Poole 1992 in Dechant et al. 2002).

34.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Sensitive
State of Arizona	Species of Greatest Conservation Need
State of California	Species of Special Concern
State of Utah	None
NV Division of Natural Heritage	Watch List
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Breeder/Migrant

Agency/Organization	Status
NatureServe Global and NV State Rank	Presumed Stable
NV Division of Natural Heritage	G4 S3
IUCN Red List	Near Threatened
CITES	None

North American Breeding Bird Survey data for 1966 to 2019 indicate a 71 percent population decline rangewide (−3.6 percent annually), with regional declines of 78 percent in the east, 65 percent in the central region, and 75 percent in the western region (NatureServe 2026). While some western populations have been reported as stable during the same time period (Peterjohn and Sauer 1995), Breeding Bird Survey data now indicate ongoing declines across all regions including the west (−75 percent over 1966 to 2000; Sauer et al. 2019).

The USFWS designated the loggerhead shrike as a Migratory Nongame Bird of Management Concern in the United States in 1987 due to range-wide declines in populations, and the species is listed as sensitive or threatened at the state level in 14 states. In Canada, the eastern population of the loggerhead shrike is listed as endangered and the western population is listed as threatened (Pruitt 2000). Partners in Flight Landbird Conservation Plan's 2016 Revision for Canada and Continental United States (Rosenberg et al. 2016) considers the loggerhead shrike to be a "common bird in steep decline," with the population in the intermountain west region, which includes all of Nevada, declining by 48 percent over the long-term (1970-2014), and by 1.3 percent in the short-term (2004-2014). The population within the Sonoran Joint Venture area suffered an estimated 54 percent decline over the same period (1970 to 2014; Rosenberg et al. 2016). NatureServe assigns this species a long-term trend of 70 to 90 percent decline over the past 40 years (NatureServe 2026).

34.4 Impact

Loss of open habitat and nesting and perching sites poses a threat to loggerhead shrike populations (Yosef 1994). The most important manageable threats to loggerhead shrikes are activities or processes that reduce nesting and perching substrates or reduce primary production on which most prey species depend (GBBO 2015). Activities in this category include off highway vehicle use, especially when it occurs on closed roads and trails. Some populations of shrikes have shown decreased reproductive success near roads (Yosef 1996). Urbanization or energy development and supporting infrastructure can also reduce available habitat, although the effect of urbanization is not clear and may be more dependent upon changes in habitat components. Habitat conversions from unimproved pasture to croplands have been correlated with loggerhead shrike declines exceeding 50 percent, whereas more moderate habitat losses resulted in less dramatic population declines (Dechant et al. 2002). Grazing by livestock and feral horses in sagebrush areas is considered detrimental to shrike populations as well (Wood 1995). Organochlorides have been associated with eggshell thinning in loggerhead shrikes in some areas (Pruitt 2000). These chemicals have been banned for use in the United States, however, wintering shrikes may bioaccumulate some organochlorides in Mexico.

Nussear et al. (2024) modeled loggerhead shrike habitat suitability on the basis of winter precipitation, spring maximum temperature, slope, start of season, flow accumulation, and vegetation. Areas of medium- and high-suitability habitat are predicted to be widespread throughout Clark County (Nussear et al. 2024). Based on the habitat suitability model (Nussear et al. 2024), approximately 2,895,421 acres of suitable loggerhead shrike habitat occur within the MSHCP Amendment Plan Area. Of this total, approximately 185,454 acres (6.4 percent) of suitable habitat occur within the MSHCP Amendment Impact Area. Approximately 1,493,050 acres (51.6 percent) of suitable habitat occur within lands managed for resource conservation, and 81,690 acres (2.8 percent) occur within the existing MSHCP Reserve System. An additional 232,540 acres (8.0 percent) of suitable habitat are located within proposed MSHCP Amendment Reserve System additions.

Loggerhead shrike* *Lanius ludovicianus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	2,895,421	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	185,454	6.4%
Suitable Habitat in Lands Managed for Resource Conservation	1,493,050	51.6%
Suitable Habitat in the existing MSHCP Reserve System	81,690	2.8%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	232,540	8.0%

*Nussear et al. 2024

34.5 Data

Surveys conducted between 2018 and 2025 found this species within Mojave Desert scrub habitat at the Boulder City Conservation Easement and in desert riparian habitat in the Riverside and Mormon Mesa area of the Virgin River (SWCA 2022, 2024, 2025).

34.6 Recommendation

Recommended for coverage. Loggerhead shrike is a wide-ranging species; however, there is indication that the species has experienced dramatic declines in the northern and eastern portions of its range. Although data in southern Nevada is lacking, and desert populations may be stable, the declines documented elsewhere in its range increase the likelihood of a federal listing during the lifetime of the permit. This species is also on several State agency status lists including Nevada Sensitive Species and the NNHP Watch List. The species is widespread in Clark County with a high potential for impacts by covered activities.

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35.0 SAGE THRASHER (*OREOSCOPTES MONTANUS*)

35.1 Species Overview

The sage thrasher is considered a high desert sagebrush/shrub-steppe obligate species. Sage thrashers feed primarily on terrestrial insects and arthropods such as ants, grasshoppers and ground beetles, which they often capture while running on the ground amid sage cover. They also forage on berries and grapes and have been seen digging for crickets.

35.2 Range

The sage thrasher is a common breeder from the Sierra Nevada, Cascades, and the Rocky Mountains, from southern British Columbia and Montana south to eastern California, southern Nevada, northern Arizona and New Mexico to northwestern Texas (Neel 1999). In Nevada, the sage thrasher is a common summer resident throughout the state, especially in areas where tall sagebrush is abundant (Alcorn 1988). Some individuals winter in southern Nevada and may remain year-round.

Occurrences of sage thrasher reported in Linsdale (1936) ranged from 4,900 to 8,200 feet, but the species likely occurs at lower elevations as well. A few nesting pairs may reside in the Lahontan Valley at 3,900 feet (Neel 1999). In Clark County, the sagebrush habitat type typically occurs above 5,000 ft. (RECON 2000). Non-breeding birds may occur year-round in southern Nevada.

35.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	Species of Greatest Conservation Need
State of California	None
State of Utah	None
NV Division of Natural Heritage	None
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Moderately Vulnerable
NatureServe Global and NV State Rank	G4 S4B
IUCN Red List	Least Concern
CITES	Not Listed

Partners in Flight estimated the global population at approximately 5,900,000 individuals (NatureServe 2026). The population is declining; Breeding Bird Survey data indicate annual declines of 1.4 percent and 1.6 percent in Nevada and the Great Basin from 1993 to 2019, which closely track the 1.4 percent rangewide annual decline the species has been experiencing (Sauer et al. 2019). NatureServe (2026) documents a long-term decline of 30 to 50

percent and a short-term decline of 10 to 30 percent, with population declines attributed primarily to loss, degradation, and fragmentation of sagebrush habitat. Rangewide, 63 percent of the sage thrasher population occurs on BLM land (Rosenberg et al. 2016). Climate modeling projects the breeding range could decrease by up to 78 percent between 2010 and 2099 as a result of ongoing climate change (van Riper et al. 2014).

35.4 Impact

Impacts include loss, degradation, or fragmentation of sagebrush shrubland due to OHV use, livestock grazing, fire, invasive plants, and the expansion of pinyon-juniper woodland into sagebrush (GBBO 2010). The 2022 Nevada State Wildlife Action Plan identifies direct threats at three levels of severity. The highest-rated threat (High) is increased frequency and intensity of wildfire in sagebrush-dominated shrublands, which damages nesting and foraging habitat and feeds a cycle favoring conversion of shrubland to invasive grassland dominated by cheatgrass (Reynolds et al. 2020). At medium severity, the spread of non-native grasses (e.g., cheatgrass) contributes to this destructive cycle by increasing fire incidence and converting shrublands to non-native grasslands. At low severity, livestock grazing practices can facilitate cheatgrass spread, and large-scale solar development poses a localized risk through foraging habitat loss. NatureServe (2026) further identifies large-scale reduction and fragmentation of sagebrush habitat due to land conversion, range improvement programs, and energy development as ongoing concerns rangewide.

Within the MSHCP Amendment Plan Area, approximately 190,784 acres of suitable sage thrasher habitat have been mapped (USGS 2018). Of this total, 16,762 acres (8.8 percent) occur within the MSHCP Amendment Impact Area. A total of 75,528 acres (39.6 percent) of suitable habitat occur within lands managed for resource conservation. Within the existing MSHCP Reserve System, 1,626 acres (0.9 percent) of suitable habitat are present, while the MSHCP Amendment Reserve System Additions contain an additional 13,462 acres (7.1 percent) of suitable habitat.

Sage thrasher* *Oreoscoptes montanus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	190,784	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	16,762	8.8%
Suitable Habitat in Lands Managed for Resource Conservation	75,528	39.6%
Suitable Habitat in the existing MSHCP Reserve System	1,626	0.9%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	13,462	7.1%

*USGS 2018

35.5 Data

Sage thrasher was not detected during breeding bird point-count surveys conducted across Clark County Multiple Species Habitat Conservation Plan (MSHCP) properties between 2020 and 2025, including the Boulder City Conservation Easement upland habitat, consistent with the species' absence from lower-elevation habitats within the MSHCP Plan Area (SWCA 2025).

35.6 Recommendation

Not Recommended for Coverage. The sage thrasher is not recommended for coverage based on its relatively large population size and wide distribution that does not expose the species to potential listing under the Federal Endangered Species Act in the lifetime of the MSHCP. In addition, there is limited habitat and few occurrences within the MSHCP plan area as the species is predominantly restricted to elevations above 4,000 feet in Clark

County; therefore, the sage thrasher is not recommended for coverage under the MSHCP.

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36.0 PHAINOPEPLA (*PHAINOPEPLA NITENS*)

36.1 Species Overview

Phainopepla (*Phainopepla nitens*) are medium-sized, long, slim passerines belonging to the family Ptiliogonatidae (silky flycatchers). They are characterized by a spiky crest, red eyes, and a long tail, ranging in length from 7.1 to 8.3 inches (18 to 21 cm). Males are glossy black with white wing patches visible mainly in flight; females are gray with paler wing edgings. The density of breeding phainopepla pairs and clutch sizes are positively correlated with mistletoe berry abundance (Walsberg 1977, Chu and Walsberg 1999). Where mistletoe is absent, other fruit-bearing plants are typically present, such as elderberry (*Sambucus spp*.), boxthorn/wolfberry (*Lycium spp*.), or Brazilian pepper trees (*Schinus terebinthifolius*).

Phainopeplas breed in two distinct habitats, desert and woodland, at different times of the year, an unusual pattern among North American passerines. In the desert, mated pairs vigorously defend feeding territories against intruders. In woodlands, phainopeplas often nest in loose colonies of 3 to 15 pairs, have overlapping home ranges, and mob nest predators. The familiar categories of breeding, wintering, and year-round ranges observed in other migratory bird species are not applicable to phainopeplas. Instead, they have winter breeding areas (desert areas occupied October through May, with breeding February to May), and summer breeding areas (woodland or higher elevation areas used for breeding May to August and not occupied in number at any other time of the year). The question of whether the behavioral flexibility of the phainopepla is exhibited by individuals or by separate populations of birds remains an unresolved issue (Chu and Walsberg 1999).

36.2 Range

Phainopepla occur throughout most of northwestern Mexico, where 63 percent of their breeding range occurs (Sauer et al. 2013). Their range within the U.S. is within the lower two-thirds of California (except the higher Sierra and Coastal ranges), southern Nevada, Washington and Iron Counties, Utah, most of southwest Arizona, a small portion of southwest New Mexico, and the Big Bend area of Texas (Sibley 2000). According to NatureServe (2016), the breeding range extends from central California, southern Nevada, southern Utah, and southern New Mexico through western Texas south to southern Baja California and the central mainland of Mexico. Wintering birds occur in southern California, southern Nevada, central Arizona, southern New Mexico, western and southern Texas, and south to northwestern Oaxaca and west-central Veracruz, Mexico.

In open deserts of Clark County, phainopepla depend on sporadic catclaw acacia (*Acacia greggii*), velvet mesquite (*Prosopis velutina*), or screwbean mesquite (*P. pubescens*) for nesting platforms. The trees usually occur along xeririparian habitat (dry washes).

36.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
State of California	None

Agency/Organization	Status
State of Utah	None
NV Division of Natural Heritage	Watch List
NV State Wildlife Action Plan	No Status
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G5 S3
IUCN Red List	Least Concern
CITES	No Status

Based on North American Breeding Bird Survey data, population trends for phainopepla are considered stable (Sauer et al. 2013). The National Audubon Society estimates the U.S. population at approximately 3,200,000 individuals (National Audubon Society 2025), and NatureServe assigns the species a global conservation status of G5 (Secure) with a national U.S. status of N5 (NatureServe 2026). While numbers vary from year to year, the overall population remains stable. Phainopepla population data for Clark County are too variable and uncertain for meaningful summary statistics; however, a plot of relative abundance, normalized for sample effort, suggested that this population did not experience major declines over the period 2004 to 2008 (Desert Research Institute 2009). One study in Clark County documented that phainopepla were observed at 25 of 53 historical locations (Fletcher et al. 2010). While climatic variables and short-term population fluctuations may account for some of the documented absences, many others occur at sites now within disturbed urban or suburban areas (Fletcher et al. 2010), where Phainopepla habitat has likely been disturbed or destroyed, at least temporarily.

Partners in Flight's North American Landbird Conservation Plan identified the phainopepla as a Species of Continental Importance for the U.S. and Canada (Rosenberg et al. 2016). Though not considered a Watch List species (birds most in need of conservation attention), it is designated as a Stewardship species (a species characteristic of a specific habitat with a high proportion of its global population concentrated within a single biome, requiring high regional stewardship responsibility) (Rosenberg et al. 2016). At the state level, Partners in Flight identified phainopepla as a priority species, and set a statewide population target of 3,929 individuals (Rosenberg 2004).

36.4 Impact

Phainopepla occupy most of the ecosystems available in Clark County as long as trees are present, particularly where mistletoe is also present. In Clark County, the invasion of non-native annual grasses that carry fire is an ecosystem threat particularly damaging to phainopepla habitat. Most surface-disturbing development activities can disturb or degrade Phainopepla habitat through tree loss.

Of the 4,039,999 acres of suitable habitat in the MSHCP Amendment Plan Area, up to approximately 227,972 acres (5.6 percent) may be impacted by covered activities. Approximately 2,440,032 acres (60.4 percent) of suitable habitat is located within lands managed for resource conservation, 86,426 acres (2.1 percent) within the existing MSHCP Reserve System, and 303,627 acres (7.5 percent) within MSHCP Amendment Reserve System additions (GBBO 2013).

Phainopepla* *Phainopepla nitens*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	4,039,999	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	227,972	5.6%
Suitable Habitat in Lands Managed for Resource Conservation	2,440,032	60.4%

Phainopepla* *Phainopepla nitens*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the existing MSHCP Reserve System	86,426	2.1%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	303,627	7.5%

*GBBO 2013

36.5 Data

Clark County Desert Conservation Program has conducted systematic avian surveys on MSHCP properties. Annual monitoring by SWCA has consistently detected this species in the Riverside and Muddy River riparian reserve properties (SWCA 2024, 2025). In 2020, phainopepla were recorded during point-count surveys at the Riverside Subunit (Parcels 3-A and 3-B) and at two of seven point-count locations within the Muddy River Riparian Reserve Unit, consistent with the species' preference for mesquite-dominated habitats (SWCA 2020). The Muddy River Unit, which supports a relatively abundant population of honey mesquite (*Prosopis glandulosa*) with dense patches of understory vegetation, is suspected to provide breeding habitat for phainopepla (SWCA 2020). No phainopepla were detected at the Mesquite West, Bunkerville, or Mormon Mesa Subunits, or at the Boulder City Conservation Easement during 2020 point-count surveys (SWCA 2020). In 2025, phainopepla were again recorded at the Riverside Subunit and the Muddy River Reserve Unit during point-count surveys (SWCA 2025). At the Riverside Subunit, phainopepla were detected from two of four point-count locations surveyed, consistent with prior years. At the Muddy River Reserve Unit, phainopepla were detected from three of seven point-count locations, with breeding status recorded as possible (singing in appropriate habitat), further supporting the unit's role as potential breeding habitat for the species. In addition, phainopepla were detected at the Bunkerville West Subunit (Parcels 2-K through 2-M) from one of two point-count locations surveyed, a subunit where the species had not been consistently recorded in prior years. No phainopepla were detected at the Mesquite Subunit, Bunkerville East, Mormon Mesa, Mormon Mesa South, or the Boulder City Conservation Easement during 2025 point-count surveys (SWCA 2025).

36.6 Recommendation

Not recommended for coverage. Approximately 23 percent of highly suitable habitat and 25 percent of moderate habitat are currently included within conservation areas. Recent population estimates have shown essentially stable populations. Phainopepla are neither a sensitive species nor a species of concern in Nevada or any of the adjacent states in which it occurs. Implementation of conservation measures such as those by PIF conserving this species should be adequate to provide long-term conservation of the species such that special consideration under the MSHCP as a covered species is not needed. This species is not anticipated to be listed or petitioned for listing under the Federal Endangered Species Act in the lifetime of the MSHCP permit.

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37.0 RIDGWAY'S (YUMA) RAIL (*RALLUS OBSOLETUS YUMANENSIS*)

37.1 Species Overview

Ridgway's (Yuma) rail was previously classified as a subspecies of clapper rail (*Rallus longirostris yumanensis*), but is now classified as a subspecies of Ridgway's rail (*R. obsoletus*) (Chesser et al. 2014, Chesser et al. 2016, Dickey 1923, Maley and Brumfield 2013, Pranty et al. 2014). The Yuma subspecies are mostly restricted to a freshwater environment along the lower Colorado River and its tributaries, as well as large, shallow marshes with moderate emergent vegetation density; the subspecies avoids both open water and densely overgrown stands (USFWS 1983). The Yuma rail forages along the ecotone between mudflats and higher vegetated zones, and in tidal sloughs, feeding primarily on mussels, clams, arthropods, snails, worms, and small fish (BirdLife International 2020). The species is generally found below 4,500 feet in elevation.

37.2 Range

Ridgway's rail occurs in southeast California, southern Arizona and Nevada, and northwest Mexico. In Clark County, this species occurs on the Virgin and Muddy Rivers, the lower Colorado system, and Las Vegas Wash, (Garnett 2004, van Dooremolen 2015), where they can be found in habitats typical of the species including emergent marsh and streamside riparian habitats.

37.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Watch List
U.S. Fish and Wildlife Service Endangered Species Act	Endangered
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Endangered
State of California	Threatened
State of Arizona	Species of Greatest Conservation Need
State of Utah	None
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G3T3 S1B
IUCN Red List	Near Threatened
CITES	No Status

The Yuma Ridgway's rail has been federally listed as endangered since 1967, first under a precursor statute and subsequently under the Endangered Species Act of 1973 (USFWS 2022, NatureServe 2024). The subspecies was listed under the synonym *Rallus longirostris yumanensis*; taxonomy was updated to *Rallus obsoletus yumanensis* by USFWS in 2021. In 2022, USFWS initiated a 5-year status review of the subspecies (USFWS 2022). NatureServe assigns a global rank of G3T3 (Vulnerable), with state ranks of S1 in both California and Nevada, and S3 in Arizona (NatureServe 2024).

Populations have declined substantially since the early 1900s, primarily due to wetland habitat loss and

degradation. NatureServe characterizes the long-term trend as a decline of 50 to 80 percent (NatureServe 2024). Habitat conversion for agriculture, industry, salt production, and urbanization has dramatically reduced the extent of available marsh habitat. In southern California alone, coastal saltmarsh habitat loss is estimated at 75 to 90 percent since the time of European settlement. Dedicated survey work prior to federal listing was limited, making precise historical baselines difficult to establish (NatureServe 2024).

Despite the long-term decline, recent data suggest the population may be stabilizing or rebounding in parts of its range. Rangewide relative abundance increased from approximately 432 individuals in 2015 to 839 in 2019, the highest count recorded in over a decade (NatureServe 2024). NatureServe characterizes the short-term trend as relatively stable, with 10 percent or less change. This apparent recovery is attributed to marsh restoration and management efforts, as well as increased and more standardized survey effort across the range (NatureServe 2024). USFWS reported a US total of 641 individuals based on compiled survey data from 1969 to 2007; however, population estimates fluctuate annually due to dynamic habitat conditions, varying survey protocols, and differing surveyor effort (NatureServe 2024).

The global population is estimated at approximately 10,000 individuals, with the large population at Ciénega de Santa Clara, Sonora, Mexico, supporting more than 70 percent of the global total (NatureServe 2024). That population has fluctuated between 1999 and 2022 but has remained broadly stable, averaging 2.09 rails per point count.

Trends in Nevada are poorly known. The 2022 Nevada State Wildlife Action Plan characterizes the population trend in Nevada as unknown, noting the subspecies declined significantly rangewide between 1970 and 1990, but that Nevada-specific trend data are lacking (NDOW 2022). Nevada individuals represent the northernmost occurrences for the subspecies, and it is uncertain whether the rail occurred in Nevada prior to the creation of the Colorado River reservoir system.

Recent survey data from Las Vegas Wash show encouraging signs: five individuals were detected in 2021, seven in 2022, and six in 2023. Prior to 2021, no more than one individual had been confirmed in the Las Vegas Wash project area in any given year (van Dooremolen et al. 2024). This increase is associated with active habitat enhancement efforts by the Las Vegas Wash Coordination Committee and Clark County, including bulrush plantings, constructed wetland ponds in the Wetlands Park Nature Preserve, and in-lieu fee mitigation wetlands (van Dooremolen et al. 2024). Nevada's NatureServe rank is S1B (critically imperiled, breeding).

37.4 Impact

The most immediate continuing threat to the Yuma Ridgway's rail is the loss, degradation, and fragmentation of wetland habitat (NatureServe 2024). Additional threats include water diversions affecting marsh extent and water quality; heavy metal and pesticide contamination, particularly selenium in the Imperial Valley; chigger mite infestations affecting up to 92 percent of some sub-populations in southwestern Arizona and Nevada; feral animals and urban encroachment; and projected future water shortages in the Colorado River basin under changing climate conditions (NatureServe 2024). In Mexico, the Ciénega de Santa Clara population faces the potential diversion of its water supply to the Yuma Desalting Plant in Arizona. Urban expansion also increases the risk of encroachment on emergent marsh habitat, channelization of nearby aquatic systems, and elevated populations of feral and human-associated wildlife (NDOW 2022).

Simandle and Nussear (2025) modeled Ridgway’s (Yuma) rail habitat suitability on the basis of aspect, bare ground, bedrock depth, habitat fragmentation, minimum temperature, soil properties, and vegetation. Large tracts of medium- and high-suitabilityhabitat are predicted to occur in central and southern Clark County including Pahrump Valley, Las Vegas Valley, Ivanpah Valley, and around the community of Searchlight (Simandle and Nussear 2025). Areas of highly suitable habitat are found along the Meadow Valley Wash, the Muddy River, the

Virgin River, and northern shores of Lake Mead. High-suitability habitat also occurs along the Colorado River in the Cottonwood Valley, and near Bullhead City in the Mohave Valley. An area in the southeast end of the Amargosa Desert also shows high-suitability habitat (Simandle and Nussear 2025). Within the MSHCP Amendment Plan Area, 16,338 acres of suitable habitat have been modeled for the Yuma Ridgway's rail. Of this total, 267 acres (1.6 percent) occur within the MSHCP Amendment Impact Area. A total of 303 acres (1.9 percent) of suitable habitat occur within lands managed for resource conservation. No suitable habitat occurs within the existing MSHCP Reserve System or the MSHCP Amendment Reserve System Additions.

Yuma Ridgway's rail* *Rallus obsoletus yumanensis*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	16,338	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	267	1.6%
Suitable Habitat in Lands Managed for Resource Conservation	303	1.9%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	0	0.0%

*Simandle and Nussear 2025

37.5 Data

Along the Las Vegas Wash, targeted surveys for Yuma Ridgway's rail have been conducted since 2000. The species was rarely detected along the Wash, with lone individuals recorded in 1998, 2005 to 2006, 2015 to 2017, and 2020 (LVWASH 2026). In 2021, five individuals were detected at survey sites, marking a notable increase. In 2023, six individuals were documented at the Wash (GBBO 2024; van Dooremolen et al. 2024). Clark County occurrences are concentrated within freshwater marshes along the Virgin, Muddy, and Colorado Rivers, as well as the Las Vegas Wash (Simandle and Nussear 2025).

37.6 Recommendation

Recommended for Coverage. Based on the State and Federal Endangered Species status, the small and likely declining population numbers, the Ridgway's (Yuma) rail is recommended for coverage.

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38.0 RUFOUS HUMMINGBIRD (*SELASPHORUS RUFUS*)

38.1 Species Overview

The rufous hummingbird (*Selasphorus rufus*) is the most abundant and widespread migrant hummingbird in Nevada during the fall migration. Rufous hummingbirds undertake the longest migration of any North American hummingbird, breeding as far north as south-central Alaska, farther north than any other hummingbird species (Calder and Jones 1989; Audubon 2024). The species is notably confrontational, with males vigorously defending patches of flowers in mountain meadows and chasing away intruders, including larger birds (Audubon 2024).

38.2 Range

Rufous hummingbirds breed in the Pacific Northwest and migrate south along the Cascade/Sierra Nevada and Rocky Mountains to central Mexico during the summer (Russell et al. 1994). The breeding range extends from southeastern Alaska, extreme southwestern Yukon, British Columbia, and southwestern Alberta southward through Washington, Oregon, and western Montana to northwestern California and Idaho (NatureServe 2020). Migration patterns coincide with weather patterns and flowering times (Calder 1993). This species will make several stops during this migration, typically in mountain meadows, although hummingbird feeders in urban areas and lowland riparian zones are also used. Several days to several weeks are spent at each stop to add body mass. Information from banded birds suggests that there is strong fidelity to breeding sites, wintering sites, and migration routes (Calder and Jones 1989). Rufous hummingbirds use stopover locations in Nevada during both spring and fall migrations.

This species was documented for the first time east of the Mississippi River in 1909. Populations have been increasing along the Gulf Coast and are now considered regular winter residents, although they occupy a small portion of available habitat there (Hill et al. 1998).

38.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	None
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
State of California	None
State of Utah	None
NV Division of Natural Heritage	None
NV State Wildlife Action Plan	None
NV Climate Change Vulnerability Index	Not Evaluated
NatureServe Global and NV State Rank	G4 S3M
IUCN Red List	Near Threatened
CITES	Appendix II

The Rufous Hummingbird remains a widespread and relatively common species across western North America, but it has experienced substantial population declines over recent decades. Global population estimates vary considerably across sources, ranging from approximately 6.5 million (Rich et al. 2004) to 11 million (Partners in Flight 2013) to 19 million individuals (Rosenberg et al. 2016). NatureServe assigns the species a global conservation status of G4 (Apparently Secure), last reviewed in November 2020, while the IUCN lists the species as Near Threatened.

Long-term trend data from the North American Breeding Bird Survey indicate a decline of approximately 60 percent between 1970 and 2014 (Rosenberg et al. 2016), though NatureServe notes that the Breeding Bird Survey is not well suited to monitoring this species, as average detections per route tend to be quite low. Over the shorter term, Breeding Bird Survey data from 2004 to 2015 show a statistically significant estimated annual decline of 2.23 percent (Sauer et al. 2017), equating to a reduction of approximately 27 percent over three generations (BirdLife International 2018). NatureServe characterizes the long-term trend as a decline of 10 to 50 percent and the short-term trend as a decline of 10 to 30 percent.

In Nevada, the species holds a state conservation rank of S3M, indicating it is considered vulnerable during migration. Nationally, the United States rank is N5B (Secure, breeding).

38.4 Impact

The primary threat driving population declines has not been definitively identified; NatureServe notes that no major threats have been conclusively linked to the observed downward population trend. Climate change is considered a likely potential threat, with modeling by Langham et al. (2015) projecting a 22 percent net loss of breeding range under a 2 degree Celsius warming scenario. The species' dependence on precisely timed habitat and floral resources across multiple seasonal ranges makes it particularly susceptible to phenological mismatches driven by climate change, a concern echoed by both Audubon and NatureServe (Audubon 2024, NatureServe 2020). Additional potential stressors include livestock grazing that reduces nectar-producing vegetation, pesticide and herbicide application, and the loss of old-growth coniferous forest in the Pacific Northwest.

Conversely, some land use changes may provide localized benefits. Timber harvest can temporarily increase early seral habitats with abundant nectar-producing shrubs, and suburban feeders and non-native garden plantings may supplement food availability beyond natural flowering seasons, though the net demographic effects of these factors remain unquantified. The nonbreeding range may also be expanding, with individuals increasingly wintering regularly along the Gulf Coast states and occurring as strays throughout eastern North America (Healy and Calder 2006).

There is no available habitat suitability model for this species.

38.5 Data

Key aspects of this species' life history remain poorly understood, particularly breeding ecology and population dynamics (Healy and Calder 2006). All of Nevada is within the migration corridor and not within the winter or breeding range.

Avian surveys conducted across the Clark County MSHCP reserve system from 2020 to 2025, including riparian reserve units along the Virgin and Muddy Rivers and the Boulder City Conservation Easement, did not detect rufous hummingbird at any survey location (SWCA 2020, 2021, 2022, 2023, 2024, 2025). This is consistent with the species' status as a transient migrant through the region with primary stopover use in montane habitats outside the MSHCP reserve system.

38.6 Recommendation

Not Recommended for Coverage. The rufous hummingbird is not recommended for coverage under the MSHCP. This species is widely distributed and does not breed or winter within Clark County. The habitat used during migration is primarily montane and unlikely to be affected by MSHCP Covered Activities.

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39.0 BREWER'S SPARROW (*SPIZELLA BREWERI*)

39.1 Species Overview

Brewer's sparrow (*Spizella breweri*) is a shrub steppe obligate species (Braun et al. 1976), occurring in areas with scattered shrubs and short grass. The species also occurs in high desert scrub (greasewood) habitats that are adjacent to shrub steppe habitat. To a lesser extent, the species can be found in mountain mahogany, rabbit brush, bunchgrass grasslands with shrubs, bitterbrush, ceanothus, manzanita, and large openings in pinyon-juniper habitat (Knopf et al. 1990; Rising 1996; Sedgwick 1987; USFS 1994; NatureServe 2026). Brewer's sparrow breeds in high densities, although the densities vary considerably from year to year (Rotenberry et al. 1999). Breeding density in eastern Nevada is 0.19 acre to 0.25 acre (Medin 1990). Breeding territory averages 1.48 to 3.09 acres and contracts as breeding bird densities increase (Wiens et al. 1985); the mean territory size varies from 0.25 acres to 5.83 acres (Rotenberry et al. 1999). Nesting season in Nevada runs from mid-April through early August; the species frequently produces two broods per year, with the second brood initiated approximately 10 days after the first brood fledges. Nests are open cups composed of dry grass, weed stems, and small sagebrush twigs, typically placed in the densest portion of taller sagebrush shrubs. Average clutch size is 3 to 4 eggs (Rotenberry et al. 1999; NDOW 2022).

39.2 Range

Brewer's sparrow breeding range extends over most of western North America, wintering south into central Mexico. The species breeds across the Intermountain West into western Canada. In northern California, Brewer's sparrow is a common summer resident and breeder east of the Cascade-Sierra Nevada crest, in mountains and higher valleys of the Mojave Desert, and at the southern end of the San Joaquin Valley. The species breeds locally above the pinyon-juniper belt (McCaskie et al. 1979) and on the western slope of the Sierra Nevada (Verner and Boss 1980). Brewer's sparrow is also a common winter resident in open desert scrub and cropland habitats of the southern Mojave and Colorado deserts, usually occurring in areas with an herbaceous understory (Dobkin and Granholm 1988).

Within Nevada, Brewer's sparrows are widespread through all regions that support sagebrush in the Great Basin Desert (Floyd et al. 2007). The species is strongly tied to big sagebrush (*Artemisia tridentata*) from valley floors to higher elevation montane sagebrush types, preferring habitat with a high degree of patchiness, varying sagebrush heights and densities, and open bare patches of ground. Sagebrush vigor and size are important components, as foraging sparrows select larger, more vigorous shrubs when pursuing insects during summer months (NDOW 2022). Major habitat types used in Nevada include low and high elevation sagebrush-dominated shrublands, salt desert shrub, pinyon-juniper woodland, and lower montane woodlands and chaparral (NDOW 2022). Breeding has also been confirmed in southern Nevada in the Spring Mountains where sagebrush is available (NDOW 2022). The species winters in Clark County but may only breed in an extremely limited portion of western Clark County (GBBO 2010).

39.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Not Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
Migratory Bird Treaty Act	Protected

Agency/Organization	Status
State of Nevada	Sensitive
State of Arizona	Species of Greatest Conservation Need
State of California	None
State of Utah	None
NV Division of Natural Heritage	Watch List
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Moderately Vulnerable
NatureServe Global and NV State Rank	G5 S3B
IUCN Red List	Least Concern
CITES	No Status

Brewer's sparrow is globally ranked G5 (Secure) by NatureServe, reflecting its broad range across western North America, though this ranking belies serious and ongoing population declines (NatureServe 2026). In Nevada, the species is ranked S3B, indicating a vulnerable breeding population (NatureServe 2026, NDOW 2022). The species is designated Sensitive by the Bureau of Land Management in Nevada and is listed as a Sensitive Bird under Nevada Administrative Code 503.050.3(g), with a Climate Change Vulnerability Index rating of Moderately Vulnerable (NDOW 2022).

Despite remaining the most abundant bird in sagebrush ecosystems across much of its range, Brewer's sparrow has experienced significant long-term population declines. North American Breeding Bird Survey data indicate a population reduction of approximately 49 percent between 1966 and 2014 (Cornell Lab of Ornithology 2026). More recent Breeding Bird Survey data show annual declines of 2.5 percent in Nevada and 2.3 percent in the Great Basin from 1993 to 2019, compared to a rangewide annual decline of 1.8 percent over the same period (NDOW 2022). Earlier Breeding Bird Survey data covering 1966 to 1996 documented even steeper survey-wide declines averaging 3.7 percent per year across 397 survey routes, with the steepest declines observed in Idaho at 6.0 percent per year; no state or physiographic region showed population increases during that period (NatureServe 2026). Partners in Flight estimates the global breeding population at approximately 13 million individuals, with 99 percent spending some portion of the year in the United States, 1 percent breeding in Canada, and 60 percent wintering in Mexico (Cornell Lab of Ornithology 2026). Partners in Flight assigns the species a Conservation Concern Score of 12 out of 20 and designates it a U.S.-Canada Concern Species (Cornell Lab of Ornithology 2026).

39.4 Impact

The direct cause of widespread declines on breeding grounds remains uncertain but is believed to be linked to broad degradation of sagebrush habitats (NatureServe 2026). Key threats include loss and fragmentation of sagebrush through land conversion, urban and energy development, and range improvement programs that remove sagebrush via burning, herbicide application, or mechanical treatment (NatureServe 2026). Livestock grazing, particularly at high intensities, can alter plant composition and trigger invasion by non-native grasses such as cheatgrass (*Bromus tectorum*), which accelerates fire cycles and converts sagebrush shrublands to annual grasslands (NatureServe 2026, NDOW 2022). Increased wildfire frequency and intensity have similarly caused persistent conversion of shrubland habitats (NDOW 2022). The species has been placed on the Partners in Flight Watch List as a conservation priority species due to these widespread long-term declines and ongoing habitat threats (NatureServe 2026).

Based on USGS (2018) habitat modeling, suitable habitat for Brewer’s sparrow within the MSHCP Amendment Plan Area totals approximately 449,015 acres. Of this, 24,145 acres (5.4 percent) occur within the MSHCP Amendment

Impact Area. Approximately 365,791 acres (81.5 percent) of suitable habitat occurs within lands managed for resource conservation. Within the existing MSHCP Reserve System, 139 acres of suitable habitat are present, and no suitable habitat occurs within the MSHCP Amendment Reserve System Additions.

Brewer's sparrow* *Spizella breweri*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	449,015	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	24,145	5.4%
Suitable Habitat in Lands Managed for Resource Conservation	365,791	81.5%
Suitable Habitat in the existing MSHCP Reserve System	139	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	0	0.0%

*USGS 2018

39.5 Data

Two subspecies of Brewer's sparrow are recognized: the nominate subspecies (*S. b. breweri*) occupies the core of the range, while the timberline sparrow (*S. b. taverneri*) breeds in subalpine habitats of western Canada. The taxonomic status of these two forms remains controversial (NatureServe 2026).

Point-count surveys conducted at MSHCP reserve properties (BCCE and Muddy and Virgin River Reserve Units) between 2020 and 2025 yielded several Brewer's sparrow detections. In 2020 nine total detections (six within 100 m of survey points), with possible breeding were recorded at the BCCE (SWCA 2020). Brewer's sparrow was not detected during 2021 and 2022 point-count surveys (SWCA 2021, 2022). During 2022 point-count surveys at the Riparian Reserve Units, one Brewer's sparrow was recorded at the Bunkerville Subunit with possible breeding noted; the species was not detected at the BCCE during the 2022 surveys, which covered 20 point-count locations across the Mojave Desert scrub habitat (SWCA 2022). During 2024 point-count surveys at the BCCE, six Brewer's sparrow detections were recorded across the Mojave Desert scrub habitat, all within 100 m of survey points, with possible breeding noted (SWCA 2024). The species was not detected during 2024 point-count surveys at the Riparian Reserve Units (SWCA 2024). During 2025 point-count surveys at the Riparian Reserve Units, Brewer's sparrow was detected at three subunits: seven detections with possible breeding at Bunkerville East, four detections with possible breeding at Bunkerville West, and five detections with possible breeding at Riverside; the species was not detected at the BCCE or the remaining Riparian Reserve subunits during 2025 surveys (SWCA 2025).

39.6 Recommendation

Not Recommended for Coverage. The Brewer's sparrow has a wide range and although some declines have been documented, the overall population remains large, including within Nevada. The species is a Nevada Sensitive Bird Species and a USFWS Bird of Conservation Concern (USFWS 2008); however, based on current data, there is no indication the species will be petitioned for listing under the Federal Endangered Species Act during the lifetime of the MSHCP.

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40.0 BENDIRE'S THRASHER (*TOXOSTOMA BENDIREI*)

40.1 Species Overview

Bendire's thrasher (*Toxostoma bendirei*) is a medium-sized thrasher in the family Mimidae. The species is found in open, arid shrublands and desert scrub habitats, where it forages on the ground for invertebrates, small vertebrates, and berries. Bendire's thrasher typically nests low in vegetation, building its nest approximately 3.3 feet above the ground surface (Brown 1901). The species is noted for breeding early in the season, and breeding activity and phenology can be altered by winter rainfall, with later phenology and reduced breeding activity following dry winters (Desert Thrasher Working Group [DTWG] 2018).

40.2 Range

The range of Bendire's thrasher was estimated to be 480,634 km² (Restrepo and Arango 2008). Bendire's thrashers are resident in southern Utah and Colorado, western New Mexico, the northern half of Arizona, southern Nevada, and the eastern Mojave Desert of California. The species' habitat best aligns with mesquite/acacia, Mojave desert scrub, blackbrush, sagebrush, and pinyon juniper ecosystems. In low-elevation desert grassland and shrubland, the presence of suitable spinescent nesting substrate is a key habitat requirement.

Bendire's thrashers are sparsely distributed and associated with stands of yucca and cholla indicative of upland mixed Mojave desert scrub habitats, and are likely restricted to those habitats in Nevada (GBBO 2010). The species is known to inhabit a range of ecosystems that includes pinyon-juniper woodland, the edges of mesquite patches within grassland, and semi-desert and desert areas scattered with large shrubs and open ground (DTWG 2018). It may also occur in sagebrush (*Artemisia* spp.) with scattered junipers at higher elevations and latitudes (England and Laudenslayer 2020). The structure of all occupied habitat types tends to be relatively open with scattered shrubs or trees (England and Laudenslayer 2020). When the species occurs in low-elevation desert grassland or shrubland, at least one large individual of a cholla (*Cylindropuntia* spp.), yucca, or spinescent shrub such as palo verde, mesquite, catclaw acacia (*Senegalia wrightii*), or desert-thorn (*Lycium* spp.) is almost always present (England and Laudenslayer 2020).

In Nevada, Bendire's thrasher inhabits a wide range of ecosystems including blackbrush (in association with yuccas), desert riparian, mesquite acacia, Mojave desert scrub, and salt desert scrub (Brown 1901, Gilman 1909, Gullion et al. 1959, SWECO 2018). The majority of observations of Bendire's thrasher in Nevada occur in southern Clark County in the upland mixed Mojave desert scrub habitat (GBBO 2010), as well as in San Bernardino County adjacent to the southern portion of Clark County (Shuford and Gardali 2008). In Nevada, all confirmed nests have been found in cactus or other spiny vegetation, and most location records are from Clark, Nye, and Lincoln counties in Joshua tree and yucca landscapes featuring abundant cholla (NDOW 2022). Bendire's thrasher typically occurs from 0 to 5,900 feet in elevation. The Mojave Desert population of Bendire's thrasher is distinctly associated with intact desert vegetation, in contrast to the Sonoran Desert population, which sometimes uses abandoned agricultural areas and modified habitats (GBBO, unpubl. data, cited in NDOW 2022).

40.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None

Agency/Organization	Status
State of Nevada	None
State of Arizona	Species of Greatest Conservation Need
State of California	State Candidate, Species of Special Concern
State of Utah	Species of Greatest Conservation Need
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4 S1B
IUCN Red List	Vulnerable
CITES	No Status

Bendire's thrasher is a species of significant conservation concern throughout its range in the southwestern United States and northwestern Mexico. Globally, NatureServe assigns the species a G4 rank (Apparently Secure), while Nevada holds an S1B ranking (Critically Imperiled, breeding), California S2 (Imperiled), and Arizona and New Mexico each S3 (Vulnerable) (NatureServe 2026). The species carries no federal listing under the Endangered Species Act, but is designated a BLM Sensitive species in Nevada and a USFWS Species of Conservation Concern (NDOW 2022; DTWG 2018). The species is listed as a Red Watch List Species in North America with high vulnerability and a recognized need for population recovery (NDOW 2022). California designated the species a candidate for Threatened or Endangered status under the California Endangered Species Act in April 2026.

Population trend data consistently indicate long-term declines. North American Breeding Bird Survey data show a significant survey-wide annual decline of approximately 4.0 percent over the 30-year period from 1966 to 1996, though sample sizes remain relatively low, with detections on only 35 routes across five states (NatureServe 2026). More recent Breeding Bird Survey analysis documents a 2.8 percent average annual decline from 1966 to 2019 across the southwestern range (NDOW 2022). Partners in Flight analysis estimated a continental population decline of 86 percent between 1970 and 2014, and within the area covered by desert scrub in the Sonoran Joint Venture, the species declined by an estimated 78 percent over the same period (NDOW 2022).

In New Mexico, where approximately 28.7 percent of the global population is estimated to occur, Breeding Bird Survey data indicate a 4.4 percent average annual decline over the decade preceding the Desmond and Sutton study, and projections at the time of that study suggested a range-wide decline of 30 percent within 15 years and 50 percent within 20 years (Desmond and Sutton 2017). In Nevada, the species exists at the periphery of its range and is considered very rare on the landscape even within preferred habitat; limited Breeding Bird Survey coverage in the state precludes reliable trend estimates, but trends are assumed to mirror range-wide declines (NDOW 2022).

40.4 Impact

Bendire’s thrasher is especially sensitive to destruction and degradation of habitat, as nests are built relatively low in vegetation and are therefore accessible to predators subsidized from suburban and urban areas (Esque et al. 2010, SWECO 2018). There is concern about inbreeding and local extinctions occurring as a result of the small and isolated populations (England and Laudenslayer 2020, SWECO 2018). The causes of population decline are not fully understood. Habitat degradation associated with urban and suburban expansion, shrub encroachment and desertification, invasive annual grasses, large-scale solar energy development, and altered wildfire regimes are

identified as primary threats (NDOW 2022; Desmond and Sutton 2017; DTWG 2018).

Wildfire fuel sources increase as invasive plant species populations increase throughout the northeastern Mojave Desert (D'Antonio and Vitousek 1992, Brooks and Esque 2002). Fires destroy and degrade habitat, while removing vegetation required for nesting. Disturbances to Bendire's thrasher habitat through development and an increase in wildland fires may result in continuous decline of the species (SWECO 2018).

The 2022 Nevada State Wildlife Action Plan identifies renewable energy development as an additional medium-level threat, noting that industrial-scale solar energy projects eliminate suitable breeding habitat in southern Nevada (NDOW 2022). Invasive annual grasses are also identified as a medium threat, as they alter the natural wildfire regime by reducing shrub density and are correlated with reduced arthropod diversity and abundance, likely diminishing prey availability for the species (NDOW 2022).

Nussear et al. (2024) modeled Bendire's thrasher habitat suitability on the basis of distance to cliffs, vegetative productivity, winter productivity, slope, flow accumulation, and vegetation. High-suitability habitat is predicted to occur in the western half of the County associated with western North American semi-desert and warm desert scrub and grassland habitats (Nussear et al. 2024). Approximately 871,245 acres of suitable habitat exists within the MSHCP Amendment Plan Area. It is estimated that 3.0 percent (25,833 acres) may be impacted by covered activities, and 60.6 percent (527,947 acres) occur on lands managed for resource conservation. Of the suitable habitat, 0.0 percent (235 acres) is protected within the existing MSHCP Reserve System, and 13.3 percent (115,584 acres) is within the MSHCP Amendment Reserve System Additions.

Bendire's thrasher* *Toxostoma bendirei*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	871,245	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	25,833	3.0%
Suitable Habitat in Lands Managed for Resource Conservation	527,947	60.6%
Suitable Habitat in the existing MSHCP Reserve System	235	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	115,584	13.3%

*Nussear et al. 2024

40.5 Data

Bendire's thrasher is a difficult species to survey for because of its wariness of potential predators and its tendency to drop to ground level when disturbed (Fisher 1903). The uncertainty of detections can increase false negatives during presence surveys, thus increasing error in distribution and density surveys (SWECO 2018). Bendire's thrasher's rarity may also be due in part to lack of survey effort (Shuford and Gardali 2008). Some models suggest that suitable habitat for Bendire's thrasher may expand in the future, with the species' range predicted to increase substantially during the next 50 years into southeastern New Mexico (Menke and Bushway 2015, SWECO 2018).

Research and monitoring gaps remain substantial. In Nevada, specific habitat predictors beyond basic land cover and nest substrate are not well characterized, and the species may rely on ephemeral invertebrate prey distributed unpredictably across the landscape, suggesting that larger areas than individual territories must be managed to sustain populations (NDOW 2022). The Desert Thrasher Working Group has recommended standardized randomized breeding surveys combined with invertebrate prey sampling to better characterize occupied versus unoccupied habitats (NDOW 2022).

Avian surveys were conducted by SWCA at Clark County Desert Conservation Program properties in 2020 through

2025, covering the Riparian Reserve Units along the Virgin and Muddy Rivers and the Boulder City Conservation Easement (BCCE) (SWCA 2020). The BCCE, which is dominated by Mojave Desert scrub co-dominated by creosote bush and burrobush and constitutes over 97 percent of the easement's vegetation community, represents potential Bendire's thrasher habitat given the species' documented association with intact upland mixed Mojave desert scrub in southern Clark County. However, no Bendire's thrasher detections were recorded during annual surveys within the BCCE (SWCA 2020, 2021a, 2022a, 2023, 2024, 2025). The absence of Bendire's thrasher detections is consistent with the species' low detectability and sparse distribution in Clark County, and does not preclude its presence within the BCCE or adjacent upland habitats.

County-wide avian surveys conducted by SWCA Environmental Consultants in 2021 resulted in three detections of Bendire's thrasher, all recorded during area-search surveys at a single subplot within the Highland Range site, with one detection per survey round (SWCA 2021b). All three detections likely represented a single breeding territory. The highest observed breeding evidence was a singing bird present 7 or more days, indicating probable breeding at this subplot. Given that 77 percent of survey subplots intersected predicted habitat, the low number of detections was somewhat unexpected. Dry conditions during the 2020 to 2021 period, including a record-setting 240 consecutive days without measurable precipitation in Las Vegas between April 20 and December 17, 2020, may have contributed to lower-than-normal detection probability (National Weather Service 2021). Field observations also indicated that some predicted habitat areas lacked suitable nesting substrates such as large cholla, yucca, or spinescent shrubs, suggesting the habitat model may overestimate the presence of Bendire's thrasher habitat in Clark County (SWCA 2021b). County-wide avian surveys conducted by SWCA in 2022 resulted in six total detections of Bendire's thrasher, with two recorded during area-search surveys and four incidental detections, all concentrated within a 220-km² area of southern Clark County near the community of Searchlight (SWCA 2022b). Both survey detections were associated with subplots, each at a different site (New York Mountains and North Searchlight). Both survey detections were of non-singing individuals, providing no evidence of breeding. One incidental detection consisted of a pair in suitable habitat, indicating probable breeding in the area (SWCA 2022b). The 2021 and 2022 survey results together are consistent with the distribution of detections in the model input dataset, all concentrated in or near the largest patch of predicted optimal habitat in the southern end of the county. Field observations from 2022 further indicated that several surveyed subplots with predicted habitat lacked key structural components associated with occupied territories, including adequate slope, suitable elevation, and structural heterogeneity, such as taller shrubs interspersed with expanses of bare ground, identified as important for territory selection by Desmond and Sutton (2017). These results reinforce the conclusion that the initial habitat model may overestimate available habitat for this species in Clark County (SWCA 2022b).

40.6 Recommendation

Recommended for Coverage. The species is a concern species for California and Arizona and the U.S. Fish and Wildlife Service has identified it as a "Bird Species of Conservation Priority" due to its previous designation as a Candidate species (USFWS 2008). Based on its extremely small range, relatively low worldwide population, low density, its potential presence in the plan area, and its potential to be affected, we recommend this species be included as a covered species.

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41.0 LE CONTE'S THRASHER (*TOXOSTOMA LECONTEI*)

41.1 Species Overview

Le Conte's thrasher (*Toxostoma lecontei*) is a medium-sized thrasher and one of four desert thrasher species found in Clark County. It is a permanent resident of open, arid desert habitats and is among the palest of the North American thrashers, with sandy-gray plumage that blends into its desert surroundings (Sheppard 2020). Le Conte's thrasher forages primarily on the ground, using its long, strongly decurved bill to probe soil and leaf litter for invertebrates and small vertebrates (Sheppard 2020). The species nests in low, dense shrubs such as cholla cactus, saltbush, and other desert scrub vegetation, typically initiating breeding activity in late winter to early spring (Sheppard 2020). Le Conte's thrasher is a covered species in the Coachella Valley Multiple Species Habitat Conservation Plan.

41.2 Range

Le Conte's thrashers are found in the San Joaquin Valley and the Colorado and Mojave deserts of California, southern Nevada, western Arizona, and extreme southwestern Utah (Fisher 1893, Dawson 1923, Sibley 2003), as well as south into Sonora and Baja California, Mexico (Sheppard 1970, Riddle et al. 2000). They are a hot desert species, inhabiting desert flats, washes, and alluvial fans with scattered shrubs and sandy and/or alkaline soil (Grinnell and Miller 1944).

In Nevada, Le Conte's thrashers occur throughout low elevation basins of Clark County in open desert flats, washes, and alluvial fans with scattered shrubs and sandy and/or alkaline soil (Grinnell and Miller 1944). Large tracts of medium- and high-suitability habitat are predicted to occur in central and southern Clark County including Pahrump Valley, Las Vegas Valley, Ivanpah Valley, and around the community of Searchlight (Nussear et al. 2024).

41.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	Not listed
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	Species of Greatest Conservation Need
State of California	Species of Special Concern[1], State Candidate
State of Utah	None
NV Division of Natural Heritage	At Risk
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G4 S2
IUCN Red List	Least Concern
CITES	No status

[1] Refers to the San Joaquin Population.

LeConte's Thrasher populations have declined substantially across its range over recent decades. Globally, NatureServe assigns the species a G4 rank (Apparently Secure), though this designation reflects range extent and the existence of protected occurrences rather than population stability. At the national level, the species is ranked N4 in the United States, but state rankings reflect more serious concern: S3 in Arizona and California, and S2 (Imperiled) in Nevada (NatureServe 2023). The USFWS currently lists the species as Not Listed under the Endangered Species Act, though a petition to list the species as threatened and to designate critical habitat was received by the agency on July 30, 2025 (USFWS 2026). California designated the species a candidate for Threatened or Endangered status under the California Endangered Species Act in April 2026.

Population trend data consistently indicate significant long-term and short-term declines. Breeding Bird Survey data indicate an average annual decline of approximately 1.7 percent across the species' southwestern U.S. range from 1966 to 2019 (NDOW 2022). Over a longer horizon, the species experienced an estimated 64 percent decline in desert scrub habitat covered by the Sonoran Joint Venture between 1970 and 2014 (NDOW 2022). eBird trend data similarly show declines of 20 to 30 percent through most of the range (NatureServe 2023). NatureServe characterizes the short-term trend as a decline of 30 to 70 percent and the long-term trend as a decline of 30 to 50 percent. The species is designated a Red Watch List Species in North America, with an estimated continental population decline of 67 percent between 1970 and 2014 (NDOW 2022). Global population estimates range from approximately 64,000 individuals in the United States (Rosenberg et al. 2016) to a broader global estimate of 190,000, though data quality for the latter figure is considered poor and ongoing declines have likely reduced that total further (NatureServe 2023).

In Nevada specifically, the species is ranked S2 and is recognized as a Species of Greatest Conservation Need in the 2022 Nevada State Wildlife Action Plan. Nevada populations are concentrated in the Mojave Desert and Great Basin/Mojave desert ecotone of southeastern Nevada, generally below 1,600 meters elevation. The Nevada State Wildlife Action Plan notes that Breeding Bird Survey routes are insufficient to adequately monitor the species within the state, and flags a recently discovered small breeding population in Lahontan Valley, roughly 200 miles north of the previously understood range boundary, as warranting rangewide reassessment (NDOW 2022).

41.4 Impact

Ecosystem-level threats to this species include any type of surface disturbance that destroys desert vegetation, modifying or reducing cover, foraging sites, and nesting areas. These disturbances include industrial or urban development, military training, and off-highway vehicle use, especially when occurring along desert washes. Wildfire or prescribed fire fueled by invasive non-native plants can also be detrimental to Le Conte’s thrashers (Germano et al. 2001).

The primary drivers of Le Conte’s thrasher population declines are habitat loss and degradation resulting from agricultural conversion, urban and suburban development, large-scale energy development, and overgrazing. Fire, increasingly frequent due to the spread of non-native grasses such as red brome (*Bromus rubens*), Sahara mustard (*Brassica tournefortii*), and Arabian schismus (*Schismus arabicus*), poses a medium-level threat by removing the shrub cover the species requires (NDOW 2022; DTWG 2018). Off-highway vehicle use, which disturbs soil substrate and litter critical to arthropod prey availability, is an additional concern. The species has demonstrated a consistent negative response to development within occupied habitat, and many local populations have been extirpated by land development projects (NDOW 2022). Le Conte’s thrashers are particularly vulnerable to solar energy facility development because the thrashers and the facilities both require the flattest landscape available. Habitat models for this species indicate that the highest quality Le Conte’s habitat and the most sought-after solar development areas almost entirely overlap.

Nussear et al. (2024) modeled Le Conte’s thrasher habitat suitability on the basis of flow accumulation, growing

season, winter precipitation, average spring maximum temperature, slope, and vegetation. According to habitat suitability modeling by Nussear et al. (2024), there are approximately 1,072,483 acres of suitable Le Conte's thrasher habitat within the MSHCP Amendment Plan Area. Of this total, approximately 125,076 acres (11.7 percent) occur within the MSHCP Amendment Impact Area. Approximately 413,676 acres (38.6 percent) of suitable habitat occur within lands managed for resource conservation, and 76,967 acres (7.2 percent) occur within the existing MSHCP Reserve System. An additional 74,685 acres (7.0 percent) of suitable habitat occur within the MSHCP Amendment Reserve System Additions.

Le Conte's thrasher* *Toxostoma lecontei*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,072,483	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	125,076	11.7%
Suitable Habitat in Lands Managed for Resource Conservation	413,676	38.6%
Suitable Habitat in the existing MSHCP Reserve System	76,967	7.2%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	74,685	7.0%

*Nussear et al. 2024

41.5 Data

Le Conte's thrasher can be challenging to detect due to its cryptic, pale coloration, preference for dense low scrub vegetation, and relatively subdued vocalizations outside of the breeding season. Detection rates may be reduced during drought years, which can suppress breeding activity and vocal behavior. Despite being predicted to occupy large areas of suitable habitat in Clark County, targeted surveys have documented relatively low detection rates, particularly during years of prolonged drought.

Annual avian surveys conducted in the Boulder City Conservation Easement (BCCE) have detected Le Conte's thrasher consistently since 2018 (SWCA 2025). During 2020 point-count surveys, biologists recorded a total of 13 Le Conte's thrasher detections at 11 of 20 point-count locations within the BCCE, the most widely distributed MSHCP evaluation species detected at that site (SWCA 2020). Although breeding could not be confirmed during point-count surveys, biologists incidentally located multiple active nests, confirming breeding at the BCCE; this was the second consecutive year that breeding was confirmed for this species at the site, and breeding is presumed to occur annually (SWCA 2020). During 2021 point-count surveys at the BCCE, Le Conte's thrasher was recorded twice from one point-count location; breeding could not be confirmed during surveys, though the species is known to breed at the site based on active nests documented in prior years (SWCA 2021a). During 2025 point-count surveys at the BCCE, Le Conte's thrasher was detected from two point-count locations; however, both detections occurred outside 100 meters of a point-count location and breeding could not be confirmed (SWCA 2025). The BCCE encompasses Mojave Desert scrub habitat co-dominated by creosote bush and burrobush, with areas of salt desert scrub, dense cholla, and desert wash habitat that provide suitable foraging and nesting conditions for this species.

In addition, SWCA conducted countywide area-search surveys at 30 randomly selected sites in Clark County in 2021 with the goal of expanding occurrence data for Le Conte's thrasher and six other target species (SWCA 2021b). Surveyors recorded 49 total detections of Le Conte's thrasher across 16 subplots at 11 sites, including 26 detections during area searches and 23 incidental detections. All 49 detections fell within predicted habitat, with 34 in habitat modeled as optimal and 15 in habitat modeled as suitable. Four detections were recorded within proposed MSHCP Amendment Impact Areas and four within the Reserve System, all within the BCCE. The highest observed breeding evidence was a "family group," recorded in habitat modeled as optimal, providing additional confirmation of breeding in Clark County (SWCA 2021b). SWCA also conducted countywide area-search surveys at

30 sites in Clark County in 2022 (SWCA 2022). Although no sites were specifically selected for Le Conte's thrasher in 2022, 78 percent (442 ha across 62 subplots) of the total surveyed area fell within predicted habitat. Surveyors recorded 16 LeConte's thrasher detections; seven during area searches and nine incidental. Detections were associated with only 2 percent (11 ha) of surveyed predicted habitat, a pattern likely influenced by the prolonged drought affecting Clark County, which may have reduced breeding activity and detection probability. Breeding was confirmed elsewhere in the county through an observed individual carrying food and an active nest with young (SWCA 2022).

41.6 Recommendation

Recommended for coverage. Based on the small population size and small range of the species and potential for impacts within the MSHCP we recommend it for coverage. The species is a concern species for California and Arizona and the U.S. Fish and Wildlife Service has identified it as a "Bird Species of Conservation Priority" (USFWS 2008). Population data indicate significant rangewide declines of up to 67 percent since 1970, and the species is listed as a Red Watch List Species in North America (Rosenberg et al. 2016). Its association with locations suitable for solar energy projects may put this species at risk in Clark County and other portions of its range.

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42.0 BELL'S VIREO (*VIREO BELLII*)

42.1 Species Overview

Bell's vireo is a small migratory songbird belonging to the family Vireonidae. It breeds across the central and southwestern United States and winters in Mexico and Central America. Four subspecies are recognized, each occupying distinct portions of the breeding range. Breeding habitat generally consists of dense, low, shrubby vegetation in riparian areas, brushy fields, young second-growth forest or woodland, scrub oak, coast chaparral, and mesquite brushlands, often near water and in desert washes in arid regions (Hutto 1985, Brown 1993). Bell's vireo use willow (*Salix gooddingii*) and honey mesquite (*Prosopis glandulosa*) for nesting and avoid salt cedar (*Tamarix* sp.), arrow weed (*Pluchea sericea*), and giant reed (*Phragmites communis*) (Serena 1986).

42.2 Range

Bell's vireo (*Vireo bellii*) breeding range extends throughout the central and southwestern United States and south through northern Mexico. The Arizona Bell's vireo (*V.b. arizonae*) is found in Arizona, Utah, and Nevada and along the Colorado River in California during the breeding season, and extends into Sonora, Mexico in winter (Franzreb 1989). Breeding habitat generally includes dense riparian shrublands and desert washes, with a preference for willow thickets, honey mesquite stands, and similar dense low woody vegetation near water.

The only Bell's vireo subspecies currently known to be present in southern Nevada is the Arizona Bell's vireo. Within Clark County, this species is concentrated in the southern tip of the county along the Colorado River with populations also found along the Virgin and Muddy Rivers, isolated springs, and Lake Mead (Floyd et al. 2007, GBBO 2009).

42.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered[1]
U.S. Fish and Wildlife Service Endangered Species Act	Not Listed
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	No Status
Migratory Bird Treaty Act	Protected
State of Nevada	No Status
State of Arizona	None
State of California	State Endangered
State of Utah	No Status
NV Division of Natural Heritage	Watch List
NV State Wildlife Action Plan	Species of Greatest Conservation Need
NV Climate Change Vulnerability Index	Presumed Stable
NatureServe Global and NV State Rank	G5T4 S2B
IUCN Red List	Least Concern[1]
CITES	No Status

[1] Status designation is for the full species Bell's vireo (*Vireo bellii*) and does not indicate subspecies status.

Bell's Vireo

Bell's vireo is ranked G5 (Secure) globally by NatureServe, reflecting a wide breeding distribution across central and southwestern North America (NatureServe 2026a). Despite its globally secure rank, Bell's vireo has experienced significant population declines across portions of its range, particularly in the arid West. North American Breeding Bird Survey data from 1966 to 1995 indicated survey-wide declines averaging 3.2 percent per year across 238 survey routes, with the steepest regional declines in the Breeding Bird Survey Central region at 4.8 percent per year (NatureServe 2026a). More recent Breeding Bird Survey data (1966 to 2019) show a nonsignificant annual increase of 1.6 percent in the Sonoran and Mojave deserts, but a declining trend of 1.3 percent per year from 1993 to 2019 (NDOW 2022). The USFWS ECOS profile notes that Bell's vireo populations are currently declining throughout the species' range, with degradation of riparian habitat identified as a primary threat (USFWS 2026b).

Several populations have been reduced or extirpated (NatureServe 2026a). The species has been largely eliminated from the Central Valley of California, which has lost approximately 95 percent of its riparian vegetation to agriculture and other anthropogenic factors (NatureServe 2026a). In Nevada, the species is ranked S2B (Imperiled, breeding), reflecting restricted distribution and vulnerability at the state level (NatureServe 2026a; NatureServe 2026b).

Arizona Bell's Vireo

The Arizona Bell's vireo (*V. b. arizonae*) was petitioned for federal Endangered Species Act listing in 1979 and was identified as a Candidate Category 3C in 1982. Category 3C is defined as "Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat" (USFWS 1982). Listing of the Arizona Bell's vireo was determined to be "not warranted" in 1984 (USFWS 1984).

The Arizona Bell's vireo is ranked G5T4 (Apparently Secure subspecies of a Secure species) by NatureServe, with a rounded global status of T4 (NatureServe 2026b). Its U.S. range includes Arizona, California, Nevada, and New Mexico, and it inhabits the Colorado River drainage, breeding in shrubby riparian habitat (NatureServe 2026b; USFWS 2026a). The subspecies is not listed under the federal Endangered Species Act, though it was designated endangered by the State of California in 1988 (NatureServe 2026a).

In Nevada, *V. b. arizonae* is ranked S2B (Imperiled, breeding) and is considered to be moderately declining (NDOW 2022; NatureServe 2026b). The subspecies occurs almost exclusively in riparian areas of southern Nevada, primarily along the Virgin, Muddy, and Colorado rivers, with the strongest populations found in wildlife refuges and other protected areas (NDOW 2022). The Climate Change Vulnerability Index rating for the subspecies in Nevada is presumed stable (NDOW 2022).

Trend information for *V. b. arizonae* is mixed. Populations in Arizona and northern Mexico are considered fairly stable (NatureServe 2026a). However, the subspecies has nearly disappeared from California; 35 singing males were recorded in 1981, compared to only 4 by 1986 (NatureServe 2026a). Conversely, populations along the Colorado River through the Grand Canyon expanded substantially following flood control at Glen Canyon Dam, with territorial males increasing from 67 to 136 over six years and the breeding range expanding by at least 219 kilometers over 11 years (NatureServe 2026a). In Nevada, Breeding Bird Survey data are insufficient to determine a statistically significant statewide trend, though the broader Sonoran and Mojave desert Breeding Bird Survey region shows a nonsignificant increase from 1966 to 2019 and a slight decline from 1993 to 2019 (NDOW 2022).

42.4 Impact

Brood parasitism by brown-headed cowbird (*Molothrus ater*) is a significant driver of Bell's vireo population decline in many areas. Observed parasitism rates range from 6 percent in the Grand Canyon to 69 percent in

Kansas, and modeling suggests that rates exceeding 30 percent can lead to unstable populations vulnerable to extirpation (NatureServe 2026a). Management programs combining cowbird control and riparian habitat restoration have produced localized population recoveries; one California site increased from 19 to 122 breeding vireos over eight years following cowbird removal, and a program at Camp Pendleton grew territories from 15 in 1980 to 259 in 1991 (NatureServe 2026a).

The Arizona Bell's vireo subspecies faces threats consistent with the broader species, including loss and degradation of riparian habitat, water diversion and altered flow regimes, improper livestock grazing, residential and commercial development, and brood parasitism by brown-headed cowbirds (NDOW 2022; NatureServe 2026a). In Nevada, the die-off of screwbean mesquite and spread of the tamarisk beetle also represent emerging threats to nesting habitat (NDOW 2022).

Nussear et al. (2024) modeled Bell's vireo habitat suitability based on average maximum temperature, vegetation productivity, winter precipitation, slope, topography, and soil properties. Areas of medium- and high-suitability habitat are predicted to occur in central Clark County, including Las Vegas Valley, Muddy River Drainage, Virgin River Drainage, and the lower Colorado River drainages (Nussear et al. 2024). Approximately 441,694 acres of modeled suitable habitat exist within the MSHCP Amendment Plan Area. Of this total, an estimated 4.7 percent (20,920 acres) may be impacted by plan activities. Approximately 69.6 percent (307,632 acres) of suitable habitat occurs within lands managed for resource conservation. An additional 1.0 percent (4,314 acres) is protected within the existing MSHCP Reserve System, and 4.7 percent (20,541 acres) falls within MSHCP Amendment Reserve System additions.

Bell's vireo* *Vireo bellii*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	441,694	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	20,920	4.7%
Suitable Habitat in Lands Managed for Resource Conservation	307,632	69.6%
Suitable Habitat in the existing MSHCP Reserve System	4,314	1.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	20,541	4.7%

*Nussear et al. 2024

42.5 Data

Because this subspecies occupies a relatively small geographic range within Nevada and Clark County, concentrated in desert riparian corridors, survey effort is constrained by habitat availability and access. Detection can be challenging during migration periods when transient individuals may be confused with territorial breeders; behavioral observations are necessary to distinguish migrant from breeding birds.

Surveys conducted by SWCA from 2016 through 2025 have detected Arizona Bell's vireo occurrences are concentrated along riparian corridors and desert washes, including the Virgin River, Muddy Rivers in the northeastern portion of the county, the southern tip of the County between the Newberry Mountains and the Colorado River, along the Las Vegas Wash, and scattered mesquite bosques north and west of Las Vegas. Nearly two thirds of all detections have occurred in desert riparian habitat along portions of the Virgin and Muddy River drainages (SWCA 2022a, 2024, 2025). Point-count surveys conducted on Clark County MSHCP Riparian Reserve Units in 2020 recorded Arizona Bell's vireo at all five subunits (Mesquite West, Bunkerville, Riverside, Mormon Mesa, and Muddy River), with a combined total of 39 detections across all subunits. The species was the most abundantly detected MSHCP-covered bird at the Riverside Subunit, where it was the third-most detected species overall, indicating use of a wider range of riparian and scrub habitats including screwbean mesquite and tamarisk

in addition to willow (SWCA 2020). In 2025, point-count surveys continued to detect Arizona Bell's vireo at multiple Riparian Reserve subunits, including Bunkerville East, Riverside, Mormon Mesa South, and Muddy River, with breeding code "possible" (PO) recorded at all subunits where the species was detected, indicating singing individuals in appropriate habitat during the breeding season (SWCA 2025).

In 2021 and 2022, SWCA conducted area-search surveys and incidental detection recording for Arizona Bell's vireo at 30 randomly selected sites across Clark County as part of a broader avian survey effort to refine habitat suitability models for the Clark County MSHCP Amendment (SWCA 2021b, 2022b). In 2021, surveyors recorded one detection during formal area-search surveys and 11 incidental detections, for a total of 12 detections across one site and one subplot. All detections but one were within predicted habitat modeled as optimal or suitable; the single detection outside predicted habitat was 318 m from the nearest predicted habitat boundary. All detections were associated with riparian vegetation adjacent to the Virgin River, lower Las Vegas Wash, or the lower Colorado River, consistent with desert riparian ecosystem classification. The sole survey detection was recorded at the northern Mohave Valley subplot, which was within 300 m of the Colorado River and contained a dense shrub layer of tamarisk and mesquite covering nearly half the subplot, the only survey site with habitat structure consistent with Bell's vireo requirements. The highest observed breeding evidence was a singing bird present seven or more days within an existing Riparian Reserve Unit in habitat modeled as optimal, indicating probable breeding. Ten of the 11 incidental detections were near previously recorded locations, corroborating existing county occurrence data.

The 2021 surveys found that key habitat requirements, primarily a dense shrub layer of sufficient height and areal extent, were absent from 27 of 30 survey sites. Although 22 subplots (37 percent) intersected habitat modeled as suitable for Arizona Bell's vireo, surveyors' observations indicated that the initial habitat model overestimated the species' presence in Clark County. Predicted suitable habitat included subplots in ecosystems where Bell's vireo is not known to breed (e.g., Mojave desert scrub, blackbrush, pinyon juniper, sagebrush) and at elevations above 1,300 m above mean sea level, beyond the species' typical breeding elevation. SWCA recommended that species-specific presence/absence surveys, with behavioral observations to distinguish territorial individuals from migrants, would be needed to increase the detection database and provide meaningful data for model refinement (SWCA 2021b).

In 2022, SWCA conducted follow-up area-search surveys for Arizona Bell's vireo at 30 sites across Clark County, with nine sites specifically selected to target the species. Survey efforts in 2022 focused on potential habitat fragments away from the three main rivers in Clark County (i.e., lower Colorado, Muddy, and Virgin Rivers). Surveyors recorded 32 detections during area searches and eight incidental detections, for a total of 40 detections (SWCA 2022b). Thirty of these detections were associated with subplots in three sites. All 39 detections within the county were in predicted habitat, with 79 percent in predicted suitable habitat and 13 percent in predicted optimal habitat. Of the area surveyed in 2022, 29 percent (163 ha across 26 subplots) was predicted Arizona Bell's vireo habitat; of that surveyed predicted habitat, only 4 percent (6 ha) was associated with detections.

Occupied territories were documented at the Meadow Valley Wash site, which was situated in the largest drainage surveyed in 2022 and contained the most extensive desert riparian habitat of any site surveyed. Detections were recorded on all three surveys at this site, with up to 17 detections during a single survey visit. The pattern of detections in both subplots represented probable breeding behavior (singing birds present seven or more days and multiple singing birds), and one Arizona Bell's vireo detection at the southern end of this site was greater than 2.5 km from any existing detection in the model input dataset, providing a new occurrence record. Single detections of migrant individuals were recorded at two additional sites (Wheeler Camp Spring and Creeks), verifying existing occurrence records at those locations. Survey results suggest that Arizona Bell's vireo uses smaller, more isolated, and more fragmented patches of habitat in Clark County for migration than for breeding. Some marginal habitat misclassification was also identified, where observed vegetation was typical of ecosystems not used by Arizona Bell's vireo (SWCA 2022b).

42.6 Recommendation

Recommended for coverage. This species *(Vireo bellii)* is experiencing population declines throughout its range (BirdLife International 2009), and both the least subspecies (*Vireo bellii pusillus*) and the Arizona subspecies (*Vireo bellii arizonae*) are listed as endangered in California. The Arizona subspecies (*Vireo bellii arizonae*) was petitioned and considered for listing under the federal Endangered Species Act previously and is considered a protected species in Nevada. The Arizona Bell's vireo has limited distribution in the MSHCP Plan Area but may be impacted by proposed activities.

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43.0 STICKY RINGSTEM (*ANULOCAULIS LEIOSOLENUS*)

43.1 Species Overview

Sticky ringstem (*Anulocaulis leiosolenus*) occurs on gypsum outcrops, rolling hills, and terraces in Mojave Desert scrub (which includes primarily creosote bush-white bursage) and salt desert scrub matrix ecological systems (Niles et al. 1999 in The Nature Conservancy [TNC] 2007). Four varieties of this species occur in North America (Spellenberg 2003). The variety that occurs in Clark County is southwestern ringstem (*Anulocaulis leiosolenus* var. *leiosolenus*). This variety occurs on gypsum soils and is thus considered a gypsophile (Spellenberg and Wootten 1999).

43.2 Range

Sticky ringstem (*Anulocaulis leiosolenus* var. *leiosolenus*) is endemic to arid regions of the southwestern U.S. and adjacent Mexico and has the largest range of all of the varieties of sticky ringstem. It occurs in southern Nevada (Clark County), extreme western Texas, south-central New Mexico, north-central Arizona, and northern Chihuahua, Mexico (Spellenberg and Wootten 1999, Spellenberg 2003). Its distribution is centered on two areas: (1) southern Nevada and northeastern Arizona and (2) New Mexico, western Texas, and northern Mexico (Hernandez-Ledesma et al. 2010), and broken down further into 17 populations, nine of which are in Clark County (TNC 2007).

The Clark County populations of sticky ringstem represent the westernmost region of this variety's range. The species overlaps with habitat for another rare plant within Clark County, the Las Vegas bearpoppy (*Arctomecon californica*) (TNC 2007), but has a narrower range and is much less abundant than the bearpoppy in Clark County (Newton 2010).

43.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not addressed
NatureServe Global and NV State Rank	G4T3T4 S2
IUCN Red List	None
CITES	None

Sticky ringstem is ranked T3 (Vulnerable) by NatureServe, with a global status last reviewed on November 1, 2021. An estimated 21 to 80 element occurrences are known rangewide, distributed across two disjunct areas: one in southern Nevada (Clark County) and northeastern Arizona (Coconino and Yavapai counties), and a second in New Mexico, western Texas, and northwestern Chihuahua, Mexico (NatureServe 2021). The area of occupancy is estimated at 26 to 125 4-km² grid cells. Both long-term and short-term population trends are listed as unknown, and global abundance is also unknown. Nevada's state rank for this variety is S2 (Imperiled). The variety has no listing under the U.S. Endangered Species Act.

43.4 Impact

Catastrophes, stochastic events, and climate change present threats to sticky ringstem at an ecosystem level (TNC 2007) due to the species' limited distribution.

TNC (2007) lists direct threats to sticky ringstem in Clark County to include gypsum mining, off-highway vehicle (OHV) use and trail development, feral horses and burros, rural and urban development, utility corridor construction and maintenance-related sprawl, federal land disposal, fire, invasive plant species, legal recreation use, habitat inundation and shoreline fluctuation at Lake Mead, military activities, agricultural activities, and trespass grazing. Wild horses and burros pose a threat as they can easily damage gypsum and cryptobiotic surface crusts where sticky ringstem grows. Once damaged, these areas are susceptible to erosion and invasive plants. Typically, invasive species are not recorded in high densities on gypsum soil because of the harsh soil conditions. The recent spread of the invasive species African malcolmia (*Malcolmia africana*) may pose a more serious threat than other invasive species to gypsum habitat and ringstem and Las Vegas bearpoppy populations (Bangle et. al. 2010).

Based on habitat modeling by Nussear et al. (2024), the MSHCP Amendment Plan Area contains approximately 115,646 acres of suitable habitat for sticky ringstem. Of this total, approximately 5,414 acres (4.7 percent) occur within the MSHCP Amendment Impact Area. A total of 75,304 acres (65.1 percent) of suitable habitat falls within lands managed for resource conservation, and 20,778 acres (18.0 percent) are within the MSHCP Amendment Reserve System Additions. Only 1 acre (0.0 percent) of suitable habitat occurs within the existing MSHCP Reserve System.

Sticky ringstem* *Anulocaulis leiosolenus var. leiosolenus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	115,646	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	5,414	4.7%
Suitable Habitat in Lands Managed for Resource Conservation	75,304	65.1%
Suitable Habitat in the existing MSHCP Reserve System	1	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	20,778	18.0%

*Nussear et al. 2024

43.5 Data

Spring 2020 surveys conducted by Ironwood Consulting for the Clark County Desert Conservation Program covered 22 general survey areas encompassing approximately 11,881 acres. Sticky ringstem was a non-modeled primary target species for these surveys; however, it was not detected. Autumn-season surveys specifically targeting sticky ringstem were not completed in 2020 due to below-average precipitation (Ironwood 2020).

The 2021 Ironwood Consulting surveys for the Clark County Desert Conservation Program encountered sticky ringstem at five locations: one location in Mud Wash, two locations in Echo Junction, and two locations at Bitter Spring, encompassing approximately 19.2 ac (7.8 ha) of occupied area with 90 individuals documented. Occurrences ranged in elevation from 464 to 620 m (1,522 to 2,034 ft). Occurrence quality was rated good to excellent; threats noted at two occurrences included trampling from recreational foot traffic and wild burro activity. Co-occurring invasive species, primarily Bromus rubens and/or *Strigosella africana*, were present at relatively low cover at three occurrences (Ironwood 2021).

Surveys conducted in 2023 found sticky ringstem at two locations: Bitter Springs North and Echo Hills North. Both locations represented new occurrence records, and all occupied areas were modeled as optimal habitat suitability by the initial species-specific habitat model provided by the DCP. The total occupied area across both occurrences was approximately 0.16 ac (0.06 ha), encompassing 11 individuals (3 at Bitter Springs North and 8 at Echo Hills North). Mean elevation ranged from 551 to 581 m (1,807 to 1,906 ft). Occurrence quality ranged from poor (Echo Hills North) to good (Bitter Springs North). Common associated species at both occurrences included Las Vegas bearpoppy (Arctomecon californica), silverleaf sunray (*Enceliopsis argophylla*), creosote bush (*Larrea tridentata*), Parry's sandpaper plant (*Petalonyx parryi*), and Fremont indigo bush (*Psorothamnus fremontii*). Invasive weeds had relatively low cover at both occurrences, restricted to scattered patches under shade of larger shrubs. Factors impacting occurrence quality included the presence of invasive weeds and observed signs of wild burro activity and OHV use outside of designated routes (Ironwood 2023).

43.6 Recommendation

Recommended for coverage. Sticky ringstem's limited distribution on gypsum soils makes it vulnerable to impacts resulting from the various human activities discussed above. Although this species overlaps on lands managed for Las Vegas bearpoppy, it has a wider range than the bearpoppy so management of Las Vegas bearpoppy may not be sufficient to protect sticky ringstem. Clark County also represents a distinct population center for this variety of sticky ringstem and may be important for the species' long-term viability.

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44.0 LAS VEGAS BEARPOPPY (*ARCTOMECON CALIFORNICA*)

44.1 Species Overview

The Las Vegas bearpoppy (*Arctomecon californica*) is a short-lived perennial herb in the poppy family (*Papaveraceae*) with showy yellow flowers that bloom from March through June. Las Vegas bearpoppy are restricted to gypsum soils (TNC 2007). Recent studies classify the species as a "gypsovag" (capable of occurring on soils with or without gypsum) rather than a strict gypsophile, as approximately 34.5 percent of documented occurrences are found on non-gypsic calcid soils (Stosich et al. 2022). Germination occurs during winter months in years with sufficient rainfall (Thompson and Smith 1997, Megill et al. 2011) and are most vulnerable in the early life stage, and losses of buds may hinder reproduction in years with low rainfall (Thompson and Smith 1997).

44.2 Range

Arctomecon californica is endemic to three counties in three states in the Mojave Desert: Clark County, Nevada; Washington County, Utah (introduced by seed); and Mohave County, Arizona. This species is taxonomically distinct with restricted distributions in Clark County (Hickerson and Wolf 1998). Thirteen (13) populations of Las Vegas bearpoppy occur in Nevada and all of the Clark County populations (10) occur on Federal lands. In Clark County, the bearpoppy occurs in several locations including Las Vegas Valley, White Basin, Las Vegas Dunes, Valley of Fire, Bitter Spring Valley, Gale Hills, Gold Butte, Government Wash, Middle Point, and Sunrise Valley.

44.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Fully Protected
State of Arizona	Salvage Restricted
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G1G2 S3
IUCN Red List	None
CITES	None

* Former candidate species. In 2024, USFWS issued 12-month finding that listing was not warranted.

Las Vegas bearpoppy is currently ranked G1G2 (Critically Imperiled to Imperiled) globally by NatureServe (NatureServe 2023), reflecting its restricted range and severe population decline. The species is ranked S3 (Vulnerable) in Nevada and S1S2 (Critically Imperiled to Imperiled) in Arizona, its only two states of occurrence (NatureServe 2023). It is not listed under the federal Endangered Species Act; in October 2024, USFWS issued a 12-month finding that listing the species as threatened or endangered was not warranted at that time (USFWS 2024).

The species occurs in approximately 57 mostly small and declining populations ranging from the vicinity of Las Vegas, Nevada, eastward to extreme northwestern Arizona near Lake Mead (NatureServe 2023). Its range extent is

estimated at approximately 6,000 square kilometers, with an area of occupancy of approximately 720 square kilometers (NatureServe 2023). Of these populations, only about six are considered to have good or excellent viability (NatureServe 2023).

Population trends for Las Vegas bearpoppy show marked long-term and short-term decline. NatureServe assigns both long-term and short-term trend ratings of a 50 to 90 percent decline (NatureServe 2023). In 1993, BLM estimated approximately 830,000 plants across 39,500 acres and 99 populations rangewide, figures that may reflect a cycle peak following above-average rainfall in 1992 and 1993 (Mistretta et al. 1996; Stosich et al. 2022). By 2000, the species' occupied range had declined by roughly half, to approximately 20,000 to 24,000 acres (TNC 2007). By 2007, estimated totals from 11 previously surveyed sites had fallen to approximately 10,000 plants (Cornelisse et al. 2019; Stosich et al. 2022). As of 1997 there were 108 known occurrences in Nevada, but by 2023 this number had dropped to an estimated 57 occurrences rangewide (NatureServe 2023). Current total population size is unknown but is estimated at between 2,500 and 100,000 individuals (NatureServe 2023).

Population fluctuations are driven in part by weather cycles. Many fragmented populations in the Las Vegas Valley were declared extirpated during 1996 and 1998 surveys, yet plants were found at 5 of 10 such populations following above-average winter rainfall in 2004 to 2005 (TNC 2007). This reflects the species' reliance on a persistent soil seed reserve, with seeds remaining viable for 15 years or more (Stosich et al. 2022). Eastern populations on protected lands are considered relatively stable when accounting for precipitation-driven recruitment pulses, while western Las Vegas Valley populations have experienced greater fragmentation and loss (TNC 2007; Stosich et al. 2022).

44.4 Impact

The primary threats to the Las Vegas bearpoppy include habitat clearing for development, highway construction and maintenance (Thompson and Smith 1997, TNC 2007), off-road vehicle use (Thompson and Smith 1997, TNC 2007), gypsum mining, flood-control projects, dumping, pollinator declines, habitat fragmentation, and invasive plants (Meyer 1986, Mistretta et al. 1996, NNHP 2001, TNC 2007). This species is also sensitive to the destruction of the cryptogamic soil crust from trampling by feral horses and burro (Mistretta et al. 1996). The decline of the rare Mojave poppy bee (*Perdita meconis*), the primary specialist pollinator of Las Vegas bearpoppy, is an additional threat. Fragmented western Las Vegas Valley populations have two to three times lower seed set compared to plants in unfragmented habitat at Lake Mead, reflecting reduced specialist pollinator activity and gene flow (Stosich et al. 2022). Extreme or long-term drought associated with climate change is also a significant threat; the southwestern U.S. is a regional climate change hotspot with projections for increasingly variable precipitation that could disrupt germination cues and plant–pollinator synchrony (Stosich et al. 2022).

Nussear et al. (2024) modeled Las Vegas Bearpoppy habitat suitability on the basis of average spring maximum temperature, soil gypsum content, vegetative productivity, soil silt content, and variation in winter precipitation. Habitat is broadly distributed throughout north-central Clark County. Approximately 492,466 acres of modeled medium- and high-suitability habitat exist within the MSHCP Amendment Plan Area. It is estimated that approximately 8.4 percent (41,479 acres) of suitable habitat may be impacted by plan activities, and 33.3 percent (163,990 acres) occur on lands managed for resource conservation. Approximately 0.1 percent (564 acres) of suitable habitat is protected within the existing MSHCP Reserve System, and an additional 11.6 percent (56,997 acres) is within the MSHCP Amendment Reserve System Additions (Nussear et al. 2024).

Las Vegas bearpoppy* *Arctomecon californica*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	492,466	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	41,479	8.4%
Suitable Habitat in Lands Managed for Resource Conservation	163,990	33.3%

Suitable Habitat in the existing MSHCP Reserve System	564	0.1%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	56,997	11.6%

*Nussear et al. 2024

44.5 Data

While data on the Las Vegas bearpoppy is more complete than for many other plants that occur in Clark County based on its status as an endemic species, there are several baseline information gaps in the collective knowledge of this plant. Additionally, there are many uncertainties regarding species and habitat information acquired thus far, and there is poor baseline species distribution and abundance information for Las Vegas Valley and some rural communities prior to development. Consequently, a complete accounting of habitat and population loss is unknown for the Las Vegas bearpoppy (TNC 2007). It is believed that populations of Las Vegas bearpoppy occurred on lands now used for urban development and gypsum mines. The BLM and National Park Service at Lake Mead National Recreation Area have programs focused on conservation of the Las Vegas bearpoppy (TNC 2007).

Clark County Desert Conservation Program rare plant surveys have documented Las Vegas bearpoppy at multiple locations across Clark County. Rare plant surveys conducted in 2020 encountered Las Vegas bearpoppy at four locations within St. Thomas Point. The survey area included a total of approximately 34 acres of occupied area and 690 individuals, at elevations ranging from 415 to 462 meters. Occurrence quality was rated good to excellent. Common associated species included *Ambrosia dumosa*, *Eriogonum insigne*, *Larrea tridentata*, and *Senegalia greggii* (Ironwood Consulting 2020).

In 2021 the surveys found Las Vegas bearpoppy at two locations within Echo Junction, three locations at Bitter Spring, and one location within Gold Butte West. The survey area included a total of approximately 22.9 acres of occupied area and 579 individuals, across an elevation range of 464 to 621 meters. Occurrence quality ranged from good to excellent, with some mortality attributed to multiple seasons of drought. Common associated species included *Anulocaulis leiosolenus* var. *leiosolenus*, *Enceliopsis argophylla*, *Ephedra torreyana*, and *Psorothamnus fremontii*. Proximity to other *A. californica* occurrences at several locations suggests that gene flow may be occurring between subpopulations (Ironwood Consulting 2021).

Surveys conducted in 2023 found Las Vegas bearpoppy at Bitter Spring North and Echo Hills North. The total occupied area included approximately 0.1 acre and seven individuals, across a mean elevation range of 550 to 574 meters (1,804 to 1,883 feet). Occurrence quality was rated as fair at both locations due to dry conditions and evidence of off highway vehicle tracks running nearby and off designated routes. Common associated species included *Anulocaulis leiosolenus*, *Enceliopsis argophylla*, *Larrea tridentata*, and *Psorothamnus fremontii* (Ironwood Consulting 2023).

44.6 Recommendation

Recommended for coverage. Based on the critically endangered status designation by the State of Nevada and range restricted primarily to Clark County, Nevada, we recommend this species for coverage. Although most, if not all, of the species' occurrence is on Federal lands, if the species were considered for listing it is likely the federal agencies responsible would be compelled to implement actions to avoid listing (candidate conservation agreement).

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45.0 WHITE BEARPOPPY (*ARCTOMECON MERRIAMII*)

45.1 Species Overview

The white bearpoppy, also variously called the desert poppy, desert bearpoppy, and great bearclaw poppy, is a tap-rooted perennial herb producing stout waxy stems 20 to 50 centimeters (7.9 to 19.7 inches) tall and hairy pale green leaves with rounded teeth located around the base of the plant. The inflorescence at the tip of each stem is composed of one white poppy flower with six petals and green sepals covered in long, white hairs. The fruit is a capsule containing many tiny seeds.

45.2 Range

The white bearpoppy is wholly confined to the northern Mojave Desert ecoregion and is found in salt desert scrub and Mojave Desert scrub habitats. The populations are scattered within various habitats including limestone and dolomite ridges, rocky slopes, gravelly canyon washes, and less often on valley bottoms, disturbed sites such as roadsides and bladed areas, and old lakebeds derived from carbonate rock sources and is often found in association with *Atriplex* (TNC 2007).

As of 1995, the range of white bearpoppy reached north to the Desert Range in Lincoln County, west to the western boundary of Death Valley National Park in Inyo County, California, east to Kane Spring Valley in Lincoln County, Nevada, and south to the Clark Mountain Range of San Bernardino County, California (Blomquist et al. 1995).

A total of 33 populations of white bearpoppy are known, and approximately one third of those populations are in Clark County. The Clark County populations are broken into three geographical classifications: north of the Spring Mountains (Spotted Range, Indian Springs, Pintwater Range, Desert Range, Black Hills, North Desert Range, and Three Lakes Valley); west of the Spring Mountains (Pahrump Valley); and, east of the Spring Mountains (Las Vegas Valley, Calico Hills, Bird Spring Range, and Devil Canyon). Populations in northwest Clark County represent the largest known populations for the species (TNC 2007).

45.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	2B.2
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3 S3
IUCN Red List	None
CITES	None

The range-wide trend for white bearpoppy is stable, but its trend has been described as declining in Las Vegas Valley (USFWS 2000) and overall in Nevada (Morefield 2001). White bearpoppy holds a global conservation status

of G3 (Vulnerable) according to NatureServe Explorer, indicating that the species is vulnerable to extinction due to a restricted range, relatively few populations, recent and widespread declines, or other factors. National and state/provincial statuses are N3 in the United States, and S3 in both California and Nevada. The species is not listed under the U.S. Endangered Species Act (ESA). The NatureServe global status was last reviewed on August 12, 2013, and is flagged as needing review. NatureServe estimates more than 150 small occurrences globally, with a global abundance of approximately 2,500 to 10,000 individuals and an area of occupancy calculated at 123 four-km² grid cells (NatureServe 2026). Short-term trend is characterized as a decline of less than 30 percent to relatively stable.

45.4 Impact

The threats to white bearpoppy in Clark County include urban/commercial development, military activities, OHV use, invasive plant competition, wild horses and burros, groundwater development, highway construction and maintenance, utility facility construction and maintenance, and BLM land disposal (TNC 2007). The California Native Plant Society also lists mining as a potential threat to this species (CNPS 2017).

Most of the populations of white bearpoppy occur on public lands including BLM-administered lands, Nellis Air Force Base (65 percent of total population), and Desert National Wildlife Refuge.

Within the MSHCP Amendment Plan Area, 367,063 acres of suitable white bearpoppy habitat have been identified (Hamilton and Kokos 2011). Of this total, 26,407 acres (7.2 percent) occur within the MSHCP Amendment Impact Area. A substantial portion of suitable habitat, 174,587 acres (47.6 percent), is located within lands managed for resource conservation. No suitable habitat (0.0 percent) falls within the existing MSHCP Reserve System; however, 46,995 acres (12.8 percent) of suitable habitat are included within the MSHCP Amendment Reserve System Additions.

White bearpoppy* *Arctomecon merriamii*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	367,063	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	26,407	7.2%
Suitable Habitat in Lands Managed for Resource Conservation	174,587	47.6%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	46,995	12.8%

*Hamilton and Kokos 2011

45.5 Data

No recent comprehensive status report has been prepared for the species throughout its range or in Nevada. As of 2001, white bearpoppy populations were estimated to possess more than 20,000 individuals and occupy about 974 ac (394 ha) of habitat throughout Nevada (Morefield 2001).

Limited data are available for DNWR and NAFB; Ackerman (1981) reported 110 sites and a total of 2,187 plants at DNWR and Knight and Smith (1994) documented 39 total populations and estimated 11,600 individuals for the southern ranges of NAFB in 1993. Knight and Smith (1994) reported four significant populations at NAFB that accounted for 65 percent of all individuals estimated in 1993. Subsequent surveys did not detect additional populations (Knight and Smith 1995, Knight et al. 1997). Las Vegas Valley has an undetermined number of plants that were identified vegetatively in 2005 and flowering in 2006 (Marrs-Smith, personal communication in TNC 2007).

In Clark County, white bearpoppy was encountered at one location in the Desert National Wildlife Refuge and two locations in Desert Range during the 2021 Clark County Rare Plant Survey. These comprise three distinct occurrences totaling 135 individuals occupying 37.5 ac (15.2 ha), across an elevation range of 1,269 to 1,558 m (4,163 to 5,112 ft). Common associates observed at multiple occurrences included *Atriplex confertifolia*, *Echinocactus polycephalus*, *Ephedra* spp., and *Yucca brevifolia*. The occurrences were given an overall quality rating of fair to good The occurrence at the Desert National Wildlife Refuge was rated as fair due to high observed mortality from unknown causes, while the two Desert Range occurrences were rated as good (Ironwood Consulting 2021). White bearpoppy was listed as a secondary target species in both the 2020 and 2021 Clark County rare plant surveys; no occurrences were documented during 2020 field surveys (Ironwood Consulting 2020, 2021). White bearpoppy was not included as a primary or secondary target species in the 2023 Clark County Rare Plant Survey, which focused on ten other target taxa across approximately 12,492 acres surveyed within the county between April 10 and May 20, 2023 (Ironwood Consulting 2023).

45.6 Recommendation

Not recommended for coverage. The white bearpoppy occurs primarily on federal lands and is thought to be relatively stable there, and thus, is not under imminent threat of listing. Should a listing proposal be considered, the federal agencies responsible for management would likely be compelled to implement actions to avoid listing (candidate conservation agreement).

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46.0 THREECORNER MILKVETCH (*ASTRAGALUS GEYERI* VAR. *TRIQUETRUS*)

46.1 Species Overview

Threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*) is a small annual plant specific to sandy habitat and is one of the first plants to bloom in early spring (Swearingen 1981, Bangle 2012). Ecosystems associated with higher suitability habitat include sagebrush, blackbrush and mixed conifer, and Mojave desert scrub.

46.2 Range

Almost the entire range of threecorner milkvetch is in Clark County, Nevada with limited encroachment into Lincoln County, Nevada and Mohave County, Arizona (Swearingen 1981, Bangle 2012). Within Nevada, the species occurs on sandy soils derived from the Tertiary-aged Muddy Creek Formation and redistributed as Aeolian and fluvial deposits along the Muddy and Virgin rivers and the Overton Arm of Lake Mead from Sandy Cove and Middlepoint to the Mormon Mesa (NNHP 2001, Niles et al. 1995, Bangle 2012). The range extends from Dry Lake Valley in the west to the confluence of the Muddy and Virgin rivers in the east, and from Sandy Cove and Ebony Cove on the north shore of Boulder Basin at Lake Mead in the south to the Virgin River drainage in the far northeast of the county, including populations near the Muddy River drainage (Niles et al. 1995, TNC 2007, Bangle 2012).

46.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Fully Protected
State of Arizona	Special-status species
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G4T2 S2S3
IUCN Red List	None
CITES	None

* Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer include this category.

Threecorner milkvetch is currently under review for federal protection under the Endangered Species Act. On April 25, 2019, Basin and Range Watch and Western Watersheds Project petitioned for the species to be listed as threatened or endangered with critical habitat designated. The USFWS made a positive 90-day finding on March 24, 2021, determining that the petition presented substantial scientific or commercial information indicating that listing may be warranted (Federal Register Vol. 86, No. 55; USFWS 2021a). A status review was subsequently initiated by the USFWS Southern Nevada Fish and Wildlife Office (Docket No. FWS-R8-ES-2020-0056). The species is included in the USFWS FY23 to 27 and FY24 to 28 National Domestic Listing Workplans, and the Endangered

Species Act status remains “Under Review” as of the date of this report (NatureServe 2026, USFWS 2023, USFWS 2024). The species is also listed as critically endangered by the State of Nevada and occurs on the BLM Sensitive Species list.

NatureServe assigns threecorner milkvetch a global conservation status of G4T2 (Imperiled variety), with a national status of N2 in the United States. State ranks are S1 (Critically Imperiled) in Arizona and S2S3 (Imperiled to Vulnerable) in Nevada. The degree of threat is assessed as High, with a long-term trend of 10 to 50 percent decline and a short-term trend that is relatively stable, though population counts are highly variable due to annual precipitation dependence (NatureServe 2026).

46.4 Impact

Habitats in which threecorner milkvetch occurs are threatened by modification and development, off-road vehicles, invasive plant species, agriculture, utility corridors, and sand mining (TNC 2007, Bangle 2012, Powell 1999). Sahara mustard (*Brassica tournefortii*) and Mediterranean grass (*Schismus* sp.) have been identified as potential habitat threats, as these species can outcompete or stabilize the sandy systems in which threecorner milkvetch occurs (Powell 1999).

The 90-day petition review found credible and substantial information supporting listing due to threats under Factor A (habitat destruction, modification, or curtailment) and Factor D (inadequacy of existing regulatory mechanisms). Specifically, the review found substantial information related to: (1) energy development, including the Gemini Solar Project proposed in occupied habitat and three utility-scale photovoltaic projects in the Dry Lake Solar Energy Zone adjacent to the Mud Lake population; (2) utility transmission construction and maintenance, including the proposed Section 39-113 West-wide Energy Corridor potentially overlapping with the California Wash and Mormon Mesa populations; and (3) weedy invasive plants, particularly Sahara mustard, red brome, and Mediterranean grass, which have proliferated throughout nearly all known threecorner milkvetch populations (USFWS 2021b). Additional potential threats, including livestock grazing, off-highway vehicle use, urban development, increased recreation, drought, and habitat fragmentation, were noted for full evaluation during the 12-month status review.

Nussear et al. (2024) modeled threecorner milkvetch habitat suitability on the basis of winter precipitation, winter minimum temperature, vegetative productivity, slope, soil silica content, soil sand content, and vegetation. Medium- and high-suitability habitat are predicted to occur north of Lake Mead and in the Ivanpah Valley. Approximately 285,042 acres of modeled suitable habitat exist within the MSHCP Amendment Plan Area. It is estimated that approximately 7.2 percent (20,518 acres) of this habitat may be impacted by plan activities. Approximately 34.0 percent (96,853 acres) of suitable habitat occurs within lands managed for resource conservation, and 0.6 percent (1,625 acres) falls within the existing MSHCP Reserve System. An additional 5.6 percent (15,918 acres) of suitable habitat is located within MSHCP Amendment Reserve System additions (Nussear et al. 2024)..

Threecorner milkvetch* *Astragalus geyeri var. triquetrus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	285,042	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	20,518	7.2%
Suitable Habitat in Lands Managed for Resource Conservation	96,853	34.0%
Suitable Habitat in the existing MSHCP Reserve System	1,625	0.6%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	15,918	5.6%

*Nussear et al. 2024

46.5 Data

Threecorner milkvetch presents significant challenges for population monitoring due to its ephemeral, precipitation-dependent life history. The species does not bloom every year, and annual fluctuations in abundance are driven by rainfall and temperatures, making population size estimates difficult. NatureServe estimates a range extent of 1,000 to 5,000 square kilometers for the species, with an area of occupancy estimated at 103 grid cells (2 km x 2 km) and approximately 56 occurrences range-wide based on data collected through 2024. Of eighteen occurrences that have been ranked for viability, six have a rank of Good (B) and none rank as Very Good (A). Global abundance is considered unknown and highly variable due to precipitation dependence (NatureServe 2026).

Clark County Desert Conservation Program survey data from Ironwood Consulting document the severe impacts of the ongoing megadrought on threecorner milkvetch populations. In the 2020 Rare Plant Survey Report, threecorner milkvetch was found at 14 locations within six survey areas: Halfway Wash, Logandale Trails, Moapa Indian Reservation, South Mormon Mesa, St. Thomas Point, and Virgin River. These populations were ranked fair to excellent in health and encompassed a total of approximately 4 acres of occupied area with 259 individuals (Ironwood Consulting 2020).

During the 2021 surveys, threecorner milkvetch was not detected at any previously known locations, despite targeted surveys of suitable habitat. The absence was attributed to drought conditions: the Las Vegas area received only approximately 2.4 inches of precipitation in 2020 and 1.9 inches in 2021, both well below the 30-year average of 4.2 inches. The above-average precipitation in 2019 (6.9 inches) is believed to have stimulated germination during the spring 2020 season, while two consecutive below-average years resulted in an absence of annual plants and reduced vigor of perennials in 2021 (Ironwood Consulting 2021). No individuals were detected in 2022.

In 2023, threecorner milkvetch was found at East Mormon Private and West Mormon 2 survey areas during the 2023 surveys. Both locations represent new occurrence records, and the populations were observed to be fair in health, largely due to the small number of diminutive individuals present at each location. A total of 14 individuals were documented across approximately 0.1 acres (0.04 ha) of occupied area. The mean elevation ranged from 399 to 509 m (1,309 to 1,669 ft). Both occurrences fell within areas modeled as optimal habitat suitability. Common associated species recorded at both occurrences included gravel milkvetch (*Astragalus sabulonum*), big galleta (*Hilaria rigida*), large desert evening primrose (*Oenothera deltoides*), and apricot mallow (*Sphaeralcea ambigua*). Invasive weed cover was relatively low at both locations. In summary, across the Clark County Desert Conservation Program surveys: 250 plants were documented across 14 sites in 2020; zero plants were found in 2021 and 2022; and 14 plants were detected at two sites in 2023 (Ironwood Consulting 2020, Ironwood Consulting 2021, Ironwood Consulting 2023). The 2023 detections are consistent with the species' known precipitation dependence: after two consecutive below-average precipitation years (2021 to 2022) during which the species was not detected, the comparatively wetter 2022 to 2023 season triggered limited germination, though total annual precipitation remained approximately half the amount recorded during the 2019 to 2020 season (Ironwood Consulting 2023).

These survey findings are consistent with U.S. Geological Survey (USGS) seed ecology research conducted from 2020 to 2022, which found no live *Astragalus geyeri* var. *triquetrus* plants at any of the 17 known population groups during field surveys, and no seeds of the species in soil seed bank samples from four populations (California Wash, Mud Lake, Bark Bay, Sandy Cove). No seedlings emerged during a nine-month greenhouse incubation of habitat soils, and no seeds of the species were recovered from soil samples sieved at the end of the incubation period, indicating that the species was extremely rare or absent from the seed bank during the prolonged drought period (DeFalco et al. 2023).

46.6 Recommendation

Recommended for coverage. The range of threecorner milkvetch is almost entirely within the Plan Area, and this species is listed by the State of Nevada as critically endangered and was once listed as a Category 2 species by the U.S. Fish and Wildlife Service.

There is potential for this species to become federally listed in the lifetime of the permit because of the extremely restricted range and threats from development and recreational activities within its range. The USFWS made a positive 90-day finding in March 2021 and has included the species in successive National Domestic Listing Workplans (FY23 to 27 and FY24 to 28), further increasing the likelihood of a federal listing determination during the permit period (USFWS 2023, USFWS 2024, NatureServe 2026).

Based on its status, range, potential for this species to become listed, and impacts to this species from covered activities, threecorner milkvetch is recommended for coverage under the MSHCP.

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47.0 STRAW MILKVETCH (*ASTRAGALUS LENTIGINOSUS* VAR. *STRAMINEUS*)

47.1 Species Overview

Straw milkvetch (*Astragalus lentiginosus* var. *stramineus*) is a monocarpic or short-lived perennial that flowers or fruits only once in its life (Barneby 1989). This variety is also known by the common names freckled milkvetch or mottled milkvetch.

47.2 Range

At the species level, straw milkvetch is widespread, but the variety *A. l.* var. *stramineus* is restricted to Clark County, Nevada; Washington County, Utah; and Mohave County, Arizona (Barneby 1989, Schoener 1975). NatureServe (2026) estimates 20 to 22 occurrences in Arizona, 7 in Utah, and 9 to 10 in Nevada, for an estimated global total of 6 to 80 element occurrences. The southernmost occurrences are found in Yavapai County, Arizona, in Prescott National Forest and along Highway 93. A recent herbarium specimen has extended the known range northwest into the Basin and Range National Monument in Nevada.

This variety occurs in sandy and gravelly valley flats, washes, and dunes at elevations between 1,575 feet and 3,281 feet (480 to 1,000 meters) in creosote bush (*Larrea tridentata*), blackbrush (*Coleogyne ramosissima*), and other mixed desert shrub communities in the Virgin River Valley (Barneby 1989, NNHP 2017). This variety is dependent on deep sand or sand dunes in Nevada (BLM 2009).

Within Clark County, straw milkvetch occurs in the northeast corner of the County along the Virgin River's main stem and its intermittent tributaries and nearby roads (SEINet 2017; NNHP 2017).

47.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
State of Utah	None
NV Division of Natural Heritage	None
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G5T2T3, S1
IUCN Red List	None
CITES	None

NatureServe (2026) assigns straw milkvetch a global conservation status of G5T2T3 (rounded to T2, Imperiled), reflecting the imperiled status of this variety within the secure parent species. In the United States, the species ranks N2N3. At the state level, it is ranked S1 (Critically Imperiled) in both Nevada and Utah and has no status rank (SNR) in Arizona. The species is not listed under the federal Endangered Species Act and has no CITES or IUCN designation. It is designated a BLM Sensitive Species.

Insufficient population data are available for this species to determine population trends; however, NatureServe (2026) notes that the species is locally plentiful within its restricted range.

47.4 Impact

Straw milkvetch is known to occur in Mojave Desert Scrub habitat, which is susceptible to invasive plant infestations, development, off-highway vehicle use, mining, grazing, and fires (Clark County 2000). Road maintenance is also identified as a likely threat because many occurrences are roadside; however, BLM (2009) noted that the species can tolerate mild disturbance, which may be beneficial at some roadside sites, while larger construction projects would likely be detrimental (NatureServe 2026). The taxon occurs on BLM land, including within the Beaver Dam Wash National Conservation Area.

An updated ensemble habitat suitability model for straw milkvetch was developed as part of the 2025 Desert Conservation Program covered species model updates (Simandle and Nussear 2025). Areas of high habitat suitability are predicted to occur in northeast Clark County, particularly near the Virgin River north of Lake Mead, the Muddy River at Moapa, and along the Meadow Valley Wash. The most influential predictor variables across model runs included the silica index, the coefficient of variation in winter precipitation, maximum vapor pressure deficit, and fractional cover of bare ground, consistent with the species' association with sparsely vegetated, gypsiferous or silica-rich substrates with relatively stable winter moisture conditions.

According to the habitat suitability model (Simandle and Nussear 2025), straw milkvetch has approximately 13,403 acres of suitable habitat within the MSHCP Amendment Plan Area. Of this total, 3,437 acres (25.6 percent) occur within the MSHCP Amendment Impact Area. Approximately 2,854 acres (21.3 percent) of suitable habitat occur within lands managed for resource conservation. No suitable habitat is modeled within the existing MSHCP Reserve System or the MSHCP Amendment Reserve System Additions (0 acres, 0.0 percent each).

Straw milkvetch* *Astragalus lentiginosus var. stramineus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	13,403	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	3,437	25.6%
Suitable Habitat in Lands Managed for Resource Conservation	2,854	21.3%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	0	0.0%

*Simandle and Nussear 2025

47.5 Data

No notable taxonomic uncertainty has been identified for *Astragalus lentiginosus* var. *stramineus*. However, as with many rare desert plants, surveying for this species can be challenging due to its monocarpic or short-lived perennial life history, which results in highly variable year-to-year detectability depending on precipitation and other environmental conditions.

Clark County Desert Conservation Program rare plant surveys conducted in 2020 and 2021 included straw milkvetch as a secondary target species. The species' typical survey habitat is described as sandy and gravelly valley flats, washes, and dunes in the creosote-bursage, blackbrush, and mixed-shrub zones (Ironwood 2020, 2021). Straw milkvetch was not detected during either survey effort, providing negative occupancy data for the areas covered. The 2023 rare plant surveys did not include straw milkvetch as a primary or secondary target species; accordingly, no survey effort was directed toward this taxon and no detection data were generated

(Ironwood 2023). The surveyed areas across all three survey efforts represent only a small fraction of predicted suitable habitat in the County.

47.6 Recommendation

Not recommended for coverage. Straw milkvetch is not recommended for coverage because of the lack of data on its status and population trends. In addition, a majority of its habitat is on public lands with 25 percent of the total modeled high- and medium-suitability habitat in conserved lands.

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48.0 HALFRING MILKVETCH (*ASTRAGALUS MOHAVENSIS* VAR. *HEMIGYRUS*)

48.1 Species Overview

The halfring milkvetch (*Astragalus mohavensis* var. *hemigyrus*) is an annual or short-lived forb (Spellenberg 1993). It is also known as curved-pod milkvetch. Halfring milkvetch is distinguished from the more common variety of Mojave milkvetch by its curved or coiled seed pods. This rare variety is known from rocky ledges and arid gravelly hillsides on limestone, including carbonate gravels and derivative soils on terraced hills and ledges, open slopes, and along washes in the creosote-bursage, blackbrush, and mixed-shrub zones (Morefield 2001; NNHP 2001). It also occurs in Mojave desert scrub and Joshua tree woodland communities (NatureServe 2026).

48.2 Range

Halfring milkvetch is restricted to southern Nevada and California. The species is known from the Charleston Mountains of southern Nevada (Clark County) and from Inyo County, California, where a population near the type locality in the west Death Valley area was rediscovered in 2001 (Baldwin et al. 2012; NatureServe 2026). Another California site near Darwin Mesa in Inyo County is considered historical. The NatureServe global range extent is estimated at 5,000 to 20,000 square km (approximately 2,000 to 8,000 square miles). Approximately 30 occurrences have been documented in Nevada since 1997, and one extant occurrence is documented in California as of 2015 (NatureServe 2026).

Predicted high suitability and moderate habitat for this species is largely contained within Blackbrush and Mojave Desert Scrub ecosystems, with some incursion into Salt Desert Scrub (SWECO 2018). The species occurs on lands administered by the BLM, USFWS, Department of Defense (DoD) United States Air Force, Humboldt-Toiyabe National Forest, and possibly private lands (NNHP 2001).

Within Nevada, this species is known from the west slopes of the Spring Mountains and in the Indian Ridge area (Niles and Leary 2007). It has been located in Clark, Lincoln, and Nye counties, Nevada (NNHP 2001). The elevational range is approximately 2,999 to 5,479 feet (914 to 1,670 m) (NNHP 2001).

48.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
California Native Plant Society	1B.1
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3G4T2T3 S3
IUCN Red List	None
CITES	None

Halfring milkvetch is currently tracked by NatureServe with a global rank (G-rank) of G3G4 for the species and a variety rank (T-rank) of T2T3 (imperiled to vulnerable), reflecting the limited range and small number of known occurrences globally. The state rank (S-rank) for Nevada is S3 (vulnerable), indicating potential vulnerability to extirpation due to restricted range and few occurrences (NatureServe 2026). The species is listed on the NNHP Animal and Plant At-risk Tracking List (NNHP 2025). Halfring milkvetch does not have a listing under the federal Endangered Species Act and has no designation under CITES or the IUCN Red List.

Population trends are incompletely known for this species. Early records documented 43 individuals in a 405-acre (1.6 km²) area during Nevada censuses, with the last entered survey prior to 2020 conducted in 1999 (NNHP 2001). The species was believed extirpated from California (Spellenberg 1993) but was subsequently rediscovered in Inyo County (Wojciechowski and Spellenberg 2012; California Native Plant Society [CNPS] 2017). Recent survey work in Clark County has expanded the known distribution of the species, suggesting that the population may be more widespread than previously recognized, though the extent of suitable habitat and population stability remain uncertain.

48.4 Impact

The community types where halfring milkvetch occurs are susceptible to invasive grass infestations and wildfire across the northeast Mojave Desert including all of Clark County (Brooks et al. 2007, Van Linn et al. 2013). Plants are potentially susceptible to incineration, loss of seed bank, and competition from invasive grasses (Esque et al. 2010). Additional documented and potential threats include off-road vehicle use and other recreational activities on public lands (NatureServe 2026; Morefield 2001); livestock, feral horse, and burro grazing (Morefield 2001; Spahr et al. 1991); historical talc mining that may have eliminated much of the California population (CNPS 2017); large-scale renewable energy development in the Mojave Desert region (NatureServe 2026); and dumping and associated habitat degradation (Morefield 2001).

The species occurs on lands administered by BLM, USFWS, Department of Defense, Forest Service, and possibly private lands (NNHP 2001). Some conservation measures for the species may be implemented on the aforementioned lands, but none specifically covering this species have been identified.

According to recent habitat modeling efforts (SWECO 2018), it is estimated that 697 acres (3 km2) of high suitability habitat and 9,027 acres (37 km2) of medium suitability habitat may be impacted by activities covered under the amended MSHCP. A total of 887,363 acres (3,591 km2) medium and high suitability habitat is present within Clark County; however, a majority of the high suitability habitat is above 4,000 feet in elevation and outside of the Plan Area.

Based on habitat modeling (SWECO 2018), approximately 272,033 acres of suitable habitat for halfring milkvetch occur within the MSHCP Amendment Plan Area. Of this, 1,160 acres (0.4 percent) fall within the MSHCP Amendment Impact Area. Approximately 152,343 acres (56.0 percent) of suitable habitat are located within lands managed for resource conservation. No suitable habitat is currently within the existing MSHCP Reserve System; however, 34,285 acres (12.6 percent) of suitable habitat are within the MSHCP Amendment Reserve System Additions.

Halfring milkvetch* *Astragalus mohavensis var. hemigyrus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	272,033	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	1,160	0.4%
Suitable Habitat in Lands Managed for Resource Conservation	152,343	56.0%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%

Halfring milkvetch* *Astragalus mohavensis var. hemigyrus*	Acres	Percent of Total Habitat within Plan Area
Suitable Habitat in the MSHCP Amendment Reserve System Additions	34,285	12.6%

*SWECO 2018

48.5 Data

Halfring milkvetch is a morphologically distinct variety of *Astragalus mohavensis*, differentiated primarily by its curved or coiled seed pods. Because the species is an annual or short-lived perennial, detectability is strongly influenced by annual precipitation and soil moisture conditions. Populations may appear absent in drought years, complicating assessments of distribution and abundance. These factors contribute to uncertainty about the true extent and stability of the species within its range.

Recent field surveys by Ironwood Consulting have substantially updated knowledge of the species' distribution in Clark County, Nevada. Rare plant surveys conducted by Ironwood Consulting in 2020 discovered two robust populations of halfring milkvetch within the Wilson Pass survey area (Ironwood Consulting 2020). A total of 44 individuals were counted occupying 0.85 acres, across an elevation range of 1,364 to 1,465 m (approximately 4,475 to 4,806 ft). Both occurrences received an overall quality rating of excellent. Associated vegetation included *Yucca schidigera, Aristida purpurea, Artemisia bigelovii, Brickellia atractyloides, Cheilanthes parryi, Encelia resinifera, Encelia virginensis, Ephedra funerea, Eriogonum inflatum, Prunus fasciculata, Thamnosma montana,* and *Yucca brevifolia*.

Halfring milkvetch was not recorded as a target species occurrence during the 2021 Ironwood Consulting rare plant surveys in Clark County. The 2021 survey effort focused on different survey areas from 2020 and did not resurvey Wilson Pass. Notably, the 2021 report documented that several annual and short-lived perennial species encountered in 2020 were absent in 2021, attributed to consecutive years of below-average precipitation (approximately 1.9 inches in 2021 versus the 30-year average of 4.2 inches). This climatic context is relevant to interpreting halfring milkvetch detectability and population variability across survey years (Ironwood Consulting 2021). Three additional new occurrences of halfring milkvetch were discovered in 2023 near Indian Ridge, ranging from fair to good in quality (Ironwood Consulting 2023).

48.6 Recommendation

Not recommended for coverage. Halfring milkvetch is not recommended for coverage because of the limited data on its overall status, modest conservation concern, and lack of documentation of pervasive threats throughout its range. Furthermore, a substantial portion of its range in Clark County and modeled high suitability habitat is above 4,000 feet in elevation and outside of the Plan Area.

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49.0 MOKIAK MILKVETCH (*ASTRAGALUS MOKIACENSIS*)

49.1 Species Overview

Mokiak milkvetch (*Astragalus mokiacensis*) is a robust perennial herbaceous plant species named after Mokiak Canyon, Arizona where it was first collected (Barneby 1989). The plant has erect stems growing in ascending clumps and is pubescent overall (McDougall 1973). It produces purple flowers that bloom most intensely from April through June and plants can grow as tall as 40 cm.

49.2 Range

Mokiak milkvetch has a restricted global range, occurring in Clark County, Nevada; Mohave County, Arizona; and Washington County, Utah. The species is found on sandy to gravelly soils in association with upper cholla/creosote bush communities at elevations ranging from 2,460 to 3,900 feet (NNHP 2001). Several local variants are known to have individualized substrate preferences. Within Nevada, distribution in Clark County is primarily at Gold Butte National Monument with an outlying occurrence known from the Overton Arm of Lake Mead.

49.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3G4Q, S1S2
IUCN Red List	None
CITES	None

NatureServe assigns Mokiak milkvetch a global conservation status of G3G4Q (Vulnerable to Apparently Secure, with taxonomic uncertainty), last reviewed in October 2015 (NatureServe 2026). The species is ranked S1S2 (Critically Imperiled to Imperiled) in Nevada, S2 (Imperiled) in Arizona, and S1 (Critically Imperiled) in Utah (NatureServe 2026). It is not listed under the Endangered Species Act, and no CITES or IUCN designations apply to this species.

49.4 Impact

Fires and fire abatement projects along with surface-disturbing activities such as off highway vehicle use and trail and road construction pose potential threats to this species. Illegal cattle grazing may be a threat within the Gold Butte National Monument. Invasive annual grasses compete with Mokiak milkvetch and increase fuel loads making fires and fire abatement activities more likely. The majority of known occurrences of this species in Clark County are located within Gold Butte National Monument, which is conserved land protected from development. Activities covered under the amended MSHCP are therefore unlikely to significantly impact most populations of this species.

Based on the habitat analysis (SWECO 2018), the MSHCP Amendment Plan Area contains approximately 60,803 acres of suitable habitat for Mokiak milkvetch. None of this suitable habitat (0 acres; 0.0 percent) falls within the MSHCP Amendment Impact Area. Approximately 58,505 acres (96.2 percent) of suitable habitat is located within lands managed for resource conservation, and 1,347 acres (2.2 percent) occurs within the MSHCP Amendment Reserve System Additions. No suitable habitat occurs within the existing MSHCP Reserve System (0 acres; 0.0 percent).

Mokiak milkvetch* *Astragalus mokiacensis*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	60,803	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	0	0.0%
Suitable Habitat in Lands Managed for Resource Conservation	58,505	96.2%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	1,347	2.2%

*SWECO 2018

49.5 Data

NatureServe assigns this species a “Q” qualifier to its global rank, indicating taxonomic uncertainty about the species’ status (NatureServe 2026). This uncertainty may affect the reliability of available conservation assessments and population estimates.

The National Park Service (NPS) conducted surveys between 2005 and 2010 that found the species to be extant in previously documented localities, and some new populations were discovered (NPS 2010). Individuals per population ranged from one to hundreds, with an average of 15 individuals per population (NPS 2010). In recently burned areas, numbers of individuals were lower, though fire did not exclude the species entirely, even in severely burned areas (NPS 2010).

Clark County Desert Conservation Program rare plant surveys conducted in spring 2020 and in spring and fall 2021 included Mokiak milkvetch as a secondary target species, but it was not detected during either survey effort (Ironwood Consulting 2020, 2021). No occurrences were detected during subsequent rare plant surveys conducted in 2023 (Ironwood Consulting 2023).

49.6 Recommendation

Not recommended for coverage. Based on currently available data, it is not anticipated that Mokiak milkvetch will become federally listed over the lifetime of the permit. Most of its range in Nevada is within the recently established Gold Butte National Monument and is protected from development. Activities covered under the MSHCP are unlikely to affect the species, as it occurs predominantly on conserved land in Clark County; therefore, it is not recommended that Mokiak milkvetch be included in the MSHCP.

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50.0 ALKALI MARIPOSA LILY (*CALOCHORTUS STRIATUS*)

50.1 Species Overview

Alkali mariposa lily (*Calochortus striatus*) is a rare bulbiferous perennial forb (USDA 2016) in the Liliaceae family. It was originally described from San Bernardino County, California (Parish 1902). The species epithet comes from the Latin *striatus* (striped), a reference to the purple vertical stripes on the petals of the species. The conspicuously dark-veined flowers are pollinated by flies and bees (Tollefson 1992).

50.2 Range

Alkali mariposa lily has been found in five counties in southern California (CNPS 2017) and two counties (Nye and Clark) in southern Nevada (Morefield and Knight 1991, NNHP 2001). The species occurs across an elevation range of 73 to 1,634 meters (239 to 5,360 feet). Alkali mariposa lily is restricted to seasonally moist alkaline soils associated with desert springs, floodplains, and topographic depressions within Mojave scrub, creosote bush, and blackbrush ecological systems.

The known distribution of alkali mariposa lily in Clark County is limited to the western portion of the county. It occurs in the Calico Hills and at Lone Willow Spring, and it has likely been extirpated from Las Vegas Valley. Clark County populations of alkali mariposa lily are an eastern disjunct of the range-wide distribution, isolated from core populations in the west Mojave Desert by approximately 160 air miles; as such, they possibly represent important populations for genetic and ecotypic variation within this distinctive species (TNC 2007). Historic collections in Clark County appear to be confined to a 9-kilometer radius within the Red Rock Canyon National Conservation Area, which also represents the easternmost range extent for this species. The nearest occurrences in Nevada outside of Clark County are located approximately 85 kilometers to the northwest, near the California border in Nye County (Ironwood Consulting 2023).

The few occurrences of alkali mariposa lily in Clark County are mapped on Aztec sandstone, alluvial deposits, and the Chinle Formation. Soil associations mapped at alkali mariposa lily populations include Rock outcrop-St. Thomas complex and Cave loamy fine sand (TNC 2007).

50.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	1B.2
NV Division of Natural Heritage	None
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3 S1
IUCN Red List	None
CITES	None

* Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession

> of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer include this category.

NatureServe (2026) ranks alkali mariposa lily as G3 (Vulnerable) globally, reflecting a restricted range and approximately 100 extant occurrences in California and approximately 6 in Nevada. The species is ranked N3 in the United States. In Nevada, it is ranked S1 (Critically Imperiled); in California it is ranked S2S3 (Imperiled to Vulnerable). The species has no status under the federal Endangered Species Act. The species has no listing under the CITES or the IUCN Red List.

NatureServe (2026) identifies a short-term population trend of decline of 10 to 30 percent, with four extirpated occurrences documented in California and one historic occurrence in Nevada. The degree of threat is rated as high. Major threats identified by NatureServe include lowering of the water table, livestock grazing, competition from weedy species, and land development; additional threats include road construction, military operations, dumping, and grading.

50.4 Impact

Threats to alkali mariposa lily include urban, commercial, and rural development (which led to the loss of the Las Vegas Valley population), non-native wild horses and burros, invasive plant species, off-highway vehicle use and trail development, groundwater development, cement mining, highway and road construction and maintenance, and utility corridor construction and maintenance. These threats have reduced the size and extent of populations and habitats through both direct mortality of individuals and loss or fragmentation of habitats. They have altered the composition of plant communities by reducing native plants, spreading invasive weeds, and altering surface water and groundwater flows.

Simandle and Nussear (2025) modeled alkali mariposa lily habitat suitability on the basis of silica index, vapor pressure deficit maximum, soil pH, and minimum temperature. Predicted medium- and high-suitability habitat occur around the periphery of the Spring, Sheep, Birdsprings, McCullough, and Virgin mountain ranges (Simandle and Nussear 2025). Within the MSHCP Amendment Plan Area, approximately 4,510 acres of suitable alkali mariposa lily habitat have been identified (Simandle and Nussear 2025). Of this total, 63 acres (1.4 percent) occur within the MSHCP Amendment Impact Area. Approximately 3,625 acres (80.4 percent) are located on lands managed for resource conservation, and 633 acres (14.0 percent) occur within the MSHCP Amendment Reserve System Additions. No suitable habitat (0.0 percent) occurs within the existing MSHCP Reserve System.

Alkali mariposa lily* *Calochortus striatus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	4,510	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	63	1.4%
Suitable Habitat in Lands Managed for Resource Conservation	3,625	80.4%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	633	14.0%

*Simandle and Nussear 2025

50.5 Data

Taxonomic and data uncertainties have historically affected the conservation assessment of this species. In 1993 the USFWS identified alkali mariposa lily as a Category 2 species, defined as taxa for which information indicated that listing as endangered or threatened was possibly appropriate, but for which sufficient data on biological

vulnerability and threat were not then available to support proposed rules (USFWS 1993). The California Native Plant Society has classified this plant in California, where it is more widespread, as "Classified Rare Plant Rank 1B: rare, threatened, or endangered in California and elsewhere". It is also a Focus Species in the Desert Renewable Energy Conservation Plan (BLM et al. 2015, CNPS 2017).

Of the 10 species of *Calochortus* that occur in Nevada, alkali mariposa lily is the only species of the genus considered rare (Morefield 2001). No systematic surveys have been conducted in Nevada, and the trend of alkali mariposa lily populations in Nevada is unknown (Morefield 2001). Alkali mariposa lily was included in the survey of endemic plants at Ash Meadows (Knight and Clemmer 1987).

The range-wide trend for the species is presumed stable, although a lack of detailed information has been noted (USFWS 2000). Available abundance data from Clark County are limited. The Calico Hills population is the largest known population group in the county, with a total abundance estimate of 344 to 906 plants recorded in 1997 (BLM data); approximately half of those data points were associated with heavy disturbance. Lone Willow Spring had fewer than 50 plants that same year. The Las Vegas Valley population is considered historic and presumed extirpated (Morefield 2001).

Clark County Desert Conservation Program surveys conducted county-wide in 2020, 2021, and 2023 did not detect alkali mariposa lily (Ironwood Consulting 2020, 2021, 2023). During the 2021 survey, the species was specifically searched for in dry lakes, springs, seeps, riparian areas, and valley bottoms within Clark County; however, the moist habitats required by this species are relatively scarce in the county, and none of the visited sites harbored alkali mariposa lily (Ironwood Consulting 2021).

50.6 Recommendation

Not recommended for coverage. Alkali mariposa lily is not recommended for coverage because of the lack of data on its status, limited concern over its conservation status, and lack of documentation of threats throughout its range.

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51.0 BLUE DIAMOND CHOLLA (CYLINDROPUNTIA MULTIGENICULATA)

51.1 Species Overview

Blue Diamond cholla (*Cylindropuntia multigeniculata*) is a member of the cactus family (Cactaceae) that is recognized as a full species (Baker and Cloud-Hughes 2014), despite previous descriptions of hybridization with other closely related species. It was formerly named *Opuntia whipplei* (Englemann and Bigelow) var. *multigeniculata.* Taxonomic uncertainty surrounding this species persists due to its history of hybridization with related chollas and its historically limited distribution data; however, it is now generally treated as a distinct species based on morphological and distributional evidence (Baker and Cloud-Hughes 2014).

Individuals of this cactus occur on limestone soils near the type locality west of Las Vegas as well as volcanic soils derived from basalt and granite for other populations. Aspect varies across known sites, and plants are typically associated with steep, dry, rocky slopes or washes with large rocks or boulders and with minimal vegetation cover (Baker 2005). Individuals of this species may be associated with overlying gypsum beds located up-slope and typically co-occur with succulents and shrubs in vegetation dominated by creosote bush or blackbrush (NNHP 2000).

51.2 Range

Based on the recent taxonomic change, this species is thought to occur only within Clark County, Nevada, with potential encroachment over the border into Mohave County, Arizona (NatureServe 2026). Habitat for this species is predominantly in Mojave Desert Scrub, Blackbrush, and Pinyon Juniper ecosystems, but potentially includes Salt Desert Scrub. A broad elevational range for Blue Diamond cholla has been recorded, from as low as 2,001 feet (Baker 2005) up to 4,249 feet (NNHP 2000), with Nussear et al. (2011) reporting a range of 2,592 to 4,659 feet in their habitat suitability modeling.

Within Clark County this species has been reported north of Blue Diamond, Nevada (type locality), in Sloan Canyon, near Gass Peak, and in Gold Butte near Bonelli Peak (Baker 2005, Nussear et al. 2011, Baker and Cloud-Hughes 2014). More recent surveys have substantially expanded the known distribution of Blue Diamond cholla in Clark County, pushing the northern range limit to within approximately 16 km of Lincoln County, Nevada, and the eastern limit to within a few kilometers of the Arizona border (Ironwood Consulting 2024).

51.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Fully Protected
State of Arizona	Salvage Restricted
NV Natural Heritage Program (2025)	G2 S2
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 2025-2)	Least Concern
CITES	Appendix II

* Removed from the candidate list based on management and habitat conservation agreements (USFWS 2001).

Blue Diamond cholla holds a global NatureServe status of G2 (Imperiled), with a national status of N2 in the United

States. State-level rankings are S2 in Nevada and S2S3 in Arizona (NatureServe 2026). The species is listed under CITES Appendix II, it is a BLM Special Status Species, and it is fully protected in the State of Nevada.

The species was removed from the Endangered Species Act candidate list in 2001 because conservation actions had been implemented to address threats, not because concerns about the species were resolved (USFWS 2001). As of the most recent NatureServe review (2026), no substantive change in global or state rank has been recorded. Based on recent survey data, Ironwood Consulting (2024) recommended a formal review of all Blue Diamond cholla occurrence records by a rare plant technical committee to evaluate whether the current State of Nevada and Clark County listing status remains appropriate, given the substantial expansion of the species' known distribution documented through recent surveys.

51.4 Impact

Primary threats to Blue Diamond cholla include gypsum mining, illegal horticultural collection, road construction, and commercial development, particularly near the type locality at Blue Diamond Hill (Baker 2005; NatureServe 2026). This species has also been threatened directly by wildfire and broader habitat loss (Baker 2005). Due to the rocky and steep terrain it occupies, this species is unlikely to be significantly impacted by off-highway vehicle activity. Desert fires have previously affected Blue Diamond cholla and will continue to be an ecosystem threat; however, the steep, rocky terrain also provides some inherent protection due to the sparseness of vegetation. The lack of fuel continuity makes fires patchier in such habitats and thus less prone to widespread damage. Invasive annual grasses such as Bromus tectorum and Bromus rubens have been documented co-occurring with this species at multiple sites, raising concern about future wildfire risk (Ironwood Consulting 2021, 2024).

Simandle and Nussear (2025) modeled Blue Diamond cholla habitat suitability on the basis of bedrock depth, soil silica index, minimum temperature, and winter precipitation variation. Areas of high-suitability habitat are broadly distributed across Clark County, concentrated at mid-elevation areas in foothills and slopes and are predicted to occur around the periphery of the Sheep Range, and adjacent areas of the Las Vegas Range, Muddy Mountains, Spring Mountains and the McCullough Range (Simandle and Nussear 2025). Within the MSHCP Amendment Plan Area, approximately 185,470 acres of suitable Blue Diamond cholla habitat have been identified (Simandle and Nussear 2025). Of this total, 352 acres (0.2 percent) occur within the MSHCP Amendment Impact Area. Approximately 155,431 acres (83.8 percent) are located on lands managed for resource conservation, and 7,281 acres (3.9 percent) occur within the MSHCP Amendment Reserve System Additions. No suitable habitat (0.0 percent) occurs within the existing MSHCP Reserve System.

Blue Diamond cholla* *Cylindropuntia multigeniculata*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	185,470	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	352	0.2%
Suitable Habitat in Lands Managed for Resource Conservation	155,431	83.8%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	7,281	3.9%

*Simandle and Nussear 2025

51.5 Data

Within the Red Rock Canyon National Conservation Area, multi-agency and stakeholder agreements have been put in place to protect habitat for this species by limiting mining development and by implementing fire prevention and suppression plans (BLM 2005). This species also inhabits the Sloan Canyon National Conservation

Area and is similarly protected (BLM 2009). A conservation agreement designed to reduce threats to this species and its habitat was a key factor in its removal from the Endangered Species Act candidate list (USFWS 2001). This agreement consists of provisions within the conservation plan for Red Rock National Conservation Area and is designed to protect 83 percent of its known habitat (Clark County 2000, BLM 2005). Legislation passed in 2013 supported land exchanges to protect habitat for this species near the type locality within Red Rock (Nevada Senate Bill 159 2013).

Some taxonomic uncertainty surrounding Blue Diamond cholla persists due to its documented hybridization with other closely related *Cylindropuntia* species, particularly near range boundaries. This may complicate species identification during field surveys and could affect the accuracy of distributional records. The species' preference for steep, rocky terrain also presents logistical challenges for survey efforts, as many occupied sites are difficult to access on foot.

As of 2016, a total of 10 populations of Blue Diamond cholla were known, with nine of the 10 appearing healthy and free of immediate threats (NatureServe 2026). At least a portion of the Blue Diamond population at the type locality was threatened by development (Baker 2005).

Rare plant surveys conducted by Ironwood Consulting in 2020 detected Blue Diamond cholla at a single location within the Frozen Toe Road survey area. This occurrence included 91 individuals inhabiting 0.46 acre of occupied area at elevations between 1,375 and 1,469 meters (4,511 to 4,819 feet), with an overall quality rating of good. The plant community at this site was dominated by *Prunus fasciculata*, *Purshia stansburiana*, and *Yucca brevifolia*. Surveyors noted that evidence of an extensive recent wildfire on adjacent ridgelines likely eliminated much of the population prior to the survey, with ridgetops appearing to have served as refugia during the fire event (Ironwood Consulting 2020).

The 2021 rare plant survey observed Blue Diamond cholla at six locations in Clark County: three within North Clark County, one in the Desert National Wildlife Refuge, one in the McCullough Mountains, and one in Summit Pass (Ironwood Consulting 2021). Combined, these six occurrences yielded an estimated total of more than 16,772 individuals across approximately 1,428 acres (578 ha) of occupied area, with elevations ranging from 999 to 1,775 meters (3,278 to 5,824 feet). Overall quality ratings ranged from good to excellent. Notably, all six occurrences were located within areas modeled as low-to-medium habitat suitability; none fell within high-suitability modeled habitat, suggesting the initial species distribution model would benefit from additional training data for this species. The largest single occurrence at Summit Pass within Gold Butte National Monument, contained an estimated 14,000 individuals across 1,001.5 acres and represents the largest contiguous known population of the species; the full extent of this occurrence had not yet been completely mapped at the time of the survey. Common associates across 2021 occurrences included *Cylindropuntia acanthocarpa*, *Ephedra nevadensis*, *Prunus fasciculata*, *Senegalia greggii*, *Yucca baccata*, and *Yucca brevifolia*. Invasive annuals *Bromus tectorum* and *Schismus* sp. were co-occurring at several sites, raising concern about future wildfire risk; evidence of previous fire was noted at occurrences at Summit Pass and one North Clark County site (Ironwood Consulting 2021).

Additional targeted surveys for Blue Diamond cholla were conducted in fall 2022 and spring and fall 2023 (Ironwood Consulting 2022, 2024). Surveys were guided by the initial habitat suitability model and 17 general survey areas were identified, totaling approximately 49,934 acres across Clark County.

The 2022 surveys covered five areas (Bird Spring Range, Keystone Wash Prospects, Lost Cabin Spring, Manse, and Trout Canyon North), encompassing approximately 22,894 total acres, including 12,675 acres of modeled habitat. No Blue Diamond cholla individuals were detected during the 2022 field effort (Ironwood Consulting 2022).

The 2023 surveys targeted the remaining 12 general survey areas, adding an opportunistic survey at Gann/Walker Spring, and covered approximately 44,483 total acres, including 29,233 acres of modeled habitat. Five new records

for Blue Diamond cholla were documented at the Wamp Spring, Gann/Walker Spring, Jumbo, and Summit Pass survey areas. Combined, these occurrences encompassed approximately 5,154 acres of occupied habitat and an estimated 52,068 individuals. The largest single occurrence at Summit Pass, where surveys added an estimated 34,000 individuals and 2,486 acres of occupied habitat to the previously delineated boundary, bringing the total estimated population at that site alone to more than 48,000 individuals across approximately 3,488 acres. The mean elevation range across 2023 occurrences was 787 to 1,573 meters (2,582 to 5,160 feet). Common associates included blackbrush (*Coleogyne ramosissima*), cat claw acacia (*Senegalia greggii*), creosote (*Larrea tridentata*), ephedra (*Ephedra* spp.), Mojave yucca (*Yucca schidigera*), and red brome (*Bromus rubens*). Habitat quality ranged from fair to good, with wildfire evidence and invasive annual plants identified as the primary threats at occupied sites.

Combined 2022 and 2023 surveys substantially expanded the known distribution of Blue Diamond cholla in Clark County. The 2023 fieldwork documented nearly 38,068 additional individuals previously unknown to science, raising the total estimated population well above the 56,500 individuals cited in the 2005 status report (Baker 2005). Ironwood Consulting (2024) recommended a formal review of all Blue Diamond cholla occurrence records by a rare plant technical committee to evaluate whether the current State of Nevada and Clark County listing status remains appropriate.

51.6 Recommendation

Recommended for coverage. Although at least 90 percent of this species' habitat is within conserved areas, it is listed as critically endangered by the State of Nevada and was removed as a candidate under the federal Endangered Species Act solely because of management and conservation actions. Therefore, to ensure it does not become federally listed and conservation and that management actions continue for the Blue Diamond cholla, we are recommending it for coverage.

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52.0 GOLD BUTTE MOSS (*DIDYMODON NEVADENSIS*)

52.1 Species Overview

Gold Butte moss (*Didymodon nevadensis*) is a recently described moss in the Pottiaceae family (Zander et al. 1995). It occurs on gypsum outcrops, limestone boulders, and sandy soil from 500 to 1,700 meters in elevation (Zander et al. 1995). Gold Butte moss is noticeably absent on adjacent substrates that are not gypsiferous. It is most abundant on loose uncompacted gypsum soil on east- and northeast-facing slopes, where it forms relatively deep mats in monospecific populations that are blackish green above and reddish brown below. Growth is extremely slow in comparison to other moss species (Vitt 1989), likely due to low annual precipitation in its arid environment (Zander et al. 1995).

52.2 Range

Gold Butte moss has a disjunct global distribution, occurring in southern Nevada and northern Texas in the United States, southern Chihuahua, Mexico, and southern British Colombia, Canada (NatureServe 2026). Although the species is widespread, its populations are isolated from one another, and within the United States, it is documented only from Nevada, Texas, and Colorado (NatureServe 2026). The species grows on gypsiferous substrates including gypsum outcrops, limestone boulders, and sandy soils, typically in arid and semiarid environments.

In Nevada, the most significant populations are believed to occur in the Gold Butte region, the Muddy Mountains (White Basin), and the north shore of Lake Mead (Stark 2007). Gold Butte moss is known from 15 locations in the Lake Mead area in Clark County, at elevations ranging from 1,640 to 5,600 feet (Stark 2007).

52.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
NV Division of Natural Heritage	None
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G4 S2
IUCN Red List	None
CITES	None

Gold Butte moss is not under immediate threat of extinction, and new populations continue to be found (Stark 2007). The Nevada Natural Heritage Program listed the species population trend as stable based on Nevada populations (NNHP 2001). NatureServe currently assigns Gold Butte moss a global rank of G4 (Apparently Secure) and a Nevada state rank of S2 (Imperiled) (NatureServe 2026). No CITES listing or IUCN Red List designation has been identified for this species.

52.4 Impact

Potential threats to Gold Butte moss include gypsum mining, off highway vehicle use, trampling from multiple

sources, invasive plants, development, and inundation (TNC 2007). The species occurs on lands managed by BLM, the State of Nevada, and the National Park Service, meaning a substantial portion of its known range falls within conserved or publicly managed areas.

Based on the suitable habitat analysis (SWECO 2018), the MSHCP Amendment Plan Area contains approximately 808,821 acres of suitable habitat for Gold Butte moss. Of this total, approximately 59,920 acres (7.4 percent) occur within the MSHCP Amendment Impact Area. Approximately 460,906 acres (57.0 percent) of suitable habitat occur within lands managed for resource conservation, and 432 acres (0.1 percent) occur within the existing MSHCP Reserve System. The MSHCP Amendment Reserve System Additions include approximately 99,572 acres (12.3 percent) of suitable habitat.

Gold Butte moss* *Didymodon nevadensis*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	808,821	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	59,920	7.4%
Suitable Habitat in Lands Managed for Resource Conservation	460,906	57.0%
Suitable Habitat in the existing MSHCP Reserve System	432	0.1%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	99,572	12.3%

*SWECO 2018

52.5 Data

No specific issues regarding taxonomic uncertainty or survey methodology have been identified for Gold Butte moss; however, the limited number of records and the species' occurrence on specialized gypsiferous substrates mean that survey coverage across its potential range may be incomplete.

As part of the Clark County Desert Conservation Program, rare plant surveys were conducted in Clark County in 2020, 2021, and 2023. Gold Butte moss was not detected during any of those surveys (Ironwood Consulting 2023).

52.6 Recommendation

Not recommended for coverage. Gold Butte moss has an extremely widespread, although patchy, distribution. The species is believed to be stable, and no data indicate population declines. Its extent of occurrence is unlikely to be significantly impacted by activities covered in the amended MSHCP, as its distribution is predominantly on public lands. Based on a current review, it is not anticipated that Gold Butte moss will be petitioned for or become listed in the lifetime of the permit; therefore, it is not recommended that Gold Butte moss be covered by the MSHCP.

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53.0 SILVERLEAF SUNRAY (ENCELIOPSIS ARGOPHYLLA)

53.1 Species Overview

Silverleaf sunray (*Enceliopsis argophylla*) is a silvery gray plant that grows in sparsely vegetated, low elevation country on soils where few other plants grow. It is restricted to clay and gypsum cliffs with overall habitat described as dry, open, barren areas on gypsum badlands, volcanic gravels and loose sands in the creosote-bursage zone (Kartesz 1988, NNHP 2017). The species has been found on gypsum deposits and sandy soils, and even in roadsides where the correct soils exist (i.e., along a roadside in Lake Mead National Recreation Area).

The silverleaf sunray is the host plant for the Mojave gypsum bee (*Andrena balsamorhizae*). Adult bees nectar on multiple plant species, but the larvae require pollen from the silverleaf sunray (Griswold et al. 2006). The type locality for this species is reportedly near St. Thomas, Nevada and has been mostly under the surface of Lake Mead for almost 80 years (Cronquist 1994).

53.2 Range

Silverleaf sunray is a rare plant nearly entirely restricted to a small portion of Clark County, Nevada (NatureServe 2026), with limited occurrences in Washington County, Utah (Cronquist 1994) and Mohave County, Arizona (McDougall 1973, Morefield 2001, Griswold et al. 2006). Records from Utah are considered uncertain (NatureServe 2026). The species is broadly associated with the vicinity of Lake Mead. Habitat consists of dry, open, barren areas on gypsum badlands, volcanic gravels, and loose sands in the creosote-bursage zone at low elevations. Soils are fragile and sensitive to disturbance.

In Nevada, silverleaf sunray occurs only in Clark County and is found from the River Mountains east of Henderson to Echo Bay and the Las Vegas Wash largely within the Lake Mead National Recreation Area (Kartesz 1988). The species predominantly occurs on federal lands, including the Lake Mead National Recreation Area and Gold Butte National Monument. Silverleaf sunray is very similar in appearance to the more common nakedstem sunray (*Enceliopsis nudicaulis*), and some historic silverleaf sunray occurrences in Utah and Arizona have been reclassified as *E. nudicaulis*.

53.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
State of Utah	None
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3 S2

Agency/Organization	Status
IUCN Red List	None
CITES	None

NatureServe (2026) assigns silverleaf sunray a global conservation status of G3 (Vulnerable), with state ranks of S2 (Imperiled) in Nevada and Arizona, and S1 (Critically Imperiled) in Utah. An estimated 61 occurrences are documented rangewide, with the majority concentrated near Lake Mead National Recreation Area. The species holds no listing under the Endangered Species Act. It is designated a Nevada Natural Heritage Program (NNHP) At-Risk species (NNHP 2025).

53.4 Impact

Threats to silverleaf sunray include disturbance to habitat from off-road vehicles on BLM-managed lands and other recreational activities within these areas (NatureServe 2026). Additional threats identified during Clark County Desert Conservation Program rare plant surveys include drought impacts, off highway vehicle use off designated routes, invasive weeds, wild burro trampling, and cattle grazing (Ironwood Consulting 2020, 2021, 2023).

Nussear et al. (2024) modeled silverleaf sunray habitat suitability on the basis of winter minimum temperature, gypsum potential, vegetative productivity, soil properties, winter precipitation, and vegetation. Habitat is broadly distributed throughout north-central Clark County including the north shore of Lake Mead (Nussear et al. 2024). Based on habitat suitability modeling by Nussear et al. (2024), suitable silverleaf sunray habitat within the MSHCP Amendment Plan Area totals approximately 279,161 acres. Of this, 13,611 acres (4.9 percent) occur within the MSHCP Amendment Impact Area. Approximately 149,564 acres (53.6 percent) of suitable habitat falls within lands managed for resource conservation, and 54,223 acres (19.4 percent) occur within the MSHCP Amendment Reserve System Additions. No suitable habitat occurs within the existing MSHCP Reserve System.

Silverleaf sunray* *Enceliopsis argophylla*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	279,161	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	13,611	4.9%
Suitable Habitat in Lands Managed for Resource Conservation	149,564	53.6%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	54,223	19.4%

*Nussear et al. 2024

53.5 Data

There is some uncertainty in the range of silverleaf sunray due to historical misidentification. Occurrences in California, and some in Utah and Arizona, were incorrectly attributed to silverleaf sunray and have since been revised to other sunray species, including the more common nakedstem sunray (*Enceliopsis nudicaulis*). Records from Utah remain uncertain (NatureServe 2026). Additionally, occurrence data used in a recent habitat model were restricted to federal lands within the Lake Mead National Recreation Area and surrounding BLM lands; potential suitable habitat extends into non-federal lands and may be affected by covered activities (SWECO 2018).

Rare plant surveys conducted by Ironwood Consulting for the Clark County Desert Conservation Program from 2020 through 2023 documented a combined total of 17 new element occurrence records for silverleaf sunray in Clark County. In 2020, four occurrences totaling 259 individuals (0.9 ac) were documented at St. Thomas Point

(Ironwood Consulting 2020). In 2021, nine occurrences totaling 1,494 individuals (38.1 ac) were documented at Gold Butte, Gold Butte West, Mud Wash, Echo Junction, Bitter Spring, and West Lake Mead (Ironwood Consulting 2021). In 2023, four additional occurrences totaling 614 individuals (21.8 ac) were documented at Arrow Canyon, Bitter Springs North, Echo Hills North, and Lava survey areas; all 2023 records were new occurrence records (Ironwood Consulting 2023). Occurrence quality across survey years ranged from poor to excellent.

53.6 Recommendation

Recommended for coverage. Silverleaf sunray has an extremely limited range and is found only in the vicinity of Lake Mead. Although most occurrence records are within federal land ownership, suitable habitat exists adjacent to these federally owned areas that may be impacted by activities covered under the amended MSHCP. This species is also designated a NNHP At-Risk species. Although distribution within potential impact areas is limited, its extremely restricted distribution and local conservation status indicate there is potential for this species to become federally listed within the lifetime of the amended MSHCP.

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54.0 PAHRUMP VALLEY BUCKWHEAT (*ERIOGONUM BIFURCATUM*)

54.1 Species Overview

Pahrump Valley buckwheat (*Eriogonum bifurcatum*) is a low-spreading annual plant that can be more than one meter wide (Reveal 1971, Mozingo and Williams 1980). It is also known by the common name "forked buckwheat." The species is associated with the shadscale (*Atriplex confertifolia*) scrub community in California (Calflora 2017), and with mesquite (*Prosopis* spp.) and shadscale in Nevada (Mozingo and Williams 1980). It occurs in valley bottoms, dry playa margins, and adjacent shore terraces (Crampton et al. 2006) on barren heavy clays, silty hardpan soils, saline flats, and sandy hills (Reveal 1988, NNHP 2001). Pahrump Valley buckwheat is highly dependent upon annual and winter rainfall, and population size fluctuates with precipitation amounts (NNHP 2001, TNC 2007).

54.2 Range

Pahrump Valley buckwheat has an extremely restricted global range and is only known from the Mesquite and Pahrump valleys in Nevada and the Stewart Valley in California (Reveal 1971, Crampton et al. 2006). The elevational range for this species is narrow, between 2,297 and 2,800 feet (700 to 853 meters) (NNHP 2001). It is associated with shadscale (*Atriplex confertifolia*) scrub in California and with mesquite (*Prosopis* spp.) and shadscale communities in Nevada (Calflora 2017, Mozingo and Williams 1980). The species occurs in valley bottoms, dry playa margins, and adjacent shore terraces on barren heavy clays, silty hardpan soils, saline flats, and sandy hills (Reveal 1988, NNHP 2001).

Within Nevada, there are 19 known extant occurrences in Clark and Nye counties, with most occurring within Nye County (NNHP 2001, NatureServe 2026). In California, there are 40 occurrences in Inyo and San Bernardino Counties (CDFW 2017), which can be grouped into four population groups (TNC 2007). In Clark County, the species occurs only in and around the town of Sandy Valley, immediately adjacent to the Nye County border (Reveal 1971, Crampton et al. 2006, TNC 2007).

54.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
California Native Plant Society	Rank 1B.2
NV Division of Natural Heritage	At Risk
NatureServe Global and NV State Rank	G3 S2
IUCN Red List	None
CITES	None

* Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer include this category.

Pahrump Valley buckwheat is tracked by the NNHP on its Animal and Plant At-risk Tracking List (NNHP 2025). NatureServe (2026) assigns this species a global rank of G3 (vulnerable) and a state rank of S2 in Nevada (imperiled in the state), reflecting its extremely restricted range and small number of known occurrences. The California Native Plant Society lists Pahrump Valley buckwheat as a rare, threatened, or endangered plant (CNPS 2017). This species was formerly designated a Category 2 candidate for federal listing under the Endangered Species Act by USFWS (USFWS 1993). Although no longer formally a candidate species, its small range and ongoing threats mean it retains potential for future federal listing. No CITES or IUCN designations apply to this species. Overall population trends for this species are difficult to determine because population size fluctuates substantially with annual precipitation (NNHP 2001, TNC 2007).

As of 2010, approximately 19 extant occurrences were documented, with 17 in Nevada and 2 in California (NatureServe 2026). The extent of occurrence is approximately 680 square kilometers, with an area of occupancy of roughly 34 four-square-kilometer grid cells. The total number of individuals in Nevada was estimated at 1,109 or more (Morefield 2001). NatureServe characterizes the short-term population trend as a decline of 10 to 30 percent, driven primarily by habitat conversion for urban development.

54.4 Impact

Pahrump Valley buckwheat faces threats from solar energy development, other land development, off-road vehicles, and non-native invasive plants (CNPS 2017). Although this species is described as tolerant of "moderate transient disturbance" (TNC 2007), utility corridors, trails, and off-road vehicles may be indirect threats by increasing the risk of invasive species establishment in the area (TNC 2007). Annual precipitation amounts are a major driver of year-to-year population variability, and changes to groundwater flow or hydrologic regimes may also affect this species (TNC 2007).

Nussear et al. (2024) modeled Pahrump Valley buckwheat habitat suitability based on average maximum temperature, soil clay content, extreme minimum temperature, silt, slope and vegetation. Modeled medium-and high-suitability habitat are concentrated in the vicinity of Sandy Valley, with a small satellite patch in the Corn Creek wash (Nussear et al. 2024). Based on habitat suitability modeling (Nussear et al. 2024), there are approximately 15,020 acres of suitable Pahrump Valley buckwheat habitat within the MSHCP Amendment Plan Area. Of this total, 5,301 acres (35.3 percent) occur within the MSHCP Amendment Impact Area. Approximately 4,574 acres (30.5 percent) of suitable habitat occur within lands managed for resource conservation. No suitable habitat occurs within the existing MSHCP Reserve System. An additional 1,082 acres (7.2 percent) of suitable habitat are included within the MSHCP Amendment Reserve System Additions.

Pahrump Valley buckwheat* *Eriogonum bifurcatum*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	15,020	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	5,301	35.3%
Suitable Habitat in Lands Managed for Resource Conservation	4,574	30.5%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	1,082	7.2%

*Nussear et al. 2024

54.5 Data

Because Pahrump Valley buckwheat is an annual species highly dependent upon annual and winter precipitation, population size fluctuates substantially from year to year, making it difficult to assess long-term population trends

(NNHP 2001, TNC 2007). No studies have been conducted on the seedbank for this species, but seedbank assessment has been suggested as a method to better understand population trends and viability independent of annual precipitation driven fluctuations.

Rare plant surveys conducted in 2020 by Ironwood Consulting, Inc. found Pahrump Valley buckwheat at the Pahrump, Sandy Valley, and Stateline PEAL survey areas. In total, these occurrences included 17,573 individuals occupying 12.79 acres (Ironwood Consulting 2020). Subsequent surveys in 2023 found four occurrences at the Near Sandy Valley and Rural ERBI survey areas, totaling approximately 246.8 acres (99.8 ha) and an estimated 92,064 individuals. Three of the four occurrences were located within 0.5 mile of an existing record. The largest occurrence was at Near Sandy Valley (EO No. 5147), covering approximately 234.4 acres with an estimated 75,000 individuals. Common associated species included *Ambrosia dumosa*, *Atriplex confertifolia*, *Eriogonum trichopes*, and *Larrea tridentata*. Overall occurrence quality ranged from fair to good, with primary concerns including proximity to dusty unpaved roads, development pressure, and the location of both survey areas within BLM disposal boundaries (Ironwood Consulting 2023).

54.6 Recommendation

Recommended for coverage. Pahrump Valley buckwheat has an extremely narrow range and is only known from four populations. This species was once listed as a Category 2 species by the U.S. Fish and Wildlife Service. There is potential for this species to become federally listed within the lifetime of the permit because of the small range and threats from development. One of the four populations is within Clark County and has the potential to be impacted by activities covered under the amended MSHCP. Based on the extremely small range, potential for this species to become listed, and impacts to this species from covered activities, Pahrump Valley buckwheat is recommended for coverage under the MSHCP.

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55.0 LAS VEGAS BUCKWHEAT (*ERIOGONUM CORYMBOSUM* VAR. *NILESII*)

55.1 Species Overview

Las Vegas buckwheat (*Eriogonum corymbosum* var. *nilesii*) is a recently identified, genetically unique subspecies in the family Polygonaceae (Reveal 2004). It is a woody perennial shrub up to 4 feet high. The numerous flowers are small and yellow, and the plant is very conspicuous when flowering in late September and early October. The subspecies is distinguished from closely related taxa by leaves that are densely hairy on one or both surfaces, at least twice as long as wide, with dense hairs spread along the stem.

55.2 Range

Las Vegas buckwheat is found on gypsum-based soils, clay beds, high-boron shale soils, and sparsely vegetated gypsum outcroppings in the Mojave Desert (Tilley 2012). Known populations occur between 200 and 850 meters (650 to 2,800 feet) in elevation in areas receiving an average of 110 millimeters (4.5 inches) of annual precipitation (Holmgren et al. 2012).

Early examination of herbarium specimens suggested that Las Vegas buckwheat not only occurred in the Las Vegas Valley but could also be present in two additional locations outside of Nevada: Paria River in southern Kane County, Utah; and Pierce Wash near St. George Utah, in northern Mohave County, Arizona (Reveal 2004). However, further genetic investigations indicated that the Utah and Arizona locations are taxonomically distinct from those described in southern Nevada (Ellis et al. 2009). The USFWS (2014a) has conducted additional investigations into the varieties in Utah, Arizona, and Nevada and concluded that, of the 14 putative *E. corymbosum* var. *nilesii* locations sampled across the three states, only four demonstrated strong genetic affinities to the reference location for *E. corymbosum* var. *nilesii* and all four of these locations occur in southern Nevada (Clark and Lincoln Counties). The USFWS (2014a) concluded that on the basis of morphological and genetic data, the range of *Eriogonum corymbosum* var. *nilesii* is restricted to southern Nevada.

In 2008, nine populations were known from 15 sites, totaling approximately 1,145 acres in Clark and Lincoln Counties, Nevada (Mrowka 2008). While somewhat widespread across the two counties, Las Vegas buckwheat habitat occupies only approximately 320 hectares (approximately 790 acres). Populations of this species occur in the Muddy Mountains of Lake Mead National Recreation Area, the north end of the Las Vegas Valley, Toquop Wash of Lincoln County, and in the north and south of Coyote Springs Valley in both Clark and Lincoln Counties.

55.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation*
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada; BLM 2023)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G5T2 S2
IUCN Red List (v 2025-2)	None
CITES	None

* Listed under the former name *E.c.* var. *aureum*.

A petition to list Las Vegas buckwheat for Federal Endangered Species Act protection was filed on April 22, 2008 (Mrowka 2008). In the 90-day and 12-month findings, the USFWS determined that the petition was substantial and that listing of this species as threatened or endangered was warranted, but precluded by other, higher priority actions (USFWS 2008). The species remained in that status until September 24, 2014, when a new finding determined that listing was not warranted (USFWS 2014b). New petitions for listing have not been submitted since that time.

NatureServe (2026) currently ranks Las Vegas buckwheat as globally imperiled (G5T2), imperiled at the national level (N2), and imperiled in Nevada (S2). The primary threats driving these rankings are urban development, off-road vehicle use, and gypsum surface mining, with NatureServe noting that approximately 95 percent of the variety's habitat has already been developed (NatureServe 2026). NatureServe estimates 6 to 20 element occurrences globally, occupying a range extent of approximately 5,000 to 20,000 square kilometers.

Population trends for this variety are notably negative at both long- and short-term scales. NatureServe records a long-term decline of 50 to 70 percent and a short-term decline of 30 to 50 percent. USFWS (2014b) reported that 3 of the previously recognized 12 occurrences have been lost entirely, and 4 of the remaining extant locations have been partially extirpated.

55.4 Impact

Past, ongoing, and future impacts that pose a threat to Las Vegas buckwheat include urban development, ORV/OHV use, minerals exploration and development, invasive plants, and climate change (USFWS 2014a, Mrowka 2008).

Several conservation measures have been completed that benefit Las Vegas buckwheat, including a conservation agreement with the City of North Las Vegas and BLM to establish the Eglington Preserve, protection of habitat within Nellis Air Force Base Area III, BLM purchase of 30 acres of the White Basin subpopulation, BLM withdrawal of public minerals within some Las Vegas buckwheat habitat, and the designation of the Muddy Mountains Wilderness and the establishment of the Tropicana and Decatur Buckwheat Conservation Area (USFWS 2009 and 2014a).

Nussear et al. (2024) modeled Las Vegas buckwheat habitat suitability on the basis of average maximum temperature, soil gypsum content, and vegetative productivity. Areas of high-suitability habitat are predicted to occur in urban Las Vegas and south of Coyote Springs. Pockets of medium-suitability habitat are predicted to occur east of Las Vegas Valley, in the Muddy Mountains and west of the Weiser Valley, Indian Springs Valley, Three Lakes Valley, and the northwestern end of Las Vegas Valley (Nussear et al. 2024). Based on modeled habitat suitability (Nussear et al. 2024), the MSHCP Amendment Plan Area contains approximately 148,814 acres of suitable Las Vegas buckwheat habitat. Of this total, approximately 12,661 acres (8.5 percent) occur within the MSHCP Amendment Impact Area. Approximately 24,805 acres (16.7 percent) of suitable habitat occur within lands managed for resource conservation, and 12,527 acres (8.4 percent) occur within the MSHCP Amendment Reserve System Additions. No suitable habitat is mapped within the existing MSHCP Reserve System (0 acres; 0.0 percent).

Las Vegas buckwheat* *Eriogonum corymbosum var. nilesii*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	148,814	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	12,661	8.5%
Suitable Habitat in Lands Managed for Resource Conservation	24,805	16.7%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%

Las Vegas buckwheat* *Eriogonum corymbosum var. nilesii*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Reserve System Additions	12,527	8.4%

*Nussear et al. 2024

55.5 Data

The taxonomic status of Las Vegas buckwheat has been subject to ongoing investigation. Genetic analyses confirmed that populations in Utah and Arizona are taxonomically distinct from those in southern Nevada, restricting the recognized range of this subspecies to southern Nevada (Ellis et al. 2009, USFWS 2014a). Identification of Las Vegas buckwheat in the field can be difficult due to morphological similarity with closely related taxa, particularly *Eriogonum corymbosum* var. *aureum* (Ellis et al. 2018). This similarity has contributed to uncertainty in survey results, as described below.

In the 2014 not-warranted finding (USFWS 2014b), the USFWS assessed the factors affecting Las Vegas buckwheat and concluded that, for individuals in some locations:

> *[…] are not impacting the plants currently or into the future such that listing would be warranted. Based on the analysis contained within the Species Report, we conclude that the best available scientific and commercial information does not indicate that these stressors currently are going to cause a decline in the plant or its habitat, either now or are likely to do so into the future.*

Rare plant surveys conducted in 2021 identified a single, inconclusive occurrence of Las Vegas buckwheat at one location in Gold Butte (Ironwood 2021). The identification was inconclusive due to the similarity between Las Vegas buckwheat and *Eriogonum corymbosum* var. *aureum*, and the poor condition of the focal specimen (Ellis et al. 2018, Ironwood 2021). Subsequent rare plant surveys in 2023 targeted suitable habitat within Clark County but did not encounter Las Vegas buckwheat at any of the surveyed locations. Future surveys specifically targeting this species are recommended, with a focus on gypsiferous soils in the Las Vegas area and areas to the northeast including Gold Butte National Monument and Mesquite (Ironwood 2023).

55.6 Recommendation

Recommended for coverage. Based on the previous petition to list the species, the continued interest in the status of the species, and the Southern Nevada and Clark County endemic localities that are potentially subject to impacts in the proposed amendment, we recommend this species for coverage.

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56.0 STICKY BUCKWHEAT (ERIOGONUM VISICIDULUM)

56.1 Species Overview

Sticky buckwheat (*Eriogonum viscidulum*) was originally described and published by Howell (1942) from Clark County. Sticky buckwheat is an herbaceous winter annual with a life span lasting five to eight months from seed germination to seed dissemination and death. Seeds germinate following sufficient precipitation during winter months in the northern Mojave Desert (Beatley 1974 and 1976).

Research on seed ecology has provided important information for conservation planning. Sticky buckwheat is a facultative winter annual whose seeds disperse in spring (May to June) with primary dormancy and require one to three months of warm, dry after-ripening before they can germinate. Seeds are capable of germinating across a broad temperature range (≥10°C to ≤25°C), allowing emergence during autumn and winter months. Seeds buried in habitat germinated almost completely following sufficient cool, wet conditions, indicating a nondormant state during autumn. The species maintains a persistent soil seed bank, and seed bank propagation in greenhouse or nursery settings has been demonstrated as a viable method for ex situ conservation collection during drought years when plants are absent from habitat. Mating system studies showed that sticky buckwheat is self-compatible, though invertebrate pollinators (particularly Bombyliidae flies) are present and may contribute to genetic diversity in natural populations (DeFalco et al. 2023).

56.2 Range

The known global distribution of sticky buckwheat is endemic to the northeastern Mojave Desert ecoregion below 4,000 feet in Nevada and Arizona. Sticky buckwheat habitat includes dune formations, open beach sand at waterline and on adjacent sandy slopes, solidified sands of dry wash channels, and sandy soils within matrix creosote bush ecological systems.

Clark County, Nevada represents the majority of the species' global distribution (TNC 2007). All known occurrences have been organized into 13 population groups centered on the confluence of the Muddy and Virgin Rivers.

56.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Critically Endangered Plant - Fully Protected
State of Arizona	Special-status Species
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G2? S1S2
IUCN Red List	None

Agency/Organization	Status
CITES	None

*Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer include this category

Sticky buckwheat holds a NatureServe Global Status of G2 (Imperiled), last reviewed on April 22, 2024. The species is ranked N2? nationally and holds state ranks of S2 (Imperiled) in Nevada and S1 (Critically Imperiled) in Arizona (NatureServe 2026). It is not currently listed under the Endangered Species Act, though it remains a species of concern for USFWS. The Nevada Natural Heritage Program classifies it as Sensitive and Fully Protected under state law, and it is a BLM Special Status Species in Nevada (NNHP 2001).

NatureServe estimates approximately 45 occurrences range-wide based on a 1 km separation distance applied to herbarium, photo-based, and NatureServe Network occurrence data from 1993 to 2024, with eight occurrences rated very good to good viability and seven rated fair to poor (NatureServe 2024). The range extent is estimated at 1,000 to 5,000 square km, with an area of occupancy of approximately 53 two-km by two-km grid cells. Earlier status assessments reported unknown population trends (Reveal 1978; USFWS 2000; Morefield 2001). As of 2001, sticky buckwheat populations were estimated to possess approximately 25,000 individuals in 29 mapped occurrences throughout Nevada with an unknown habitat extent (Morefield 2001). TNC (2007) estimated the sticky buckwheat's viability across four grouped areas over its range as "fair." Monitoring was initiated at Lake Mead National Recreation Area in 2003 (Powell 2003), but annual fluctuations from variable climate conditions obscure population trends. The degree of threat is rated High, with a long-term trend of decline of less than 50 percent to relatively stable; the short-term trend remains unknown due to interannual fluctuations driven by variable precipitation (NatureServe 2026). Inventory remains incomplete despite extensive surveys, and continued search for additional populations is needed, particularly on federal lands (NNHP 2001).

56.4 Impact

Historically, the largest loss of sticky buckwheat was likely due to inundation by Lake Mead (Niles et al. 1995, Powell 1999). Other ongoing impacts include habitat clearing for urban development, fire, energy infrastructure development and maintenance, invasive plant species, off-road vehicle use, surface water development, agriculture, grazing and trampling by livestock and wild burros and horses, sand and gravel mining, and recreation (TNC 2007).

Occurrences within Lake Mead National Recreation Area are afforded some protection, though some are still affected by lake level fluctuations and recreational pressures. About ten occurrences fall within the active Mormon Mesa grazing allotment, and another nine fall within Gold Butte National Monument, where illegal cattle grazing has occurred for more than two decades. Large-scale solar energy developments have been proposed for Mormon Mesa and other occupied habitats but have not been approved (NatureServe 2026). Increased drought intensity may reduce germination and growth, though the species' capacity to produce large seed crops in favorable years provides some resilience to climate-driven precipitation variability (Cuello et al. 2022).

Nussear et al. (2024) modeled sticky buckwheat habitat suitability on the basis of average spring maximum temperature and winter spring precipitation variation. Areas of high-suitability habitat are predicted to occur in the Muddy Mountains (Nussear et al. 2024). Based on habitat suitability modeling by Nussear et al. (2024), approximately 257,366 acres of suitable habitat for sticky buckwheat occur within the MSHCP Amendment Plan Area. Of this, 20,797 acres (8.1 percent) occur within the MSHCP Amendment Impact Area. Approximately 117,390 acres (45.6 percent) of suitable habitat fall within lands managed for resource conservation, and 607 acres (0.2 percent) occur within the existing MSHCP Reserve System. An additional 9,128 acres (3.5 percent) of suitable

habitat are located within MSHCP Amendment Reserve System Additions.

Sticky buckwheat* *Eriogonum viscidulum*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	257,366	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	20,797	8.1%
Suitable Habitat in Lands Managed for Resource Conservation	117,390	45.6%
Suitable Habitat in the existing MSHCP Reserve System	607	0.2%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	9,128	3.5%

*Nussear et al. 2024

56.5 Data

Population trend data for sticky buckwheat are limited, in part because the species' annual life history makes it highly sensitive to interannual precipitation variability, which can cause populations to appear or disappear entirely from year to year. Earlier status reports indicated unknown trends (Reveal 1978; USFWS 2000; Morefield 2001), and monitoring initiated at Lake Mead National Recreation Area (Powell 2003) has not resolved this uncertainty, as annual fluctuations from variable climate conditions have masked population trends.

Sticky buckwheat is a covered species under the Lower Colorado River Multi-Species Conservation Plan and the goal in the plan area is to maintain and increase populations (Bangle 2012).

Research on seed ecology has provided important information for conservation planning. Sticky buckwheat is a facultative winter annual whose seeds disperse in spring (May to June) with primary dormancy and require one to three months of warm, dry after-ripening before they can germinate. Seeds are capable of germinating across a broad temperature range (≥10°C to ≤25°C), allowing emergence during autumn and winter months. Seeds buried in habitat germinated almost completely following sufficient cool, wet conditions, indicating a nondormant state during autumn. The species maintains a persistent soil seed bank, and seed bank propagation in greenhouse or nursery settings has been demonstrated as a viable method for ex situ conservation collection during drought years when plants are absent from habitat. Mating system studies showed that sticky buckwheat is self-compatible, though invertebrate pollinators (particularly Bombyliidae flies) are present and may contribute to genetic diversity in natural populations (DeFalco et al. 2023).

Rare plant surveys conducted by Ironwood Consulting on behalf of the Clark County Desert Conservation Program have provided the most current occurrence data for the species within Clark County. Surveys in 2020 detected new occurrences in Halfway Wash and South Mormon Mesa survey areas. These occurrences were good to excellent in quality and comprised a total of 271 individuals across 1.1 acres, at elevations ranging from 562 to 616 meters (Ironwood 2020). Despite targeting suitable habitat in 2021, sticky buckwheat was not detected, an absence attributed to two consecutive years of below-average annual precipitation (approximately 2.4 inches in 2020 and 1.9 inches in 2021, compared to the 30-year average of 4.2 inches), which suppressed germination of annual plants across the survey areas (Ironwood 2021). Surveys in 2023 detected occurrences in East Mormon 2, West Mormon 2, and West Mormon 3 survey areas, with a total of 1,733 individuals across 4.5 acres at elevations ranging from 456 to 550 meters and ranging from fair to good in quality (Ironwood 2023).

56.6 Recommendation

Recommended for coverage. Based on the State of Nevada's Fully Protected status, the near endemic distribution in Clark County, and the potential for sticky buckwheat to occur in the Plan Area, this species is recommended for coverage under the MSHCP.

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57.0 CATCHFLY GENTIAN (*EUSTOMA EXALTATUM*)

57.1 Species Overview

Catchfly gentian*, (Eustoma exaltatum*; syn*. Gentiana exaltata*) is a small-flowered biennial in the gentian (Gentianaceae) family native to the southern United States, Mexico, Central America, and the West Indies. The species is a perennial that produces additional shoots each season. Catchfly gentian flowers from June through November (Shinners 1957). The species has a strong association with heavy alkaline, saline, or clay soils, and those soils are frequently at seeps or are otherwise waterlogged (Shinners 1957, Turner 2014). Elevation range for the species is reported as 0 to 1,900 meters (0 to 6,234 feet) and it occurs in moist to wet, typically alkaline habitats including prairies, meadows, fields, riparian areas, sandy coastal areas, coastal dunes, and brackish, saline, or freshwater marshes (FNA 2023).

57.2 Range

Catchfly gentian is native to the southern United States, Mexico, Central America, and the West Indies (Turner 2014). The species inhabits moist to wet alkaline environments and has been documented across a broad elevational and geographic range. Plants have been reported in the Organ Pipe Cactus National Monument in Arizona (Pinkava et al. 1992). Occurrence records for the species available for iNaturalist (2018) come from Riverside County, California and the Colorado River watershed in California.

Few sources list catchfly gentian as occurring in Nevada. Neither Shinners (1957) nor Turner (2014) recorded the species occurring in Nevada, and no iNaturalist accounts document it there (iNaturalist 2018); however, the Nevada Natural Heritage Program (2011) listed the species as “confident or certain” occurrence in Clark County, with an occurrence count of two. USDA Plants Database also indicates *E. exaltatum* occurrence in Clark County, Nevada (USDA NRCS 2016). The species is listed as occurring around Lake Mead, Lake Havasu, and Lake Mohave within the lower Colorado River watershed, but may be extirpated in the vicinity of Lake Havasu and Lake Mohave (NatureServe 2024).

57.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	None
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
State of California	None
NV Division of Natural Heritage	Watch List
NatureServe Global and NV State Rank	G5 S1
IUCN Red List	None
CITES	None

NatureServe (2024) assigns catchfly gentian a global rank of G5 (Secure) and a Nevada state rank of S1 (Critically Imperiled), reflecting its very limited documented presence within the state. The species is not currently designated as a special-status species by any managing entity, including BLM (BLM 2023). No CITES or IUCN designations apply to this species.

The species has a large range extent exceeding 2,500,000 square km. Based on herbarium records and photo-based observations from 1993 to 2024, NatureServe estimates over 800 occurrences rangewide (NatureServe 2024). Both long-term and short-term population trends are listed as unknown. Species-specific management actions or plans do not appear to exist for catchfly gentian in Nevada.

57.4 Impact

Because catchfly gentian has a high association with waterlogged soils (Shinners 1957, Turner 2014), the most likely Clark County ecosystem where this species would occur is desert riparian habitat. As such, threats to riparian areas could pose a threat to the species, if present. Clark County populations of catchfly gentian, if they exist, may occur within Lake Mead National Recreation Area (NatureServe 2024), and those populations would be subject to the protection and regulations of the area.

Catchfly gentian* *Eustoma exaltatum*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	186,673	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	21,820	11.7%
Suitable Habitat in Lands Managed for Resource Conservation	130,971	70.2%
Suitable Habitat in the existing MSHCP Reserve System	765	0.4%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	256	0.1%

*SWECO 2018

57.5 Data

Catchfly gentian presents some data limitations relevant to this assessment. The species is documented from relatively few Nevada records, and the discrepancy between major floristic treatments (Shinners 1957, Turner 2014) and occurrence databases such as the Nevada Natural Heritage Program (2011) and USDA (2016) suggests taxonomic or distributional uncertainty for Nevada populations. No iNaturalist accounts document the species in Nevada (iNaturalist 2018), further highlighting the limited observational record for the state.

No individuals of this species were detected during county-wide rare plant surveys conducted from 2020 to 2023 (Ironwood Consulting 2023). No other agency survey data specific to catchfly gentian in Nevada or Clark County was identified for this assessment.

57.6 Recommendation

Not recommended for coverage. Catchfly gentian has a broad global distribution, being most common in the warmer climates of the southern United States, Mexico and the Caribbean. It is not currently designated as a special-status species by any managing entity. It is unlikely that it will become a listed species during the timeframe covered by the MSHCP and is therefore not recommended for inclusion.

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58.0 POLISHED BLAZING STAR (*MENTZELIA POLITA*)

58.1 Species Overview

Polished blazing star (*Mentzelia polita*) is an herbaceous perennial first described in 1909. Other than morphological descriptions found in manuals (Christy 1998, Brokaw et al. 2017) and a phylogeny (Schenk 2011) comparing more recently discovered *Mentzelia* species with *M. polita*, little has been published about this plant since it was first described in 1909.

58.2 Range

Little is known about the historic or current populations of polished blazing star. Historical herbaria collections and more current occurrence records from NNHP and SEINet are the only known sources for range distributions. NatureServe (2026) estimates approximately 20 known occurrences with an area of occupancy of about 84 square kilometers and a range extent of approximately 9,300 square kilometers.

Polished blazing star is limited to limestone and gypsum-rich soils in the hills and washes of mountain ranges in portions of California and Nevada. In California, its range is limited to the slopes of the Clark Mountain Range in San Bernardino County (Brokaw et al. 2017; NatureServe 2026). In Nevada, it has been found in the foothills of mountain ranges surrounding the Las Vegas metropolitan area, primarily around the base of the Spring Mountains in Clark County (NNHP 2018; NatureServe 2026). A disjunct occurrence has also been documented near Towne Pass, northeast of Death Valley. Polished blazing star has historically been reported from Arizona, but those plants have since been reclassified as the distinct species *Mentzelia memorabilis* (Holmgren and Holmgren 2002; Flora of North America Editorial Committee 2016). Elevation in Nevada ranges from 450 to 1,370 meters; in California from 1,200 to 1,500 meters (FNA 2016).

When first collected, polished blazing star was found in the washes among hillsides of Las Vegas, Nevada (Nelson 1909). In the larger Las Vegas Valley, he collected from Mesquite Spring (now near the junction of Sunset Road and Green Valley Parkway), Las Vegas Wash, the “hills near the town of Las Vegas,” and Tule Ranch (Tule Springs). His records show that he collected two other Mentzelia species from Tule Springs, but the vouchers no longer exist, therefore those species remain unknown.

58.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
California Native Plant Society	Rank 1B.2
NV Division of Natural Heritage	At Risk
NatureServe Global and NV State Rank	G2G3 S3
IUCN Red List	None
CITES	None

Polished blazing star is globally ranked G2G3 (Imperiled, rounded to G2) by NatureServe, reflecting a small range estimated at approximately 9,300 square kilometers, limited to the Spring Mountains in Clark County, Nevada, and the Clark Mountains in San Bernardino County, California, with a disjunct occurrence near Towne Pass northeast of Death Valley. The national rank is N2N3, and the Nevada state rank is S2 (Imperiled). Approximately 20 occurrences are known, with an area of occupancy of roughly 84 square kilometers based on 4-square-kilometer grid cells (NatureServe 2026). Population abundance is largely unknown; prior to 2000, plants at two locations were considered uncommon and at one location occasional. No current population counts are available, and both short- and long-term trends are unknown (NatureServe 2026).

58.4 Impact

Polished blazing star occurs in Mojave Desert scrub in gypsum-rich soils, typically in the washes among limestone hills (Nelson 1909, Brokaw et al. 2017). Development in these areas may threaten populations of this species.

Threats to the species are not well known but are estimated to be high to medium, and include development, off-road vehicle impacts, and drought exacerbated by climate change (NatureServe 2026).

Simandle and Nussear (2025) modeled polished blazing star habitat suitability on the basis of soil silica content, terrain slope, and winter precipitation variability. High-suitability habitat is predicted to occur around the edges of the Spring Mountains, Half Pint Range, Spotted Range, Pintwater Range, Sheep Range, Las Vegas Range, and near Sandy Valley. Medium-quality habitat is distributed widely throughout Clark County (Simandle and Nussear 2025).

Polished blazingstar* *Mentzelia polita*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	175,497	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	3,501	2.0%
Suitable Habitat in Lands Managed for Resource Conservation	85,980	49.0%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	8,515	4.9%

*Simandle and Nussear 2025

58.5 Data

Two locations of polished blazing star that are closest to urban Las Vegas are in Red Rock Canyon National Conservation Area and the Las Vegas Springs Preserve. The Las Vegas Springs Preserve has managed the restoration of several rare and sensitive plants on their land, although it is unknown whether polished blazing star was among the 70 native plant species that were replanted or reseeded within the restoration zone. The known locations of *Mentzelia polita* within Red Rock Canyon National Conservation Area are far from roads and will therefore not likely be affected by any park improvements.

Rare plant surveys conducted by Ironwood Consulting for Clark County from 2020-2023 detected polished blazing star only during the 2020 survey season. Two occurrences were found in the vicinity of the Wilson Pass survey area, totaling 36 individuals occupying approximately 0.7 acre across an elevation range of 422 to 449 meters (1,385 to 1,473 feet). Common associated species included *Brickellia atractyloides* and *Agave utahensis*. The annual invasive *Bromus rubens* was observed at both occurrences at low densities. Each occurrence was rated as excellent in quality, likely due to the steep and challenging terrain this species inhabits (Ironwood 2020). The species was listed as a secondary target in the 2021 survey but was not detected, consistent with reduced annual

plant abundance observed that season following two consecutive years of below-average precipitation (Ironwood 2021). Polished blazing star was not a primary target species in the 2023 surveys and was not detected in that survey year (Ironwood 2023).

58.6 Recommendation

Not recommended for coverage. Polished blazing star is considered a sensitive species by the BLM but has no state or federal status. It is known to occur in several areas where it is sympatric with protected species and benefits from habitat-level protections in these areas. There is no data on the species to establish population trends, and there are no indicators of concern over its status or potential for petition to list the species; therefore, this species is not recommended for inclusion in the MSHCP.

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59.0 BEAVER DAM BREADROOT (*PEDIOMELUM CASTOREUM*)

59.1 Species Overview

Beaver Dam breadroot (*Pediomelum castoreum*), also known as Beaver Dam scurfpea or Beaver Indian breadroot, is a member of the Fabaceae (legume) family. The species is a perennial geophyte, producing large subsurface tubers from which above-ground stems emerge seasonally. It blooms from April to May (CNPS 2018). The roots of the species were used by Native Americans and early European settlers for food (Dayton et al. 1937).

Beaver Dam breadroot is native to the deserts at the intersection of California, Nevada, and Arizona, where it grows in local habitats, including disturbed areas. It is associated with creosote bush scrub, Joshua tree woodland, and pinyon-juniper woodland habitats, occurring in washes or where sandy substrates are present (Munz 1974). Parent materials in these habitats may be limestone or sandstone.

59.2 Range

Beaver Dam breadroot inhabits the Mojave Desert of southern California, near Victorville and Barstow, and extends eastward through Death Valley, into Nevada, and northern Arizona (AZGFD 2005; MacKay 2013). Reports of the species in Utah and some areas of California are suspected to be inaccurate (AZGFD 2005, Wojciechowski and Grimes 2012; NatureServe 2026). The species occurs in northwestern Arizona (Mohave County), southern Nevada (Clark and Lincoln Counties), and southeastern California (Inyo and San Bernardino Counties) (NatureServe 2026). There are an estimated 62 occurrences rangewide, based on a 1 km separation distance applied to herbarium specimens, photo-based observations, and occurrence data documented between 1994 and 2025 (NatureServe 2026).

The habitats of Beaver Dam breadroot include Mojave desert scrub and Joshua tree woodland, occurring on sandy surfaces or sandy gravel, including washes and roadcuts (CNPS 2018; MacKay 2013). The species is present in desert areas with dry, sandy soils. In Nevada, the species occurs at elevations ranging from 390 to 1,524 meters (1,280 to 5,000 feet); in Arizona the species occurs at elevations ranging from 534 to 1,196 meters (1,750 to 3,925 feet) (SWECO 2018, AZGFD 2005).

Beaver Dam breadroot is known to occur in Lincoln and Clark Counties in Nevada (Kartesz 1988). Most observations occur within the Moapa Valley area, the Virgin River corridor from Lake Mead to Mesquite, areas near the Beaver Dam Wash, Riverside, Gold Butte, and along the Virgin River to its confluence with the Muddy River (Kartesz 1988; Nussear et al. 2011; NNHP 2017; AZGFD 2005). Other documented locations in Nevada include Bonnie Springs and Lovell Canyon, near the southern Spring Mountains (iNaturalist 2018).

59.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Watch List
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	Special-status Species
California Native Plant Society	Rank 1B.2
NV Division of Natural Heritage	G3 S2

Agency/Organization	Status
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	
IUCN Red List	None
CITES	None

*Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer include this category.

Beaver Dam breadroot has a NatureServe global conservation status of G3 (Vulnerable), last reviewed March 5, 2025. The species is ranked N3 nationally in the United States. State rankings are S1 (Critically Imperiled) in Arizona, S2 (Imperiled) in California, and S2 (Imperiled) in Nevada (NatureServe 2026). The species has no listing under the Endangered Species Act (NatureServe 2026) and is not listed under CITES (CITES 2017).

Despite extensive distribution surveys, information on population trends for this species is limited (NNHP 2017). NatureServe (2026) notes a long-term decline of approximately 35 percent in the number of occurrences, though the species appears to tolerate light disturbance and has no obvious intrinsic vulnerabilities. Total population size is difficult to estimate because plants do not emerge in dry years and several occurrences lack population counts (NatureServe 2026).

59.4 Impact

Beaver Dam breadroot faces several threats to its persistence. The species is potentially threatened by vehicles and road widening (CNPS 2018) and is vulnerable to population declines due to small population sizes, off highway vehicle use, and the expansion of urban areas and infrastructure (MacKay 2013). The primary threats facing the species include livestock and feral animal disturbances, invasive plant species, urbanization, and energy and utility transportation corridor development (SWECO 2018).

Beaver Dam breadroot is found in Mojave desert scrub through pinyon-juniper woodland ecosystems. Mojave desert scrub habitats are susceptible to fire driven by invasive species. Invasive grasses may outcompete Beaver Dam breadroot seedlings; however, the geophytic growth form of the species (i.e., the large subsurface tubers) would likely protect the plant from fire impacts. Livestock and feral horses are likely to be detrimental to the species through herbivory and soil surface disturbance. In addition, some Beaver Dam breadroot habitat was likely inundated by the creation of Lake Mead (SWECO 2018).

Habitat modeling for sand-dependent species provides estimates of habitat suitability within Clark County ecosystems. High suitability habitat for Beaver Dam breadroot was identified primarily in Mojave desert scrub and to a lesser extent in mesquite acacia, while moderate suitability habitat includes some desert riparian areas (SWECO 2018). As shown in the table below, suitable habitat within the MSHCP Amendment Plan Area totals 244,518 acres. The MSHCP Amendment Impact Area contains 16,329 acres (6.7 percent) of suitable habitat. Suitable habitat in lands managed for resource conservation totals 97,759 acres (40.0 percent of total suitable habitat), including 15 acres within the existing MSHCP Reserve System and 8,983 acres (3.7 percent) within the MSHCP Amendment Reserve System additions (SWECO 2018).

Beaver Dam breadroot* *Pediomelum castoreum*	Acres	Percent of Total Habitat within Plan Area
Suitable Habitat in the MSHCP Amendment Plan Area	244,518	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	16,329	6.7%
Suitable Habitat in Lands Managed for Resource Conservation	97,759	40.0%
Suitable Habitat in the existing MSHCP Reserve System	15	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	8,983	3.7%

*Hamilton and Kokos 2011

59.5 Data

Beaver Dam breadroot is occasionally misidentified as *Psoralidium lanceolatum* (Kartesz 1988), which presents a challenge when evaluating occurrence records. The species also does not emerge in dry years, further complicating efforts to assess population size and distribution trends. Despite these challenges, distribution surveys have been conducted across the species' range (NNHP 2017).

The Nevada Natural Heritage Program (NNHP 2017) documents occurrences in Lincoln and Clark Counties in Nevada. The Bureau of Land Management Nevada Sensitive and Status Species List (BLM 2023) also includes the species. Habitat modeling conducted by SWECO (2018) for the Clark County Desert Conservation Program (DCP) identified high suitability habitat for Beaver Dam breadroot primarily in Mojave desert scrub, with moderate suitability habitat in some desert riparian areas.

Rare plant surveys conducted by Ironwood Consulting in 2020 detected Beaver Dam breadroot in five locations in the Halfway Wash, St. Thomas Point and Virgin River areas, comprising 1,320 individuals. The occurrences were rated good in quality, though the presence of invasive species and off highway vehicle trails were noted (Ironwood Consulting 2020). Five additional new occurrences were discovered in 2023, comprising 145 individuals ranging from poor to good in health (Ironwood Consulting 2023).

59.6 Recommendation

Not recommended for coverage. Beaver Dam breadroot is not recommended for coverage under the MSHCP based on extremely limited data on the species. The species is however associated with Joshua tree, has a limited range, and occurs within the Plan Area; therefore, a review of potential additional data sources was requested prior to final determination. No additional information was received on this species, and Joshua tree is recommended for coverage under the MSHCP. Conservation actions provided for Joshua tree will likely extend to Beaver Dam breadroot.

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60.0 WHITE-MARGINED BEARDTONGUE (*PENSTEMON ALBOMARGINATUS*)

60.1 Species Overview

White-margined beardtongue (*Penstemon albomarginatus*) is a perennial with a large taproot, 1 to 4 feet long. The species is a psammophile restricted to sandy habitats with mostly deep, loose to stabilized sand, sometimes on sand dunes or in sandy to gravelly washes. Permanent, non-shifting sand of sufficient depth is required to permit establishment and maintenance of such a deep root system (Scogin 1989). In Nevada, plants are found on loose deposits of aeolian sand or sandy alluvium, particularly in or near small dry drainages, wash bottoms, on valley floors, gentle foot-slopes, or alluvial terraces (Smith 2001). This specialized habitat is surrounded by zonal creosote bush-white bursage or salt desert scrub ecological systems in Clark County.

60.2 Range

The currently understood global distribution for white-margined beardtongue is restricted to the southeastern Mojave Desert ecoregion spanning three states. Southern Clark County appears to be its center of distribution with three arms radiating northwest into Nye County, southwest into California, and southeast into Arizona (TNC 2007).

The distribution of white-margined beardtongue in Clark County is limited to its southern portion. It is comprised of four population groups mostly separated by hill topography disconnecting the valley bottoms. Because southern Clark County is centrally located within this species' limited global extent, maintaining these core populations and their habitat may be very important for providing connectivity for ecosystem functions within local (and possibly distant) populations and ultimately for the species' long-term survival (TNC 2007).

60.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
California Rare Plant Society	Rank 1B.1
State of Arizona	Salvage Restricted
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G1 S2
IUCN Red List	None
CITES	None

* Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer includes this category.

Under the U.S. Endangered Species Act, the species is currently Under Review following a 90-day finding by USFWS (January 25, 2024) that a petition to list the species may be warranted. It is included in the USFWS FY24 to FY28

National Domestic Listing Workplan (NatureServe 2026).

White-margined penstemon is recognized as a species of significant conservation concern across its entire range. NatureServe (2026) assigns the species a global rank of G1 (Critically Imperiled), with a national rank of N1 in the United States. State ranks are S1 (Critically Imperiled) in California, S1S2 in Arizona, and S2 (Imperiled) in Nevada. The Nevada Natural Heritage Program (2001) assigned historic ranks of G2 S2 and listed the species as Threatened under the Nevada Native Plant Society. The species is also a BLM Special Status Species in Nevada.

Early survey data were limited. The NNHP (2001) estimated more than 14,000 individuals in Nevada across 13 to 16 occurrences, covering approximately 368 hectares. Subsequent surveys by Smith (2001) estimated 25,964 plants in Clark County and 42,200 in Nye County. A resurvey by Etyemezian et al. (2010) substantially revised these figures upward, estimating approximately 125,825 plants in Clark County and 78,954 in Nye County, roughly five times and two times the Smith (2001) estimates, respectively. The authors note, however, that methodological differences between the two survey approaches make it unclear whether the discrepancy reflects a genuine population increase or differences in survey methodology.

Peak abundance across all populations was documented at 309,199 plants during surveys conducted between 1988 and 2010 (NatureServe 2026).

Population trends are sharply negative. The most recent comprehensive surveys in 2021 found only 68,535 plants across all four populations, a dramatic reduction from the peak estimate (NatureServe 2026; Miller 2021). NatureServe (2026) characterizes the long-term trend as a decline of 70 to 80 percent range-wide. Documented declines from historical estimates to the most recent surveys are as follows: Mohave County, Arizona, 99.8 percent; San Bernardino County, California, 99.0 percent; Clark County, Nevada, 73.2 percent; and Nye County, Nevada, 56.2 percent (NatureServe 2026). NatureServe (2026) notes that no occurrences have been evaluated as having Very Good or Good estimated viability; 19 occurrences have been evaluated as having only Fair or Poor viability.

Extinction probability modeling based on long-term demographic monitoring projects high risk of quasi-extinction within 50 years under current climate conditions: Arizona, 70 percent; California, 100 percent; Clark County, 80 percent; and Nye County, 50 percent. Under scenarios of increased drought frequency, these probabilities rise to 85, 100, 90, and 90 percent, respectively (Miller 2021). The species has low rates of reproduction and recruitment and is an obligate outcrosser, fruit production is significantly reduced without access to pollinators, which limits its capacity for recovery (DeFalco et al. 2023). Recruitment events are rare and episodic, tied to successive wet years that favor seed production, germination, and seedling survival (Etyemezian et al. 2010; DeFalco et al. 2023).

60.4 Impact

TNC (2007) considers the overall threat status for this species' populations as very high. Populations of white-margined beardtongue have been reduced in size and extent by direct mortality of individuals and loss or fragmentation of habitat from several threats. The primary threats to white-margined beardtongue in Clark County are rural development, mineral exploration, utility corridor construction and maintenance, invasive plant species, OHV use, livestock grazing, highway and road construction and maintenance, legal and illegal off-highway events, federal land disposal to private ownership, sand and gravel mining, and construction of the planned Ivanpah Airport (TNC 2007). The composition of plant communities has been altered by reducing native plant cover and introducing weeds, while some threats have altered soil structure and stability. Disturbance regimes, including aeolian sand deposition and timing or intensity of fire in the matrix creosote bush vegetation, have or may negatively impact its landscape context. The historic prevalence of cattle grazing in combination with the introduction and spread of highly flammable exotic annuals has played a large role in altering historic fire regimes within the landscape dominated by creosote bush plant communities. Recent fires in the Mojave Desert

indicate the likelihood of more frequent fire as weeds increase in cover and native shrubs decrease.

More recent assessments identify additional significant threats range-wide. The increasing frequency and intensity of droughts is causing substantial declines in all populations; plants produce fewer flowers and viable seeds during drought years and may remain completely dormant during severe events (Miller 2021). Invasive plants, including Sahara Mustard (*Brassica tournefortii*), Mediterranean Grass (*Schismus* spp.), and Tumbleweed (*Salsola tragus*), are present in all populations, particularly along roads and utility corridors. Numerous organized off-road races occur within occupied habitat in both Nevada populations (NatureServe 2026). Utility-scale solar developments, a proposed airport, and continued growth of the Las Vegas Valley could result in additional habitat loss. The Greenlink West power line project will disturb a corridor up to 600 feet wide through occupied habitat in Nye County (NatureServe 2026).

Nussear et al. (2024) modeled white-margined beardtongue habitat suitability on the basis of depth to bedrock, extreme minimum temperature, slope, winter precipitation and vegetation. Areas of high-suitability habitat are predicted to occur along the I-15 corridor and perimeter of Las Vegas (Nussear et al. 2024). Based on habitat suitability modeling (Nussear et al. 2024), approximately 56,178 acres of suitable habitat for white-margined beardtongue occur within the MSHCP Amendment Plan Area. Of this total, 17,364 acres (30.9 percent) fall within the MSHCP Amendment Impact Area. Approximately 11,118 acres (19.8 percent) of suitable habitat occur within lands managed for resource conservation, and 201 acres (0.4 percent) occur within the existing MSHCP Reserve System. An additional 6,876 acres (12.2 percent) of suitable habitat are within the MSHCP Amendment Reserve System Additions.

White margined beardtongue* *Penstemon albomarginatus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	56,178	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	17,364	30.9%
Suitable Habitat in Lands Managed for Resource Conservation	11,118	19.8%
Suitable Habitat in the existing MSHCP Reserve System	201	0.4%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	6,876	12.2%

*Nussear et al. 2024

60.5 Data

A Clark County Desert Conservation Program-funded study conducted by the Nevada System of Higher Education (October 2007 through September 2009) investigated sediment transport processes in relation to *P. albomarginatus* habitat at seven instrumented field sites in Clark and Nye Counties. Population resurveys of all 12 known occurrences documented in the 1997 to 1998 Smith surveys yielded estimates of approximately 125,825 plants in Clark County and 78,954 plants in Nye County, approximately five times and two times the earlier estimates, respectively; the authors note the two methods are not directly comparable and inter-annual variation is substantial (Etyemezian et al. 2010). The study found that *P. albomarginatus* habitat is characterized by soils with greater than 80 percent sand to a depth of at least 60 cm, slopes of 1.8 to 4.6 percent, south-to-west aspects, and shrub cover below 20 percent. The Bluepoint and Arizo soil series supported the largest populations in both counties. Plant community analysis found that the native perennial grass *Pleuraphis rigida* and the native shrubs *Krascheninnikovia lanata* and *Acamptopappus shockleyi* are the most likely indicator species for *P. albomarginatus* in Clark County, with 66 to 94 percent of plants occurring in canopy inter-spaces. Recruitment is rare and episodic, likely requiring successive wet years. Phenology monitoring at the four Clark County sites found that drought and insect herbivory reduced reproductive success in 2009, with seed dispersal observed only at the Hidden Valley site, at distances of 1 to 15 cm. The study concluded that although present-day eolian sand transport rates are very

low, the eolian origin of the soils is a key habitat attribute; present-day sediment transport processes are unlikely to have an appreciable effect on habitat quality in the absence of significant vegetation change. The study also noted that due to the species' deep root system, transplanting is not a practical mitigation tool, but seed-based establishment at suitable sites may be feasible (Etyemezian et al. 2010).

A USGS study (DeFalco et al. 2023) on seed dormancy and germination provides important information for conservation management and survey planning. The study confirmed that *P. albomarginatus* is an obligate outcrosser, requiring cross-pollination for fruit set, making maintenance of pollinator populations essential. Seeds have seasonal dormancy cycling tied to temperature; successful germination requires warm summer after-ripening followed by cold conditions. The study also demonstrated that seed-based propagation at suitable sites is more practical than transplanting, given the species' deep root system.

The 2020 rare plant survey conducted by Ironwood Consulting (2020) encountered white-margined beardtongue at four locations within the Jean Dry Lake survey area. In total, these occurrences included 8,691 individuals occupying 55 acres across an elevation range of 863 to 912 meters and ranged from fair to excellent in quality. Common associated species included *Ambrosia dumosa*, *Larrea tridentata*, *Malacothrix glabrata*, and *Pleuraphis rigida*. The annual invasive *Schismus* sp. was encountered across all occurrences. The immediate threats to these occurrences included moderate to high levels of OHV use (including evidence of frequent travel off designated routes) and potential solar development (Ironwood 2020).

Ironwood's 2021 rare plant survey targeted sandy habitats within Clark County but did not encounter *P. albomarginatus* during that survey season. Two consecutive years of below-average moisture conditions were noted as having reduced the abundance and vigor of perennial plants across survey areas, and the areas of true suitable habitat for this species in Clark County are limited (Ironwood 2021).

Ironwood's 2023 rare plant survey found this species at the Hidden Valley Disposal and Jean Lake East survey areas. One of the locations represents a new occurrence record while the other location is within 0.5 mile of an existing record. The total occupied area included approximately 0.3 acres and 11 individuals. Both occurrences were rated poor in quality due to small population size and proximity to highly trafficked OHV routes. The 2023 survey also revisited a historic element occurrence record for *P. albomarginatus* in the "Revisit PEAL" survey area, where the plant community was dominated by Utah juniper and singleleaf pinyon on limestone-derived substrate, clearly unsuitable habitat for this species. No individuals were observed, suggesting the historic record was likely a misidentification or contained incorrectly recorded locality details (Ironwood 2023).

60.6 Recommendation

Recommended for coverage. The high level of threat for all populations throughout the species' restricted range, including those within Clark County, creates a high potential for the species to be listed in the future. The species is a former Candidate 2 species for listing under the federal Endangered Species Act; it is a special-status species in California and Arizona. Clark County is the core of the species' range, so providing conservation measures through coverage is appropriate.

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61.0 ROSY TWOTONE BEARDTONGUE (*PENSTEMON BICOLOR* SSP. *ROSEUS*)

61.1 Species Overview

Rosy twotone beardtongue (*Penstemon bicolor* ssp. *roseus*) (rosy beardtongue) is one of two bi-colored *Penstemon* species that inhabit southern Nevada. The species is a short-lived perennial that grows up to 0.5 meters tall and ranges in color from red to cream; in the southern Nevada area, roughly two-thirds of the plants express the rose-colored phase, while the remainder express the yellow variant (Smith 2005). The plant is pollinated by at least two bee species in the *Osmia* genus (Glenne 2003).

61.2 Range

This species was first discovered near Goodsprings, Clark County, Nevada. The yellow variant occurs on the eastern slopes of the Spring Range and Bird Spring Mountains, south through Red Rock, Blue Diamond, and Goodsprings. The red variant typically occurs south of Las Vegas, through the Eldorado and McCullough Mountains, and on the western slopes of the Spring Range near Pahrump (Smith 2005). The species is associated with rocky calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar settings that receive enhanced runoff within the creosote-bursage, blackbrush, and mixed-shrub zone (NNHP 2018). It occurs from 549 to 1,245 meters (1,800 to 4,085 feet) in elevation (NNHP 2018).

61.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Watch List
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	Salvage Restricted
California Rare Plant Society	Rank 1B.1
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3T3Q S3
IUCN Red List	None
CITES	None

*Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer include this category.

Population trends are unknown, and the estimated total number of *Penstemon bicolor* ssp. *roseus* individuals is less than 7,000. Numbers vary widely from year to year, making trends difficult to discern (Smith 2005; NNHP 2018).

NatureServe (2026) assigns *Penstemon bicolor* ssp. *roseus* a global conservation status of G3T3Q (Vulnerable

subspecies), indicating that the taxon is vulnerable to extinction or elimination rangewide. The subspecies is ranked S3 (Vulnerable) in Nevada, S2 (Imperiled) in Arizona, and S1 (Critically Imperiled) in California. The subspecies has no federal protection under the Endangered Species Act. The subspecies is known from 47 occurrences in Clark and Nye counties, Nevada, with an estimated 21 to 80 element occurrences range-wide across Nevada, Arizona, and California, and the range extent is estimated at 250 to 20,000 square kilometers. No occurrences are considered appropriately protected and managed at the time of the most recent global status review (NatureServe 2026). The global status was last reviewed in April 2008 and is flagged as needing review.

61.4 Impact

Rosy twotone beardtongue is threatened by habitat loss from development and mining and faces additional pressure from continued urbanization throughout the Las Vegas Valley. NatureServe (2026) identifies horticultural collection and feral burros as the primary threats. Restoration plantings of *P. palmeri* may pose a hybridization risk where populations are close enough to share pollinators, and re-seeding of linear disturbances increases the likelihood of crossing through or near P. bicolor populations (Glenne 2003).

Simandle and Nussear (2025) modeled rosy twotone beardtongue habitat suitability using winter precipitation variation, maximum vapor pressure deficit, absolute minimum temperature, and silica index. High suitability habitat is predicted to be scattered throughout Clark County at mid-elevation with concentrations of high suitability habitat predicted to occur in and around the Spring Mountains, Sandy Valley, and the margins of the Birdsprings, McCullough, Highlands, and Eldorado Ranges (Simandle and Nussear 2025). Based on habitat suitability modeling by Simandle and Nussear (2025), the MSHCP Amendment Plan Area contains approximately 695,349 acres of suitable habitat for rosy twotone beardtongue. Of this total, approximately 63,727 acres (9.2 percent) occur within the MSHCP Amendment Impact Area. Approximately 362,119 acres (52.1 percent) of suitable habitat occur within lands managed for resource conservation. The existing MSHCP Reserve System encompasses 8,664 acres (1.2 percent) of suitable habitat, and the MSHCP Amendment Reserve System Additions encompass an additional 48,622 acres (7.0 percent).Based on habitat suitability modeling by Simandle and Nussear (2025), the MSHCP Amendment Plan Area contains approximately 695,349 acres of suitable habitat for rosy twotone beardtongue. Of this total, approximately 63,727 acres (9.2 percent) occur within the MSHCP Amendment Impact Area. Approximately 362,119 acres (52.1 percent) of suitable habitat occur within lands managed for resource conservation. The existing MSHCP Reserve System encompasses 8,664 acres (1.2 percent) of suitable habitat, and the MSHCP Amendment Reserve System Additions encompass an additional 48,622 acres (7.0 percent).

Rosy two-toned beardtongue* *Penstemon bicolor ssp. roseus*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	695,349	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	63,727	9.2%
Suitable Habitat in Lands Managed for Resource Conservation	362,119	52.1%
Suitable Habitat in the existing MSHCP Reserve System	8,664	1.2%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	48,622	7.0%

*Simandle and Nussear 2025

61.5 Data

The taxonomic status of this subspecies remains uncertain. Townshend Stith Brandegee first described the plant as

Penstemon palmeri ssp. *bicolor* in 1916. Clokey and Keck (1939) elevated it to species rank as *Penstemon bicolor*, recognizing subspecies bicolor and roseus based on yellow and rose flower color, respectively. While *Penstemon bicolor* continues to be accepted as a valid species, the validity of the subspecies has been questioned (Smith 2005). Dr. Noel Holmgren did not recognize the subspecies in California in his 1993 and 2002 Jepson Manual treatments (Holmgren 1993, 2002).

The total observed area occupied by rosy beardtongue is 82 hectares (202 acres) (NNHP 2018). Smith (2005) estimates that approximately 91 percent of the *Penstemon bicolor* ssp. *roseus* population occurs on federal land, primarily BLM lands. No conservation areas or management actions specific to this subspecies are known beyond those broadly inclusive of all plants within existing protected areas (e.g., Red Rock Canyon National Conservation Area, Sloan Canyon National Conservation Area).

Ironwood Consulting (2021) documented rosy twotone beardtongue at one location in the McCullough Mountains during rare plant surveys. This occurrence comprised 75 individuals and was rated fair quality due to nearby roadside and vehicular disturbance (Ironwood 2021).

During spring 2023 rare plant surveys, Ironwood Consulting (2023) documented *Penstemon bicolor* (twotone beardtongue, not identified to subspecies) at two locations within Clark County. One occurrence was recorded at the Highland Spring wetland survey area, comprising 33 individuals occupying approximately 0.1 acre at a mean elevation of 1,340 meters (4,396 feet). A second occurrence of a single individual was documented at the Cow Spring wetland survey area at a mean elevation of 1,214 meters (3,982 feet). Associated species at both locations included *Datura wrightii* (sacred datura) and *Senegalia greggii* (cat claw acacia). Both occurrences were rated fair quality due to competition from the invasive annual grass *Bromus rubens*, which had moderate to high cover at both sites (Ironwood 2023).

61.6 Recommendation

Not recommended for coverage. There is a lack of recognized status for the subspecies level of the rose-colored variant of the species, and at the species level, *Penstemon bicolor* is widely distributed in several states and is not in immediate threat of extinction or listing; therefore, this species is not recommended for inclusion in the MSHCP.

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62.0 YELLOW TWO-TONE BEARDTONGUE (*PENSTEMON BICOLOR* SSP. *BICOLOR*)

62.1 Species Overview

Yellow two-tone beardtongue (*Penstemon bicolor* ssp. *bicolor*) is a perennial flowering plant in the family Plantaginaceae. Yellow two-tone beardtongue depends on insect pollinators for much of its reproductive success. The species is generally restricted to naturally or artificially disturbed, often calcareous, moisture-accumulating sites such as washes and roadsides, as well as rocky slopes, crevices, and talus in mountains on all aspects, at elevations from 550 to 1,670 meters (1,800 to 5,480 feet). All sites are surrounded by Joshua tree/shrub, mixed-shrub, or creosote bush vegetation types.

62.2 Range

Yellow two-tone beardtongue is known from many areas in the Mojave Desert of southern Nevada and adjacent southeastern California and northwestern Arizona. The range of all variants of *Penstemon bicolor* includes the New York and Castle mountains of California (CNPS 2017) and the Black Mountains of Arizona, but most of the known populations occur in mountain ranges of Clark County, Nevada (Smith 2005). Yellow two-tone beardtongue occurs in habitats that are common throughout the Mojave Desert in southern Nevada (Smith 2005).

Within Nevada and Clark County, populations are concentrated on the eastern slopes of the Spring Mountains in the Red Rock Canyon Conservation Area and on the Bird Springs Range near Goodsprings, Nevada. Outlier populations are found at higher elevations in the McCullough and El Dorado mountains, though the rose-colored subspecies is much more common in those ranges (Smith 2005). The species has historically also been found in the Southern Las Vegas Range and the Muddy Mountains, though those areas have not been surveyed recently (Smith 2005). Eighty-two percent of 288 observations of this subspecies were found below 4,000 feet elevation. Approximately 31 occurrences are known from Clark County, Nevada, scattered primarily on BLM and private lands immediately adjacent to the expanding limits of the Las Vegas urban area (NatureServe 2015).

62.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of California	None (Species level)
State of Arizona	None
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3T2Q S2
IUCN Red List (v 2025-2)	None

Agency/Organization	Status
CITES	None

*Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer include this category.

Yellow two-tone beardtongue holds a NatureServe Global Status of G3T2Q (Imperiled Subspecies), a U.S. National Status of N2, and a Nevada State Status of S2 (Imperiled) (NatureServe 2015). The global status was last reviewed in August 2015 and is noted as needing review. The subspecies is not listed under the Endangered Species Act and has no COSEWIC status. It is a BLM Sensitive Species. The estimated range extent is 1,000 to 5,000 square kilometers, with an estimated 21 to 80 element occurrences documented. Total estimated individuals number 784 or more (Morefield 2001 as cited in NatureServe 2015).

Long-term trend data indicate that approximately 9 percent of the estimated 80 historical occurrences of *Penstemon bicolor* in Nevada are known to have been extirpated. Most of these losses have been of the yellow-flowered form (*Penstemon bicolor* ssp. *bicolor*), suggesting this segment of the genetic variation in *Penstemon bicolor* is particularly vulnerable to further losses (Smith and Morefield 2006 as cited in NatureServe 2015). Short-term trends indicate a decline of 10 to 50 percent, with Las Vegas urbanization encroaching on habitat; at least six occurrences are known to have been extirpated, and potentially up to half of all known occurrences have been or will soon be extirpated (NatureServe 2015).

62.4 Impact

The primary threat to yellow two-tone beardtongue populations is habitat loss due to housing and road development, mining activities, off-road vehicle use, utility corridor development and maintenance, and water development (Smith 2005). Additional threats identified by NatureServe (2015) include livestock grazing and trampling, road and right-of-way construction and maintenance, and large-scale renewable energy development within the species' range. An emerging threat is hybridization with Palmer's penstemon (*Penstemon palmeri*), a closely related species that is seeded into disturbed areas within the range of yellow two-tone beardtongue for revegetation by land management agencies (Glenne 2003). The collection of plants and seeds for horticulture is also a potential threat to this taxon (Arizona Game and Fish Department 2003).

Simandle and Nussear (2025) modeled yellow two-tone beardtongue habitat suitability on the basis of winter precipitation variation, soil silica content, vapor pressure deficit, and variation in minimum temperature. Areas of medium- and high-suitability habitat are predicted to occur in the southeastern and southwestern margins of the Spring Mountains, in the vicinity of Sandy Valley, and in the Birdsprings Valley and Goodsprings Valley (Simandle and Nussear 2025). According to habitat suitability modeling by Simandle and Nussear (2025), approximately 185,495 acres of suitable habitat for yellow two-tone beardtongue occur within the MSHCP Amendment Plan Area. Of this total, 13,859 acres (7.5 percent) fall within the MSHCP Amendment Impact Area and are therefore subject to potential impacts from covered activities. Approximately 58,434 acres (31.5 percent) of suitable habitat occur within lands managed for resource conservation, and 33,216 acres (17.9 percent) occur within the MSHCP Amendment Reserve System Additions. No suitable habitat occurs within the existing MSHCP Reserve System.

Yellow two-toned beardtongue* *Penstemon bicolor ssp. bicolor*	Acres	Percent of Total Habitat within Plan Area
Suitable Habitat in the MSHCP Amendment Plan Area	185,495	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	13,859	7.5%

Yellow two-toned beardtongue* *Penstemon bicolor ssp. bicolor*	Acres	Percent of Total Habitat within Plan Area
Suitable Habitat in Lands Managed for Resource Conservation	58,434	31.5%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	33,216	17.9%

*Simandle and Nussear 2025

62.5 Data

The taxonomic validity of the two subspecies (yellow and rose phases) of Penstemon bicolor has been in question for several years. Recent data on pollination and genetics indicate no significant differences between the subspecies (Smith 2005); however, the Nevada Natural Heritage Program continues to describe it as a subspecies. Because some survey records do not distinguish between subspecies, this adds uncertainty to estimates of abundance and distribution for the yellow-flowered form specifically.

About 92 percent of the Nevada occurrences of yellow two-tone beardtongue are on public lands managed by the BLM, with most of the remainder on privately managed lands. Most populations are within the Red Rock Canyon National Conservation Area and are managed for both recreation and resource protection. Yellow two-tone beardtongue was accounted for in the final Environmental Assessment for the proposed scenic loop drive and parking areas improvements (BLM 2015). Many occurrences are also at least partly within road and highway rights-of-way managed by the Nevada Department of Transportation (Smith 2005).

Rare plant surveys conducted by Ironwood Consulting in Clark County in 2020 and 2021 did not document occurrences of yellow two-tone beardtongue (*P. bicolor* ssp. *bicolor*), though the rosy subspecies (P. bicolor ssp. roseus) was recorded in 2020 (Ironwood Consulting 2020, 2021). Rare plant surveys conducted by Ironwood Consulting in 2023 documented two new occurrences of two-tone beardtongue near Highland Spring (33 individuals) and Cow Spring (one individual). Both occurrences were fair in quality due to competition from invasive weeds. This survey did not distinguish these occurrences by subspecies (Ironwood Consulting 2023).

62.6 Recommendation

Not recommended for coverage. This species is not predicted to receive significant state or federal attention due to its rarity and taxonomic ambiguity. Forty-nine percent of predicted medium- and high-suitability habitat for this species occurs on conserved lands. Only 7 percent of predicted medium- and high-suitability habitat may be impacted by activities covered under the MSHCP; therefore, this species is not recommended for inclusion in the MSHCP.

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63.0 DEATH VALLEY BEARDTONGUE (*PENSTEMON FRUTICIFORMIS* SSP. *AMARGOSAE*)

63.1 Species Overview

Death Valley beardtongue (*Penstemon fruticiformis* ssp. *amargosae*) is a perennial herb in the Plantaginaceae family and is one of two subspecies of *Penstemon fruticiformis* (Dudek 2012). Many of the species within this family are characterized by narrow distributions, with more than 100 being endemic to one state (Wolfe et al. 2006). Death Valley beardtongue occurs in sandy or gravelly washes within creosote bush scrub (Dudek 2012; Weatherwax and Holmgren 2026).

63.2 Range

NatureServe (2026) describes the range of Death Valley beardtongue as primarily centered in the Death Valley region of California, with an eastward extent into Nevada. The species occurs in creosote shrublands and sandy or gravelly washes at elevations ranging from 900 to 1,900 meters (NatureServe 2026). The California Native Plant Society (CNPS) reports the elevation range for this species as from 850 to 1,400 meters (2,788 to 4,593 feet) (CNPS 2017). In California, this species occurs in eastern San Bernardino and Inyo Counties but is most concentrated in Death Valley (Dudek 2012). In Nevada, Death Valley beardtongue has 24 occurrences in Nevada east of Death Valley in Nye County (NNHP 2017). The Nevada Natural Heritage Program (NNHP 2017) lists the status of this species in Clark County as probable.

63.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
California Native Plant Society	Rank 1B.3
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G4T3 S2
IUCN Red List (v 2025-2)	None
CITES	None

*Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer include this category.

Death Valley beardtongue has no protections under the federal Endangered Species Act or state law in Nevada or California (NatureServe 2026). NatureServe (2026) assigns this subspecies a global conservation status of G4T3 (vulnerable), a national status of N3 (vulnerable) in the United States, and a state status of S2 (imperiled) in both California and Nevada. The BLM designates this species as sensitive in Nevada (BLM 2023). Population trends for Death Valley beardtongue are unknown given the limited number of documented occurrences in California and Nevada (Dudek 2012).

The overall range extent is estimated at 250 to 20,000 square kilometers. No quantitative population trend data are available, and NatureServe notes that the global status is in need of review, with conservation status factors last assessed in 1997 (NatureServe 2026).

63.4 Impact

Threats to Death Valley beardtongue include off highway vehicles (especially in washes), habitat degradation and fragmentation, and grazing (Dudek 2012).

No habitat suitability model has been prepared for this species.

63.5 Data

The U.S. Fish and Wildlife Service listed this species as possibly appropriate to list as Threatened or Endangered but as lacking sufficient available information in 1993 (USFWS 1993). In addition, this species has not been confirmed to occur in Clark County. No occurrences of this species were detected during county-wide rare plant surveys conducted from 2020 through 2023 (Ironwood 2023).

63.6 Recommendation

Not recommended for coverage. The Death Valley beardtongue is not recommended for coverage under the MSHCP. There is very limited population data currently available and there has not been confirmation of occurrence within Clark County. If this species occurs within Clark County, it would likely be in the western portion where impacts from the MSHCP are not anticipated.

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64.0 CLARKE PHACELIA (*PHACELIA FILIAE*)

64.1 Species Overview

Clarke phacelia (*Phacelia filiae*) is a small annual forb in the Hydrophyllaceae family. It is closely related to *P. parishii* and *P. beatleyae* (Atwood et al. 2002). Clarke phacelia is an annual that blooms from late April to early June, bearing purple flowers. The species is most abundant in years of high precipitation (Atwood et al. 2002; NatureServe 2022). It occurs primarily in blackbrush, Mojave Desert Scrub, and Salt Desert Scrub communities dominated by blackbrush, shadscale, and creosote (Atwood et al. 2002).

64.2 Range

Clarke phacelia is endemic to the transition zone between the Mojave Desert and the Mojave/Great Basin, and is known from only three counties in Nevada: Clark, Lincoln, and Nye (NatureServe 2022). The species is found mostly in the foothills of the Mojave mountain ranges, above the playas on relatively flat areas or low knolls on valley floors within an elevation range of 609 to 1,219 m (2,000 to 4,000 feet) (Atwood et al. 2002). It occurs on pale-colored outcrops and calcareous substrates including gypsiferous sandstone, siltstone, tuffaceous claystone, and limestone, and is often associated with *Atriplex confertifolia* (Atwood et al. 2002).

Within Clark County, the species has been documented on the Nellis Test and Training Range (Leidos 2017), in the Desert National Wildlife Refuge, and in the City of Las Vegas (Atwood et al. 2002). The Desert National Wildlife Refuge is managed by USFWS and supports occurrences of this species (NatureServe 2022).

64.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3 S3
IUCN Red List	None
CITES	None

NatureServe (2022) ranks *Phacelia filiae* as G3 (Vulnerable) globally and N3 nationally. Nevada ranks the species as S3 (Vulnerable). The species is not listed under the Endangered Species Act. The BLM considers the species sensitive in Nevada (BLM 2023). The global rank reflects that *P. filiae* is known from fewer than 30 occurrences in a small area of south-central Nevada that is vulnerable to urban expansion, military activities, and commercial development (NatureServe 2022). As of 2021, *P. filiae* was reduced from a concern category of “moderate” to “watch” on the Nevada National Security Site because the species is rarely encountered during activities on the property and is considered widespread in the southern portion of the property (Hall and Perry 2021).

Population trends are largely unknown across most of the species' range. Several populations are presumed to have been lost in the Las Vegas urban area prior to formal documentation, and short-term trend data are otherwise unavailable (NatureServe 2022). Because this is an annual species, abundance varies considerably among years and is

greatest during years of high precipitation (Atwood et al. 2002).

64.4 Impact

Threats to habitat where this species is found include wildfire, livestock, grazing, and various types of development. The populations of this species are under a variety of ownerships and land managements, and each population faces a different set of threats. Existing populations within urban areas of Las Vegas face direct losses from development as well as losses related to habitat fragmentation, and some have already been extirpated. Populations on land managed by the Department of Defense and the Department of Energy are at lower risk due to their remote location and restricted access; however, populations such as those on Nellis Air Force Base may be at risk from exposure to defense-related activities or expansion (Atwood et al. 2002, Nellis Air Force Base 2010, Leidos 2017).

Simandle and Nussear (2025) modeled Clarke phacelia habitat suitability on the basis of vapor pressure deficit maximum, soil pH, soil silica content, and winter precipitation variation. Areas of high-suitability habitat are predicted to occur in Indian Springs Valley, Three Lakes Valley, and the northwestern end of Las Vegas Valley (Simandle and Nussear 2025). Based on modeled habitat (Simandle and Nussear 2025), the MSHCP Amendment Plan Area contains approximately 89,069 acres of suitable habitat for Clarke phacelia. Of this total, an estimated 3,549 acres (4.0 percent) occur within the MSHCP Amendment Impact Area. Approximately 43,565 acres (48.9 percent) of suitable habitat occur within lands managed for resource conservation. No suitable habitat occurs within the existing MSHCP Reserve System (0 acres; 0.0 percent), and 1,277 acres (1.4 percent) occur within MSHCP Amendment Reserve System Additions.

Clarke phacelia* *Phacelia filiae*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	89,069	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	3,549	4.0%
Suitable Habitat in Lands Managed for Resource Conservation	43,565	48.9%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	1,277	1.4%

*Simandle and Nussear 2025

64.5 Data

Available data for this species are limited to records at 66 localities in Clark County, predominantly in the vicinity of Indian Springs (Simandle and Nussear 2025). Population sizes for these occurrences are unknown. Several populations in the urban Las Vegas area were likely lost prior to documentation. No occurrences of this species were detected during county-wide rare plant surveys conducted from 2020 to 2023 (Ironwood Consulting 2020, 2021, 2023).

64.6 Recommendation

Not recommended for coverage. Data for this species are severely lacking; however, this species has a restricted range limited to southern Nevada. Only one percent of modeled medium to high-suitability habitat occurs within the Impact Area, and one documented occurrence may be impacted by covered plan activities. Most known occurrences occur on conserved lands. This species was initially designated for further review. No additional information on the species' status within the Plan Area was discovered. Based on the lack of data and the assumption that most occurrences within Clark County are on conserved lands, this species is not recommended

for coverage.

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65.0 PARISH PHACELIA (*PHACELIA PARISHII*)

65.1 Species Overview

Parish phacelia (*Phacelia parishii*) is a winter annual which germinates in early spring as a response to increased moisture that dilutes concentrated salts in valley soils where the plant is found (Harrison 1980). In the Mojave Desert, Parish phacelia occurs on alkaline flats, playas, lakebeds and margins, and valley floors. These habitats are typically sparsely vegetated, generally dry, and fill as seasonal pools in years of high rainfall. Parish phacelia usually occurs on flats with no slope or aspect, and it has not been documented on slopes greater than three degrees (TNC 2007).

65.2 Range

Parish phacelia's known global distribution spans Nevada, California, and Arizona and two ecoregions (Mojave and Great Basin) in widely scattered populations. Its center of distribution appears to be the northeastern Mojave Desert in Clark, Lincoln, and Nye counties. Three arms radiating north, southwest, and southeast from this center define its spatial distribution. Parish phacelia occurrences range from 1,778 to 5,917 feet in elevation (TNC 2007).

Only two of 16 population groups occur within Clark County. The two population groups in Clark County, along with those in adjacent Nye and Lincoln counties appear to be the center of the distribution for this species, and the Nevada Test and Training Range may have the majority of the Nevada population (Leidos 2017). Given the distantly patchy nature of all known populations, Clark County locations contribute to its long-term survival (TNC 2007).

65.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	None*
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Arizona	None
California Native Plant Society	Rank 1B.1
NV Division of Natural Heritage	At Risk
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3 S3
IUCN Red List (v 2025-2)	None
CITES	None

*Former US Fish and Wildlife Service Category 2 Candidate, defined as "[T]axa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules." (USFWS 1993). The USFWS has revised their policy on Candidate Species and no longer include this category

Parish phacelia has no status under the federal Endangered Species Act. It is listed as a sensitive species by BLM. NatureServe (2022) assigns a global rank of G3 (Vulnerable), reflecting an estimated 21 to 80 occurrences globally, with roughly 30 to 35 known occurrences across the species' range. The national rank for the United States is N3.

State ranks are S1 (Critically Imperiled) in Arizona and California, and S3 (Vulnerable) in Nevada.

An estimated 21 to 80 element occurrences are known rangewide, distributed across approximately 33 4x4 km grid cells. Of these, one to two occurrences are considered extant in Arizona, 22 in Nevada, and 12 in California. NatureServe estimates the total number of occurrences at approximately 30 to 35.

Population abundance is highly variable and difficult to assess because *P. parishii* is an ephemeral annual tied to episodic rainfall events. In favorable wet years, populations can be extraordinarily large, (at Coyote Dry Lake, an estimate of 200 million plants was recorded in a single year), while in subsequent dry years no individuals may be detected at all (White 2006). This boom-or-bust dynamic makes both global abundance and population trends difficult to quantify; NatureServe rates both as unknown. Short-term and long-term trends are likewise unresolved (NatureServe 2022).

65.4 Impact

Threats include casual vehicle use and trail development, groundwater development, urban development and sprawl, military training and facilities development, utility corridor construction and maintenance, invasive plant species, commercial development, and livestock grazing management. These threats have reduced the size and extent of populations and habitats by both direct mortality of individuals and loss or fragmentation of habitats. They have altered composition of its plant communities by reducing native plants and spreading weeds. These threats have also altered surface water or groundwater flows (TNC 2007). TNC (2007) summarizes the overall threat status of all populations and distribution as very high.

Simandle and Nussear (2025) modeled Parish phacelia habitat suitability on the basis of winter precipitation variation, soil pH, slope, and silica index. Pockets of medium-quality habitat are predicted to occur in Indian Springs Valley, the Las Vegas Valley, on the eastern flank of the McCullough Range, the Highland Range, the Eldorado Mountains, and in the vicinity of Searchlight, NV (Simandle and Nussear 2025). Within the MSHCP Amendment Plan Area, approximately 103,666 acres of suitable Parish phacelia habitat have been identified. Of this total, 21,948 acres (21.2 percent) occur within the Impact Area and are potentially subject to impacts from activities covered under the MSHCP Amendment. Lands managed for resource conservation contain 19,882 acres (19.2 percent) of suitable habitat, providing a substantial buffer for the species. The existing MSHCP Reserve System contains 4,528 acres (4.4 percent) of suitable habitat, and the MSHCP Amendment Reserve System Additions contribute an additional 297 acres (0.3 percent) of suitable habitat (Simandle and Nussear 2025).

Parish phacelia* *Phacelia parishii*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	103,666	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	21,948	21.2%
Suitable Habitat in Lands Managed for Resource Conservation	19,882	19.2%
Suitable Habitat in the existing MSHCP Reserve System	4,528	4.4%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	297	0.3%

*Simandle and Nussear 2025

65.5 Data

Field data forms and herbarium labels have often described Parish phacelia as abundant, but it is an ephemeral annual and its occurrence in any given year is apparently undependable. No occurrences of this species were detected during county-wide rare plant surveys conducted from 2020 through 2023 (Ironwood

2023). A single 1976 herbarium record from within the Desert National Wildlife Refuge was originally used to train the Desert Conservation Program habitat suitability model for this species; however, that record was originally misidentified as *Phacelia parishii* and later annotated as *P. rotundifolia*. Survey of the historic locality confirmed unsuitable habitat for *P. parishii* and an abundance of *P. rotundifolia*; removal of this record from the habitat suitability model is recommended to improve model performance (Ironwood 2023).

65.6 Recommendation

Not recommended for coverage. Parish phacelia is considered a sensitive species by the BLM but has no state or federal status. It is known to occur in several areas where it is sympatric with protected species and benefits from habitat level protections in these areas. Only 10 percent of the predicted medium-and high-suitability habitat may be impacted by activities covered under the MSHCP; therefore, this species is not recommended for inclusion in the MSHCP.

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66.0 ST. GEORGE BLUE-EYED GRASS (*SISYRINCHIUM RADICATUM*)

66.1 Species Overview

St. George blue-eyed grass (*Sisyrinchium radicatum*) is a perennial forb in the Iridaceae family. It is similar to and closely related to *S. demissum*, and the two have in the past been classified as the same species, leading to some taxonomic confusion (Cronquist et al. 1977, Welsh et al. 1987).

66.2 Range

The species is found in Nevada and Utah and is expected to be in the adjacent northwest corner of Arizona (Bicknell 1901). It is thought to be restricted to the northeast Mojave Desert between St. George, Utah, and Ash Meadows, Nevada. In Nevada, it has been documented in Lincoln, Nye, and Clark County, where it grows on moist, sometimes alkaline meadows, borders of springs, and stream banks from 595 to 2,285 meters (1,950 to 7,500 feet) (SEInet 2017). Eleven (11) localities are known for this species within Clark County, most occurring in moist or wetland soils in desert springs, alkaline meadows, or along riparian corridors.

66.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	None
State of Utah	None
NV Division of Natural Heritage	Watch List
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G2?Q S1S2
IUCN Red List (v 2025-2)	None
CITES	None

St. George blue-eyed grass has a NatureServe global conservation status of G2 (Imperiled), with a qualified rank of G2?Q reflecting uncertainty in both the rank and the species concept (NatureServe 2026). The species is ranked S1S2 in Nevada and S1 (Critically Imperiled) in Utah. It has no status under the Endangered Species Act and it is currently not listed under Nevada state law. It is tracked by NDNH.

The species is known from only a few locations. As of February 2015, six Nevada occurrences were on record in the NatureServe central database, all last observed prior to 2003. Two herbarium specimens in the SEINet collection database document Nevada occurrences from Nye and Clark counties, dated 2003 and 2010, respectively. Utah occurrence data are sparse; the most recent Utah specimens in SEINet date to 1929 (NatureServe 2026). The area of occupancy is estimated at 3 to 5 four-km² grid cells, with an estimated 1 to 5 element occurrences globally.

Population trends are difficult to assess given the limited survey effort and taxonomic confusion with the closely related *S. demissum*. Welsh et al. (2008) treats *S. radicatum* as a synonym of *S. demissum*, which may result in underreporting of occurrences (NatureServe 2026).

66.4 Impact

Threats to this species include wildfire, illegal harvesting, livestock grazing, and off-highway vehicle impacts. This species is especially sensitive to altered surface or groundwater flows because it is found in moist meadows and along springs and streams.

Simandle and Nussear (2025) modeled St. George blue eyed grass habitat suitability in Clark County. Areas of high-suitability habitat are predicted to occur in the Spring Mountains (Simandle and Nussear 2025). Based on habitat suitability modeling by Simandle and Nussear (2025), a total of 155,229 acres of suitable habitat for St. George blue-eyed grass occur within the MSHCP Amendment Plan Area. Of this, 644 acres (0.4 percent) are located within the MSHCP Amendment Impact Area. Approximately 74,163 acres (47.8 percent) of suitable habitat occur on lands managed for resource conservation, and an additional 51,390 acres (33.1 percent) are within the MSHCP Amendment Reserve System Additions. No suitable habitat occurs within the existing MSHCP Reserve System.

St. George blue-eyed grass* *Sisyrinchium radicatum*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	155,229	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	644	0.4%
Suitable Habitat in Lands Managed for Resource Conservation	74,163	47.8%
Suitable Habitat in the existing MSHCP Reserve System	0	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	51,390	33.1%

*Simandle and Nussear 2025

66.5 Data

Taxonomic relationships within the *Sisyrinchium demissum* complex, including *S. radicatum*, *S. funereum*, and *S. halophilum*, remain unresolved based on both genetic and morphological data, and additional taxonomic research is recommended (Ironwood 2023).

SEInet (2017) lists six occurrences of this species within Clark County, but only three of those are located below 4,000 feet in elevation. Of these, two records are from 1905 with a locality of Las Vegas and are likely extirpated from that area. Two additional records from 2010 near Moapa were also identified (J. Morefield, pers. comm., May 2018) and indicate occurrences below 4,000 feet are still extant within Clark County. Rare plant surveys conducted by Ironwood Consulting (2020) detected a single occurrence of this species in the Kiup Spring area. Ironwood Consulting (2023) detected a second occurrence of this species at the Kiup Spring survey area, comprising 589 individuals occupying approximately 2.3 acres (0.9 hectares) at a mean elevation of 1,578 meters (5,177 feet); this represented a new element occurrence record. Two additional *Sisyrinchium* occurrences were left at genus due to the unresolved taxonomic relationships among sister species (Ironwood 2023).

66.6 Recommendation

Not recommended for coverage. St. George blue-eyed grass is not recommended for coverage under the MSHCP due to the minuscule amount of suitable habitat predicted to be impacted by covered activities (less than one percent), and the high proportion of suitable habitat (82 percent) protected on conserved lands. It is unlikely to receive federal and state attention due to its conservation status.

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67.0 EASTERN JOSHUA TREE (*YUCCA JAEGERIANA*)

67.1 Species Overview

The eastern Joshua tree (*Yucca jaegeriana*) is a large tree-like succulent plant occupying mid- to upper-elevational zones of Mojave Desert shrubland communities (McKelvey 1938, Rowlands 1978, Cole et al. 2011). Eastern Joshua trees require their own species of *Tegeticula* moth for pollination (Pellmyr and Segraves 2003), and the moths require the ripening seeds of the Joshua tree as sustenance for their developing larvae (Trelease 1893). Successful reproduction and growth to maturity of Joshua trees requires a remarkable coincidence of appropriate environmental and biological conditions (DeFalco et al. 2010).

Mortality for adult Joshua trees is usually relatively low (approximately two to three percent per year or less), but severe drought can cause increased mortality and drought effects are more severe on smaller Joshua trees (DeFalco et al. 2010). Joshua trees are important to many wildlife species across the Mojave Desert (Miller and Stebbins 1964) and may be considered an umbrella species in this region.

67.2 Range

Joshua trees (*Yucca brevifolia* and *Yucca jaegeriana*) are distributed across the southern Mojave Desert of California, northwestern Arizona, southwestern Utah, and southern Nevada, occurring at elevations of 2,500 to 4,500 feet (Benson and Darrow 1981, Rowlands 1978, Cole et al. 2011). *Yucca jaegeriana* is the only Joshua tree species known in Clark County, Nevada.

Joshua trees are widespread in Clark County, Nevada. Geomorphically, Joshua trees occupy some higher elevation valley bottoms, bajadas, and lower mountain slopes. They are found in all types of soil origins including granite, volcanic, sandstone, and various limestone species including dolomite. They generally do not occur in very fine soil textures of playas in lower valley bottoms (Nussear 2018).

67.3 Status Summary

Agency/Organization	Status
MSHCP (2000)	None
U.S. Fish and Wildlife Service Endangered Species Act	None
U.S. Bureau of Land Management (Nevada, 2023)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	State Code prohibits commercial collection
State of California	State Candidate
State of Arizona	None
NV Division of Natural Heritage	None
NV Climate Change Vulnerability Index	Not Addressed
NatureServe Global and NV State Rank	G3G4 S3S4
IUCN Red List (v 2025-2)	Least Concern
CITES	None

* SNR – Status not ranked at the state level for species or subspecies

The eastern Joshua tree (*Yucca jaegeriana*) is not currently listed as threatened or endangered under the federal

Endangered Species Act. In 2019, USFWS completed a 12-month finding on a petition to list the Joshua tree and determined that listing was not warranted at that time (USFWS 2019). The eastern Joshua tree is ranked G3G4 globally and S3S4 in Nevada by NatureServe, indicating a vulnerable to apparently secure status, and is listed as Least Concern on the IUCN Red List.

The species' long-term population trend reflects a decline of 10 to 30 percent, driven primarily by development around Las Vegas, Henderson, and Pahrump, Nevada (USFWS 2018). Short-term trend is currently unknown. The species occupies a range extent of approximately 20,000 to 200,000 square kilometers within the Mojave Desert, with a small area of range overlap with *Y. brevifolia* in Tikaboo Valley, Nevada, where hybridization occurs (Lenz 2007; Royer et al. 2016).

67.4 Impact

The primary ecosystem threats to the Joshua tree are development and wildfire associated with red brome (*Bromus madritensis*) invasions. Other direct impacts are destruction due to vandalism, removal during development, and rodent damage during drought. Development is most evidently a threat to Joshua tree populations on the west side of the Las Vegas Valley. A potentially greater threat to Joshua tree stands is wildfire fueled by invasive plant species (Nussear 2018).

The species may be negatively affected by climate change (Cole et al. 2011, Barrows and Murphy-Mariscal 2012). For example, it has been demonstrated that Joshua tree stands in parts of Joshua Tree National Park are not reproducing rapidly enough to keep up with natural declines of the populations (Nussear 2018).

Among the largest stands of protected Joshua trees in Clark County are those within Gold Butte National Monument and the wilderness areas therein. Additional protection is afforded in Lake Mead National Recreation Area, Red Rock Canyon National Conservation Area, the Desert National Wildlife Refuge, and the Bureau of Land Management's Wee Thump Wilderness. Some areas within Clark County that have experienced past wildfire will likely benefit from ongoing restoration efforts conducted by federal, state, and county agencies (Nussear 2018).

Simandle and Nussear (2025) modeled Joshua tree habitat suitability on the basis of habitat coarse fragments, soil properties, absolute minimum temperature, maximum vapor pressure deficit, winter precipitation, and vegetation. Areas of high-suitability habitat are predicted to be widespread throughout Clark County, primarily found at mid-range elevations along the periphery of mountain ranges and low in valley bottoms (Nussear et al. 2024). Based on habitat suitability modeling by Simandle and Nussear (2025), approximately 1,990,707 acres of suitable Joshua tree habitat occur within the MSHCP Amendment Plan Area. Of this total, 67,434 acres (3.4 percent) fall within the MSHCP Amendment Impact Area. Approximately 67.1 percent of suitable habitat (1,335,236 acres) is located within lands managed for resource conservation. Within the existing MSHCP Reserve System, only 122 acres (less than 0.1 percent) of suitable habitat are currently conserved. The MSHCP Amendment Reserve System Additions would incorporate an additional 167,754 acres, representing 8.4 percent of total suitable habitat within the Plan Area.

Joshua tree* *Yucca brevifolia*	**Acres**	**Percent of Total Habitat within Plan Area**
Suitable Habitat in the MSHCP Amendment Plan Area	1,990,707	n/a
Suitable Habitat in the MSHCP Amendment Impact Area	67,434	3.4%
Suitable Habitat in Lands Managed for Resource Conservation	1,335,236	67.1%
Suitable Habitat in the existing MSHCP Reserve System	122	0.0%
Suitable Habitat in the MSHCP Amendment Reserve System Additions	167,754	8.4%

*Simandle and Nussear 2025

67.5 Data

Current taxonomy recognizes two distinct Joshua tree species: the western Joshua tree (*Yucca brevifolia*) and the eastern Joshua tree (*Yucca jaegeriana*). These two species were elevated to species rank based on morphological, pollination, and genetic distinctions (Lenz 2007), and the USFWS recognizes both as distinct species (USFWS 2019). The taxonomic separation of the two Joshua tree species is relatively recent, and some older literature refers to all Joshua trees under *Yucca brevifolia*. Users of older references should be aware that data attributed to *Yucca brevifolia* may pertain to either or both species.

Joshua trees are abundant where they occur across many locations in the Mojave Desert (Cole et al. 2011), including Clark County, Nevada. While population studies on Joshua trees are ongoing (Esque et al. 2010), no existing research projects are of sufficient scale to determine the population status of either Joshua tree species across Clark County, Nevada, or similar areas of this size (Nussear 2018). No Clark County Desert Conservation Program (DCP) surveys specifically targeting *Yucca jaegeriana* were identified in the available survey data. Given the species' widespread distribution and abundance across Clark County, targeted surveys have not been considered a priority under the DCP.

67.6 Recommendation

Recommended for coverage. The species' potential for listing (either as a species or subspecies if recognized as such in the future) combined with the threats to those Joshua trees occurring in Clark County, the potential impacts of climate change, potential consideration as a keystone species, and the permit length collectively form the basis for taking a proactive approach to conserving the species by including it as a covered species.

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ATTACHMENT B

TABLE OF ALL WILDLIFE AND PLANT SPECIES REVIEWED

Common Name	Scientific Name	MSHCP Status (2000)	Federal Status	State Status	BLM Status (Southern NV 2023)	Wildlife Action Plan Species of Conservation Priority (2022)	NDNH Plant and Animal Watch List (2024) and Track List (2025)	List Count	In Plan Area?	Habitat Notes
Western toad	*Anaxyrus boreas* (was Bufo)			SGCN, G4, S4	S	X		3	No	BLM does not consider this in southern NV. On NV list but identified in Elko Office. Rocky mountain population was under review, but 2017 a "listing not warranted" decision was made.
Boreal toad	*Anaxyrus boreas boreas* (was Bufo)							0	No	On fringe of southern NV but range in NV is north half of state. Rocky Mountain population was under review and believed to be in decline, but 2017 a "listing not warranted" decision for full species was made.
California toad	*Anaxyrus boreas halophilus* (was Bufo)							0	No	Range in NV is in western NV closer to Reno, not in Clark County.
Great Plains toad	*Anaxyrus cognatus* (was Bufo)	Watch List		SGCN, G5, S2	S	X	AT	4	Yes	
Arizona toad	*Anaxyrus microscaphus* (was Bufo)	Evaluation	Under Review	SGCN, G3, S2	S	X	AT	5	Yes	BLM labels this species in Southern NV, but range maps only clip extreme northeastern Clark County. Range is predominantly outside of NV; extirpated from Las Vegas wash and fragmented within range.
Amargosa toad	*Anaxyrus nelsoni* (was Bufo and formerly *A.boreas nelsoni*)			SGCN, G2, S2	S	X	AT	4	No	BLM does not consider this in southern NV. On NV list but identified in Battle Mtn Office. Petition but listing not warranted decision in 2010.
Red-spotted toad	*Anaxyrus punctatus* (was Bufo)	Evaluation				X		0	yes	Southern NV is northern extent of range, but widespread species. hybridizes with woodhouse.
Woodhouse toad	*Anaxyrus woodhousii* (was Bufo)	Watch List						0		May hybridize with other species.
Relict leopard frog	*Lithobates onca*	Covered		SGCN, G1, S1	S	X	AT	4	Yes	
Northern leopard frog	*Lithobates pipiens*			SGCN, G5, S2	S	X	WL	4	Yes - northern Clark County only	Requires a mosaic of habitats, including aquatic overwintering and breeding habitats, upland post-breeding habitats, and links between the two. Springs, slow streams, marshes, bogs, ponds, canals, flood plains, reservoirs, and lakes are used. Petitioned, but listed not warranted decision.
Pacific tree frog	*Pseudacris regilla*	Evaluation						0	Yes	Widespread and tolerant of broad range of habitats.
Columbia spotted frog (Great Basin pop)	*Rana luteiventris pop. 3*			SGCN, G4, S2	S	X	AT	4	No	Jarbridge, Independence, Ruby, and Toiyabe mountains. BLM does not list this in the Southern NV office. Petitioned for listing but not warranted decision made.
Sierra Nevada yellow-legged frog	*Rana sierrae*		E	G2, SH	S		AT	4	No	
Great Basin spadefoot	*Spea intermontana*					X		1	Yes - northern Clark County only	Loose soils in sagebrush flats, shrublands, and pinyon-juniper woodland.

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Northern goshawk	*Accipiter gentilis*	Watch List	SOC	SGCN, G5, S3, S		S	X		4	No - wintering only	Higher elevation montane habitats; Not on BLM southern NV list, but on all other NV BLM list; considered scarce wintering species in southern NV.
Northern saw-whet owl	*Aegolius acadicus*	Watch List							0	No	Higher elevation forests, in NV in Sierra Nevada mountain range.
Tricolored blackbird	*Agelaius tricolor*	-			X		X	AT	3	No	Population in NV restricted to one population in Douglas County. Not known in southern NV.
Baird's sparrow	*Ammodramus bairdii*	-							0	No	Breeding is in northern US prairies and wintering is predominantly Mexico.
Nelson's sparrow	*Ammodramus nelsoni*	-							0	No	Breeding is in northern US/Canada and migration is in midwestern US.
Grasshopper sparrow	*Ammodramus savannarum*	-							0	No	Thicker, brushier sites in shortgrass prairie and southwestern grasslands.
Northern pintail	*Anas acuta*	-					X		1	No - wintering only	
Sprague's pipit	*Anthus spragueii*	-							0	No	USFWS decision on petition: "listing not warranted" in 2016.
Greater sandhill crane	*Antigone (Grus) canadensis tabida*						X	AT, WL	3	No	Not on BLM Southern NV, on all other BLM NV lists; southern NV is outside of migratory and wintering range.
Golden eagle	*Aquila chrysaetos*	Watch List		SGCN, G5, S4, Protected		S	X	AT, WL	5	Yes - year-round resident	Nests in rugged canyons, cliffs, mountains, but forages in valleys. Relatively intolerant of close human presence.
Bell's sparrow	*Artemisiospiza belli*	-		Protected	X			AT	3	Yes	Most designations are based on the previous taxonomic classification. Dense saltbrush habitat, also occasionally in sagebrush.
Sagebrush sparrow	*Artemisiospiza nevadensis*	-		SGCN, G5, S3B, S4N	X	S	X	AT	5	Yes	
Short-eared owl	*Asio flammeus*	-		SGCN, G5, S2		S	X	AT	4	No - wintering only	Not on BLM southern NV list, but on all other NV BLM list; Open habitats, excluding forest and some desert areas. Habitat loss and fragmentation a factor in declines.
Long-eared owl	*Asio otus*					S	X	AT	3	Yes	Nests in dense or brushy vegetation amidst adjacent open habitats such as grasslands or shrublands.
Western burrowing owl	*Athene cunicularia hypugaea*	Evaluation		SGCN, G4, S3B, Protected	X	S	X	AT, WL	6	Yes - year-round resident	Mojave scrub, sagebrush, salt desert, and Joshua tree habitats. Threatened by habitat loss and declines in burrowing animal populations.
Redhead	*Aythya americana*	-							0	No - wintering only	
Canvasback	*Aythya valisineria*	-					X		1	No - wintering only	

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Juniper titmouse	*Baeolophus ridgwayi*								0	Yes	Oak–juniper (Quercus–Juniperus) and pinyon–juniper (Pinus–Juniperus) woodlands; scattered breeder in NV mountain ranges.
Upland sandpiper	*Bartramia longicauda*	-							0	No	Range is northern U.S. and migration range is New Mexico and east. NV not in range.
American bittern	*Botaurus lentiginosus*	-					X		1	No - wintering only	
Ferruginous hawk	*Buteo regalis*	Watch List		SGCN, G4, S3B, S4N		S	X	AT, WL	5	Yes - Migration/ winter	Sagebrush and salt desert scrub. Open country, primarily prairies, plain and badlands, breeding in trees near streams or on steep slopes, sometimes on mounds in open desert.
Swainson's hawk	*Buteo swainsoni*	-		SGCN, G5, S3B		S	X	AT, WL	5	Yes	Breeding in Clark County is limited, and species is widespread in Great Basin portion of NV.
Common black-hawk	*Buteogallus anthracinus*	-						WL	1	No - unlikely	Range in AZ may extend on rare occasion into southern tip of NV at Colorado River but no documented nesting.
Green heron	*Butorides virescens*	Watch List							0	Yes	Breeding range in NV is along Colorado River, else southern NV is considered migratory range.
Lark bunting	*Calamospiza melanocorys*	-							0	No	May pass over in migration, but NV is not in wintering or breeding range; wintering range extends west to AZ.
Chestnut-collared longspur	*Calcarius ornatus*	-							0	No	May pass over in migration, but NV is not in wintering or breeding range; wintering range extends west to AZ.
Smith's longspur (nb)	*Calcarius pictus*	-							0	No	
Western sandpiper	*Calidris mauri*	-					X		1	No	May pass over in migration, but NV is not in wintering or breeding range.
Buff-breasted sandpiper (nb)	*Calidris subruficollis*	-							0	No	May pass over in migration, but NV is not in wintering or breeding range.
Lucifer hummingbird	*Calothorax lucifer*	-							0	No	Range predominantly Mexico and extreme southern New Mexico and Arizona.
Costa's hummingbird	*Calypte costae*	-					X	AT	2	Yes - breeding	Most commonly associated with Mojave scrub habitats, but also in lowland riparian, springs, and mesquite/catclaw habitats.
Cactus wren	*Campylorhynchus brunneicapillus*	Watch List			X				1	Yes	Creosotebush scrub communities of the “warm” Chihuahuan, Sonoran, and Mojave Deserts; cholla, prickly-pear, Joshua tree, Mojave yucca, catclaw acacia, mesquite, desert ironwood, and palo verde.

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Red-faced warbler	*Cardellina rubrifrons*	-							0	No	Rare occurrence extend into southern NV and a montane breeder above 4,000 feet
Canyon wren	*Catherpes mexicanus*	Watch List							0	Yes	Limited to cliffs, steep-sided canyons, rocky outcrops, and boulder piles, usually in arid region; Cool, shaded, stream-carrying canyons with exposed, steep-walled rock outcrops and a vertical component are typical.
Greater sage-grouse	*Centrocercus urophasianus*	-		SGCN, G3, S3		S	X	WL	4	No	Not on BLM Southern NV, on all other BLM NV lists.
Mountain plover	*Charadrius montanus*				X				1	No	
Snowy plover	*Charadrius nivosus*				X	S	X		3	No - migration only	
Western snowy plover	*Charadrius nivosus (alexandrinus) nivosus*	-	T	SGCN, G3, S3B		S	X	AT, WL	6	No	
Black tern	*Chlidonias niger*	-					X	AT, WL	3	No - Migration	Migrant through Clark County only. Would not be substantially impacted by plan activities.
Common nighthawk	*Chordeiles minor*	-		SGCN, G5, S3B		S	X	AT, WL	5	Yes	Northwest corner of Clark County may breed.
Yellow-billed cuckoo	*Coccyzus americanus*	Covered	T	SGCN, G5, S1B, S	X	S	X	AT	6	Yes - breeding	Riparian obligate. Requires dense stands of cottonwood-willow forest. Threatened by water diversions, dams and river flow management, stream channelization and stabilization, unsustainable livestock grazing, groundwater pumping, woodcutting, and invasion of non-native vegetation such as tamarisk.
Black-billed Cuckoo	*Coccyzus erythropthalmus*				X				1	No	
Gilded flicker	*Colaptes chrysoides*			SGCN, G5, S1		S	X	AT	4	Yes - year-round resident	Associated with Joshua trees and other tall Yuccas that provide a substrate for nest cavities. Also uses Mojave lowland riparian habitat. Loss or degradation of habitat, invasive weeds and increased fire frequency.
Olive-sided flycatcher	*Contopus cooperi*			SGCN, G4, S2B	X	S	X	AT	5	Yes	Spring Mountains of Clark County and uncommon breeder. Species not likely to be greatly impacted by covered activities based upon range in County.
Yellow rail	*Coturnicops noveboracensis*				X				1	No	
Trumpeter swan	*Cygnus buccinator*						X	WL	1	No	
Sooty grouse	*Dendragapus fuliginosus*	-					X		1	No	
Dusky grouse	*Dendragapus obscurus*	-					X		1	No	

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Bobolink	*Dolichonyx oryzivorus*	-		SGCN, G5, S2	X	S	X	AT, WL	6	No	
Great Basin willow flycatcher	*Empidonax traillii adastus*	-		SGCN, G5, S1B	X	S	X	AT	5	No - migration only	
Sierra Nevada mountain willow flycatcher	*Empidonax traillii brewsteri*	-			X		X	AT	3	No	
Southwestern willow flycatcher	*Empidonax traillii extimus*	Covered	E, Critical Habitat	SGCN, G5, S1B, E	X	S	X	AT	6	Yes - breeding	Riparian obligate. Restricted to willow or tamarisk habitats in saturated soils. Nests in swampy thickets4-7 m or more in height, 0.5 ha or greater in size.
Prairie falcon	*Falco mexicanus*	-					X		1	Yes	Shrub-steppe desert, grasslands, mixed shrub and grasslands, desert grassland, and chaparral where cliffs present nearby for nesting.
Peregrine falcon	*Falco peregrinus*	Covered	Delisted	SGCN, G4, S3, E	X	S	X	AT	5	Yes - year-round resident	Various open environments including open water, desert shrub, and marshes usually in close association with suitable nesting cliffs; also mountains, open forested regions, and human population centers.
Common loon	*Gavia immer*	-					X	WL	2	No - migration only	
Northern pygmy owl	*Glaucidium gnoma*	Watch List					X		1	No	Known in Carson and Snake Ranges and borders Clark County.
Pinyon jay	*Gymnorhinus cyanocephalus*			SGCN, G3, S3	X	S	X	AT	5	Yes	As name suggested, associated with pinon pines; foothills and mid-elevations, Piñon-juniper woodland is used most extensively but flocks also breed in sagebrush (Artemesia spp.), scrub oak, and chaparral communities. There is no data on population trends.
Cassin's finch	*Haemorhous (Carpodacus) cassinii*	-		SGCN, G5, S3		S	X		3	No	In higher elevations and within NV typically above 2,000m (6,500 ft) and out of Plan Area.
Bald eagle	*Haliaeetus leucocephalus*	Watch List	Delisted	SGCN, G5, S2B, S4N, E	X	S	X	AT	5	Yes	Nests in tall trees or on cliffs near bodies of water that provide a food base. In Clark County, largely restricted to Lake Mead NRA.
Yellow-breasted chat	*Icteria virens*								0	Yes	Riparian habitats, dense vegetation; Clark County/southern NV likely restricted to Colorado River and other rivers with suitable riparian vegetation.

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Scott's oriole	*Icterus parisorum*	Watch List		SGCN, G5, S3, S4B		S	X		3	Yes	Breeds extreme eastern edge Clark County; arid habitats, piñon-juniper belt in foothills and semiarid plains between mountain ranges, where yuccas are common, not associated with cactus or true deserts. Range is expanding northward.
Least bittern	*Ixobrychus exilis*			SGCN, G4, S2B	X	S	X	AT	5	No	Not on southern NV BLM list, but on other NV BLM lists; not on mapped range, but could breed in extreme southern tip of Clark County which gets close to north end of Colorado River range.
Western least bittern	*Ixobrychus exilis hesperis*	Watch List		SGCN, G4, S2B	X	S		AT	4	No	Not on southern NV BLM list, but on other NV BLM lists; not on mapped range, but could breed in extreme southern tip of Clark County which gets close to north end of Colorado River range.
Loggerhead shrike	*Lanius ludovicianus*	Evaluation		SGCN, G4, S3, S	X	S	X	AT, WL	6	Yes - year-round resident	Favors arid, open country with a few perches or lookouts. Scattered small trees or large shrubs are important habitat components. Recorded in 9 habitats in Clark County by GBBO.
Black rosy-finch	*Leucosticte atrata*	-		SGCN, G4, S2		S	X	AT	4	No	Not on southern NV BLM list, but on all other NV offices; winters in NV north of Clark County.
Gray-crowned rosy-finch	*Leucosticte tephrocotis*			SGCN, G5, S2		S	X	AT	4	No	
Short-billed dowitcher (nb)	*Limnodromus griseus*				X				1	No	
Long-billed dowitcher	*Limnodromus scolopaceus*	-					X		1	No - migration only	
Marbled godwit	*Limosa fedoa*				X				1	No	Migration range encroaches into the extreme western border of Clark County.
Hudsonian godwit (nb)	*Limosa haemastica*				X				1	No	
Western screech owl	*Megascops kennicottii*	Watch List						AT	1	Yes	
Red-headed woodpecker	*Melanerpes erythrocephalus*				X				1	No	
Lewis's woodpecker	*Melanerpes lewis*	-		SGCN, G4, S2B		S	X	AT	4	No - winter and migration only	
Elf owl	*Micrathene whitneyi*				X				1	No	
Long-billed Curlew	*Numenius americanus*			SGCN, G5, S2	X	S	X	AT, WL	6	No - migration only	
Mountain quail	*Oreortyx pictus*	-		SGCN, G5, S3		S	X	WL	4	No	Sierra Nevada Mountain and other areas north of Clark County.
Sage thrasher	*Oreoscoptes montanus*	-		SGCN, G4, S4B, S	X	S	X		4	Yes - migration/ winter	Rare in southern Nevada, more common in northern Nevada. Usually associated with intact, dense stands of sagebrush. Also salt desert scrub. Only incidental records recorded by GBBO in Clark County.

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Lucy's warbler	*Oreothlypis (Vermivora) luciae*							AT	1	Yes	Breeding range includes eastern edge of Clark County; riparian or mesquite bosques.
Virginia's warbler	*Oreothlypis (Vermivora) virginiae*	-			X		X	AT	3	Yes	Breeding range includes Clark County and most of desert southwestern US; pinon juniper and oak woodland habitats; lower, piñon-juniper foothills; and classified as transient in riparian and montane forest systems.
Colima warbler	*Oreothlypis crissalis*				X				1	No	Not in NV.
Blue grosbeak	*Passerina (Guiraca) caerulea*	Covered							0	Yes	Old fields, forest edge, transmission-line corridors, open slashings (left after logging), hedgerows, stream edge, deserts, mesquite savanna, and salt cedar.
Painted bunting	*Passerina ciris*				X				1	No	NV is not in range, rare vagrants have been Observed.
Varied bunting	*Passerina versicolor*				X				1	No	Range is extreme southern AZ and mostly Mexico.
American white pelican	*Pelecanus erythrorhynchos*	-					X	AT, WL	3	No - migration only	
Cassin's sparrow	*Peucaea cassinii*				X				1	No	Potential casual record in southern NV, but could be from confusion of species prior to taxonomic reorganization.
Phainopepla	*Phainopepla nitens*	Covered		G5, S3		S		AT, WL	4	Yes	Widespread in Clark County in all ecosystems with trees present.
Red-necked phalarope	*Phalaropus lobatus*	-					X		1	No - migration only	
Wilson's phalarope	*Phalaropus tricolor*	-					X	AT	2	No - migration only	
White-headed woodpecker	*Picoides albolarvatus*	-					X	AT	2	No	Range is CA and Pacific NW, with small extension into NV near Lake Tahoe.
American three-toed woodpecker	*Picoides dorsalis*							AT, WL	2	No	Small breeding population in northeastern NV, not in Clark County.
Summer tanager	*Piranga rubra*	Covered							0	Yes	Breeds in extreme southern Clark County; riparian woodlands dominated by willows (Salix) and cottonwoods (Populus) at lower elevations; mesquite and salt cedar habitats at higher elevations.
White-faced ibis	*Plegadis chihi*	Watch List					X	AT, WL	3	No - migration only	
Horned grebe	*Podiceps auritus*				X				1	No - winter and migration only	Winters along Colorado River.
Vesper sparrow	*Pooecetes gramineus*								0	No - winter and migration only	

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Flammulated owl	*Psiloscops (Otus) flammeolus*	Watch List		SGCN, G4, S3	X	S	X	AT, WL	6	No	High elevation forests only. The flammulated owl was once considered rare, but improved census techniques revealed that it is actually quite common.
Vermillion flycatcher	*Pyrocephalus rubinus*	Covered							0	Yes	Arid scrub, farmlands, parks, golf courses, desert, savanna, cultivated lands, and riparian woodland; usually found near water.
Yuma Ridgway's rail	*Rallus obsoletus yumanensis*	Watch List	E	SGCN, G3, S1B, E		S	X	AT	5	Yes - year-round resident	Freshwater and alkali marshes dominated by stands of emergent vegetation interspersed with open water and upland benches.
American avocet	*Recurvirostra americana*	-					X		1	No - migration only	Migratory through southern NV.
McCown's longspur	*Rhynchophanes mccownii*				X				1	No	Rare even as a migrant, range is east of Rocky Mtns.
Bank swallow	*Riparia riparia*	-		SGCN, G5, S2B		S	X	AT	4	No - migration only	Migratory only, breeds in northern NV.
Rufous hummingbird	*Selasphorus rufus*						X		1	No - migration only	Wide variety of primarily montane habitats.
Grace's warbler	*Setophaga graciae*			SGCN, G5, S2B		S	X	AT	4	Yes	Pine-dominated forests of s. Nevada (Mt. Charleston, Sheep Mtns., Mt. Irish), but may breed predominantly above 4000 feet
Yellow warbler (sonorana ssp.)	*Setophaga petechia*				X				1	No	Range noted as sparse breeder in NV but described as largely absent from southern NV, likely only migratory through Clark County.
Mountain bluebird	*Sialia currucoides*			EM (state bird)					1	No - wintering only	
Western bluebird	*Sialia mexicana*	Evaluation							0	No	Southern NV is mostly migration range, but small breeding population in Spring Mountains; Open coniferous and deciduous woodlands, wooded riparian areas, grasslands, farmlands.
Red-naped sapsucker	*Sphyrapicus nuchalis*								0	Yes	Winters in southern NV and small breeding population in Spring and Sheep Mtns. deciduous and mixed woodlands except not in oak woodlands.
Dickcissel	*Spiza americana*				X				1	No	Grasslands; range is east of Rocky Mtns, on extremely rare occasion may breed west of Rocky Mtns.

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Black-chinned sparrow	*Spizella atrogularis*	-		SGCN, G5, S2S3	X	S	X	AT	5	Yes	Arid brushlands on rugged mountain slopes from sea level to almost 2,700 m. Small portion of breeding range includes Clark County; breeding range predominantly AZ, NM, CA.
Brewer's sparrow	*Spizella breweri*	-		SGCN, G5, S3B, S		S	X	AT, WL	5	Yes - Migration/ winter	Sagebrush habitats and salt desert scrub habitats, usually within 1km of surface water. Recorded in 10 habitats in Clark County by GBBO.
California spotted owl	*Strix occidentalis occidentalis*	-	Under review				X	AT	3	No	Sierra Nevada Mountain forests; not known in NV, if enters Nevada it will be north of Clark County
Bendire's thrasher	*Toxostoma bendirei*	Evaluation		SGCN, G4, S1B, C		S	X	AT	4	Yes - breeding	Primarily Joshua tree and mesquite/catclaw habitats. Populations have low densities across the landscape and territories are widely dispersed. Requires large, intact tracts of land with appropriate habitat features. Recorded in 5 habitats in Clark County by GBBO.
Crissal thrasher	*Toxostoma crissale*	Evaluation		SGCN, G5, S3		S	X	AT, WL	5	Yes	Clark County is extreme northern edge of range; range is predominantly in AZ and Mexico; desert washes and riparian thickets in the Colorado River; preference in U.S. for dense, brushy habitats of desert landscapes and often narrowly restricted to larger arroyos (dry washes) or mesquite thickets.
Le Conte's thrasher	*Toxostoma lecontei*	Evaluation		SGCN, G4, S2, C	X	S	X		4	Yes - year-round resident	Occurs in low elevation sandy desert habitats. Generally associated with nearly flat landscapes with short, open stands of scrublands with specific shrub components such as saltbush, cholla, prickly pear, or yucca.
Solitary sandpiper (nb)	*Tringa solitaria*				X				1	No	Migratory only within NV, does not breed or winter in NV.
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	-		SGCN, G5, S1		S	X		3	No	Not on BLM Southern NV, only Elko list; range does not extend to southern NV, breeds in central northern US.
Bell's vireo	*Vireo bellii*	Covered		SGCN, G5, S2B	X	S	X	AT, WL	6	Yes - breeding	Inhabits lowland riparian areas with willows, mesquite, and seepwillows. The vireo prefers dense, low, shrubby vegetation in riparian areas.
Gray vireo	*Vireo vicinior*	Evaluation			X		X	AT, WL	4	No	Breeding in southern NV but likely mostly above 4000 feet (out of plan area), overall breeding range limited to portions of desert southwest (AZ, southern CO, western NM, and Clark County); juniper and pinon mixed woodland and oak scrub.

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Pallid bat	*Antrozous pallidus*			SGCN, G4, S3, Protected	S	AT, WL	X	5	Yes	Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees, barns, porches, bat boxes, and human- occupied as well as vacant buildings.
Mountain beaver	*Aplodontia rufa*					AT	X	2	No	Sierra Nevada range in western NV. Species does not occur in or near Clark County.
Mono Basin mountain beaver	*Aplodontia rufa californica*			S			X	2	No	Sierra Nevada range in western NV. Subspecies does not occur in or near Clark County.
Pygmy rabbit	*Brachylagus idahoensis*			SGCN, G4, S3	S	AT	X	4	No	Species is in northern NV and Great Basin region.
Desert pocket mouse	*Chaetodipus penicillatus*	Evaluation		SGCN, G5, S1	S	AT	X	4	Yes	Associated with sandy soils on creosote-scrub flats or washes bordered with small trees. It avoids rocky soils.
Spiny pocket mouse	*Chaetodipus spinatus*	Watch List				AT, WL		2	Yes	Usually inhabits rough desert landscapes of boulders, washes, rocky slopes, coarse soil, and sparse vegetation characteristic of the lower Sonoran life zone. On islands it prefers rocky desert.
Townsend's big-eared bat	*Corynorhinus townsendii*	Evaluation		SGCN, G4, S2, S	S	AT	X	4	Yes	Found throughout the state but restricted to caves and mines with suitable microclimates.
Desert kangaroo rat	*Dipodomys deserti*	Evaluation		SGCN, G5, S2S3	S	AT, WL	X	5	Yes	
Chisel-toothed kangaroo rat	*Dipodomys microps*	Evaluation						0	Yes	
Panamint kangaroo rat	*Dipodomys panamintinus caudatus*	Evaluation		SGCN, G5, S4	S			2	Yes	
Big brown bat	*Eptesicus fuscus*					AT, WL		2	Yes	Habitat generalist.
Spotted bat	*Euderma maculatum*	Watch List		SGCN, G4, S2, T	S	AT	X	4	Yes	Found in a variety of habitats from low desert to high mountains. Roosts in in cracks and crevices associated with cliff faces and occasionally mines and caves.
Western mastiff bat	*Eumops perotis*	Watch List		SGCN, G4, S1, S	S	AT	X	4	Yes	Suitable habitat consists of extensive open areas with potential roost locations having vertical faces to drop off from and take flight. Natural roosts are often found under large exfoliating slabs of granite, sandstone slabs or in columnar basalt, on cliff faces or in large boulders.
Northern flying squirrel	*Glaucomys sabrinus*			Protected				1	No	Sierra Nevada mountains, not in Clark County.
North American wolverine	*Gulo gulo luscus*		T	Protected		AT, WL		4	No	
Allen's big-eared bat	*Idionycteris phyllotis*	Watch List		SGCN, G4, S1 Protected	S	AT	X	4	Yes	Inhabits mountainous areas and uses a variety of habitats including Mojave Desert scrub, coniferous forests, and riparian woodlands although mostly higher elevation habitats in Clark County. Roosts in rocks, cliffs, snags, and mines throughout its range but known roosts in Nevada consist only of snags and abandoned mines. Maternity colonies are generally found in mines.

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Silver-haired bat	*Lasionycteris noctivagans*	Covered		SGCN, G3, S3	S		AT	X	4	Yes	Roosting habitat is limited primarily to forested habitats. Most commonly found in mature forests. In southern Nevada, they are usually found at lower elevations (1,500 to 8,200 feet) in association with riparian corridors.
Western red bat	*Lasiurus blossevillii*			SGCN, G4, S2, S	S		AT	X	4	Yes	Restricted to riparian habitats along the western and southern edge of Nevada. Found in wooded habitats including mesquite bosques and cottonwood/willow riparian areas.
Hoary bat	*Lasiurus cinereus*			SGCN, G3, S2S3	S		AT	X	4	Yes	Found primarily in forested upland habitats such as pinyon-juniper and conifers, as well as gallery forest riparian zones.
Western yellow bat	*Lasiurus xanthinus*						AT		1	Yes	Preferentially roosts in trees, generally palms in the southern U.S. Known to occur in a number of palm oases, but are also believed to be expanding their range with the increased usage of ornamental palms in landscaping.
Sagebrush vole	*Lemmiscus curtatus*						AT, WL	X	2	Yes	
Sierra Nevada snowshoe hare	*Lepus americanus tahoensis*						WL	X	2	No	
Northern river otter	*Lontra canadensis*			G5, S2	S			X	3	Yes	
California leaf-nosed bat	*Macrotus californicus*	Watch List		SGCN, G3, S2, S	S		AT	X	4	Yes	Clark County represents the northernmost limit of this species. Species day roosts in caves and mines. Night roosting occurs in a variety of places including buildings, cellars, porches, bridges, rock shelters, and mines. Winter roosts generally consist of geothermally heated abandoned mines.
American (Pacific) marten	*Martes americana (caurina)*						AT	X	2	No	
Dark kangaroo mouse	*Microdipodops megacephalus*			SGCN, G4, S2, Protected	S		AT	X	4	No	
Pale kangaroo mouse	*Microdipodops pallidus*			SGCN, Protected	S		AT	X	4	No	A highly specialized sand obligate. Typically restricted to fine, loose sandy soils in valley bottoms dominated by saltbush and greasewood. Minimum known elevation range is approximately 3,900 feet.
Pahranagat Valley montane vole	*Microtus montanus fucosus*			SGCN, G5, S1, S	S		AT	X	4	No	
Ash Meadows montane vole	*Microtus montanus nevadensis*			S			AT		2	No	
Short-tailed weasel	*Mustela erminea*	Evaluation							0	No	
Long-tailed weasel	*Mustela frenata*	Evaluation							0	Yes	Muddy and Virgin Rivers. Spring Mtn population is not in Plan Area.
California myotis	*Myotis californicus*			G5, S3S4	S		AT, WL		3	Yes	
Small-footed myotis	*Myotis ciliolabrum*	Evaluation		SGCN, G5, S3S4	S		AT, WL	X	4	Yes	
Long-eared myotis	*Myotis evotis*	Covered		G5, S3	S		AT, WL	X	5	Yes	Usually associated with coniferous forests. Roosts under tree bark, in hollow trees, and occasionally in caves, mines, cliff crevices, sink- holes, and rocky outcrops.

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Little brown myotis	*Myotis lucifugus*			SGCN, G3, S2S3	S	AT	X	4	No	All known records in Nevada are from the Great Basin. No individuals have been captured or acoustically recorded in the Mojave Desert.
Fringed myotis	*Myotis thysanodes*	Evaluation		SGCN, G4, S2 Protected	S	AT	X	4	Yes	Day and night roosts in caves, mines, trees, and buildings. Found in a wide range of habitats from low to high elevations.
Cave myotis	*Myotis velifer*	Watch List		SGCN, G4, S1	S	AT	X	4	Yes	Only one known population near Lake Mead NRA in Clark County. May have once been a maternity colony, but is now strictly composed of bachelor males.
Long-legged myotis	*Myotis volans*	Covered		SGCN, G4, S3S4	S	AT, WL	X	5	Yes	
Yuma myotis	*Myotis yumanensis*	Watch List		SGCN, G5, S3	S	AT, WL	X	5	Yes	
Humboldt yellow-pine chipmunk	*Neotamias amoenus celeris*			SGCN, G5, S2	S	AT	X	4	No	
Palmer's chipmunk	*Neotamias palmeri*	Covered		S		AT	X	3	No	Spring Mountains but above 4,000ft, outside of Plan Area.
Shadow (Allen's) chipmunk	*Neotamias senex*					AT, WL	X	3	No	Sierra Nevada range.
Hidden Forest Uinta chipmunk	*Neotamias umbrinus nevadensis*	Evaluation		S		AT		2	Yes	Subspecies in Sheep Mountain Range, but maybe above elevation and out of Plan Area.
Bushy tailed woodrat	*Neotoma cinerea lucida*	Evaluation						0	Yes	
Crawford's desert shrew	*Notiosorex crawfordi*					AT, WL		2	Yes	Southern tip of Clark County.
Big free-tailed bat	*Nyctinomops macrotis*	Watch List		SGCN, G5, S1	S	AT	X	4	Yes	
American pika	*Ochotona princeps*			SGCN, G5, S2, Protected	S	AT	X	4	No	Northwestern Nevada and central mountain ranges.
Mule deer	*Odocoileus hemionus*						X	1	Yes	
Desert bighorn sheep	*Ovis canadensis nelsoni*				S	WL	X	3	Yes	
Sierra Nevada bighorn sheep	*Ovis canadensis sierrae*		E		S			1	No	
Brush mouse	*Peromyscus boylii rowleyi*					AT		1	Yes	
Canyon bat (western pipistrelle)	*Parastrellus (Pipistrellus) hesperus*			SGCN, G5, S3S4	S	AT, WL	X	5	Yes	
Colorado River cotton rat	*Sigmodon arizonae plenus*					AT		1	Yes	Only southern tip along Colorado River- covered under the Lower Colorado River HCP.
Merriam's shrew	*Sorex merriami*			SGCN, G4, S3	S	AT, WL	X	5	No	Range begins just north of Clark County, may not extend into the County.
Montane shrew	*Sorex monticolus*					AT	X	2	No	
American water shrew	*Sorex palustris*						X	1	No	
Preble's shrew	*Sorex preblei*			SGCN, G4, S3	S	AT	X	4	No	
Inyo shrew	*Sorex tenellus*	Evaluation		SGCN, G4, S3	S	AT	X	4	No	Maybe present in extreme NW corner of Clark County, but range is outside of the County.
Trowbridge's shrew	*Sorex trowbridgii*					AT, WL	X	3	No	
Golden-mantled ground squirrel	*Callospermophilus (Spermophilus) lateralis certus*	Evaluation						0	Yes	Spring Mountains, maybe within elevation range of Plan.
Wyoming ground squirrel	*Urocitellus (Spermophilus) elegans nevadensis*						X	1	No	
Desert cottontail	*Sylvilagus auduboni*							0	Yes	
Nuttall's cottontail	*Sylvilagus nuttallii*	Evaluation						0	No	Higher elevation species.

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Mexican free-tailed bat	*Tadarida brasiliensis*			SGCN, G5, S4 Protected	S	AT, WL	X	5	Yes	Found in a variety of habitats from low desert to high mountains. Roosts in cliff faces, mines, caves, buildings, bridges, and hollow trees.
Douglas's squirrel	*Tamiasciurus douglasii*			Protected		WL		2	No	
Botta's pocket gopher	*Thomomys bottae*					AT	X	2	Yes	Associated with a wide range of vegetation types and soils. They reside in open habitats and meadows where soils are deep enough for establishing permanent burrowing systems. Found in all elevations, habitats may include riparian areas, washes, farms, mesquite bosques, and golf courses.
Fish Spring pocket gopher	*Thomomys bottae abstrusus*				S		X	2	No	
San Antonio pocket gopher	*Thomomys bottae curtatus*				S	AT	X	3	No	
Mountain pocket gopher	*Thomomys monticola*					AT, WL	X	3	No	
Kit fox	*Vulpes macrotis*					AT, WL		2	Yes	
Sierra Nevada red fox	*Vulpes vulpes necator*		E			AT, WL		3	No	
Big (western) jumping mouse	*Zapus princeps*			SGCN, G5, S2	S	AT	X	4	No	

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Northwestern pond turtle	*Actinemys marmorata marmorata*		PT	SGCN, G3, S2	S	AT	X	5	No	BLM list for Carson City not on Southern NV list.
Glossy snake	*Arizona elegans*	Covered				AT, WL	X	3	Yes	Widespread in US and Mexico.
Common zebra-tailed lizard	*Callisaurus draconoides draconoides*	Watch List						0	Yes	Widespread in NV, CA, AZ, and Mexico.
Northern rubber boa	*Charina bottae*			SGCN, G5, S3	S	AT, WL	X	5	No	BLM list for Carson City, not Southern NV; range is northern half of NV.
Mojave shovel-nosed snake	*Chionactis occipitalis occipitalis*			SGCN, G5, S4	S	AT, WL	X	5	Yes	Occurs in sparsely vegetated desert habitat, including rocky slopes, dunes, washes, and sandy flats. Prefers flat areas with sandy soils. Occurs in sand dunes if sufficient vegetation and soil islands are present.
Great Basin whiptail	*Cnemidophorus tigris tigris*							0	Yes	Species is widespread through the west, and subspecies is also widespread in NV, CA, and AZ.
Banded gecko	*Coleonyx variegatus*	Covered					X	1	Yes	
Western diamondback	*Crotalus atrox*	Evaluation						0	yes	Clark County is extreme north end of range, only enters into very southern tip of NV/Clark County; widespread range through AZ, NM, TX.
Sidewinder	*Crotalus cerastes*	Covered				AT, WL	X	3	Yes	Inhabits open desert terrain with fine windblown sand, desert flats with sandy washes, or sand dunes sparsely vegetated with creosote bush or mesquite; sometimes it occurs in rocky or gravelly sites.
Speckled rattlesnake	*Crotalus mitchellii*	Covered						0	Yes	
Mojave green rattlesnake	*Crotalus scutulatus scutulatus*	Covered						0	Yes	Clark County is near northern extent of range, limited range in US to southern NV, CA, AZ but widespread range in Mexico.
Great Basin collared lizard	*Crotaphytus bicinctores*	Covered				AT, WL	X	3	Yes	
Regal ringneck snake	*Diadophis punctatus*	Evaluation		SGCN, G5, S3	S		X	3	Yes	Occurs in forest, woodlands, grassland, chaparral, and riparian corridors in arid regions. Habitats are moist, at least seasonally.
Desert iguana	*Dipsosaurus dorsalis*	Covered		SGCN, G5, S3, S	S	AT, WL	X	5	Yes	Occurs in lower bajadas and valley bottoms - deep, fine, sandy gravel, loam or clay. Closely tied to creosote.
Sierra alligator lizard	*Elgaria coerulea palmeri*			G5, S2, PR	S	AT		3	No	Central Sierra Nevada mountains. BLM does not include on Southern NV list only Carson City.
Shasta alligator lizard	*Elgaria coerulea shastensis*			PR		AT		2	No	Small population in extreme northwest Nevada.
Panamint alligator lizard	*Elgaria panamintina*					WL	X	2	No	Range in NV is extremely small and north of Clark County.
Western skink	*Plestiodon skiltonianus utahensis*						X	1	Yes	Northern portion of Clark County is southern edge of subspecies range. Widespread range through NV, ID, CO.
Large-spotted leopard lizard	*Gambelia wislizenii wislizenii*	Covered					X	1	Yes	

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Desert tortoise	*Gopherus agassizii*	Covered	T	SGCN, G3, S2, T, Critical Habitat	S	AT	X	5	Yes	A variety of habitats from sandy flats to rocky foothills, including alluvial fans, washes and canyons where suitable soils for den construction might be found.
Gila monster	*Heloderma suspectum*	Evaluation		G4, S2, PR	S	AT	X	4	Yes	Desert scrub habitats, frequently near canyons or rocky slopes. Refuges include spaces under rock, dense shrubs, burrows, or woodrat nests.
Night snake	*Hypsiglena torquata*							0	Yes	
California kingsnake	*Lampropeltis getulus californiae*	Covered						0	Yes	Widespread subspecies, throughout CA, most of NV, most of AZ, and Baja Mexico.
Sonoran Mountain kingsnake	*Lampropeltis pyromelana*	Evaluation		SGCN, G4, S2 PR	S	AT	X	4	No	East-central Nevada mountain ranges. BLM does not include on Southern NV list, only Ely.
Desert rosy boa	*Lichanura trivirgata (orcutti)*			G4, SU, PR	S	AT, WL	X	5	Yes	Extreme southern tip of NV/Clark County in Newberry Mountains. Very few locales documented in NV, previous range maps did not include NV.
Red racer coachwhip	*Masticophis flagellum*							0	Yes	Range is widespread in western US.
Striped whipsnake	*Masticophis taeniatus*							0	Yes	Range is widespread in western US.
Pygmy short-horned lizard	*Phrynosoma douglasii*			SGCN, G5, SNR	S	AT, WL	X	5	No	Northern NV only (BLM sensitive for Battle Mtn office not Southern NV), this species is not in Clark County.
Greater short-horned lizard	*Phrynosoma hernandesi*			SGCN, G5, SNR	S	AT, WL	X	5	No	Northeastern NV and AZ, this species is not in Clark County.
Southern desert horned lizard	*Phrynosoma platyrhinos calidiarum*	Evaluation					X	1	yes	NV is main part of range but extends to surrounding states; open sandy areas in deserts, chaparral, grassland; often near ant hills.
Spotted leaf-nosed snake	*Phyllorhynchus decurtatus*	Covered					X	1	Yes	Occurs in rocky, gravelly, or sandy desert plains or dunes with creosote bush. May burrow into loose sand or soil, and it hides under rocks or surface debris or in abandoned rodent burrows.
Gopher snake	*Pituophis catenifer*							0	Yes	Species is widespread throughout the US.
Gilbert's Skink (Western red-tailed skink)	*Plestiodon gilberti rubricaudatus*	Covered		SGCN, G5, SNR	S	AT	X	4	Yes	BLM list for Battle Mtn not Southern NV; range maps include Clark County; Grassland, chaparral, woodlands, and pine forests. Prefers areas where moisture is present nearby.
Western threadsnake (blind snake)	*Rena humilis*						X	1	Yes	Clark County is northern end of range; underground, sometimes as deep as 20 meters (66 ft). Its diet is made up mostly of ant/termite insects, their larvae, and eggs. Deserts and scrub where the soil is loose enough to work.
Western long-nosed snake	*Rhinocheilus lecontei lecontei*	Covered						0	Yes	Range in NV, much of CA, AZ, and Mexico.
Common chuckwalla	*Sauromalus ater*			SGCN, G5, S3	S	AT, WL	X	5	Yes	Range in southeastern CA, southern NV and southwestern NM into Baja California and northwestern Mexico. Occurs in rocky desert environments with crevices and basking areas.

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Coville abronia	*Abronia nana* ssp. *covillei*						AT, WL	2			
Transmontane sand verbena	*Abronia turbinata*							0	Delisted		
Ivory-spined agave	*Agave utahensis* var. *eborispina*			G4, S3	S		AT, WL	4	Delisted		
Clark Mountain agave	*Agave utahensis* var. *nevadensis*			G4, S3	S		AT, WL	4	Delisted		
	Anacolia menziesii	Covered						0			
Woolly fishhooks	*Ancistrocarphus filagineus*							0	Marginal/ Disjunct		
	Androsace occidentalis							0	Marginal/ Disjunct		
	Anelsonia eurycarpa						AT	1	Marginal/ Disjunct		
Charleston Mountain Angelica (rough angelica)	*Angelica scabrida*	Covered		G1, S2	S	T	AT	4		No - over 4,000 ft	Narrow endemic of the Spring Mountains.
Charleston pussytoes	*Antennaria soliceps*	Covered				WL	AT	2			
Southwestern sticky ringstem	*Anulocaulis leiosolenus* var. *leiosolenus*	Covered		G4, S2	S	WL	AT	4		Yes	Alkaline or gypseous soils in open areas of xeromorphic desert shrub; also gypsum dunes shrubland.
Las Vegas bearpoppy	*Arctomecon californica*	Covered		FP, G3, S3 CEFP, G3, S3, CE	S	T	AT	4		Yes	Open, dry, spongy or powdery, often dissected ("badland") or hummocked soils with high gypsum content, often with well-developed soil crust, in areas of generally low relief on all aspects and slopes, with a sparse cover of other gypsum- tolerant species.
White bearpoppy	*Arctomecon merriamii*	Covered		G3, S3	S	WL	AT	4		Yes	On a wide variety of dry to sometimes moist basic soils, including alkaline clay and sand, gypsum, calcareous alluvial gravels, and carbonate rock outcrops.
Silverbush	*Argythamnia cyanophylla*							0	Delisted		
	Asplenium resiliens							0	Marginal/ Disjunct		
	Asplenium trichomanes-ramosum							0	Marginal/ Disjunct		
California perianth liverwort	*Asterella californica*							0	Marginal/ Disjunct		
Ackerman milkvetch	*Astragalus ackermanii*	Evaluation				WL	AT	2			
Clokey milkvetch	*Astragalus aequalis*	Covered				WL	AT	2		Yes - over 4,000 ft	Limestone bedrock habitats in the Spring Mountains.
Sheep Range milkvetch	*Astragalus amphioxys* var. *musimonum*	Evaluation		G5, S2	S	WL	AT	4		Yes - over 4,000 ft	Foothills of the Sheep Mountains.
	Astragalus atratus var. *mensanus*							0			
Austin milkvetch	*Astragalus austiniae*						AT	0	Research Needed		
One-leaflet Torrey milkvetch	*Astragalus calycosus* var. *monophyllidius*	Watch List		G5, S3	S	WL	AT	4		Yes - over 4,000 ft	
Black woollypod	*Astragalus funereus*	Evaluation		G2, S2	S	WL	AT	4		Yes - over 4,000 ft	
	Astragalus geyeri var. *geyeri*							0			
Three-corner milkvetch	*Astragalus geyeri* var. *triquetrus*	Covered		FP, G4, S2, CE	S	T	AT	4		Yes	Open, deep sandy soil or dunes, generally stabilized by vegetation and/or a gravel veneer. Dependent on sand dunes or deep sand in Nevada.
Horn milkvetch	*Astragalus hornii* var. *hornii*					WL	AT	2			

Borrego milkvetch	*Astragalus lentiginosus* var. *borreganus*							0	Marginal/ Disjunct		

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San Pitch Valley milkvetch	*Astragalus lentiginosus* var. *chartaceus*						AT	1	Marginal/ Disjunct		
Kern Plateau milkvetch	*Astragalus lentiginosus* var. *kernensis*					WL	AT	2			
Straw milkvetch	*Astragalus lentiginosus* var. *stramineus*			G5, S1	S	WL	AT	4		Yes	Sandy and gravelly flats and dunes. Occurs in the lower Virgin Valley.
Halfring milkvetch	*Astragalus mohavensis* var. *hemigyrus*	Evaluation		G3, S3	S	WL	AT	4		Yes	Rocky ledges and arid gravelly hillsides in the Creosote Bush Scrub community, Joshua tree woodland", carbonate soil. Rare and local from near Indian Springs in the eastern foothills of the Spring Mountains.
Mojave milkvetch	*Astragalus mohavensis* var. *mohavensis*						AT, WL	2			
Mokiak milkvetch	*Astragalus mokiacensis*	Evaluation		G3, S1	S	WL	AT	4		Yes	Sandy soils. Bluffs, cliff terraces, gullied badlands, disturbed areas along streams. Known only from the valleys and canyons of the Colorado and Virgin Rivers.
Nye milkvetch	*Astragalus nyensis*			G3, S3	S	WL	AT	4			
Clokey eggvetch	*Astragalus oophorus* var. *clokeyanus*	Covered				WL	AT	2		Yes - over 4,000 ft	Upper reaches of Lee Canyon and the north and west side of the Charleston Mts., Clark county, Nevada.
	Astragalus panamintensis						AT	1	Marginal/ Disjunct		
Littlefield milkvetch	*Astragalus preussii* var. *laxiflorus*			G4, S1	S	WL	AT	4			
Spring Mountains milkvetch	*Astragalus remotus*	Covered		G2, S2	S	WL	AT	3		Yes	A narrow endemic of the southern foothills of the Spring Mountains. Desert shrub/wash communities in dry, gravelly soils derived from limestone or sandstone on canyons, rocky hillsides and washes at 3600-5500 feet elevation.
Rolled screwmoss	*Barbula convoluta*							0	Marginal/ Disjunct		
	Boechera cusickii						AT	1	Marginal/ Disjunct		
	Boechera davidsonii						AT	1	Marginal/ Disjunct		
Spring Mountains rockcress	*Boechera nevadensis*					WL	AT	2			
Shockley rockcress	*Boechera shockleyi*						AT, WL	2	Delisted		
Upswept moonwort	*Botrychium ascendens*	Evaluation				WL	AT	2			
Dainty moonwort	*Botrychium crenulatum*	Evaluation		G4, S2	S	WL	AT	4			
Slender moonwort	*Botrychium lineare*					WL	AT, WL	3		Unknown, but likely over 4,000 ft	Species has a large range, but with sporadically occurring, widely separated, and extremely small populations. Possibly occurs in Nevada.
Moosewort	*Botrychium tunux*					WL	AT	2			
	Bowlesia incana							0	Marginal/ Disjunct		
Knapp brickellbush	*Brickellia knappiana*						AT	1	Marginal/ Disjunct		
Bolander candlemoss	*Bruchia bolanderi*					WL		1			

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Panamint mariposa lily	*Calochortus panamintensis*						AT, WL	2	Marginal/ Disjunct		
Alkali mariposa lily	*Calochortus striatus*	Covered		G3, S1	S	WL	AT	4		Yes	Calcareous sandy soil in seasonally moist alkaline habitats such as alkali meadows, ephemeral washes, vernally moist depressions and at seeps within saltbush scrub at 300- 4500 ft. elevation.
Thicknerve sedge	*Carex microptera* var. *crassinervia*							0	Delisted		
Yellow paintbrush	*Castilleja flava*							0	Delisted		
Clokey paintbrush	*Castilleja martinii* var. *clokeyi*	Covered					AT, WL	2	Delisted		
Remote rabbitbrush	*Chrysothamnus eremobius*	Evaluation		G1, S1	S	WL	AT	4		Yes - over 4,000 ft	Limestone cliff crevices at lower elevations (1450-1700 m elevation) of desert mountains.
Keystone Canyon thistle	*Cirsium arizonicum* var. *tenuisectum*					WL	AT	2			
Clokey thistle	*Cirsium eatonii* var. *clokeyi*	Covered					AT	1	Delisted		
Snake Range thistle	*Cirsium eatonii* var. *viperinum*					WL	AT	2			
Hall Thistle	*Cirsium hallii*							0			
	Cirsium mohavense			G3, S3	S		AT, WL	4			
Virgin River thistle	*Cirsium virginense*	Evaluation		G2, S1	S	WL	AT	4			
	Cistanthe ambigua							0	Marginal/ Disjunct		
California sawgrass	*Cladium californicum*						AT, WL	2	Marginal/ Disjunct		
Whipple roughmoss	*Claopodium whippleanum*	Covered						0	Marginal/ Disjunct		
Clokey pincushion	*Coryphantha vivipara* var. *rosea*	Watch List						0	Delisted		
Rough fringemoss	*Crossidium seriatum*	Evaluation		G3, S2	S	WL	AT	4			
Hoffman's cryptantha	*Cryptanth virginensis*	Watch List						0			
Mound catseye	*Cryptantha compacta*			G2, S1	S	WL		3			
Weakstem catseye	*Cryptantha flaccida*							0	Marginal/ Disjunct		
Las Vegas catseye	*Oreocarya (=Cryptantha) insolita*	Evaluation		CE	S		AT	3	Possibly Extirpated	Yes	
New York Mountains catseye	*Oreocarya (=Cryptantha) tumulosa*	Watch List				WL	AT, WL	3		Yes - over 4,000 ft	
Blue Diamond cholla	*Cylindropuntia multigeniculata*	Covered		G2, S2, CE	S	WL	AT	4		Yes	Soil types include sandy-loam, gravel, coarse-cobbled soils, silty alluvial fan terraces, decomposed granite and schist, and clays of volcanic origin. Plants generally prefer steep, dry, rocky slopes with minimal vegetative competition.
Ripley's biscuitroot	*Cymopterus ripleyi* var. *saniculoides*	Evaluation		G3, S3	S		AT	3			
Silverskin lichen	*Dermatocarpon luridum*			G5, S1	S	WL	AT	4			
	Dicranoweisia crispula	Covered						0			
Gold Butte moss	*Didymodon nevadensis*	Evaluation		G4, S2	S	WL	AT	3		Yes	Scattered, but wide distribution. On or near gypsiferous deposits and outcrops or limestone boulders, especially on east to north facing slopes of loose uncompacted soil, often associated with other mosses and lichens.
Incline distichium moss	*Distichium inclinatum*	Evaluation						0			

	Dodecatheon conjugens							0	Marginal/ Disjunct		
Wasatch draba	*Draba brachystylis*					WL	AT	2			
Cusick whitlowgrass	*Draba cusickii*							0			
Jaeger whitlowcress	*Draba jaegeri*	Covered				WL	AT	2			
Charleston draba	*Draba paucifructa*	Covered				WL	AT	2			
Chalk liveforever	*Dudleya pulverulenta*	Watch List						0			

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Chalk liveforever	*Dudleya pulverulenta* ssp. *arizonica*			G4, S3	S		AT, WL	4			
Silverleaf sunray	*Enceliopsis argophylla*	Evaluation		G2, S2	S	WL	AT	4		Yes	Dry, open, relatively barren areas on gypsum badlands, volcanic gravels, loose sands, etc., in the creosote-bursage zone.
Death Valley Mormon tea	*Ephedra funerea*						AT, WL	2	Marginal/ Disjunct		
Nevada willowherb	*Epilobium nevadense*	Evaluation		G3, S2	S	WL	AT	4		Yes - over 4,000 ft	
Mount Charleston sandwort	*Eremogone congesta* var. *charlestonensis*					WL	AT	2			
Rosy King sandwort	*Eremogone kingii* var. *rosea*	Covered				WL		1			
Meadow Valley sandwort	*Eremogone stenomeres*	Evaluation		G2, S2	S	WL	AT	4			
Antelope Canyon goldenbush	*Ericameria cervina*			G2, S1	S	WL	AT	4		Yes - over 4,000 ft	Rock crevices and talus in shadscale and Douglas-fir-bristlecone pine communities.
Charleston goldenbush	*Ericameria compacta*					WL	AT	2			
Clokey fleabane	*Erigeron clokeyi* var. *clokeyi*	Watch List				WL	AT	2			
	Erigeron eatonii var. *eatonii*						AT	2	Marginal/ Disjunct		
Nevada willowherb	*Epilobium nevadense*	Evaluation		G3, S2	S	WL	AT	4		Yes - over 4,000 ft	
Mount Charleston sandwort	*Eremogone congesta* var. *charlestonensis*					WL	AT	2			
Rosy King sandwort	*Eremogone kingii* var. *rosea*	Covered				WL		1			
Meadow Valley sandwort	*Eremogone stenomeres*	Evaluation		G2, S2	S	WL	AT	4			
Antelope Canyon goldenbush	*Ericameria cervina*			G2, S1	S	WL	AT	4		Yes - over 4,000 ft	Rock crevices and talus in shadscale and Douglas-fir-bristlecone pine communities.
Charleston goldenbush	*Ericameria compacta*					WL	AT	2			
Clokey fleabane	*Erigeron clokeyi* var. *clokeyi*	Watch List				WL	AT	2			
	Erigeron eatonii var. *eatonii*						AT	2	Marginal/ Disjunct		
Kern River daisy	*Erigeron multiceps*					WL	AT	2			
	Erigeron nanus							0	Marginal/ Disjunct		
Sheep fleabane	*Erigeron ovinus*	Evaluation		G2, S2	S	WL	AT	4		Yes - over 4,000 ft	Limestone rock outcrops, especially in crevices and at the base of cliffs. Common associates are singleleaf pinyon (*Pinus monophylla*), ponderosa pine (*P. ponderosa*), white fir (*Abies concolor*), and dwarf mountain mahogany.
Charleston fleabane	*Erigeron uncialis* var. *conjugans*	Covered					AT, WL	2	Delisted		
Alexander buckwheat	*Eriogonum alexanderae*			G5, S2	S	WL	AT	4			

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Pahrump Valley buckwheat	*Eriogonum bifurcatum*	Covered		G3, S2	S	T	AT	4		Yes	Occurs on desert playas and salt flats. Known only from the Mesquite, Pahrump, and Stewart valleys along the California- Nevada border. Locally abundant in wet years.
Amargosa buckwheat	*Eriogonum contiguum*			G3, S1	S		AT, WL	4	Marginal/ Disjunct		
Las Vegas buckwheat	*Eriogonum corymbosum* var. *nilesii*	Evaluation		G5, S2	S	T	AT	4		Yes	On and near gypsum soils, often forming low mounds or outcrops in washes and drainages, or in areas of generally low relief, often with *Arctomecon californica* and other gypsum-tolerant species.
	Eriogonum davidsonii							0	Marginal/ Disjunct		
	Eriogonum elatum var. *villosum*						AT	1	Marginal/ Disjunct		
Clokey buckwheat	*Eriogonum heermannii* var. *clokeyi*	Evaluation		G5, S2	S	WL	AT	4		Yes - over 4,000 ft	Carbonate outcrops, talus, scree, and gravelly washes and banks in the creosote-bursage, shadscale, and blackbrush zones. Elevations recorded: 4,000 to 6,000 ft.
Clark Mountain buckwheat	*Eriogonum heermannii* var. *floccosum*						AT	1	Marginal/ Disjunct		
	Eriogonum kennedyi var. *purpusii*						AT	1	Marginal/ Disjunct		
	Eriogonum latens						AT	1	Marginal/ Disjunct		
Pinyon Mesa buckwheat	*Eriogonum mensicola*					WL	AT	2			
	Eriogonum nudum var. *pubiflorum*							0	Marginal/ Disjunct		
	Eriogonum ochrocephalum var. *calcareum*						AT	1	Marginal/ Disjunct		
	Eriogonum ovalifolium var. *depressum*							0	Marginal/ Disjunct		
	Eriogonum rixfordii						AT	1	Marginal/ Disjunct		
Saltwort buckwheat	*Eriogonum salicornioides*							0			
	Eriogonum saxatile						AT	1	Marginal/ Disjunct		
Deseret sulphurflower	*Eriogonum umbellatum* var. *desereticum*							0	Marginal/ Disjunct		
	Eriogonum umbellatum var. *furcosum*							0	Marginal/ Disjunct		
	Eriogonum umbellatum var. *porteri*						AT	1	Marginal/ Disjunct		
Sticky buckwheat	*Eriogonum viscidulum*	Covered		FP, G2, S2 CE	S	T	AT	4		Yes	Deep loose sandy soils in washes, flats, roadsides, steep aeolian slopes, and stabilized dune areas.
	Eriogonum wrightii var. *wrightii*							0	Marginal/ Disjunct		
Catchfly gentian	*Eustoma exaltatum*						AT, WL	2	Marginal/ Disjunct	Yes	Obligate wetland species. Roadsides, alkaline marshes, saline to freshwater marshes, and other open, wet places.

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Barrel cactus	*Ferocactus cylindraceus* var. *lecontei*	Watch List					WL	1			
Hotspring feathersedge	*Fimbristylis thermalis*						AT	1	Marginal/ Disjunct		
	Fissidens sublimbatus	Watch List						0			
	Fouquieria splendens							0	Marginal/ Disjunct		
Clark Mountain green gentian	*Frasera albomarginata* var. *induta*			G5, S2	S	WL	AT	4			
Ripley gilia	*Gilia ripleyi*						WL	1	Delisted		
Clokey greasebush	*Glossopetalon spinescens var. clokeyi*	Covered				WL	AT	2			
Smooth dwarf greasebush	*Glossopetalon pungens* var. *glabrum*	Covered		G2, S2	S	WL	AT	4		Yes - over 4,000 ft	Crevices of carbonate cliffs and outcrops, generally avoiding southerly exposures, in the pinyon-juniper, mountain mahogany, and montane conifer zones.
Rough dwarf greasebush	*Glossopetalon pungens* var. *pungens*	Covered		G2, S2	S	WL	AT	4		Yes - over 4,000 ft	
Nevada greasebush	*Glossopetalon spinescens* var. *aridum*	Watch List						0			
American dry rock moss	*Grimmia americana*	Evaluation				T	AT	2			
Utah sunflower	*Helianthus anomalus*							0	Delisted		
Dune sunflower	*Helianthus deserticola*				S		AT	2	Delisted		
Duran alumroot	*Heuchera duranii*							0	Delisted		
Paleface rosemallow	*Hibiscus denudatus*							0	Marginal/ Disjunct		
Satintail	*Imperata brevifolia*			G3, S1	S	WL	AT	4			
Red Rock Canyon aster	*Ionactis caelestis*	Covered		G1, S1	S	WL	AT	4		Yes - over 4,000 ft	Confined to a single sandstone ridge that outcrops in southern Nevada. The ridge is isolated physically and geologically from similar habitats (it appears to be a western outlier of the Navajo Sandstone of the Colorado Plateau).
Hidden ivesia	*Ivesia cryptocaulis*	Covered				WL	AT	2			
Jaeger ivesia	*Ivesia jaegeri*	Covered		G2, S2	S	WL	AT	4		Yes - over 4,000 ft	Rock crevices of limestone cliffs and lower-angle bedrock outcrops at 1585-3400 m elevation.
California juniper	*Juniperus californica*							0	Marginal/ Disjunct		
California summer-cypress	*Kochia californica*						AT	1	Marginal/ Disjunct		
Thickleaf pepperwort	*Lepidium integrifolium*			G2, S1	S	WL	AT	4			
California sea lavender	*Limonium californicum*						AT	1	Marginal/ Disjunct		
Dune linanthus	*Linanthus arenicola*						AT, WL	2	Delisted		
Alpine stinking lomatium	*Lomatium graveolens* var. *alpinum*	Evaluation					AT, WL	2	Delisted		
Scrub lotus	*Acmispon (=Lotus) argyraeus* var. *multicaulis*			G4, S1	S	WL	AT	4		unknown	Data not readily available.
Holmgren's lupine	*Lupinus polyphyllus* var. *humicola*			G2, S2	S			2	Delisted		
	Lupinus uncialis							0			
Sand aster	*Machaeranthera ammophila*							0	Marginal/ Disjunct		

Desert hoary aster	*Machaeranthera canescens* var. *leucanthemifolia*							0	Delisted		
Rayless tansy aster	*Machaeranthera grindelioides* var. *depressa*						AT, WL	2	Delisted		
California manroot	*Marah fabaceus*							0	Marginal/ Disjunct		
California manroot	*Marah fabaceus* var. *agrestis*							0	Marginal/ Disjunct		
Polished blazingstar	*Mentzelia polita*			G2, S2	S	WL	AT	4		Yes	Open areas in mixed desert shrub communities. 450-1370 m elevation in Nevada.
Bashful four-o'clock	*Mirabilis pudica*						AT, WL	2	Delisted		
Pygmy muilla	*Muilla coronata*						AT	1	Marginal/ Disjunct		
Silverleaf red loco	*Oxytropis besseyi* var. *argophylla*						AT	1	Marginal/ Disjunct		

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	Panicum urvilleanum							0	Marginal/ Disjunct		
	Pedicularis centranthera							0			
Charleston pinewood lousewort	*Pedicularis semibarbata* var. *charlestonensis*	Covered					AT, WL	2	Delisted		
Beaver Dam breadroot	*Pediomelum castoreum*	Watch List		G2, S2	S	WL	AT	4		Yes	Dry, sandy deserts. Recorded locations between 1,280 and 5,000 ft.
White-margined beardtongue	*Penstemon albomarginatus*	Covered		G2, S2	S	T	AT	4		Yes	Habitats are characterized by deep stable eolian sands, typically of the Bluepoint Soil series (*Typic Tropopsamments*) and all Nevada populations occur on BLM managed lands.
Yellow two-toned beardtongue	*Penstemon bicolor* ssp. *bicolor*	Evaluation		G3, S2	S	WL	AT	4		Yes	Calcareous or carbonate soils in washes, roadsides, rock crevices, outcrops, or similar places receiving enhanced runoff, in the creosote-bursage, blackbrush, mixed-shrub, and lower juniper zones.
Rosy two-toned beardtongue	*Penstemon bicolor* ssp. *roseus*	Watch List		G3, S3	S	WL	AT	4		Yes	Rocky calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving enhanced runoff, in the creosote-bursage, blackbrush, and mixed-shrub zones.
Limestone beardtongue	*Penstemon calcareus*					WL	AT	2			
Death Valley beardtongue	*Penstemon fruticiformis* ssp. *amargosae*	Evaluation		G4, S2	S	T	AT	4		Yes	Documented from Nye and Clark counties in 21 occurrences. Grows within sandy or gravelly washes within Mojave desert scrub communities and pinyon-juniper woodlands.
Idaho beardtongue	*Penstemon idahoensis*			G2, S1	S	WL	AT	4			
Charleston beardtongue	*Penstemon leiophyllus* var. *keckii*	Covered				WL	AT	2			
Jaeger beardtongue	*Penstemon thompsoniae* ssp. *jaegeri*	Covered		G4, S3	S	WL	AT	4		Yes - over 4,000 ft	Gravelly limestone soils on knolls and slopes, in drainages, and under conifers, from the pinyon-juniper to the subalpine conifer zones.
Desert rockdaisy	*Perityle intricata*						AT, WL	2	Delisted		
	Petalonyx thurberi ssp. *gilmanii*							0			
Spiny-node milkvetch	*Peteria thompsonae*						AT	1	Marginal/ Disjunct		
Aven Nelson phacelia	*Phacelia anelsonii*						AT, WL	2	Marginal/ Disjunct		

Clarke phacelia	*Phacelia filiae*			G3, S3	S	WL	AT	4		Yes	Mostly barren outcrops and silty to clay, often gypsiferous soils derived from white to pinkish volcanic tuff in the creosote-bursage, shadscale, mixed-shrub, and blackbrush zones, often associated with *Atriplex confertifolia*.
Jaeger phacelia	*Phacelia geraniifolia*			G2, S2	S	WL	AT	4			
Spring Mountains phacelia	*Phacelia hastata* var. *charlestonensis*						AT, WL	2			
Nodding scorpionflower	*Phacelia laxiflora*						AT, WL	2	Marginal/ Disjunct		
	Phacelia neglecta							0	Marginal/ Disjunct		
Parish phacelia	*Phacelia parishii*	Covered		G3, S3	S	WL	AT	4		Yes	Moist to superficially dry, open, flat to hummocky, mostly barren, often salt-crusted silty-clay soils on valley bottom flats, lake deposits, and playa edges, often near seepage areas, sometimes on gypsum deposits, surrounded by saltbush scrub vegetation but with few immediate associates such as *Atriplex confertifolia, A. canescens, A. argentea, Poa secunda, Monolepis nuttalliana, Phacelia fremontii, Lepidium flavum, Sarcobatus vermiculatus*, etc. Aquatic or wetland- dependent in Nevada.
Rock phacelia	*Phacelia petrosa*						AT, WL	2	Marginal/ Disjunct		

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Quinn Canyon Range bladderpod	*Physaria hitchcockii* var. *confluens*					WL	AT	2			
Hitchcock bladderpod	*Physaria hitchcockii* var. *hitchcockii*	Covered				WL	AT	2			
	Physaria newberryi var. *racemosa*							0	Marginal/ Disjunct		
Ancient bristlecone pine	*Pinus longaeva*			G4, S3	S			2	Delisted		
Pygmy poreleaf	*Porophyllum pygmaeum*	Evaluation				WL	AT	2		Yes - over 4,000 ft	Dry, open, relatively deep, rocky carbonate soils of alluvial fans and hillsides, often in slight depressions, low benches adjacent to minor drainages, or other moisture-enhanced microsites, in the blackbrush, mixed-shrub, and lower pinyon- juniper zones.
Bearded screwmoss	*Pseudocrossidium crinitum*	Evaluation		G4, S1	S	WL	AT	4			
Smokethorn	*Psorothamnus spinosus*							0	Marginal/ Disjunct		
Canyon live oak	*Quercus chrysolepis*							0	Marginal/ Disjunct		
Canyon live oak	*Quercus chrysolepis* var. *chrysolepis*							0	Marginal/ Disjunct		
Helmet liverwort	*Reboulia hemisphaerica*							0	Marginal/Disjunct		
Clokey mountain sage	*Salvia dorrii* var. *clokeyi*	Covered		G5, S2	S	WL	AT	4		Yes - over 4,000 ft	Shallow, rocky to gravelly carbonate soils on ridges, slopes, and drainages in the pinyon-juniper, montane conifer, mountain mahogany, and subalpine conifer zones.
Lesser clubmoss	*Selaginella selaginoides*							0	Marginal/Disjunct		
Utah spikemoss	*Selaginella utahensis*	Watch List				WL	AT	2			
White checkermallow	*Sidalcea candida* var. *glabrata*							0	Marginal/Disjunct		

Clokey catchfly	*Silene clokeyi*	Covered				WL	AT	2			
St. George blue-eyed grass	*Sisyrinchium radicatum*			G2, S1	S	WL	AT	4		Yes	Associated with Poa pratensis, Juncus spp., and Glaux maritima, the plants occur in moist meadows or on streambanks.
Fringed chocolate chip lichen	*Solorina spongiosa*					WL	AT	2			
Charleston tansy	*Sphaeromeria compacta*	Covered				WL	AT	2			
	Splachnobryum obtusum	Watch List					AT	1			
	Stenotus lanuginosus							0			
	Stenotus lanuginosus var. *andersonii*							0	Marginal/ Disjunct		
Charleston kittentails	*Synthyris ranunculina*	Covered				WL	AT	2			
Bartram screwmoss	*Syntrichia bartramii*							0	Marginal/ Disjunct		
	Syntrichia princeps	Covered						0			
Undescribed syntrichia moss	*Syntricia* spp.							0			
Undescribed targonia liverwort	*Targonia* spp.							0			
	Tetracoccus hallii						AT	1	Marginal/ Disjunct		
Loose flowered thelypody	*Thelypodium laxiflorum*							0	Marginal/ Disjunct		
Ovalleaf thelypody	*Thelypodium sagittatum* ssp.						AT	1	Delisted		

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	ovalifolium										
Charleston grounddaisy	*Townsendia jonesii* var. *tumulosa*	Covered		GNR, S3	S	WL	AT	4		Yes - over 4,000 ft	Open, sparsely vegetated calcareous areas, on shallow gravelly carbonate soils on slopes and exposed knolls in forest clearings mostly in the montane conifer zone.
Poison oak	*Toxicodendron diversilobum*							0	Marginal/ Disjunct		
Sweet moustache moss	*Trichostomum sweetii*	Evaluation		G2, SNR	S	WL	AT	4			
	Trisetum projectum							0	Marginal/ Disjunct		
	Trixis californica							0	Marginal/ Disjunct		
Charleston violet	*Viola charlestonensis*			G3, S2	S	WL	AT	4			
Limestone violet	*Viola purpurea* var. *charlestonensis*	Covered						0			

67.8 Status Code Abbreviations

C	Candidate
D	Delisted
E	Endangered
PT	Proposed Threatened
T	Threatened
SOC	Species of Concern
S	Sensitive
AT	At-risk Track List
WL	Watch List
PA	Protected Amphibian
EM	Emblem (State bird)
PR	Protected Reptile
CE	Critically Endangered
SGCN	Species of Greatest Conservation Need (Nevada State Wildlife Action Plan)
FP	Fully Protected (NRS 527.050, 527.300)
G1	Critically Imperiled (global)
G2	Imperiled (global)
G3	Vulnerable (global)
G4	Apparently Secure (global)
G5	Secure (global)
S1	Critically Imperiled (species)
S2	Imperiled (species)
S3	Vulnerable (species)
S4	Apparently Secure (species)
S5	Secure (species)