Clark County Multiple Species Habitat Conservation Plan Amendment

Covered Species Analysis Report

Prepared For:
Clark County Department of Air
Quality Desert Conservation Program
4701 West Russell Blvd., Suite 200
Las Vegas, NV 89118

WRA Contact:
Ken Sanchez
(415) 578-3184
sanchez@wra-ca.com
Patricia Valcarcel
(415) 524-7542
valcarcel@wra-ca.com
Date: June 11, 2018

WRA Project: 26346

2169-G East Francisco Blvd., San Rafael, CA 94702 (415) 454-8868 tel info@wra-ca.com www.wra-ca.com

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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. This extensive list has proven to be difficult to manage in terms of the implementation and analysis process. 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 allow more conservation dollars to be spent on conservation actions for those species most impacted and at risk.

The current list has species for which there are unlikely to be impacts from future covered activities, are not considered at risk, and/or 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 Permittees anticipate 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 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, so 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 Permittees can more effectively administer meaningful conservation actions and focus the analysis and conservation

on those species most at risk and directly or indirectly 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 65 species requested for detailed review for inclusion by the County, and Appendix A contains the summary and recommendation for each of the 65 species reviewed. Appendix B provides a table prepared by the County of over 400 species reviewed and from which the 65 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 step-wise systematic approach for evaluating species based on 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 the comprehensive list of over 400 species including 231 species addressed by the Clark County MSHCP, previous efforts (PBS&J 2009 and Southwest Ecology 2018), and overall review of species potentially occurring in or near southern Nevada to systematically evaluate the inclusion of these species. The overall species reviewed is provided as Appendix A, and is the source from which the 65 species reviewed in this document is based. 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 Natural Heritage Program Plant and Animal Watch and Track Lists (NNHP 2017a and 2017b);
- Nevada Natural Heritage Program Climate Change Vulnerability Index (NNHP 2012);
- Nevada Wildlife Action Plan (Wildlife Action Plan Team 2012);
- U.S. Forest Service Region 4 Sensitive Species List (USFS 2016);
- Bureau of Land Management Nevada Sensitive Species Lists (2011, 2017);
- U.S. Fish and Wildlife Service Birds of Conservation Concern Region 8 (2008)

- 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 (2017);
- International Union for Conservation of Nature Red List of Threatened Species version 3.1; 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 any of the criteria but more likely meet several of the criteria.

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 following the status criteria:

- Listed under the federal ESA as threatened or endangered, proposed or candidate;
- 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, 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 Natural Heritage Program (NNHP).

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. Those species for which 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. The Permittees determined that they would have no covered activities above 4,000 feet and much of the land above 4,000 feet in the County is already managed for conservation purposes by state and/or federal land management agencies. The majority of development in the 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 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 the County, the current MSHCP Plan Area includes Nevada Department of Transportation (NDOT) rights-of-way below 5,000 feet in four counties outside the County. Under the MSHCP Amendment rights-of-way outside of the County will no longer be covered. Therefore, the MSHCP Amendment will not cover these NDOT rights-of-way outside of the County or above 4,000 feet in elevation within the County.

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 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 (USDOI, USFWS, USDOC, 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 subject to 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 included reviews and status analysis from a variety of relevant sources (see previous section *"Species Considered for Coverage"*) to inform our recommendation. Recommendations were based on a preponderance of evidence to conclude inclusion was necessary for a scientifically defensible conservation plan.

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 with the exception of activities by NDOT (who would no longer be a permittee). 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 the 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.

Impacts to the species that were reasonably likely to occur was a necessary factor to be included 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, even data from which to properly characterize the most basic attributes—habitat requirements, distribution, 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 on the species, the likelihood of it being included as a covered species was very unlikely.

A review of the available scientific literature was conducted for all species considered in this revision process, and included information compiled by Southwest Ecology (2018). 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 threats or impacts to the species. The intent of this review was to acquire enough information about each species to verify their occurrence within the 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. Those species for which adequate information, limited, inconclusive, or nonexistent data was not available did not meet this criterion and were not recommended for coverage.

4.0 SPECIES RECOMMENDED FOR COVERAGE UNDER THE AMENDED MSHCP

A total of 65 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 previously 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 2.

Table 2. Species Evaluated and Recommendations

Species	Recommended for Coverage	Not Recommended for Coverage
Mojave shovel-nosed snake (*Chionactis occipitalis occipitalis)*		X
sidewinder *(Crotalus cerastes)*		X
regal ringneck snake *(Diadophis punctatus)*		X*
desert iguana *(Dipsosaurus dorsalis)*		X
desert tortoise *(Gopherus agassizii)*	X	
banded Gila monster *(Heloderma suspectum cinctum)*	X	
spotted leaf-nosed snake *(Phyllorhynchus decurtatus)*		X
common chuckwalla *(Sauromalus ater)*		X
MacNeill's saltbush sootywing skipper *(Hesperopsis gracielae)*		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	

Species	Recommended for Coverage	Not Recommended for Coverage
sage thrasher *(Oreoscoptes montanus)*		X
phainopepla *(Phainopepla nitens)*		X
Ridgeway'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*	
Arizona Bell's vireo *(Vireo bellii arizonae)*	X	
desert pocket mouse *(Chaetodipus penicillatus)*	X*	
desert kangaroo rat *(Dipodomys deserti)*		X
Colorado River cotton rat *(Sigmodon arizonae plenus)*		X*
Townsend's big-eared bat *(Corynorhinus townsendi)i*	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

Species	Recommended for Coverage	Not Recommended for Coverage
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	
Pahrump Valley buckwheat *(Eriogonum bifurcatum)*	X	
Las Vegas buckwheat *(Eriogonum corymbosum* var. *nilesii)*	X	
sticky buckwheat *(Eriogonum viscidulum)*	X	

Species	Recommended for Coverage	Not Recommended for Coverage
catchfly gentian *(Eustoma exaltatum)*		X
polished blazingstar *(Mentzelia polita)*		X*
Beaver Dam breadroot *(Pediomelum castoreum)*		X*
white margined beardtongue *(Penstemon albomarginatus)*	X	
yellow twotone beardtongue *(Penstemon bicolor ssp. bicolor)*		X
rosy twotone 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*	
Joshua tree *(Yucca brevifolia)*	X	
Total	***28***	***37***

*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 3 for ease of reference.

Table 3. Animal and Plant Species Recommended for Coverage in the Amended MSHCP

Animals	Plants
desert tortoise *(Gopherus agassizii)*	sticky ringstem *(Anulocaulis leiosolenus* var. *leiosolenus)*
banded Gila monster *(Heloderma suspectum cinctum)*	Las Vegas bearpoppy *(Arctomecon californica)*
golden eagle *(Aquila chrysaetos)*	threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*)
burrowing owl *(Athene cunicularia)*	alkali mariposa lily (*Calochortus striatus)*
yellow-billed cuckoo *(Coccyzus americanus)*	Blue Diamond cholla *(Cylindropuntia multigeniculata)*
gilded flicker *(Colaptes chrysoides)*	silverleaf sunray *(Enceliopsis argophylla)*
southwestern willow flycatcher *(Empidonax traillii extimus)*	Pahrump valley buckwheat *(Eriogonum bifurcatum)*
loggerhead shrike *(Lanius ludovicianus)*	Las Vegas buckwheat *(Erigonom corymbosum* var. *nilesii)*
Ridgway's rail *(Rallus obsoletus yumanensis)*	sticky buckwheat *(Erigonom viscidulum)*
Bendire's thrasher *(Toxostoma bendirei)*	white-margined beardtongue *(Penstemon albomarginatus)*
Le Conte's thrasher *(Toxostoma lecontei)*	Parish phacelia *(Phacelia parishii)*
Arizona Bell's vireo *(Vireo bellii arizonae)*	St. George blue-eyed grass *(Sisyrinchium radicatum)*
desert pocket mouse (*Chaetodipus penicillatus*)	Joshua tree *(Yucca brevifolia)*
Townsend's big eared bat *(Corynorhinys townsendii)*	
spotted bat *(Eudema maculatum)*	

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APPENDIX A

SPECIES RECOMMENDATION SUMMARIES

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

1. **Species Overview**

A nocturnal snake in dry, sandy habitats 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 are currently recognized (Stebbins 2003).

2. Range

Klauber first described the Nevada subspecies *Chionactis occipitalis talpina* (Nevada shovel-nosed snake) in Nye and Esmeralda counties in 1951, and these were later found in the Amargosa Desert of Nye County, Nevada, and across the border in Saline Valley, California (Elvin 1963). These 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 hypotheses of 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*.

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	None
NV Natural Heritage Program Watch List (2017)	G5, S4

NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Moderately vulnerable
IUCN Red List (v 3.1, 2007)	Least concern
CITES	None

4. Impact

Arizona populations have been declining for 25 years. Status of Nevada populations has not been documented, but with the reasons for decline in Arizona (agriculture and urbanization) it would seem that Nevada populations might experience similar trends. 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 the range of *C. occipitalis klauberi* are bounded be large urban developments of Phoenix and Tucson. Listing was determined to not be warranted for *C. occipitalis klauberi* (79 FR 56730) following genetic research that this subspecies had a broader range than previously known (Wood et al 2014). Primary threats are conversion of land to agriculture, development of alternative energy, off-highway vehicle use, urbanization, and habitat fragmentation from land conversion including large-scale renewable energy. (Wildlife Action Plan Team 2012).

The SWECO model estimates approximately 200,000 acres of high and medium quality habitat for the subspecies within Clark County may be impacted by covered activities. In comparison, approximately 238,000 acres of medium and high quality habitat are in reserve lands and another 1,100,000 acres of medium and high quality habitat are conserved lands.

5. Data

Data within Clark County and Nevada are limited, but the distribution for *Chionactis* as illustrated in the SWECO model indicate 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. This subspecies is wide ranging, and new genetic research lends support that the two existing subspecies in Nevada may not be substantiated (Wood et al. 2014) and only one subspecies may exist in Nevada with a broad range.

6. Recommendation

Not recommended for coverage. Based on information discussed in 2 through 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 in Tucson with a much narrower range was determined listing was not warranted at the federal level.

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MOJAVE DESERT SIDEWINDER (*CROTALUS CERASTES CERASTES)*

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.

2. Range

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. 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).

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 Natural Heritage Program Watch List (2017)	G5, S4
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Moderately vulnerable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	None

4. Impact

Impacts include loss of habitat and/or mortality, urbanization, road construction and road related mortality, ORV use, and collecting . In Nevada, currently there are no rules limiting the collection of all reptiles including sidewinders for commercial purposes. The State of Nevada is in the process of revising the current regulations to disallow collection of reptiles for commercial or personal purposes. 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 (Wildlife Action Plan Team 2012).

Habitat models prepared for Clark County estimate approximately 3.6 million acres of potential habitat for Mohave Desert sidewinder within the county, of which 298,669 acres (8.4 percent of the total potential habitat) have been identified as being potentially impacted in the future.

5. Data

Population studies of *C. c. cerastes* are rare and have not been conducted to sufficiently evaluate trends in this species (Wildlife Action Plan Team 2012). IUCN currently lists the global population as “Stable.”

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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REGAL RINGNECK SNAKE (*DIADOPHIS PUNCTATUS REGALIS*)

1. Species Overview

The regal ringneck snake (*Diadophis punctalis regalis*) is a relatively small (up to 30 inches long) and slender. 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 that to discourage predators.

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.

2. Range

Ringneck snakes occur throughout the northeastern and southeastern United States and a more patchy 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 punctalis 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 its range in Nevada, western Arizona, and Utah, and this subspecies is uncommon and highly localized in Clark County, Nevada.

In Clark County, these this species occur 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).

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	None
State of California	Species of Special Concern[1]
State of Arizona	None
State of Utah	None
NV Natural Heritage Program Watch List (2017)	G5, S3

NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Moderately vulnerable
IUCN Red List (v 3.1, 2007)	Least concern
CITES	None

[1] California designation is at the subspecies level of regal ringneck snake, *D.p. regalis*

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 (Nevada Wildlife Action Plan Team 2012). There may be some threats from natural predators, and feral and free-ranging domestic species.

5. Data

There is no population level information available for this species.

The Nevada Wildlife Action Plan considers the regal ringneck snake to be a Species of Conservation Priority, and recommends developing monitoring protocols, determining occurrence and habitat functionality, and maintaining habitat (especially downed wood/litter near riparian) and population connectivity. Regal ringneck snakes are also a species of Management Concern in Great Basin National Park.

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.

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 data at this time 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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DESERT IGUANA (*DIPSOSAURUS DORSALIS DORSALIS*)

1. Species Overview

Desert iguanas 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.

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).

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
State of Arizona	None
State of Utah	Species of Concern
NV Natural Heritage Program Watch List (2017)	G5, S3
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Moderately vulnerable
IUCN Red List (v 3.1, 2007)	Least concern
CITES	None

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. Commercial collection may also exert pressure on local populations, although the quantitative impacts of these threats are unknown. 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 (Wildlife Action Plan Team 2012).

Commercial collection is reported annually, but population trends are not discernable using the reporting data alone, and no density or demographic surveys have been conducted to ascertain the level of impact that collection may have on the species.

Habitat models prepared for Clark County estimate approximately 3.7 million acres of potential habitat for desert iguana within the county, of which approximately 298,669 acres (8.2 percent of the total potential habitat) have been identified as being potentially impacted in the future. Habitat modeled as highly suitable for desert iguana totaled 655,395 acres, of which 104,253 acres (15.9 percent of total highly suitable habitat) have been identified as having the potential to be impacted.

5. Data

Population studies of desert iguana are rare and have not been conducted to sufficiently evaluate trends in this species (Wildlife Action Plan Team 2012). IUCN currently lists the global population as Stable and estimates the population at over 100,000.

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.

7. References Cited

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DESERT TORTOISE (*GOPHERUS AGASSIZII*)

1. Species Overview

The protected Mojave population of desert tortoise includes those occurring north and west of the Colorado River in Arizona, California, Nevada, and Utah. Some tortoises east and south of the River in Arizona are also protected. Desert tortoises occupy a variety of habitats from flats and slopes dominated by creosote bush scrub at lower elevations to rocky slopes in blackbrush and juniper woodland ecotones at higher elevations. Throughout their range, desert tortoises occur from below sea level to an elevation of 7,300 feet (USFWS 2011).

2. Range

Mojave desert tortoise habitat occurs widely throughout Clark County. While Clark County covers 8,062 square miles, tortoise habitat covers 6,769 square miles, or 87 percent of the County. The types of habitats that Mojave desert tortoises occupy 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. (Species accounts). Clark County contains portions of the Eastern Mojave and Northeastern Mojave Recovery Units, so is a key component of the overall survival and recovery of the species. Approximately 999,680 acres of formally designated desert tortoise critical habitat occur in Clark County, or approximately 16 percent of the species range-wide total of critical habitat.

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	Threatened
State of Arizona	Species of Greatest Conservation Need
State of Utah	Sensitive (Federal Threatened)
NV Natural Heritage Program Watch List (2017)	G3, S2S3
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Presumed stable
IUCN Red List (v 3.1, 2007)	Vulnerable
CITES	None

4. Impact

Desert tortoises possess a combination of life history and reproductive characteristics that affect the ability of populations to survive 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 developed. Thus, a particular threat or subset of threats with discernable solutions that could be targeted to the exclusion of other threats has not been identified for the desert tortoise (USFWS 2011).

Approximately 2,860,213 acres of modeled habitat exists within Clark County. It is estimated that approximately 6.7 percent of modeled desert tortoise habitat within Clark County could be directly impacted by activities covered under the Amendment (Species account 2017). The location and extent of these impacts, their proximity to reserves/conservation areas, and maintaining connectivity between the reserves will be key to the implementation of a properly functioning MSHCP.

5. Data

BLM ACECs, some National Park Service lands, other lands allocated for resource conservation (e.g. 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.

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.

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 make it vulnerable to the many human induced impacts occurring, or anticipated to occur, over the life of the permit throughout the County.

7. References Cited

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GILA MONSTER (*HELODERMA SUSPECTUM SUSPECTUM*)

1. **Species Overview**

Gila monsters are a large (350 – 500 mm in length) venomous lizard that range across portions of the Sonoran, Mojave, and Chihuahuan deserts in the U.S. and Mexico. In the US they are distributed in Arizona, southern Nevada, portions of southeastern California near the Nevada border, and southwest Utah. Two subspecies are recognized (*Heloderma suspectum suspectum*, and *Heloderma suspectum cinctum*), and *H.s. suspectum* is present in Nevada.

They are brightly colored, yet cryptic, and have a short activity period (e.g., ~ 90 days from April to mid-June), with limited activity (i.e., only 1/3 of days during their activity season) (Beck 1990). They are strongly associated with burrows and deep caves, and as such are frequently found in rocky (e.g. sandstone) or mountainous terrain. They are a secretive diurnal predator and feed largely on the eggs and young of desert vertebrates, and feed by widely searching on sandy areas and bajadas in the desert scrub habitats surrounding their shelter sites.

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 2500 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 1994) where the prey base is larger. Data are lacking on reproduction and nest sites for this species (Beck Jennings and Hayes 1994, 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).

H.s. suspectum is distributed from Central Arizona to southern Nevada, and southwestern Utah, and *H.s. cinctum* is distributed in the southern portion of the range, from Mexico to central Arizona (Bogert and de Campo 1956). WildEarth and Beck (2010) argued for recognition of a unique DPS in southwestern Utah, citing isolation and ecological distinction. However, recent genetic analysis refutes the division of the species into subspecies (Davidson et al. 2010).

Approximately 25% 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.

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	Protected
State of California	Species of Special Concern
State of Arizona	Species of Greatest Conservation Need
State of Utah	Species of Concern
NV Natural Heritage Program Watch List (2017)	G4T4, S2
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Highly Vulnerable
IUCN Red List (v 3.1, 2007)	Near Threatened
CITES	Appendix II Species

The Gila Monster was petitioned for listing under the ESA as a distinct population segment (DPS) in Utah in 2010. The DPS 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 as they determined that there was insufficient scientific evidence presented 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 Utah, and Arizona which prohibits collection for personal or commercial purposes (NDOW 2009).

The banded Gila monster is covered under the 1998 Conservation Agreement for the Spring Mountain Range. The banded Gila monster is included as a Covered Species in the Coyote Springs Investment Multiple-Species Habitat Conservation Plan published in July 2008 and the corresponding Endangered Species Act 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 Multiple-Species Habitat Conservation Plan area covers portions of Clark and Lincoln counties, north of the Clark County MSHCP area.

4. Impact

Gila monsters spend up to 98% 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. Roughly 25% of this subspecies' distribution occurs in Clark County (Stebbins 2003). Suitable habitat for this species within Clark County was modeled based on elevation, distance to springs, land cover, and landform (Nussear et al 2016). Approximately 531,054 acres of modeled habitat exists within Clark County. It is estimated that approximately 235,000 acres of medium and high quality modeled habitat for Gila monster within Clark County could be impacted by activities covered under the Amendment. An additional 226,000 acres of medium and high quality modeled habitat is proposed for reserve and 1.5 million acres of medium and high quality modeled habitat are in conservation lands.

Direct threats to the Gila monster, including those in Clark County include illegal collection for commercial and recreational purposes, 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 banded Gila monster declines (Jennings and Hayes 1994, WildEarth and Beck 2010). Additionally, the banded Gila monster has a poisonous bite and has therefore been the target of unwarranted destruction by humans (NDOW 2009, WildEarth and Beck 2010).

5. Data

Banded 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 2009). 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.

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% 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 make 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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SPOTTED LEAF-NOSED SNAKE (*PHYLLORHYNCHUS DECURTATUS*)

1. Species Overview

Previously there were five subspecies recognized – *P.d. arenicola*, *P.d. decurtatus*, *P.d. perkinsi*, *P.d. nubilis*, and *P.d. norrisi* (Smith and Langbartel, 1951). However, McDiarmid and McCleary (1993) and Gardner and Mendelson (2004), determined these are geographically distinct populations but do not represent a subspecies level classification.

The 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 and Ernst et al 2003). The snake is secretive and little is known of its habitats or status likely due its nocturnal habits. The snake eats primarily lizard eggs as well as small lizards.

The 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).

2. Range

The range of this species extends from southern California, southern Nevada, southwestern Utah (one individual) (Utah DNR 1997), 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 we estimate the portion of the range of the species in the plan area is less than 10%. This species is likely distributed throughout Clark County and the Plan Area where suitable habitat exists.

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 Natural Heritage Program Watch List (2017)	None
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Presumed Stable

IUCN Red List (v 3.1, 2007)	Least concern
CITES	None

4. Impact

Impacts include loss of habitat and/or mortality, urbanization, road construction and road related mortality, ORV use, and collecting . In Nevada, currently there are no rules limiting the collection of all reptiles including leaf-nosed snake for commercial purposes. The State of Nevada is in the process of revising the current regulations to disallow collection of reptiles for commercial and personal purposes.

5. Data

No population or population trend data for the leaf-nosed snake is available. We were unable to locate any systematic studies or surveys for the leaf-nosed snake population 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% per year without citing any data (Frost et al 2007).

An estimated impact of 270,000 acres of medium and high quality habitat may occur in the Plan Area; however, and nearly 2 million acres of medium and high quality habitat is on conserved lands. We are not aware of any specific conservations actions for the leaf-nosed snake in Nevada. Conservation management associated the current MSHCP as well as those occurring on public lands likely benefit the leaf-nosed snake along with other desert reptiles utilizing similar habitats.

6. Recommendation

Not recommended for coverage. The IUCN last evaluated the species in March 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% 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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COMMON CHUCKWALLA (*SAUROMALUS ATER*)

1. Species Overview

This species is represented by a large number of viable occurrences throughout the majority of the range in California, Arizona, Nevada, Utah, and Sonora, Mexico. This lizard inhabits rocky desert; lava flows, hillsides, and outcrops. Creosote bush occurs throughout most of the range (Stebbins 2003 in Hammerson 2007). Abundance information is not available range-wide, but the total adult population size is probably more than 100,000. Populations may vary with environmental conditions. The area of occupancy and population size appear to be relatively stable over most of the range (Hammerson 2007).

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 (WAPT 2012). 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 (Species Account Manual, MSHCP, accessed September 8, 2017).

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	None
State of California	None
State of Arizona	Special-status Species (population level)
State of Utah	Species of Concern
NV Natural Heritage Program Watch List (2017)	G5, S3
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Moderately Vulnerable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	None

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 (WAPT 2012). The Nevada Wildlife Commission voted to ban commercial collection of reptiles in Sept 2017, including the chuckwalla. Regulations implementing the Commission's action and non-renewal of existing permits will be occurring over the next several months. Only hobby collecting will be authorized, with a possession limit of 2. Hobby collection activities and regulations are to be reviewed in the near future.

5. Data

The WAPT (2012) determined information on population numbers, abundance, and trends are needed, as well as the need to identify the extent and impacts of collection on population and habitat. The data situation described for Nevada appears to be applicable range-wide.

6. Recommendation

Not recommended for coverage. The chuckwalla should not be included as a covered species. Commercial collection as a threat in Nevada will be eliminated as a result of actions by the Nevada Wildlife Commission. The species is not considered to be a Species of Conservation Concern/Need in California (Thomson et. al. 2016; CDFW 2017) or Arizona (AGFD 2012, 2017). The chuckwalla has an extremely limited range in Utah, and was recently added as a Utah Species of Concern (UDNR 2017). Based on current knowledge there is no indication the species is likely to become a listed species based on its presumed range-wide and widespread relative abundance, without any documented significant threats.

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MACNEILL'S SALTBUSH SOOTYWING (*HESPEROPSIS GRACIELAE*)

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 in southeastern California (Austin and Austin 1980).

2. Range

Occurs along the Colorado River and its tributaries form extreme southwestern Utah through Clark County, Nevada. Also, present in Bill Williams, Gila, and Salt Rivers in Arizona, Coachella Valley in California, and Baja Norte in Mexico (Wiesenborn 2012).

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 (Pratt and Wiesenborn 2009).

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	None
State of California	None
State of Arizona	None
State of Utah	None
NV Natural Heritage Program Watch List (2017)	None
NV Wildlife Action Plan (2012)	None
NV Climate Change Vulnerability Index	None
IUCN Red List (v 3.1, 2007)	None
CITES	None
Xerces Red List	Vulnerable

4. Impact

Modification through demining, 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).

5. Data

Population trends for this species are unknown.

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.

Based on SWECO habitat models prepared for Clark County, over 2 million acres of potential habitat (91% of it in low quality habitat) exist in conserved land and another 266,000 acres are in reserved lands. Approximately 280,000 acres of potential habitat are within areas that have been identified as being potentially impacted by Plan activities in the future.

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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PALLID BAT (*ANTROZOUS PALLIDUS*)

1. **Species Overview**

The pallid bat (*Antrozous pallidus*) has a relatively large body size and its woolly fur is yellowish to cream-colored above, and whitish below (Nowak 1991). This species is a member of the Vespertilionidae – a group of bats with exceptionally long and wide ears. They are 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 coarse the habitat in search of many types of ground-dwelling invertebrates or small vertebrates (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, mine shafts and even holes in the ground (in desert localities). 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), and scorpions (Scorpione). 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 about October 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). The colonies are usually small with fewer than 100 individuals (Tuttle 1988). Roosts are important resources for bats at any time of year. During spring and autumn these bats often occupy deep vertical crevices. 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 2º 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).

While pallid bats may be found in a variety of habitat types, a study in Clark County found that 88% 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 and prey abundance, [and water availability] are considered to be primary determinants of high quality 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).

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 (420-2,580 m), 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 (Bradley et al. 2006). The pallid bat is expected to have a wide distribution in Clark County below 6000 feet (O'Farrel et al. 1967, Tuttle 1982). 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.

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 Natural Heritage Program Watch List (2017)	G5, S3
NV Wildlife Action Plan (2012)	None
NV Climate Change Vulnerability Index	None
Western Bat Working Group (Region 8)	Low Priority
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	None

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/wild fire, and renewable energy developments. Large-scale urban development can destroy large areas of foraging and roosting habits. Building transportation corridors often destroys riparian habitats or results in loss of cliff habitats used for roosts (Miner and Stokes 2005). At this time, prescribed fire activities usually take into consideration sensitive wildlife, however, wildfires cannot be controlled.

Renewable energy development can threaten bat habitat in a couple of ways. First there is the direct habitat disturbance. In this regard, 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. In contrast, wind turbines can have direct impacts to bats through collisions or barotrauma (Cryan and Barclay 2009, Cryan 2011). Pallid bats may be most vulnerable to the latter disturbance as they leave and return from roosting sites to foraging areas, because during foraging they spend a great deal of time outside the danger zone for damage (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 other than Clark County, large scale industrial farming may increase prey species, however, roosting sites may be unavailable over large areas, and industrial pest control may reduce prey items, or indirectly have negative impact on the bats through toxicity. However, die-offs from environmental contaminants are not recorded for pallid bats (Clark 1981).

5. Data

The current status of the pallid bat in Clark County, Nevada is not well known. 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 (Minder and Stokes 2005). Populations are expected to continue to decline in that region as urban expansion increases.

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.

6. Recommendation

Not recommended for coverage.

Pallid bat is not recommended for coverage under the MSHCP because it is a wide-ranging species, there is a lack of data on population trends in the region, and conservation areas encompass the higher elevation lands within Clark County known and with high potential to support this species. It 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 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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TOWNSEND'S BIG-EARED BAT (*CORYNORHINUS TOWNSENDII*)

1. **Species Overview**

Townsend's big-eared bat is a medium-sized bat (90 to 100 mm in length) with large ears (30 – 39 mm) that inhabits most of the western United States, north through British Columbia, Canada, and south into Mexico. 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 roost 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 fewer than 100 individuals, 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).

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 and 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 acoustically recorded at several sites within the Spring Mountains.

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	Sensitive

State of California	None
State of Arizona	Special-Status Species
State of Utah	Species of Concern
NV Natural Heritage Program Watch List (2017)	None
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Presumed Stable
Western Bat Working Group (Region 8)	High Priority
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	None

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). The use of pesticides by limiting the availability of prey and timber harvesting is also likely to negatively impact the species (Piaggio 2005).

White-nosed fungus (*Geomyces destructans*) has the potential to impact the species (Gargas et al. 2009). Although incidence of white-nosed fungus 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).

5. Data

The species is thought to be declining in abundance throughout its range; a number of recent studies show 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). There is little trend data known for Clark County, although recent surveys along the Colorado River Corridor indicate the species is rare but the survey may not have overlapped with the typical foraging habitat for this species (Williams et al. 2006).

6. Recommendation

<u>Recommended for coverage.</u>

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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SPOTTED BAT (*EUDERMA MACULATUM*)

1. Species Overview

Spotted bats locate relatively large prey over relatively long distances (Woodsworth et al. 1981). They forage primarily on moths with body lengths of 5-12 mm reported (Gervais 2016). Data suggest that female spotted bats roost singly and do not form nursery colonies (Chambers et al. 2011). Spotted bats use crevices in tall, sheer cliffs that have little vegetation (Gervais 2016). Foraging takes place in adjacent open habitats (Chambers et al. 2011).

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. 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).

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	Threatened
State of California	None
State of Arizona	Special-status Species
State of Utah	Species of Concern
NV Natural Heritage Program Watch List (2017)	None
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Presumed Stable
Western Bat Working Group (Region 8)	Medium Priority
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	None

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 Kennaith 2007). Pollution and contamination of water sources from may result in ingestion of pollutants and/or the reduction of the abundance of prey species (Gervais 2016). In addition, white-nosed fungus (*Geomyces destructans*) has the potential to impact this species (Gervais 2016).

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 Kennaith 2007).

6. Recommendation

Recommended for coverage.

The spotted bat is recommended to be covered under the MSHCP solely because it is state listed as threatened. 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, and 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 facilities, white-nose syndrome awareness and prevention protocols, etc.

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SILVER–HAIRED BAT (*LASIONYCTERIS NOCTIVAGANS)*

1. Species Overview

Silver-haired bats are found in most of the United States, with the exception of the southeast and southwestern coasts of the United States (Bentley 2017). Silver-haired bats are among the most common bats in forested areas of America, most closely associated with coniferous or mixed coniferous and deciduous forest types, especially in areas of old growth. 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 these bats (BCI 2017).

Silver-haired bats are 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 solitary animals that will seek shelter and sleep under loose bark, in dead trees or snags, inside hollow cavities of trees where heart rot may have taken place and holes that may have been used for birds and squirrels (Bentley 2017).

2. Range

Lasionycteris noctivagans is found from southern Alaska, throughout southern Canada, and most of the United States into the San Carlos Mountains of northeastern Mexico.

Silver-haired bats are widely distributed in Nevada, but confined primarily to forested habitats and more specifically to riparian habitats in southern Nevada (Bradley 2006). This species was observed occupying closed mine shafts at 9 of 13 sites surveyed in central Nevada (Morrison and Fox 2009), and flying near Searchlight NV, which also has several active and abandoned mine sites (Tetra Tech 2009).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	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	No Status
State of Arizona	No Status (AGFD 2012)
State of California	No Status (CDFW 2017)
State of Utah	No Status (UWAPJT 2015)
NV Natural Heritage Program Watch List (2017)	G5 S3B
NV Wildlife Action Plan (2012)	S3

NV Climate Change Vulnerability Index	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No Status

4. Impact

The primary threat to *L. noctivagans* range-wide is likely to be loss of roosting habitat due to logging practices that fail to accommodate the roosting needs of this species (e.g., clusters of large snags). Loss of temporary roosts within migration corridors could also be important. Loss of foraging habitat in riparian areas, and reduction of prey base due to broadcast application of pesticides are other potential threats (Western Bat Working Group 2017).

The silver-haired bat has been observed in Desert Riparian, and Mixed Conifer ecosystems (Bradley et al. 1965). As this species is reported to roost in both trees and in caves, mines and man-made structures, it is potentially influenced by changes to tree densities (e.g. as affected by forest fires, urbanization, or other disturbances that reduce tree cover in their habitats), as well as disturbances to caves, and mines, and abandoned structures that they use for roosts. This species also forages in riparian areas in Clark County, and likely travels between roost sites and foraging areas, thus opening the potential susceptibility to mortality due to windmill blade collisions, or barotrauma should these facilities be constructed in Clark County (Baerwald et al. 2008, Cryan and Barclay 2009 *in* Nussear 2017).

5. Data

More information is needed on the distribution of breeding populations, on regional differences in roosting requirements, the timing and patterns of migration for each sex throughout the west, and the location of possibly important mating and migratory stopover sites. Information is also needed on what factors (e.g., temperature, local food availability) determine year to year variation in local distribution and abundance (WBWG 2017). The species has been detected acoustically in Las Vegas Wash (Eckburg and Foster 2010) and in other locations in Clark County (Bradley et. al. 2006). Its overall status is poorly understood (Bradley et. al. 2006). Its abundance throughout the distribution is somewhat unpredictable, but has patches of high local abundance (Kunz 1982 in Nussear 2017).

Relatively few records in the scientific literature for this species exist in Clark County. Localities for silver-haired bats are sparsely distributed with only 25 of 32 observations for the Mojave Desert within the County. Observations were associated with the Spring Mountains, Corn Creek, The Sheep Mountains, and Moapa Valley riparian areas, Searchlight with two observations within the Las Vegas metropolitan area. Early records include observations in the Sheep Mountains at 8500 ft, and Corn Creek Ranch (now the Desert National Wildlife Refuge) at 3000 ft (Hall 1946 in Nussear 2017). Most locations have been in the northern part of the County (Nussear 2017).

The primary conservation/management issues facing the species statewide include: timber harvest; grazing of riparian habitats; pesticide spraying. More information is needed about breeding populations, roost requirements, and the timing and patterns of migration (Bradley 2006). Silver-haired bats are potentially influenced by changes to tree densities (e.g. as affected by forest fires, urbanization, or other disturbances that reduce tree cover in their habitats), as well as disturbances to caves, and mines, and abandoned structures that they use for roosts. It's foraging habits open the potential susceptibility to mortality due to windmill blade collisions, or

barotrauma should these facilities be constructed in Clark County (Baerwald et al. 2008, Cryan and Barclay 2009 in Nussear 2017).

6. Recommendation

Not Recommended for Coverage.

The species wide distribution (nationwide), at presumably stable levels, and no evidence of potential threats in Nevada, or specifically Clark County, and surrounding states make it highly unlikely to become listed in the future. State and Federal agencies have numerous conservation measures to ensure the long-term conservation of bat species in general, and would likely apply to silver-haired 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 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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WESTERN RED BAT (*LASIURUS BLOSSEVILLII*)

1. Species Overview

Lasiurus blossevillii (Lesson & Garnot 1826) 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). The western red bat has rusty-red dorsal coloration; noticeably fewer frosted dorsal hairs; and a bare posterior margin of the uropatagium.

Until recently, western red bats were rarely observed in Nevada but now have at least 6 record locations (Bradley et al. 2006). Recent advances in acoustic sampling has proven to be much better at providing occurrence data than the historical use of mist nets for these solitary bats (Williams 2001). Western red bats are considered to be foliage or tree dependent species in regard to their 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. Also thought to be migratory to the southern portions of their range in the winter (Bradley et al).

2. Range

The species range includes all or portions of British Columbia, Washington and Oregon, Nevada, California and Arizona, Utah, Colorado, Wyoming, Idaho, Montana, New Mexico, and most of western Texas (NatureServe 2006). Western red bat distribution continues throughout Mexico, Central America, and almost the entire continent of South America (NatureServe 2006).

While using mist-nets, harp traps, and acoustic sampling to study bats along the Muddy River in Moapa Valley in Clark County, Nevada, Williams (2001) found that red bats were the sixth-most abundant species acoustically detected. Western red bats have also been recorded acoustically along the Las Vegas Wash. The Nevada Bat Conservation Plan sites 6 locations in the south and western portion of the state including 2 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 (Riparian forest galleries and urban landscaping with stands of trees and palms) and foraging (grasslands and riparian) exists. The total amount of the species range in Clark County is estimated to be less than 1%.

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	Sensitive
State of Arizona	Special-Status Species
State of California	No Status
State of Utah	Species of Concern
NV Natural Heritage Program Watch List (2017)	G5 S1M
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Presumed Stable
Western Bat Working Group (Region 8)	High Priority
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No Status

4. Impact

Threats often cited for the western red bat and for many bat species include habitat loss (Pierson et al. 2006), white nose syndrome (WNS), collision with wind machines (Hayes 2013, Johnson and Ericson 2011), pesticides (impacts to prey and bio-accumulation) and predation by birds of prey, roadrunners, opossums, and domestic cats (Shump and Shump 1982). However, available habitat, including trees for roosting, do not seem to be a limiting factor for the species and may well allow for range expansion in the desert especially as urbanization includes ornamental trees and palms.

5. Data

Most authors cite lack of systematic survey and monitoring data for red bats when trying to determine population numbers and trends (Stephenson and Calcarone 1999, Carter et al. 2003, Ellison et al. 2003). That being said, it was also stated that western red bats probably benefit from the conservation measures provided in both commercial and public forests and riparian forest restoration (Carter et al. 2003). It has also been noted that western red bats have shown some ability to adapt to new roosting opportunities such as ornamental trees and this is likely to their advantage (Carter et al. 2003).

The species is a seasonal migrant; however, knowledge of wintering behavior and hibernation is lacking. Individuals have been documented foraging on occasion during winter in the San Francisco Bay area (WBWG 2017).

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 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 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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HOARY BAT (*LASIURUS CINEREUS*)

1. Species Overview

The hoary bat is brownish or greyish, with white highlights (thus its namesake “hoary”), a white shoulder patch, and yellowish throat patch (Shump and Shump 1982). They are a solitary bat and roost 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 reportedly has a strong preference for moths, but is also known to eat beetles, flies, grasshoppers, termites, dragonflies, and wasps (WBWG 2015). Copulation and fertilization likely occurs during late fall and during the overwintering season, with young born in early June (Kohler et al. 2000).

2. Range

The hoary bat is a large migratory tree roosting bat found from northern Canada to Argentina and Chile in South America making them 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 are 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 US, and females in the east, and there is also evidence of separation in some regions during winter where more males are found in Mexico, with 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).

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	No Status
State of Arizona	No Status

State of California	No Status
State of Utah	No Status
NV Natural Heritage Program Watch List (2017)	G5 S3N
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Not Vulnerable/Increase Likely
Western Bat Working Group (Region 8)	Medium Priority
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No Status

4. Impact

There are no known predators of importance to this species (Shump and Shump 1982), however, as solitary foliage-roosters this species likely fall prey to birds, opossums, and domestic cats similar to others 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.

Direct impacts are not known, but like other bats this species may be impacted during migration by energy development. Collision with energy associated structures or barotrauma may occur (Arnett et al. 2008, Baerwald et al. 2008, Cryan and Barclay 2009, Cryan 2011).

5. Data

A review was conducted to determine the status of several species of solitary foliage-roosting bats in the United States (Carter et al. 2003). That study concluded that: “No quantitative information concerning long-term population trends of solitary foliage roosting bats can be drawn from existing data. Lack of standardized reporting and the inability to determine the proportion of total populations sampled (detection probabilities) for each of the observation and capture methods employed renders all capture data incomparable.” This species migrates seasonally, and little is known about wintering sites and the prevalence of hibernation.

Habitat modeling conducted in Southwest Ecosystems (SWECO 2016), estimated highest suitable habitat or core habitat was focused on the Spring and Sheep Ranges and also along riparian corridors of the Virgin and Muddy Rivers.

6. Recommendation

Not recommended for coverage.

Although there is not much data specific to hoary bats in Clark County, but data seems to support 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 impacted by the proposed actions in the

MSHCP (i.e. riparian forests will not be lost), and the mountain ranges with predicted high quality 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, and 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, white-nose syndrome 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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WESTERN YELLOW BAT (*LASIURUS XANTHINUS*)

1. **Species Overview**

The western yellow bat is a medium to large-sized bat, whose fur is yellowish-buff to light brownish, with fur tipped with gray or white. This species weighs 0.32-0.8 oz (9.2 to 22.5 g), and wingspan ranges from 13-14 inches (33.5 to 35.5 cm). Ears are shorter than many other species, but their length is longer than their width. The anterior half of skin between the legs is well-furred, while the posterior half is bare or almost bare.

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 & Barrow 2014, Williams et al 2006, Bradley et al 2006, Marty, J. and R. Unnasch. 2015, Arroyo-Cabrales, & Álvarez-Castañeda 2017).

Some populations may be migratory although some individuals appear to be present year-round, even in the northern most portion of the range (Bradley et al 2006). Western yellow bats probably do not hibernate; activity has been observed year round in both the southern and northern portions of the range. The diet includes Coleoptera, Diptera, Hemiptera, Homoptera, Lepidoptera, and Orthoptera (O'Farrell et al 2004, Marty, J. and R. Unnasch. 2015).

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 (IUCN 2017, Texas Parks and Wildlife, 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 and 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, as well as canyon and riparian situations and palm groves seem to be used frequently (O'Farrell et al 2004, Arroyo-Cabrales, & Álvarez-Castañeda 2017, Bradley et al 2006). Roosting and foraging seems concentrated within California fan palm groves throughout the upper Moapa Valley (Clark County) and is also known from the Las Vegas area.

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 (2011)	Sensitive
U.S. Forest Service - Region 3 (2007)	Sensitive
State of Nevada	None
State of California	Species of Special Concern
State of Arizona	G4G5 S2/S3
State of Utah	None
NV Natural Heritage Program Watch List (2017)	Not Included
NV Wildlife Action Plan (2012)	Not Included
NV Climate Change Vulnerability Index	Presumed Stable
Western Bat Working Group (Region 8)	High Priority
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	Not Included

4. Impact

The western yellow bat has likely expanded its historical range to Clark County associated with the trees, especially date and fan palms, used in landscaping of urban areas. The cosmetic trimming of palm trees is probably one of the primary threats to yellow bats. Known and likely predators of the western yellow bat include urban adapted and native animals including domestic cats, dogs, rats, barn owls, birds of prey, roadrunners, and opossums. The use of pesticide threatens both bats and their insect prey.

White-nose syndrome (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 an insect predator and its economic importance to agriculture as pollinators, the California Department of Fish and Wildlife and other local, state, and federal government agriculture and wildlife agencies have established methods and mechanisms to monitor this threat (CDFW 2017).

5. Data

Systematic population surveys have not been conducted or models developed for the Western yellow bat, therefore little is known about the status and trend of the population range-wide or in Clark County. However, most reports and authors suggest the population remains well distributed in the Southwest U.S. and northern Mexico and is stable to increasing based on the expansion of

landscaped urban areas (Wilson and Ruff 1999, Ortiz & Barrow 2014, Williams et al 2006, Bradley et al 2006). The range expansion into Clark County in the late 90's likely associated with the planting of fan and date palms and could be an indicator of the continued suitable conditions for range stability. It is also likely that with the development of sophisticated sonic detection techniques, bats in general will be detected in additional locations and ranges better understood.

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 do not for the most part, 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 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 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, and 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, white-nose syndrome 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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CALIFORNIA LEAF-NOSED BAT (*MACROTUS CALIFORNICUS*)

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. 2007; 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 occurs. Summer colonies range from six to several hundred individuals, while winter colonies may contain 100 to over 1000 individuals.

2. Range

The California leaf-nosed bat ranges 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). In Nevada, this species has been documented along the Muddy River in Moapa Valley as well as the Las Vegas Wash (Williams 2001; O'Farrell Biological Consulting 2006). 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 root in winter (Brown et al. 1993; Brown 2005). Their elevation ranges between 210 to 690 meters (Bradley et al. 2006).

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	Sensitive
State of California	Species of Special Concern
NV Natural Heritage Program Watch List (2017)	G4 S2
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Presumed Stable
Western Bat Working Group (Region 8)	High Priority
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No Status

4. Impact

Primary threats to the California leaf-nosed bat includes 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). 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).

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 a knowledge of the location active roost sites, which are limited in number in Nevada. IUCN (2017) lists the population as stable and locally common in restricted localities.

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, Nature Serve 2017). While 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, and 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, white-nose syndrome 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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MEXICAN FREE-TAILED BAT (*TADARIDA BRASILIENSIS*)

1. Species Overview

Mexican free-tailed bat, or 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, 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 further north than females, and these bats are also known to roost in man-made structures (Wilkins 1986). They select areas with upper ambient temperatures of 35 ºC in laboratory conditions (Herreid 1967), but can be found roosting in structures and caves with warmer temperatures up to 40ºC (Wilkins 1989). They are an insectivorous species eating primarily moths, beetles, flying ants, midges, and mosquitos (Kunz et al 1995).

2. Range

Mexican free-tailed bat is among the most widely distributed species of mammals 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). They aggregate in large numbers while roosting, and are frequently seen exiting roosts simultaneously for foraging bouts of up to 4 hours (Wilkins 1989).

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	Special-Status Species
State of California	Roosts Protected (CEQA)
State of Utah	Species of Special Concern
NV Natural Heritage Program Watchlist (2017)	G5 S3S4
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Presumed Stable
Western Bat Working Group (Region 8)	Low
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	None

4. Impact

The Mexican free-tailed bat faces threats from disturbance at roosts, pollution, development and vandalism, and declines in some populations have been attributed to the use of DDT and disturbance due to guano mining in Mexico (Wiederholt et al. 2013). Natural predators include falcons, hawks, owls, skunks, raccoons, several species of snakes, and other carnivores (Wilkins 1986).

Disturbances to and closures of roosting habitat are ecosystem level threats to this species. Because they may fly long distances to foraging areas, it is likely that structures interfering with flyways, and loss of foraging habitat would also negatively affect this species. For example, wind turbines are likely to affect survival during migrations (Arnett et al. 2008) as Mexican free-tailed bats are among the most frequently observed bat species at energy development facilities in the Southern US (Cryan and Barclay 2009).

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

5. Data

This species is commonly accepted as among the most common bats in North America (Kunz and Reynolds 2003). 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 2016). Recent genetic analyses of migrating populations indicated that earlier hypotheses of distinctions among migratory populations (see Wilkins 1986) were not supported by genetic structure, and that like many migratory and widely dispersing species only 1 genetic population was supported (Russel et al. 2006). An effective population size for the species was estimated at 28.4 million females (Russel 2003).

Eight Mexican free-tailed bat colonies for which there were at least four years of data were analyzed for their population trends in the United States, and two of them showed positive population trends, six of them had no trend, and zero 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 that involved an artificial cave entrance (Bradley et al. 2006). Mexican free-tailed bats in Nevada are stated to potentially be below historical levels (Bradley et al. 2006), but no quantitative data were provided to support this suggestion.

In a study along the Muddy river drainage near Moapa in Clark county NV, 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 300m above ground surface in Clark County, NV (Griffin and Thompson 1982). Point distributions and predicted habitat provided in the Species Distribution Model (Nussear et al. *in prep*) 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 NRA, and in the Colorado River drainage in the southernmost extent of the County near AVI.

6. Recommendation

Not recommended for coverage.

It is not recommended that the Mexican free-tailed bat be covered under the MSHCP due to it not being federally listed and there is no evidence of 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 high suitability habitat, 478,039 acres and medium suitability habitat, 1,089,953 acres in Clark County is in conservation lands.

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DESERT KANGAROO RAT (*DIPODOMYS DESERTI DESERTI*)

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). Its 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 include greasewood (*Sarcobatus vermiculatus*), four-winged saltbush (*Atriplex canescens*) (Kotler 1984a), 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).

This species may form loose colonies of 6 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 (Ryan 1968). Densities vary seasonally from 0.5 to 3.04 per hectare (Grinnell 1937; Ryan 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*) (Burt 1934; Hall 1946).

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). In the Mojave Desert of Nevada, desert kangaroo rats may comprise of only 1 percent of the rodent fauna (Beatley 1976). 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.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation Species
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
State of Nevada	No Status
State of Arizona	No Status

State of California	No Status
State of Utah	No Status
NV Natural Heritage Program Watch List (2017)	G5 S2S3
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No Status

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 through urban and suburban development including those listed as covered activities within 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).

5. Data

No data on population trends is available. The desert kangaroo rat is presumed common in suitable habitat throughout its range; the IUCN (2017) lists its population trend as stable and classifies this species as "Least Concern."

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 declines, 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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KIT FOX (*VULPES MACROTIS*)

1. Species Overview

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 two were comparative to that of the genus' *Vulpes* and *Alopex*, and therefore they should be recognized at the species level, which we follow here (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 not fully resolved (Cypher and List 2014). As many as eight subspecies of kit foxes 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 & 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).

The kit fox is a desert fox found in shrub-steppe and arid and semiarid desert habitats within in its range (Wilson & Ruff 1999, McGrew 1979, O'Farrell 1987). In southern Nevada it can be found throughout Clark County where suitable habitat occurs. The kit fox is nocturnal and its primary prey are kangaroo rats and other small nocturnal rodents (Meany et al 2006 and Cypher 2014).

2. Range

Kit foxes occur in southeastern Oregon, Utah, Nevada, southern California, Arizona, New Mexico, southwestern Colorado, western Texas, and northern Mexico. Clark County constitutes a relatively small portion of the range (<1%).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	No Status*
U.S. Bureau of Land Management (Nevada)	No Status
U.S. Forest Service (Region 4)	No Status
State of Nevada	Fur-Bearing Mammal (NAC 503.025)
State of Arizona	Special-status Species
State of California	No Status*
State of Utah	Species of Concern

NV Natural Heritage Program (2017)	Watch List: G4 S3
NV Wildlife Action Plan (2012)	Not Included
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	Not Listed

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

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 (Meany et al 2006, Cypher and List 2014). In California, a recent mange outbreak has resulted in the loss of animals; in addition, rabies, parvovirus, sylvatic plague, hepatitis and distemper is documented in the genera (Cypher and List 2014, McCue and O'Farrell 1988, Standley et al. 1992).

5. Data

The population trend is likely stable in Nevada (Cypher and List 2014); however, elsewhere in its range the species is in decline (Meany 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, Meany et al 2006). All level to rolling grasslands and scrub (ideally <10% gradient slope) below 5,700 ft. in Clark County are suitable for this species (Cypher and List 2014).

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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COLORADO RIVER COTTON RAT (*SIGMODON ARIZONAE PLENUS*)

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 quickly 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).

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. This marks the first species encounter in Nevada since 1961. Subsequent Trapping events have confirmed a resident population in the area (Hill 2011 & 2012).

The distribution of cotton rats occur 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 as occurring in historical locations (Neiswenter 2016).

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	Special-status Species
State of California	Species of Special Concern
NV Natural Heritage Program (2017)	At Risk: G5T2T3, S1
NV Wildlife Action Plan (2012)	None

NV Climate Change Vulnerability Index	Not Listed
IUCN Red List (v 3.1, 2007)	Not Listed
CITES	Not Listed

* 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.

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.

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 mostly absent. Colorado River cotton rat is also covered under the Lower Colorado River Multi-Species Conservation Plan (LCRMSCP).

6. Recommendation

Not Recommended for Coverage.

This subspecies was initially designated as further review, as 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 ESA. 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 thissub species 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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BOTTA'S POCKET GOPHER (*THOMOMYS BOTTAE*)

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* (Wildlife Action Plan Team 2012), do not occur in Clark County below 4000 feet of elevation. Within the MSHCP Area multiple subspecies may occur including *T.b. centralis and T.b. phelleocus*, and none are designated a Conservation Priority (Wildlife Action Plan Team 2012); 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) and their numbers can be reduced in abundance 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 related 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 others (Lay 1978, Smith and Patton 1980, Jones and Baxter 2004).

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).

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
NV Natural Heritage Program (2017)	At-Risk List[1,2]: G5, SH
NV Wildlife Action Plan (2012)	None
NV Climate Change Vulnerability Index (NNHP 2012)	Moderately Vulnerable[1,2]

IUCN Red List (v 3.1, 2007)	Least Concern
CITES	None

[1] Fish Springs pocket gopher (*Thomomys bottae abstrusus*)
[2] San Antonio pocket gopher (*Thomomys bottae curtatus*)

4. Impact

Botta's pocket gophers are widespread and occupy a broad number of ecological niches (Jones and Baxter 2004) and 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 measures for control such as trapping and rodenticide may be used in those areas.

5. Data

Information on population trends in Botta's pocket gopher in the Clark County is sparse. One study shows declining populations with OHV use (Vollmer et al. 1977). However, the species is often locally abundant, even in urban areas, where suitable friable soils and forage are present.

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 Area. It is unlikely that subspecies of Botta's pocket gopher within the MSHCP will become listed over the course of the lifetime of the MSHCP. Therefore, it is not recommended that Botta's pocket gopher be included in the Clark County MSHCP; however, further review was initially requested to ensure no narrowly endemic subspecies are present within the MSHCP. No additional information on subspecies within the MSHCP Plan Area was found, and discussions with Nevada Department of Fish and Wildlife 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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DESERT POCKET MOUSE (*CHAETODIPUS PENICILLATUS SOBRINUS*)

1. Species Overview

Desert pocket mice are solitary and do not have overlapping home ranges (Jones 1985). Activity tends to be low during the hottest and driest parts of the year and is at its peak in late spring. Within Clark County, only one subspecies occurs, *C.p. sobrinus*. Earlier work recognized a single subspecies (*Chaetodipus penicillatus sobrinus*) in the Mojave and Sonoran Deserts (Lee et al. 1996), subsequent genetic analysis recognized a separation between the Mojave and Sonoran ecotone, and the Colorado River (Wood et al. 2013). Thus the overall range of *C.p. sobrinus* has been reduced, and is almost entirely within Clark County.

2. Range

Chaetodipus penicillatus occurs 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 *Chaetodipus penicillatus* (Jezkova et. al. 2009). *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 36–1,585 m.

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	None
State of Arizona	None
State of California	None
State of Utah	None
NV Natural Heritage Program (2017)	At Risk Species: G5, S1S2
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	MV/VH
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	None

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 (Wildlife Action Plan Team 2012). In addition, off-highway use can result in direct mortality. Habitat within the lower Colorado drainage system is highly fragmented, reducing resilience to disturbance and increases 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).

Based on Inman et al. 2014, approximately 103,390 acres of high and medium suitability modeled habitat may be impacted by covered activities. This is approximately 10 percent of predicted high and medium suitability modeled habitat within Clark County (Nussear 2017).

5. Data

IUCN considers *Chaetodipus penicillatus* populations to be stable; however, population trends for *C.p. sobrinus* are unknown. *C.p. sobrinus* is also covered under the Lower Colorado River Multi-Species Conservation Plan.

6. Recommendation

Recommended for Coverage

Chaetodipus penicillatus is considered stable across its range but the current population trend for the subspecies that occurs in Clark County, *Chaetodipus penicillatus sobrinus*, is unknown. Although provided habitat models predict activities under the MSHCP will only directly impact 10 percent of modeled high and medium suitability habitat (Nussear 2017), *C.p. sabrinus* has an extremely limited range and almost entirely restricted to Clark County. 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 if information was available to indicate a broader range or population size. Following discussions with Nevada Department of Fish and Wildlife in which NDOW concurred with the existing data, this species was recommended for coverage under the MSHCP.

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COSTA'S HUMMINGBIRD (*CALYPTE COSTAE*)

1. Species Overview

Costa's Hummingbird is a Mojave Desert bird in Nevada, and 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. Because they are so small and have high-energy requirements, they may rely on a state of torpor to survive when energy reserves are low (Lasiewski 1963). As a highly temperature dependent species their range is likely dependent upon climate extremes.

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 & Scott 1996, Birdlife International 2016). In Southern Nevada and Clark County, Costa's breeds widely and occurs year-round in limited areas. Costa's occurs in lower elevations (below 4,000 feet) likely based on temperature sensitivity. Some sources suggest a recent range expansion (Baltosser & Scott 1996).

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	No Status
NV Natural Heritage Program (2017)	No Status; G5 S3B
NV Wildlife Action Plan (2012)	No Status
NV Climate Change Vulnerability Index (NNHP 2012)	Not Vulnerable/Very High Confidence
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	Appendix ii

4. Impact

Research or data do not identify specific threats to the species (GBBO 2010, Birdlife International 2016, Latta et al 1999). Possible threats that may occur in Clark County and elsewhere include water diversions and groundwater pumping which may affect blooming plants around riparian and spring areas, invasive plants that compete with preferred food plants, and destruction or degradation of habitat by fire or grazing that significantly reduces abundance of blooming plants during critical times (Wethington et al 2009).

5. Data

The IUCN lists the population rangewide as stable (Birdlife International 2016), while some sources indicate slight declines (Baltosser and Scott 1996, Latta et al 1999, Rich 2004 et al.). The Breeding Bird Survey indicates a slight population decline from 1966 to 2015 (Sauer et al. 2017).

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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GILDED FLICKER (*COLAPTES CHRYSOIDES*)

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. A requirement of these areas is 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. Another requirement is the presence of large open areas including bare ground, lawns, or golf courses where they forage on the ground for invertebrates (Turner 2006).

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.

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	Special-status Species
State of California	Endangered
NV Natural Heritage Program (2017)	No Status; G5 S1
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No Status

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 based on their 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.

Conservation of the Gilded Flicker is important because the species excavates nest cavities used by numerous secondary cavity-nesting species, meaning that the status of its populations could have broader community or ecosystem-level effects (Moore 2017).

5. Data

Long-term data from the Breeding Bird Survey (BBS) indicated that Gilded Flicker breeding populations in Arizona declined by 1.18% per year between 1968 and 2015 (Sauer et al. 2017). Over a 45-yr period (1970–2014), BBS data indicated that the U.S. population declined by an estimated 54% (Rosenberg et al. 2016). Partners in Flight placed the species on its Yellow Watch List for the United States (Rosenberg et al. 2016).

The Nevada 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 (Wildlife Action Plan Team 2012). 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 the impact of covered activities on habitat; avoiding and minimizing disturbance during the breeding season, and conducting research to better identify threats and habitat requirements.

Predictive modeling (GBBO 2013; GBBO 2015) shows potential habitat for the species throughout Clark County, mostly in foothill regions of the mountain ranges. IUCN (BirdLife International 2012) lists the species as Least Concern due to its large population, large range, and slow rate of population decline.

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 is indication 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, gilded flicker is recommended to be covered under the MSHCP.

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WESTERN BURROWING OWL (*ATHENE CUNICULARIA HYPUGAEA*)

1. Species Overview

Burrowing owl is found in a variety of open habitats including desert scrub, sagebrush, grasslands, and lowland desert vegetation. The species lives in underground refugia; however, it is not known to construct burrows, and tends to be most common in habitats where suitable burrows already exist (Floyd et al. 2007). In the north end of their range they are largely dependent on prairie dog (*Cynomys* spp.) colonies for burrow sites, while in the southern portion of their range, owls may use a variety of small mammal burrows including ground squirrel, skunk, and fox. In the Mojave and Sonoran deserts, burrowing owl will use desert tortoise (*Gopherus agassizii*) burrows (Klute et al. 2003, McDonald et al. 2004). In the northern portion of the range the species is migratory, in the south United States and northern Mexico locations may have both resident and migratory wintering owls, and further south in Mexico and Central America only wintering owls occur.

2. Range

Western burrowing owl ranges across western North America from southern Manitoba and British Columbia south through Texas and California and extending to Central America. The burrowing owl breeds in southern Nevada, and some individuals may reside year-round; however, most will migrate south to the extreme southern U.S. and Mexico during the winter months (Haug et al. 1993). In southern Nevada, burrowing owls mostly used desert tortoise burrows; therefore, distribution of burrowing owls in Clark County largely overlaps that of desert tortoise. 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). Recent transects in Clark County observed low densities of owls in desert scrub habitats, and no observations of owls in blackbrush or pinyon-juniper habitats (Crowe and Longshore 2010b). Higher numbers of owls, were noted in Gold Butte, Piute Valley, the eastern slopes of Eldorado Valley, and bajadas on the western side of Lake Mohave (Crowe and Longshore 2010b).

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	Protected
State of Arizona	Special-status Species
State of California	SSC
State of Utah	Species of Concern

NV Natural Heritage Program (2017)	Watch List: G4T4, S3B
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Comprehensive Bird Conservation Plan (GBBO 2010)	Special-status Species
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	Appendix ii

4. Impact

Habitat loss and fragmentation as a result of agricultural and urban conversion and reduction of fossorial species providing burrow habitat are the most significant causes of population declines in this species (Millsap and Bear 2000, Desmond et al. 2000). The most recent cause for loss of habitat is large-scale renewable energy development for solar and wind energy generation, and disturbances from off-highway vehicles has also been noted (Wildlife Action Plan Team 2012). This activity will result in direct loss of habitat by surface disturbance and compaction. Some artificial perches will no doubt result from these activities, but the net gains or losses to owls have not been calculated. Other threats include the elimination of suitable burrow sites through rodent control programs, rodenticides, predation from domestic and feral cats (*Felis catus*), and dogs (*Canis familiaris*), vehicle collisions, and pesticides or other contaminants (Klute et al. 2003).

Habitat models for burrowing owl in Clark County are broad scale and/or created from limited datasets with high sampling bias. Based on surveys and habitat modeling conducted by Crowe and Longshore (2010a), Clark County contains 5,476 km^2 of habitat with relatively higher probability of owl occurrence, 10,731 km^2 of habitat with a relatively moderate probability of occurrence, and 3,898 km^2 of habitat with a relatively low probability of occurrence of burrowing owls. However, occurrence data appears biased to southern Clark County. One other model produced is based solely on perceived suitable habitat and not related to occurrence data. Occurrences are known north and northwest of the City of Las Vegas, so this species is likely more broadly distributed in Clark County than current models suggest. Burrowing owl in Las Vegas Valley would be impacted through loss of habitat by covered activities.

5. Data

Breeding Bird Survey data from the last 30 years indicate that the burrowing owl is in decline nation-wide. They are also declining in much of western North America and precipitously in Canada (Holroyd et al. 2001). Trends in Nevada and other arid parts of the west are harder to determine based on limited survey routes and irregular sampling, and trends vary from declining to increasing based upon source (GBBO 2010).

The USFWS Urban Burrowing Owl Monitoring Project established a three-year monitoring program which has continued with the Red Rock Audubon Society to determine the success of burrowing owls nesting within the Las Vegas Valley and the general population trend of urban-nesting burrowing owls. Burrowing owls have successfully bred within some urbanized areas of Las Vegas and Pahrump (Manville 2009, Red Rock Audubon 2016). Publicly available reports for data on the monitoring effort have not been found.

Crowe and Longshore (2010a) developed modified survey techniques for the Mojave Desert and conducted transect surveys, including sites in Clark County (Crowe and Longshore 2010b). The

surveys were not of sufficient time to document trends; however, they did quantify relative abundances of owls in areas within the county, and found on average 0.12 owl territories per km^2, nest success of approximately 60 percent, and approximately three fledged young per nesting attempt over the span of the two-year study (Crowe and Longshore 2010b).

The Nevada Comprehensive Bird Conservation Plan considers the burrowing owl a Special Status Species and recommends the actions to protect burrowing owl. Recommended actions include establish and implement effective monitoring programs to determine population status and trends, maintain short vegetation and healthy prey populations near known colony locations, establish a no-disturbance buffer zone around active nest burrows, provide artificial burrows to help restore populations, and discourage the use of pesticides within 600 m of nest burrows (GBBO 2010).

6. Recommendation

Recommended for coverage.

This species is believed to be declining in northern portions of its range and has potential for listing during the lifetime of the permit. In addition, the species may be focused along edges of urban development with a high potential for impacts by covered activities.

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GOLDEN EAGLE (*AQUILA CHRYSAETOS*)

1. Species Overview

The golden eagle is one of North America's largest raptors. The distribution of golden eagles is circumpolar in 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. Recent efforts have been established to better understand the status of golden eagle populations in North America and learn about their 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 areas of human activity and urban areas (unpublished NDOW raptor nest database). 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, with no known tree nests.

2. Range

Currently, golden eagle populations are most robust west of the Great Plains with additional populations in northeastern Canada and isolated locations in the eastern U.S. (Kochert et al. 2002, DeLong 2004). In Clark County, known adjacent nests are considerably further apart than reported in the literature (unpublished USGS golden eagle nesting database, NDOW raptor nest database in Nussear 2017). Foraging has been documented in most habitat types occurring in Clark County. Mojave Desert scrub habitats in the valley bottoms and outwash plains of Clark County comprise a great deal of the foraging areas, as do mountain slopes and peaks (Longshore et al. *In Prep*. as cited by Nussear 2017).

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
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	Protected
State of Arizona	Special-status Species
State of California	Fully Protected
NV Natural Heritage Program (2017)	Watch List: G5, S4
NV Wildlife Action Plan (2012)	Species of Conservation Priority

NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	Appendix ii

4. Impact

Primary direct impacts to golden eagles include electrocution due to small gauge power lines (Benson 1982) and their large wing spans, vehicular collisions while eating road kill, 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 and urban development. Wind turbine strikes may be a future concern in Clark County (Nussear 2017). Of approximately 317,330 acres (128,419 hectares) of modeled habitat, 2 percent was impacted, 26 percent conserved, and 0.3 percent disturbed (Nussear 2017).

The golden eagle is federally protected by the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Lacey Act. The Nevada Wildlife Action Plan considers the golden eagle a Species of Conservation Priority and recommends the following actions: protection of nesting and roosting sites, research to develop non-lethal wind turbine designs, and the continuation of helicopter surveys to monitor the population (Wildlife Action Plan Team 2012). The Nevada Wildlife Action Plan and Bird Conservation Plan recognize the need for increased monitoring, nest site protection, and appropriate habitat management for prey populations.

5. Data

Golden eagle populations tend to roughly follow 10-year cycles (Nielson et. al. 2013). Several large scale efforts to determine population trends across the nation have been undertaken recently. Estimates obtained through these efforts tend to have wide margins of error. Nielson et. al. (2013) found no evidence of population trends, or number of juveniles, in four Bird Conservation Regions in the western U.S. Population declines are suspected in the west, but the trend is inconclusive in Nevada (Nevada Wildlife Action Team 2012).

6. Recommendation

<u>Recommended for coverage.</u>

The golden eagle should be included as a Covered Species. This recommendation is made on the basis of increased concern for golden eagle populations west-wide, its relative rarity in Clark County, its protection under the Bald and Golden Protection Act, and the challenges in obtaining permits for the species.

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YELLOW-BILLED CUCKOO (*COCCYZUS AMERICANUS*)

1. Species Overview

The yellow-billed cuckoo is a neo-tropical 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). The optimal size of habitat patches for the species are generally greater than 200 acres (81 hectares) in extent and have 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).

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.

Very little cuckoo habitat remains within Clark County today because of 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.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	Threatened (DPS)
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	Threatened
State of Nevada	Sensitive
State of Arizona	Special-status Species
State of California	Endangered
NV Natural Heritage Program (2017)	At Risk: G5 S1B

NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	Moderately Vulnerable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No Status

The western DPS of the yellow-billed cuckoo is listed under the ESA, critical habitat designation was proposed in 2014, with a recovery plan not being published to date. The three critical habitat units in Clark County total approximately 13,000 acres (the Virgin River Unit is partially within Arizona).

4. Impact

Ecosystem threats include habitat fragmentation and loss (Nevada Partners in Flight 1999). The primary threats currently facing the yellow-billed cuckoo include the destruction, fragmentation, and modification of riparian habitat, and pesticide application. Principal causes of riparian habitat losses 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.

5. Data

Western populations of yellow-billed cuckoos are in decline (Hughes 2015). 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. 2008).

Approximately 43,985 (178 km^2) of modeled habitat exist within Clark County (Boykin et al, 2008), although the proportion that is suitable for cuckoo nesting is estimated to be much less. This species occurs rarely in the MSHCP area, although covered activities have the potential to impact species habitat. Approximately 18% of this species' modeled habitat within Clark County could be impacted by activities covered under the Amendment, while 13% is already disturbed, and 13% is located within proposed or existing conservation areas.

The Virgin River Habitat Conservation and Recovery Program, Clark County, NV addresses preservation of habitat for this and other species (USFWS 2007). 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 land owners and federal agencies in order 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.

6. Recommendation

Recommended for coverage.

The yellow-billed cuckoo should be included as a covered species. It's rarity, current federal-listing as 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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BELL'S (SALTBUSH) SPARROW (*ARTEMISIOSPIZA BELLI CANESCENS)*

SAGEBRUSH SPARROW (*ARTEMISIOSPIZA NEVADENSIS*)

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 (*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, with one specifying this as the Mojave Desert Bell's sparrow subspecies. Recent research indicates that *A.b. canescens*, may warrant separation as a species of its own.

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).

2. Range

Occurrence records appear to be for the former nominate species, sage sparrow (*Amphispiza belli*), within Clark County and show a scattered, low density population throughout the county. Although the breeding and/or wintering status of these birds is unknown, Nussear (2017) reports that half of these observations were recorded between March and May and presumably indicate breeding records. Great Basin Bird Observatory staff (Nussear 2017) 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.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	No status
U.S. Fish and Wildlife Service Endangered Species Act	No status[1]
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	Protected
State of Arizona	No Status
State of California	No Status[2]
NV Natural Heritage Program (2017)	No Status: G5, S4B, S4N
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	Moderately Vulnerable[3]
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No status

[1] San Clemente sage sparrow (*Artemisiospiza belli clementeae*) is Threatened under the Federal ESA
[2] California Department of Fish and Wildlife list Bell's sage sparrow (*Artemisiospiza belli belli*) as a Watch List species and San Clemente sage sparrow (*Artemisiospiza belli clementeae*) as a Species of Special Concern
[3] sage sparrow (*Amphispiza belli*)

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 species. Invasive plant species such as cheatgrass may outcompete native species and provide fuel for the spread of wildfires that contribute to habitat decline.

5. Data

Data for both species indicate that they are widespread with large populations, and while populations appear to be declining, the decline is not a rate sufficient enough to warrant additional protections for the species (BirdLife International 2016).

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). Sage sparrow is also considered a Species of Conservation Priority by the Nevada Wildlife Action Plan because their sagebrush habitat is at risk of large-scale conversion and loss and the species maybe moderately vulnerable to climate change (Wildlife Action Plan Team 2012). The plan recommends protecting large expanses of high quality sagebrush and mixed xeric shrub habitat from wildfire, cheatgrass invasion, heavy OHV use, and urban and suburban development (Wildlife Action Plan Team 2012).

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 Area, if covered activities will impact each species, and if data is 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. Neither species is recommended for covered under the MSHCP.

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SOUTHWESTERN WILLOW FLYCATCHER (*EMPIDONAX TRALII EXTIMUS*)

1. Species Overview

The southwestern willow flycatcher (*Empidonax tralii extimus*) is one of four subspecies (*E. t. brewsteri, E. t. adastus, and E. t. tralii*) 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 comprised 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).

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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	Endangered (w/CH)
Migratory Bird Treaty Act	Protected
U.S. Bureau of Land Management (Nevada)	Sensitive
U.S. Forest Service (Region 4)	Sensitive
State of Nevada	Endangered
State of Arizona	Endangered

State of California	Endangered
State of Utah	Sensitive Species
NV Natural Heritage Program (2017)	At Risk: G5T2, S1B
NV Wildlife Action Plan (2012)	Covered
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern*
CITES	Not Listed

*Evaluated only at the species level

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 non-native plants, and brood parasitism by the brown-headed cowbird (*Molothrus ater*) (USFWS 1995 and 2002).

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, with both approximately 75% short of recovery goals and there has been little change overall in the territory numbers within these three recovery units since completion of the recovery plan in 2002 (USFWS 2014). Recent survey efforts have declined, thus estimating population numbers and trends is less precise, however, the southwestern willow flycatcher population appears to be stable to declining (USFWS 2014).

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 range-wide and the potential for MSHCP covered activities to impact the species.

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ARIZONA BELL'S VIREO (*VIREO BELLII ARIZONAE*)

1. Species Overview

Arizona Bell's vireo (*Vireo bellii arizonae*) is one of four subspecies of Bell's vireo (Bent 1950). Arizona 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). 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).

2. Range

Bell's vireo (*Vireo bellii*) breeding range occurs throughout the central and southwestern U.S. 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 the winter (Franzreb 1989).

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).

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)	No Status
U.S. Forest Service (Region 4)	No Status
Migratory Bird Treaty Act	Protected
State of Nevada	No Status
State of Arizona	Special-status Species
State of California	Endangered
State of Utah	No Status
NV Natural Heritage Program (2017)	Watch List: G5T4, S2B
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Near Threatened[1]
CITES	No Status

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

The Least Bell's Vireo (*Vireo bellii pusillus*) is listed as an endangered subspecies under the Federal Endangered Species Act (51FR16474).

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 3 C 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" (47FR58454). Listing of the Arizona Bell's vireo was determined to be "not warranted" in 1984 (49FR2475).

4. Impact

Threats to this species' habitat include urban and suburban development on floodplains and riparian habitat, the presence of large areas of tamarisk, and off-road vehicular activity (DeSante and George 1994, Wildlife Action Plan Team 2012). Urban development, water diversion, flood control projects, grazing, and the spread of agriculture have destroyed much of the nesting habitat in the West (Dudley et al. 2000, Krueper et al. 2003, NatureServe 2009). Tamarisk has been shown to reduce insectivorous bird abundance (Dudley et al. 2000) and is associated with reduced or complete lack of nesting in this species, which prefers willow thickets or stands of honey mesquite for nesting (Serena 1986). Brood parasitism by brown-headed cowbirds (*Molothrus ater*) is considered a significant threat to some populations of this species and has resulted in reductions in breeding populations in the southwestern U.S. (Serena 1986, Brown 1993, DeSante and George 1994).

5. Data

The current population of the full species is estimated to be approximately 1,500,000 individuals (BirdLife International 2009, BirdLife International 2012). The Nevada Bird Count estimates approximately 1,000 Arizona Bell's vireo's in Nevada (GBBO 2009). The North American Breeding Bird Survey data also indicates significant widespread declines of the full species averaging 3.2 percent per year (Sauer et al. 2008). Great Basin Bird Observatory data shows Bell's vireo declines in most regions, but that trend was not confirmed for Nevada (GBBO 2009).

Some studies have shown recovery trends as a result of the removal of stressors and subsequent vegetation recovery (Krueper et al. 2003). Population trends for the subspecies Arizona Bell's vireo were not reported in these studies. The IUCN Redlist categorizes the full species as "Near Threatened" due to widespread population declines of approximately 2.7% per year, although subspecies trends are not reported (BirdLife International 2012).

This species is also listed as a Bird of Conservation Concern by the USFWS within the Mojave Desert BCR (USFWS 2008). It is also listed as a covered species under the Lower Colorado River Multi-Species Conservation Program. The Nevada Wildlife Action Plan includes recommended conservation actions specific to this subspecies and subspecies habitat (Wildlife Action Plan Team 2012).

6. Recommendation

<u>Recommended for coverage.</u>

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 pursuant 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 area but may be impacted by proposed activities.

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LOGGERHEAD SHRIKE (*LANIUS LUDOVICIANUS*)

1. Species Overview

Loggerhead shrike is a medium-sized bird inhabiting 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, creosotebush twigs, and barbed wire across the American southwest.

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/prey handling resources for hunting (Brooks and Temple 1990). In the desert southwest they are known to inhabitat 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 very widespread and fairly 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 creosotebush (*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).

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)	None
U.S. Forest Service (Region 4)	None
State of Nevada	Sensitive Bird
State of Arizona	Special-status Species
State of California	Species of Special Concern
State of Utah	None

NV Natural Heritage Program (2017)	Watch List: G4, S4
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Comprehensive Bird Conservation Plan (GBBO 2010)	None
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	None

4. Impact

Losses of open habitat and perching and nesting sites may be 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 are 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 1995). 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 greater than 50% (Dechant et al. 2002), in comparison with more moderate habitat declines that had less dramatic losses of shrike populations. Grazing by livestock and feral horses in sagebrush areas is considered to be negative to shrike populations as well (Wood 1995a). Organochlorides have been associated with egg shell 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.

5. Data

Population declines for this species have been reported throughout the eastern U.S. (Brooks and Temple 1990, Pruitt 2000). For example the Breeding Bird Surveys have documented widespread declines of 3.7% per year from 1966-1998 (Pruitt 2000, Sauer et al. 2013). While exact causes of decline are unknown, habitat loss and degradation are suspected to be major contributing factors, but are not sufficient to explain the levels of documented decline (Pruitt 2000). Some western populations have been reported as stable during the same time period (Peterjohn and Sauer 1995); however, there is still concern that the sources of declines are unknown, and a series of measures have been proposed to improve habitat conditions (Cade and Woods 1997) including restoring nesting habitat, habit diversity, and hunting perches in habitat (Yosef 1994, 1996).

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% over the long-term (1970-2014), and by 1.3% in the short-term (2004-2014).

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 potential for the species to become listed 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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PHAINOPEPLA (*PHAINOPEPLA NITENS*)

1. Species Overview

Phainopepla (*Phainopepla nitens*) are medium-sized passerines with long tails and deep red eyes. The density of breeding Phainopepla pairs and clutch sizes are positively correlated with mistletoe berry abundance (Walsberg 1977, Chu and Walsberg 1999). If mistletoe is not found nearby, then other plants that bear small fruits likely will be, 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 from 3-15 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 observed in Phainopeplas. Instead, they have winter breeding areas (desert areas occupied Oct through May, with breeding Feb–May), and summer breeding areas (woodland or higher elevation areas used for breeding May–Aug and not occupied in number at any other time of the year). The question of whether the remarkable behavioral flexibility of the Phainopepla is exhibited by individuals or by separate populations of birds remains an unresolved and pressing issue (Chu and Walsberg 1999).

2. Range

Phainopepla occur throughout most of northwestern Mexico, where 63% of their breeding range occurs (Sauer et al. 2013). Their range within the U.S. is within the lower 2/3 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).

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).

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)	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 Natural Heritage Program (2017)	At Risk: G5 S2B
NV Wildlife Action Plan (2012)	No Status
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No Status

4. Impact

Partners in Flight's (PIF) North American Landbird Conservation Plan identified the Phainopepla as a Species of Continental Importance for the U.S. and Canada (Rosenburg et al. 2016). Though not considered a Watch List species (birds most in need of conservation attention), it is designated a Stewardship species (species that are characteristic of specific habitats and require high stewardship responsibility for that species within that regional boundary with a high percent of its global population in a single biome (Rosenburg et al. 2016). At the state level, PIF identified Phainopepla as a priority species, and set an objective of maintaining the current Nevada population at 3,900 individuals (Rosenberg 2004). In order to meet continental population objectives, the statewide population target was set to 3,929 individuals (Rosenberg 2004).

Phainopepla occupy most of the ecosystems available in Clark County as long as there are trees present and especially with mistletoe. In Clark County, the invasion of annual grasses that carry fire is an ecosystem threat that is particularly damaging to Phainopepla habitat. Most surface-disturbing development activities can contribute to habitat disturbance for Phainopepla by loss of trees.

5. Data

Based on the North American Breeding Bird Survey data, population trends for Phainopepla are considered to be stable (Sauer et al. 2013). The U.S. population estimate is 1,000,000 Phainopepla population data for Clark County are too variable and uncertain to make the generation of summary statistics a meaningful exercise. However, cautious interpretation of a plot of relative trend in abundance, normalized around sample effort suggested that this population did not experience major declines over the period 2004 through 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 of the current absences are located on sites that are now in disturbed sites within the urban or suburban footprints of municipalities (Fletcher et. al. 2010), and Phainopepla habitat was likely disturbed or destroyed in those areas – at least temporarily.

Approximately 25,698 acres (104 km^2) of highly suitable habitat exists within the County, of which 23% is located within conservation areas, while only 9% will likely be impacted by the proposed amendment and only 3% is currently disturbed. Approximately 156,170 acres (632 km^2) of moderate habitat exists, and 25% of this is located within conserved areas, while very little is expected to be impacted (3%) (Nussear 2017).

6. Recommendation

Not recommended for coverage.

Approximately 23% of highly suitable habitat and 25% of moderate habitat are currently included within conservation areas. Recent population estimates have shown essentially stable populations. Phainopepla are not a sensitive species, or species of concern, in Nevada or any of the adjacent States within 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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RIDGEWAY'S (YUMA) RAIL (*RALLUS OBSOLETUS YUMANENSIS*)

1. Species Overview

Ridgeway's (Yuma) rail was previously classified as a subspecies of clapper rail (*Rallus longirostris yumanensis*), but is now classified as a subspecies of Ridgeway'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 system and its tributaries, or in large, shallow marshes with a moderate density of emergent vegetation, avoiding both open water and overgrown emergent stands (USFWS 1983). The Yuma rail forages along the ecotone between mudflats, higher vegetated zones, and in tidal sloughs and feeds primarily on mussels, clams, arthropods, snails, worms and small fish (BirdLife International 2016). The species is typically found below 4,500 feet of elevation.

2. Range

R. o. yumanensis occurs in southeast California, southern Arizona and Nevada, and northwest Mexico. In Clark County, the Ridgeway's (Yuma) rail 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.

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)	Endangered
State of Nevada	Endangered
State of California	Endangered
State of Arizona	Endangered
NV Natural Heritage Program (2017)	At Risk: G5T3/S1
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Near Threatened
CITES	No Status

4. Impact

Impacts include loss or degradation of marshes due to water diversions, declines in water quality, development, and changes in water level during nesting period (GBBO 2010). In addition, loss of marsh habitat through channelization, dredging/filling activities, declines in quality of habitat due to build-up of residual vegetation that clogs movement through the vegetation, and selenium contamination of the prey base (USFWS 2010).

5. Data

This newly split/reclassified Yuma rail has a relatively small population with limited distribution in its range. The rail population is declining owing to a variety of threats including conversion and degradation of wetlands because of agricultural, industrial and residential development, pollution, and predation by invasive species. It is classified as Near Threatened by the IUCN (BirdLife International 2016) and has been on the Federal Endangered Species Act list since its inception in 1973.

The Yuma rail is estimated to number 1,700-2,000 individuals (Ehrlich *et al*. 1992) and has experienced increases and decreases in habitat availability and the habitat is threatened overall with conversion and high water flows. A more recent population estimate, however, put the population at 6,629 individuals (95% CI: 4,859-8,399) in the Colorado River delta region of Mexico (Hinojosa-Herta *et al*. 2001).

Approximately 22,623 acres of modeled habitat exists within Clark County, although the proportion of this that is suitable for Yuma Ridgway's rail nesting (i.e., open marsh habitat) is likely to be much less. Although this species rarely occurs in the plan area, covered activities have the potential to adversely affect this species within Clark County. We estimate that approximately 6.6 percent of Yuma Ridgway's rail modeled habitat within Clark County could be impacted by activities covered under the Amendment.

6. Recommendation

<u>Recommended for Coverage</u>

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

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RUFOUS HUMMINGBIRD (*SELASPHORUS RUFUS*)

1. Species Overview

The rufous hummingbird (*Selasphorus rufus*) is the most abundant and widespread migrant hummingbird in Nevada during the fall migration. Rufous hummingbirds migrate further than any other hummingbird with a potential range of 1,442 km (Calder and Jones 1989).

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). 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 will use stopover locations in Nevada during 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).

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 Natural Heritage Program (2017)	None: G5, S3M
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least concern
CITES	Appendix II

4. Impact

One of the primary threats to the rufous hummingbird is the modification and loss of habitat along migration routes in montane meadows (Russell *et al.* 1994). Survival rates of migrating individuals decreases when fewer flowering plants are available. In addition to declining levels of fitness, individuals tend to stay in their stopover locations for longer periods, which can lead to diminishing habitat quality across the remainder of their route as the summer progresses.

5. Data

Rufous hummingbirds are widespread and common, but available data suggests that populations have been declining about 3 percent over the past 30 years in parts of their breeding range (Bailey *et al.* 2013). Less decline is present in Alaska, Washington, northern Idaho, Montana, and Alberta. The life history of this species is lacking, specifically the 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.

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 primary habitat utilized in migration is predominantly located in montane environments, which are not likely to be impacted by activities covered under the MSHCP.

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BREWER'S SPARROW (*SPIZELLA BREWERI*)

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, ceonothus, manzanita, and large openings in pinyon-juniper habitat (Knopf et al. 1990; Rising 1996; Sedgwick 1987; USFS 1994; NatureServe 2017). Brewer's sparrow breeds in high densities, although the densities vary greatly from year to year (Rotenberry et al. 1999).

2. Range

Brewer's sparrow breeding range extends over most of western North America and winters south into central Mexico. 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, as well as on the southern end of the San Joaquin Valley. The species breeds locally above the pinyon-juniper belt (McCaskie et al. 1979), as well as on the western slope of the Sierra Nevada (Verner and Boss 1980). The brewer's sparrow is a common winter resident in open desert scrub and cropland habitats of southern Mojave and Colorado deserts, usually occurring in areas with a herbaceous understory (Dobkin and Granholm 1988). The species winters in Clark County but may only breed in an extremely limited portion of western Clark County (GBBO 2010).

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
State of Nevada	Sensitive
State of Arizona	None
State of California	None
State of Utah	None
NV Natural Heritage Program Watch List (2017)	Watch List: G5, S4B
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index	Moderately Vulnerable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No Status

4. Impact

According to the Breeding Bird Survey, Brewer's sparrow populations have declined by over 50 percent during the past 25 years (BirdLife 2016). The species population decline is likely linked to extensive alteration of sagebrush (*Artemisia* spp.) shrubsteppe habitat. Though this habitat is widespread, it constitutes one of the most threatened ecosystems in the United States, due to extensive livestock grazing, alteration of natural fire regimes, and invasion by non-native plant species, particularly cheatgrass (*Bromus tectorum*). The loss and fragmentation of Brewer's sparrow's habitat caused by agricultural, urban, suburban, energy, and road development also threatens the species (Holmes and Johnson, 2005).

5. Data

Breeding density of the species in eastern Nevada is 0.19 acre to 0.25 acre (Medin 1990). Breeding territory averages between 1.48 acres to 3.09 acres, and contracts as densities of breeding birds increases (Wiens et al. 1985). The mean territory size of the species varies from 0.25 acres to 5.83 acres (Rotenberry et al. 1999).

The overall species is believed to be experiencing population declines (Ashley and Stoval 2004, BirdLife 2016); however, the IUCN has assessed Brewer's sparrow as "Least Concern" because the decline is not considered sufficiently rapid, the overall population size is extremely large, and the species has a large and widespread range (BirdLife 2016). In addition, the species may be expanding its range in Montana (Pernanen 1994). Population data within southern Nevada or the Mojave Desert region is unknown, although North American Breeding Bird Survey has shown Brewer's sparrow to be most abundant in central Nevada to southeastern Oregon (Peterjohn et al. 1995, Sauer et al. 2003). This species breeds in a limited area of Clark County (GBBO 2010).

6. Recommendation

Not Recommended for Coverage

The Brewer's sparrow has a wide range and although some declines have been documented, the population size is still considered to have a large population even 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 indiction the species will be petitioned for listing under the Federal Endangered Species Act during the lifetime of the MSHCP.

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SAGE THRASHER (*OREOSCOPTES MONTANUS*)

1. Species Overview

Sage thrasher is considered a high desert sagebrush/shrubsteppe 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.

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 sage thrashers winter in southern Nevada where resident birds stay year-round.

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

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)	Sensitive
U.S. Forest Service (Region 4)	None
State of Nevada	Sensitive Bird
State of Arizona	None
State of California	Species of Special Concern
State of Utah	None
NV Natural Heritage Program (2017)	Watch List: G5, S5B
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	Moderately Vulnerable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	Not Listed

4. Impact

Impacts include loss, degradation, or fragmentation of sagebrush shrubland due to OHV's, livestock grazing, fire, invasive plants, and the expansion of pinyon-juniper woodland into sagebrush (GBBO 2010). Sagebrush habitat does not occur in Clark County below 4,000 feet; therefore, we do not expect significant impacts to the species will occur.

5. Data

Rich et al (2014) estimates the sage thrasher's population to be 7,900,000 individuals while the BBS estimates the population to be 5,900,000 (USGS 2012). Rangewide, 63% of the sage thrasher population occurs on BLM land (Rosenberg et al 2016). Sources indicate the sage thrasher population is decreasing slightly (<3% per year) (USGS 2012).

6. Recommendation

Not Recommended for Coverage

Based on the relatively large population size and wide distribution which do 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 occurrences within the MSHCP plan area as the species is predominantly above 4,000 feet within Clark County. Therefore, we do not recommend the sage thrasher be covered under the MSHCP.

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BENDIRE'S THRASHER (*TOXOSTOMA BENDIREI*)

1. Species Overview

Bendire's thrashers were 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 (GBBO 2010). Bendire's thrasher can be a difficult species to survey for because of their wariness of potential predators and dropping to ground level when disturbed (Fisher 1903). The uncertainty of detections can increase false negatives during presence surveys, thus increasing the error in distribution and density surveys (Nussear 2017).

2. Range

The range of the Bendire's Thrasher was estimated to be 480,634 km^2 (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.

Bendire's thrasher inhabits a wide range of ecosystems native to Clark County including blackbrush (association with yuccas), desert riparian, mesquite acacia, Mojave Desert scrub, and Salt Desert scrub (Brown 1901, Gilman 1909, Gullion et al. 1959, Nussear 2017). The majority of observations of Bendire's thrasher occur in southern Clark County in the upland mixed Mojave Desert Scrub habitat (GBBO 2010), as well as adjacent to the southern portion of Clark County, in San Bernardino County (Shuford and Gardali 2008). Bendire's thrasher typically occur from 0 to 5,900 feet in elevation.

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
Migratory Bird Treaty Act	Protected
State of Nevada	None
State of Arizona	Species of Conservation Priority
State of California	Species of Special Concern
NV Natural Heritage Program (2017)	At Risk: G4, S1
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	Not Vulnerable/Presumed Stable
IUCN Red List (v 3.1, 2007)	Vulnerable
CITES	No Status

4. Impact

Bendire's thrasher are especially sensitive to destruction and degradation of their habitat, as they build their nests relatively low in vegetation, approximately 3.3 feet above the ground surface (Brown 1901). Therefore, predators subsidized from suburban and urban areas are capable of accessing Bendire's thrasher nests (Esque et al. 2010, Nussear 2017). There is concern about inbreeding occurence within the species or that local extinctions will occur as a result of the small and isolated populations (England and Laudenslayer, Jr. 1995, Nussear 2017).

Wildfire fuel sources increase as invasive plant species population's increase throughout the northeastern Mojave Desert (D'Antonia 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 the continuous decline of the species (Nussear 2017).

5. Data

Bendire's thrasher populations are significantly declining across their ranges (Sauer 2013). The GBBO reported Nevada's population of Bendire's thrashers to be less than 50 birds (GBBO 2010) and California's population of Bendire's thrasher consists of less than 400 birds (England and Laudenslayer 1993, Nussear 2017). California's small population of Bendire's thrasher is approximately eight times larger than Nevada's population. Historically, the species has a low population size, thus being more vulnerable to habitat degradation (Wildlife Action Plan Team 2012). Although Bendire's thrashers, along with many other desert dwelling species, are shown to respond positively to restoration of desert habitats including cessation of over-grazing and addition of water spreading features (Monson 1941).

Bendire's thrasher's rarity may be due in part to lack of survey effort (Shuford and Gardali 2008), and difficulty to detect. The uncertainty of detections can increase false negatives during presence surveys resulting in higher error of the species' distribution and density (Nussear 2017). Some models also suggest that suitable habitat for Bendire's thrasher may expand in the future, and predicted the species' range may increase substantially during the next 50 years into southeastern New Mexico (Menke and Bushway 2015, Nussear 2017).

6. Recommendation

<u>Recommended for Coverage</u>

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

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LE CONTE'S THRASHER (*TOXOSTOMA LECONTEI*)

1. Species Overview

Le Conte's thrasher (*Toxostoma lecontei*) is one of four species of desert thrashers found in Clark County. They are permanent residents in the San Joaquin Valley and the Colorado and Mohave 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 (Grinnell and Miller 1944).

2. Range

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).

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	Special-status Species
State of California	Species of Special Concern
State of Utah	None
NV Natural Heritage Program (2017)	At Risk: G4 S2
NV Wildlife Action Plan (2012)	Species of Conservation Priority
NV Climate Change Vulnerability Index (NNHP 2012)	Presumed Stable
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	No status

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 that 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). Le Conte's thrashers are particularly vulnerable to solar energy farms because the thrashers and the farms 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.

5. Data

Le Conte's thrasher habitats are afforded some protections on lands administered by the National Park Service, U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, and U.S. National Forest, including Lake Mead National Recreation Area, Gold Butte National Monument, Desert National Wildlife Refuge, Red Rock National Conservation Area, the Weethump Wilderness, Toiyabe National Forest, and several Areas of Critical Environmental Concern throughout Clark County. Le Conte's thrasher is a covered species in the Coachella Valley Multiple Species Habitat Conservation Plan.

The Nevada Wildlife Action Plan estimates approximately 100 individuals in the Nevada population, and states that the trend is inconclusive (Wildlife Action Plan Team 2012). Quantitative time-trend data are not available within Clark County; however, large-scale habitat disturbance such as those in the Eldorado, Indian Springs, and Ivanpah Valleys may have reduced populations in those key areas.

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 US Fish and Wildlife Service has identified it as a "Bird Species of Conservation Priority" (USFWS 2008). Although population data is inconclusive and trends are unknown, it's 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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STICKY RINGSTEM (*ANULOCAULIS LEIOSOLENUS*)

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 TNC 2007). Four varieties of this species occur in North America (Spellenberg 2003). The variety which 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).

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 out 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 eight of which are in Clark County (TNC 2007).

The Clark County populations of sticky ringstem represent the westernmost region of this variety range. Within Clark County the species overlaps with habitat for another rare plant, 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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	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	No Status
State of Arizona	No Status
NV Natural Heritage Program (2017)	At Risk: G4T3 S2
NV Native Plant Society	Watch List
NV Climate Change Vulnerability Index	Not addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

4. Impact

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

TNC (2007) lists direct threats to sticky ringstem in Clark County to include gypsum mining, OHV use and trail development, feral horse 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 horse and burros also 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 may pose a more serious threat to gypsum habitat and ringstem and Las Vegas bearpoppy populations than other invasive species (Bangel et. al. 2010).

5. Data

As of 2007, no management actions had been implemented by Clark County specifically for sticky ringstem, but some populations were protected as a result of measures taken to protect gypsum habitat and Las Vegas bearpoppy. Some populations occur in Wilderness Areas and designated ACECs and have some protection as a result (Nussear 2017a).

Very little specific data exist for viability estimates of sticky ringstem populations. The range-wide trend was reported to be stable as of 2000 (USFWS 2000), but not enough information is available to determine trends of populations in Nevada. NPS and BLM monitoring reports note that habitat condition for Las Vegas bearpoppy may be applicable to sticky ringstem habitat (TNC 2007). The presently accepted peripheral nature of Clark County populations may be important for contributing genetic and ecotypic variation to the taxon's global population characteristics (TNC 2007).

Approximately 36.7 percent of predicted highly suitable habitat (24,216 acres) is located within conservation areas. Approximately 28.3 percent of habitat is likely to be impacted by future development and/or is already disturbed (Nussear 2017a). However, these estimates are based on a habitat model for a group of gypsophile plant species, and not specific to sticky ringstem (Nussear 2017b).

6. Recommendation

Recommended for coverage**.**

Sticky ringstem's limited distribution on gypsum soils make 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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LAS VEGAS BEARPOPPY (*ARCTOMECON CALIFORNICA*)

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 in March-June. Las Vegas bearpoppy are restricted to gypsum soils (TNC 2007). Germination occurs during winter months in years with sufficient rainfall (Thompson and Smith 1997, Meyer 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).

The taxonomic distinctiveness of the Las Vegas bearpoppy status based on morphological and ecological dissimilarities is currently in question and the potentially revised interpretations may uniquely distinguish Clark County populations from those occurring in Arizona further distinguishing this species rarity (TNC 2007).

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 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.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	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	Critically Endangered
State of Arizona	Special-status Species; Salvage Restricted
NV Natural Heritage Program (2017)	At Risk: G3, S3
NV Native Plant Society	Threatened
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

* 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.

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 Las Vegas bearpoppy was one of several plant species identified by the USFWS as a MSHCP covered species of greatest concern in their Biological Opinion (USFWS 2000), because they are State listed, exhibit low population numbers, occur in limited distribution on specialized habitats, and are subject to substantial threats which may result in declining status. Janish (1977) noted that the entire genus was at risk of extinction, and Nelson and Welsh (1993) recommended that all three species in the genus be covered under the ESA.

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 plants. Additionally, there are many uncertainties regarding species and habitat information acquired thus far; there is poor baseline species distribution and abundance information for Las Vegas Valley and some rural communities prior to development. Consequently, a complete range of habitat and population loss is unknown primarily for 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 NPS at Lake Mead NRA have programs focused on conservation of the Las Vegas bearpoppy (TNC 2007).

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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WHITE BEARPOPPY (*ARCTOMECON MERRIAMII*)

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.

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)

2. Range

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 1/3 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, 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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	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	No Status
State of California	Special-status Species
NV Natural Heritage Program (2017)	At Risk: G3, S3
NV Native Plant Society	Watch List
NV Climate Change Vulnerability Index	Not Addressed

IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

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). California Native Plant Society also lists mining as a potential threat to this species (CNPS 2017).

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 is available for Desert National Wildlife Refuge (DNWR) and Nellis Air Force (NAFB) Base; 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% of all individuals estimated in 1993. Subsequent surveys did not detect additional populations (Knight & 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).

Most of the populations of white bearpoppy occur on public lands including Bureau of Land Management, NAFB (65% of total population), and DNWR. The rangewide 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).

6. Recommendation

<u>Not recommended for coverage</u>

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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THREECORNER MILKVETCH (*ASTRAGALUS GEYERI* VAR. *TRIQUETUS*)

1. Species Overview

Threecorner milkvetch 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.

2. Range

Almost the entire range of threecorner milkvetch is in Clark County with limited encroachment into Lincoln County, Nevada and Mohave County, Arizona (Swearingen 1981, Bangle 2012). Within Clark County, three-corner milkvetch 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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	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	Critically Endangered
State of Arizona	Special-status species
NV Natural Heritage Program (2017)	At Risk; G4T2T3, S2S3
NV Native Plant Society	Threatened
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

* 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.

4. Impact

Habitats in which this species occurs are threatened by modification and development, off-road vehicles, invasive plant species, agriculture, utility corridors, sand mining, and agriculture (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 the threecorner milkvetch occurs (Powell 1999).

5. Data

No population trend data is available, and there are annual fluctuations dependent upon rainfall and temperatures.

6. Recommendation

Recommended for coverage.

The range of threecorner milkvetch is almost entirely within the Plan Area, this species is listed by the State of Nevada as critically endangered, as threatened by the Nevada Native Plant Society, 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. 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.

7. References Cited

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

1. Species Overview

Straw milkvetch (*Astragalus lentiginosus* var. *stramineus*) is a monocarpic or short-lived perennial which only flowers or fruits once in its life (Barneby 1989). This variety is also known by the common names freckled or mottled milkvetch. It occurs in sandy and gravelly valley flats, washes, and dunes at elevations between 1,575 feet and 3,281 feet (480-1,000 meters) in creosote bush (*Larrea tridentata*), blackbrush (*Coleogyne ramosissima*), and other mixed desert shrub communities in the Virgin River Valley (Barneby 1989, NNHP 2017).

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). 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). This variety is dependent on deep sand or sand dunes in Nevada (BLM 2009).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	No Status
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	No Status
State of Arizona	No Status
State of Utah	No Status
NV Natural Heritage Program (2017)	At Risk: G5T2T3; S1S2
NV Native Plant Society	Watch List
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

4. Impact

Straw milkvetch is known to occur in Mojave Desert Scrub habitat, which is susceptible to invasive plant infestations, development, grazing, off-highway vehicles, mining, grazing, and fires (Clark County 2000).

5. Data

Insufficient population data are available on this species to determine population trends; however, NatureServe (2016) lists the species as locally plentiful within its restricted range.

Based on a recent habitat modelling effort (Nussear 2017), an estimated 38,425 acres (156 km^2) of predicted high suitability habitat may be impacted by covered activities. This is approximately 20% of a total 187,382 acres (758 km^2) predicted high suitability habitat in the County. The model is based on 29 occurrences of which eight are within extreme northeastern Clark County. Surveys to confirm presence in predicted high suitability habitat have not been done; therefore, the accuracy of the model is not known.

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% of the total modeled high and medium suitability habitat in conserved lands.

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HALFRING MILKVETCH (*ASTRAGALUS MOHAVENSIS VAR. HEMIGYRUS*)

1. Species Overview

The halfring milkvetch (*Astragalus mohavensis* var. *hemigyrus*) is an annual or short-lived perennial species (Spellenberg 1993). It is also known as curved-pod milkvetch. Halfring milkvetch is known from the west slopes of the Spring Mountains and in the Indian Ridge area (Niles and Leary 2007). This rare variety can be found only in Nevada, having been extirpated from the California side of the desert (Spellenberg 1993). It can be distinguished from the more common variety of Mohave milkvetch by its curved or coiled seed pods. This species is known from creosote-bursage (Larrea/Ambrosia), mixed desert shrub, and blackbrush (*Coleogyne ramosissima*) communities (NNHP 2001).

2. Range

Halfring milkvetch is restricted to southern Nevada and California. It was believed to be extirpated in California but was verified as extant in Inyo County in 2009 (Wojciechowski and Spellenberg 2012, NatureServe 2016, CNPS 2017). Within Nevada, this species has been located in Clark, Lincoln, and Nye counties, Nevada (NNHP 2001). The elevational range for this species is 2,999 to 5,479 feet (914-1670 m) (NNHP 2001). 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 (Nussear 2017). Halfring milkvetch has been found among limestone derived soils (Spellenberg 1993). The geomorphic surfaces where it can be found include terraces, hillslopes, and along washes (Niles and Leary 2007).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
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	No Status
State of California	Special-status Species
NV Natural Heritage Program (2017)	At Risk: G3G4T2T3; S2S3
NV Native Plant Society	Watch List
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

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). Mining is also a threat and may have resulted in extirpation of most California populations (NatureServe 2016, CNPS 2017). Recreation activities on public land including OHV has also been cited as a threat to this species (NatureServe 2016).

According to recent habitat modelling efforts (Nussear 2017), it is estimated that 697 acres (3 km^2) of high suitability habitat and 9,027 acres (37 km^2) of medium suitability habitat may be impacted by activities covered under the MSHCP. A total of 887,363 acres (3,591 km^2) medium and high suitability habitat is present within Clark County; however, a majority of the high suitability habitat is above 4,000 feet and outside of the Plan Area (see Figure 1, attached).

5. Data

Population trends are unknown for this species. It was thought to be extirpated from California (Spellenberg 1993), but was rediscovered in Inyo County (Wojciechowski and Spellenberg 2012, CNPS 2017). Forty-three individuals were counted in a 405 acre (1.6 km^2) area during censuses in Nevada (NNHP 2001). The last entered survey was conducted in 1999 (NNHP 2001).

This species occurs on lands administered by U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, Department of Defense-United States Air Force, USDA-Humboldt-Toiyabe National Forest, 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.

6. Recommendation

Not recommended for coverage.

Halfring milkvetch is not recommended for coverage because of the lack of data on its status, little concern over its conservation status, and lack of documentation of threats throughout its range. In addition, 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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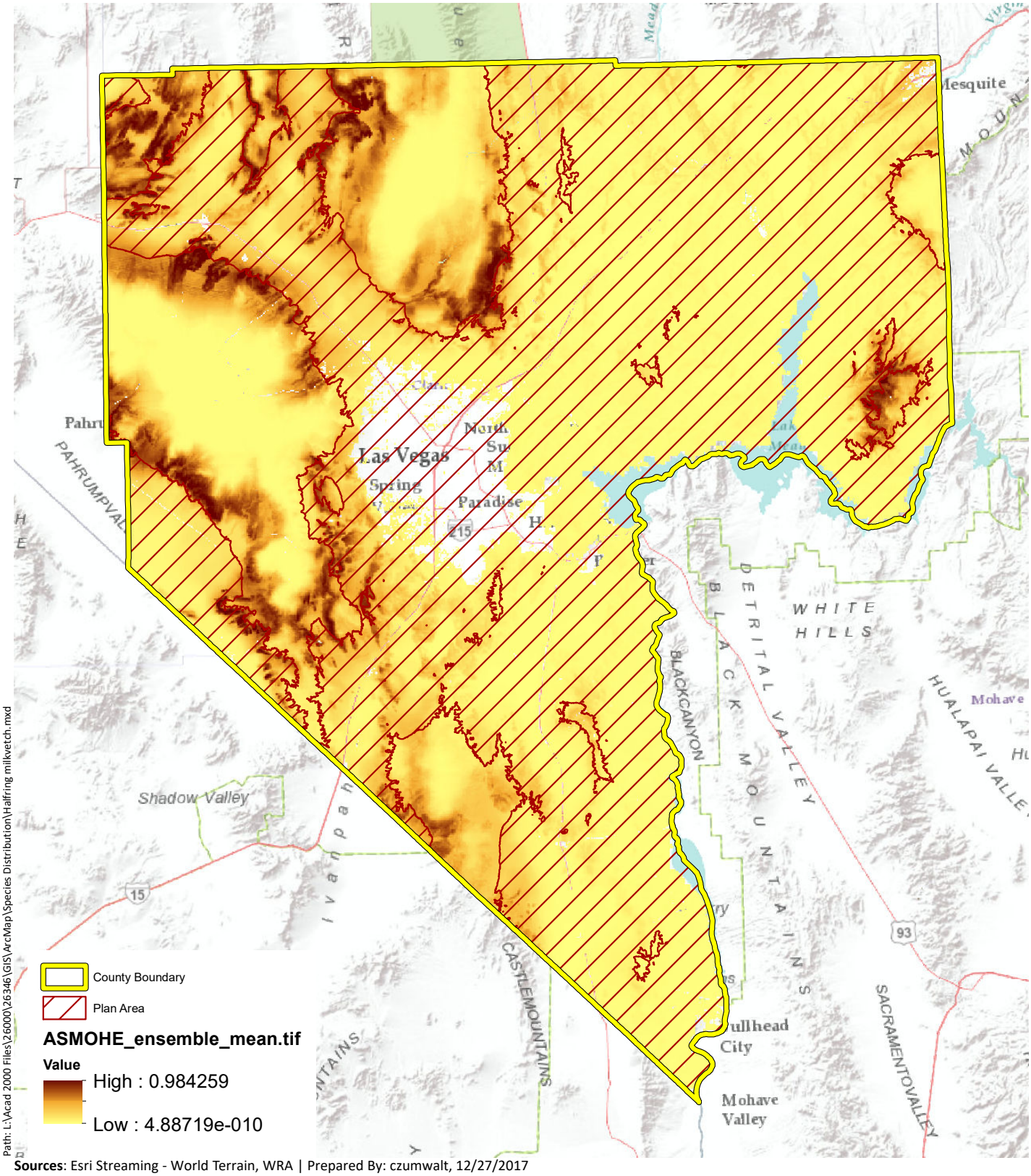

Sources: Esri Streaming - World Terrain, WRA | Prepared By: czumwalt, 12/27/2017

Figure 1. Halfring Milkvetch Habitat Suitability within the MSHCP Area

DRAFT

Clark County HCP Amendment
Clark County, Nevada

0 10 20 Miles

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ENVIRONMENTAL CONSULTANTS

MOKIAK MILKVETCH (*ASTRAGALUS MOKIACENSIS*)

1. Species Overview

Mokiak milkvetch (*Astragalus mokiacensis*) is a robust perennial herbaceous plant species named after Mokiak Canyon, Arizona where it was first found (Barneby 1994). This plant has erect stems growing in ascending clumps and is pubescent overall (McDougall 1973). It has purple flowers that blooms most intensely from April through June and the plant can be as tall as 40 cm.

2. Range

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

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
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	No Status
State of Arizona	No Status
Nevada Native Plant Society	Watch List
NV Natural Heritage Program (2017)	At Risk; G1G3Q, S1S2
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

4. Impact

Fires and fire abatement projects along with surface disturbing activities such as OHV activity, trail and road building pose potential threats to this species. Illegal cattle grazing may be a threat in the Gold Butte National Monument. Invasive annual grasses compete with Mokiak milkvetch and also increase fuel loads making fires and fire abatement activities more likely.

5. Data

Surveys conducted between 2005 and 2010 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 the average number of individuals per population being 15 (NPS 2010). In recently burned areas, numbers of individuals were less, though fire did not exclude the species entirely, even in severely burned areas (NPS 2010).

6. Recommendation

Not Recommended for Coverage.

Based on currently available data, it is not anticipated Mokiak milkvetch will become a federally listed species over the lifetime of the permit. The majority of its range in Nevada is in the newly 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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ALKALI MARIPOSA LILY (*CALOCHORTUS STRIATUS*)

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).

Alkali mariposa lily is restricted to seasonally moist alkaline soils in association with desert springs, floodplains, and topographic depressions. The moist alkaline soils lack surface salts and typically support small patch herbaceous meadow vegetation within large patch or matrix-forming Mojave scrub, creosote bush, or blackbrush ecological systems.

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 known distribution of alkali mariposa lily in Clark County is limited to the western portion. It occurs in the Calico Hills and at Lone Willow Spring, and it likely has been extirpated from Las Vegas Valley. Clark County populations of alkali mariposa lily are an eastern disjunct of its rangewide distribution, isolated from core populations in the west Mojave Desert by about 160 air miles; as such they possibly represent important populations for genetic and ecotypic variation within this distinctive species (TNC 2007).

Alkali mariposa lily elevation range is between 73 and 1634 meters (239 to 5,360 feet) in elevation. 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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	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	No Status
State of California	Special-status Species
NV Natural Heritage Program (2017)	At Risk: G3 S1
NV Native Plant Society	No Status
NV Climate Change Vulnerability Index	Not Addressed

IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

* 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.

4. Impact

Threats include urban, commercial, and rural development (which led to the loss in Las Vegas Valley), non-native wild horse and burro's, invasive plant species, OHV use and trail development, groundwater development, cement mining, highway and road construction and maintenance, utility corridor construction and maintenance. 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 and they have altered surface water or groundwater flows.

5. Data

In 1993 the US Fish and Wildlife Service identified this as a Category 2 species – "Taxa 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 sufficient data on biological vulnerability and threat are not currently 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 (CRPS) 1B: rare, threatened, or endangered in California and elsewhere", and it is a Focus Species in the Desert Renewable Energy Conservation Plan (BLM et al. 2015, CNPS 2017).

Alkali mariposa lily was included in the survey of endemic plants at Ash Meadows (Knight and Clemme 1987), but no systematic surveys have been conducted in Nevada (Morefield 2001). Of the 10 species of *Calochortus* that occur in Nevada, alkali mariposa lily is the only species of the genus considered rare (Morefield 2001).

The rangewide trend for the species is presumed stable although a lack of detailed information is stated (USFWS 2000). The trend of alkali mariposa lily populations in Nevada is unknown (Morefield 2001). Calico Hills is the largest population group in Clark County with a total abundance estimate of 344-906 plants in 1997 (BLM data). About half of those data points had heavy disturbance. Lone Willow Spring had fewer than 50 plants that same year. The Las Vegas population group is historic and presumed extirpated (Morefield 2001).

6. Recommendation

<u>Recommended for Coverage</u>

We recommend this species for coverage in the MSHCP based on its limited and disjunct distribution, its rarity in Nevada, and its recent extirpation in the Las Vegas Valley. This disjunct population is considered important for conservation and should be considered in comprehensive conservation planning efforts. The range of this species is within the Plan Area and there is potential for activities covered under the MSHCP to impact this species.

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BLUE DIAMOND CHOLLA (*CYLINDROPUNTIA MULTIGENICULATA*)

1. Species Overview

Blue Diamond cholla (*Cylindropuntia multigeniculata*) 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 & Bigelow var. *multigeniculata.* 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 associated with vegetation dominated by creosote bush or blackbrush (NNHP 2000).

2. Range

Based on the recent taxonomic change, this species is thought to only occur within Clark County, Nevada with potential encroachment over the border into Mohave County, Arizona (NatureServe 2016). A broad elevational range for Blue Diamond cholla has been noted as low as 2,001 feet (Baker 2005) up to 4,249 feet (NNHP 2001b), with Nussear et al. (2011) reporting a range of 2,592 – 4,659 feet in their habitat suitability modeling. Habitat for this species is predominantly in Mojave Desert Scrub, Blackbrush and Pinyon Juniper ecosystems, but potentially includes Salt Desert Scrub.

Within Clark County this species has been reported north of Blue Diamond, NV (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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	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	Critically Endangered; Protected Cactus
State of Arizona	Special-status Species; Salvage Restricted
NV Natural Heritage Program (2017)	At Risk: G4?T2Q, S2
NV Native Plant Society	Watch List

NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	Least Concern
CITES	Appendix ii

* Removed from the candidate list based on management and habitat conservation agreements (USFWS 2001).

4. Impact

This species has been threatened directly by wildfire, and habitat loss (e.g. due to gypsum mining and road building, (Baker 2005). Due to the rocky and steep terrain in its habitat, this species is unlikely to be impacted significantly by OHV activity. Desert fires have previously influenced the Blue Diamond cholla, and will continue to be an ecosystem threat. However, the steep, rocky terrain occupied by this species also provides some inherent level of protection due to the sparseness of vegetation. The lack of fuel continuity make fires patchier in such habitats, and thus less prone to widespread damage.

5. Data

A total of ten populations of blue diamond cholla are known, and nine of the ten populations appeared healthy and free of immediate threats (NatureServe 2016). At least a portion of the Blue Diamond Population, which is the type locality for blue diamond cholla, was threatened by development (Baker 2005).

Within the Red Rock Canyon National Conservation Area (NCA), 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 NCA and wilderness, and would be similarly protected (BLM 2009). A conservation agreement designed to reduce threats to this species and its habitat removed it from the candidate list (USFWS 2001). This agreement consists of provisions within the BLM Red Rock NCA conservation plan, and is designed to protect 83% 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 the BLM Red Rock Canyon NCA (Nevada S.B. 159, 2013).

6. Recommendation

Recommended for Coverage.

Although at least 83% 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 management actions continue for the Blue Diamond cholla, we are recommending it for coverage.

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GOLD BUTTE MOSS (*DIDYMODON NEVADENSIS*)

1. Species Overview

Gold Butte moss (*Didymodon nevadensis*) is a recently described (Zander et al. 1995) moss in the Pottiaceae family, occurring on gypsum outcrops, limestone boulders and sandy soil from 500-1,700 meters (Zander et al. 1995). It is noticeably absent on adjacent substrates that are not gypsiferous. It is most abundant on lose un-compacted gypsum soil on east and northeast facing slopes and 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), probably due to low annual precipitation (Zander et al. 1995).

2. Range

Gold Butte moss is known to occur in southern Nevada and northern Texas in the United States and southern Chihuahua, Mexico and southern British Colombia, Canada (NatureServe 2016). Gold Butte moss is known from 15 locations in Lake Mead in Clark County between 1,640 and 5,600 feet in elevation. Although the species is widespread the populations are disjunct, and within the United States, this species is only documented to occur in Nevada, Texas, and Colorado (NatureServe 2016). It is likely that the most significant populations are located in the Gold Butte region, the Muddy Mountains (White Basin) and the north shore of Lake Mead (Stark 2007). Those three populations are within Clark County, Nevada.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
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	No Status
Nevada Native Plant Society	Watch List
NV Natural Heritage Program (2017)	At Risk; G4, S1
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

4. Impact

Potential threats to Gold Butte moss include gypsum mining, OHV use, trampling from multiple sources, invasive plants, development and inundation (TNC 2007).

5. Data

Gold Butte moss is not under immediate threat of extinction and new populations are continuing to be found (Stark 2007). Nevada Natural Heritage Program listed the species trend as stable based on Nevada populations (NNHP 2001). The species occurs on lands under management by the Bureau of Land Management, State of Nevada, and National Park Service.

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 indicates population declines. Its extent of occurrence is unlikely to be significantly impacted by activities covered in the 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 the Gold Butte moss be covered by the MSHCP.

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SILVERLEAF SUNRAY (*ENCELIOPSIS ARGOPHYLLA*)

1. Species Overview

Silverleaf sunray 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 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). This 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 Park). The silverleaf sunray is the food plant for the Mojave gypsum bee (*Andrena balsamorhizae*); adults nectar on multiple species, but the young require pollen of the silverleaf sunray (Griswold et al. 2006).

2. Range

Silverleaf sunray is a rare plant in the vicinity of Lake Mead and almost entirely restricted to a small portion of Clark County, Nevada (NatureServe 2016); Washington County, Utah (Cronquist 1994); and Mohave County, Arizona (McDougall 1973, Morefield 2001, Griswold 2006), and records from Utah are uncertain (NatureServe 2016). This species is rare and in Nevada only occurs in Clark County. Within Clark County, it occurs from the River Mountains east of Henderson to Echo Bay and the Las Vegas Wash within the Lake Mead National Recreation Area (Kartesz 1988). 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 determined to be *E. nudicaulis*.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
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	No Status
State of Arizona	Special-status species
State of Utah	No Status
NV Natural Heritage Program (2017)	At-risk; G2G3, S1?
NV Native Plant Society	Watch List
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

4. Impact

Silverleaf sunray predominantly exists within federal lands including the Lake Mead National Recreation Area and Gold Butte National Monument in proximity to Lake Mead. Threats include disturbance to habitat from off-road vehicles in BLM-managed lands and other recreational activities within these areas (NatureServe 2016). Soils in this habitat are fragile and sensitive to disturbance.

A total 37,793 acres (153 km^2) of potentially medium and high suitability habitats may be impacted by activities covered under the Plan (Nussear 2017). This is approximately 6% of the predicted medium and high suitability habitats in the County.

5. Data

There is no information or data available on population trends. The range of this species is likely restricted to Clark County with minor extensions into Washington County, Utah (Cronquist 1994); and Mohave County, Arizona (McDougall 1973, Morefield 2001, Griswold 2006) in the vicinity of Lake Mead. Occurrences in California and some in Utah and Arizona were incorrectly identified as silverleaf sunray and have been revised to various sunray species. Occurrence data used in a recent habitat model was restricted to federal lands on the Lake Mead National Recreation Area and surrounding BLM lands; however, potential suitable habitat extends into non-federal lands and may be impacted by covered activities (Nussear 2017).

6. Recommendation

Recommended for coverage.

Silverleaf sunray has an extremely limited range and is only found within the vicinity of Lake Mead. Although most occurrence records are within federal land ownership, there is suitable habitat adjacent to these areas which are not federally owned and may be impacted by activities covered under the Amendment. This species is also on the Nevada Native Plant Society Watch List and is designated a NNHP At-Risk species. Although distribution within potential impact areas is limited; based on its extremely restricted distribution and local status, there is potential for this species to become federally listed in the lifetime of the Amendment.

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PAHRUMP VALLEY BUCKWHEAT (*ERIOGONUM BIFURCATUM*)

1. Species Overview

Pahrump Valley buckwheat is a low-spreading annual plant and can be more than one meter wide (Reveal 1971, Mozingo and Williams 1980). It is also known under the common name "forked buckwheat." In California, this plant is described as associated with the shadscale (*Atriplex confertifolia*) scrub community (Calflora 2017), and also in Nevada with mesquite (*Prosopis* spp.) and shadscale (Mozingo and Williams 1980). This species 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).

2. Range

Pahrump Valley buckwheat has an extremely restricted 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 also narrow, between 2297 – 2800 feet (700 – 853 meters, NNHP 2001). There are 19 known extant occurrences in Clark and Nye counties in Nevada, with most occurring within Nye County (NNHP 2001, NatureServe 2010), and 40 occurrences in Inyo and San Bernardino Counties in California (CDFW 2017), which can be grouped into four population groups (TNC 2007). Pahrump Valley buckwheat has also been found on Las Vegas Resource Management Plan lands near the town of Sandy Valley on the edge of the Mesquite dry lake (Crampton et al. 2006).

In Clark County, Pahrump Valley buckwheat 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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	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	No Status
State of California	Special-status species
Nevada Native Plant Society	Threatened
California Native Plant Society	Rank 1B.2
NV Natural Heritage Program (2017)	At-risk; G3, S2
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

* 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.

4. Impact

Threatened by solar energy and other development, and possibly threatened by vehicles and non-native plants (CNPS 2017). The Pahrump Valley buckwheat is described as tolerant of "moderate transient disturbance" (TNC 2007), but utility corridors, trails, and off-road vehicles may be indirect threats by potentially increasing the risk from invasive species in the area (TNC 2007). The amount of precipitation is a major cause of annual variability for this species and changes to groundwater flow or hydrologic regimes may affect this species (TNC 2007).

Based on a review of the Pahrump Valley buckwheat in Clark County, approximately 85% of the population within Clark County is on BLM-managed lands and the remaining 15% is on privately owned lands (TNC 2007).

5. Data

Pahrump Valley buckwheat is highly dependent upon annual and winter rainfall, and the population size will fluctuate based on precipitation amounts. Thus, overall population trends are difficult to determine with the annual fluctuation (NNHP 2001, TNC 2007). The populations in Pahrump and Stewart valleys are extant (Crampton et al. 2006), but in the Mesquite Valley, it is believed that some populations have been extirpated on private lands (USFWS 2000). The Mesquite Valley population is the smallest of the Nevada populations (TNC 2007). No studies have been done on the seedbank for this species, but it has been suggested as a way to better understand population trends and viability separate from annual fluctuations as a result of precipitation.

6. Recommendation

Recommended for coverage.

Pahrump Valley buckwheat has an extremely narrow range and is only known from four populations. This species is listed as threatened by the Nevada Native Plant Society, 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 small range and threats from development within its range. One of the four populations is within Clark County and has potential to be impacted by activities covered under the 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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[USFWS] U.S. Fish and Wildlife Service. 2000. Intra-Service Biological and Conference Opinion on Issuance of an Incidental Take Permit to Clark County, Nevada for a Multiple Species Habitat Conservation Plan. Pages 237. November 19. US Fish and Wildlife Service, Reno, Nevada.

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LAS VEGAS BUCKWHEAT (*ERIOGONUM CORYMBOSUM VAR. NILESII*)

1. Species Overview

Las Vegas buckwheat (*Eriogonum corymbosum* var. *nilesii*) is a recently identified, genetically unique subspecies in the Polygonaceae (Reveal 2004).

Las Vegas buckwheat is found on gypsum based soils, clay beds, high-boron shale soils and sparsely vegetated gypsum outcroppings in the Mojave Desert (Tilly 2012). The Las Vegas buckwheat is a woody perennial shrub up to 4 feet high. 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. The numerous flowers are small and yellow and is very conspicuous when flowering in late September and early October.

2. Range

In 2008 there were nine populations known from 15 sites, totaling approximately 1,145 acres in Clark and Lincoln Counties, Nevada (Mrowka 2008). 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. While somewhat widespread across the two counties, Las Vegas buckwheat habitat occupies only ~ 320 ha (~790 ac). Known populations occur between 200 and 850 meters (650 to 2,800 feet) elevation in areas receiving an average of 110 millimeters (4.5 inches) 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 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 (2014) has conducted additional investigations into the varieties in Utah, Arizona, and Nevada and concluded 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 of these four locations occur in southern Nevada (Clark and Lincoln Counties). The USFWS (2014a) concluded, "….on the basis of morphological and genetic data, that the range of *Eriogonum corymbosum* var. *nilesii* is restricted to southern Nevada."

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation*
U.S. Fish and Wildlife Service Endangered Species Act	No Status
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status

State of Nevada	No Status
Nevada Native Plant Society	Research Needed (R)
NV Natural Heritage Program (2017)	At Risk; G5T2 S1S2
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

* Listed under the former name *E.c.* var. *aureum*.

A petition to list the 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 is 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

4. Impact

Past, ongoing and future impacts include urban development, ORV/OHV use, minerals exploration and development, invasive plants, and climate change are all factors the pose a threat to the species (USFWS 2014, Mrowka 2008).

5. Data

In the finding (USFWS 2014b) the USFWS determined that of the factors that may have impacts on individuals in some locations they "…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."

Several conservation measures have been completed that benefit the 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, Designation of the Muddy Mountains Wilderness Establishment of Tropicana and Decatur Buckwheat Conservation Area (USFWS 2009 and 2014a):

6. Recommendation

<u>Recommended for Coverage.</u>

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 covering this species

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PARISH PHACELIA (*PHACELIA PARISHII*)

1. Species Overview

Parish phacelia 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).

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 1778 to 5917 feet in elevation (TNC 2007).

Only 2 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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	No Status*
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of Arizona	Special-status Species
State of California	Special-status Species; Rank 1B.1
NV Natural Heritage Program (2017)	At-Risk; G2G3 S2S3
NV Native Plant Society	Watch List
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

*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

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 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 also have altered surface water or groundwater flows (TNC 2007). TNC (2007) summarizes the overall threat status of all populations and distribution as very high.

Over 90 percent of cited locations are considered conserved (in IMAs and LIMAs), less than 10 percent subject to potential direct impacts, and none subject to potential indirect impacts (Clark County Department of Air Quality 2008).

5. Data

Field data forms and herbarium labels have often described Parish's phacelia as abundant, but it is an ephemeral annual and its occurrence in any given year is apparently undependable. The USFWS notes a stable rangewide trend (TNC 2007). Its trend for Nevada is declining (Morefield 2001, Smith 1997), apparently based on acreage. Viability estimates from literature and expert review are "good" for the two populations in Clark County and "fair" for the remaining populations in Nevada and other States (TNC 2007).

6. Recommendation

Recommended for coverage.

The threats facing this species range-wide, its limited distribution, and management efforts currently in place support maintaining this as a covered species.

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ST. GEORGE BLUE-EYED GRASS (*SISYRINCHIUM RADICATUM*)

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 the same species, leading to some confusion as a result (Cronquist et al. 1977, Welsh et al. 1987). The species is found in Nevada and Utah and is expected to be in the adjacent northwest corner of Arizona (Bicknell 1901).

2. Range

This species 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 localities are known for this species within Clark County, most occurring in moist or wetland soils in desert springs, in alkaline meadows, or along riparian corridors.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	No Status
U.S. Fish and Wildlife Service Endangered Species Act	No Status
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of Utah	No Status
NV Natural Heritage Program (2017)	At-Risk; G2?Q, S1S2
NV Native Plant Society	Watch List
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

4. Impact

Threats to this species include wildfire, illegal harvesting, livestock grazing, and OHV impacts. Because this species is found in moist meadows and along springs and streams, it is especially sensitive to altered surface or ground water flows.

5. Data

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. No population data is available for the species for any of the occurrences.

6. Recommendation

Recommended for coverage.

We recommend this species for coverage in the MSHCP based on its rarity, presumed small population, and limited distribution below 4,000 feet within Clark County. This species was initially designated for further review to determine if the elevation range of the species limited occurrences within the Plan Area. James Morefield of the Nevada Natural Heritage Program indicated extant occurrences within the Plan Area which were not identified in the initial review. Based on the extant occurrences of this species within the Plan Area, its rarity, and potential to be impacted by covered activities, this species is recommended for coverage under the MSHCP.

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STICKY BUCKWHEAT (*ERIOGONUM VISICIDULUM*)

1. Species Overview

Sticky buckwheat (*Eriogonum visicidulum*) was originally described and published by Howell (1942) from Clark County. Sticky buckwheat is an herbaceous winter annual and has 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 & 1976). 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.

2. Range

The known global distribution of sticky buckwheat is endemic to the northeastern Mojave Desert ecoregion below 4,000 ft. in Nevada and Arizona. Clark County represents the vast majority of the species distribution (TNC 2007). All of its known occurrences have been organized into 13 population groups centered on the confluence of the Muddy and Virgin Rivers.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	No Status*
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	Critically Endangered Plant - Fully Protected
State of Arizona	Special-status Species
Nevada Native Plant Society	Threatened
NV Natural Heritage Program (2017)	At Risk; G2 S2
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

*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

4. Impact

Historically, the largest loss of sticky buckwheat was likely due to inundation by Lake Mead (Niles 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, recreation (TNC 2007).

5. Data

Monitoring was initiated at Lake Mead NRA recently (Powell 2003), but annual fluctuations from variable climate conditions have masked population trends. The dated status report for the species in Nevada indicated an unknown trend (Reveal 1978), and more recently stated unknown trends (USFWS 2000, Morefield 2001) suggest no alternate status. 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".

Besides inclusion in the Clark County MSHCP, sticky buckwheat is considered in the Lower Colorado River Multi-Species Conservation Plan and the goal in the planning area is to maintain and increase populations (Bangle 2012).

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 the sticky buckwheat to occur in the Plan Area, this species is recommended for coverage under the MSHCP.

7. References Cited

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WHITE MARGINED BEARDTONGUE (*PENSTEMON ALBOMARGINATUS*)

1. Species Overview

White-margined beardtongue is a psammophile restricted to sandy habitats—mostly deep, loose to stabilized sand, sometimes on sand dunes or in sandy to gravelly washes. 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.

White-margined beardtongue is a perennial with a large taproot, one to four feet long. Permanent, nonshifting sand of sufficient depth is required to permit establishment and maintenance of such a deep root system (Scogin 1989).

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 for 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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Covered
U.S. Fish and Wildlife Service Endangered Species Act	No Status*
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of California	Special-status Species; Rank 1B.1
State of Arizona	Special-status Species
NV Natural Heritage Program (2017)	At Risk; G2S2
NV Native Plant Society	Threatened
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status

CITES	No Status

* 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.

4. Impact

TNC (2007) considers the overall threat status for all 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 its habitats from a number of 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 its plant communities have 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 fire as weeds increase in cover and native shrubs decrease.

5. Data

Range-wide, population trends are presumed stable, but may be declining in areas with intensive grazing (USFWS 2000). Trends in Nevada were described as unknown by Smith (2001), and Nevada Natural Heritage Program (2001). Populations in Clark County appear to be stable (TNC 2007).

This species' habitat is included in Nevada's Wildlife Action Plan within the Sand Dunes and Badlands Key Habitat type. The recommended conservation strategy for this habitat includes the objective of maintaining disturbance in sand dune and badland habitats within levels that do not compromise the sustainability of the vegetation and wildlife communities. Conservation actions are focused on OHV use, minimizing disturbance, and developing conservation agreements that maintain biodiversity and multiple uses (Wildlife Action Plan Team 2012). TNC (2007) outlines a conservation strategy for this species.

6. Recommendation

<u>Recommended for coverage.</u>

The high level of threat for all populations throughout the species restricted range, including those within Clark County, create a high potential for becoming listed in the future. The species is a former Candidate 2 species for listing under the federal Endangered Species Act, the Nevada Native Plant Society lists the status as "threatened," and it is a special-status species in California and Arizona. Clark County is the core of the species existence, providing conservation measures through coverage is appropriate.

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ROSY TWOTONE BEARDTONGUE (*PENSTEMON BICOLOR* SSP. *ROSEUS*)

1. Species Overview

The rosy twotone beardtongue (*Penstemon bicolor* ssp. *roseus*) (rosy beardtongue) is one of two bi-colored *Penstemon* that inhabit southern Nevada. The species is red to cream in color, and is a short-lived perennial that grows up to 0.5 meters tall and (Smith 2005). In the southern Nevada area roughly two-thirds of the plants are the rose colored phase, while the remaining are of the yellow variant (Smith 2005). The plant is pollinated by at least two bee species in the *Osmia* genus (Glenne 2003).

Townshend Stith Brandegee named and published the new plant as *Penstemon palmeri* ssp. *Bicolor* in 1916. Clokey and Keck (1939) elevated it to a species, *Penstemon bicolor*, in 1939, with subspecies *bicolor* and *roseus* based on the yellow and rose color forms of the flowers, respectively. *Penstemon bicolor* continues to be accepted as a valid species, but the validity of the subspecies has been in question for a few years (Smith 2005). Dr. Noel Holmgren did not recognize the subspecies in California for his 1993 and 2002 Jepson Manual treatments (Holmgren 1993, 2002).

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 and the red variant typically occurs in the areas south of Las Vegas, through the Eldorado and McCullough Mountains, and on the western slopes of the Spring Range near Pahrump (Smith 2005). It is associated with rocky calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving enhanced runnoff in the creosote-pursage, 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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Watch List
U.S. Fish and Wildlife Service Endangered Species Act	No Status*
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of Arizona	Special-status Species
State of California	Special-status Species (Rank 1B.1)
Nevada Native Plant Society	Watch List
NV Natural Heritage Program (2017)	At Risk; G3T3Q S3

NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

*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.

4. Impact

This species is threatened by habitat loss due to development and mining and is thought to be threatened throughout the Las Vegas Valley area due to continued urbanization. Restoration efforts using *P. palmeri* may pose a threat of hybridization if populations are close enough to be visited by the same pollinators, and re-seeding of linear disturbances increases the probability of crossing through or near *P. bicolor* populations (Glenne 2003).

5. Data

Current population trends are unknown (NNHP 2001). The estimated number of total individuals of *Penstemon bicolor* ssp *roseus* is less than 7,000, and numbers vary widely from year to year, making trends difficult to discern (Smith 2005). The total observed area occupied by the rosy beardtongue is 82 hectares (202 acres) (NNHP 2018). Smith estimates that approximately 91% of the population of *Penstemon bicolor* ssp. *roseus* occurs on federal land, mostly BLM. We are not aware of existing conservation areas or management actions that exist beyond those which would be inclusive of all plants with a protected area (e.g. Red Rock Canyon NCA, Sloan canyon NCA, etc.).

6. Recommendation

Further Review / 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.

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YELLOW TWO-TONE BEARDTONGUE (*PENSTEMON BICOLOR* SSP. *BICOLOR*)

1. Species Overview

Penstemon bicolor continues to be accepted as a valid species, but the validity of the two subspecies (yellow and rose phases) has been in question for a few years, because recent data on pollination and genetics indicate no significant differences between the subspecies (Smith 2005). However, the Nevada Natural Heritage Program still describes it as a subspecies.

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, and also to rocky slopes, crevices, and talus in the mountains, on all aspects between 550 to 1,670 meters (1,800 and 5,480 feet) elevation. All sites are surrounded by Joshua tree/shrub, mixed-shrub, or creosote bush vegetation types. Yellow two-tone beardtongue occurs in similar habitats in California and Arizona. These habitats are common throughout the Mojave Desert in southern Nevada (Smith 2005).

2. Range

Yellow two-toned beardtongue is still known from many areas in the Mojave Desert of southern Nevada and adjacent southeastern California and northwestern Arizona. Yellow two-toned beardtongue populations are concentrated on the eastern slopes of the Spring Mountains in Red Rock Canyon Conservation Area and on the Bird Springs Range near Goodsprings, NV. Outlier populations are found in the higher elevations of the McCullough and El Dorado mountains but the rose-colored subspecies is much more common in these ranges (Smith 2005). Eighty-two percent of 288 observations of this subspecies were found below 4,000 feet elevation.

The range of all variants of *Penstemon bicolor* includes the New York and Castle mountains of California (CNPS 2017), the Black Mountains of Arizona, but most of the known populations occur in mountain ranges of Clark County, Nevada (Smith 2005). Besides the previously mentioned mountain ranges, the species has historically been found in the Southern Las Vegas Range, and the Muddy Mountains (but they have not been surveyed recently) (Smith 2005).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	No Status*
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of California	No Status (Species level)
State of Arizona	Sensitive Species (Species level)
NV Natural Heritage Program (2017)	At Risk; G3T2Q S2
NV Native Plant Society	Watch List

NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

*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**.**

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).

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).

5. Data

The yellow two-tone beardtongue is an uncommon species within Clark County (Nussear 2017). About 92% of the Nevada occurrences are on public lands managed by the Bureau of Land Management, with most of the remainder on privately managed lands. Most of the populations of yellow two-tone beardtongue are within the Red Rock Canyon Natural Recreation 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 of these occurrences are also at least partly within road and highway rights-of-way managed by the Nevada Department of Transportation (Smith 2005).

6. Recommendation

Further Review / Not recommended for coverage.

Although this subspecies (and species) has experienced approximately a 9 percent loss of habitat due to urbanization, Smith (2005) believes yet undiscovered populations will compensate for this loss. Additionally, questions surrounding the taxonomy of the species/subspecies and 18 percent of the species range occurring above 4,000 feet in elevation, and existing conservation measures (most of the species occurring in Red Rock) preclude the need to include this as a covered species.

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BEAVER DAM BREADROOT (*PEDIOMELUM CASTOREUM*)

1. Species Overview

Beaver Dam breadroot (*Pediomelum castoreum*), also known as Beaver Dam scurfpea or beaver Indian breadroot, is a member of the Fabaceae family which blooms from April to May (CNPS 2018). The species is native to the deserts around the intersection of California, Nevada, and Arizona, where it grows in local habitats, including disturbed areas. It is associated with creosote bush scrub and Joshua tree, or pinyon-juniper woodland habitats, in washes or where sandy substrates are present (Munz 1974). Parent materials in the habitats may be limestone or sandstone. The root of the species was used by Native Americans and early European settlers for food (Dayton et al. 1937).

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. M.F. and J. Grimes 2012, NatureServe 2017). Beaver Dam breadroot's habitats include Mojave desert scrub and Joshua tree woodland, occurring on sandy surfaces or sandy gravel, including washes and roadcuts (CNPS 2018; MacKay 2013). In Nevada, the species occurs from an elevation range of 390 to 1,524 meters (1,280 to 5,000 feet) and in Arizona the species occurs from an elevation range of 534 to 1,196 meters or 1,750 to 3,925 feet (Nussear 2017, AZGFD 2005).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Watch List
U.S. Fish and Wildlife Service Endangered Species Act	No Status*
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of Arizona	Special-status Species
State of California	Special-status Species (Rank 1B.2)
NV Natural Heritage Program (2017)	At Risk: G3 S3
NV Native Plant Society	Watch List
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

*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.

4. Impact

Beaver Dam breadroot is possibly threatened by vehicles and road widening (CNPS 2018). The species is vulnerable to population declines due to the small population sizes, the potential to be influenced by OHV use, and expansion of urban areas and infrastructure (MacKay 2013). The primary threats facing the species include livestock and feral animal disturbances, invasive plant species, urbanization, as well as energy and utility or transportation corridor development (Nussear 2017).

Beaver Dam breadroot is found in Mojave desert scrub through pinyon-juniper woodland ecosystems. Mojave desert scrub habitats are often susceptible to fire, due to invasive species. Invasive grasses may outcompete Beaver Dam breadroot seedlings. Despite this, the geophytic growth form of the species, i.e. the large subsurface tubers, would likely protect the Beaver Dam breadroot from fire impacts. Livestock and feral horses are likely to be detrimental to the species through herbivory and soil surface disturbances. In addition, it is likely that some Beaver Dam breadroot habitat was inundated by the creation of Lake Mead (Nussear 2017).

5. Data

Despite extensive distribution surveys, information on population trends for this species is lacking (NNHP 2017). Beaver Dam breadroot is known to occur in Lincoln and Clark Counties in Nevada (Kartesz 1988). There are approximately 17 recorded localities for this species in Nevada, with most observations for the species occurring within the Moapa Valley area, the Virgin River from Lake Mead to Mesquite, areas nearby the Beaver Dam Wash, Riverside, Gold Butte, and along the Virgin River to the confluence with the Muddy River (Kartesz 1988; Nussear et al. 2011; NNHP 2017; AZGFD 2005). Other locations where the species are documented to occur include Bonnie Springs and Lovell Canyon, near the southern Spring Mountains (iNaturalist 2017). Beaver Dam breadroot is occasionally misidentified as *Psoralidium lanceolatum* (Kartesz 1988).

The species is present in desert areas with dry, sandy soils. Habitat modeling for sand dependent species was conducted and provides estimates of the amount of area for species habitat categories within Clark County ecosystems. Estimated high suitability habitat for the Beaver Dam breadroot was identified in Mojave Desert scrub and to a lesser extent mesquite acacia. Moderate habitat for the species includes some desert riparian areas (Nussear 2017).

The species is projected to have 17 percent of direct impacts to predicted high suitability habitat, with 12 percent of moderate suitability habitat being directly impacted. Conserved habitat consists of 32 percent for the high suitable habitat and 20 percent of total habitat for the moderate suitable habitat for the species. Areas where the species occurs that are conserved contain 1.75 times more area than the combined disturbed and impacted habitat in the high suitability category, and 1.4 times the combined disturbed and impacted areas for moderate habitat. Relatively little area under evaluation was identified as already disturbed (Nussear 2017).

6. Recommendation

<u>Not Recommended for Coverage.</u>

The Beaver Dam breadroot is not recommended for coverage under the MSHCP based on extrememly limited data on the species. However, the species is associated with Joshua tree, has a limited range, and is 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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CATCHFLY GENTIAN *(EUSTOMA EXALTATUM)*

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. It is a perennial, producing additional shoots each season. Catchfly gentian flowers 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 otherwise water-logged soils (Shinners 1957, Turner 2014). Elevation range for the species is reported as 100-600 meters (325-1,970 feet) and it occurs on roadsides, alkaline marshes, and other open, wet places (Pringle 2012).

2. Range

Catchfly gentian is native to the southern United States, Mexico, Central America, and the West Indies (Turner 2014). Plants have been reported in the Organ Pipe National Monument in Arizona (Pinkava et al. 1992). I-Naturalist (2018) accounts exist for the species in 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 catchfly gentian occurring in Nevada and no I-Naturalist accounts show the species in Nevada (I-Naturalist 2018). However, the Nevada Natural Heritage Program (2018) listed the species as "confident or certain" occurrence in Clark County (with an occurrence count of two). USDA plants 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 of the lower Colorado River watershed, but may be extirpated in the vicinity of Lake Havasu and Lake Mohave (NatureServe 2016).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	No Status
U.S. Fish and Wildlife Service Endangered Species Act	No Status
U.S. Bureau of Land Management (Nevada; BLM 2017)	No Status
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of Arizona	No Status
State of California	No Status
Nevada Native Plant Society	Marginal/potentially vulnerable
NV Natural Heritage Program (2017)	Watch List; G5 S1
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

4. Impact

Because catchfly gentian has a high association with water-logged 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.

5. Data

Clark County populations of catchfly gentian may exist in Lake Mead NRA (NatureServe 2015), so these populations are under the protection and regulations of greater Lake Mead NRA. Species-specific management actions or plans do not appear to exist catchfly gentian in Nevada.

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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CLARKE PHACELIA (*PHACELIA FILIAE*)

1. Species Overview

Clark phacelia (*Phacelia filiae*) is a small annual forb in the Hydrophyllaceae family. It is closely related to the more widely distributed and abundant *P. crenulata.* This species occurs in primarily in blackbrush, Mojave Desert Scrub, and Salt Desert Scrub communities dominated by blackbrush, shadscale, and creosote (Atwood et al. 2002).

2. Range

This species is known from only three counties in Nevada: Clark, Lincoln, and Nye (NHHP 2017). It is endemic to the transition between Mohave Desert and Mohave/Great Basin zone and with Clark County has been found on Nellis Test and Training Range (Leidos 2017), in Desert National Wildlife Refuge, and in the City of Las Vegas (Atwood et al. 2002). 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 2000 to 4000 feet.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	No Status
U.S. Fish and Wildlife Service Endangered Species Act	No Status
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
NV Natural Heritage Program (2017)	At Risk: G2; S2
NV Native Plant Society	Watch List
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

4. Impact

Threats to the habitats where this species is found including 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)

5. Data

Data for this species is limited to records at 26 localities in Clark County. Population size for these occurrences are unknown. Several populations of this species in the urban Las Vegas area were likely lost prior to documentation.

6. Recommendation

Not recommended for coverage.

Data for this species is severely lacking; however, this species has a restricted range limited to southern Nevada. Although most known occurrences may be on conserved lands, the species is known within the Plan Area and may be impacted by covered activities. This species was initially designated for further review; however, no additional information on the species status within the Plan Area was discovered. Based on the lack of data and assumption that most occurrences within Clark County are on conserved lands, this species is not recommended for coverage.

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DEATH VALLEY BEARDTONGUE (*PENSTEMON FRUTICIFORMIS SSP. AMARGOSAE*)

1. Species Overview

Death Valley beardtongue (*Penstemon fruticiformis* ssp. *amargosae*) is a perennial; herb and a member of 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; Jepson 2018).

2. Range

In California, Death Valley beardtongue occurs in eastern San Bernardino and Inyo Counties but is more concentrated in Death Valley (Dudek 2012). Death Valley beardtongue has twenty-four occurrences in Nevada east of Death Valley in Nye County (NNHP 2017). The Nevada Natural Heritage Program (2017) lists its status in Clark County as probable. The California Native Plant Society (CNPS) lists the elevation for this species between 850 to 1,400 meters (2,788 and 4593 feet) (CNPS 2017).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	Evaluation
U.S. Fish and Wildlife Service Endangered Species Act	No Status*
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of California	Special-status species (Rank 1B.3)
NV Natural Heritage Program (2017)	At-risk; G4T3 S2
NV Native Plant Society	Threatened
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

*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.

4. Impact

Threats to Death Valley beardtongue include off-highway vehicles, especially in washes, habitat degradation and fragmentation, and grazing (Dudek 2012).

5. Data

Population trends for the Death Valley beardtongue are unknown given the limited number of documented occurrences in California and Nevada (Dudek 2012). The U.S. Fish and Wildlife 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.

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.

7. References Cited

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POLISHED BLAZING STAR (*MENTZELIA POLITA*)

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 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.

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.

Polished blazing star is limited to gypsum rich soils in the hills and washes of mountain ranges in limited portions of California, Nevada, and Arizona. In California, its range is limited to the northeast part of the Clark Mountain Range just west of Primm, NV (Brokaw et al. 2017). In Arizona, the only known location is in Northern Mohave County (the Arizona Strip), somewhere south of Colorado City, AZ (Christy 1998). In Nevada, it has been found in the foothills of mountain ranges surrounding the Las Vegas metropolitan area.

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 the species remain unknown.

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	No Status
U.S. Fish and Wildlife Service Endangered Species Act	No Status
U.S. Bureau of Land Management (Nevada; BLM 2017)	Sensitive
U.S. Forest Service (Region 4)	No Status
State of Nevada	No Status
State of Arizona	No Status
State of California	Special-status Species (Rank 1B.2)
Nevada Native Plant Society	Watch List
NV Natural Heritage Program (2017)	At Risk; G2 S1S2
IUCN Red List (v 3.1, 2007)	None
CITES	None

4. Impact

This species occurs in the Mojave Desert scrub in gypsum rich soils usually in the washes among limestone hills (Nelson 1909, Brokaw 2017). Development in these areas may threaten populations of this species.

5. Data

This species benefits from conservation actions designed to protect habitats in general, and other species. Two locations of polished blazing star that are closest to urban Las Vegas are in Red Rock 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 if polished blazing star was one of the 70 native plant species that were replanted or reseeded within the restoration zone.

Red Rock Conservation Area is required to provide Environmental Assessment Documents in order to start major construction projects. The most recent Environmental Assessment is for the new improvements on the Scenic Loop Drive and its parking areas (BLM 2015). The two plants that were managed for are the Blue Diamond cholla and *Penstemon bicolor* ssp. *bicolor*. The known locations of *Mentzelia polita* within Red Rock Canyon are far from roads and therefore will not likely be affected by alterations on the Scenic Loop Drive. There seem to be no other management plans that might affect the polished blazing star.

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 indications 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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JOSHUA TREE (*YUCCA BREVIFOLIA)*

1. **Species Overview**

Joshua trees (*Yucca brevifolia*) are large tree-like succulent plants occupying mid- to upper-elevational zones of Mojave Desert shrubland communities (McKelvey 1938, Rowlands 1978, Cole et al. 2011). Joshua trees require their own species of *Tegeticula* moth for pollination (Pellmyr and Segreaves 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 e.g., ~2-3% per year or less), but severe drought can cause increased mortality although 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.

2. Range

Joshua trees occur at 2,500 to 4,500 feet elevation (Benson & Darrow 1981) in the southern Mojave Desert of California, northwest Arizona, southwest Utah, and southern Nevada (Rowlands 1978, Cole et al. 2011). Currently recognized taxonomy and associated nomenclature identifies a single taxonomic entity *Yucca brevifolia* (Joshua tree) (Hess & Robbins 2002, Hess 2012). Joshua trees are sometimes independently viewed as two intraspecific entities, the western Joshua tree (*Y. b. brevifolia*) and eastern Joshua tree (*Y. b. jaegeriana*) (USFWS 2016). The eastern Joshua tree (*Y.b. jaegeriana*) is the only variety (synonym or potential subspecies) of Joshua tree known in Clark County. Our review discusses Joshua tree at the species level (*Yucca brevifolia*), unless referencing specific articles describing subspecies or varietal classifications.

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).

3. Status Summary

Agency/Organization	Status
MSHCP (2000)	No Status
U.S. Fish and Wildlife Service Endangered Species Act	Not Listed; Positive 90-day Finding; 12-month pending
U.S. Bureau of Land Management (Nevada)	No Status
U.S. Forest Service (Region 4)	No Status

State of Nevada	No Status State Code prohibits commercial collection
State of California	No Status
State of Arizona	Special-status species (Watch List); BLM Sensitive: S3S4 G4G5
NV Natural Heritage Program (2017)	No Status Global: G4G5, State: SNR*
NV Native Plant Society	No Status
NV Wildlife Action Plan (2012)	Not Addressed
NV Climate Change Vulnerability Index	Not Addressed
IUCN Red List (v 3.1, 2007)	No Status
CITES	No Status

* SNR – Status not ranked at the state level for species or subspecies

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).

5. Data

Joshua trees are abundant where they occur in many locations across 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 species of Joshua tree across Clark County, Nevada, or similar areas of this size (Nussear 2018).

Approximately 32 percent of high, 31 percent of medium, and 21 percent of low categorized modeled habitat are considered conserved (Nussear 2018). Among the largest stands of protected Joshua trees are in the Gold Butte National Monument, and wilderness areas therein. Additional protection of smaller areas of Joshua trees are afforded in Lake Mead National Recreation Area, Red Rock National Conservation Area, the Desert National Wildlife Refuge, and BLM's Wee Thump Wilderness. Some areas within Clark County that experienced past wildfire will likely benefit from ongoing restoration efforts being conducted by Federal, State, and County agencies (Nussear 2018).

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 form the basis for taking a proactive approach to conserving the species and including it as a covered species.

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APPENDIX B

TABLE OF ALL WILDLIFE AND PLANT SPECIES REVIEWED

Common Name	Scientific Name	MSHCP Status (2000)	Federal Status	State Status	BLM Status Southern NV (2017)	Wildlife Action Plan Species of Conservation Priority (2012)	NNHP Plant and Animal List (2017)	List Count	In Plan Area?	Habitat Notes
western toad	Anaxyrus boreas (was Bufo)				S	X		2	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)				S		WL	2	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)				S		WL	2	No	range in NV is in western NV closer to Reno, not in Clark County
Great Plains toad	Anaxyrus cognatus (was Bufo)	Watch List				X	AT	2	Yes	
Arizona toad	Anaxyrus microscaphus (was Bufo)	Evaluation	Under Review		S	X	AT	4	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)				S	X	AT	3	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 (waws Bufo)	Evaluation						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
Plains toad	Bufo cognatus (now Anaxyrus)							0		
relict leopard frog	Lithobates onca	Covered	C	PA	S	X	AT	5	Yes	
northern leopard frog	Lithobates pipiens			PA	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 listeed 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			PA	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 nont warrated decision made.
Sierra Nevada yellow-legged frog	Rana sierrae		E	PA	S	X	AT	5	No	
Great Basin spadefoot	Spea intermontana					X		1	Yes - northern Clark County only	loose soils in sagebrush flats, shrublands, and pinyon-juniper woodland

Common Name	Scientific Name	MSHCP Status (2000)	Federal Status	State Status	USFWS Region 8 Birds of Conservation Concern (2008)	BLM Status (Southern NV 2017)	Wildlife Action Plan (2012) Species of Conservation Priority	NNHP Plant and Animal List (2017)	List Count	Breeding In Plan Area?	Notes
Northern goshawk	*Accipiter gentilis*	Watch List		S			X	AT	3	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*	-	Under review		X		X	AT	4	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	WL	2	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		Protected		S	X	WL	4	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		X		3	?	*most designations are based on the previous taxonomic classification. Dense saltbrush habitat, also occasionally in sagebrush
Sagebrush sparrow	*Artemisiospiza nevadensis*	-			X					?	
Short-eared Owl	*Asio flammeus*	-					X	WL	2	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*								0	Yes	Nests in dense or brushy vegetation amidst adjacent open habitats such as grasslands or shrublands
Western burrowing owl	*Athene cunicularia hypugea*	Evaluation		Protected	X	S	X	WL	5	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*	-					X		1	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				S	X	AT	3	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*	-				S		WL	2	Yes	breeding in Clark County is limited, and species is widspread in Great Basin portion of NV
Common Black-Hawk	*Buteogallus anthracinus*	-							0	No - unlikely	Range in AZ may extend on rare occasion into southern tip o fNV 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 passover 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 passover 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 passover in migration, but NV is not in wintering or breeding range
Buff-breasted Sandpiper (nb)	*Calidris subruficollis*	-							0	No	may passover 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*	-								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
Red-faced Warbler	*Cardellina rubrifrons*	-							0	No	rare occurrence extend into southern NV and a montane breeder above 4,000 feet

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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*	-		Game Bird			X	WL	3	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			2	No - migration only	
Western Snowy Plover	*Charadrius nivosus (alexandrinus) nivosus*	-	T				X	WL	3	No	
Black Tern	*Chlidonias niger*	-					X	WL	2	No - Migration	Migrant through Clark County only. Would not be substantially impacted by plan activities.
Common Nighthawk	*Chordeiles minor*	-					X		1	Yes	northwest corner of Clark County may breed
Yellow-billed cuckoo	*Coccyzus americanus*	Covered	T	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*						X		1	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*				X		X	WL	3	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*							WL	1	No	
Sooty Grouse	*Dendragapus fuliginosus*	-		Game Bird			X		2	No	
Dusky Grouse	*Dendragapus obscurus*	-		Game Bird			X		2	No	
Bobolink	*Dolichonyx oryzivorus*	-			X		X	WL	3	No	
Great Basin Willow Flycatcher	*Empidonax traillii adastus*	-			x	S	X	AT	4	No - migration only	
Sierra Nevada Mountain Willow Flycatcher	*Empidonax traillii brewsteri*	-			x		X	WL	3	No	

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Southwestern willow flycatcher	*Empidonax traillii extimus*	Covered	E	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	WL	2	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	E	X	S	X	AT	6	Yes - year-round resident	Various open environments including open water, desrt shrub, and marshes usually in close asociaton with suitable nesting cliffs; also mountains, open forested regions, and human poulation centers.
Common Loon	*Gavia immer*	-					X	WL	2	No - migration only	
Northern pygmy owl	*Glaucidium gnoma*	Watch List							0	No	known in Carson and Snake Ranges and borders Clark County
Pinyon Jay	*Gymnorhinus cyanocephalus*				X	S	X	WL	4	Yes	as name suggested, associated with pinon pines; foothills and midelevations, 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*	-					X		1	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	E	X	S	X	AT	6	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
Scott's oriole	*Icterus parisorum*	Watch List					X		1	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 asociated with cactus or true deserts. Range is expanding northward
Least Bittern	*Ixobrychus exilis*				X				1	No	not on southern NV BLM list, but on other NV BLM lists; not on mapped range, but could breed in extremem southern tip of Clark County which gets close to north end of Colorado River range

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Western least bittern	*Ixobrychus exilis hesperis*	Watch List			X		X	AT	3	No	not on southern NV BLM list, but on other NV BLM lists; not on mapped range, but could breed in extremem southern tip of Clark County which gets close to north end of Colorado River range
Loggerhead shrike	*Lanius ludovicianus*	Evaluation		S	X	S	X	WL	5	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*	-					X	WL	2	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*						X	WL	2	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 extremem western border of Clark County
Hudsonian Godwit (nb)	*Limosa haemastica*				X				1	No	
Western screech owl	*Megascops kennicottii*	Watch List							0	Yes	
Red-headed Woodpecker	*Melanerpes erythrocephalus*				X				1	No	
Lewis's Woodpecker	*Melanerpes lewis*	-					X	WL	2	No - winter and migration only	
Elf Owl	*Micrathene whitneyi*				X				1	No	
Long-billed Curlew	*Numenius americanus*				X		X	WL	3	No - migration only	
Mountain Quail	*Oreortyx pictus*	-		Game Bird			X	WL	3	No	Sierra Nevada Mountain and other areas north of Clark County
Sage Thrasher	*Oreoscoptes montanus*	-		S	X	S	X	WL	5	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.
Lucy's Warbler	*Oreothlypis (Vermivora) luciae*								0	Yes	breeding range includes eastern edge of Clark County; riparian or mesquite bosques
Virginia's Warbler	*Oreothlypis (Vermivora) virginiae*	-			X		X		2	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

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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 extremem southern AZ and mostly Mexico
American White Pelican	*Pelecanus erythrorhynchos*	-					X	WL	2	No - migration only	
Cassin's Sparrow	*Peucaea cassinii*				X				1	No	potential casual record in southern NV, but also could be from confusion of species prior to taxonomic reorganization
Phainopepla	*Phainopepla nitens*	Covered				S		AT	2	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		1	No - migration only	
White-headed Woodpecker	*Picoides albolarvatus*	-					X	WL	2	No	range is CA and Pacific NW, with small extension into NV near Lake Tahoe
American Three-toed Woodpecker	*Picoides dorsalis*							WL	1	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	WL	2	No - migration only	
Horned Grebe	*Podiceps auritus*				X				1	No - winter and migration only	winter along Colorado River
Vesper Sparrow	*Pooecetes gramineus*								0	No - winter and migration only	
Flammulated owl	*Psiloscops (Otus) flammeolus*	Watch List	Status Undefined		X	S	X	WL	5	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	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

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Bank Swallow	*Riparia riparia*	-					X		1	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*								0	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.
Black-chinned Sparrow	*Spizella atrogularis*	-			X		X		2	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 predominantely AZ, NM, CA.
Brewer's sparrow	*Spizella breweri*	-		S		S	X	WL	4	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				S	X	AT	3	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.

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Crissal thrasher	*Toxostoma crissale*	Evaluation				S			1	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			X	S	X	AT	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*	-		Game Bird			X	AT	3	No	not on BLM Southern NV, only Elko list; range does not extend to southern NV, breeds in central northern US
Arizona Bell's Vireo	*Vireo bellii arizonae*	Covered			X		X	WL	3	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			WL	2	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*			Protected	S	WL		3	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		1	No	Sierra Nevada range in western NV. Species does not occur in or near Clark County.
Mono Basin mountain beaver	*Aplodontia rufa californica*			Sensitive			X	2	No	Sierra Nevada range in western NV. Subspecies does not occur in or near Clark County.
Pygmy rabbit	*Brachylagus idahoensis*			Game Mammal		AT	X	3	No	species is in northern NV and Great Basin region.
desert pocket mouse	*Chaetodipus penicillatus*	Evaluation				AT	X	2	Yes	It is 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				WL		1	Yes	This rodent 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		Sensitive	S	AT	X	4	Yes	Found throughout the state, but restricted to caves and mines with suitable microclimates.
Desert kangaroo rat	*Dipodomys deserti*	Evaluation				WL	X	2	Yes	
Chisel-toothed kangaroo rat	*Dipodomys microps*	Evaluation						0	Yes	
Panamint kangaroo rat	*Dipodomys panamintinus caudatus*	Evaluation						0	Yes	
big brown bat	*Eptesicus fuscus*				S	WL		2	Yes	habitat generalist
Spotted bat	*Euderma maculatum*	Watch List		Threatened	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		Sensitive		AT		2	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		WL	X	3	No	Sierra Nevada mountains, not in Clark County
North American wolverine	*Gulo gulo*		PT	Protected		WL		3	No	
Allen's big-eared bat	*Idionycteris phyllotis*	Watch List		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 habtiats 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.
Silver-haired bat	*Lasionycteris noctivagans*	Covered			S	WL	X	3	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.

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Western red bat	*Lasiurus blossevillii*			Sensitive	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*				S	WL	X	3	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. They are 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*					WL	X	2	Yes	
Sierra Nevada snowshoe hare	*Lepus americanus tahoensis*			Game Mammal		WL	X	3	No	
northern river otter	*Lontra canadensis*			Fur-bearing		AT	X	2	Yes	
California leaf-nosed bat	*Macrotus californicus*	Watch List		Sensitive	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)*			Fur-bearing		AT	X	2	No	
dark kangaroo mouse	*Microdipodops megacephalus*			Protected		AT	X	3	No	
pale kangaroo mouse	*Microdipodops pallidus*			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*			Sensitive		AT	X	3	No	
Ash Meadows montane vole	*Microtus montanus nevadensis*			Sensitive	S	AT		3	No	
Short-tailed weasel	*Mustela erminea*	Evaluation		Unprotected				1	No	
Long-tailed weasel	*Mustela frenata*	Evaluation		Unprotected Mammal				1	Yes	Muddy and Virgin Rivers. Spring Mtn population is not in Plan Area.
California myotis	*Myotis californicus*				S	WL		2	Yes	
Small-footed myotis	*Myotis ciliolabrum*	Evaluation			S	WL	X	3	Yes	
Long-eared myotis	*Myotis evotis*	Covered			S	WL	X	3	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.
little brown myotis	*Myotis lucifugus*				S	WL	X	3	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		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			S	AT	X	3	Yes	Only one known population near Lake Mead NRA in Clark County. May have once been a maternity colony, but is now stricIty composed of bachelor males.
Long-legged myotis	*Myotis volans*	Covered			S	WL		2	Yes	
Yuma myotis	*Myotis yumanensis*	Watch List			S	WL		2	Yes	
Humboldt yellow-pine chipmunk	*Neotamias amoenus celeris*					AT	X	2	No	

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Palmer's chipmunk	*Neotamias palmeri*	Covered		Sensitive		AT	X	3	No	Spring Mountains but above 4,000ft, outside of Plan Area.
shadow (Allen's) chipmunk	*Neotamias senex*					WL	X	2	No	Sierra Nevada range
Hidden Forest Uinta chipmunk	*Neotamias umbrinus nevadensis*	Evaluation		Sensitive		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*					WL		1	Yes	southern tip of Clark County
Big free-tailed bat	*Nyctinomops macrotis*	Watch List			S	AT		2	Yes	
American pika	*Ochotona princeps*			Protected		AT	X	3	No	Northwestern Nevada and central mountain ranges.
mule deer	*Odocoileus hemionus*						X	1	Yes	
desert bighorn sheep	*Ovis canadensis nelsoni*			Game Mammal	S	WL	X	2	Yes	
Sierra Nevada bighorn sheep	*Ovis canadensis sierra*		E				X		No	
brush mouse	*Peromyscus boylii rowleyi*					WL		1	Yes	
canyon bat (western pipistrelle)	*Parastrellus (Pipistrellus) hesperus*				S	WL		2	Yes	
Colorado River cotton rat	*Sigmodon arizonae plenus*					AT			Yes	only southern tip along Colorado River- covered under the Lower Colorado River HCP
Merriam's shrew	*Sorex merriami*					WL	X	2	No	Range begins just north of Clark County, may not extend into the County
montane shrew	*Sorex monticolus*						X	1	No	
American water shrew	*Sorex palustris*						X	1	No	
Preble's shrew	*Sorex preblei*						X	1	No	
Inyo shrew	*Sorex tenellus*	Evaluation					X	1	No	Maybe present in extreme NW corner of Clark County, but range is outside of the County
Trowbridge's shrew	*Sorex trowbridgii*					WL		1	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		No	
desert cottontail	*Sylvilagus auduboni*								Yes	
Nuttall's cottontail	*Sylvilagus nuttallii*	Evaluation		Game Mammal				0	No	higher elevation species
Mexican free-tailed bat	*Tadarida brasiliensis*			Protected	S	WL	X	4	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*				S		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	AT	X		No	
San Antonio pocket gopher	*Thomomys bottae curtatus*				S	AT	X		No	
mountain pocket gopher	*Thomomys monticola*					WL	X	2	No	
kit fox	*Vulpes macrotis*			Fur-bearing		WL		2	Yes	
Sierra Nevada red fox	*Vulpes vulpes necator*		C	Fur-bearing		WL		2	No	
big (western) jumping mouse	*Zapus princeps*					AT	X	2	No	

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northwestern pond turtle	*Actinemys marmorata marmorata*		Under Review			WL	X	3	No	BLM list for Carson City not on Southern NV list
Glossy snake	*Arizona elegans*	Covered			S	WL		2	Yes	species is widespread in US and Mexico
Common zebra-tailed lizard	*Callisaurus draconoides draconoides*	Watch List						0	Yes	Range is widespread in NV, CA, AZ, and Mexico
northern rubber boa	*Charina bottae*					WL	X	2	No	BLM list for Carson City, not Southern NV; range is northern half of NV
Mojave shovel-nosed snake	*Chionactis occipitalis occipitalis*				S	WL	X	3	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 thorugh 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 extremem north end of range, only enters into very southern tip of NV/Clark County; widespread range through AZ, NM, TX,
sidewinder	*Crotalus cerastes*	Covered			S	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			S		X	2	yes	
Regal ringneck snake	*Diadophis punctatus*	Evaluation			S	WL	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		S	S	WL	x	4	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*			PR		AT	X	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	X	3	No	Small population in extreme northwest Nevada.
Panamint alligator lizard	*Elgaria panamintina*		Under Review			WL	X	3	No	Range in NV is extremely small and north of Clark County
western skink	*Plestiodon skiltonianus utahensis*							0	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			S		X	2	Yes	

desert tortoise	*Gopherus agassizii*	Covered	T	T	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.
banded Gila monster	*Heloderma suspectum cinctum*	Evaluation		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		PR		AT	X	3	No	East-central Nevada mountain ranges. BLM does not include on Southern NV list only Ely
desert rosy boa	*Lichanura trivirgata*			PR	S	AT	X	4	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 widespred in western US
pygmy short-horned lizard	*Phrynosoma douglasii*					WL	X	2	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*						X	1	No	northeastern NV and AZ, this species is not in Clark County
Southern desert horned lizard	*Phrynosoma platyrhinos calidiarum*	Evaluation			S		X	2	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
Western red-tailed skink	*Plestiodon gilberti rubricaudatus*	Covered				AT	X	2	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 metres (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

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Coville abronia	*Abronia nana ssp. covillei*						X	X	2			
transmontane sand verbena	*Abronia turbinata*								0	Delisted		
ivory-spined agave	*Agave utahensis var. eborispina*						X	X	2	Delisted		
Clark Mountain agave	*Agave utahensis var. nevadensis*						X	X	2	Delisted		
	Anacolia menziesii	Covered							0			
woolly fishhooks	*Ancistrocarphus filagineus*								0	Marginal/Disjunct		
	Androsace occidentalis								0	Marginal/Disjunct		
	Anelsonia eurycarpa								0	Marginal/Disjunct		
rough angelica	*Angelica scabrida*	Covered			S	T	X		3		No - over 4,000 ft	Narrow endemic of the Spring Mountains.
Charleston pussytoes	*Antennaria soliceps*	Covered				WL	X		2			
sticky ringstem	*Anulocaulis leiosolenus*	Covered			S	WL	X		3		Yes	Alkaline or gypseous soils in open areas of xeromorphic desert shrub; also gypsum dunes shrubland.
Las Vegas bearpoppy	*Arctomecon californica*	Covered		CE	S	T	X		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			S	WL	X		3		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	X		2			
Clokey milkvetch	*Astragalus aequalis*	Covered			S	WL	X		3		Yes - over 4,000 ft	Limestone bedrock habitats in the Spring Mountains
Sheep Range milkvetch	*Astragalus amphioxys var. musimonum*	Evaluation			S	WL	X		3		Yes - over 4,000 ft	Foothills of the Sheep Mountains
	Astragalus atratus var. mensanus				SS				1			
Austin milkvetch	*Astragalus austiniae*								0	Research Needed		
one-leaflet Torrey milkvetch	*Astragalus calycosus var. monophyllidius*	Watch List			S	WL	X		3		Yes - over 4,000 ft	
black woollypod	*Astragalus funereus*	Evaluation			S	WL	X		3		Yes - over 4,000 ft	
	Astragalus geyeri var. geyeri				SS				1			
threecorner milkvetch	*Astragalus geyeri var. triquetrus*	Covered		CE	S	T	X		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			1			
	Astragalus lentiginosus var. borreganus								0	Marginal/Disjunct		

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San Pitch Valley milkvetch	*Astragalus lentiginosus var. chartaceus*								0	Marginal/Disjunct		
Kern Plateau milkvetch	*Astragalus lentiginosus var. kernensis*					WL	X		2			
straw milkvetch	*Astragalus lentiginosus var. stramineus*				S	WL	X		3		Yes	Sandy and gravelly flats and dunes. Occurs in the lower Virgin Valley.
halfring milkvetch	*Astragalus mohavensis var. hemigyrus*	Evaluation			S	WL	X		3		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*						X	X	2			
Mokiak milkvetch	*Astragalus mokiacensis*	Evaluation			S	WL	X		3		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*					WL	X		2			
Clokey eggvetch	*Astragalus oophorus var. clokeyanus*	Covered			SS	WL	X		3		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								0	Marginal/Disjunct		
Littlefield milkvetch	*Astragalus preussii var. laxiflorus*					WL	X		2			
Spring Mountains milkvetch	*Astragalus remotus*	Covered			S	WL	X		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								0	Marginal/Disjunct		
	Boechera davidsonii								0	Marginal/Disjunct		
Spring Mountains rockcress	*Boechera nevadensis*					WL			1			
Shockley rockcress	*Boechera shockleyi*						X	X	2	Delisted		
upswept moonwort	*Botrychium ascendens*	Evaluation				WL	X		2			
dainty moonwort	*Botrychium crenulatum*	Evaluation				WL	X		2			
slender moonwort	*Botrychium lineare*					WL	X	X	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			1			
	Bowlesia incana								0	Marginal/Disjunct		
Knapp brickellbush	*Brickellia knappiana*								0	Marginal/Disjunct		
Bolander candlemoss	*Bruchia bolanderi*					WL			1			
Panamint mariposa lily	*Calochortus panamintensis*							X	1	Marginal/Disjunct		
alkali mariposa lily	*Calochortus striatus*	Covered			S	WL	X		3		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		

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yellow paintbrush	*Castilleja flava*								0	Delisted		
Clokey paintbrush	*Castilleja martinii var. clokeyi*	Covered					X	X	2	Delisted		
remote rabbitbrush	*Chrysothamnus eremobius*	Evaluation			S	WL	X		3		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	X		2			
Clokey thistle	*Cirsium eatonii var. clokeyi*	Covered					X		1	Delisted		
Snake Range thistle	*Cirsium eatonii var. viperinum*					WL			1			
Hall Thistle	*Cirsium hallii*								0			
	Cirsium mohavense				S				1			
Virgin River thistle	*Cirsium virginense*	Evaluation				WL	X		2			
	Cistanthe ambigua								0	Marginal/Disjunct		
California sawgrass	*Cladium californicum*								0	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				WL	X		2			
Hoffman's cryptantha	*Cryptanth virginensis*	Watch List							0			
mound catseye	*Cryptantha compacta*					WL			1			
weakstem catseye	*Cryptantha flaccida*								0	Marginal/Disjunct		
Las Vegas catseye	*Cryptantha insolita*	Evaluation		CE	SS		X		3	Possibly Extirpated	Yes	
New York Mountains catseye	*Cryptantha tumulosa*	Watch List				WL	X	X	3		Yes - over 4,000 ft	
Blue Diamond cholla	*Cylindropuntia multigeniculata*	Covered		CE	S	WL	X		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							0			
silverskin lichen	*Dermatocarpon luridum*					WL	X		2			
	Dicranoweisia crispula	Covered							0			
Gold Butte moss	*Didymodon nevadensis*	Evaluation			S	WL	X		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	X		2			
Cusick whitlowgrass	*Draba cusickii*								0			
Jaeger whitlowcress	*Draba jaegeri*	Covered				WL	X		2			
Charleston draba	*Draba paucifructa*	Covered				WL	X		2			
Chalk liveforever	*Dudleya pulverulenta*	Watch List							0			
chalk liveforever	*Dudleya pulverulenta ssp. arizonica*						X	X	2			
silverleaf sunray	*Enceliopsis argophylla*	Evaluation			S	WL	X		3		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*						X	X	2	Marginal/Disjunct		

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Nevada willowherb	*Epilobium nevadense*	Evaluation			S	WL	X		3		Yes - over 4,000 ft	
Mount Charleston sandwort	*Eremogone congesta var. charlestonensis*					WL	X		2			
rosy King sandwort	*Eremogone kingii var. rosea*	Covered				WL	X		2			
Meadow Valley sandwort	*Eremogone stenomeres*	Evaluation				WL	X		2			
Antelope Canyon goldenbush	*Ericameria cervina*				S	WL	X		3		Yes - over 4,000 ft	Rock crevices and talus in shadscale and Douglas-fir-bristlecone pine communities.
Charleston goldenbush	*Ericameria compacta*					WL	X		2			
Clokey fleabane	*Erigeron clokeyi var. clokeyi*	Watch List				WL	X		2			
	Erigeron eatonii var. eatonii								0	Marginal/Disjunct		
Kern River daisy	*Erigeron multiceps*					WL	X		2			
	Erigeron nanus								0	Marginal/Disjunct		
sheep fleabane	*Erigeron ovinus*	Evaluation			S	WL	X		3		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					X	X	2	Delisted		
Alexander buckwheat	*Eriogonum alexanderae*					WL			1			
Pahrump Valley buckwheat	*Eriogonum bifurcatum*	Covered			S	T	X		3		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*						X	X	2	Marginal/Disjunct		
Las Vegas buckwheat	*Eriogonum corymbosum var. nilesii*	Evaluation	C		S	T	X		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								0	Marginal/Disjunct		
Clokey buckwheat	*Eriogonum heermannii var. clokeyi*	Evaluation			S	WL	X		3		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*								0	Marginal/Disjunct		
	Eriogonum kennedyi var. purpusii								0	Marginal/Disjunct		
	Eriogonum latens								0	Marginal/Disjunct		
Pinyon Mesa buckwheat	*Eriogonum mensicola*					WL	X		2			
	Eriogonum nudum var. pubiflorum								0	Marginal/Disjunct		
	Eriogonum ochrocephalum var. calcareum								0	Marginal/Disjunct		
	Eriogonum ovalifolium var. depressum								0	Marginal/Disjunct		
	Eriogonum rixfordii								0	Marginal/Disjunct		

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saltwort buckwheat	*Eriogonum salicornioides*								0			
	Eriogonum saxatile								0	Marginal/Disjunct		
Deseret sulphurflower	*Eriogonum umbellatum var. desereticum*								0	Marginal/Disjunct		
	Eriogonum umbellatum var. furcosum								0	Marginal/Disjunct		
	Eriogonum umbellatum var. porteri								0	Marginal/Disjunct		
sticky buckwheat	*Eriogonum viscidulum*	Covered		CE	S	T	X		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*				S		X	X	3	Marginal/Disjunct	Yes	Obligate wetland species. Roadsides, alkaline marshes, saline to freshwater marshes, and other open, wet places.
Barrel cactus	*Ferocactus cylindraceus var. lecontei*	Watch List					X	X	2			
hotspring feathersedge	*Fimbristylis thermalis*								0	Marginal/Disjunct		
	Fissidens sublimbatus	Watch List							0			
	Fouquieria splendens								0	Marginal/Disjunct		
Clark Mountain green gentian	*Frasera albomarginata var. induta*					WL	X		2			
Ripley gilia	*Gilia ripleyi*						X	X	2	Delisted		
Clokey greasebush	*Glossopetalon clokeyi*	Covered				WL	X		2			
smooth dwarf greasebush	*Glossopetalon pungens var. glabrum*	Covered			S	WL	X		3		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			S	WL	X		3		Yes - over 4,000 ft	
Nevada greasebush	*Glossopetalon spinescens var. aridum*	Watch List							0			
American dry rock moss	*Grimmia americana*	Evaluation				T	X		2			
Utah sunflower	*Helianthus anomalus*								0	Delisted		
dune sunflower	*Helianthus deserticola*						X		1	Delisted		
Duran alumroot	*Heuchera duranii*								0	Delisted		
paleface rosemallow	*Hibiscus denudatus*								0	Marginal/Disjunct		
satintail	*Imperata brevifolia*					WL	X		2			
Red Rock Canyon aster	*Ionactis caelestis*	Covered			S	WL	X		3		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	X		2			
Jaeger ivesia	*Ivesia jaegeri*	Covered			S	WL	X		3		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*								0	Marginal/Disjunct		
thickleaf pepperwort	*Lepidium integrifolium*					WL			1			

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California sea lavender	*Limonium californicum*								0	Marginal/Disjunct		
dune linanthus	*Linanthus arenicola*						X	X	2	Delisted		
Alpine stinking lomatium	*Lomatium graveolens var. alpinum*	Evaluation					X	X	2	Delisted		
scrub lotus	*Lotus argyraeus var. multicaulis*				S	WL	X		3		unknown	Data not readily available
Holmgren lupine	*Lupinus polyphyllus*								0	Delisted		
	Lupinus uncialis				SS				1			
sand aster	*Machaeranthera ammophila*								0	Marginal/Disjunct		
desert hoary aster	*Machaeranthera canescens var. leucanthemifolia*								0	Delisted		
rayless tansy aster	*Machaeranthera grindelioides var. depressa*						X	X	2	Delisted		
California manroot	*Marah fabaceus*								0	Marginal/Disjunct		
California manroot	*Marah fabaceus var. agrestis*								0	Marginal/Disjunct		
polished blazingstar	*Mentzelia polita*				S	WL	X		3		Yes	Open areas in mixed desert shrub communities. 450-1370 m elevation in Nevada
bashful four-o'clock	*Mirabilis pudica*						X	X	2	Delisted		
pygmy muilla	*Muilla coronata*								0	Marginal/Disjunct		
silverleaf red loco	*Oxytropis besseyi var. argophylla*								0	Marginal/Disjunct		
	Panicum urvilleanum								0	Marginal/Disjunct		
	Pedicularis centranthera				SS				1			
Charleston pinewood lousewort	*Pedicularis semibarbata var. charlestonensis*	Covered					X	X	2	Delisted		
Beaver Dam breadroot	*Pediomelum castoreum*	Watch List			S	WL	X		3		Yes	Dry, sandy deserts. Recorded locations between 1,280 and 5,000 ft.
white margined beardtongue	*Penstemon albomarginatus*	Covered			S	T	X		3		Yes	Habitats are characterized by deep stable eolian sands, typically of the Bluepoint Soil series (Typic Torripsamments) and all Nevada populations occur on BLM managed lands.
yellow twotone beardtongue	*Penstemon bicolor ssp. bicolor*	Evaluation			S	WL	X		3		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 twotone beardtongue	*Penstemon bicolor ssp. roseus*	Watch List			S	WL	X		3		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			1			
Death Valley beardtongue	*Penstemon fruticiformis ssp. amargosae*	Evaluation			S	T	X		3		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*				S	WL			2			
Charleston beardtongue	*Penstemon leiophyllus var. keckii*	Covered				WL	X		2			
Jaeger beardtongue	*Penstemon thompsoniae ssp. jaegeri*	Covered			S	WL	X		3		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.

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desert rockdaisy	*Perityle intricata*						X	X	2	Delisted		
	Petalonyx thurberi ssp. gilmanii				SS				1			
spiny-node milkvetch	*Peteria thompsonae*								0	Marginal/Disjunct		
Aven Nelson phacelia	*Phacelia anelsonii*						X	X	2	Marginal/Disjunct		
Clarke phacelia	*Phacelia filiae*				S	WL	X		3		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*					WL	X		2			
Spring Mountains phacelia	*Phacelia hastata var. charlestonensis*						X	X	2			
nodding scorpionflower	*Phacelia laxiflora*						X	X	2	Marginal/Disjunct		
	Phacelia neglecta								0	Marginal/Disjunct		
Parish phacelia	*Phacelia parishii*	Covered			S	WL	X		3		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*						X	X	2	Marginal/Disjunct		
Quinn Canyon Range bladderpod	*Physaria hitchcockii var. confluens*					WL	X		2			
Hitchcock bladderpod	*Physaria hitchcockii var. hitchcockii*	Covered				WL			1			
	Physaria newberryi var. racemosa								0	Marginal/Disjunct		
ancient bristlecone pine	*Pinus longaeva*								0	Delisted		
pygmy poreleaf	*Porophyllum pygmaeum*	Evaluation			S	WL	X		3		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				WL	X		2			
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			S	WL	X		3		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.

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	Selaginella selaginoides								0	Marginal/Disjunct		
Utah spikemoss	*Selaginella utahensis*	Watch List				WL	X		2			
white checkermallow	*Sidalcea candida var. glabrata*								0	Marginal/Disjunct		
Clokey catchfly	*Silene clokeyi*	Covered				WL	X		2			
St. George blue-eyed grass	*Sisyrinchium radicatum*				S	WL	X		3		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			1			
fringed chocolate chip lichen	*Solorina spongiosa*						X		1			
Charleston tansy	*Sphaeromeria compacta*	Covered				WL	X		2			
	Splachnobryum obtusum	Watch List							0			
	Stenotus lanuginosus				SS				1			
	Stenotus lanuginosus var. andersonii								0	Marginal/Disjunct		
Charleston kittentails	*Synthyris ranunculina*	Covered				WL	X		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								0	Marginal/Disjunct		
loose flowered thelypody	*Thelypodium laxiflorum*								0	Marginal/Disjunct		
ovalleaf thelypody	*Thelypodium sagittatum ssp. ovalifolium*								0	Delisted		
Charleston grounddaisy	*Townsendia jonesii var. tumulosa*	Covered			S	WL	X		3		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				WL	X		2			
	Trisetum projectum								0	Marginal/Disjunct		
	Trixis californica								0	Marginal/Disjunct		
Charleston violet	*Viola charlestonensis*					WL	X		2			
Limestone violet	*Viola purpurea var. charlestonensis*	Covered							0			

Status Code Abbreviations

C	Candidate
D	Delisted
E	Endangered
PT	Proposed Threatened
T	Threatened
S	Sensitive
AT	At-risk Track List
WL	Watch List
PA	Protected Amphibian
EM	Emblem (State bird)
PR	Protected Reptile
CE	Critically Endangered