

F I N A L

Appendix J to S
Volume 3, Book 2

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C O Y O T E S P R I N G S
I N V E S T M E N T

P L A N N E D D E V E L O P M E N T P R O J E C T

Coyote Springs Investment Planned Development Project

Appendix J to S July 2008

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COYOTE SPRINGS INVESTMENT PLANNED DEVELOPMENT PROJECT

Appendix J to S



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Species Selection Process

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S.1 OVERVIEW OF SPECIES SELECTION APPROACH

The general approach for selecting Covered Species for the CSI MSHCP follows three steps resulting in the development of a decision matrix for designation of species (Table S-1). Designation of species in the CSI MSHCP refers to whether Section 10 coverage will be requested for species (Covered Species), or whether they will be considered Evaluation or Watch List Species.

STEP 1: DEVELOP PRELIMINARY LIST OF SPECIES CONSIDERED FOR COVERAGE

In coordination with local resource agencies, develop a preliminary master species list that includes species likely to be found across the Covered Area with a potential to be affected by the Covered Activities.

STEP 2: REVIEW OF RELEVANT INFORMATION

- To determine status of species:
 - Identify federal and state designations of species included in the preliminary master species list.
- To determine relative potential overlap with the proposed Covered Activities:
 - Identify potential range of species included in the preliminary master species list through application of the Southwestern Region GAP Analysis Program (SWReGAP).
 - Calculate acreage of potential range of each species on the preliminary master species list in the Covered Area and vicinity based on available geographic information system (GIS) layers of preferred habitat characteristics.
 - Assess the degree to which individual species may be affected by the proposed Covered Activities based on distribution of potential range across the Covered Area and vicinity.

STEP 3: DESIGNATION OF COVERED SPECIES, EVALUATION SPECIES, AND WATCH LIST SPECIES

Proposed designations for species are based upon: 1) status of species and 2) the relative potential overlap of the proposed Covered Activities on individual species.

Table S-1 Decision Matrix for Conducting a Designation of Species to be Considered for Coverage Under the Coyote Springs Investment Multi-Species Conservation Plan (CSI MSHCP)

Preliminary Selection Criteria	Species Status – Level of Protection Warranted			
	Federal Protection	State Protection	Designated Imperiled	Not Designated
Potential Overlap				
High	Covered Species	Covered Species	Evaluation Species	Watch List Species
Medium	Covered Species	Evaluation Species	Watch List Species	Watch List Species
Low	Evaluation Species	Watch List Species	Watch List Species	Watch List Species
Not Detectable	Watch List Species	Watch List Species	Watch List Species	Watch List Species

S.1.1 Framework of Species Selection Approach

S.1.2 Species Status

For the purposes of this analysis, a species' status is defined by level of protection designated by a state or federal resource agency. Levels of protection include:

- Federal Protection– status warrants listing under Endangered Species Act (ESA)
- BLM Designation – status warrants designation as a sensitive species by BLM in Nevada
- State Protection – status warrants state protection

- Global and State Conservation Status Ranks
- Imperiled – Global conservation status rank of G1 (critically imperiled) or G2 (imperiled) and/or state conservation status rank of S1 (critically imperiled) or S2 (imperiled). There is no statutory protection from these designations.
- Not identified as imperiled (global or state conservation status rank lower than 2). There is no statutory protection from these designations.

S.1.2.1 Federal Protection and Designations

FEDERAL PROTECTION

A species' status under the federal ESA is determined according to five listing factors. Based upon the level of threat (five listing factors), a species' status may warrant protection under the ESA. The ESA listing status for each species on the preliminary master species list has been obtained from the NNHP Rare Animal List (March 18, 2004) and the Rare Plant and Lichen List (April 1, 2005). The ESA status is then cross-referenced with the USFWS Threatened and Endangered Species System (<http://ecos.fws.gov>). Codes that are used to delineate the level of protection are defined as:

- FE = Federal Endangered;
- FT = Federal Threatened;
- FC = Federal Candidate; and
- XC2 = Former Category-2 Candidate, now species of concern.

BLM DESIGNATION

The Bureau of Land Management (BLM) classifies sensitive species. The classification for Nevada was obtained from the NNHP Rare Animal List (March 18, 2004) and the Rare Plant and Lichen List (April 1, 2005). Codes are defined as:

- S = Nevada Special Status Species: USFWS listed, proposed or candidate, or protected by Nevada state law.
- N = Nevada Special Status Species: designated sensitive by the BLM State Office.
- P = Proposed Nevada Special Status Species: designated proposed sensitive by BLM State Office.

S.1.2.2 State of Nevada Protection

Some species warrant additional protection by the State of Nevada. Species' status in Nevada has been obtained from the NNHP Rare Animal List (March 18, 2004) and the Rare Plant and Lichen List (April 1, 2005). This state status designation is then cross-referenced with a NatureServe (2006e) species comprehensive report, available from <http://www.natureserve.org/explorer/>.

In the state of Nevada, faunal species are designated as either warranting state protection or not under Nevada Revised Statute (NRS) Chapter 501. Flora species are designated under NRS Chapter 527 as:

- CE = Critically Endangered;
- CY = Protected as cactus, yucca, or Christmas tree; or
- P = Proposed for state listing.

S.1.2.3 Global and State Conservation Status Ranks

GLOBAL CONSERVATION STATUS

NatureServe and NNHP use the global conservation status rank (G-rank), which is a range-wide assessment of the species or ecological community (NatureServe 2006e). The ranks are defined as:

- G1 = Critically Imperiled: At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
- G2 = Imperiled: At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
- G3 = Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
- G4 = Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- G5 = Secure: Common; widespread and abundant.

Qualifiers are used to further define the rank:

- ? = Inexact Numeric Rank: Denotes some uncertainty about the numeric rank (e.g., G3? - believed most likely a G3, but some chance of either G2 or G4).
- Q = Questionable Taxonomy: Taxonomic distinctiveness of this entity at the current level is questionable. Resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or the inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority conservation priority.
- C = Captive or Cultivated Only: At present extant only in captivity or cultivation, or as a reintroduced population not yet established.
- T = Intraspecific Taxon: The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above for global conservation status ranks. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A T-rank cannot imply the subspecies or variety is more abundant than the species as a whole—for example, a G1T2 cannot occur. A vertebrate animal population, such as those listed as distinct population segments under the U.S. Endangered Species Act, may be considered an infraspecific taxon and assigned a T-rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.

In this species selection process, the global and state conservation status ranks are first taken from the NNHP Rare Animal List (March 18, 2004) and the Rare Plant and Lichen List (April 1, 2005), and then compared with species descriptions compiled by NatureServe (2006e) to determine the most current global and state conservation status ranks.

STATE CONSERVATION STATUS

The NNHP uses state conservation status ranks (S), which are similar to global ranks, except that the ranks are based on distribution within the state at the species or subspecies level, rather than distribution throughout the entire range (NNHP 2004). The ranks are defined as:

- S1 = Critically Imperiled: due to rarity, imminent threats, and/or biological factors.
- S2 = Imperiled: due to rarity and/or other demonstrable factors.
- S3 = Vulnerable: rare and local throughout its range, or with very restricted range, or otherwise vulnerable to extinction.
- S4 = Apparently Secure: though frequently quite rare in parts of its range, especially at its periphery.
- S5 = Secure: demonstrably secure, though frequently quite rare in parts of its range, especially at its periphery.

Qualifiers include:

- B = Breeding: Conservation status refers to the breeding population of the species in the state.
- N = Nonbreeding: Conservation status refers to the non-breeding population of the species in the state.

- M = Migrant: Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the state.

S.1.3 Assessment of Relative Potential Overlap

The relative overlap of the proposed Covered Activities with individual species potential ranges is designated as High, Medium or Low. These are defined as:

- High: An activity that has the potential to destroy or degrade most of the habitat within the Southern Nevada region for a species or its food source, to the extent that the species can no longer utilize the habitat.
- Medium: An activity that may destroy or degrade a portion of the habitat for a species within the Southern Nevada region or its food source to the extent that the local population may be reduced or compromised to some extent.
- Low: An activity that may occur across a very small percentage of the habitat within the Southern Nevada region for a species, or activities that would minimally degrade habitat.

The magnitude of the relative measure of overlap from the proposed Covered Activities is determined by considering several factors, including:

- Relative dependence on habitat within the Covered Area.
 - Habitat distribution within the Covered Area.
 - Habitat distribution within Nevada and the region (Lincoln and Clark counties).
 - Critical habitat distribution, if applicable.
- Potential overlap between species-specific threats and the proposed Covered Activities. This analysis was accomplished in the context of the United States Fish and Wildlife Service (USFWS) listing criteria which include:
 - The present or threatened destruction, modification, or curtailment of its habitat or range;
 - Over-utilization for commercial, recreational, scientific, or educational purposes;
 - Disease or predation;
 - The inadequacy of existing regulatory mechanisms; and
 - Other natural or manmade factors affecting its continued existence.

S.1.4 Designation Recommendations

A decision matrix (Table S-1) was used to identify species categories by considering species status and potential overlap. Three categories of species designations are assigned through this process. They include: Covered, Evaluation, and Watch List Species, described in Section S.1.4.1.

The final recommendations for the level of species coverage will be based on adequate description of Covered Activities and an assessment of the overlap of those activities with species' potential ranges. This may require revisiting the level of coverage under the CSI MSHCP for selected species during the process.

S.1.4.1 Species Designation Categories

To best utilize resources and protection efforts, species considered for some level of protection and/or consideration under this MSHCP have been designated hierarchically as Covered, Evaluation or Watch List Species using a process briefly presented below and further described in Appendix F. Criteria for these designations were adapted from USFWS guidelines and the Clark County Multiple Species Habitat Conservation Plan and Environmental Impact Statement (RECON 2000).

COVERED SPECIES (INCIDENTAL TAKE REQUESTED)

Covered Species are those species for which coverage under an incidental take permit (ESA Section 10(a)(1)(B) permit) is requested. As described in the USFWS Region 1 Guidelines for Determining Covered Species Lists (1995), HCP applicants should consider:

- All federally listed species likely to be incidentally taken during the life of the permit,
- State listed species that are likely to be incidentally taken during the life of the permit,
- Those species for which sufficient information is known and for which adequate existing management prescriptions exist or can be easily defined and implemented sufficient to support an application for an incidental take permit,
- Those species about which a great deal of information may not be available but which are definitively known to share habitat with other Covered Species. For those species, it is believed that the management prescriptions (existing or easily defined) for other Covered Species would benefit sufficiently to support an application for an incidental take permit, and
- Those species whose federal listing appears imminent, unless conservation measures are instituted which would be likely to assure survival and recovery of such species in the wild.

EVALUATION SPECIES (FURTHER ASSESSMENT RECOMMENDED)

Evaluation Species in this CSI MSHCP are those species for which additional information is required or for which sufficient management prescriptions are unlikely to be defined and implemented sufficiently to support an application for an incidental take permit. The application to the USFWS will not initially request an incidental take permit for those species. However, as additional information is accumulated and as management prescriptions are developed, CSI may submit amendments to this CSI MSHCP together with requests that certain Evaluation Species be added to the list of Covered Species. Evaluation Species include:

- Federally listed species where there is a low likelihood of incidental take during the term of the permit,
- State listed species or species designated as imperiled or critically imperiled, where there is a likelihood to be incidentally taken during the life of the permit,
- Those species for which there is insufficient information and for which imangement prescriptions that exist, or could be easily defined and implemented, would be insufficient to support an application for an incidental take permit, and
- Those species where little information is available but they are known to share habitat with Covered Species. These species may benefit from the management prescriptions proposed to be implemented for the Covered Species in this CSI MSHCP.

WATCH LIST SPECIES (NO FURTHER CONSIDERATION)

Watch List Species are those species with inadequate information to assess population range, current status, or conservation potential and includes those species considered not to be at risk during the planning horizon of the MSHCP. Watch List Species include:

- Federally listed species where there is no likelihood for incidental take during the life of the permit,
- State listed species where there is a low likelihood to be incidentally taken during the life of the permit,
- Species designated as imperiled where there is a low to medium likelihood to be incidentally taken during the life of the permit,
- All species that have not been designated by state or federal agencies.

S.2 SPECIES SELECTION PROCESS

S.2.1 Preliminary List of Species

A preliminary list of species to be considered was developed in cooperation with USFWS, Bureau of Land Management (BLM) and the Science Advisory Committee (SAC) (Table S-2). Species identified in a January 7, 2005, letter from the USFWS (File No. 1-5-05-SP-410) as having the potential to occur within the Covered Area were considered for coverage by this MSHCP. The species list includes desert tortoise, Moapa dace, Yuma clapper rail, southwestern willow flycatcher and yellow-billed cuckoo. The Covered Activities may also have a potential to affect habitat for additional special-status species.

ESA take prohibition applies to fish and wildlife species only. However, ESA Section 9 prohibits unlawful removal and reduction to possession, or malicious damage or destruction of any endangered plant under federal control. Additionally, Section 9 prohibits acts to remove, cut, dig up, or damage or destroy an endangered plant in nonfederal areas in knowing violation of any state law or in the course of criminal trespass. Therefore, this CSI MSHCP will consider fish, wildlife, and plants.

S.2.2 Species Status

The status of each species was defined in a variety of ways and each is described below. The status identified by species is provided (Table S-3). State and federal status definitions were obtained from a variety of sources previously described in Section S.2.1.

S.2.3 Relative Measure of Potential Overlap with Covered Activities

S.2.3.1 Species Occurrence and Potential Range in Covered Area

The degree to which individual species are dependent on the Covered Area for habitat and potential level of vulnerability of individual species to the Covered Activities depends, in part, on whether suitable habitat is available and whether species utilize that habitat. To determine potential use of habitat on the Covered Area, the SWReGAP database was employed. Habitat availability was extrapolated from SWReGAP data for vegetation, soils, and geologic information.

The potential range for species within the Covered Area was estimated (Table S-4). Acreage estimates are separated by the Development Area (area proposed for development), the Coyote Springs Resource Management Area (reserve area proposed for conservation), Lincoln County, Clark County, and Nevada. Because of the coarseness of the available GIS data and associated habitat models, these acreages are not intended to identify the exact amount of potential habitat or the exact locations of potential habitat within the Covered Area. Rather, the use of these acreages is to identify the relative likelihood that a species and/or its habitat have the potential to occur within the Covered Area. For this reason, the more general term “potential range” is used within this CSI MSHCP to refer to the acreages calculated using habitat information.

Due to a discrepancy in our ability to discriminate between specific habitat types in aquatic versus terrestrial habitat, a more detailed analysis of habitat use by terrestrial species was possible. Habitat use is defined in a general sense for aquatic species, whereas detailed habitat data including elevation, vegetation type, landform, soil composition and distance to water, are available for terrestrial species. This estimate of potential habitat is coarse and is only for gaining a sense of whether the species has the potential to be located in the Covered Area and, if so, in what general area of the Covered Area. This information has been included at the end of this appendix in Tables S-7 and S-8.

Table S-2 List of Species Considered for Coverage

Common Name	Scientific Name
<i>Fish Species</i>	
White River springfish	<i>Crenichthys baileyi baileyi</i>
Moapa White River springfish	<i>Crenichthys baileyi moapae</i>
Hiko White River springfish	<i>Crenichthys baileyi grandis</i>
Moapa dace	<i>Moapa coriacea</i>
Virgin River chub	<i>Gila seminuda</i>
Moapa speckled dace	<i>Rhinichthys osculus moapae</i>
<i>Reptiles</i>	
Desert tortoise	<i>Gopherus agassizii</i>
Banded gecko	<i>Coleonyx variegates</i>
Desert iguana	<i>Dipsosaurus dorsalis</i>
Large spotted leopard lizard	<i>Gambelia wislizenii wislizenii</i>
Banded Gila monster	<i>Heloderma suspectum cinctum</i>
Northern desert horned lizard	<i>Phrynosoma platyrhinos platyrhinos</i>
Glossy snake	<i>Arizona elegans</i>
California (common) kingsnake	<i>Lampropeltis getulus californiae</i>
Spotted leaf-nose snake	<i>Phyllorhynchus decurtatus</i>
Western long-nose snake	<i>Rhinocheilus lecontei lecontei</i>
(Sonoran) Lyre snake	<i>Trimorphodon biscutatus lambda</i>
<i>Amphibians</i>	
Relict leopard frog	<i>Rana onca</i>
Arizona toad	<i>Bufo microscaphus</i>
<i>Mammals</i>	
Kit fox	<i>Vulpes macrotis</i>
<i>Birds</i>	
Western burrowing owl	<i>Athene cunicularia hypugea</i>
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Phainopepla	<i>Phainopepla nitens</i>
<i>Invertebrates</i>	
Moapa pebblesnail	<i>Fluminicola avernalis</i>
Amargosa naucorid	<i>Pelocoris shoshone shoshone</i>
Moapa Warm Spring riffle beetle	<i>Stenelmis moapa</i>
Grated tryonia	<i>Tryonia clathrata</i>
<i>Plants</i>	
Three-corner milkvetch	<i>Astragalus geyeri var triquetrus</i>
Sheep Mountain milkvetch	<i>Astragalus amphioxys var. musimonum</i>
Nye milkvetch	<i>Astragalus nyensis</i>
Sticky ringstem	<i>Anulocaulis leisolenus</i>
White bearpoppy	<i>Arctomecon merriamii</i>
Meadow Valley sandwort	<i>Arenaria stenomeres</i>
Las Vegas buckwheat	<i>Eriogonum corymbosum var. nilesii</i>
Sticky buckwheat	<i>Eriogonum viscidulum</i>
White-margined beardtongue	<i>Penstemon albomarginatus</i>
Yellow two-toned beardtongue	<i>Penstemon bicolor</i> spp. <i>Bicolor</i>

Table S-3 Status of Species Considered for Evaluation as Defined by ESA, BLM, State of Nevada, and NNHP Global Rank, State Rank, Global/State Imperiled Considered for Coverage Under This MSHCP¹

Common Name	Federal Protection	BLM Status	State Protection	Global Rank	State Rank	Global/State Imperiled ²	Occurs in Covered Area	Occurs in Development Area
<i>Fish Species</i>								
White River springfish	FE	S	Yes	G2T1	S1	yes/yes	no	no
Moapa White River springfish			Yes	G2T2	S2	yes/yes	no	no
Hiko White River springfish	FE	S	Yes	G2T1	S1	yes/yes	no	no
Moapa dace	FE	S	Yes	G1	S1	yes/yes	no	no
Virgin River chub	FE, Virgin River population only	N	Yes	G1T1Q	S1	yes/yes	no	no
Moapa speckled dace		N	Yes	G5T1	S1	yes/yes	no	no
<i>Reptiles</i>								
Desert tortoise	FT	S	Yes	G4	S2S3	no/yes	yes	yes
Western banded gecko				G5	S4	no/no	yes	yes
Desert iguana				G5	S3	no/no	yes	yes
Large spotted leopard lizard				G5	S4	no/no	yes	yes
Banded Gila monster	XC2	N	Yes	G4T4	S2	no/yes	yes	yes
Northern desert horned lizard				G5T5	S4	no/no	yes	yes
Glossy snake				G5	S4	no/no	yes	yes
California (common) kingsnake				G5T5	S4	no/no	yes	yes
Spotted leaf-nose snake				G5	S4	no/no	yes	yes
Western long-nose snake				G5	S5	no/no	yes	yes
(Sonoran) Lyre snake				G5T5	S4	no/no	yes	no
<i>Amphibians</i>								
Relict leopard frog	FC		Yes	G1	S1	yes/yes	no	no
Arizona toad	XC2			G3G4	S2	no/yes	no	no
<i>Mammals</i>								
Kit fox				G4	S3	no/no	yes	yes
<i>Birds</i>								
Western burrowing owl	XC2	N	Yes	G4T4	S3B	no/no	yes	yes
Western yellow-billed cuckoo	FC	S	Yes	G5T3	S1B	no/yes	no	no
Southwestern willow flycatcher	FE	S	Yes	G5T1T2	S1B	yes/yes	no	no
Phainopepla		N	Yes	G5	S2B	no/yes	yes	yes
Yuma clapper rail	FE		Yes	G5T?	S1	no/yes	no	no

Table S-3 Status of Species Considered for Evaluation as Defined by ESA, BLM, State of Nevada, and NNHP Global Rank, State Rank, Global/State Imperiled Considered for Coverage Under This MSHCP¹

Common Name	Federal Protection	BLM Status	State Protection	Global Rank	State Rank	Global/State Imperiled ²	Occurs in Covered Area	Occurs in Development Area
<i>Invertebrates</i>								
Moapa pebblesnail	XC2			G1G2	S1S2	yes/yes	no	no
Amargosa naucorid		N		T1G1G3	S1	yes/yes	no	no
Moapa Warm Spring riffle beetle	XC2	N		G1	S1	yes/yes	no	no
Grated tryonia	XC2			G2	S2	yes/yes	no	no
<i>Plants</i>								
Three-corner milkvetch	XC2	S	CE ³	G4T2T3	S2S3	no/yes	yes	yes
Sheep Mountain milkvetch	XC2	N		G5T2	S2	no/yes	no	no
Nye milkvetch				G3	S3	no/no	yes	yes
Sticky ringstem				G4	S2	no/yes	yes	yes
White bearpoppy	XC2	N		G3	S3	no/no	yes	yes
Meadow Valley sandwort				G2	S2	yes/yes	yes	no
Las Vegas buckwheat	FC	N		T2T3?QG5	S1S2	no/yes	Yes	yes
Sticky buckwheat	XC2	S	CE	G2	S2	yes/yes	Yes	no
White-margined beardtongue	XC2	N		G2	S2	yes/yes	Yes	no
Yellow two-toned beardtongue	XC2	N		G3T2Q	S2	yes**/yes	No	no
¹ Sources: Nevada Natural Heritage Program Rare Animal List (March 18, 2004) and the Rare Plant and Lichen List (April 1, 2005). The Nevada status was then cross-referenced with a NatureServe (2006) species comprehensive report (available from http://www.natureserve.org/explorer/). ² Denotes a global rank of G1 or G2 and/or a state rank of S1 or S2. ³ CE = critically endangered.								

Table S-4 Potential Species Habitat within the Covered Area and Critical Habitat, Where Designated

Scientific Name	Common Name	Potential Range In Nevada (acres [ac]) ²	Potential Range in Lincoln County (ac)	Potential Range in Clark County (ac)	Potential Range in Covered Area (ac) ⁵	Potential Range in Covered Area and a 1 Mile Buffer (ac)	Potential Range in Development Area (ac) ⁶	Reserve Area (ac)
Aquatic Species¹								
Fishes								
<i>Moapa coriacea</i>	Moapa dace	See Footnote 1	Does not occur within Lincoln County	See Footnote 1	Does not occur within Covered Area ³	Does not occur within Lincoln County	Does not occur within Covered Area ³	Does not occur within Covered Area ³
<i>Gila seminuda</i>	Virgin River chub – Muddy River population	See Footnote 1	Does not occur within Lincoln County	See Footnote 1	Does not occur within Covered Area ³	Does not occur within Lincoln County	Does not occur within Covered Area ³	Does not occur within Covered Area ³
<i>Gila seminuda</i> – Critical Habitat	Virgin River chub – Critical Habitat	Not calculated	0	1,145	0	0	0	0
<i>Crenichthys baileyi baileyi</i>	White River springfish	See Footnote 1	Limited to Pahrnagat Valley, See Footnote 1	Does not occur in Clark County	Does not occur within Covered Area ³	Does not occur within Covered Area with a 1 mile buffer ³	Does not occur within Covered Area ³	Does not occur within Covered Area ³
<i>Crenichthys baileyi grandis</i>	Hiko White River springfish	See Footnote 1	Limited to Pahrnagat Valley, See Footnote 1	Does not occur in Clark County	Does not occur within Covered Area ³	Does not occur within Covered Area with a 1 mile buffer ³	Does not occur within Covered Area ³	Does not occur within Covered Area ³
<i>Crenichthys baileyi moapae</i>	Moapa White River springfish	See Footnote 1	Does not occur within Lincoln County	See Footnote 1	Does not occur within Covered Area ³	Does not occur within Covered Area with a 1 mile buffer ³	Does not occur within Covered Area ³	Does not occur within Covered Area ³
<i>Rhinichthys osculus moapae</i>	Moapa speckled dace	See Footnote 1	Does not occur within Lincoln County	See Footnote 1	Does not occur within Covered Area ³	Does not occur within Covered Area with a 1 mile buffer ³	Does not occur within Covered Area ³	Does not occur within Covered Area ³
Invertebrates								
<i>Fluminicola avernalis</i>	Moapa pebblesnail	See Footnote 1	See Footnote 1	See Footnote 1	Does not occur within Covered Area ³	Does not occur within Covered Area with a 1 mile buffer ³	Does not occur within Covered Area ³	Does not occur within Covered Area ³
<i>Pelocoris shoshone shoshone</i>	Amargosa naucorid	See Footnote 1	See Footnote 1	See Footnote 1	Does not occur within Covered Area ³	Does not occur within Covered Area with a 1 mile buffer ³	Does not occur within Covered Area ³	Does not occur within Covered Area ³
<i>Stenelmis moapa</i>	Moapa Warm Spring riffle beetle	See Footnote 1	Does not occur within Lincoln County	See Footnote 1	Does not occur within Covered Area ³	Does not occur within Lincoln County	Does not occur within Covered Area ³	Does not occur within Covered Area ³
<i>Tryonia clathrata</i>	Grated tryonia	See Footnote 1	May occur in Pahrnagat Valley, See Footnote 1	See Footnote 1	Does not occur within Covered Area ³	Does not occur within Covered Area with a 1 mile buffer ³	Does not occur within Covered Area ³	Does not occur within Covered Area ³

Table S-4 Potential Species Habitat within the Covered Area and Critical Habitat, Where Designated

Scientific Name	Common Name	Potential Range In Nevada (acres [ac]) ²	Potential Range in Lincoln County (ac)	Potential Range in Clark County (ac)	Potential Range in Covered Area (ac) ⁵	Potential Range in Covered Area and a 1 Mile Buffer (ac)	Potential Range in Development Area (ac) ⁶	Reserve Area (ac)
Terrestrial Species								
Reptiles								
<i>Gopherus agassizii</i>	Desert tortoise	5,780,363	1,283,9412	3,014,832	36,655	55,354	21,454	12,176
<i>Gopherus agassizii</i> – Critical Habitat	Desert tortoise – Critical Habitat	6,872,432	270,302	955,780	36,263	59,004	21,454	12,508
<i>Coleonyx variegates</i>	Western banded gecko	4,168,693	1,684,967	2,109,429	37,311	59,813	21,454	12,587
<i>Dipsosaurus dorsalis</i>	Desert iguana	3,133,470	349,482	2,158,996	36,314	53,511	21,603	11,818
<i>Gambelia wislizenii wislizenii</i>	Large spotted leopard lizard	43,197,579	4,255,896	4,044,374	33,980	58,478	21,454	12,526
<i>Heloderma suspectum cinctum</i>	Banded Gila monster	4,523,808	972,465	3,426,573	33,958	57,694	21,737	12,221
<i>Phrynosoma platyrhinos platyrhinos</i>	Northern desert horned lizard	43,985,376	4,864,129	4,558,523	34,041	62,686	21,454	12,587
<i>Arizona elegans</i>	Glossy snake	6,347,025	1,497,854	3,059,859	33,724	58,1967	21,454	12,270
<i>Lampropeltis getulus californiae</i>	California (common) kingsnake	29,267,137	4,910,055	4,744,912	34,041	62,686	21,454	12,587
<i>Phyllorhynchus decurtatus</i>	Spotted leaf-nosed snake	1,186,995	135,618	928,749	12,359	20,856	7,053	5,306
<i>Rhinocheilus lecontei lecontei</i>	Western long-nose snake	273,546	33,189	71,760	530	897	482	48
<i>Trimorphodon biscutatus lambda</i>	(Sonoran) Lyre snake	1,787,733	624,714	1,134,829	0	3,297	0	0
Amphibians								
<i>Bufo microscaphus</i>	Arizona toad	38,672	21,745	18,542	0	39	0	24
<i>Rana onca</i>	Relict leopard frog	519	36	454	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1

Table S-4 Potential Species Habitat within the Covered Area and Critical Habitat, Where Designated

Scientific Name	Common Name	Potential Range In Nevada (acres [ac]) ²	Potential Range in Lincoln County (ac)	Potential Range in Clark County (ac)	Potential Range in Covered Area (ac) ⁵	Potential Range in Covered Area and a 1 Mile Buffer (ac)	Potential Range in Development Area (ac) ⁶	Reserve Area (ac)
Mammals								
<i>Vulpes macrotis</i>	Kit fox	35,366,488	4,941,249	4,232,454	34,041	59,813	21,454	12,587
Birds								
<i>Athene cunicularia</i>	Western burrowing owl	49,312,012	4,888,528	4,245,026	33,993	58,912	21,454	12,539
<i>Coccyzus americanus</i>	Yellow-billed cuckoo	2,047	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher	1,665,003	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1
<i>Empidonax traillii extimus</i> –Critical Habitat	Southwestern willow flycatcher – Critical Habitat	Not calculated	None	4,001	0	0	0	0
<i>Phainopepla nitens</i>	Phainopepla	2,762,658	1,023,683	1,185,636	443	1,356	367	76
<i>Rallus longirostris yumanensis</i>	Yuma clapper rail	0.0	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1
Plants³								
<i>Astragalus geyeri</i> var <i>triquetrus</i>	Threecorner milkvetch	See Footnote 4	See Footnote 4	See Footnote 4	8,864	14,051	3,835	5,209
<i>Astragalus amphioxys</i> var <i>musimonum</i>	Sheep Mountain milkvetch	See Footnote 4	See Footnote 4	See Footnote 4	0	18	0	0
<i>Astragalus nyensis</i>	Nye milkvetch	See Footnote 4	See Footnote 4	See Footnote 4	33,795	61,148	21,454	12,341
<i>Anulocaulis leisolenus</i>	Sticky ringstem	See Footnote 4	See Footnote 4	See Footnote 4	1,503	2,508	1,503	0
<i>Arctomecon merriamii</i>	White bearpoppy	See Footnote 4	See Footnote 4	See Footnote 4	34,065	62,725	21,454	12,611
<i>Arenaria stenomeres</i>	Meadow Valley sandwort	See Footnote 4	See Footnote 4	See Footnote 4	0	584	0	0
<i>Eriogonum corymbosum</i> var <i>nilesii</i>	Las Vegas buckwheat	See Footnote 4	See Footnote 4	See Footnote 4	10	10	10	0
<i>Eriogonum viscidulum</i>	Sticky buckwheat	See Footnote 4	See Footnote 4	See Footnote 4	412	1,182	0	412

Table S-4 Potential Species Habitat within the Covered Area and Critical Habitat, Where Designated

Scientific Name	Common Name	Potential Range In Nevada (acres [ac]) ²	Potential Range in Lincoln County (ac)	Potential Range in Clark County (ac)	Potential Range in Covered Area (ac) ⁵	Potential Range in Covered Area and a 1 Mile Buffer (ac)	Potential Range in Development Area (ac) ⁶	Reserve Area (ac)
<i>Penstemon albomarginatus</i>	White-margined beardtongue	See Footnote 4	See Footnote 4	See Footnote 4	1,892	7,989	599	1,293
<i>Penstemon bicolor</i> spp <i>Bicolor</i>	Yellow two-toned beardtongue	See Footnote 4	See Footnote 4	See Footnote 4	0	2,022	0	0
<p>¹Note that potential range was not mapped for these species, because extent of potential overlap of covered activities on these species could not be appropriately determined spatially.</p> <p>²Potential range within Nevada based upon table created for SWReGAP program, obtained from Ken Boykin at New Mexico State University.</p> <p>³Species is dependent upon perennial waters, which do not occur within the Covered Area or vicinity.</p> <p>⁴Potential range within Nevada was not calculated for plant species, because there is not enough information about the extent of their ranges.</p> <p>⁵Covered Area includes the Development Area, Coyote Springs Reserve Management Area, and utility corridor ROW.</p> <p>⁶Some species occur throughout the entire Development Area, and is reflected by the maximum official acreage.</p>								

S.2.3.2 Summary of Potential Threats to Special-Status Species

Potential threats to special-status species that may occur within the Covered Area are summarized in Table S-5. These potential threats are classified based on ESA Section 4(a)(1)'s determination of listing factors:

- (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) over-utilization for commercial, recreational, scientific, or educational purposes;
- (C) disease or predation;
- (D) the inadequacy of existing regulatory mechanisms; or
- (E) other natural or manmade factors affecting its continued existence.

CSI activities that may potentially affect species designated through the species selection process include ground-disturbing activities (e.g., laying foundation down for buildings, road construction, creating parks, transmission pipeline construction), water management activities (e.g., groundwater withdrawal, storage facilities, reuse and recharge), and storm water control and management (creation of storm water facilities and maintenance). Many of these activities may fall into the ESA-classified threats already identified for many of the considered species. Overlap of Covered Activities may exist between class (A) habitat degradation and (E) other natural or manmade factors threats.

S.2.4 Species Designations for the CSI MSHCP

Of the 38 species assessed, five are designated as potential Covered Species, seven as potential Evaluation Species, and 28 as potential Watch List Species (Table S-6). Coverage is not requested for all species identified in the initial USFWS letter, as not all of those species were determined to be incidentally taken as a result of the Covered Activities. The CSI MSHCP will cover two species (Moapa dace and desert tortoise) and their habitats that are currently protected under the federal ESA and three species (Virgin River chub, banded Gila monster, Western burrowing owl) that are currently protected by the State of Nevada. These species have the potential to be incidentally taken during the life of the permit. Two species (southwestern willow flycatcher and Yuma clapper rail) with federal protection are included as potential Evaluation Species because of the low potential for an overlap with the Covered Activities. An additional wildlife species (relict leopard frog) would be evaluated that may be federally listed in the foreseeable future or within the life of the permit. Two plant species (three-corner milkvetch and sticky buckwheat) listed as critically endangered by the state of Nevada will be included as potential Evaluation Species. These plant species are not currently listed under the federal ESA.

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Table S-5 Species Potentially Affected by Covered Activities and Potential Overlap of Identified Threats to Species Persistence

Common Name	Description of Potential Threat	Potential Overlap with Covered Activities	Source	Notes
<i>Fish Species</i>				
White River springfish	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Habitat disturbance and introductions of exotic fishes. Presence of cattle may be incompatible with effective protection. Potential future threats exist from proposed ground and surface water development projects. <p><u>(C) Disease and predation</u></p> <ul style="list-style-type: none"> Competition with nonnative fishes and predation by nonnative fishes including convict cichlides (<i>Cichlasomanigro fasciatum</i>), shortfin mollies (<i>Poecilia mexicana</i>), and mosquitofish (<i>Gambusia affinis</i>). <p><u>(D) Inadequate regulatory mechanisms</u></p> <ul style="list-style-type: none"> Majority of habitat is privately owned. Coordination is required between federal, state, private interests for protection of this species. <p><u>(E) Other manmade or natural factors</u></p> <ul style="list-style-type: none"> Endemic to one spring system, Ash Spring. 	No overlap anticipated; upstream of Covered Area	NatureServe 2006e, Taylor et al. 1989, cited in NatureServe 2006e, NDOW 2005c, Courtenay et al. 1985 and Tippie et al. 1991, cited in NDOW 2005c.	
Moapa White River springfish	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Water loss. Habitat modifications. Key concerns: habitat degradation, alteration, and fragmentation, current and potential future threats from surface and groundwater development. <p><u>(C) Disease and predation</u></p> <ul style="list-style-type: none"> Competition and predation by nonnative fishes (including tilapia and mollies). <p><u>(D) Inadequate regulatory mechanisms</u></p> <ul style="list-style-type: none"> Some key habitats occur on private lands but do not have landowner agreements for protection and long-term security. <p><u>(E) Other manmade or natural factors</u></p> <ul style="list-style-type: none"> Endemic to headwater springs of Muddy River, Clark County. 	Potential indirect overlap	NatureServe 2006e, NDOW 2005c, USFWS 1996	
Hiko White River springfish	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Habitat disturbance and introductions of exotic fishes. Habitat alteration from irrigated pastures and hay crops near White River. Potential effects of future ground and surface water development. <p><u>(D) Inadequate regulatory mechanisms</u></p> <ul style="list-style-type: none"> Occupied habitat occurs on private land and protection is needed for long-term security of populations. <p><u>(E) Other manmade or natural factors</u></p> <ul style="list-style-type: none"> Endemic to Crystal and Hiko springs (unclear if extirpated in Hiko Spring). 	No overlap anticipated; upstream of Covered Area	NatureServe 2006e, NDOW 2005c, Scoppettone and Rissler 2002, cited in NatureServe 2006e	
Moapa dace	<p><u>A) Habitat degradation</u></p> <ul style="list-style-type: none"> Introduction of blue tilapia (<i>Oreochromis aurea</i>). Loss of habitat due to water diversions and impoundments. Loss of habitat due to reductions to surface spring flows resulting from groundwater pumping, and physical alterations of springs and associated stream channels (e.g., Warm Springs Area). Cipoletti weir gaging station impounds riverine habitat, hinders upstream migration, and reduces river water temperature to below that preferred by Moapa dace. Vulnerability to catastrophic events, such as the fire that killed or displaced dace in the upper Refuge Stream, given the restricted range of the species. Most sensitive to water development of the four endemic fish species to the Muddy River. <p><u>(C) Disease or predation</u></p> <ul style="list-style-type: none"> Introduction of nonnative fish species (mosquito fish [<i>Gambusia affinis</i>] and shortfin mollies [<i>Poecilia mexicana</i>]) and parasites (tapeworms [<i>Bothriocephalus acheilognath</i>], nematodes [<i>Contracaecum</i> spp.] and anchor worms [<i>Lernaea</i> spp]). 	Potential indirect overlap	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Deacon and Bradley 1972, Scoppettone et al. 1998, NDOW 2005c <p><u>(C) Disease or predation</u></p> <ul style="list-style-type: none"> Deacon and Bradley 1972, Cross 1976, Scoppettone et al. 1987, Scoppettone 1993, Wilson et al. 1966, Heckman 1988 	

Table S-5 Species Potentially Affected by Covered Activities and Potential Overlap of Identified Threats to Species Persistence

Common Name	Description of Potential Threat	Potential Overlap with Covered Activities	Source	Notes
Virgin River chub	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Habitat alteration (water impoundments and diversions). Floods. Decline may have been related to cumulative effects of changes in flow, water quality, and substrate, channelization. <p><u>(C) Disease or predation</u></p> <ul style="list-style-type: none"> Decline may have been related to cumulative effects of parasitism and the establishment of non-native fish species. <p><u>(E) Other manmade or natural factors</u></p> <ul style="list-style-type: none"> Toxic spills threaten persistence of Virgin River chub. 	Potential indirect overlap	(USFWS, FR, 24 July 1995), USFWS 2001c, NDOW 2005c, NatureServe 2006e	
Moapa speckled dace	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Vulnerable to habitat alteration. May be particularly sensitive to reductions in water quality and quantity in the Muddy River. <p><u>(C) Disease or predation</u></p> <ul style="list-style-type: none"> Introduction and proliferation of nonnative fishes is a threat. 	Potential indirect overlap	USFWS 1996, NDOW 2005c	
Reptiles				
Desert Tortoise	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Loss of habitat from construction projects such as roads, housing and energy developments, and conversion of habitat to agriculture. Grazing and off-highway vehicle activity have degraded additional habitat. Fire (recurrent fire due to proliferation of non-native plants). <p><u>(B) Overutilization</u></p> <ul style="list-style-type: none"> Significant population declines. Illegal collection. Release of captives into wild populations may be detrimental. <p><u>(C) Disease or predation</u></p> <ul style="list-style-type: none"> Predation on juvenile tortoise by common ravens, coyotes (<i>Canis latrans</i>) and kit foxes (<i>Vulpes macrotis</i>). Upper respiratory tract disease (URTD). Changes in ecological conditions that increase susceptibility to disease (e.g. proliferation of non-native plants). <p><u>(D) Inadequate regulatory mechanisms</u></p> <ul style="list-style-type: none"> Varying levels of protection in Nevada, California, Arizona, and Utah. <p><u>(E) Other manmade or natural factors</u></p> <ul style="list-style-type: none"> Collisions with vehicles on paved and unpaved roads. Livestock and feral burros may compete for food in some cases. Continued drought can cause physiological stress that may cause other threats to be more pronounced. 	Potential overlap	USFWS 2006, 1994a, 1990, NDOW 2005c, Brooks and Esque 2002, Brown et al. 2002, 1994	
Glossy snake	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Intensive agricultural development and urbanization probably eliminated or reduced some populations, but presently in most areas this species does not appear to be very threatened. 	Potential overlap	NatureServe 2006e	
Western banded gecko	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> In northern part of its range, local threats include conversion of habitat to human uses (e.g., development of retirement communities and associated infrastructure). <p><u>Overutilization</u></p> <ul style="list-style-type: none"> Potential pressure from commercial collection. 	Potential overlap	NatureServe 2006e, NDOW 2005c	
Desert iguana	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Habitat loss or degradation due to conversion to human uses (agriculture, commercial and residential development, roads). Populations along busy highways presumably reduced as a result of road mortality. These threats affect a relatively small portion of the overall range. <p><u>Overutilization</u></p> <ul style="list-style-type: none"> Potential pressure from commercial collection. 	Potential overlap	NatureServe 2006e, NDOW 2005c	

Table S-5 Species Potentially Affected by Covered Activities and Potential Overlap of Identified Threats to Species Persistence

Common Name	Description of Potential Threat	Potential Overlap with Covered Activities	Source	Notes
Large spotted leopard lizard	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Barriers that result in separation of suitable habitat: Busy highway or highway with obstructions presumably prevented lizards from crossing successfully, Major river, lake, pond, or deep marsh, and Urbanized area dominated by buildings and pavement. <p><u>(B) Overutilization</u></p> <ul style="list-style-type: none"> Potential pressure from commercial collection. <p><u>(E) Other manmade or natural factors</u></p> <ul style="list-style-type: none"> Tend to have small home ranges. 	Potential overlap	NatureServe 2006e, NDOW 2005c	No information found for large spotted leopard lizard; threats are for <i>G. wislizenii</i> , not the subspecies.
Banded Gila monster	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Habitat loss due to urban development. Off-road vehicles and associated events, causing habitat degradation and direct mortality. Equestrian trail rides, dog field trails, flying machine events (remote and piloted), skydiving, and associated parking for these events may result in possible impacts. <p><u>(B) Overutilization</u></p> <ul style="list-style-type: none"> Poaching for black market sales thought to be contributing to decline. <p><u>(C) Disease or predation</u></p> <ul style="list-style-type: none"> Pet encounters thought to be contributing to decline. <p><u>(D) Inadequate regulatory mechanisms</u></p> <ul style="list-style-type: none"> Stringent prohibitions against exploitation and unnecessary killing are needed.. <p><u>(E) Other manmade or natural factors</u></p> <ul style="list-style-type: none"> Unwarranted persecution due to its poisonous bite. 	Potential overlap	NDOW 2005b, RECON 2000, Jennings and Hayes 1994	
California (common) kingsnake	No information available.	More information needed	NatureServe 2006e	
Northern desert horned lizard	<p><u>(B) Overutilization</u></p> <ul style="list-style-type: none"> Potential pressure from commercial collection. <p><u>(C) Disease or predation</u></p> <ul style="list-style-type: none"> Invasion of exotic fire ants may threaten this species. 	Potential indirect overlap	NatureServe 2006e, NDOW 2005c	
Spotted leaf-nosed snake	No information available.	More information needed	NatureServe 2006e	
Western long-nose snake	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Locally, some habitat lost or degraded due to urbanization or conversion to intensive agricultural uses 	Potential overlap	NatureServe 2006e	
(Sonoran) Lyre snake	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Habitat loss. 	Potential overlap	NatureServe 2006e, NDOW 2005c	
Amphibians				
Relict leopard frog	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Water development within the historic range of the frog, including impoundment of water, loss of the natural flow regime, damming of the Colorado River and subsequent inundation of suitable habitat. Lowering of the water table via diversions and ground water pumping. Lowering of the water table could result in the drying of the spring-influenced wetlands they inhabit. Cattle and feral burro cause physical destruction of habitat such as erosion from trampling which may cause water quality impacts. Low genetic variation due to low population numbers and severe fragmentation of habitat. Invasive plant species such as tamarisk, with high evapo-transpiration rates may further lower ground water and cause higher salinity levels within relict leopard frog habitat. <p><u>(B) Overutilization</u></p> <ul style="list-style-type: none"> Due to small population size, any collection or utilization may be significant. <p><u>(C) Disease or predation</u></p> <ul style="list-style-type: none"> Grazing animals may serve as a vector for disease and fungal infection and cause direct mortality and loss of recruitment by trampling adult frogs and egg masses. Disease and fungal infections (although chytrid fungus does not appear to have infected extant relict leopard frog populations). Introduced exotic species that predate upon and/or compete with native ranid frogs. 	Potential indirect overlap	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> CBD and SUWA 2002, AGFD 1996, 1998, Jennings and Hayes 1994, Jones 1979 <p><u>(C) Disease or predation</u></p> <ul style="list-style-type: none"> USFWS 2000b, CBD and SUWA 2002, Sredl 1997, Corn 1994, Jennings and Hayes 1994 NDOW 2005c, Relict Leopard Frog Conservation Team 2005 	

Table S-5 Species Potentially Affected by Covered Activities and Potential Overlap of Identified Threats to Species Persistence

Common Name	Description of Potential Threat	Potential Overlap with Covered Activities	Source	Notes
	<p>(D) Inadequate regulatory mechanisms</p> <ul style="list-style-type: none"> Varying levels of protection in Nevada, Arizona, and Utah. Regulations have not prevented illegal collection. <p>(E) Other manmade or natural factors</p> <p>Small population size and limited habitat make this species vulnerable</p>			
Arizona Toad	<p>(A) Habitat degradation</p> <ul style="list-style-type: none"> Alterations in riparian corridor through construction of impoundments resulted in extirpation from historical locations in Arizona. Susceptible to declines due to water diversions, groundwater pumping, or other activities leading to declines in springs and seeps. <p>(E) Other manmade or natural factors</p> <ul style="list-style-type: none"> Woodhouse's toad (<i>B. woodhousii</i>) is displacing this species in some areas in central Arizona and in the Las Vegas Valley. 	Potential indirect overlap	Sullivan and Lamb 1988 cited in NatureServe 2006e, Sullivan 1993 cited in NatureServe 2006e, NDOW 2005c	
Mammals				
Kit fox	<p>(C) Disease or predation</p> <ul style="list-style-type: none"> Possible red fox invasion into historical kit fox range in east and central Nevada. <p>(E) Other manmade or natural factors</p> <ul style="list-style-type: none"> Currently the global range is declining. Recent population declines in northern range. 	Potential indirect overlap	NatureServe 2006e, NDOW 2005c	
Birds				
Western burrowing owl	<p>(A) Habitat degradation</p> <ul style="list-style-type: none"> Habitat loss and fragmentation primarily due to agricultural and urban land conversion. Habitat degradation due to control and extermination of colonial burrowing mammals. Fragmentation and isolation are threats to small and localized populations. Habitat alteration and extermination of top predators (e.g. wolves) lead to increases in small predators (foxes, badgers and coyotes). Scarcity of nesting habitat may reduce opportunity for unpaired owls to find mates. Collapse of burrows. <p>(C) Disease or predation</p> <ul style="list-style-type: none"> Predators. Harassment and predation by dogs and cats. <p>(D) Inadequate regulatory mechanisms</p> <ul style="list-style-type: none"> Varying levels of protection. <p>(E) Other manmade or natural factors</p> <ul style="list-style-type: none"> Vehicle collisions Pesticide use . Food availability. 	Potential overlap	NatureServe 2006e, NDOW 2005c	
Southwestern willow flycatcher	<p>(A) Habitat degradation</p> <ul style="list-style-type: none"> Loss, modification and fragmentation of habitat through: water management, land use practices, fire and introduction of exotic species. Water management reduces suitable riparian habitat with dams or reservoirs, diversions, and ground water pumping. Reduction or modification of riparian habitat due to alterations in flood frequencies and duration, sediment and nutrition deposition, floodplain hydration, inundation period, and seed dispersal of riparian species. Channelization and bank stabilization increases stream velocity and raises streambeds above groundwater levels, preventing adequate water to riparian vegetation. Agricultural development converted riparian forest to farmland. Trampling by cattle caused soil compaction, increasing runoff and erosion and decreasing dispersal and regeneration of vegetation; grazing affects composition and density of riparian areas. Recreation and urban development result in destruction of native vegetation, introduction of exotic species, increased fire risk and soil compaction. Exotic species replace native riparian vegetation along waterways. <p>(C) Disease or predation</p> <ul style="list-style-type: none"> Brood parasitism by brown-headed cowbirds. <p>(E) Other manmade or natural factors</p> <ul style="list-style-type: none"> Small, fragmented populations make above threats particularly acute. Threats may also occur during the winter migration and on the wintering grounds. 	Potential indirect overlap	Finch et al. 2000 cited in USFWS 2002, Whitfield 1990 and Finch et al. 2000 as cited in USFWS 2002, NDOW 2005c	

Table S-5 Species Potentially Affected by Covered Activities and Potential Overlap of Identified Threats to Species Persistence

Common Name	Description of Potential Threat	Potential Overlap with Covered Activities	Source	Notes
Yuma clapper rail	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Water management within the lower Colorado River basin has destroyed and created habitat. Damming of the Colorado River altered natural flow regimes, inundated habitats, and created backwaters that developed extensive marshlands. Channel dredging, bank stabilization, water diversions, and other channel maintenance activities, as well as development in the flood plain can potentially destroy large areas of marsh habitat and disturb birds, especially during nesting. Controlling the natural flow regime has eliminated variable physical conditions that provide for marsh regeneration. Many of the backwaters trap high sediment loads, facilitating successional changes so they no longer provide habitat. Mosquito abatement activities. Mitigation projects have negatively impacted some marsh habitats. <p><u>(E) Other manmade or natural factors</u></p> <ul style="list-style-type: none"> Contamination from selenium may potentially cause adverse impacts. 	Potential indirect overlap	Eddleman 1989, California Department of Fish and Game 1990, cited in NatureServe 2006e, NDOW 2005c	
Yellow-billed cuckoo	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Habitat loss and fragmentation. Water management practices reduce or modify riparian habitat by altering flood duration and frequency, sediment and nutrition deposition, floodplain hydration, inundation period, and seed dispersal of riparian vegetation. Land use practices that reduce habitat include channelization and bank stabilization, conversion to agricultural use, and grazing. Exotic species such as salt cedar and giant reed (<i>Arundo donax</i>) displace native riparian species without providing suitable nesting or foraging opportunities. Pesticide use may cause thinner eggs, reducing reproductive success or killing birds. May indirectly affect yellow-billed cuckoo by reducing available prey. 	Potential overlap	Laymon 1998, Laymon and Halterman 1987, Neel 1999	
Phainopepla	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Habitat loss. <p><u>(E) Other manmade or natural factors</u></p> <ul style="list-style-type: none"> Breeding resident in southern Nevada – Population in northern part of range migrates southward for winter. 	Potential overlap	NatureServe 2006e, NDOW 2005c	
<i>Invertebrates</i>				
Moapa pebblesnail	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> May be threatened by the introduction of the nonnative oriental snail (<i>Melanoides tuberculatum</i>). Narrow endemic that may be locally abundant. 	No overlap anticipated	USFWS 1996, as cited in NatureServe 2006e	
Amargosa naucorid	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Habitat modification likely most significant threat. 	Potential overlap	USFWS 1996	
Moapa Warm Spring riffle beetle	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Distribution is very restricted to approximately 4 sq km area along the Muddy River, Clark County, Nevada. Area has been altered considerably through human activity. 	Potential overlap	NatureServe 2006e	
Grated tryonia	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Currently threatened by introduction of exotic species (<i>M. tuberculatum</i>) and potentially threatened by habitat modification. 	Potential overlap	NatureServe 2006e	
<i>Plants</i>				
Threecorner milkvetch	<p><u>(A) Habitat degradation</u></p> <ul style="list-style-type: none"> Rural development and sprawl. Increased fire frequency and intensity. Energy development. Surface water development. Invasive exotic species competition. Utility corridor construction and maintenance. Inappropriate agricultural practices (water-intensive alfalfa production). Commercial development. BLM land disposal to private development. Wild horse and burro management. Sand and gravel mines active and expanding throughout range. Off-road vehicles and trail development. 	Low potential overlap	The Nature Conservancy 2007, NatureServe 2006a, RECON 2000	

Table S-5 Species Potentially Affected by Covered Activities and Potential Overlap of Identified Threats to Species Persistence

Common Name	Description of Potential Threat	Potential Overlap with Covered Activities	Source	Notes
	<ul style="list-style-type: none"> ▪ Concentrated recreation use. ▪ Grazing may result in significant habitat destruction and trampling. <p>(D) Inadequate regulatory mechanisms</p> <ul style="list-style-type: none"> ▪ Lack of knowledge of general ecology and population trends makes managing this species difficult. 			
Sheep Mountain milkvetch	<p>(E) Other manmade or natural factors</p> <ul style="list-style-type: none"> ▪ Limited distribution in Nevada and Arizona. 	Low potential overlap	NatureServe 2006e	
Nye milkvetch	<p>(A) Habitat degradation</p> <ul style="list-style-type: none"> ▪ The proposed missile system (Mozingo and Williams 1980) that once threatened this plant was never built. No active threats are known. <p>(E) Other manmade or natural factors</p> <ul style="list-style-type: none"> ▪ Endemic to Nevada. 	Low potential overlap	NatureServe 2006e	
Sticky ringstem	<p>(A) Habitat degradation</p> <ul style="list-style-type: none"> ▪ Over grazing. ▪ Residential development. ▪ Mining. 	Potential overlap	NatureServe 2006e	
White bearpoppy	<p>(A) Habitat degradation</p> <ul style="list-style-type: none"> ▪ Outside of its relatively safe existence in the Desert National Wildlife Range, its threats include urban expansion, off-road vehicle use, mining and trail use. ▪ In Nevada threats are localized in a portion of its range. 	Potential overlap	NatureServe 2006b, NNHP 2001d	
Meadow Valley sandwort	<p>(E) Other manmade or natural factors</p> <ul style="list-style-type: none"> ▪ A narrow endemic of Clark and Lincoln Counties, Nevada, where it is known from only 6 sites. The species' inaccessible habitat has protected it from human-caused disturbances. ▪ Habitat unsuitable for man-caused modifications. 	Low potential overlap	NatureServe 2006c	
Las Vegas buckwheat	<p>(A) Habitat degradation</p> <ul style="list-style-type: none"> ▪ Trash dumping, gypsum mining, water diversions, and ground water pumping have all become serious threats ▪ Habitat conversion. ▪ Off-road vehicles and associated events, causing habitat degradation and direct mortality. ▪ Equestrian trail rides, dog field trails, flying machine events (remote and piloted), skydiving, and associated parking for these events may result in possible impacts. 	Low potential overlap	NNHP 2004b; RECON 2000	
Sticky buckwheat	<p>(A) Habitat degradation</p> <ul style="list-style-type: none"> ▪ Rural development and sprawl. ▪ Increased fire frequency and intensity. ▪ Energy development. ▪ Invasive exotic species competition. ▪ Casual OHV use and trail development. ▪ Surface water development. ▪ Utility corridor construction and maintenance. ▪ Commercial development. ▪ BLM land disposal to private development. ▪ Erosion and washouts. ▪ Sand and gravel mining, ▪ Grazing may result in significant habitat destruction and trampling. <p>(D) Inadequate regulatory mechanisms</p> <ul style="list-style-type: none"> ▪ Lack of knowledge of general ecology and population trends makes managing this species difficult. 	Potential overlap	The Nature Conservancy 2007, NatureServe 2006e, RECON 2000	

Table S-5 Species Potentially Affected by Covered Activities and Potential Overlap of Identified Threats to Species Persistence

Common Name	Description of Potential Threat	Potential Overlap with Covered Activities	Source	Notes
White-margined beardtongue	<u>(A) Habitat degradation</u> <ul style="list-style-type: none"> ▪ May be threatened by: ▪ military activities, ▪ ORV's, ▪ dumping, ▪ mining, and ▪ activities associated with the transmission line and pipeline. 	Potential overlap	NatureServe 2006d	
Yellow two-toned beardtongue	<u>(A) Habitat degradation</u> <ul style="list-style-type: none"> ▪ Urban expansion of Las Vegas. 	Low potential overlap	NatureServe 2006e	Found in Clark County, Muddy River Watershed

Table S-6 Species Designations Recommended Under the CSI MSHCP

Common Name	MSHCP Classification	Status Warrants Protection	Potential for Overlap	Rationale for Designation
Fish Species				
White River springfish	Watch List	ESA - endangered Nevada endangered	Not Detectable	This species is not found in the Covered Area. It is only found upstream of the Covered Area in the Pahrnagat Drainage.
Hiko White River springfish	Watch List	Nevada endangered	Not Detectable	This species is not found in the Covered Area. It is only found upstream of the Covered Area in the Pahrnagat Drainage.
Moapa dace	Covered	ESA - endangered Nevada endangered	Medium	This species is not found in the Covered Area. It is found in springs, tributaries, and springs along the Muddy River. Lowering of the water table caused by groundwater extraction and subsequent alterations to habitat could affect this species.
Virgin River chub	Covered	Nevada endangered	Medium	This species is not found in the Covered Area. It is found in the main channel of the Muddy River. Lowering of the water table caused by groundwater extraction and subsequent alterations to habitat could affect this species.
Moapa White River springfish	Evaluation	Nevada endangered	Medium	This species is not found in the Covered Area. It is found in springs, tributaries, and springs along the Muddy River. Lowering of the water table caused by groundwater extraction and subsequent alterations to habitat could affect this species. Therefore, the proposed covered activities may enhance threats that warrant federal protection.
Moapa speckled dace	Evaluation	Nevada endangered	Medium	This species is not found in the Covered Area. It is found in springs, tributaries, and springs along the Muddy River. Lowering of the water table caused by groundwater extraction and subsequent alterations to habitat could affect this species. Therefore, the proposed covered activities may enhance threats that warrant federal protection.
Reptiles				
Desert tortoise	Covered	ESA - endangered Nevada threatened	High	This species occurs within the Covered Area. Additionally, designated critical habitat for this species also occurs within the Covered Area. The proposed covered activities may enhance the threats that warranted federal and state protection of the species.
Western banded gecko	Watch List		Medium	This species occurs within the Covered Area. Potential range occurs in a majority of the Development Area.
Desert iguana	Watch List		Medium	This species occurs within the Covered Area. Potential range occurs in a majority of Development Area. Species threats include habitat loss or degradation due to conversion to human uses and direct mortality on road systems.
Large spotted leopard lizard	Watch List		Medium	Threats include habitat separation barriers resulting from urbanization and roads.
Banded Gila monster	Covered	Nevada protected	High	This species occurs in the Covered Area. The covered activities have a high potential to affect the species. The proposed covered activities may enhance threats that warrant federal protection.
Northern desert horned lizard	Watch List		Medium	This species may potentially occur anywhere in the Covered Area.
Glossy snake	Watch List		Low	This species occurs in the Covered Area. Although intensive agricultural development and urbanization probably eliminated or reduced some populations, this species does not appear to be very threatened in most areas. Therefore, CSI activities will probably not adversely affect the overall species.
California (common) kingsnake	Watch List		Medium	This species occurs in the Covered Area. This species has the potential to occur on many habitat types that are within the Development Area/Covered Area.
Spotted leaf-nose snake	Watch List		Low	This species occurs in the Covered Area.
Western long-nose snake	Watch List		Low	This species occurs in the Covered Area.
(Sonoran) Lyre snake	Watch List		Low	The potential for this species to occur in the Covered Area is low.
Amphibians				
Relict leopard frog	Evaluation	ESA candidate Nevada protected	Medium	This species occurs in the lower Muddy River system. Lowering of the water table caused by groundwater extraction could affect this species. Therefore, the proposed covered activities may enhance threats that warrant federal protection.
Arizona toad	Watch List		Low	This species could occur in a small patch of Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland habitat in Covered Area. Additional information is required.
Mammals				
Kit fox	Watch List		Medium	Potential suitable habitat occurs throughout the Covered Area. Higher impact would result if development occurs on top of dens.
Birds				
Western burrowing owl	Covered	Nevada protected	Medium	Potential suitable habitat for this species occurs throughout the Covered Area. Known threats to the species include habitat loss due to agricultural and urban land conversion and fragmentation and isolation resulting in small and localized populations.
Western yellow-billed cuckoo	Watch List	ESA candidate Nevada sensitive	Low	This species occurs in the lower Muddy River system. The proposed covered activities are unlikely to enhance threats that would warrant federal protection. This species does not occur in the Covered Area.
Southwestern willow flycatcher	Evaluation	ESA - endangered Nevada endangered	Low	This species occurs in the lower Muddy River system and in the Pahrnagat Drainage upstream of the Covered Area. This species does not occur in the Covered Area. The proposed covered activities are unlikely to enhance threats that warranted federal protection.
Phainopepla	Watch List	Nevada protected	Low	This species occurs in the lower Muddy River system and is a common inhabitant of washes and riparian areas. The proposed covered activities are unlikely to enhance threats that would warrant federal protection.
Yuma clapper rail	Evaluation	ESA - endangered Nevada endangered	Low	This species is not found in the Covered Area. It occurs in the lower Muddy River system. The proposed covered activities are unlikely to enhance threats that warranted federal protection.

Table S-6 Species Designations Recommended Under the CSI MSHCP

Common Name	MSHCP Classification	Status Warrants Protection	Potential for Overlap	Rationale for Designation
<i>Invertebrates</i>				
Moapa pebblesnail	Watch List		Medium	This species is not found in the Covered Area. It occurs in the lower Muddy River system. The proposed covered activities are unlikely to enhance threats that would warrant federal protection.
Pahranagat naucorid bug	Watch List		Low	This species is not found in the Covered Area. It is only found upstream of the Covered Area in the Pahranagat Drainage.
Amagosa naucorid	Watch List			This species is not found in the Covered Area. It occurs in the lower Muddy River system. The proposed covered activities are unlikely to enhance threats that would warrant federal protection.
Moapa Warm Spring riffle beetle	Watch List		Medium	This species is not found in the Covered Area. It occurs in the lower Muddy River system. The proposed covered activities are unlikely to enhance threats that would warrant federal protection.
Grated tryonia	Watch List		Low	This species is not found in the Covered Area. It occurs in the lower Muddy River system. The proposed covered activities are unlikely to enhance threats that would warrant federal protection.
<i>Plants</i>				
Threecorner milkvetch	Evaluation	Nevada critically endangered	Medium	This species may occur in the Covered Area. It is found in open, deep sandy soil or dunes, generally stabilized by vegetation and/or a gravel veneer. It is dependent on sand dunes or deep sand in Nevada. Threats include off-road vehicles and other recreational use of the habitat, residential expansion, sand and gravel mining, and utility developments and corridors.
Sheep Mountain milkvetch	Watch List		Low	This species grows in carbonate alluvial gravels, particularly along drainages, roadsides, and in other micro-sites with enhanced run-off. It is endemic to Lincoln and Clark counties, but does not occur in the Covered Area.
Nye milkvetch	Watch List		Low	This plant is found in the foothills of desert mountains, calcareous outwash fans and gravelly flats, sandy soil (NNHP 2001c). This plant may occur in the Covered Area.
Sticky ringstem	Watch List		Low	This plant occurs mainly in and around gypsum soils. This plant may occur in the Covered Area.
White bearpoppy	Watch List		Medium	This plant occurs on dry to moist basic soils (including alkaline clay and sand, gypsum, calcareous alluvial gravels, and carbonate rock outcrops) (NNHP 2001d). This plant may occur in the Covered Area.
Meadow Valley sandwort	Watch List		Low	This plant is found mainly on cliffs, canyon walls, ledges, and rocky slopes (NNHP 2001e). It seems unlikely that CSI development will affect this plant. This plant may occur in a very small portion of the Covered Area.
Las Vegas buckwheat	Evaluation	ESA Candidate	Low	This species may occur in a small portion of the Covered Area and is endemic to Clark County.
Sticky buckwheat	Evaluation	Nevada critically endangered	Medium	This species may occur in the Covered Area. It is found along Muddy River from Weiser Wash to confluence with Virgin River. Changes in habitat caused by water projects and subsequent lowering of water table could affect this species.
White-margined beardtongue	Watch List		Low	This species may occur in the Covered Area. Relevant threats include dumping, activities associated with transmission line and pipeline, and off-road vehicles.
Yellow two-toned beardtongue	Watch List		Low	This plant is found on calcareous or carbonate soils in washes, roadsides, rock crevices, outcrops, or similar places receiving enhanced runoff (NNHP 2001f). It is not found in the Covered Area, but may occur in the one-mile buffer surrounding the Covered Area.

Table S-7 Characteristics of Potential Range for Special Status Aquatic Species in CSI Lands Including Differences Between Juvenile and Adult Habitat Use, Critical Habitat, and Habitat Use by Species²

Species	Habitat: Juveniles vs. Adults	Critical Habitat	Information Source	Habitat Use	Notes
Aquatic Species²					
Fishes					
Moapa dace	Juveniles prefer tributaries and habitats with increasing flow velocities as they grow. Adults prefer both tributaries and the main stem Muddy River, with the largest adults occurring in the river (USFWS 2006).	N	USFWS 2006	Occurs in headwaters of Warm Springs area in Clark County (spring pools, tributaries of springs, upper 2.48 miles of mainstem Muddy River)	Endemic to Warm Springs area
Virgin River chub	Virgin chubs are most often associated with deep runs or pool habitats of slow to moderate velocities with large boulders or instream cover, such as root snags. Adults and juveniles are often associated together within these habitats. However, the larger adults are collected most often in the deeper pool habitats within the River (USFWS 1994b).	Y	USFWS 1994b	Occurs along 134 miles of the Muddy River, and the mainstem Virgin River from Pah Tempe Springs, UT to confluence with Colorado River; Muddy River population occurs in the Muddy River	Virgin River chub is federally listed only for the Virgin River population. The Muddy River population was not listed, but taxonomically is the same species (54 FR 35305 35311)
White River springfish	N	Y	USFWS 1998	Occurs only in Ash Springs and associated outflow	White River spring fish (<i>C. b. bailey</i>) is found only in Ash Spring located north of the Development Area. Other subspecies of White River springfish are endemic to the Warm Springs area.
Moapa White River Springfish	N	N	NatureServe 2006e; USFWS 1996	Found at or near springheads and in pools and backwaters along outflow streams until water temperatures become too cold downstream. Occurs only in headwater springs of Muddy River (Apcar, Baldwin, Cardy, Lamb, Muddy Spring, Refuge) and upper Muddy River.	
Hiko White River springfish	N	Y	NatureServe 2006e	Occurs in Crystal and Hiko springs	Refugium population in Blue Link Spring far outside the native range.
Moapa specked dace	N	N	USFWS 1996	Typically lives on stream bottom in shallow, cobble riffles, hiding in low flow velocity areas behind rocks.	Endemic to Muddy River
Invertebrates					
Moapa pebblesnail	N	N	USFWS 1996	Found on pebbles, cobbles, concrete surfaces, and submerged vegetation in springs	Endemic to Warm Springs area - found in Apcar, Refuge, Plummer Springs, springs on Warm Springs Ranch, and a number of unnamed springs in the Warm Springs area
Amargosa naucorid	N	N	USFWS 1996	Found in pools and lower velocity stream reaches in the Amargosa River system in southwestern Nevada	Endemic to Warm Springs area
Moapa Warm Spring riffle beetle	N	N	USFWS 1996	Adult beetles found in outflow streams immediately downstream of the spring sources, swift shallow water on pebbles, algae-covered rocks with sand pebble areas, aquatic vegetation, and especially bare tree roots	Endemic to Warm Springs area
Grated tryonia	N	N	USFWS 1996	Occurs near detritus and algae in spring systems associated with the Muddy River	Occurs in Warm Springs area, but also occurs in spring systems in the Pahranaqat and White River valleys, Nevada
¹ Due to the coarse nature of the data and habitat modeling process, potential range in this CSI MSHCP is defined as an area where a given species has the potential to occur. Note that potential range was not mapped for these species, because extent of potential overlap of covered activities on these species could not be appropriately determined spatially.					

Table S-8 Characteristics of Potential Range for Special Status Terrestrial Species in CSI Lands Including Critical Habitat, Elevation, Vegetation Type, Landform Description, Soil Type, and Distance to Water

Species	Critical Habitat	Information Source	Elevation	Vegetation Types	Landform	Soil Type	Distance to Water	Notes
Terrestrial Species								
Reptiles								
Desert tortoise	Y	SWReGAP 2005a	up to 1600 m	Closed Chaparral, Open Chaparral, Cottonwood-Willow Riparian, Juniper/Mixed Shrub Woodland, Canotia Mixed Shrub, Mesquite Bosque/flooded woodland, Mixed Riparian (Xeroriparian Scrub), Mojave Desert scrub, Sonoran Desert scrub (Arizona Upland)	valley flats; toe slopes, bottoms, and swales; gently sloping ridges and hills; nearly level plateau or terrace	Not applicable	Not applicable	
Western banded gecko	N	SWReGAP 2005b	0-1520 meters	North American Warm Desert Wash, North American Warm Desert Playa, Colorado Plateau Pinyon-Juniper Woodland, Great Basin Pinyon-Juniper Woodland, Rocky Mountain Gambel Oak-Mixed Montane Shrubland, Madrean Encinal, Mogollon Chaparral, Apacherian-Chihuahuan Mesquite Upland Scrub, Mojave Mid-Elevation Mixed Desert Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, Sonora-Mojave Desert Mixed Salt Desert Scrub, Inter-Mountain Basins Juniper Savanna, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, Inter-Mountain Basins Semi-Desert Shrub Steppe, Inter-Mountain Basins Semi-Desert Grassland, North American Warm Desert Riparian Woodland and Shrubland, North American Warm Desert Riparian Mesquite Bosque, Chihuahuan-Sonoran Desert Bottomland and Swale Grassland, Madrean Pinyon-Juniper Woodland, Madrean Juniper Savanna, Sonoran Mid-Elevation Desert Scrub, Southern Colorado Plateau Sand Shrubland	Not applicable	Not applicable	Not applicable	
Desert iguana	N	SWReGAP 2005c	0-1060 meters	Mojave Mid-Elevation Mixed Desert Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, North American Warm Desert Riparian Woodland and Shrubland	valley flats; toe slopes, bottoms, and swales; gently sloping ridges and hills; nearly level plateau or terrace	Not applicable	Not applicable	
Large spotted leopard lizard	N	SWReGAP 2005d	0-2100 meters	Colorado Plateau Pinyon-Juniper Shrubland, Inter-Mountain Basins Big Sagebrush Shrubland, Great Basin Xeric Mixed Sagebrush Shrubland, Colorado Plateau Mixed Low Sagebrush Shrubland, Apacherian-Chihuahuan Mesquite Upland Scrub, Colorado Plateau Blackbrush-Mormon Tea Shrubland, Mojave Mid-Elevation Mixed Desert Scrub, Chihuahuan Succulent Desert Scrub, Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Inter-Mountain Basins Mixed Salt Desert Scrub, Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, Sonora-Mojave Desert Mixed Salt Desert Scrub, Chihuahuan Mixed Salt Desert Scrub, Coahuilan Chaparral, Sonoran Mid-Elevation Desert Scrub	Not applicable	Not applicable	Not applicable	SWReGAP model is for entire species (<i>Gambelia wislizenii</i>), not subspecies (<i>Gambelia wislizenii wislizenii</i>)
Banded Gila monster	N	SWReGAP 2005e	30-1585 meters	Mogollon Chaparral, Apacherian-Chihuahuan Mesquite Upland Scrub, Mojave Mid-Elevation Mixed Desert Scrub, Chihuahuan Succulent Desert Scrub, Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, North American Warm Desert Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Riparian Woodland and Shrubland, North American Warm Desert Riparian Mesquite Bosque, Chihuahuan-Sonoran Desert Bottomland and Swale Grassland, Madrean Pinyon-Juniper Woodland, Madrean Juniper Savanna, Sonoran Mid-Elevation Desert Scrub	Not applicable	Not applicable	Not applicable	SWReGAP model is for species (<i>Heloderma suspectum</i>), not subspecies (<i>Heloderma suspectum cinctum</i>)
Northern desert horned lizard	N	SWReGAP 2005f	0-1900 m	Inter-Mountain Basins Shale Badland, Inter-Mountain Basins Active and Stabilized Dunes, Inter-Mountain Basins Volcanic Rock and Cinder Land, Inter-Mountain Basins Wash, Inter-Mountain Basins Playa, North American Warm Desert Bedrock Cliff and Outcrop, North American Warm Desert Badland, North American Warm Desert Active and Stabilized Dune, North American Warm Desert Volcanic Rockland, North American Warm Desert Wash, North American Warm Desert Pavement, North American Warm Desert Playa, Inter-Mountain Basins Big Sagebrush Shrubland, Great Basin Xeric Mixed Sagebrush Shrubland, Colorado Plateau Blackbrush-Mormon Tea Shrubland, Mojave Mid-Elevation Mixed Desert Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Inter-Mountain Basins Mixed Salt Desert Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, Sonora-Mojave Desert Mixed Salt Desert Scrub, Southern Rocky Mountain Juniper Woodland and Savanna, Inter-Mountain Basins Semi-Desert Shrub Steppe, North American Warm Desert Lower Montane Riparian Woodland and Shrubland, Inter-Mountain Basins Greasewood Flat, North American Warm Desert Riparian Woodland and Shrubland, North American Warm Desert Riparian Mesquite Bosque, Sonora-Mojave-Baja Semi-Desert Chaparral, Sonoran Mid-Elevation Desert Scrub	Not applicable	Not applicable	Not applicable	ReGAP model is for entire species (<i>Phrynosoma platyrhinos</i>), not subspecies (<i>Phrynosoma platyrhinos platyrhinos</i>)

Table S-8 Characteristics of Potential Range for Special Status Terrestrial Species in CSI Lands Including Critical Habitat, Elevation, Vegetation Type, Landform Description, Soil Type, and Distance to Water

Species	Critical Habitat	Information Source	Elevation	Vegetation Types	Landform	Soil Type	Distance to Water	Notes
Glossy snake	N	SWReGAP 2005g	0-1830 meters	Co lorado Plateau Mixed Bedrock Canyon and Tableland, Inter-Mountain Basins Playa, North American Warm Desert Active and Stabilized Dune, North American Warm Desert Wash, Rocky Mountain Gambel Oak-Mixed Montane Shrubland, Western Great Plains Sandhill Shrubland, Inter-Mountain Basins Big Sagebrush Shrubland, Apacherian-Chihuahuan Mesquite Upland Scrub, Colorado Plateau Blackbrush-Mormon Tea Shrubland, Chihuahuan Succulent Desert Scrub, Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, Inter-Mountain Basins Montane Sagebrush Steppe, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, Inter-Mountain Basins Semi-Desert Shrub Steppe, Western Great Plains Foothill and Piedmont Grassland, Central Mixedgrass Prairie, Western Great Plains Shortgrass Prairie, Western Great Plains Sandhill Prairie, Inter-Mountain Basins Semi-Desert Grassland, Rocky Mountain Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Riparian Mesquite Bosque, Chihuahuan Mixed Salt Desert Scrub, Western Great Plains Tallgrass Prairie	Not applicable	Not applicable	Not applicable	
California (common) kingsnake	N	SWReGAP 2005h	24-2130 meters	Rocky Mountain Cliff and Canyon, Sierra Nevada Cliff and Canyon, Inter-Mountain Basins Cliff and Canyon, Colorado Plateau Mixed Bedrock Canyon and Tableland, Inter-Mountain Basins Shale Badland, Inter-Mountain Basins Active and Stabilized Dunes, Inter-Mountain Basins Volcanic Rock and Cinder Land, Inter-Mountain Basins Playa, North American Warm Desert Bedrock Cliff and Outcrop, North American Warm Desert Badland, North American Warm Desert Active and Stabilized Dune, North American Warm Desert Volcanic Rockland, North American Warm Desert Wash, North American Warm Desert Pavement, North American Warm Desert Playa, Madrean Pine-Oak Forest and Woodland, Rocky Mountain Ponderosa Pine Woodland, Southern Rocky Mountain Pinyon-Juniper Woodland, Colorado Plateau Pinyon-Juniper Woodland, Great Basin Pinyon-Juniper Woodland, Western Great Plains Sandhill Shrubland, Madrean Encinal, Great Basin Xeric Mixed Sagebrush Shrubland, Mogollon Chaparral, Apacherian-Chihuahuan Mesquite Upland Scrub, Colorado Plateau Blackbrush-Mormon Tea Shrubland, Mojave Mid-Elevation Mixed Desert Scrub, Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Inter-Mountain Basins Mixed Salt Desert Scrub, Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, Sonora-Mojave Desert Mixed Salt Desert Scrub, Southern Rocky Mountain Juniper Woodland and Savanna, Inter-Mountain Basins Juniper Savanna, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, Inter-Mountain Basins Semi-Desert Shrub Steppe, Chihuahuan Gypsophilous Grassland and Steppe, Western Great Plains Foothill and Piedmont Grassland, Western Great Plains Shortgrass Prairie, Inter-Mountain Basins Semi-Desert Grassland, Rocky Mountain Subalpine-Montane Riparian Shrubland, Rocky Mountain Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Lower Montane Riparian Woodland and Shrubland, Western Great Plains Riparian Woodland and Shrubland, Inter-Mountain Basins Greasewood Flat, North American Warm Desert Riparian Woodland and Shrubland, North American Warm Desert Riparian Mesquite Bosque, North American Arid West Emergent Marsh, Western Great Plains Saline Depression Wetland, Madrean Pinyon-Juniper Woodland, Chihuahuan Sandy Plains Semi-Desert Grassland, Sonora-Mojave-Baja Semi-Desert Chaparral, Madrean Juniper Savanna, Chihuahuan Mixed Salt Desert Scrub, Coahuilan Chaparral, Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland, Western Great Plains Floodplain Herbaceous Wetland, Sonoran Mid-Elevation Desert Scrub, Southern Colorado Plateau Sand Shrubland, Agriculture	Not applicable	Not applicable	Not applicable	
Spotted leaf-nosed snake	N	SWReGAP 2005i	300 - 910 meters	Apacherian-Chihuahuan Mesquite Upland Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub	valley flats; toe slopes, bottoms, and swales; gently sloping ridges and hills	Not applicable	Not applicable	
Western long-nose snake	N	SWReGAP 2005j	0-1650 meters	North American Warm Desert Active and Stabilized Dune, North American Warm Desert Wash, Western Great Plains Sandhill Shrubland, Madrean Encinal, Apacherian-Chihuahuan Mesquite Upland Scrub, Colorado Plateau Blackbrush-Mormon Tea Shrubland, Chihuahuan Succulent Desert Scrub, Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Southern Rocky Mountain Juniper Woodland and Savanna, Inter-Mountain Basins Juniper Savanna, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, Western Great Plains Shortgrass Prairie, Western Great Plains Sandhill Prairie, Rocky Mountain Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Riparian Woodland and Shrubland, North American Warm Desert Riparian Mesquite Bosque, Madrean Juniper Savanna, Chihuahuan Mixed Salt Desert Scrub, Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland, Western Great Plains Floodplain Herbaceous Wetland, Western Great Plains Tallgrass Prairie	Not applicable	sandy soils	0-100 m from permanent streams	

Table S-8 Characteristics of Potential Range for Special Status Terrestrial Species in CSI Lands Including Critical Habitat, Elevation, Vegetation Type, Landform Description, Soil Type, and Distance to Water

Species	Critical Habitat	Information Source	Elevation	Vegetation Types	Landform	Soil Type	Distance to Water	Notes
(Sonoran) Lyre snake	N	SWReGAP 2005k	0-2260 meters	Colorado Plateau Mixed Bedrock Canyon and Tableland, North American Warm Desert Bedrock Cliff and Outcrop, Madrean Pine-Oak Forest and Woodland, Rocky Mountain Ponderosa Pine Woodland, Southern Rocky Mountain Pinyon-Juniper Woodland, Colorado Plateau Pinyon-Juniper Woodland, Rocky Mountain Gambel Oak-Mixed Montane Shrubland, Madrean Encinal, Mogollon Chaparral, Apacherian-Chihuahuan Mesquite Upland Scrub, Mojave Mid-Elevation Mixed Desert Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Southern Rocky Mountain Juniper Woodland and Savanna, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, Rocky Mountain Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Riparian Woodland and Shrubland, Chihuahuan-Sonoran Desert Bottomland and Swale Grassland	Not applicable	Not applicable	Not applicable	ReGAP model is for species (<i>Trimorphodon biscutatus</i>), not subspecies (<i>Trimorphodon biscutatus lambda</i>)
Amphibians								
Relict leopard frog	N	SWReGAP 2005l	up to 1000 m	Not applicable	Not applicable	Not applicable	up to 100 m from springs	
Arizona toad	N	SWReGAP 2005m	90 to 2700 meters	North American Warm Desert Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Riparian Woodland and Shrubland, North American Warm Desert Riparian Mesquite Bosque, Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland, Invasive Southwest Riparian Woodland and Shrubland	Not applicable	Not applicable	0-60 m from permanent streams	
Mammals								
Kit fox	N	SWReGAP 2005n	22-1980 meters	Colorado Plateau Mixed Bedrock Canyon and Tableland, Inter-Mountain Basins Shale Badland, Inter-Mountain Basins Wash, Inter-Mountain Basins Playa, North American Warm Desert Badland, North American Warm Desert Active and Stabilized Dune, North American Warm Desert Wash, North American Warm Desert Playa, Inter-Mountain Basins Mat Saltbush Shrubland, Western Great Plains Sandhill Shrubland, Colorado Plateau Pinyon-Juniper Shrubland, Great Basin Semi-Desert Chaparral, Inter-Mountain Basins Big Sagebrush Shrubland, Great Basin Xeric Mixed Sagebrush Shrubland, Colorado Plateau Mixed Low Sagebrush Shrubland, Mogollon Chaparral, Apacherian-Chihuahuan Mesquite Upland Scrub, Colorado Plateau Blackbrush-Mormon Tea Shrubland, Mojave Mid-Elevation Mixed Desert Scrub, Chihuahuan Succulent Desert Scrub, Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Inter-Mountain Basins Mixed Salt Desert Scrub, Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, Sonora-Mojave Desert Mixed Salt Desert Scrub, Inter-Mountain Basins Montane Sagebrush Steppe, Southern Rocky Mountain Juniper Woodland and Savanna, Inter-Mountain Basins Juniper Savanna, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, Inter-Mountain Basins Big Sagebrush Steppe, Inter-Mountain Basins Semi-Desert Shrub Steppe, Chihuahuan Gypsophilous Grassland and Steppe, Western Great Plains Shortgrass Prairie, Chihuahuan Sandy Plains Semi-Desert Grassland, Sonora-Mojave-Baja Semi-Desert Chaparral, Madrean Juniper Savanna, Chihuahuan Mixed Salt Desert Scrub, Coahuilan Chaparral, Wyoming Basins Low Sagebrush Shrubland, Sonoran Mid-Elevation Desert Scrub, Southern Colorado Plateau Sand Shrubland	Not applicable	sandy soils, loam soils	Not applicable	
Birds								
Western burrowing owl	N	SWReGAP 2005o	198-2743 meters	Inter-Mountain Basins Shale Badland, Inter-Mountain Basins Active and Stabilized Dunes, Inter-Mountain Basins Playa, North American Warm Desert Active and Stabilized Dune, North American Warm Desert Playa, Inter-Mountain Basins Mat Saltbush Shrubland, Western Great Plains Sandhill Shrubland, Colorado Plateau Pinyon-Juniper Shrubland, Great Basin Semi-Desert Chaparral, Inter-Mountain Basins Big Sagebrush Shrubland, Great Basin Xeric Mixed Sagebrush Shrubland, Colorado Plateau Mixed Low Sagebrush Shrubland, Apacherian-Chihuahuan Mesquite Upland Scrub, Colorado Plateau Blackbrush-Mormon Tea Shrubland, Mojave Mid-Elevation Mixed Desert Scrub, Chihuahuan Succulent Desert Scrub, Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Inter-Mountain Basins Mixed Salt Desert Scrub, Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, Sonora-Mojave Desert Mixed Salt Desert Scrub, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, Inter-Mountain Basins Big Sagebrush Steppe, Inter-Mountain Basins Semi-Desert Shrub Steppe, Chihuahuan Gypsophilous Grassland and Steppe, Western Great Plains Foothill and Piedmont Grassland, Central Mixedgrass Prairie, Western Great Plains Shortgrass Prairie, Western Great Plains Sandhill Prairie, Inter-Mountain Basins Semi-Desert Grassland, Western Great Plains Saline Depression Wetland, Chihuahuan-Sonoran Desert Bottomland and Swale Grassland, Chihuahuan Sandy Plains Semi-Desert Grassland, Chihuahuan Mixed Salt Desert Scrub, Sonoran Mid-Elevation Desert Scrub, Western Great Plains Tallgrass Prairie, Southern Colorado Plateau Sand Shrubland, Developed, Low Intensity, Agriculture	Not applicable	Not applicable	Not applicable	

Table S-8 Characteristics of Potential Range for Special Status Terrestrial Species in CSI Lands Including Critical Habitat, Elevation, Vegetation Type, Landform Description, Soil Type, and Distance to Water

Species	Critical Habitat	Information Source	Elevation	Vegetation Types	Landform	Soil Type	Distance to Water	Notes
Yellow-billed cuckoo	N	SWReGAP 2005s	up to 2424 m	Rocky Mountain Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Riparian Woodland and Shrubland, North American Warm Desert Riparian Mesquite Bosque, Invasive Southwest Riparian Woodland and Shrubland	Not applicable	Not applicable	up to 50 m from permanent streams and springs	
Southwestern willow flycatcher	Y	SWReGAP 2005p	22m to 3028 m	Rocky Mountain Aspen Forest and Woodland, Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland, Complex, Rocky Mountain Subalpine-Montane Riparian Shrubland, Rocky Mountain Subalpine-Montane Riparian Woodland, Rocky Mountain Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Lower Montane Riparian Woodland and Shrubland, Western Great Plains Riparian Woodland and Shrubland	Not applicable	Not applicable	up to 100 m from permanent streams/ lakes/ wetlands and springs	ReGAP model is for species (<i>Empidonax traillii</i>), not subspecies (<i>Empidonax traillii extimus</i>)
Phainopepla	N	SWReGAP 2005r	Not applicable	Inter-Mountain Basins Wash, North American Warm Desert Active and Stabilized Dune, North American Warm Desert Wash, Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland, Madrean Pine-Oak Forest and Woodland, Madrean Encinal, Mogollon Chaparral, Apacherian-Chihuahuan Mesquite Upland Scrub, Mojave Mid-Elevation Mixed Desert Scrub, Chihuahuan Succulent Desert Scrub, Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, Sonoran Paloverde-Mixed Cacti Desert Scrub, Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub, Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, Western Great Plains Shortgrass Prairie, Rocky Mountain Lower Montane Riparian Woodland and Shrubland, North American Warm Desert Lower Montane Riparian Woodland and Shrubland, Western Great Plains Riparian Woodland and Shrubland, North American Warm Desert Riparian Woodland and Shrubland, North American Warm Desert Riparian Mesquite Bosque, Madrean Upper Montane Conifer-Oak Forest and Woodland, Madrean Pinyon-Juniper Woodland, Sonora-Mojave-Baja Semi-Desert Chaparral, Madrean Juniper Savanna, Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland, Western Great Plains Tallgrass Prairie, Southern Colorado Plateau Sand Shrubland, Agriculture, Invasive Southwest Riparian Woodland and Shrubland	Not applicable	Not applicable	0-100 m from permanent streams	
Yuma clapper rail	N	SWReGAP 2005q	Not applicable	North American Arid West Emergent Marsh	Not applicable	Not applicable	up to 50 m from wetlands	ReGAP model is for species (<i>Rallus longirostris</i>), not subspecies (<i>Rallus longirostris yumanensis</i>)
Plants¹								
Threecorner milkvetch	N	NNHP 2001a	335 to 732 meters	Sonora Mojave Creosote-White Bursage Desert Scrub	Not applicable	sandy	Not applicable	fewer than 25 occurrences in a restricted range near a large population center (NatureServe 2006a); Clark and Lincoln counties, maybe Arizona; (NNHP 2001a)
Sheep Mountain milkvetch	N	NNHP 2001b	1341 to 1829 meters	Sonora Mojave Creosote-White Bursage Desert Scrub; Sonora Mojave Mixed Salt Desert Scrub	Not applicable	Not applicable	Not applicable	endemic to Clark and Lincoln counties in Nevada (NNHP 2001b)
Nye milkvetch	N	NNHP 2001c	335 to 1707 meters	North American Warm Desert Bedrock Cliff and Outcrop; Sonora Mojave Creosote-White Bursage Desert Scrub; North American Warm Desert Wash, Colorado Plateau Blackbrush Mormon Tea Shrubland	Not applicable	Not applicable	Not applicable	endemic to Clark, Lincoln, Nye counties (NatureServe 2006e)
Sticky ringstem	N	BLM 2004a	Not applicable	Not applicable	"nearly level plateaus or terrace" or "gently sloping ridges and hills"	gypsum soils	Not applicable	eastern edge of Mojave desert in Clark County, not known whether taxonomically distinct from wider population that extends to NM and AZ (BLM 2004a)
White bearpoppy	N	NNHP 2001d	610 to 1914 meters	Not applicable	Not applicable	Not applicable	Not applicable	narrow range of Mojave desert in Desert NWR and outside (NatureServe 2006b); Clark, Lincoln, Nye counties, also in California (NNHP 2001d)
Meadow Valley sandwort	N	NNHP 2001e	884 to 1097 meters	Not applicable	"very moist steep slopes", "very dry steep slopes", "cool aspect scarps, cliffs, canyons", "hot aspect scarps, cliffs, canyons", "medium dry slopes"	carbonate soils	Not applicable	narrow endemic of Clark and Lincoln counties, known from only 6 sites (NatureServe 2006c)
Las Vegas buckwheat	N	NNHP 2001f	579 to 1170 meters	North American Warm Desert Wash	Not applicable	gypsum soils	Not applicable	endemic to Clark County, Nevada, although may also occur in Utah (NNHP 2001f)
Sticky buckwheat	N	NNHP 2001g	366 to 671 meters	Not applicable	Not applicable	Not applicable	Not applicable	

Table S-8 Characteristics of Potential Range for Special Status Terrestrial Species in CSI Lands Including Critical Habitat, Elevation, Vegetation Type, Landform Description, Soil Type, and Distance to Water

Species	Critical Habitat	Information Source	Elevation	Vegetation Types	Landform	Soil Type	Distance to Water	Notes
White-margined beardtongue	N	NNHP 2001h, NatureServe 2006d	838 to 1795 meters	Sonora Mojave Creosote-White Bursage Desert Scrub, Sonora Mojave Mixed Salt Desert Scrub	Not applicable	sandy	Not applicable	
Yellow two-toned beardtongue	N	NNHP 2001i	762 to 1670 meters	Colorado Plateau Blackbrush Mormon Tea Shrubland, Sonora Mojave Creosote-White Bursage Desert Scrub, Sonora Mojave Mixed Desert Scrub, Great Basin Pinyon-Juniper Woodland, Intermountain Basins Juniper Shrubland	Not applicable	carbonate soils	Not applicable	

¹Potential range within Nevada was not calculated for plant species, because there is not enough information about the extent of their ranges.

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