

**Final
Clark County Multiple Species Habitat Conservation Plan
and
Environmental Impact Statement
for
Issuance of a Permit to Allow Incidental Take of
79 Species in Clark County, Nevada
September 2000**

Appendix A: Ecosystem Analyses

**Clark County Department of Comprehensive Planning
500 S. Grand Central Parkway, Suite 3012
Las Vegas, Nevada 89155-8270**

**U.S. Fish and Wildlife Service
1340 Financial Blvd, Suite 234
Reno, Nevada 89502-5093**

Prepared by:

**RECON
1927 Fifth Avenue, Suite 200
San Diego, California 92101-2358**

TABLE OF CONTENTS

Chapter 1: Introduction	A-1
1.1 The Ecosystem-level Approach	A-1
1.2 Organization of the Analyses	A-2
1.3 Conservation Management Categories	A-7
1.3.1 Intensively Managed Areas	A-7
1.3.2 Less Intensively Managed Areas	A-8
1.3.3 Multiple Use Managed Areas	A-11
1.3.4 Unmanaged Areas	A-11
Chapter 2: County-Wide Conservation Actions	A-13
2.1 Public Information and Education	A-13
2.1.1 Clark County	A-14
2.1.2 USFS	A-14
2.1.3 USFWS	A-20
2.1.4 BLM	A-21
2.1.5 NPS	A-21
2.1.6 NDOW	A-21
2.1.7 NDOT	A-21
2.1.8 Nevada Division of State Parks	A-22
2.2 Research, Inventory, and Monitoring—Elements of Adaptive Management	A-22
2.2.1 Research	A-24
2.2.2 Inventory	A-26
2.2.3 Monitoring	A-28

2.3 Protective and Restoration and Enhancement Actions	A-30
2.3.1 Protective Actions	A-31
2.3.2 Restoration and Enhancement	A-33
2.4 Land Use Policies and Actions	A-34
2.4.1 Clark County	A-35
2.4.2 USFS	A-36
2.4.3 USFWS	A-46
2.4.4 BLM	A-48
2.4.5 USAF	A-54
2.4.6 NPS	A-54
2.4.7 NDOW	A-56
2.4.8 NDOT	A-56
2.4.9 Nevada Division of State Parks	A-57
2.4.10 NDF	A-57
Chapter 3: Alpine Ecosystem	A-59
3.1 Description and Distribution	A-59
3.2 MSHCP Species	A-60
3.3 Potential Threats and Stressors	A-60
3.4 Alpine Habitat Management	A-63
3.5 Existing and Proposed Conservation Actions	A-63
3.5.1 USFS	A-63
3.6 Adequacy of Existing Management	A-70
3.7 MSHCP Conservation Contributions	A-70
Chapter 4: Bristlecone Pine Ecosystem	A-71
4.1 Description and Distribution	A-71
4.2 MSHCP Species	A-72
4.3 Potential Threats and Stressors	A-75

4.4 Bristlecone Pine Habitat Management	A-75
4.5 Existing and Proposed Conservation Actions	A-76
4.5.1 USFS	A-79
4.5.2 USFWS	A-89
4.6 Adequacy of Existing and Proposed Management	A-90
4.7 MSHCP Conservation Contributions	A-91
Chapter 5: Mixed Conifer Ecosystem	A-93
5.1 Description and Distribution	A-93
5.1.1 White Fir Community	A-94
5.1.2 Ponderosa Pine Community	A-94
5.1.3 Ponderosa Pine/Mountain Shrub Community	A-94
5.2 MSHCP Species	A-97
5.3 Potential Threats and Stressors	A-98
5.4 Mixed Conifer Habitat Management	A-98
5.4.1 White Fir Community Management	A-101
5.4.2 Ponderosa Pine Community Management	A-101
5.4.3 Ponderosa Pine/Mountain Shrub Community Management	A-101
5.5 Existing and Proposed Conservation Actions	A-102
5.5.1 USFS	A-102
5.5.2 USFWS	A-113
5.6 Adequacy of Existing and Proposed Management	A-114
5.7 MSHCP Conservation Contributions	A-115
Chapter 6: Pinyon-Juniper Ecosystem	A-117
6.1 Description and Distribution	A-117
6.1.1 Mountain Shrub Community	A-117
6.1.2 Pinyon Pine Community	A-118

6.1.3 Pinyon-Juniper Community	A-118
6.1.4 Juniper Community	A-118
6.2 MSHCP Species	A-118
6.3 Potential Threats and Stressors	A-122
6.4 Pinyon-Juniper Habitat Management	A-122
6.4.1 Mountain Shrub Community Management	A-126
6.4.2 Pinyon Pine Community Management	A-126
6.4.3 Pinyon-Juniper Community Management	A-127
6.4.4 Juniper Community Management	A-127
6.5 Existing and Proposed Conservation Actions	A-127
6.5.1 USFS	A-128
6.5.2 USFWS	A-138
6.5.3 BLM	A-140
6.6 Adequacy of Existing Management	A-143
6.7 MSHCP Conservation Contributions	A-144
Chapter 7: Sagebrush Ecosystem	A-145
7.1 Description and Distribution	A-145
7.1.1 Sagebrush Community	A-145
7.1.2 Sagebrush/Perennial Grassland Community	A-146
7.2 MSHCP Species	A-146
7.3 Potential Threats and Stressors	A-149
7.4 Sagebrush Habitat Management	A-149
7.4.1 Sagebrush Community Management	A-150
7.4.2 Sagebrush/Perennial Grassland Community Management	A-153
7.5 Existing and Proposed Conservation Actions	A-153
7.5.1 USFS	A-154
7.5.2 USFWS	A-163
7.5.3 BLM	A-165

7.6 Adequacy of Existing Management	A-169
7.7 MSHCP Conservation Contributions	A-170
Chapter 8: Blackbrush Ecosystem	A-171
8.1 Description and Distribution	A-171
8.1.1 Blackbrush Community	A-171
8.1.2 Hopsage Community	A-171
8.2 MSHCP Species	A-172
8.3 Potential Threats and Stressors	A-172
8.4 Blackbrush Habitat Management	A-175
8.4.1 Blackbrush Community Management	A-179
8.4.2 Hopsage Community Management	A-179
8.5 Existing and Proposed Conservation Actions	A-179
8.5.1 USFS	A-180
8.5.2 USFWS	A-187
8.5.3 BLM	A-189
8.5.4 NPS	A-193
8.6 Adequacy of Existing Management	A-194
8.7 MSHCP Conservation Contributions	A-195
Chapter 9: Salt Desert Scrub Ecosystem	A-197
9.1 Description and Distribution	A-197
9.2 MSHCP Species	A-198
9.3 Potential Threats and Stressors	A-201
9.4 Salt Desert Scrub Habitat Management	A-202
9.5 Existing and Proposed Conservation Actions	A-205
9.5.1 USFWS	A-205
9.5.2 BLM	A-207
9.5.3 USAF	A-210
9.5.4 NPS	A-211

9.6 Adequacy of Existing Management	A-213
9.7 MSHCP Conservation Contributions	A-213
Chapter 10: Mojave Desert Scrub Ecosystem	A-215
10.1 Description and Distribution	A-215
10.1.1 Mojave Mixed Scrub Community	A-215
10.1.2 Creosote-Bursage Community	A-216
10.2 MSHCP Species	A-216
10.3 Potential Threats and Stressors	A-219
10.4 Mojave Desert Scrub Habitat Management	A-220
10.4.1 Mojave Mixed Scrub Community Management	A-223
10.4.2 Creosote-Bursage Community Management	A-224
10.5 Existing and Proposed Conservation Actions	A-224
10.5.1 USFWS	A-225
10.5.2 BLM	A-227
10.5.3 USAF	A-231
10.5.4 NPS	A-232
10.5.5 Boulder City	A-234
10.5.6 State Parks	A-235
10.5.7 NDOW	A-236
10.6 Adequacy of Existing Management	A-237
10.7 MSHCP Conservation Contributions	A-237
Chapter 11: Mesquite/Catclaw Ecosystem	A-239
11.1 Description and Distribution	A-239
11.1.1 Mesquite Community	A-240
11.1.2 Catclaw Community	A-240
11.2 MSHCP Species	A-240
11.3 Potential Threats and Stressors	A-243

11.4 Mesquite/Catclaw Habitat Management	A-243
11.4.1 Mesquite Community Management	A-244
11.4.2 Catclaw Community Management	A-244
11.5 Existing and Proposed Conservation Actions	A-247
11.5.1 USFWS	A-247
11.5.2 BLM	A-249
11.5.3 NPS	A-253
11.5.4 NDOW	A-255
11.6 Adequacy of Existing Management	A-256
11.7 MSHCP Conservation Contributions	A-256
Chapter 12: Desert Riparian/Aquatic Ecosystem	A-257
12.1 Description and Distribution	A-257
12.2 MSHCP Species	A-258
12.3 Potential Threats and Stressors	A-261
12.4 Desert Riparian/Aquatic Habitat Management	A-261
12.5 Existing and Proposed Conservation Actions	A-262
12.5.1 USFWS	A-265
12.5.2 BLM	A-265
12.5.3 NDOW	A-270
12.5.4 NDOT	A-271
12.6 Adequacy of Existing Management	A-271
12.7 MSHCP Conservation Contributions	A-272
Chapter 13: Spring Ecosystems	A-273
13.1 Description and Distribution	A-273
13.2 MSHCP Species	A-274
13.3 Potential Threats and Stressors	A-277
13.4 Springs Habitat Management	A-277

13.5 Existing and Proposed Conservation Actions	A-278
13.5.1 USFS	A-281
13.5.2 USFWS	A-286
13.5.3 BLM	A-287
13.5.4 USAF	A-291
13.5.5 NPS	A-291
13.5.6 State Parks	A-293
13.5.7 NDOW	A-294
13.5.8 NDOT	A-294
13.6 Adequacy of Existing Management	A-295
13.7 MSHCP Conservation Contributions	A-295
Chapter 14: Other Communities	A-297
14.1 Bats	A-297
14.1.1 Description and Distribution	A-297
14.1.2 MSHCP Species	A-297
14.1.3 Potential Threats and Stressors	A-297
14.1.4 Existing and Proposed Conservation Actions	A-298
14.1.5 Adequacy of Existing Management	A-303
14.1.6 MSHCP Conservation Contributions	A-303
14.2 Mojave Desert Lizards and Snakes	A-303
14.2.1 USFWS	A-305
14.2.2 BLM	A-305
14.2.3 USAF	A-308
14.2.4 NPS	A-309
14.2.5 Boulder City	A-309
14.2.6 State Parks	A-310
14.2.7 NDOW	A-310

14.3 Butterflies	A-310
14.3.1 USFS	A-311
14.4 Rock Outcrops, Cliffs, Boulder Fields, and Lava Flows	A-313
14.4.1 USFS	A-313
14.4.2 USFWS	A-313
14.4.3 NPS	A-314
14.5 Sand Dunes	A-314
14.6 Gypsum Soils	A-314
14.7 Dry Lake Beds and Playas	A-315
14.8 Boreal Islands	A-316

FIGURES

1-1: Distribution of land managers in plan area	A-3
1-2: Distribution of land management in plan area	A-5
1-3: Conservation management categories	A-9
2-1: Distribution of ecosystems in plan area	A-15
2-2: Distribution of vegetation in plan area	A-17
3-1: Alpine ecosystem	A-61
3-2: Alpine ecosystem management	A-65
4-1: Bristlecone pine ecosystem	A-73
4-2: Bristlecone pine ecosystem management	A-77
5-1: Mixed conifer ecosystem	A-95
5-2: Mixed conifer ecosystem management	A-99
6-1: Pinyon-juniper ecosystem	A-119
6-2: Pinyon-juniper ecosystem management	A-123
7-1: Sagebrush ecosystem	A-147
7-2: Sagebrush ecosystem management	A-151
8-1: Blackbrush ecosystem	A-173
8-2: Blackbrush ecosystem management	A-177
9-1: Salt desert scrub ecosystem	A-199
9-2: Salt desert scrub ecosystem management	A-203
10-1: Mojave desert scrub ecosystem	A-217
10-2: Mojave desert scrub ecosystem management	A-221
11-1: Mesquite/catclaw ecosystem	A-241
11-2: Mesquite/catclaw ecosystem management	A-245

FIGURES cont.

12-1: Desert riparian/aquatic ecosystem	A-259
12-2: Desert riparian/aquatic ecosystem management	A-263
13-1: Spring ecosystem	A-275
13-2: Spring ecosystem management	A-279

TABLES

4-1: Management of Habitat in the Bristlecone Pine Ecosystem	A-76
5-1: Vegetation Communities in the Mixed Conifer Ecosystem	A-93
5-2: Management of Habitat in the Mixed Conifer Ecosystem	A-101
6-1: Vegetation Communities in the Pinyon-Juniper Ecosystem	A-117
6-2: Management of Habitat in the Pinyon-Juniper Ecosystem	A-126
7-1: Vegetation Communities in the Sagebrush Ecosystem	A-145
7-2: Management of Habitat in the Sagebrush/Perennial Grassland Ecosystem	A-150
8-1: Vegetation Communities in the Blackbrush Ecosystem	A-171
8-2: Management of Habitat in the Blackbrush Ecosystem	A-176
9-1: Vegetation Communities in the Salt Desert Scrub Ecosystem	A-197
9-2: Management of Habitat in the Salt Desert Scrub Ecosystem	A-202
10-1: Vegetation Communities in the Mojave Desert Scrub Ecosystem	A-215
10-2: Management of Habitat in the Mojave Desert Scrub Ecosystem	A-223
11-1: Vegetation Communities in the Mesquite/Catclaw Ecosystem	A-239
11-2: Management of Habitat in the Mesquite/Catclaw Ecosystem	A-244
12-1: Vegetation Communities in the Desert Riparian/Aquatic Ecosystem	A-258
12-2: Management of Habitat in the Desert Riparian/Aquatic Ecosystem	A-262
13-1: Distribution within the Springs Ecosystem	A-274
13-2: Springs Habitat Management	A-278

Appendix A: Ecosystem Analyses

Chapter 1 Introduction

1.1 The Ecosystem-level Approach

Each of the land management, resource agency, and local government entities participating in this plan have agreed to substantial roles and responsibilities in the conservation and management of biological resources within their own spheres of jurisdiction. The specific management actions to be undertaken by each of the Participants is detailed in Section 2.8 of the MSHCP, reflecting their overall commitments to the MSHCP process. Appendix B analyzes the proposed conservation actions with respect to how they address species-specific threats and stressors affecting species included in MSHCP.

The biological resources within Clark County are organized functionally in nature as assemblages of organisms that can be identified as ecosystems, or for wide-ranging species as communities, which share similar characteristics (climate, geographical distribution, relation to water, elevational distribution, or specialized habitat requirements). From the perspective of management of biological resource values, ecosystems and communities are the most appropriate level to apply conservation actions in order to maximize the beneficial effects, both in terms of cost and effectiveness. One of the principal conservation benefits of the MSHCP, in addition to substantial funding for conservation actions, is the Adaptive Management Process. The AMP provides a means for coordination of conservation actions among the land managers and resource agencies in Clark County at the ecosystem and community level.

The ecosystem or community level approach, facilitates the implementation of adaptive management which results in prioritization of management actions resulting in their application where they are most needed and most effective to respond to both ecosystem-level and species-specific threats and stressors. The ecosystem level approach also provides substantial benefits to non-target species by focusing on overall health of the

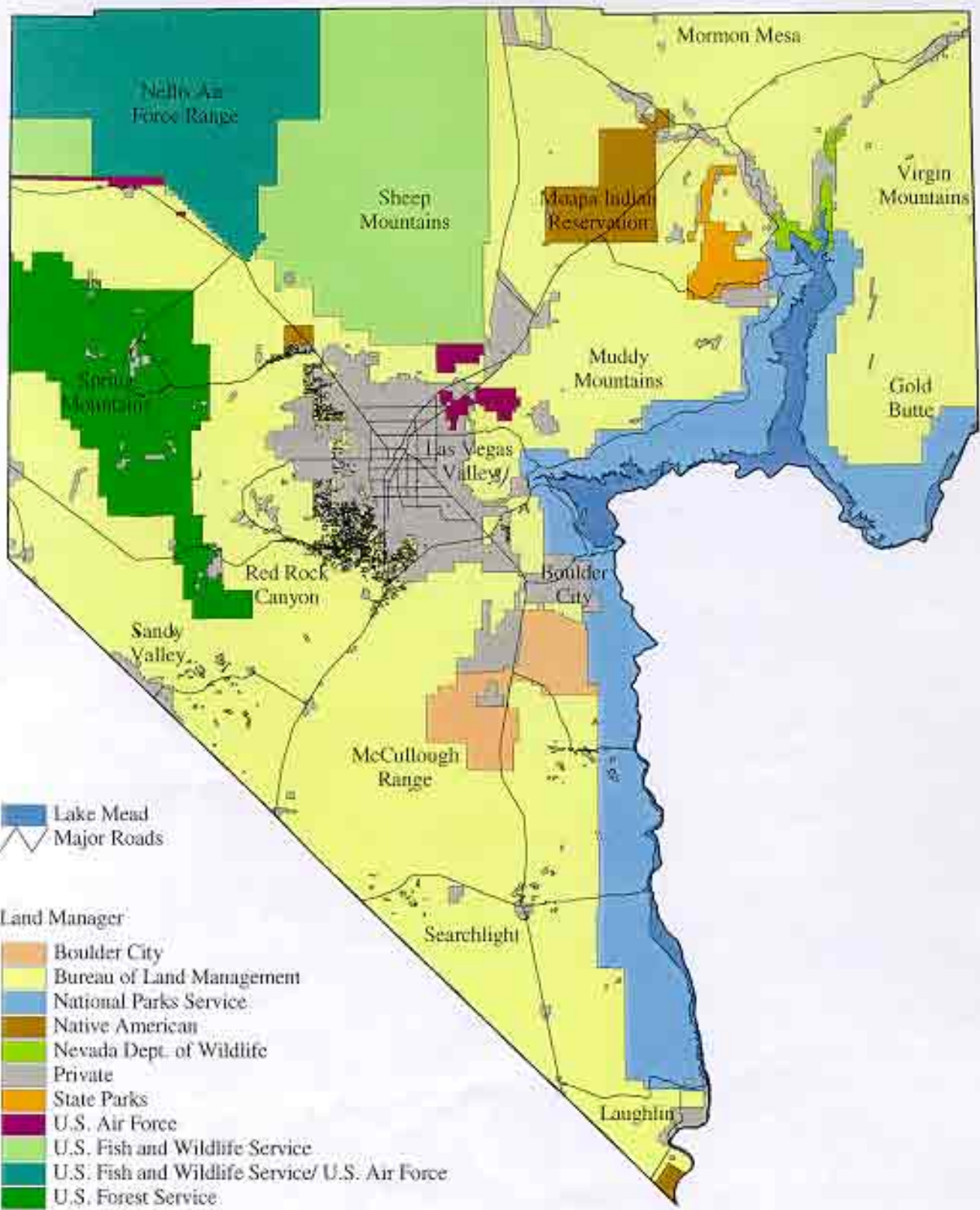
ecosystem upon which all of the component species depend. By focusing on the larger scale of the ecosystem within the region, and not within a single jurisdiction or site (the landscape), this approach provides for the resolution of potential management conflicts between species, and between species and other land uses.

1.2 Organization of the Analyses

The purpose of this document is to analyze the proposed conservation actions within each ecosystem and community (specific, functionally associated groups of species), with respect to how they address the ecosystem level threats and stressors identified.

The ecosystems and communities addressed in the MSHCP are not distributed evenly among the participating jurisdictions, because of the distribution of land managers and land management classes (Figures 1-1 and 1-2). Therefore, some entities play more significant roles in the management of individual ecosystems, while others provide for conservation actions throughout Clark County.

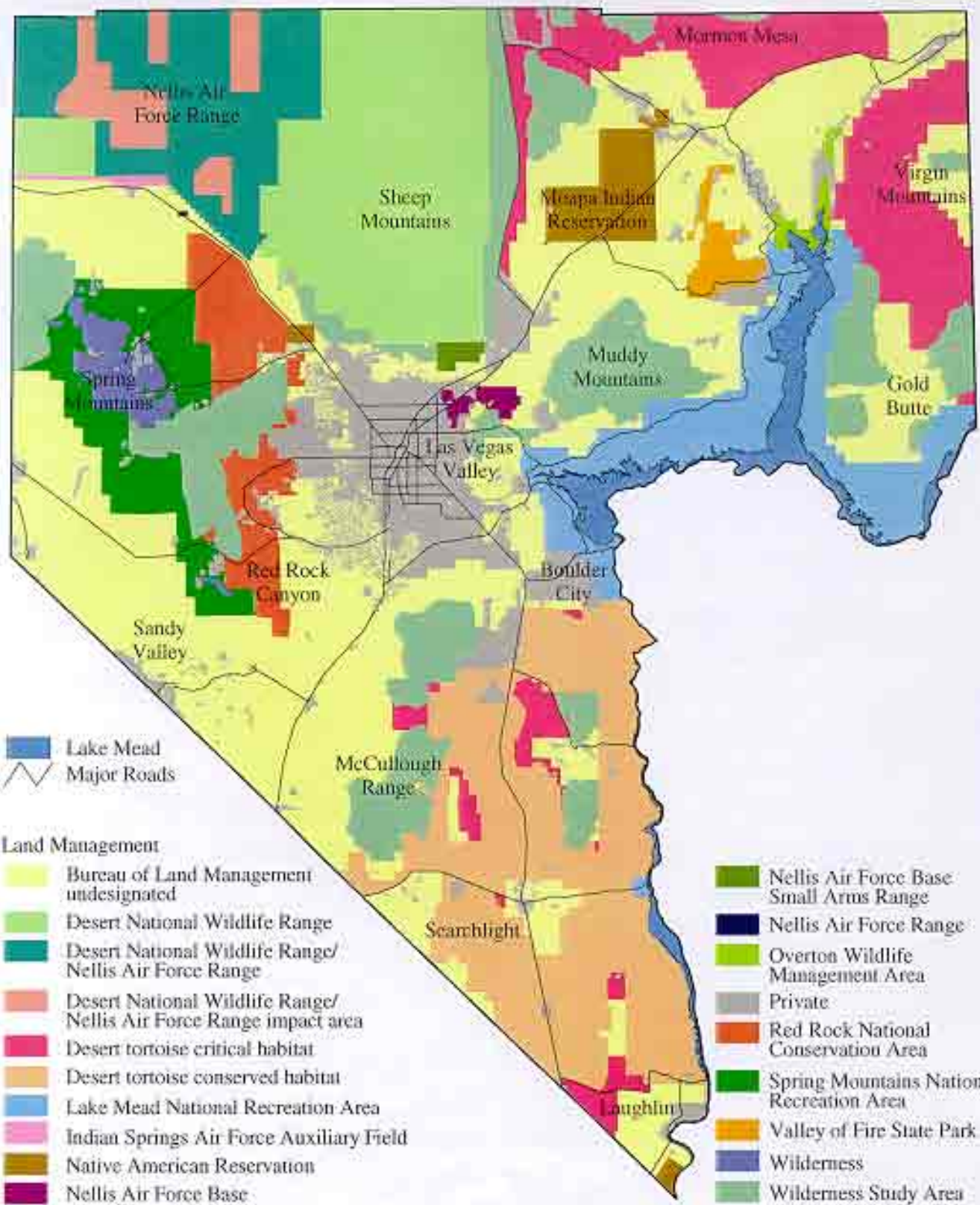
- Clark County (all ecosystems)
- USFS (alpine, bristlecone pine, mixed conifer, pinyon-juniper, sagebrush, and blackbrush)
- USFWS (as a resource agency, throughout Clark County; as land managers, bristlecone pine, mixed conifer, pinyon-juniper, sagebrush, blackbrush, salt desert scrub, Mojave desert scrub, and mesquite/catclaw)
- BLM (pinyon-juniper, sagebrush, blackbrush, salt desert scrub, Mojave desert scrub, mesquite/catclaw, and desert riparian/aquatic)
- USAF (salt desert scrub and Mojave desert scrub)
- NPS (blackbrush, salt desert scrub, Mojave desert scrub, and mesquite/catclaw)
- Boulder City (Mojave desert scrub)
- State Parks (Mojave desert scrub)
- NDOW (as a resource agency, throughout Clark County; as land managers, Mojave desert scrub, mesquite/catclaw, and desert riparian/aquatic)
- NDOT (all ecosystems below alpine)
- NDF (all ecosystems)



5 0 5 10 Miles
August 31, 1998



FIGURE 1-1
Distribution of Land Managers



5 0 5 10 Miles
August 31, 1998



FIGURE 1-2
Distribution of Land Management

This document is organized as follows. Chapter 2 details conservation measures provided by each of the Participants that apply throughout Clark County, within their respective jurisdictions. The following ecosystem and community focused chapters describe:

- each ecosystem or community in Clark County,
- MSHCP species that occur,
- ecosystem level threats and stressors,
- roles that each agency plays in ecosystem specific conservation actions, and
- adequacy of those actions, combined with county-wide conservation actions (Chapter 2) and species-specific conservation actions (Appendix B) in providing conservation for MSHCP Covered Species.

1.3 Conservation Management Categories

In the context of the pattern of land management in Clark County, and based upon the analysis of the management designations and the rules applicable to such designations, the landscape has been divided into four basic conservation management categories (Figure 1-3):

- | | |
|----------------------------------|-------|
| • Intensively Managed Areas | IMAs |
| • Less Intensively Managed Areas | LIMAs |
| • Multiple Use Managed Areas | MUMAs |
| • Unmanaged Areas | UMAs |

The conservation principles set forth in Section 2.4.2.2 of the MSHCP have been applied to each of these types of planning units located within Clark County and evaluated for their effects upon the habitats contained within each unit as well as the effects upon the species which inhabit each such unit.

1.3.1 Intensively Managed Areas

IMAs consist of lands in which management is oriented toward actions that reduce or eliminate potential threats to biological resources, such as wilderness areas, biodiversity

hotspots, wilderness study areas, or the conserved/critical habitat areas established for the Mojave Desert tortoise. Ideally, IMAs will provide an adequate amount and quality of habitats to support viable populations of all of the species covered by the MSHCP. This MSHCP designates the following lands as IMAs:

- BLM lands committed to conservation of the desert tortoise pursuant to the terms of the DCP
- All National Park Service lands except those set aside as developed areas
- Wilderness, Research Natural Areas, Wilderness Study Areas, and Instant Study Areas managed by the BLM and the USFS
- The Desert National Wildlife Range (including portions of NAFR), and other refuges, managed by the USFWS
- State Wildlife Management Areas located within the plan area
- State parks located within the plan area
- Nellis Small Arms Range

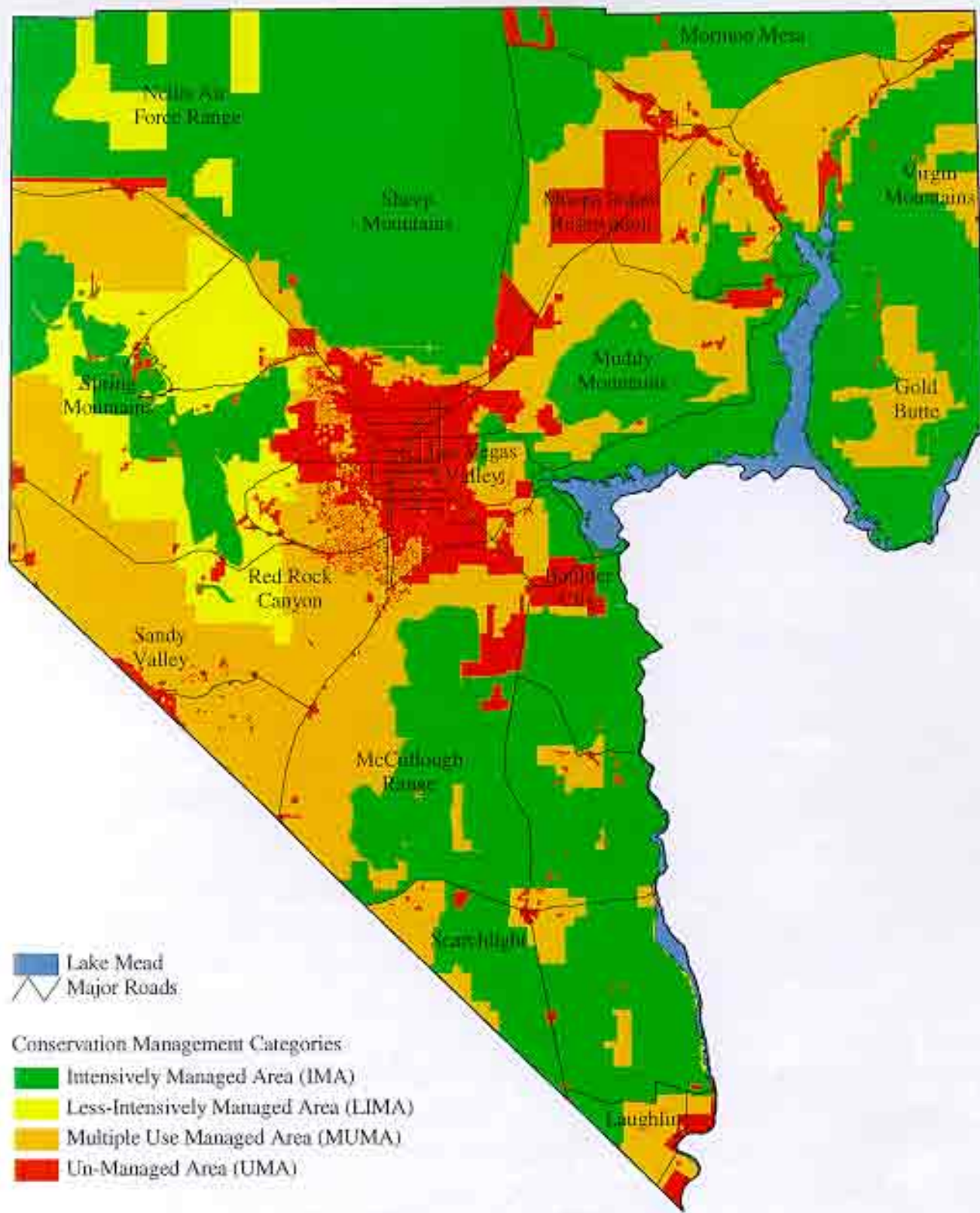
It should be noted that WSAs are not permanent designations. It is up to the U.S. Congress, based upon the recommendations of the Federal land managers and the public, to make a final decision on the ultimate status of these lands. The potential effects that changes in WSA status could have on the conservation of species and habitats covered in this MSHCP are discussed in Chapter 3, Alternatives Considered, of the MSHCP/EIS.



Furthermore, the Federal and state land managers will agree, through the provisions of the MSHCP and Implementation Agreement, to continue management of these lands in a manner consistent with the conservation of the species covered in this plan for the term of the 10(a) Permit.

1.3.2 Less Intensively Managed Areas





LIMAs are lands on which management generally limits the range of uses allowed to primarily recreational uses. LIMAs may function to augment the habitat in IMAs for some species, as well as providing buffers from areas of more intensive uses and connectivity between IMAs. This MSHCP designates the following areas as LIMAs:

- BLM lands managed as National Conservation Areas
- USFS lands managed as the Spring Mountains National Recreation Area



 Lake Mead
 Major Roads

Conservation Management Categories

-  Intensively Managed Area (IMA)
-  Less-Intensively Managed Area (LIMA)
-  Multiple Use Managed Area (MUMA)
-  Un-Managed Area (UMA)



5 0 5 10 Miles
 August 31, 1998



FIGURE 1-3
Conservation Management Categories

- Lands within NAFR and NSAR with limited Air Force use and restricted access
- Target areas on NAFR

1.3.3 Multiple Use Managed Areas

MUMAs are lands on which human activities are not precluded and which may, at times, be intense but which nevertheless continue to support significant areas of undisturbed natural vegetation. MUMAs provide connectivity between the populations of species in IMAs and LIMAs, additional habitat for these species, and buffering between the IMAs, LIMAs, and areas of more intensive use. Agricultural lands may, in some situations, provide similar values. This MSHCP designates the following areas as MUMAs:

- Undesignated BLM lands

1.3.4 Unmanaged Areas

UMAs are lands on which human activities predominate and which may incidentally support populations of some species. This MSHCP designates the following areas as UMAs:

- Private lands
- Indian reservations
- Intensive/developed recreation use areas
- Highways and material sites
- Lands disturbed by previous land uses
- Mines
- Landfills
- Intensive agriculture
- Nellis Air Force Base and Indian Springs Air Force Auxiliary Field

Over time, significant areas of habitat currently categorized as MUMA or UMA but which are surrounded by lands categorized as IMA or LIMA may be included and managed as part of the surrounding IMA and LIMA.

Chapter 2 County-Wide Conservation Actions

Many of the conservation actions incorporated in the MSHCP are neither species-specific nor ecosystem-specific in scope, but rather apply to all ecosystems (Figure 2-1), habitats (Figure 2-2), and species in Clark County, within the jurisdiction of each Participant. These actions respond to ecosystem-level and species-specific threats and stressors, where applicable.

Existing agency conservation measures, except those identified for the Bureau of Land Management, are discussed throughout this document and shown in *italics*. Existing measures that have been identified by the land managers as currently unfunded are indicated by an asterisk (*). For BLM actions, those that require an amendment to the RMP or Red Rock GMP before they can be implemented are identified in *italics* and those that are currently unfunded or underfunded are indicated by an asterisk (*).

2.1 Public Information and Education

Public information and education is a key component of the MSHCP. Through this program and cooperation with land managers and other conservation organizations, the MSHCP provides the opportunity to address conservation issues that effect all ecosystems, biological communities, and species throughout Clark County. Public information and education programs respond particularly to the following threats and stressors:

Threat 401: habitat degradation and modification and indirect effects on species due to dispersed recreational activities (trampling of plants and soil by hunters, hikers, campers, mountain bikers, and equestrians); trail construction and maintenance

Threat 402: habitat degradation and modification resulting from concentrated recreation (camping, ski area expansion, facilities development)

Threat 403: habitat modification and degradation and wildlife mortality from competitive OHV races

Threat 404: habitat modification and degradation and wildlife mortality from casual use (non-competitive non-commercial) OHV activities

Threat 406: reduction of fauna populations by indiscriminate recreational shooting

Threat 407: habitat degradation, population displacement from spelunking

Threat 408: increased long-term recreation demand in natural areas from human population increases

Threat 409: commercial non-competitive OHV tours and events

Threat 601: mortality of non-target species through direct or indirect poisoning or trapping for small mammals or pest species

Threat 602: increased use of pesticides and herbicides (resulting in mortality in non-targets species, eggshell thinning, and other inadvertent consequences)

Threat 1001: habitat degradation from wood removal

Threat 1601: predation by feral animals and uncontrolled pets

Threat 1601: predation by feral animals and uncontrolled pets

Threat 1702: illegal waste ponds, dumping, and waste disposal

Threat 1703: illegal drug production, transport, and use

The following specific public information and education actions are included in the MSHCP.

2.1.1 Clark County

CC(4) Public Information and Education Program

2.1.2 USFS

USFS(1) Ensure NRA staff are familiar with the basic habitat elements of the species of concern, including requirements of endemic butterflies (larval host plants, nectar sources, puddles and mud) bats (open water, caves, mines, cliffs, crevices, and other roost sites). Palmers chipmunk (shelter requirements), and rare plants (edaphic and other requirements). (CA-GC 7.0(1))

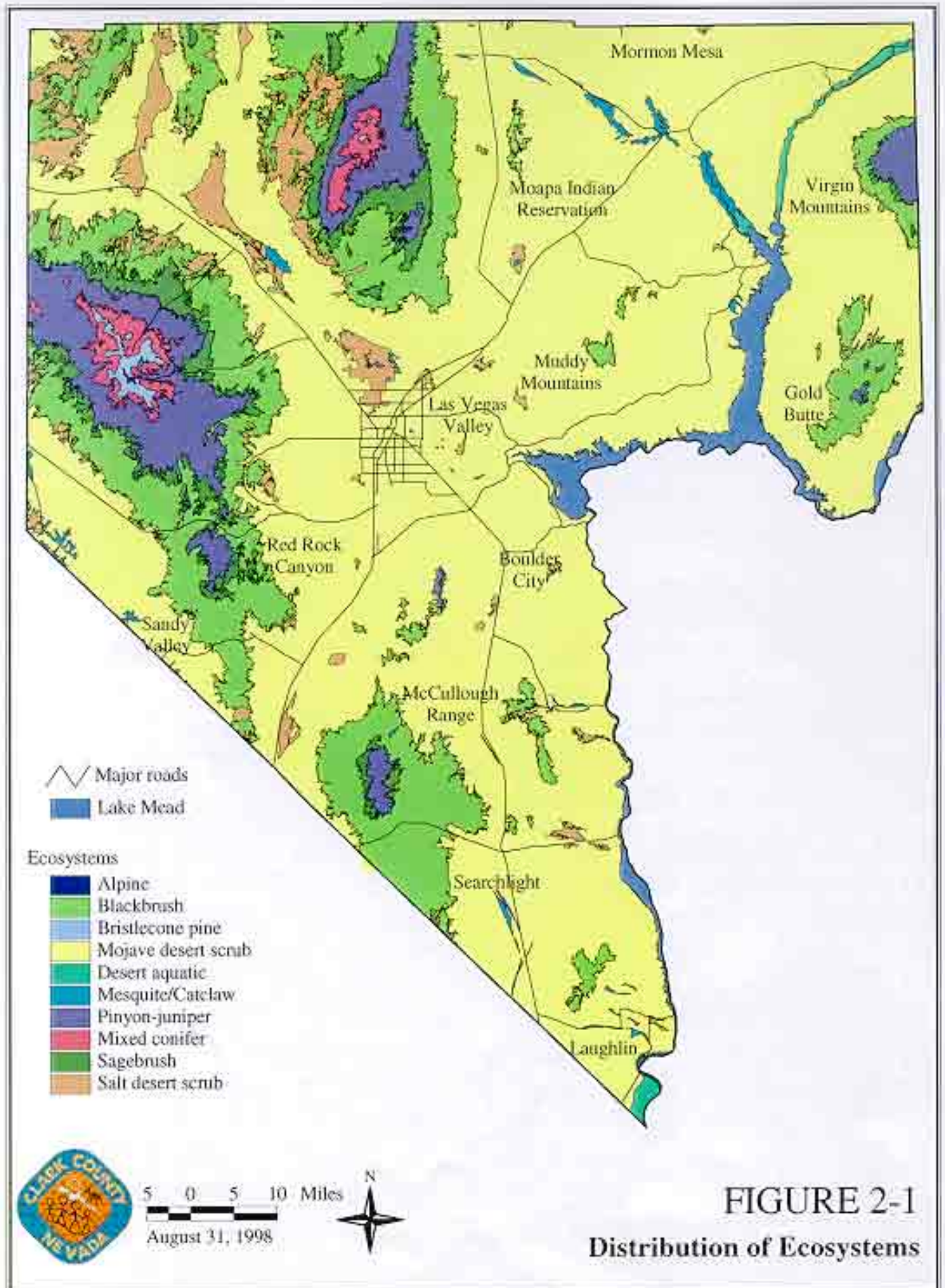
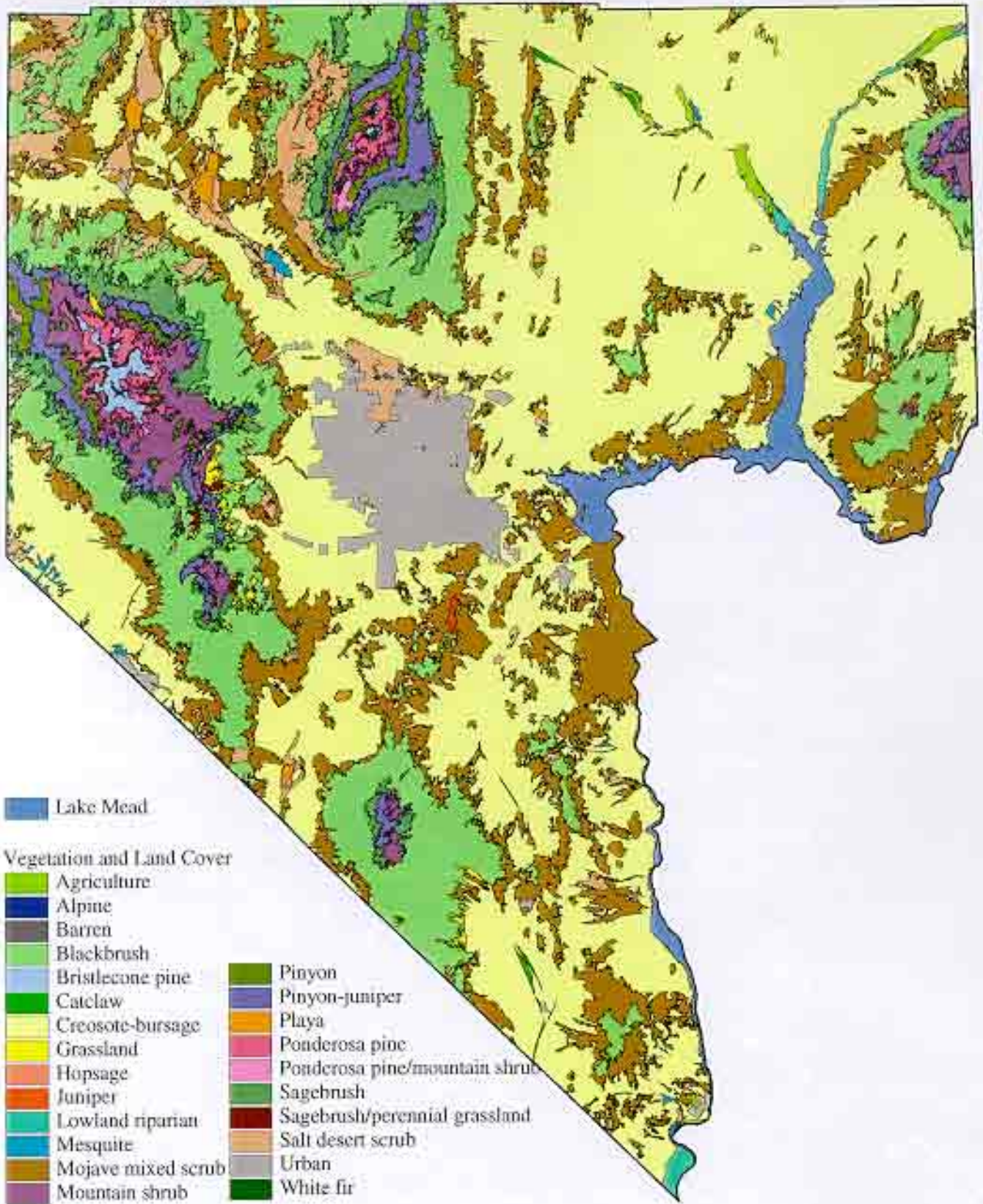


FIGURE 2-1
Distribution of Ecosystems



5 0 5 10 Miles
August 31, 1998



FIGURE 2-2
Distribution of Vegetation in Plan Area

USFS(2) Use all opportunities where the public is contacted (e.g., ranger stations, future visitor center and entrance stations, public meetings) to distribute materials emphasizing biodiversity protection and ecosystem management. Ensure that educational materials are focused on critical issues such as staying on trails, controlling pets, and avoidance of vegetation trampling and wildlife harassment. (CA-GC 7.0(2))

*USFS(3) Secure funding for educational materials, including brochures, displays, driving programs, and school materials. (CA-GC 7.0(3))**

*USFS(4) Develop a series of environmental education programs (slide presentations, display boards, etc.), for presentation to schools, user groups, town board meetings, and other community events. Individual programs will highlight biodiversity, sensitive ecological resources, endemic butterflies and plants, and sensitive bats. Ensure that materials are available for use by other agencies, NRA partners, and teachers. (CA7.1)**

*USFS(5) Develop and distribute information and education materials; directed at specific user groups (climbers, cavers, mountain bikers, equestrians, off-highway vehicle users, etc.), and the public at large; emphasizing protection of riparian habitats, alpine areas, and other sensitive areas. (CA7.2)**

*USFS(7) Develop display materials highlighting the unique resources and biological diversity of the Spring Mountains NRA for the NRA office, Kyle Canyon Guard Station, and for community events. (CA7.4)**

*USFS(8) Develop brochures for ten trailheads (North Loop, South Loop, Bonanza, Mary Jane Falls, Trail Canyon, Bristlecone, Big Falls, Little Falls, Robbers Roost, and Fletcher Canyon), highlighting the unique resources and biological diversity of the Spring Mountains NRA. (CA7.5)**

*USFS(9) Develop driving tour programs using tapes or low frequency radio transmitters at selected locations to provide NRA information and highlight the unique resources and biological diversity of the Spring Mountains NRA. (CA7.6)**

USFS(10) Design and install information and educational signs in accordance with Interagency Agreement # 14-48-0001-94605 between the USFS and USFWS for the Spring Mountains NRA (Appendix H). Signs will be located outside the Wilderness Area, at trailheads or near sensitive habitats, and will provide information on low impact recreation and ecological resource protection. Priorities include the following: (CA7.7)

Fused PVC color signs:

Cathedral Rock

Mary Jane Falls Trailhead

Deer Creek Picnic Area
Bristlecone Trailhead
*Robbers Roost Trailhead**
*Fletcher Canyon Trailhead**
*Trail Canyon Trailhead**
*North Loop Trailhead**
*Bonanza Trailhead**
*Harris Spring Trailhead**
*Carpenter Canyon**

Smaller signs:

Mummy Springs
Stanley B Spring
CC Spring
Trough Spring
Cave Spring
Macks Canyon Spring

USFS(12) Work cooperatively with Federal, state, local agencies, tribal governments, and others to increase public education and awareness of resource values and interpretation opportunities throughout the SMNRA. (FS-OBJ-0.30)

USFS(13) Educate the public to the sensitivity of endemic species of the Spring Mountains, the importance of diversity, the significance of the Spring Mountains' biodiversity, and how to recreate without impacting these resources. (FS-GU-0.68)

USFS(14) As existing appropriate permits expire, require permittee to provide for education and interpretation of natural resources. (FS-GU-0.125)

USFS(15) Educate the public to the value of Wilderness, not just as a non-motorized recreation area, but as a place of natural processes and of personal risks. (FS-OBJ-12.13)

2.1.3 USFWS

USFWS(1) Develop interpretive outreach program highlighting unique habitat and the biotic communities of Clark County (Ecological Services and DNWR).

USFWS(2) Coordinate outreach actions and publications with PIE where deemed appropriate by USFWS and Clark County (Ecological Services and DNWR).

2.1.4 BLM

BLM(1) Provide environmental information and educational materials to the public from the Red Rock Canyon NCA visitor center.

BLM(5) Develop brochures, pamphlets, and interpretive signs for covered species and the habitats of which they depend as determined to be appropriate by BLM in coordination with the HCP I & M Committee.*

2.1.5 NPS

NPS(1) Develop brochures, pamphlets, interpretive signs, and exhibits for Covered Species and the habitats on which they depend as determined to be appropriate by NPS in coordination with the MSHCP I & M Committee.

NPS(2) On a case-by-case basis, install signs at springs explaining the need for their protection and to reiterate state law that prohibits camping within 100 feet of water sources.

2.1.6 NDOW

NDOW(1) Cooperate with local agencies in developing a backyard habitat program.

NDOW(2) Continue to support the Teaming with Wildlife Initiative, which would provide funding for habitat restoration, wildlife conservation education, acquisition of land for conservation purposes, development of interpretive recreation programs, and monitoring for non-game species.

NDOW(3) Facilitate awareness of the MSHCP into the ongoing Project Wild.

NDOW(4) Coordinate with PIE, as requested, in developing material for NDOW's weekly television spot with local NBC affiliate.

2.1.7 NDOT

NDOT(1) Include in the current NDOT hazardous material awareness training course, a section identifying aquatic resources that occur within NDOT rights-of-way and the importance of fast responses on hazardous spills in such areas.

NDOT(2) Develop a worker education program for NDOT personnel in the plan area describing the MSHCP requirements. This will be coordinated by NDOT's Environ-

mental Services Division. Currently, NDOT requires all maintenance personnel working in desert tortoise habitat to attend a desert tortoise training class.

NDOT(3) Develop a reference binder which contains natural history information on all species covered under the MSHCP and make this binder available to all workers, including contractors and encroachment permittees, involved in activities on NDOT rights-of-way. Binders will be available at NDOT's District I (Las Vegas) office and appropriate maintenance stations. Binder will also be available at construction sites that occur in the permit area.

2.1.8 Nevada Division of State Parks

NSP(1) Provide rules in brochure and signs throughout the park to remind people of rules and regulations.

NSP(3) Displays in the Valley of Fire visitor center reinforce rules and regulations.

NSP(4) Provide discussion concerning protection of resources during interpretive programs.

2.2 Research, Inventory, and Monitoring— Elements of Adaptive Management

The Adaptive Management Process is the most important contribution of the MSHCP. The development and implementation of the AMP is dependent upon appropriate and directed research, inventory and monitoring activities. Through implementation of the AMP in cooperation with land managers and resource agencies, the MSHCP provides the opportunity to prioritize and address conservation issues that effect all ecosystems, biological communities, and species throughout Clark County. The AMP responds particularly to the following threats and stressors:

Threat 101: susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities)

Threat 102: unknown population trends

Threat 301: habitat degradation and modification due to fire suppression and fuels management, post fire suppression and fuels management, historical fire management, fire

Threat 302: vegetation community conversion to fire regime due to introduction of exotic annuals

Threat 401: habitat degradation and modification and indirect effects on species due to dispersed recreational activities (trampling of plants and soil by hunters, hikers, campers, mountain bikers, and equestrians); trail construction and maintenance

Threat 402: habitat degradation and modification resulting from concentrated recreation (camping, ski area expansion, facilities development)

Threat 403: habitat modification and degradation and wildlife mortality from competitive OHV races

Threat 404: habitat modification and degradation and wildlife mortality from casual use (non-competitive non-commercial) OHV activities

Threat 406: reduction of fauna populations by indiscriminate recreational shooting

Threat 407: habitat degradation, population displacement from spelunking

Threat 408: increased long-term recreation demand in natural areas from human population increases

Threat 409: commercial non-competitive OHV tours and events

Threat 501: reduction of wildlife populations through highway mortality

Threat 1302: changes in habitat quality due to changes in water flows (quantity, quality, seasonality) resulting from water diversion and groundwater pumping

Threat 1401: habitat degradation resulting from spring diversion and modification

Threat 1402: habitat degradation resulting from spring outflow diversion

In addition, implementation of focused research, inventory, and monitoring efforts at the ecosystem level or on Evaluation Species during Phase 1 of the MSHCP will be the primary means to incorporate these as Covered Species. In particular, the AMP could provide the basis for inclusion of additional species that are adequately conserved under the umbrella of ecosystem level management or management for Covered Species.

The following are research, inventory, and monitoring actions in the MSHCP.

2.2.1 Research

2.2.1.1 Clark County

CC(10) Development and Implementation of an Adaptive Management Program

2.2.1.2 USFS

USFS(16) Secure funding for research based on identified priorities. (CA-GC 6.0(1))

USFS(17) Encourage and support research in the Spring Mountains NRA, particularly in the Carpenter Canyon Research Natural Area, to assist with management concerns as well as to focus on basic research interests. (CA-GC 6.0(2))

*USFS(18) Develop an information package identifying and promoting research opportunities in the Spring Mountains NRA and Carpenter Canyon RNA. Update and distribute to local researchers, universities, and other research entities. (CA6.1)**

*USFS(19) Conduct research on the species of concern and ecological communities of the Spring Mountains NRA by prioritizing research needs and identifying funding sources. Priority research needs include the following: (CA6.2)**

- *Survey and study of NRA customer needs to determine who is visiting, what is expected from their visits, and how to communicate with non-English-speaking visitors. This survey would assess visitor awareness of, and interest in species and ecological resource conservation issues. (CA6.2k)*
- *Development of a recreation use monitoring strategy to determine amount, type, and timing of recreation trail use. (CA6.2l)*
- *Waste management in the Wilderness Area: Effects of waste on resources and methods for control or removal. (CA6.2m)*

USFS(16) Secure funding for research based on priorities identified below. (CA-GC 6.0(1))

USFS(17) Encourage and support research in the Spring Mountains NRA, particularly in the Carpenter Canyon Research Natural Area, to assist with management concerns as well as to focus on basic research interests. (CA-GC 6.0(2))

*USFS(18) Develop an information package identifying and promoting research opportunities in the Spring Mountains NRA and Carpenter Canyon RNA. Update and distribute to local researchers, universities, and other research entities. (CA6.1)**

*USFS(19) Conduct research on the species of concern and ecological communities of the Spring Mountains NRA by prioritizing research needs and identifying funding sources. Priority research needs include the following: (CA6.2)**

- *Survey and study of NRA customer needs to determine who is visiting, what is expected from their visits, and how to communicate with non-English-speaking visitors. This survey would assess visitor awareness of, and interest in species and ecological resource conservation issues. (CA6.2k)*
- *Development of a recreation use monitoring strategy to determine amount, type, and timing of recreation trail use. (CA6.2l)*
- *Waste management in the Wilderness Area: Effects of waste on resources and methods for control or removal. (CA6.2m)*

2.2.1.3 USFWS

USFWS(3) Encourage the development and dissemination of knowledge regarding the ecosystems in Clark County (DNWR).

USFWS(4) In cooperation with the I & M Committee, identify and implement research projects that address management issues and concerns (DNWR).

2.2.1.4 BLM

BLM(9) BLM will cooperate with the I & M Committee and through the Adaptive Management Plan participate in the identification, development, and implementation of research projects located on Public Lands. Emphasis shall be placed on research that addresses management concerns and the conservation of covered and evaluation species.

BLM(8) Manage the Desert Tortoise Conservation Center Management Area (CCMA) (this includes the Desert Tortoise Conservation Center and the surrounding basin consisting of 11,014 acres) to support desert tortoise research and other research associated with the Mojave Desert Ecosystem. When feasible, expand the function of the center to include an environmental education/awareness program in close coordination with other Federal agencies and State and local governments.*

BLM(7) Encourage the obtainment and dissemination of knowledge regarding the Mojave Desert ecosystem including desert tortoise biology.*

2.2.1.5 USAF

USAF(2) As appropriate, coordinate research activities with other Participants in the MSHCP.

2.2.1.6 NPS

NPS(3) Cooperate in the identification, development, and implementation of research projects located on Federal lands. Emphasis shall be placed on research that addresses management concerns and the conservation of Covered and Evaluation Species.

NPS(4) Investigate the basic ecology of obligate pollinators of target plant species to insure complementarity of conservation recommendations and the location of protected areas, insuring the inclusion of the pollinator's full habitat and food source requirements.

2.2.1.7 NDOW

NDOW(6) Consider and authorize, as appropriate, in conjunction with the USFWS, utilization of wildlife collected pursuant to this plan for research and educational programs.

NDOW(8) Coordinate and cooperate with applied management research initiatives, as appropriate.

2.2.1.8 NDOT

NDOT(4) NDOT will continue to monitor tortoise fencing along NDOT rights-of-way at specific sites designated as field testing areas for the tortoise barrier program. At this time, fencing within NDOT rights-of-way at the translocation site is the only site being monitored. (Clark County must spend a one-time amount of \$110,000 on the field testing phase of the barrier program. This is in addition to any biennial funding for tortoise fencing. This \$110,000 came from NDOT as part of the DCP. At this time _____ of this \$110,000 has been expended for construction of fencing at the translocation site).

2.2.2 Inventory

2.2.2.1 Clark County

CC(10) Development and Implementation of an Adaptive Management Program

2.2.2.2 USFS

USFS(21) Evaluate inventory priorities on an annual basis and coordinate in development of inventory strategies. (CA-GC)

USFS(22) Work cooperatively with interested groups to evaluate caves. The inventory process should document all unique biological, hydrological, geological, mineralogical, paleontological, educational, scientific, cultural, and/or recreational values. (FS-ST-0.50)

2.2.2.3 USFWS

USFWS(5) Conduct preactivity surveys for biological resources before implementing projects which may impact resources; and avoid sensitive species to the extent possible (DNWR).

2.2.2.4 BLM

BLM(13) Continue to conduct inventories as determined by the BLM and I & M Committee on special status plant species to determine their distribution, abundance, and potential threats and take appropriate actions to protect the habitat of these plant and animal species.*

BLM(17) BLM will develop and maintain a digital data base for all inventory data collected and cooperate with other participants in establishing and maintaining a repository for digital biological data covering Clark County.*

2.2.2.5 USAF

USAF(3) Survey for Covered and Evaluation Species prior to land disturbing activities.

USAF(4) Cooperate with breeding bird atlas surveys.

USAF(5) As appropriate, coordinate inventory activities with other Participants in the MSHCP.

2.2.2.6 NDOW

NDOW(13) Pursue additional funding to conduct inventories of evaluation and watch species where needed.

NDOW(14) Coordinate with the Adaptive Management Program in setting species priorities, selecting survey methods, and evaluation of data collected.

2.2.2.7 NDOT

NDOT(5) Compile an inventory of Covered Species and valuable habitat lands that occur on NDOT rights-of-way. This inventory will be accumulated on a project-by-project basis during NDOT's environmental review process.

NDOT(6) Compile an inventory of all culvert/bridge crossings and tortoise fencing within the permit area.

2.2.3 Monitoring

2.2.3.1 Clark County

CC(10) Development and Implementation of an Adaptive Management Program

2.2.3.2 USFS

USFS(23) Evaluate monitoring priorities on an annual basis and coordinate in development of additional monitoring protocols for species and habitats, as needed. (CA-GC 3.0(1))

USFS(24) Use the results of monitoring activities to, where feasible and necessary, refine management strategies for protection of the species of concern. Where monitoring has indicated status decline or habitat degradation for the species of concern, develop and implement strategies to avert further decline or degradation, and improve species status and habitat quality. (CA-GC 3.0(2))

*USFS(30) Develop a plan to monitor riparian function and habitat condition. The plan will focus primarily on Deer Creek, Cold Creek, Willow Creek, and Carpenter Canyon, but may include others areas as appropriate. Monitoring protocol will be specific to each area, emphasizing evaluation of habitat requirements of the species particularly dependent on these areas. Conduct periodic monitoring of riparian areas, using methods described in the riparian monitoring plan. (CA3.6)**

USFS(31) Develop and implement a monitoring program for assessing effects of recreational use on high elevation communities and the species that occur in these communities. (CA3.7)

USFS(32) Develop and implement a program to monitor selected biodiversity hotspots and species of concern habitats not covered in 3.1 through 3.7, based on periodic biologist site visits and/or photo points to document habitat conditions. This program will provide information needed to assess management suitability and the need to modify management practices in these areas.

*USFS(33) Develop and implement a recreation monitoring strategy involving trail counters and wilderness rangers. This strategy will include development of methods resulting in collection of data to assess recreation trends and effects on the species of concern and ecological resources. (CA3.9)**

USFS(34) Develop and implement a cumulative impact tally to monitor effects of NRA activities on the species of concern and their habitats. This program will provide sufficient information to trigger the need for quantitative monitoring or remedial actions to halt species declines. (CA3-10)

*USFS(35) Develop and implement a plan to inventory and map problem areas of non-native plants, and monitor encroachment over time. (CA3-11)**

*USFS(36) Monitor increase of exotic non-native plant populations in the alpine to identify the need for any trail closures and restrictions for equestrian use. (FS-GU-12.16)**

2.2.3.3 USFWS

USFWS(6) Monitor and protect water sources and water flows (springs, seeps, and streams) to assure adequate water is provided for sensitive species (DNWR).

USFWS(7) Trap or remove exotic animals as necessary within the Desert National Wildlife Refuge Complex (DNWR).

USFWS(8) Develop and implement long-term surveys to assess population trends, to document breeding and nesting activity in southern Nevada in the spring, and to assess occurrence in southern Nevada during the summer months (phainopepla and summer tanager) (DNWR).

USFWS(10) Investigate the basic ecology of obligate pollinators of target plant species to insure complementarity of conservation recommendations and the location of protected areas, insuring the inclusion of the pollinator's full habitat and food source requirements (DNWR).

USFWS(11) Monitor populations and population trends of Covered and Evaluation Species on the DNWR as appropriate (DNWR).

2.2.3.4 USAF

USAF(8) As appropriate, coordinate monitoring activities with other Participants in the MSHCP.

2.2.3.5 NPS

NPS(13) Monitor wintering bald eagle population trends.

NPS(20) Monitor traffic volume on road and trails near sensitive resources as appropriate.

2.2.3.6 NDOW

NDOW(10) Evaluate the need for area closures at the Overton Wildlife Management Area (OWMA) to protect nesting sites of sensitive species.

NDOW(11) Pursue state funds to monitor tortoise populations and recovery within Nevada and other Covered and Evaluation Species, as appropriate.

NDOW(12) Pursue funding for inventory and assessment of amphibian populations and provide support for such efforts within constraints of budget allocations.

2.2.3.7 NDOT

NDOT(7) Complete the NDOT land disturbance/take form when land disturbance/takes occur. NDOT Environmental Services will supply Clark County and the USFWS with four quarterly and one annual report summarizing takes, land disturbance, and mitigation fees paid. This will be incorporated into the current monitoring protocol used for the DCP.

2.3 Protective and Restoration and Enhancement Actions

For the most part, protective and restoration and enhancement actions are either ecosystem or community specific (see following ecosystem descriptions in Chapters 3 to 17 or species specific (Vol. III). Nonetheless, there are several of actions proposed by Clark County and NDOT, that are not tied to either land management area or ecosystems, that will be implemented throughout Clark County. Included in this category are the enforcement activities of NDF with respect to native plants, which apply on all lands within the County.

Threat 501: reduction of wildlife populations through highway mortality

Threat 502: reduction of wildlife populations (especially reptiles) through highway mortality on high elevation paved roads

Threat 503: habitat fragmentation and destruction by roads and trails

Threat 504: habitat degradation from highway and road construction and maintenance activities (including vegetation control and salting)

Threat 505: habitat degradation from highway runoff

Threat 602: increased use of pesticides and herbicides (resulting in mortality in non-targets species, eggshell thinning, and other inadvertent consequences)

Threat 702: competition of herbivores with cattle and equids

Threat 703: habitat degradation by livestock grazing and trampling

Threat 1501: habitat degradation and population decreases resulting from introductions, competition, and encroachment of exotic species (such as tamarisk, *Vallisneria*, fan palm invasion [upper Muddy], red shiners, *Tilapia*, and other species)

Threat 1701: poaching, illegal collection, or killing of flora and fauna

In particular, the actions below deal with the impacts of livestock grazing, highway mortality and construction and maintenance activities, collection of state listed plants and yucca and cactus species. The County program to acquire grazing allotments covering the majority of sensitive resource areas, provides a county-wide measure to reduce the significance of the impacts of livestock grazing.

2.3.1 Protective Actions

2.3.1.1 Clark County

CC(5) Purchase of Grazing Allotments and Interest in Real Property and Water

CC(6) Maintenance and Management of Allotments, Land, and Water Rights Which Have Been Acquired

CC(7) Construction of Barriers along Linear Features

2.3.1.2 NDOT

NDOT(8) In previously disturbed habitat, perform maintenance and construction activities without biological clearances from NDOT's Environmental Services Division. Previously disturbed habitat, for the purpose of this conservation plan, will include those areas that NDOT had historically graded, mowed, sprayed, excavated, and so on, in the previous two years (24-month period) in association with rights-of-way maintenance and construction activities. In addition, those areas which NDOT biologists or NDOT approved biological consultants deem to have no habitat value for Covered Species are considered disturbed.

NDOT(9) Clear maintenance and construction activities conducted in undisturbed habitat by NDOT's Environmental Services Division prior to disturbance. For the purpose for the MSHCP, undisturbed habitat will include those areas that NDOT had not historically graded, mowed, sprayed, excavated, and so on, in the previous year (12-month period) in association with rights-of-way maintenance and construction activities, and/or those areas which NDOT biologists or NDOT approved biological consultants deem to have potential habitat values for Covered Species.

NDOT(10) Avoid any Covered Species discovered in disturbed or undisturbed habitat in proposed maintenance or construction areas, if possible. If unable to avoid, best efforts will be made to relocate/salvage species. Relocation/salvage will only be attempted if the species is highly likely to survive the action and it is reasonably cost effective. This will be determined by NDOT's Environmental Services Division.

NDOT(12) Provide a biological monitor during material site sampling/exploration.

NDOT(13) Minimize and avoid impacts to rock outcrops, lava, flows, and surrounding areas. If these areas cannot be avoided and must be disturbed, clearance surveys by NDOT biologists or NDOT approved biological consultants must be conducted prior to maintenance or construction activities.

NDOT(14) Restrict maintenance and construction activities to NDOT right-of-way.

NDOT(15) Leave natural, large woody debris in place where ever possible, particularly out of sight from roads.

NDOT(16) Eliminate unnecessary substantial earthen berms along roads if these areas are determined to attract illegal collection.

NDOT(17) Ensure new roadside structures are designed and constructed to prevent animals from becoming trapped. Encourage retrofitting existing structures that pose a trapping problem.

NDOT(18) Restrict spraying herbicides or other chemicals that are toxic to aquatic organisms 100 feet from the aquatic habitats, such as well developed riparian areas, wetlands or perennial waters, including tributaries to such lands. Use mechanical and/or herbicides/chemicals non-toxic to aquatic organisms when working in such lands. No herbicide spraying within 100 feet of known covered invertebrate habitat.

NDOT(19) Install highway runoff pollution control devices in areas where Covered aquatic species may be impacted by highway runoff.

NDOT(20) Never keep relocated species for private use.

NDOT(21) To the maximum extent practicable, avoid construction and maintenance projects in habitats during sensitive times, such as breeding or nesting or overwintering (e.g., near bat hibernacula).

NDOT(22) During emergency situations, the first priority for NDOT is to protect the safety of the public. During such emergency situations (i.e., casualties, disasters-flooding, fire, national defense, security), work on roadways in Covered Species habitat will be conducted in an expedited manner. If possible, work will be confined to the road shoulder or previously disturbed area. If work is required in undisturbed areas, the area must be first surveyed by an NDOT biologist or NDOT approved biological consultant. If time prevents this, surveys will be performed by other NDOT personnel to the best of their ability.

NDOT(23) Install movement directing devices in conjunction with highway/roadway protective fencing.

NDOT(24) Ameliorate existing, or install new, under-road culverts to allow passage of terrestrial species.

NDOT(25) All other appropriate requirements as stated in the DCP will apply to NDOT for this conservation plan, as many avoidance and minimization measures apply to and overlap for species in both plans.

2.3.1.3 NDF

NDF(1) Regulate the removal and possession of cacti and yucca for commercial purposes (NRS 527.070).

NDF(2) Prohibit the removal or destruction of native flora listed as fully protected (NRS 527.270).

2.3.2 Restoration and Enhancement

2.3.2.1 Clark County

CC(9) Participation in and Funding of Local Rehabilitation and Enhancement Programs, including the Muddy River Regional Environmental Impact Alleviation Committee and the Las Vegas Wetlands Park

2.3.2.2 NDOT

NDOT(27) Scarify, recontour, and reseed NDOT material sites after project completion if the site is not expected to be used for another project in the near future.

2.4 Land Use Policies and Actions

The following measures primarily deal with aspects of implementation (including funding) and coordination of management actions within and between the Participant entities in the MSHCP. In addition, policies and actions deal with specific threats and stressors, including:

Threat 201: reduction of populations of flora and fauna by commercial collection

Threat 202: habitat modification and degradation resulting from commercial collection

Threat 301: habitat degradation and modification due to fire suppression and fuels management, post fire suppression and fuels management, historical fire management, fire

Threat 302: vegetation community conversion to fire regime due to introduction of exotic annuals

Threat 401: habitat degradation and modification and indirect effects on species due to dispersed recreational activities (trampling of plants and soil by hunters, hikers, campers, mountain bikers, and equestrians); trail construction and maintenance

Threat 402: habitat degradation and modification resulting from concentrated recreation (camping, ski area expansion, facilities development)

Threat 403: habitat modification and degradation and wildlife mortality from competitive OHV races

Threat 404: habitat modification and degradation and wildlife mortality from casual use (non-competitive non-commercial) OHV activities

Threat 406: reduction of fauna populations by indiscriminate recreational shooting

Threat 407: habitat degradation, population displacement from spelunking

Threat 408: increased long-term recreation demand in natural areas from human population increases

Threat 409: commercial non-competitive OHV tours and events

Threat 701: habitat degradation by wild horse and burro grazing and trampling

Threat 702: competition of herbivores with cattle and equids

Threat 801: habitat degradation at target sites, on roads, or other military access locations

Threat 802: habitat modification from facilities construction and maintenance activities

Threat 901: habitat degradation from locatable, leasable, and saleable mineral development

Threat 902: habitat degradation and wildlife displacement from extraction of minerals

Threat 1001: habitat degradation from wood removal

Threat 1101: habitat degradation resulting from urban and rural development

Threat 1102: habitat fragmentation by urban/rural development

Threat 1103: landfills, associated non-native species, and subsidized species such as ravens and coyotes

Threat 1201: mortality through collisions and electrocution with power lines

Threat 1202: habitat degradation associated with utility facility construction and maintenance

Threat 1701: poaching, illegal collection, or killing of flora and fauna

Threat 1702: illegal waste ponds, dumping, and waste disposal

Threat 1703: illegal drug production, transport, and use

2.4.1 Clark County

CC(1) Imposition of \$550-per-Acre Development Fee and Implementation of an Endowment Fund

CC(2) Funding of Conservation Measures

CC(3) Administration of the MSHCP

2.4.2 USFS

USFS(134) Maintain a philosophy of adaptive management in implementing this CA which provides the basis for changes and mid-course corrections as determined to ensure species viability and habitat protection. (CA-GC 1.0(1))

USFS(135) Develop new trails and encourage trail use outside of biodiversity hotspots to avoid further adverse effects on rare and sensitive species. (CA-GC 1.0(2))

USFS(136) Implement the principles of ecosystem management in the Spring Mountains NRA (CA-GC 1.0(3))

USFS(137) Conduct preactivity surveys for the species of concern prior to any actions that may affect them, and design projects to minimize or avoid adverse effects. Ensure that surveys consider unique habitat components of the species of concern (e.g., mud and puddles for butterflies) (CA-GC 1.0(4))

USFS(138) Secure funding for projects involving inventory, monitoring, research, protection, restoration, and education in the Spring Mountains NRA. (CA-GC 1.0(5))

USFS(139) Secure funding for additional staff positions including a field ecologist, biologist, botanist, interpreters, visitor center personnel, wilderness manager and rangers, dispersed recreation rangers, and law enforcement officers. (CA-GC 1.0(6))

USFS(140) Ensure that all NRA staff annually review a copy of this CA and are familiar with its intent and terms. This will provide the basis for informed decision making in providing for species and ecological resource protection during planning and implementation of new and ongoing projects. (CA1.1)

USFS(141) Ensure that all NRA staff annually review species and ecosystem protection recommendations made by field researchers. This information is summarized in the document "Management Recommendations for Species and Ecosystem Management in the Spring Mountains National Recreation Area," on file in the Spring Mountains NRA office. (CA1.2)

USFS(142) Conduct annual briefings with USFS, USFWS, and State line officers (management) to update them on the status of CA implementation and to provide an assessment of future funding needs. (CA1.3)

USFS(143) Provide NRA staff and key permittees and partners with annual information on biodiversity hotspots, the species that occur in these areas, and the importance of avoiding adverse impacts to the species of concern and their habitats. (CA1.4)

USFS(144) Provide copies of this CA to, and hold annual meetings with, partners and other interested parties to increase awareness of conservation priorities and encourage partnerships in accomplishment of conservation actions. (CAI.5)

USFS(145) Establish a technical advisory group comprised of individuals with knowledge and expertise on conservation of the species of concern, and convene annual meetings to discuss conservation actions. (CAI.6)

USFS(146) Integrate efforts in this CA with the Clark County Multispecies Planning effort to ensure that mutual goals to achieve species conservation are accomplished. (CAI.7)

USFS(147) Coordinate with BLM in project planning and implementation in conservation of the species of concern and other sensitive ecological resources within their purview, and work towards inclusion of BLM lands within the Spring Mountains ecosystem into the CA. (CAI.8)

*USFS(148) Develop and distribute a field guide for use by Spring Mountains NRA and Red Rock NCA staff and others in identifying species of concern and their habitats in the Spring Mountains. (CAI.9)**

*USFS(149) Maintain, periodically update, and make accessible to NRA staff and other involved agencies and partners, a Geographic Information System, with locations of the species of concern and other sensitive ecological resources. This will provide baseline information useful for avoiding where feasible, or minimizing when necessary, adverse impacts on the species of concern and their habitats. (CAI.10)**

*USFS(150) Develop and implement a prescribed burn plan for the NRA , with emphasis on ecosystem health and enhancement of habitat for sensitive bats, endemic plants and butterflies, and other ecological resources. This plan will, at a minimum, determine the location, species, and habitats for enhancement, identify studies needed prior to implementation, outline a public information campaign, and identify the time frame in which the plan will be implemented. The prescribed burn plan will address concerns, and where feasible implement recommendations for protection of rare and sensitive flora and plant communities (Nachlinger and Reese 1996), overwintering pollinators, endemic butterflies and their host plants (Weiss et al. 1997), Palmer's chipmunk (Tomlinson 1995), bats (Ramsey 1994, 1997), and other species of concern. This plan will specifically address the issue of whether or not Clokey eggvetch may benefit from prescribed burns. (CAI.11)**

USFS(151) Develop and implement a fuelwood plan for the NRA which addresses and ameliorates potential impacts to the species of concern, in particular, Palmer's chipmunk, bats, and other species that may be affected by fuelwood cutting. The fuelwood

*plan will address concerns, and where feasible, implement recommendations for protection of Palmer's chipmunk (Tomlinson 1995), bats (Ramsey 1994, 1997), butterflies (Weiss et al. 1997), reptiles, overwintering pollinators, and other species. (CAI.12)**

*USFS(152) Identify and pursue purchases or exchanges of National Forest inholdings that will benefit the species of concern and other sensitive ecological resources. (CAI.13)**

USFS(153) Develop and implement memoranda of understanding with climbing and caving groups, and hold annual meetings emphasizing species conservation, identifying protective measures, and specifying surveys for the species of concern prior to establishment of new climbing or caving opportunities. The information derived from these programs will assist the FS in determining future management actions for species protection. (CAI.14) Identify additional special interest groups and develop memoranda of understanding. (CAI.14)

USFS(154) Maintain or enhance ecosystem health, function, sustainability, and diversity (plant, animal, and community). (FS-OBJ-0.1)

USFS(155) Maintain or restore the health and size of riparian areas at natural water sources, and at human-made water sources where native and desired non-native species have become accustomed to using them (e.g., broken pipelines). (FS-OBJ-0.2)

USFS(156) Return fire, as a historic ecological process, to the SMNRA. Maintain and improve ecosystem function and health through the management of prescribed fire and prescribed natural fire. (FS-OBJ-0.3)

USFS(157) Continue to provide firewood and meet ecosystem health goals and objectives by allowing dead and down, and green fuelwood collection. (FS-OBJ-0.4)

USFS(158) Maintain air quality at a level that is adequate for the protection and use of resources (Air Quality Related Values) and that meets or exceeds air quality standards as set by Clark County Health District. (FS-OBJ-0.5)

USFS(159) Maintain historic/natural operation of floodplains, where possible. (FS-OBJ-0.6)

USFS(160) Maintain historic conditions of water chemistry, temperature, clarity, and surface flow. (FS-OBJ-0.7)

USFS(161) Manage for endemic levels of native insects and diseases within the ecosystem. (FS-OBJ-0.8)

USFS(162) Prevent the destruction or adverse modification of critical threatened and endangered species habitat, recover populations of threatened and endangered species, and avoid the listing of additional species as threatened or endangered by maintaining populations and ecological processes necessary to their sustainability. (FS-OBJ-0.9)

USFS(163) Increase populations of threatened, endangered, and sensitive species, and species of concern, and their suitable habitat over the long term. (FS-OBJ-0.10)

USFS(164) Provide sufficient habitat to support the continued existence of all native resident and migratory species throughout the planning area. Restore desert bighorn sheep to their historic range. (FS-OBJ-0.11)

USFS(165) Provide sufficient habitat to support the continued existence of desired non-native species so long as their presence does not limit the viability of native species. (FS-OBJ-0.12)

USFS(166) Forage utilization will be 30% or less on any area in the Spring Mountains NRA. (FS-OBJ-0.13)

USFS(167) The habitat capability (population size in relation to available resources) to support elk will be based upon 15% of available resources available water and forage; and animal condition. Elk populations will be maintained at current 1996 population levels until additional habitat is provided through ecosystem and vegetation management. (FS-OBJ-0.14)

USFS(168) Manage wild horses and burros in a thriving ecological balance with long-term ecosystem health. (FS-OBJ-0.15)

USFS(169) Appropriate management levels (population size) for wild horses and burros will be based upon limiting factor: available water and forage; area sensitivity; and animal condition. Initial levels will be based upon 7% of available water. (FS-OBJ-0.16)

USFS(170) Manage cave resources within the SMNRA to protect resources, provide for public safety, and provide recreational opportunities as set forth in the Federal Cave Resources Protection Act of 1988. (FS-OBJ-0.18)

USFS(171) Develop new relationships/partnerships and strengthen existing efforts with user groups, including hunters, trappers, rock climbers, cavers, trail users, summer home and special use permittees, and American Indians, to help manage the SMNRA and protect resources. (FS-OBJ-0.29)

USFS(172) Assert claims to water that benefit recreation development, in-stream flow, wildlife, threatened, endangered, and sensitive species, species of concern, and wild horse and burro populations. (FS-ST-0.9)

USFS(173) Divert 25% or less of the surface flow from new developments at springs, seeps, and streams. (FS-ST-0.11)

USFS(174) Chaining will not be allowed. (FS-ST-0.18)

USFS(175) Use prescribed natural fire throughout the SMNRA, where lives and property can be protected and outside the Creosote and Blackbrush Land Type Associations, to achieve ecosystem health goals and reduce fuels when conditions, fuel, weather, and national/local fire seasons allow. (FS-GU-0.20)

USFS(176) Planning for prescribed fires will include community involvement in determining the strategy, timing, and any coordination for fuelwood removal prior to and after the burn. (FS-ST-0.21)

USFS(177) Use prescribed fire, silvicultural and mechanical treatments, and shaded fuelbreaks throughout the SMNRA to achieve ecosystem health goals, reduce fuel loads, and protect public safety, developed areas, and private property. (FS-GU-0.22)

USFS(178) Use prescribed fire within known and potential habitat of Clokey eggvetch to improve habitat suitability when fuel, weather, and local/national fire season allows. (FS-GU-0.23)

USFS(179) All species listed as candidates for the Federal threatened or endangered species list, all species listed as protected rare, endangered, and critically endangered by the State of Nevada, and all Forest Service sensitive species will be considered "species of concern," and treated as if they were on the Forest Service sensitive species list. (FS-ST-0.27)

USFS(180) Limit negative impacts to all species of concern due to management activities. Enclosed species list is the current (9/96) list of species of concern. (FS-GU-0.29)

USFS(181) New facilities and roads will be sited so as to avoid vital populations or habitats of species of concern. (FS-ST-0.35)

USFS(184) Permit application of herbicides and insecticides only to avoid or control epidemic outbreaks of insect and plant diseases where there is a threat to public safety, private property, or extreme fire danger. When applied, use only formulations registered by the EPA for the intended use, at minimum effective rates, and using selective methods.

Avoid use in habitat for threatened, endangered, or sensitive species, or species of concern whenever possible. Single tree treatment will be used. (FS-ST-0.39)

USFS(185) Do not permit introduction of new non-native species of fish or wildlife. (FS-ST-0.40)

USFS(186) Initial elk populations will be maintained at current 1996 population levels until such time as additional elk habitat is provided through ecosystem and vegetation management. Work with NDOW to reduce the initial elk populations, should the elk herds not move into newly created habitats. (FS-ST-0.42)

USFS(187) Work with NDOW to identify current elk population's utilization levels of key forage species, home ranges of elk herds, and resource overlap with other grazing animals. (FS-ST-0.43)

USFS(188) Cooperate with NDOW to reduce elk population when habitat capability is exceeded by 15%. if possible, reduce population size to 20% below. (FS-ST-0.44)

USFS(189) Develop and maintain cooperative partnerships with hunters and trappers to benefit ecosystem health. (FS-GU-0.46)

USFS(190) Close all livestock allotment on the Spring Mountains NRA to grazing under term or temporary grazing permits. Livestock will only be permitted to graze to achieve specific desired ecological conditions. Domestic sheep and goats are prohibited throughout the Spring Mountains NRA. (FS-ST-0.48)

USFS(196) Avoid cutting fuelwood, or cutting trees for salvage or sanitation within 0.5 mile of active or recently active flammulated owl or goshawk nest. Trees hazardous to public safety or extreme fire danger may be removed. Insect and disease treatments may occur within this area to control epidemic outbreaks. (FS-GU-0.60)

USFS(197) Allow collection of snags only between the months of October and the end of February. (FS-ST-0.61)

USFS(198) Minimize paving of existing unpaved forest system roads within the SMNRA, provided public safety and resource management objectives are met. (FS-GU-0.62)

*USFS(199) Allow motorized vehicle use only on designated roads and trails, except for snowmobile use in approved areas. Close washes to motorized use. (FS-ST-0.65)**

*USFS(200) Allow bicycle use only on established and/or designated roads and trails. (FS-ST-0.66)**

USFS(201) No sale of National Forest System land within the SMNRA. (FS-ST-0.67)

USFS(202) Use bulldozers in fire suppression only as a last resort (lives or private property threatened). (FS-GU-0.89)

USFS(203) When possible, use existing human-made and natural barriers as control lines in preference to building new lines when suppressing wildfires and prescribing fires. (FS-GU-0.92)

USFS(204) Do not use bulldozers to create control lines for prescribed burns. (FS-ST-0.93)

USFS(208) Require permits for publicized and/or organized events with 25 or more participants. (FS-ST-0.130)

*USFS(209) Require permits for groups with 15 or more pack or saddle stock. Require as part of the permit, all participants must stay on approved trails. Require removal of all hay and fecal material as part of site rehabilitation. (FS-ST-0.131)**

USFS(210) New facilities, special uses, or private developments on National Forest System lands will be constructed or carried out using “defensible space,” guidelines to limit the incidence, speed, and damage from wildfire, where consistent with maintaining habitat for species of concern. (FS-ST-0.134)

USFS(211) Provide additional developed recreation facilities in appropriate locations to encourage use away from upper Kyle and Lee Canyons. Emphasize new facilities in lower Kyle and Lee Canyons (east of Highway 158), at Cold Creek, and on the west side of the Spring Mountains. (FS-GU-0.135)*

USFS(212) New campgrounds and picnic areas will be located outside the 50-year floodplain, riparian areas, and avalanche hazard zones. (FS-ST-0.137)

USFS(213) Allow development of low standard facilities (signs, trails, restrooms) and parking areas within the 50-year floodplain if no other alternative is available. Design these facilities to provide for public safety and to maintain floodplain function. (FS-GU-0.138)

USFS(214) Provide alternative parking sites, road alignments, and fencing where feasible to allow for continued recreational use outside of riparian areas. (FS-GU-0.140)

USFS(215) Construct any new roads outside riparian areas, washes, and the 50-year floodplain; and at least 100 yards away from existing water sources, except at crossings perpendicular to the water course. (FS-ST-0.141)

USFS(216) New commercial developments will be approved only if they meet all the following requirements: (FS-ST-0.144)

- *Do not negatively impact threatened, endangered, or sensitive species, or species of concern;*
- *Incorporate “defensible space” design (landscape design to prevent loss of property or life in case of wildfire), and fire safe facilities;*
- *Provide for education and interpretation of natural resources;*
- *Fit within a mountain setting;*
- *Offer activities not generally provided on private land;*
- *Minimize visual impacts;*
- *Traditional or historic public use(s) is not limited;*
- *Private land is not available;*
- *Provide additional public restrooms (as appropriate);*
- *Gambling is not part of Forest Service authorization.*

USFS(217) New administrative facilities will be located outside the 50-year floodplain, riparian areas, and avalanche hazard zones. (FS-ST-0.145)

USFS(218) All new administrative facilities will use drought tolerant landscaping with an emphasis on native species. (FS-GU-0.146)

USFS(219) All private lands within the SMNRA outside of developed subdivisions are suitable for acquisition, through purchase, exchange, or donation. (FS-GU-0.147)

USFS(220) Consider disposal through exchange of land occupied by Special Use Permits or summer homes if it would result in ecosystem, administrative, and recreational benefits and where exchange will further the purposes of the Spring Mountains National Recreation Area Act. (FS-GU-0.150)

USFS(222) Allow surface flows to return to ecosystem use in developed canyons. (FS-OBJ-11.4)

USFS(223) Develop cooperative management relationships with recreational residence associations in developed canyons. (FS-OBJ-11.15)

*USFS(224) Allow collection of butterflies in Lee Canyon, Cold Creek, Willow Creek, and upper Kyle Canyon only through permits. (FS-ST-11.6)**

*USFS(225) Where possible, control access to, and revegetate areas in the developed canyons that are adjacent to recreation developments and have slopes greater than 25 percent. (FS-GU-11.7)**

USFS(226) To maintain wildlife cover in developed sites, encourage campground hosts/concessionaire to provide wood for purchase by campers/picnickers. (FS-GU-11.10)

*USFS(227) Designate specific primitive camp and picnic sites in upper Macks Canyon and at the Archery Range (at Deer Creek) by using parking barriers, fencing, signing, and education. (FS-GU-11.24)**

*USFS(228) Prohibit snowmobile use in upper Lee Canyon (west of Deer Creek Highway) except for administrative use, search and rescue, and operational use within or for the Las Vegas Ski and Snowboard Resort. (FS-ST-11.25)**

*USFS(229) Provide entrance stations on State Highways 157 and 158 at the entrances to upper Kyle and Lee canyons, in cooperation with Federal, state, and local agencies, and local residents and business interests. The stations will include gates or other methods to manage traffic flow. (FS-GU-11.51)**

*USFS(230) Provide additional multi-use recreation facilities in lower Kyle or Lee canyons. (FS-GU-11.53)**

*USFS(231) As possible, develop additional snow play area in Kyle Canyon, within the area road and parking capacity, or if needed parking/transportation capacity is provided. Avoid species of concern. If avalanche hazard zones cannot be avoided, provide for adequate forecasting, warning, and closure. (FS-GU-11.63)**

USFS(232) Manage the Carpenter Canyon Research Natural Area to retain its natural and scientific values. (FS-OBJ-12.3)

*USFS(233) Reduce impacts of non-native plants in the Wilderness. (FS-OBJ-12.4)**

USFS(234) Allow fires to play their historic role in the Wilderness, where consistent with the protection of wilderness resources, public safety, and private property and developed facilities in surrounding areas. (FS-OBJ-12.5)

USFS(235) Allow natural disturbances (fire, flood, avalanche) in the Wilderness to achieve desired condition of vegetation mosaic. Use management tools to achieve desired condition only if other alternatives are not available. (FS-GU-12.1)

USFS(236) Allow for treatment of exotic pests within the Wilderness when scientific evaluations indicate a need. Only use pesticides when no other options are available and then use the least persistent chemical or biological pesticide. Avoid use in habitat for species of concern whenever possible. (FS-GU-12.3)

*USFS(237) Trail construction and commercial uses within the Research Natural Area are prohibited, except for outfitters/guides passing through the RNA on the Mt. Charleston Loop Trail. (FS-ST-12.10)**

*USFS(238) Rock climbing in the Fletcher Canyon and Robbers' Roost areas (both within and outside the Wilderness boundary) will continue only on existing routes until surveys for species of concern are complete. After surveys have been completed, local restrictions or seasonal closures may be used to protect species of concern. (FS-GU-12.12)**

*USFS(239) Wilderness permits are required for all overnight use within the Wilderness. Prohibit camping in sensitive areas, as determined through monitoring. (FS-ST-12.13)**

*USFS(240) Camp stoves are not restricted within the Wilderness. Campfires of any kind are prohibited. (FS-ST-12.14)**

*USFS(241) Discontinue equestrian use in the alpine if monitoring determines that equestrian use is having a negative impact on vegetation within the biodiversity hotspots. (FS-ST-12.17)**

*USFS(242) Pack and saddle stock are limited to day use on all of South Loop Trail and on North Loop Trail from Trail Canyon trail junction to Charleston Peak (FS-ST-12.18)**

USFS(243) Encourage the use of weed-free feed. (FS-GU-12.19)

*USFS(244) A maximum of 15 pack or saddle stock will be permitted to use the trails in the Wilderness for organized trail rides. (FS-ST-12.24)**

*USFS(246) Maintain unfragmented blocks of land in the West Side management area . (FS-OBJ-13. 2)**

USFS(247) Habitat Capability for elk: Wheeler Pass, 87; Lovell Summit, 65. (FS-OBJ-13.8)

USFS(248) Appropriate Management Level for wild horses and burros in Wheeler Pass: horses, 11; burros, 0 (based upon 7% of available water). Lowest recorded water flow rate is used; assuming wild horses require 10 gallons of water per day. Those gpm rates (gallons per minute): Wheeler Well, 0.0 gpm; Buck Spring, 0.75 gpm; Rosebud Spring, 0.34 gpm. Appropriate Management Level for wild horses and burros in Wheeler/Wallace: horses, 10; burros, 21 (based upon 7% of available water). Lowest recorded water flow rate is used; assuming wild horses require 10 gallons of water per day; burros require 5 gallons of water per day. Those gpm rates (gallons per minute): Kiup Spring, 1.7 gpm; Ford Spring, 0.25 gpm; Carpenter Tank, 0.0 gpm; Lee Spring,

unknown; Trout Spring, 0.0; Horse Spring, 0.0* Dedicated to community/private use). Appropriate Management Level for wild horses and burros in Red Rock Territory: horses, 50; burros, 50 (based upon Bureau of Land Management recommendations and the best available information). (FS-OBJ-13.10)*

*USFS(249) Maintain large undisturbed blocks of vegetation in an unfragmented condition without new roads or motorized trails including: Lovell Wash/Yount/Rose Springs area. (FS-ST-13.2)**

USFS(251) Take advantage of the remote setting of this Mt. Sterling management area to actively restore historic disturbance regimes and improve wildlife habitat. (FS-OBJ-14.2)

*USFS(252) Maintain existing roadless character of the Mt. Sterling Wilderness Study Area. (FS-OBJ-14.6)**

USFS(253) Habitat capability for elk for Mount Stirling is 97. (FS-OBJ-14.7)

USFS(254) Initial Appropriate Management Level for Johnnie Territory: horses, 50; burros, 75 (based upon Bureau of Land Management recommendations and the best available information). (FS-OBJ-14.8)

USFS(255) Prohibit construction of developed recreation sites or additional roads in the Mount Stirling WSA until such time as Congress makes the decision regarding inclusion in the National Wilderness Preservation System. (FS-ST-14.2)

USFS(256) Include in their agency budget requests adequate dedicated and earmarked funding to allow USFS to fully operate, manage, maintain, and monitor their lands pursuant to the terms of this MSHCP and to fulfill their obligations to protect the species and ecosystems consistent with statutory obligations imposed by Congress. They acknowledge that funds collected by Clark County and paid to them to assist in land management policies and actions are not intended to be substituted for monies which would otherwise be allocated to them to fulfill statutory obligations to protect the resources, but are intended to supplement those funds.

2.4.3 USFWS

USFWS(42) Assure full and continuing implementation of existing management policies and actions, and monitoring of sensitive habitats and species (DNWR).

USFWS(43) Review and implement management measures to protect habitat and species from military impacts (DNWR).

USFWS(44) Assure implementation of Integrated Pest Management Plans (DNWR).

USFWS(45) Focus new recreation activities into less sensitive areas of the DNWR (DNWR).

USFWS(46) Consolidate utility corridors to the extent feasible on Federal lands (DNWR).

USFWS(47) Prohibit camping within one-quarter mile of water sources (DNWR).

USFWS(48) Provide an Environmental Assessment of the effects of the expansion of any public use areas, especially effects on species of concern (including Covered Species) (DNWR).

USFWS(49) Implement measures incorporated in the Conservation Agreement for the Spring Mountains NRA with the USFS (Ecological Services).

USFWS(50) Review and provide a written report concerning the proposed management plans and budgets which will evaluate the consistency of the proposed management plans with the ESA, recovery plans, and this conservation plan, prior to the submittal of the proposed management plans and budgets to the I & M Committee. The written report will be provided within 45 days after the proposed management plans and budgets are submitted to the USFWS. In addition, if required by law, the Federal land managers will consult or confer with the USFWS pursuant to Section 7 of the ESA regarding the proposed management plan and budget. The Section 7 Biological Opinion, if required, and the report will be furnished to the I & M Committee to assist it in its deliberations. Section 7 consultations may take up to 135 days (Ecological Services).

USFWS(51) Cause minimization measures that result from authorization of incidental take pursuant to Section 7 of the ESA (Section 7) to be consistent with the mitigation measures required under this plan, under normal circumstances. However, nothing in this plan is intended to prohibit or proscribe the USFWS from requiring measures in excess of that provided for in this plan, should the circumstances so warrant (Ecological Services).

USFWS(52) Coordinate with and provide technical assistance to the I & M Committee. (Ecological Services)

USFWS(54) Include in its agency budget requests adequate funding to allow it to fully perform the obligations and tasks assigned to it pursuant to the terms hereof, including, but not limited to, the review of the biennial management plan and budget as well as cooperating with and providing technical assistance to the I & M Committee.

USFWS(55) Convene Muddy River Recovery Implementation Team to develop and oversee implementation of the Muddy River Recovery Implementation Plan (Ecological Services).

USFWS(56) Convene Virgin River Recovery Implementation Team to develop and oversee implementation of the Virgin River Recovery Implementation Plan (Ecological Services).

2.4.4 BLM

BLM(80) Red Rock Canyon NCA is closed to mining laws, subject to valid and existing rights (83% of blue diamond cholla population is protected).

BLM(162) In accordance with the BLM/Clark County Interlocal Agreement approved July 1, 1997, BLM will regulate and manage organized recreational activities on County RS2477 roads in accordance with 43 CFR subpart 8372 within proposed or designated desert tortoise ACECs.

BLM(163) BLM will review their special status species list annually and update it as appropriate to include the MSHCP “covered” species, and where appropriate, “evaluation” species.

BLM(306) Approximately 11,014 acres of the Desert Tortoise Conservation Center Management Area are available for withdrawal by other Federal agencies when such transfer would further objective SS-4. (Manage the CCMA [11,013 acres] to support desert tortoise research and other research associated with the Mojave Desert Ecosystem. When feasible, expand the function of the center to include an environmental education/awareness program in close coordination with other Federal agencies and State and local governments.)

BLM(11) Survey abandoned mines for the presence of bats before authorization of mine closures. If use of the mine by bats is documented, consider installing bat gates to ensure that the habitat continues to be suitable for bats, while promoting public safety. Total closure of abandoned mines known to support bats should be considered only as a last resort.

BLM(145) During development of all activity plans, give special attention to protecting riparian zones as wildlife habitat and to protect associated native floral and fauna.*

BLM(164) The following are land acquisition priorities on a willing seller basis: *

- 1) Private lands required to meet management objectives within designated ACECs, WSAs, T&E habitat and areas containing special status species.

- 2) Private lands along the Virgin River south of Riverside Bridge.
- 3) Lands not specifically identified for acquisition could be acquired on a case-by-case basis for the following reasons: a) protection of T&E and special status species; b) to provide resource protection; c) to facilitate implementation of the Resource Management Plan; d) to provide a more manageable land ownership pattern; or e) to maintain or enhance public uses and values.

BLM(200) Withdraw from entry under locatable mineral laws 11,014 acres comprising the Desert Tortoise Conservation Center Management Area. Also do not authorize (or renew) material sites rights-of-way, mineral material disposal, and solid and fluid mineral leasing within the CCMA.

BLM(201) Withdraw from locatable mineral entry and close to all solid mineral leasing within ¼ mile of natural springs, the floodplain of the Virgin and Muddy Rivers, and all ACECs.

BLM(202) Allow fluid mineral leasing, subject to No Surface Occupancy stipulations within areas having important cultural, geological, and riparian resources; special status species plant and animal habitat; Areas of Critical Environmental Concern; administrative sites; and Special Recreation Management Areas. (See the RMP ROD [Record of Decision] for a list of ACECs and acreages which includes 866,000 acres.)

BLM(203) Allow fluid mineral leasing subject to timing and surface use constraints in the following ACECs: Amargosa Mesquite (Crystal), Gold Butte (Parts B and C).

BLM(204) Do not allow saleable mineral disposal in ACECs with the following exception: 1) allow saleable mineral disposal within ½ mile of Federal and State highways and county roads identified by the RMP. These will only be allowed as extensions to existing material site rights-of-way and free use permits for State and local governmental entities, and 2) allow existing free-use and community pit authorization at one site in the Rainbow Gardens ACEC to be reauthorized or renewed but do not allow expansion of the sites.

BLM(206) Designate the following areas as ACECs for the conservation of Federally listed and special status species of wildlife and plants:

Piute/Eldorado	329,440 acres
Coyote Springs	75,500 acres
Mormon Mesa	151,360 acres
Gold Butte (Parts A, B, &C)	344,437 acres
Rainbow Garden	37,620 acres
River Mountains	5,617 acres
Virgin River	6,411 acres

BLM(207) Implement the following management actions in desert tortoise ACECs (743,209 acres):

- 1) Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and where possible, staying on existing roads and trails. However, the priority shall be in keeping the wildfire to an absolute minimum.
- 2) Manage for zero wild horses and burros within desert tortoise areas of critical environmental concern.
- 3) Implement inventory, monitoring and research projects dealing with management issues within desert tortoise areas of critical environmental concern.
- 4) Limit utility corridors to 3,000 feet or less in width.
- 5) Do not allow new landfills.
- 6) Do not authorize military maneuvers.
- 7) Allow development of camp grounds only if consistent with the objectives of the Tortoise Recovery Plan.
- 8) On a case-by-case basis, support fencing of highways and moderately to heavily traveled dirt roads with tortoise-proof fencing and installation of culverts to allow tortoises to cross under the highway.
- 9) Commercial activities may be permitted on a case-by-case basis if not in conflict with the recovery of the desert tortoise.
- 10) Designate as "Limited to designated roads and trails" for all motorized and mechanized vehicles.
- 11) Allow non-speed off-highway vehicle events subject to the restrictions identified elsewhere.
- 12) Campers may pull their vehicles off the edge of the road but must stay within 15 feet of the edge of the road, except in Wilderness Study Areas where the vehicle must remain within the berm of the road.

BLM(208) Within desert tortoise ACECs, do not allow commercial collection of flora. Only allow commercial collection of wildlife upon completion of either a credible study

or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat, as determined by NDOW. This action will not affect hunting, trapping, or casual collection as permitted by the State. Limit collection or sale of desert vegetation and other vegetative resources for public use to approved areas including disposal areas, rights-of-way and gravel pits.

BLM(209) Commercial collection of decorative rock and other saleable minerals is prohibited in all ACECs and RRCNCA (already prohibited in RRCNCA). Commercial collection in other areas will be considered on a case-by-case basis consistent with the conservation of special status species.

BLM(210) Do not allow OHV speed events, mountain bike races, horse endurance rides, four-wheel drive hill climbs, mini events, publicity rides, high speed testing, and other similar speed based events within tortoise ACECs. These restrictions apply to other ACECs except that horse endurance rides and mountain bike events may be allowed on a case-by-case basis.

BLM(211) Designate 1,107,800 acres as limited to designated roads and trails for all motorized and mechanized vehicles within desert tortoise ACECs, Rainbow Garden ACEC, and areas adjacent to Red Rock Canyon NCA and Spring Mountains NRA.

BLM(215) Close all allotments, to livestock grazing, within the planning unit except for Hidden Valley, Mount Stirling, Lower Mormon Mesa, Roach Lake, White Basin, Muddy River, Wheeler Wash, Mesa Cliff, Arrow Canyon in Battleship Wash, Flat Top Mesa, Jean Lake and Arizona administered allotments. That portion of the Jean Lake allotment within the desert tortoise ACEC would be closed to grazing.

BLM(216) Additional allotment closures could be approved based on voluntary relinquishment of grazing privileges, permits or leases.

BLM(217) Establish an AML of zero burros in the Eldorado herd management area and Gold Butte (Part A) ACEC.

BLM(218) Close WSAs and ACECs to land use leases and permits under Sec. 302 of FLPMA, and airport leases.

BLM(219) Designate 158,800 acres of utility corridors. All ACECs exclusive of designated corridors are designated as right-of-way avoidance area.

BLM(220) Designate important bearpoppy habitat in Lovell Wash (Muddy Mountains) and the Bitter Springs as ACECs for the protection of Las Vegas bearpoppy and sticky ringstem. These areas should be limited to designated roads and trails, closed to OHV competitive events and all forms of mineral entry. (Land Use Amendment Required)

BLM(221) Limit vehicular use to designated roads and trails in and around mesquite woodlands.

BLM(222) Designate significant mesquite woodlands as ACECs. The management of multiple uses within mesquite woodlands will be consistent with managing for the long-term viability of these habitats and the wildlife they support.

BLM(212) Bureau of Land Management shall consider with respect to rural roads the following measures which have been proposed by the I & M Committee and specifically those members of the I & M Committee who represent the interests of the environmental groups, the rural communities, and the OHV community:

Relax permitting restrictions on non-speed OHV events, to the extent that such relaxation does not threaten other resource values and is consistent with law, policy, and procedures as hereinafter provided.

Impose the conditions described below for organized OHV events during the first three years of the MSHCP or until the recommendation of the rural roads component of the AMP has been completed, whichever last occurs. Members of the OHV community and the environmental community recognize and agree that after completion of the rural roads component of the AMP, these rules and regulations may be modified to reflect the results of the AMP process, including the scientific component as well the socioeconomic and sociopolitical elements, and that conditions within Conserved Areas may be either more or less restrictive than those set forth herein.

Utilizing a streamlined permit process as described below a permit shall be required for all non-speed OHV events with 26 or more vehicles within desert tortoise ACECs and 50 vehicles outside desert tortoise ACECs.

Within desert tortoise ACECs:

A maximum of five permitted non-speed events and non-speed portions of speed-based events are permitted in each desert tortoise ACEC during the period of March 1 through March 15 and June 15 through August 31. No OHV non-speed events, or non-speed portions of speed-based events, will be permitted from March 16 through June 14 and from September 1 through October 15. (The September through October dates may vary up to three days to allow a full weekend [i.e., Saturday and Sunday] for an event. A maximum of 60 permitted non-speed events and non-speed portions of speed-based events are permitted cumulatively in desert tortoise ACECs during the period of October 16 through February 28 (29 in leap year) subject to additional restrictions described below (see Appendix I maps):

- a. events with 76 to 150 vehicles shall count as two events. Events with 151 to 225 vehicles will count as three events, and events with 226 to 300 vehicles will count as four events.
- b. no OHV events are permitted in the Piute/Eldorado ACEC west of US 95 during any part of the year.
- c. events within the Gold Butte ACEC shall only be permitted on and east of the existing paved road between the Riverside Bridge and Whitney Pockets and on and north of the unpaved road between Whitney Pockets and the Arizona State line.
- d. events within the Mormon Mesa ACEC shall only be allowed on the Carp/Elgin Road, Halfway Wash Road and the East Halfway Wash Road.
- e. no OHV events are permitted in the Coyote Springs ACEC.
- f. up to six non-speed OHV events are permitted in that area east of US 95 and south of SR164 during the tortoise inactive season only (October 16 through February 28).
- g. vehicles shall not exceed the legal speed limit (posted or unposted) of the roads used during events. Clark County speed limit for unposted roads is 25 miles per hour. If the speed limit is not posted, the speed limit shall be 25 miles per hour.

Outside ACECs:

BLM agrees to pre-approve 10 non-speed OHV events annually outside of desert tortoise ACECs where there are more than 49 entries or vehicles (thus requiring a permit) by January 1, 2000. The BLM also agrees to waive all insurance requirements and the County agrees to pay the permit fee (\$80.00 per event). The OHV promoter shall ensure that all permissions necessary from private landowners or rights-of-way grant holders are obtained prior to the BLM approving the particular courses in question. Once the applicant has provided to the BLM the appropriate permissions and proposed course, the BLM will approve or deny the permit within 45 days. These permits shall then be granted to non-speed OHV event organizers on a first come basis.

Other Terms and Conditions:

The BLM will develop a pamphlet or similar product for distribution to the public, suggesting places to go outside ACECs and other environmentally

sensitive areas. A potential target for this type of information may include rental car agencies that rent four-wheel-drive vehicles. Maps of desert tortoise ACECs should be included.

Outside desert tortoise ACECs and Rainbow Garden ACEC non-speed events and non-speed portions of speed-based events may occur on existing roads, trails, and dry washes. For the purposes of this proposal, dry washes are defined as: the channel of a flat-floored ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

2.4.5 USAF

USAF(25) Incorporate analysis of potential effects on MSHCP species for any action requiring site-specific environmental evaluation.

USAF(26) To the extent permitted by law, integrate the terms of the Multiple Species Habitat Conservation Plan and their obligations hereunder into their respective management plans that govern their land management policies.

USAF(27) Include in their agency budget requests adequate dedicated and earmarked funding to allow the U.S. Air Force to fully operate, manage, maintain, and monitor their lands pursuant to the terms of this MSHCP and to fulfill their obligations to protect the species and ecosystems consistent with statutory obligations imposed by Congress. They acknowledge that funds collected by Clark County and paid to them to assist in land management policies and actions are not intended to be substituted for monies which would otherwise be allocated to them to fulfill statutory obligations to protect the resources, but are intended to supplement those funds.

USAF(28) Prepare a biennial management plan and report. As set forth in other sections of this document, the Biennial Management Plan will be submitted to the USFWS through Clark County. This Biennial Management Plan will address proposed management plans and programs for the ensuing two years as well as an evaluation of management actions imposed or continued during the previous two-year period. The Biennial Management Plan will provide information enabling the USFWS and the I & M Committee to determine that the terms of the MSHCP and the permit are being fulfilled.

2.4.6 NPS

NPS(51) Assure full and continuing implementation of existing management policies and actions, and monitoring of sensitive habitats and species.

NPS(52) Add MSHCP Covered Species to sensitive species status for NPS.

NPS(53) Cooperate with other Federal agencies in actions to implement the Recovery Plan for the Rare Aquatic Species of the Muddy River Ecosystem and the Virgin River Fishes Recovery Plan.

NPS(55) As appropriate for conservation of biological resources in the LMNRA, develop conservation agreements or easements with adjacent willing landowners with habitat for Covered Species.

NPS(56) Institute and keep in full force and effect the land use controls upon all lands where grazing privileges have been purchased as established in the Short-Term HCP and DCP.

NPS(57) Prepare a biennial management plan and report (Biennial Management Plan). As set forth in other sections of this document, the Biennial Management Plan will be submitted to the USFWS through Clark County. This Biennial Management Plan will address proposed management plans and programs for the ensuing two years as well as an evaluation of management actions imposed or continued during the previous two-year period. The Biennial Management Plan will provide information enabling the USFWS and the I & M Committee to determine that the terms of the MSHCP and the permit are being fulfilled.

NPS(58) To the extent permitted by law, integrate the terms of the Multiple Species Habitat Conservation Plan and their obligations hereunder into their respective management plans which govern their land management policies.

NPS(59) Include in their agency budget requests adequate dedicated and earmarked funding to allow NPS to fully operate, manage, maintain, and monitor their lands pursuant to the terms of this MSHCP and to fulfill their obligations to protect the species and ecosystems consistent with statutory obligations imposed by Congress. They acknowledge that funds collected by Clark County and paid to them to assist in land management policies and actions are not intended to be substituted for monies which would otherwise be allocated to them to fulfill statutory obligations to protect the resources, but are intended to supplement those funds.

NPS(60) Consolidate utility corridors to the extent feasible on Federal lands.

NPS(61) Close the LMNRA to new mining.

2.4.7 NDOW

NDOW(26) Regulate hunting, trapping, and fishing allowed at OWMA.

NDOW(27) Cooperate with and provide technical assistance to the I & M Committee including but not limited to assistance in the development and implementation of the Adaptive Management Program, review and evaluation of and/or assistance in collection of data for Covered and Evaluation Species.

NDOW(28) Include in its internal budget requests adequate funding to allow it to fully perform the obligations and tasks assigned to it pursuant to the terms hereof, including, but not limited to cooperating with and providing technical assistance to the I & M Committee.

NDOW(29) Review the management plan for the OWMA for consistency with the wildlife conservation goals for Covered and Evaluation Species of the MSHCP.

2.4.8 NDOT

NDOT(29) Relinquish NDOT material sites to the BLM when they are no longer useful for NDOT construction and maintenance activities.

NDOT(30) Coordinate with BLM to perform plant salvages prior to work in undisturbed habitat and/or when Covered plant species cannot be avoided, especially cactus and yucca species.

NDOT(31) Only use existing material sites in IMAs and LIMAs if no other reasonable options are available outside these areas.

NDOT(32) Require contractor and encroachment permittees to abide by all MSHCP requirements.

NDOT(33) Pursue funds for environmental provisions included in transportation-related funding measures that occur during the term of the MSHCP.

NDOT(34) During project development and design, avoid areas known to support Covered Species to the maximum extent practicable.

NDOT(35) Within IMAs and LIMAs, if NDOT acquires new material sites or expands existing material sites, NDOT will relinquish the same amount of acreage from existing material sites within IMAs and LIMAs to the BLM.

2.4.9 Nevada Division of State Parks

NSP(18) To the extent feasible, ensure that minimal impacts occur to resources during the planning stages for projects.

NSP(19) Construct all facilities to create the least amount of visual impact to the park.

2.4.10 NDF

NDF(3) Cooperate, to the maximum extent practicable, with Clark County, and enter into agreements, as appropriate, with Clark County and other Participants in the MSHCP for the administration and management of any areas established for the conservation, protection, restoration, and propagation of species of native flora which are threatened with extinction (NRS 527.300).

Chapter 3 Alpine Ecosystem

3.1 Description and Distribution

The alpine ecosystem consists of herbaceous, high-altitude tundra vegetation, generally above timberline and above 11,500 feet on Mt. Charleston in the Spring Mountains area in Clark County (Figure 3-1). The alpine community on Mt. Charleston is a soil-dependent community developed on the rocky high elevation environment. This open community is considered a depauperate (less than normally developed) extension of the Great Basin alpine tundra. Presumably this reduced biodiversity is due to species extinctions resulting from the warmer temperatures and lower precipitation experienced after the last glaciation. Even though the Mt. Charleston alpine community is missing portions of the alpine flora typically found in well-developed alpine tundra communities elsewhere in North America (Clokey 1951), there are several endemic species. The geographic, climatic, and biological isolation of the Spring Mountains has allowed new plant species to evolve in situ or persist as relict populations here, even though they may have been more widespread in the past but became extinct elsewhere.

Because the Spring Mountains are entirely surrounded by desert, the alpine community has become isolated and, as a result, a unique assemblage of plants species has evolved there. Individual species of plants which occur in the alpine zone on Mt. Charleston exhibit several patterns of local, regional, and global distribution. Certain dwarf perennial herb species common to alpine regions in North America and elsewhere in the northern hemisphere are restricted to the alpine zone of Mt. Charleston. These include hawksbeard (*Crepsis nana*), hairgrass (*Trisetum spicatum*), and alpine mouse-ear (*Cerastium beringianum*), which have circumpolar distributions, along with the columbine (*Aquilegia scopulorum*), which ranges to the northeast through east-central Nevada into Utah (Clokey 1951).

Other species occur from the alpine zone down past the tree line where the alpine zone contacts bristlecone pine forest. These species include Spring Mountains endemic perennial herbs such as Jaeger whitlowgrass (*Draba jaegeri*), Charleston tansy (*Sphaeromeria compacta*), and hidden ivesia (*Ivesia cryptocaulis*) as well as species such as pendulous mustard (*Arabis pendulina*), which has a distribution restricted to the southern part of the Great Basin. Some species range from lower elevations in bristlecone pine forest up to the tree line or just into the alpine zone, including mountain current (*Ribes montigenum*), a widespread North American species, and the sedge (*Carex*

subfusca), which also occurs in Oregon, southern California, and Arizona (Clokey 1951). Other species in this cold, windswept zone appear to be adapted to living in the transitional area at the tree line; these include the Spring Mountains endemic Clokey catchfly (*Silene clokeyi*). Jaeger whitlowgrass, Charleston tansy, hidden ivesia, and Clokey catchfly, all MSHCP Covered Species. Open grassy areas at high elevations are dominated by a fescue (*Festuca ovina* var. *brachyphylla*). Diverse biogeographic patterns of the individual plant species in the alpine community on Mt. Charleston are an indication of a complex and varied geologic, climatic, and evolutionary history. Individual species in the alpine zone show affinities to related plants in mountainous areas of southern California, the Great Basin, Cascade Ranges, North American arctic areas, as well as Asia and Europe (Clokey 1951). These biogeographic patterns are evidence of a former continuum of alpine vegetation types across what is now desert. Summer rains and deeper soils in the desert may allow additional species to persist. Because of the high elevations, the growing season is brief, typically extending from June to August. The short growing season results in slow annual plant growth which makes these species susceptible to damage from human-related disturbances.

3.2 MSHCP Species

The alpine ecosystem provides habitat for 11 Covered Species, all of them plants.

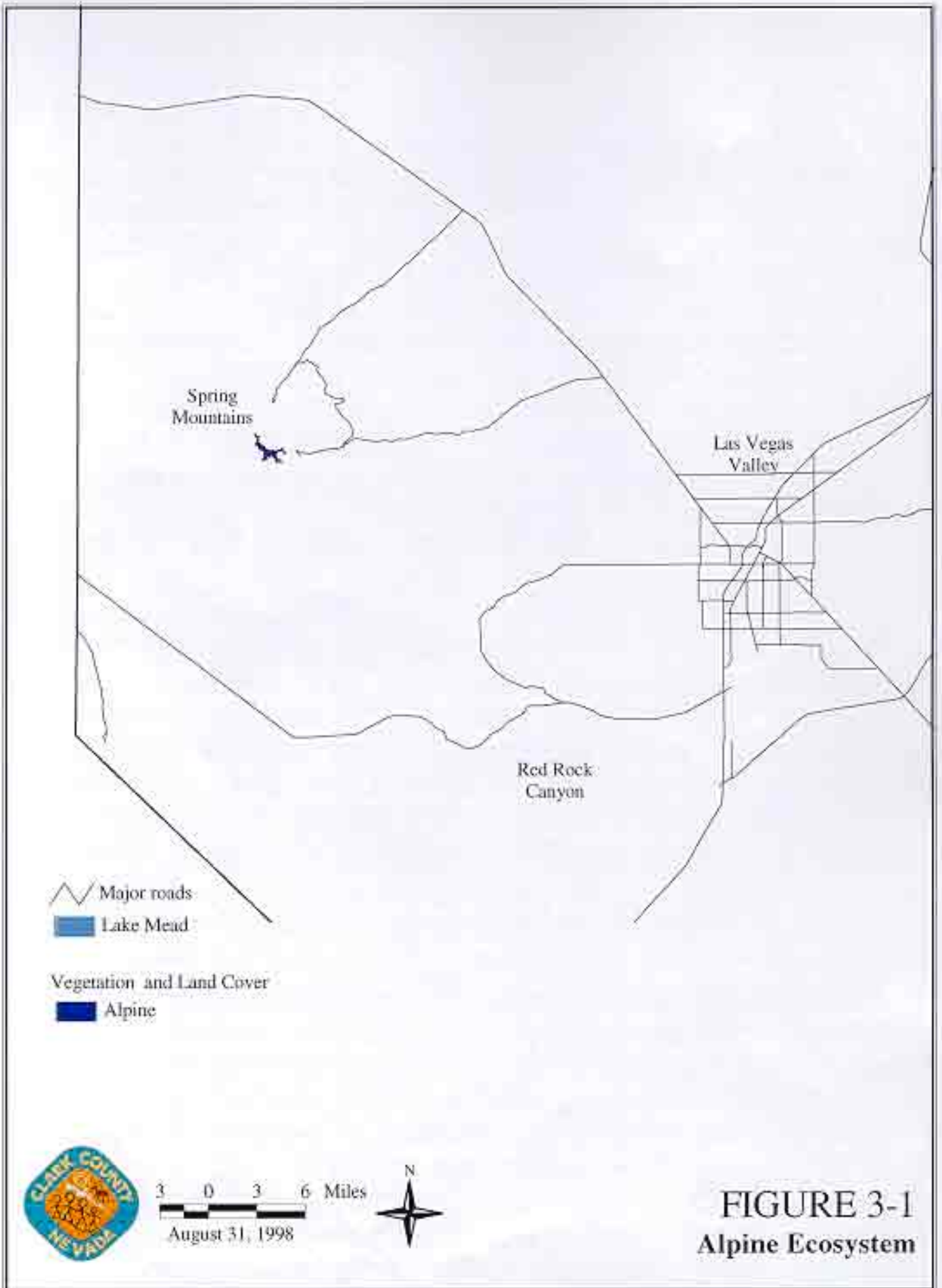
Covered Species:

Charleston pussytoes	<i>Antennaria soliceps</i>
Clokey thistle	<i>Cirsium clokeyi</i>
Jaeger whitlowgrass	<i>Draba jaegeri</i>
Charleston draba	<i>Draba paucifructa</i>
Hidden ivesia	<i>Ivesia cryptocaulis</i>
Hitchcock bladderpod	<i>Lesquerella hitchcockii</i>
Charleston beardtongue	<i>Penstemon leiophyllus</i> var. <i>keckii</i>
Clokey catchfly	<i>Silene clokeyi</i>
Charleston tansy	<i>Sphaeromeria compacta</i>
Charleston kittentails	<i>Synthyris ranunculina</i>
Charleston grounddaisy	<i>Townsendia jonesii</i> var. <i>tumulosa</i>

3.3 Potential Threats and Stressors

The primary ecosystem level threats and stressors to alpine habitat are:

- Fires and fire management (habitat degradation **Threat 301**)
- Recreation activities and development (dispersed recreational activities **Threat 401** and concentrated recreation **Threat 402**)
- Highways, roads, and trails (highway mortality **Threat 501**)
- Grazing (wild horse and burro grazing and trampling **Threat 701**)



- Urban and agricultural development (urban and rural development **Threat 1101** and fragmentation by urban/rural development **Threat 1102**)
- Water development and use and flood control at springs (spring diversion and modification **Threat 1401** and spring outflow diversion **Threat 1402**)
- Exotic and introduced species (introductions, competition, and encroachment of exotic species **Threat 1501**)

3.4 Alpine Habitat Management

All of the 500 acres of alpine habitat (USU Code 52; CA WHR Code ADS–Alpine Dwarf Scrub) in Clark County are within the Mt. Charleston Wilderness and Carpenter Canyon Research Natural Area of the Spring Mountains National Recreation Area of Humboldt-Toiyabe National Forest (Figure 3-2).

3.5 Existing and Proposed Conservation Actions

All of the 500 acres of alpine habitat in Clark County is within the Mt. Charleston Wilderness and Carpenter Canyon RNA of the Spring Mountains NRA of Humboldt-Toiyabe National Forest.

The conservation agreement (CA) for the Spring Mountains NRA identifies general management actions for alpine habitats, including development and implementation of a monitoring program for assessing effects of recreational use on high elevation communities and the species that occur in these communities, implementation of an overnight wilderness permitting process that provides visitor education on sensitive resource issues, prohibition of camping in sensitive areas as determined through monitoring, removal of selected informal high elevation and alpine campsites, and implementation of a weed management strategy.

3.5.1 USFS

3.5.1.1 Protective Measures

USFS(37) Focus new recreation development (campgrounds, picnic areas, and other facilities), in the least sensitive areas at lower elevations, to lessen visitor impacts on the species of concern and other sensitive ecological resources. (CA-GC 4.0(1))

USFS(38) Encourage partnerships with volunteers to maintain and enhance natural resources in the NRA. (CA-GC 4.0(2))

USFS(39) Adhere to goals, objectives, standards and guidelines detailed in the Plan Amendment which promote protective management of the species of concern and other ecological resources. (CA-GC 4.0(3))

USFS(40) Identify specific areas of exceptional sensitivity where conservation management will be emphasized over recreation. (CA-GC 4.0(4))

USFS(42) Prior to use of pesticides and other chemicals, determine potential impacts to the species of concern (e.g., butterflies, bats), and implement strategies to avoid impacts to those species. (CA-GC 4.0(6))

*USFS(43) Protect habitat of the species of concern from dispersed recreation (e.g., heavy foot traffic, off-road vehicles, mountain bikes), and the adverse effects of wild horses and burros. (CA-GC 4.0(7))**

USFS(44) Develop and implement an overnight wilderness permitting process that provides education on sensitive resources. (CA4.1)

USFS(49) Manage wild horses and burros in the NRA to avoid damage to species of concern habitats, particularly in lower Lee Canyon, northwest Mount Stirling, Wheeler Pass, Wheeler Wash, Wood Canyon, Carpenter Canyon, and lower Deer Creek, and continue to quickly remove any stray horses at upper elevations, particularly in upper Lee Canyon, Deer Creek, and Kyle Canyon. (CA4.6)

*USFS(50) Develop and distribute information to equestrians on the importance of using pelletized feed within the NRA, and develop and distribute a weed-free feed policy for equestrians on Federal lands. (CA4.7)**

USFS(51) Sign closure order allowing USFS to prohibit camping within specific distance of water sources, based on species and habitat protection needs, and control dispersed, primitive camping in the NRA by enforcing the closure order. (CA4.8)

*USFS(52) Develop and implement plan to collect seed for endowment and cultivation of sensitive and rare plants. (CA4.9)**

USFS(53) Expand Carpenter Canyon Research Natural Area to help protect unique alpine biodiversity. (CA4.10)

USFS(54) Consider, and as appropriate, develop additional protective designations in the NRA to protect the species of concern and other ecological resources. (CA4.11)

USFS(56) Ensure consistent law enforcement and ranger presence on the east side of the NRA, west side of the NRA, and in the Wilderness Area, a minimum of four days per week

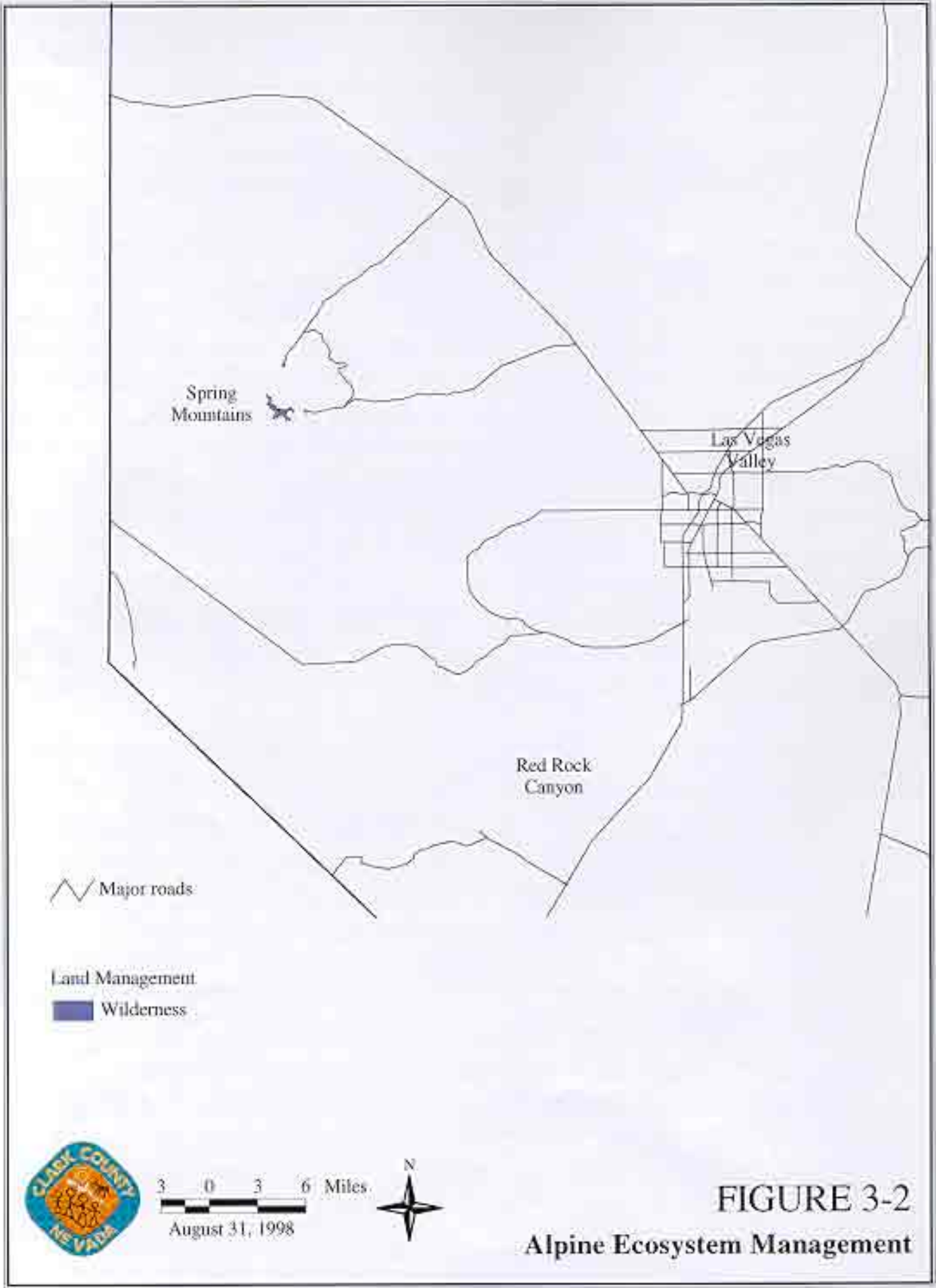


FIGURE 3-2
Alpine Ecosystem Management

*per area (including weekends and holidays) during the period April 15 - October 15, and a minimum of three days per week (including weekends and holidays) during the period October 15 - April 15. Enforcement will emphasize protection of the species of concern and their habitats (e.g., peregrine falcon eyries, bat roosts, and alpine species). Increased wilderness ranger presence in high elevation forests and alpine areas will provide a means to distribute information on species conservation needs, ecological resource sensitivity, and low impact recreation use practices. (CA4.13)**

USFS(63) New recreational facilities will be located and designed to ensure public safety, ecosystem health, and customer satisfaction. (FS-OBJ-0.44)

USFS(64) Continue to provide rock climbing opportunities while protecting resource values. (FS-OBJ-0.45)

USFS(71) Collection of threatened, endangered, and sensitive plant species requires a permit from the Regional Forester, except for traditional use by American Indians. (FS-ST-0.28)

USFS(73) New roads, administrative facilities, and developed recreation sites other than low-impact facilities (trails, trailhead parking, signs, restrooms, etc.) will be outside a 100 yard buffer zone around known Clokey eggvetch and rough angelica populations or potential habitat, and outside biodiversity hotspots (defined as areas of particular diversity or sensitivity) (FS-ST-0.31)

USFS(76) Use temporary closures (roads, trails, dispersed areas) to protect important seasonal habitat for species of concern (animals, plants, insects), in coordination with appropriate state and local agencies. (FS-GU-0.34)

*USFS(77) Allow access to all caves only from the beginning of March through the end of May; and from the beginning of September through the end of October. Seasonal restrictions will remain in place until bat roosting/hibernating inventories have been completed. Long-term seasonal restrictions will be determined based on survey results. Allow year-round access to Robbers' Roost Cave. (FS-ST-0.51)**

*USFS(78) Gate cave or mine openings where needed for public safety and resource protection. (FS-GU-0.54)**

*USFS(79) Rock climbing within 100 yards of known active or recently active peregrine falcon nests will be allowed only from the beginning of July through the end of January. Specific routes may be signed as necessary to inform of seasonal closures if nests are identified. Monitor peregrine nesting success to determine if the 100-yard closure is effective. (FS-ST-0.57)**

*USFS(82) Manage designated and informal use (unnumbered) trails that are causing resource damage to reduce damage and restrict use to a single trail. (FS-GU-0.123)**

USFS(90) Close the Bristlecone Trail to motorized vehicles. Place barriers to prohibit off-trail travel into populations of species of concern. Use signs to educate users to the importance of species of concern, and the threats to their existence. (FS-ST-11.33)

USFS(91) Address user conflicts on Bristlecone Trail through a site-specific planning involving US Fish and Wildlife Service, trail users, and interested groups. (FS-GU-11.35)

USFS(95) Protect natural and heritage resources and natural processes that enhance backcountry/wilderness recreational opportunities, including prohibiting consumptive uses of wilderness resources except where authorized by law or regulation. (FS-OBJ-12.2)

*USFS(96) Protect wilderness resources, including live and dead bristlecone pines, from removal/cutting for fuel. (FS-OBJ-12.6)**

USFS(97) Keep wild horses and burros out of the Wilderness. (FS-OBJ-12.8)

USFS(100) When maintaining upper North Divide Trail switch-backs, minimize ground disturbance to protect rare plants. (FS-GU-12.8)

*USFS(101) Relocate South Loop Trail away from meadow if practical, and if other resources will not be affected. (FS-GU-12.9)**

3.5.1.2 Restoration and Enhancement

USFS(102) Secure funding for restoration programs beyond those under the scope of Interagency Agreement # 14-48-0001-94605. (CA-GC 5.0(1))

USFS(103) Wherever possible, select only locally native species for restoration, and where appropriate, use seed from the plant species of concern and endemic butterfly host plants. (CA-GC 5.0(2))

USFS(104) Ensure that restoration projects focus on protection and enhancement of the species of concern and do not inadvertently cause irretrievable damage to the habitats of the species of concern (e.g., open water for bats, mud puddles for butterflies). (CA-GC 5.0(3))

USFS(105) Develop native plant material and seed list for restoration projects by plant community. The list will specifically identify larval and nectar host plants for the

endemic butterflies. Develop plan to collect local seed for restoration efforts and establish and maintain a native seed bank. (CA5.1)

*USFS(111) Remove selected informal high-elevation and alpine campsites (particularly those within or near the habitats of the plant species of concern and butterfly host plants) encourage use of specific strategically placed campsites, and remove high elevation fire rings. (CA5.7)**

USFS(113) Organize volunteer work parties to manually remove exotic plants and noxious weeds along the ridgeline trail and other high elevation routes. (CA5.9)

USFS(115) Work with volunteers to provide nest boxes for cavity nesting western and mountain bluebirds and roosting bats to replace lost habitat. (CA5.11)

USFS(118) Use seed mixtures or seedlings for site rehabilitation, fire rehabilitation, or permit requirement in order of preference: 1) Native plants; 2) no seeding (only if erosion is not a serious concern and there is no cheatgrass invasion); 3) non-persistent (sterile) exotics; and 4) persistent exotics. (FS-GU-0.16)

*USFS(120) Provide a minimum of five wildlife cover sites per acre within developed or primitive recreation sites by maintaining or adding dead and down wood material or rocks at appropriate locations. (FS-ST-0.38)**

*USFS(121) Remove all structures related to grazing activities that are not necessary for current management, or of historic value. (FS-ST-0.49)**

*USFS(125) Enhance developed sites where feasible to restore resource or wildlife values where recreation use has adversely affected resources. (FS-OBJ-11.5)**

USFS(127) Close and rehabilitate trail to and “Gary Abbot Campground” site. Close area to overnight use. (FS-ST-11.8)

*USFS(130) Restore and maintain the natural, ecological, and visual character of the Wilderness. (FS-OBJ-12.1)**

*USFS(131) Restore water sources to historic flows in the Wilderness. (FS-OBJ-12.7)**

*USFS(132) Where possible, remove obvious exotic plants (dandelions, cheatgrass) in the Wilderness manually. (FS-GU-12.2)**

*USFS(133) Remove fire rings from the Wilderness. Emphasis should be placed on removing features which encourage use on degraded or sensitive sites. (FS-GU-12.4)**

3.6 Adequacy of Existing Management

Alpine habitat is found exclusively within an IMA, the Mt. Charleston wilderness area of the Spring Mountains NRA. There is no private land within this habitat type and no plans for developed facilities or other infrastructure.

Implementation of existing USFS management actions and the CA for the Spring Mountains NRA will adequately address the ecosystem level threats to Covered Species within the alpine habitat, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

3.7 MSHCP Conservation Contributions

The alpine habitat and the 11 Covered Species it supports will benefit from the MSHCP through general public education and information programs and potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers.

Chapter 4 Bristlecone Pine Ecosystem

4.1 Description and Distribution

The bristlecone pine ecosystem in Clark County is found in the Spring and Sheep Mountains (Figure 4-1). Bristlecone pine forest is distributed through the higher mountainous areas of Colorado, Utah, Arizona, New Mexico, Nevada, and eastern California. This forest ecosystem is composed of evergreen conifers and typically ranges in elevation from 8,000 feet to tree line at 11,500-12,500 feet depending on the location in the Southwest. Data on fossil pollen and other plant material from packrat middens of Pleistocene age in the eastern and southern Great Basin have revealed that subalpine conifers such as bristlecone pine and limber pine were present at significantly lower elevations than today. The cooler and possibly moister climate present during the Late Wisconsin glaciation (25,000 to 11,000 years before the present) caused bristlecone pine to have a lower elevational limit in Clark County (Potosi Mountain) of approximately 6,000 feet, nearly 3,300 feet below its modern limit (Thompson and Mead 1982).

In the Sheep Mountains during the Pleistocene, limber pine grew as low as 5,200 feet with Utah juniper (*Juniperus osteosperma*). Additional fossil localities in the Sheep Mountains revealed the presence of limber pine with white fir and Utah juniper at 5,900 feet and bristlecone-limber pine mixed with white fir, single-leaf pinyon (*Pinus monophylla*), and little leaf mountain mahogany (*Cercocarpus intricatus*) at 6,500 feet. (Spaulding 1977; Van Devender and Spaulding 1979). The presence of these communities at lower elevations allowed associated flora and fauna to exchange between adjacent mountain ranges across the intervening valleys (Thompson and Mead 1982). Approximately 8,000 years ago the climate changed to the warmer and drier conditions we see today. It is during this xeric period that coniferous forests retreated up the mountain slopes and the intervening valleys became covered with desert scrub communities (Van Devender and Spaulding 1979).

The bristlecone pine ecosystem in Clark County is entirely composed of bristlecone pine vegetation (USU Code 10,11,12; CA WHR Code SCN–Sub-Alpine Conifer). The bristlecone pine community ranges in elevation from 9,000 feet to 11,500 feet in the Spring and Sheep Mountains on exposed, dry, rocky slopes and ridges in the subalpine zone up to tree line (Little 1980; Pase and Brown 1982). This habitat is comprised of evergreen conifer woodland dominated by bristlecone pine (*Pinus longaevus*), where it frequently forms pure stands from the tree line down to where it contacts and becomes

codominant with limber pine (*Pinus flexilis*). Individual bristlecone pines can be found growing as low as 7,500 feet with ponderosa pines. White fir (*Abies concolor*) is found scattered throughout the bristlecone pine ecosystem either singly or in small groups but typically does not occur in large stands. Some species such as Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*), which are common in similar communities in the Rocky Mountains, are absent in Clark County. Associated shrub species tend to be widely scattered except in natural openings and near forest edges. Shrubs include dwarf juniper (*Juniperus communis*), which ranges from southern Nevada through the Rocky Mountains to Alaska and Labrador; mountain current, another widespread North American species; Clokey mountain sage (*Salvia dorrii* var. *clokeyi*); and sagebrush (*Artemisia* sp.). The substrate is gravelly with many rocks; thin soils occasionally develop in these areas and are composed primarily of coarse sand. Most areas within bristlecone habitat tend to be dry because of excessive drainage and low organic content. The high elevations result in a short growing season for shrubs and flowering plants. The principal conifers are slow growing, but the successional stages are not well understood.

4.2 MSHCP Species

The 23 Covered Species include 6 butterflies and 17 species of plants. The plants are endemic to forest and woodland habitats within the Spring and Sheep Mountains. Seven only occur in the high elevation alpine meadow or pine forest.

Covered Species:

Spring Mountains icarioides blue	<i>Icaricia icarioides</i> ssp.
Spring Mountains/Mt. Charleston blue butterfly	<i>Icaricia shasta charlestonensis</i>
Morand's checkerspot butterfly	<i>Euphydryas anicia morandi</i>
Carole's silverspot butterfly	<i>Speyeria zerene carolae</i>
Nevada admiral	<i>Limenitis weidemeyerii nevadae</i>
Spring Mountains comma skipper	<i>Hesperia comma mojavensis</i>
Charleston pussytoes	<i>Antennaria soliceps</i>
Rosy king sandwort	<i>Arenaria kingii</i> ssp. <i>rosea</i>
Clokey paintbrush	<i>Castilleja martinii</i> var. <i>clokeyi</i>
Clokey thistle	<i>Cirsium clokeyi</i>
Jaeger whitlowgrass	<i>Draba jaegeri</i>
Charleston draba	<i>Draba paucifruita</i>
Inch high fleabane	<i>Erigeron uncialis</i> ssp. <i>conjugans</i>
Jaeger ivesia	<i>Ivesia jaegeri</i>
Hitchcock bladderpod	<i>Lesquerella hitchcockii</i>
Charleston pinewood lousewort	<i>Pedicularis semibarbata</i> var. <i>harlestonensis</i>
Charleston beardtongue	<i>Penstemon leiophyllus</i> var. <i>keckii</i>
Clokey mountain sage	<i>Salvia dorrii</i> var. <i>clokeyi</i>
Clokey catchfly	<i>Silene clokeyi</i>
Charleston tansy	<i>Sphaeromeria compacta</i>
Charleston kittentails	<i>Synthyris ranunculina</i>
Charleston grounddaisy	<i>Townsendia jonesii</i> var. <i>tumulosa</i>
Limestone (Charleston) violet	<i>Viola purpurea</i> var. <i>charlestonensis</i>

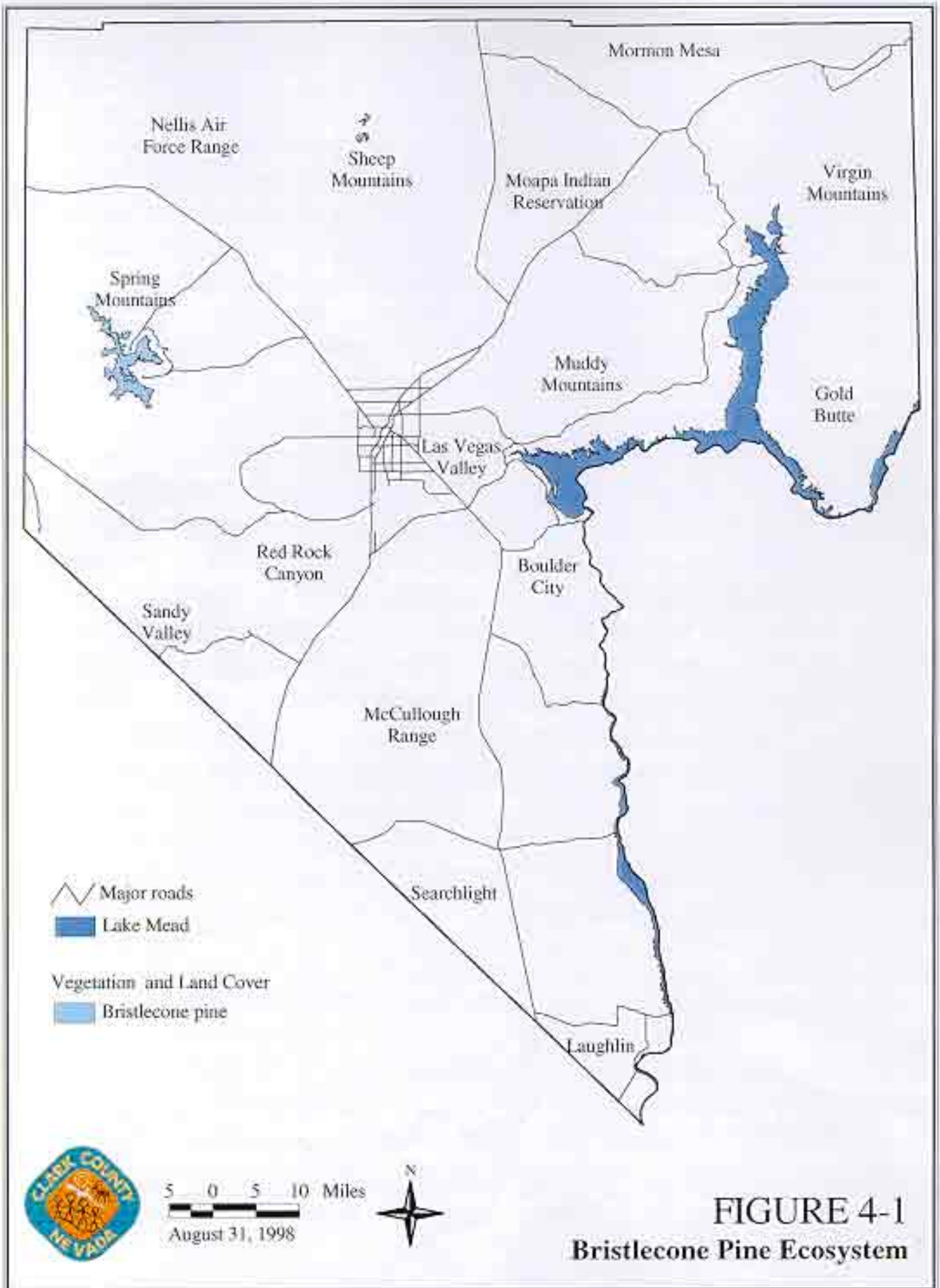


FIGURE 4-1
Bristlecone Pine Ecosystem

4.3 Potential Threats and Stressors

The primary ecosystem level threats and stressors in bristlecone pine are:

- Fires and fire management (habitat degradation **Threat 301**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, concentrated recreation **Threat 402**, casual use OHV activities **Threat 404**, rock climbing **Threat 405**)
- Highways, roads, and trails (highway mortality **Threat 501**, road construction and maintenance **Threat 504**)
- Pest control (pesticides and herbicides **Threat 602**)
- Grazing (wild horse and burro grazing and trampling **Threat 701**, livestock grazing and trampling **Threat 703**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**)
- Exotic and introduced species (introductions, competition, and encroachment of exotic species **Threat 1501**)

4.4 Bristlecone Pine Habitat Management

In Clark County, bristlecone pine habitat is predominantly found in the Spring Mountains but also occurs in the Sheep Mountains. Of a total of 15,800 acres, 86 percent is located in the Mt. Charleston Wilderness and Carpenter Canyon RNA and an additional 3 percent in the SMNRA of the Humboldt-Toiyabe National Forest. Within the forest, there are private holdings totaling 1,000 acres. Approximately 800 acres of habitat occur in the Sheep Mountains within the Desert National Wildlife Range.

Figure 4-2 and Table 4-1 show the distribution of management within the bristlecone pine habitat. Management of the SMNRA, Mt. Charleston Wilderness, and Carpenter Canyon RNA (14,400 acres, or 91.1% of total habitat) is oriented around intensive management: roadless primitive recreational uses and conservation of sensitive wildlife and plants. The area is closed to new mining claims, livestock grazing, new roads, OHV use, and new utility and transportation rights-of-way. The USFWS manages 5.1 percent of the habitat in the Sheep Mountains with similar management policies. The USFS and the USFWS have entered into a conservation agreement (1997) that provides additional protective and adaptive management measures for sensitive wildlife and plants, as well as research and public education for visitors to the Spring Mountains. The remaining 6.3 percent of habitat is private unmanaged land either vacant or developed for recreation or rural residential uses in the Spring Mountains.

**TABLE 4-1
MANAGEMENT OF HABITAT IN THE BRISTLECONE PINE ECOSYSTEM**

Category	Manager	Management Classification	Acres	% of Habitat
IMA	USFS	Wilderness	13,600	86.1
	USFWS	DNWR	800	5.1
IMA Total			14,400	91.1
LIMA	USFS	SMNRA	400	2.5
LIMA Total			400	2.5
UMA	Private		1,000	6.3
UMA Total			1,000	6.3
Grand Total			15,800	100.0

4.5 Existing and Proposed Conservation Actions

Of the total of 15,800 acres of bristlecone pine habitat, 86.1 percent is located in USFS Wilderness (Mt. Charleston Wilderness and Carpenter Canyon RNA) and an additional 2.5 percent in the Spring Mountains NRA. Within the forest, there are private inholdings totaling 6.3 percent. Approximately 3.0 percent of the habitat occurs in the Sheep Mountains within the Desert National Wildlife Range.

Management of the Spring Mountains NRA, Mt. Charleston Wilderness, and Carpenter Canyon RNA (14,400 acres, or 91.1 percent of total habitat) is oriented around intensive management: roadless primitive recreational uses and conservation of sensitive wildlife and plants.

The CA for the Spring Mountains NRA identifies general management actions for high elevation ecosystems, including development and implementation of a monitoring program for assessing effects of recreational use on high elevation communities and the species that occur in these communities, implementation of an overnight wilderness permitting process that provides visitor education on sensitive resource issues, prohibition of camping in sensitive areas, as determined through monitoring, removal of selected informal high elevation and alpine campsites, and implementation of a weed management strategy.

USFWS management of the DNWR includes significant constraints on recreation access and other activities including exclusion OHV, grazing, mining, and other intensive land uses.

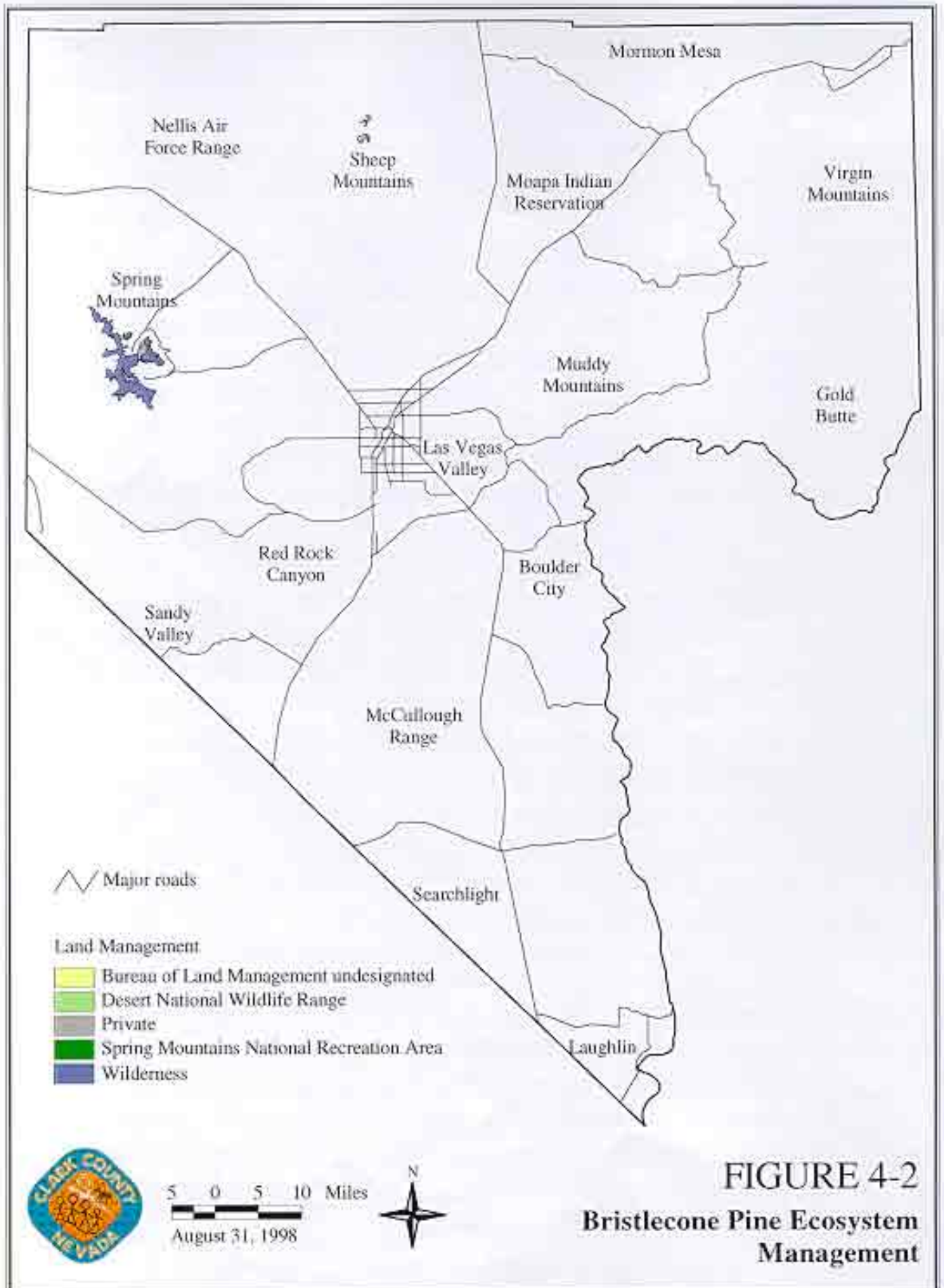


FIGURE 4-2
Bristlecone Pine Ecosystem
Management

4.5.1 USFS

4.5.1.1 Protective Measures

USFS(37) Focus new recreation development (campgrounds, picnic areas, and other facilities), in the least sensitive areas at lower elevations, to lessen visitor impacts on the species of concern and other sensitive ecological resources. (CA-GC 4.0(1))

USFS(38) Encourage partnerships with volunteers to maintain and enhance natural resources in the NRA. (CA-GC 4.0(2))

USFS(39) Adhere to goals, objectives, standards and guidelines detailed in the Plan Amendment which promote protective management of the species of concern and other ecological resources. (CA-GC 4.0(3))

USFS(40) Identify specific areas of exceptional sensitivity where conservation management will be emphasized over recreation. (CA-GC 4.0(4))

USFS(41) Minimize clearing of undergrowth during construction of new facilities. (CA-GC 4.0(5))

USFS(42) Prior to use of pesticides and other chemicals, determine potential impacts to the species of concern (e.g., butterflies, bats), and implement strategies to avoid impacts to those species. (CA-GC 4.0(6))

*USFS(43) Protect habitat of the species of concern from dispersed recreation (e.g., heavy foot traffic, off-road vehicles, mountain bikes), and the adverse effects of wild horses and burros. (CA-GC 4.0(7))**

USFS(44) Develop and implement an overnight wilderness permitting process that provides education on sensitive resources. (CA4.1)

USFS(45) Develop and implement a climbing “self registration” process that encourages development of new routes away from ecologically sensitive areas. (CA4.2)

*USFS(46) Develop and implement a plan to protect bat roosts in mines and caves. The plan will address the following protective measures: Gating or closing mines and caves to protect bat roost sites, removing important bat roost mines and caves from future additions of NRA maps, avoiding identification of exact locations of maternity roosts, caves, and occupied mines to the general public, determining the need to close roads to mines and caves, and avoiding use of heavy equipment near mine and cave roosts. (CA4.3)**

USFS(47) Facilitate, with Clark County, enforcement of leash laws, and control of feral cats and dogs in areas where adverse effects on Palmer's chipmunk and other wildlife have occurred, particularly areas adjacent to the private developments of Mt. Charleston, Deer Creek, and Lee Canyon. (CA4.4)

USFS(48) Coordinate with county health department in management of disease transmittal by animals to humans (e.g., hanta virus, plague) to ensure that control methods do not have adverse effects on populations of Palmer's chipmunk or other species of concern. (CA4.5)

USFS(49) Manage wild horses and burros in the NRA to avoid damage to species of concern habitats, particularly in lower Lee Canyon, northwest Mount Stirling, Wheeler Pass, Wheeler Wash, Wood Canyon, Carpenter Canyon, and lower Deer Creek, and continue to quickly remove any stray horses at upper elevations, particularly in upper Lee Canyon, Deer Creek, and Kyle Canyon. (CA4.6)

*USFS(50) Develop and distribute information to equestrians on the importance of using pelletized feed within the NRA, and develop and distribute a weed-free feed policy for equestrians on Federal lands. (CA4.7)**

USFS(51) Sign closure order allowing USFS to prohibit camping within specific distance of water sources, based on species and habitat protection needs, and control dispersed, primitive camping in the NRA by enforcing the closure order. (CA4.8)

*USFS(52) Develop and implement plan to collect seed for endowment and cultivation of sensitive and rare plants. (CA4.9)**

USFS(54) Consider, and as appropriate, develop additional protective designations in the NRA to protect the species of concern and other ecological resources. (CA4.11)

USFS(55) Coordinate with owners of golf course in lower Kyle Canyon on procedures for use of pesticides, fertilizers, and other chemicals, to eliminate deleterious effects on endemic butterflies, rare plant pollinators, and other species of concern. (CA4.12)

*USFS(56) Ensure consistent law enforcement and ranger presence on the east side of the NRA, west side of the NRA, and in the Wilderness Area, a minimum of four days per week per area (including weekends and holidays) during the period April 15 - October 15, and a minimum of three days per week (including weekends and holidays) during the period October 15 - April 15. Enforcement will emphasize protection of the species of concern and their habitats (e.g., peregrine falcon eyries, bat roosts, and alpine species). Increased wilderness ranger presence in high elevation forests and alpine areas will provide a means to distribute information on species conservation needs, ecological resource sensitivity, and low impact recreation use practices. (CA4.13)**

*USFS(57) Remove brown-headed cowbirds where nest parasitism occurs during neotropical migratory bird inventories or other activities. (CA4.14)**

USFS(58) Work with utility companies to ensure poles are raptor-safe. (CA4.15)

USFS(59) Coordinate with Nevada Department of Transportation and USFS road crews to ensure that road maintenance activities (e.g., shoulder work, road salting) do not adversely affect the species of concern (in particular, Morand's checkerspot, acastus checkerspot, and rough angelica in Kyle Canyon, and acastus checkerspot along Deer Creek Highway). (CA 4.16)

USFS(60) Limit impacts of new administrative facilities on natural and heritage resources, and visual quality. (FS-OBJ-0.19)

*USFS(61) Manage all active claims and abandoned mines to minimize effects on natural, visual, and heritage resources and provide protection for the public. (FS-OBJ-0.34)**

*USFS(62) Maintain roads to a standard necessary for public safety and as needed to respond to resource management objectives, including resource protection and recreation, through maintenance of road surfaces and minimizing erosion. (FS-OBJ-0.37)**

USFS(63) New recreational facilities will be located and designed to ensure public safety, ecosystem health, and customer satisfaction. (FS-OBJ-0.44)

USFS(64) Continue to provide rock climbing opportunities while protecting resource values. (FS-OBJ-0.45)

*USFS(65) Acquire available land within the Spring Mountains National Recreation Area to protect natural resources, provide public recreation opportunities, and increase efficiency of land management. (FS-OBJ-0.52)**

USFS(66) Prohibit parking and camping within riparian areas. (FS-ST-0.3)

USFS(67) Where possible, maintain historic floodplain and channel width, slope, and gradient. (FS-GU-0.5)

USFS(68) Maintain/restore open pools of slow moving water (0.5 meter in diameter) at some historic water sources, well distributed throughout the range. Develop open pools of water at least 0.5 meter in diameter at newly developed/diverted water sources. (FS-GU-0.6)

USFS(69) Develop new perennial water sources, including guzzlers, only to benefit native species, to improve distribution of non-native species, where historic water sources have disappeared, or where access is limited. Only develop water sources in the Wilderness or WSAs to improve desert bighorn sheep habitat. These developments must protect wilderness character. (FS-GU-0.7)

USFS(70) When developing water sources, pipe water from a point downstream of the source if snails or other sensitive species are present, or if the spring source has not been previously developed. (FS-ST-0.8)

USFS(71) Collection of threatened, endangered, and sensitive plant species requires a permit from the Regional Forester, except for traditional use by American Indians. (FS-ST-0.28)

USFS(72) Work with Nevada Division of Wildlife, US Fish and Wildlife Service, the Audubon Society, and other interested agencies and organizations to control cowbird populations as monitoring identifies negative impacts to species of concern from this parasitic, non-native species. (FS-GU-0.30)

USFS(73) New roads, administrative facilities, and developed recreation sites other than low-impact facilities (trails, trailhead parking, signs, restrooms, etc.) will be outside a 100 yard buffer zone around known Clokey eggvetch and rough angelica populations or potential habitat, and outside biodiversity hotspots (defined as areas of particular diversity or sensitivity) (FS-ST-0.31)

USFS(76) Use temporary closures (roads, trails, dispersed areas) to protect important seasonal habitat for species of concern (animals, plants, insects), in coordination with appropriate state and local agencies. (FS-GU-0.34)

*USFS(77) Allow access to all caves only from the beginning of March through the end of May; and from the beginning of September through the end of October. Seasonal restrictions will remain in place until bat roosting/hibernating inventories have been completed. Long-term seasonal restrictions will be determined based on survey results. Allow year-round access to Robbers' Roost Cave. (FS-ST-0.51)**

*USFS(78) Gate cave or mine openings where needed for public safety and resource protection. (FS-GU-0.54)**

*USFS(79) Rock climbing within 100 yards of known active or recently active peregrine falcon nests will be allowed only from the beginning of July through the end of January. Specific routes may be signed as necessary to inform of seasonal closures if nests are identified. Monitor peregrine nesting success to determine if the 100-yard closure is effective. (FS-ST-0.57)**

*USFS(80) Develop and maintain a network of shaded fuelbreaks to interrupt continuous stands of fuel. Maintain 50 linear feet/acre of downed trees with a 12-inch diameter at breast height within the shaded fuelbreak (if fuelbreak is being managed ecologically for the late seral stage of Pinyon/juniper and Mixed Conifer Land Type Associations, or if managed for other seral stage within Palmers chipmunk habitat). Use existing road corridors and natural barriers. (FS-GU-0.91)**

USFS(81) Work cooperatively with interested groups to establish seasonal use periods for caves and to educate cave users. (FS-GU-0.103)

*USFS(82) Manage designated and informal use (unnumbered) trails that are causing resource damage to reduce damage and restrict use to a single trail. (FS-GU-0.123)**

USFS(85) Future trail alignments in the developed canyons will emphasize public safety, resource protection, and customer satisfaction. (FS-OBJ-11.17)

*USFS(86) Provide protection of the riparian areas (in accordance with NV Revised Statute 503.660) at Cold and Willow Creeks through the use of new road alignments, vehicle barriers, and/or signage. Redirect parking and camping away from riparian corridors. Allow only day-use, walk-in activities to occur within the riparian corridor. (FS-ST-11.1)**

USFS(87) Allow day-use only in the meadow area in Lee Canyon. Use temporary closures to allow for resource restoration/rehabilitation. (FS-ST-11.4)

*USFS(88) Provide trail markers and post restrictions to bouldering in the vicinity of Robbers' Roost Cave to protect Jaeger ivesia and Clokey greasebush. Interpretive signage may be used as appropriate. (FS-GU-11.5)**

USFS(89) Construct fences in strategic locations to keep wild horses out of Kyle and Lee Canyons. (FS-GU-11.20)

USFS(90) Close the Bristlecone Trail to motorized vehicles. Place barriers to prohibit off-trail travel into populations of species of concern. Use signs to educate users to the importance of species of concern, and the threats to their existence. (FS-ST-11.33)

USFS(91) Address user conflicts on Bristlecone Trail through a site-specific planning involving US Fish and Wildlife Service, trail users, and interested groups. (FS-GU-11.35)

USFS(92) Work with recreation residence associations to maintain the character and quality of recreational residence areas (summer homes under permit on National Forest System lands) while protecting natural resource values. (FS-GU-11.44)

USFS(93) Only allow low standard recreation facilities, including small camping areas or restrooms to be developed in upper Kyle and Lee canyons west of State Highway 158 as a resource protection measure. Allow new campgrounds and picnic areas to be developed in lower Kyle and Lee canyons, east of State Highway 158. (FS-ST-11.54)

*USFS(94) Allow limited expansion of ski area in Lee Canyon and enhancement of skiing opportunities and facilities within the scope of an approved master development plan and under the following constraints: (FS-ST-11.57)**

- *Expansion occurs within the existing sub-basin.*
- *Does not impact any threatened, endangered, or sensitive species or species of concern, or its habitat.*
- *Expansion is commensurate with development of additional parking in the lower Lee Canyon area, and shuttle services.*
- *Expansion incorporates defensible space design and fire safe facilities.*
- *Where consistent with other standards and guidelines.*

USFS(95) Protect natural and heritage resources and natural processes that enhance backcountry/wilderness recreational opportunities, including prohibiting consumptive uses of wilderness resources except where authorized by law or regulation. (FS-OBJ-12.2)

*USFS(96) Protect wilderness resources, including live and dead bristlecone pines, from removal/cutting for fuel. (FS-OBJ-12.6)**

USFS(97) Keep wild horses and burros out of the Wilderness. (FS-OBJ-12.8)

USFS(99) Discourage foot-traffic and camping at Mummy Spring by removing visitor-made trails, trail signage, and restoring native vegetation in riparian areas. (FS-GU-12.6)

USFS(100) When maintaining upper North Divide Trail switch-backs, minimize ground disturbance to protect rare plants. (FS-GU-12.8)

*USFS(101) Relocate South Loop Trail away from meadow if practical, and if other resources will not be affected. (FS-GU-12.9)**

4.5.1.2 Restoration and Enhancement

USFS(102) Secure funding for restoration programs beyond those under the scope of Interagency Agreement # 14-48-0001-94605. (CA-GC 5.0(1))

USFS(103) Wherever possible, select only locally native species for restoration, and where appropriate, use seed from the plant species of concern and endemic butterfly host plants. (CA-GC 5.0(2))

USFS(104) Ensure that restoration projects focus on protection and enhancement of the species of concern and do not inadvertently cause irretrievable damage to the habitats of the species of concern (e.g., open water for bats, mud puddles for butterflies). (CA-GC 5.0(3))

USFS(105) Develop native plant material and seed list for restoration projects by plant community. The list will specifically identify larval and nectar host plants for the endemic butterflies. Develop plan to collect local seed for restoration efforts and establish and maintain a native seed bank. (CA5.1)

USFS(106) Restore habitat in accordance with Interagency Agreement # 14-48-0001-94605 between the USFS and USFWS for the Spring Mountains NRA. All restoration activities will be designed and implemented in coordination with the Technical Working Group (CA1.6) to avoid inadvertent adverse effects on the species of concern. Priorities identified to date are as follows: (CA5.2)

- *McFarland Spring - Improve fence, treat head cut, construct dry well - very high priority (CA5.2a)*
- *Mummy Spring - Remove informal trails - very high priority (CA5.2b)*
- *Carpenter Canyon - Close last ¼ mile of road, create parking area -very high priority (CA5.2c)**
- *Trough Spring - Close road, treat road bed, seed area - high priority (CA5.2d)*
- *Lost Cabin Spring - Close road, eliminate diversion, restore spring brook - high priority (CA5.2e)**
- *Big Timber Spring - Remove stock tank and stock pond - high priority (CA5.2f)**
- *Gold Spring - Remove stock tank, headbox, and pipeline - high priority (CA5.2h)**

- *Middle Mud Spring and East Mud Spring - Repair fence, remove headbox and pipeline -medium priority (CA5.2i)*
- *Buck Spring - Remove headbox, pipeline, and trough - medium priority (CA5.2j)**
- *Macks Canyon Spring - Extend exclosure - medium priority (CA5.2k)**
- *Younts Spring - Eliminate salt cedar, remove impoundment - medium priority (CA5.2l)**
- *Santa Cruz Spring - eliminate salt cedar, construct exclosure, dry well, and pipeline - medium priority (CA5.2m)**
- *Ninety-nine Spring - Discontinue dredging, construct exclosure, dry well, and pipeline - medium priority (CA5.2n)**
- *Mexican Spring - Discontinue dredging, construct exclosure, dry well, and pipeline - medium priority (CA5.2o)**
- *Cougar Spring - Construct exclosure, dry well, and pipeline - medium priority (CA5.2p)**

USFS(107) Work with private property owners to restore and enhance the Cold Creek area. This effort will include plans to relocate facilities (e.g., fences, patios, and sheds) outside the riparian zone, and to control camping and fires (to protect butterflies), and maintain habitats for the species of concern (e.g., mud and seeps). (CA5.3)

*USFS(108) Develop and begin implementing a comprehensive restoration plan for the Willow Creek area. This plan will include relocation of roads and campgrounds out of the riparian area, removal of unneeded spur roads, a walk-in day-use plan, protection and habitat enhancement for springsnails, butterflies (including mud), and phainopepla. The plan will emphasize opportunities for public participation. (CA5.4)**

USFS(109) Work with summer home residents on the NRA to ensure that all future improvements avoid adverse effects to the species of concern, and where possible, enhance their habitats and populations. (CA5.5)

*USFS(110) Work with Las Vegas Ski and Snowboard Resort to develop protective strategies for sensitive ecological resources. This will include investigating options for erosion control of the Lee Canyon ski slopes with native seed mixes, including *Astragalus calycosus* var. *mancus* to enhance butterfly habitat, management of herbicides and pesticides, and a plan for eventual elimination of non-native seeding, and management of the Three Springs area. (CA5.6)*

*USFS(111) Remove selected informal high-elevation and alpine campsites (particularly those within or near the habitats of the plant species of concern and butterfly host plants) encourage use of specific strategically placed campsites, and remove high elevation fire rings. (CA5.7)**

*USFS(112) Remove roads causing environmental damage: road to Cave Spring road to CC spring, road to Lost Cabin Spring, and identify additional roads for closure, particularly in biodiversity hotspots, and work with community groups to close them. (CA5.8)**

USFS(113) Organize volunteer work parties to manually remove exotic plants and noxious weeds along the ridgeline trail and other high elevation routes. (CA5.9)

*USFS(114) Develop and implement vegetation management and restoration plans for campgrounds and day use areas that enhance resources for Palmer's chipmunk, endemic butterflies, and rare plants. Priority areas include: (CA5.10)**

- *Deer Creek Picnic Area - Move picnic tables out of the riparian zone, and revegetate the area to enhance habitat for Palmer's chipmunk, neotropical migratory birds, and bats. (CA5.10a)**
- *Lee Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat. (CA5.10b)**
- *Kyle Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat. (CA5.10c)**
- *Gary Abbot Campground - Close campsite and restore area to enhance habitat of Clokey eggvetch and butterflies. (CA5.10d)*

USFS(115) Work with volunteers to provide nest boxes for cavity nesting western and mountain bluebirds and roosting bats to replace lost habitat. (CA5.11)

USFS(117) Remove existing water developments and debris from springs, providing they no longer serve their original purpose, are not critical to wildlife, and the items are not of historical significance. (FS-ST-0.13)

USFS(118) Use seed mixtures or seedlings for site rehabilitation, fire rehabilitation, or permit requirement in order of preference: 1) Native plants; 2) no seeding (only if erosion is not a serious concern and there is no cheatgrass invasion); 3) non-persistent (sterile) exotics; and 4) persistent exotics. (FS-GU-0.16)

*USFS(120) Provide a minimum of five wildlife cover sites per acre within developed or primitive recreation sites by maintaining or adding dead and down wood material or rocks at appropriate locations. (FS-ST-0.38)**

*USFS(121) Remove all structures related to grazing activities that are not necessary for current management, or of historic value. (FS-ST-0.49)**

*USFS(122) Close all undesignated spur roads in riparian areas; close other spur roads on a case by case basis, after site specific analysis. (FS-GU-0.63)**

*USFS(123) Relocate existing roads outside of washes, riparian areas, and 50-year floodplains if relocation will result in better resource conditions. Priority should be given to relocating roads when major maintenance is required and to roads that: 1) Are located in vital habitat for plant or animal species of concern, and 2) receive higher levels of use. (FS-GU-0.64)**

USFS(124) Require site/area rehabilitation upon completion/termination as part of all new permits. (FS-ST-0.126)

*USFS(125) Enhance developed sites where feasible to restore resource or wildlife values where recreation use has adversely affected resources. (FS-OBJ-11.5)**

*USFS(129) Provide water sources for wildlife adjacent to or within developed facilities. Maintain public restrooms to prevent access by wildlife (Palmer's chipmunk). (FS-GU-11.11)**

*USFS(130) Restore and maintain the natural, ecological, and visual character of the Wilderness. (FS-OBJ-12.1)**

*USFS(131) Restore water sources to historic flows in the Wilderness. (FS-OBJ-12.7)**

*USFS(132) Where possible, remove obvious exotic plants (dandelions, cheatgrass) in the Wilderness manually. (FS-GU-12.2)**

*USFS(133) Remove fire rings from the Wilderness. Emphasis should be placed on removing features which encourage use on degraded or sensitive sites. (FS-GU-12.4)**

4.5.1.3 Land Use Policies and Actions

USFS(182) Retain all snags that do not pose a threat to public safety or extreme fire danger. Snags are retained to provide habitat for cavity nesting animals and animals that feed upon the insects living within dead trees. Retain a minimum of 5 snags per acre

in late seral stages of the Pinyon/juniper, Mixed Conifer, and Bristlecone Pine Land Type Associations in all cases. (FS-ST-0.36)

4.5.2 USFWS

4.5.2.1 Protective Measures

USFWS(12) Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).

USFWS(13) Adopt and implement policies to protect plant species from dispersed or unregulated recreation (DNWR).

USFWS(14) Implement snag management in habitat areas, including limiting wood collection to down wood, and coordination of fire management activities within proposed wilderness areas of the DNWR (DNWR).

USFWS(15) Manage woodcutting, shrub clearing, and limit other human activity disturbance off existing roads within the DNWR (DNWR).

USFWS(17) Protect existing riparian habitat from the effects of recreational activities (DNWR).

USFWS(18) Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(20) Minimize clearing of undergrowth in construction of new facilities within the DNWR (DNWR).

USFWS(21) Prohibit access to caves for recreation (DNWR).

USFWS(22) Prohibit horses, burros, and livestock grazing (DNWR).

USFWS(24) Prohibit highway and road construction on the Refuge (DNWR).

USFWS(25) Retrofit roads to permit ingress and egress for a broad range of organisms (DNWR).

USFWS(26) Conduct biological surveys prior to road maintenance and retrofit activities, (DNWR).

USFWS(27) Ensure that roads are engineered to adequately spread runoff to minimize erosion (DNWR).

USFWS(28) Ensure that adequate law enforcement and ranger patrolling is implemented within the DNWR (DNWR).

USFWS(31) Maintain dead snags and fallen trees on slopes and canyon bottoms in the DNWR (DNWR).

USFWS(32) Limit collection of dead wood including yucca skeletons to within 100 feet of designated roads (DNWR).

USFWS(33) Evaluate effects of rock climbing on biological resources. Rock climbing is currently allowed, but is under investigation; if adverse impacts are found it will be prohibited on DNWR (DNWR).

4.5.2.2 Restoration and Enhancement Measures

USFWS(35) Create new open water resources for bats and other wildlife (DNWR).

USFWS(36) Expand the seed bank program to include populations in the Sheep Mountains areas (DNWR).

USFWS(38) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the DNWR (DNWR).

USFWS(39) If proposed actions will result in surface disturbance near a population of white bearpoppy, remove soil with seed source and relocate to a potential habitat site and monitor over time (DNWR).

USFWS(40) Restore/rehabilitate all key access points of closed roads and areas (DNWR).

4.6 Adequacy of Existing and Proposed Management

About 93.6 percent of the habitat is within IMAs and LIMAs (USFS wilderness areas, Spring Mountains NRA, and in the DNWR) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. Approximately 6.3

percent is in UMAs (privately held) and may be used for more intensive recreation, including snow play, skiing, camping, and private residential and commercial recreational uses.

Implementation of existing USFWS and USFS management actions and the CA for the Spring Mountains NRA will adequately address the ecosystem level threats affecting Covered Species within the bristlecone pine habitat, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

4.7 MSHCP Conservation Contributions

The bristlecone pine habitat and the 23 Covered Species it supports will benefit from the MSHCP through general public education and information programs; potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

Chapter 5 Mixed Conifer Ecosystem

5.1 Description and Distribution

The mixed conifer ecosystem in Clark County includes the following community types: white fir, ponderosa pine, and ponderosa pine/mountain shrub. White fir and ponderosa pine communities are found in the Spring and Sheep Mountains and ponderosa pine/mountain shrub communities are found in these ranges and also occur as small patches in the Virgin Mountains (Figure 5-1, Table 5-1). Mixed conifer forests are found from the Rocky Mountains through the Southwest in Arizona and New Mexico, south into the Sierra Madre Occidental and Sierra Madre Oriental of Mexico (Pase and Brown 1982). These mixed conifer forests also occur in the Sierra Nevada of California and southward through the Peninsular Range into Baja California. This forest ecosystem is typically composed of evergreen conifers and shrubs and typically ranges in elevation from 7,200 to 10,800 feet. During the Late Wisconsin glaciation (25,000 to 11,000 years before the present), montane species including white fir and ponderosa pine are rare or unknown as fossils from packrat middens (Thompson and Mead 1982). White fir has been recovered from middens only from the southernmost localities of Clark Mountain, California, and Potosi Mountain and the Sheep Mountains of Clark County, Nevada, at elevations nearly 3,300 feet lower than they are found in this area today. Late Wisconsin records of ponderosa pine are unknown from the Great Basin (Thompson and Mead 1982). As the climate became warmer and drier in the last 8,000 years, mixed conifer forest ecosystems expanded their distribution to the north into the Great Basin and came to occupy their current range in the mountains of Clark County, Nevada (Van Devender and Spaulding 1979).

**TABLE 5-1
VEGETATION COMMUNITIES IN THE MIXED CONIFER ECOSYSTEM**

Vegetation Type	Acres	% of Ecosystem
White fir	7,500	13.2
Ponderosa pine	42,000	74.5
Ponderosa pine/mountain shrub	6,900	12.2
Total Habitat	56,400	100.0
Total Ecosystem	56,400	100.0

5.1.1 White Fir Community

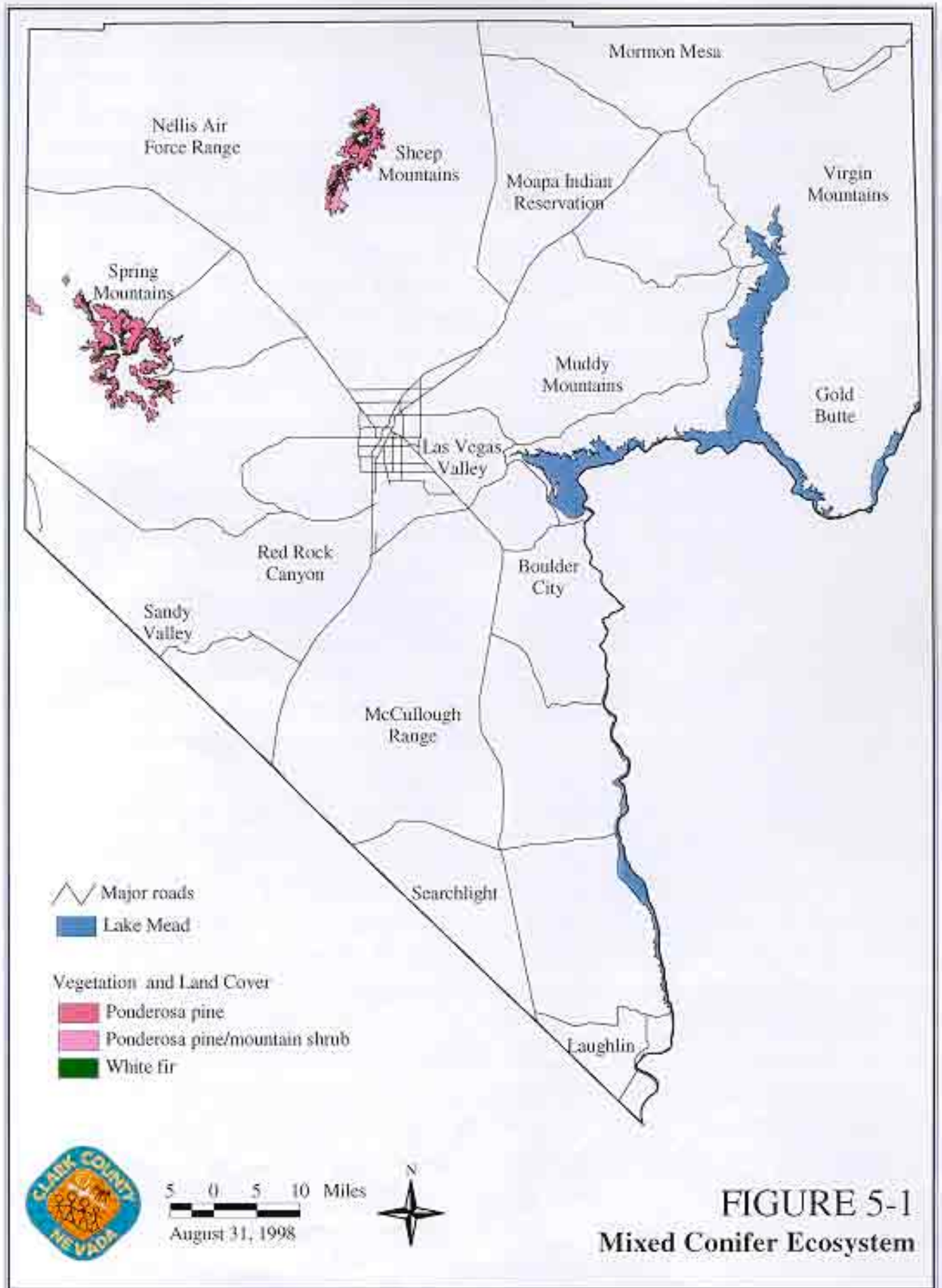
Conifer forest principally dominated by white fir (*Abies concolor*) (USU Code 37; CA WHR Code WFR–Mixed Conifer-White Fir) is found in the Spring and Sheep Mountains on generally north- and east-facing slopes at elevations between 7,400 and 10,800 feet. White fir inhabits the warmest and driest habitats of all the fir species. Associated trees include bristlecone pine (*Pinus longaevus*) and limber pine (*Pinus flexilis*) at the higher elevations within its range. At lower elevations, ponderosa pine (*Pinus ponderosa*) becomes a common associate of white fir. In some areas the range of white fir contacts pinyon pine (*Pinus monophylla*). Shrub species in the white fir community include mountain mahogany (*Cercocarpus ledifolius*) and Rocky Mountain juniper (*Juniperus communis*). Associated herbaceous plants include Clokey paintbrush (*Castilleja martinii* var. *clokeyi*), Jaeger ivesia (*Ivesia jaegeri*), Hitchcock bladderpod (*Lesquerella hitchcockii*), white-margined beardtongue (*Penstemon albomarginatus*), Jaeger beardtongue (*Penstemon thompsonae* var. *jaegeri*), Clokey mountain sage (*Salvia dorrii* var. *clokeyi*), Charleston grounddaisy (*Townsendia jonesii* var. *tumulosa*), and rosy king sandwort (*Arenaria kingii* ssp. *rosea*); Spring Mountains endemics include Clokey milkvetch (*Astragalus aequalis*), inch high fleabane (*Erigeron uncialis* ssp. *conjugans*), and the Clokey thistle (*Cirsium clokeyi*).

5.1.2 Ponderosa Pine Community

Ponderosa pine (USU Code 21; CA WHR Code PPN–Ponderosa Pine) is the most extensive of the conifer forest habitats in Clark County, comprising some 42,000 acres. This community ranges from 3,900 to 8,900 feet and is dominated by ponderosa pine (*Pinus ponderosa*), which often occurs in nearly pure stands. At higher elevations within its range, ponderosa pine mixes with white fir (*Abies concolor*) and bristlecone pine (*Pinus longaevus*); and at lower levels it contacts pinyon (*Pinus monophylla*), juniper (*Juniperus osteosperma*), white fir, limber pine (*Pinus flexilis*), mountain mahogany (*Cercocarpus ledifolius*), and bristlecone pine with canopies of 30 to 60 percent cover. Associated shrubs include sagebrush (*Artemisia* spp.), oak (*Quercus gambelii*), alder leaf mountain mahogany (*Cercocarpus montanus*), snowberry (*Symphoricarpos* spp.), manzanita (*Arctostaphylos* spp.), and little leaf mountain mahogany (*Cercocarpus intricatus*).

5.1.3 Ponderosa Pine/Mountain Shrub Community

Ponderosa pine/mountain shrub (USU Code 20; CA WHR Code PPN/LSG–Ponderosa Pine/Low Sage) is an extension of the conifer forest community characterized by lower canopy coverage of ponderosa pine (less than 30 percent) and codominance of mountain shrubs such as oak (*Quercus gambelii*), alder leaf mountain mahogany (*Cercocarpus*



montanus), snowberry (*Symphoricarpos* spp.), manzanita (*Arctostaphylos* spp.), and little leaf mountain mahogany (*Cercocarpus intricatus*). Other associated trees include pinyon (*Pinus monophylla*), juniper (*Juniperus osteosperma*), white fir (*Abies concolor*), limber pine (*Pinus flexilis*), mountain mahogany (*Cercocarpus ledifolius*), and bristlecone pine (*Pinus longaevus*). Other associated shrubs include sagebrush (*Artemisia* spp.).

5.2 MSHCP Species

The 33 Covered Species in the mixed conifer ecosystem include 3 species of bats, Palmer's chipmunk, 1 raptor, 1 lizard, 1 snake, 8 butterflies, 17 vascular plants, and 1 non-vascular plant.

Covered Species:

Silver-haired bat	<i>Lasionycteris noctivagans</i>
Long-eared myotis	<i>Myotis evotis</i>
Long-legged myotis	<i>Myotis volans</i>
Palmer's chipmunk	<i>Tamias palmeri</i>
American peregrine falcon	<i>Falco peregrinus anatum</i>
Western red-tailed skink	<i>Eumeces gilberti rubricaudatus</i>
Sonoran lyre snake	<i>Timorphodon biscutatus lambda</i>
Dark blue butterfly	<i>Euphilotes enoptes purpurea</i>
Spring Mountains icarioides blue	<i>Icaricia icarioides austinatorum</i>
Spring Mountains acastus checkerspot	<i>Chlosyne acastus robusta</i>
Spring Mountains/Mt. Charleston blue butterfly	<i>Icaricia shasta charlestonensis</i>
Morand's checkerspot butterfly	<i>Euphydryas anicia morandi</i>
Carole's silverspot butterfly	<i>Speyeria zerene carolae</i>
Nevada admiral	<i>Limenitis weidemeyerii nevadae</i>
Spring Mountains comma skipper	<i>Hesperia comma mojavensis</i>
Clokey milkvetch	<i>Astragalus aequalis</i>
Clokey eggvetch	<i>Astragalus oophorus</i> var. <i>clokeyanus</i>
Rough angelica	<i>Angelica scabrida</i>
Rosy king sandwort	<i>Arenaria kingii</i> ssp. <i>rosea</i>
Clokey paintbrush	<i>Castilleja martinii</i> var. <i>clokeyi</i>
Clokey thistle	<i>Cirsium clokeyi</i>
Inch high fleabane	<i>Erigeron uncialis</i> ssp. <i>conjugans</i>
Clokey greasebush (forsellesia)	<i>Glossopetalon (=Forsellesia) clokeyi</i>
Red Rock Canyon aster	<i>Ionactis caelestis</i>
Jaeger ivesia	<i>Ivesia jaegeri</i>
Hitchcock bladderpod	<i>Lesquerella hitchcockii</i>
Charleston pinewood lousewort	<i>Pedicularis semibarbata</i> var. <i>charlestonensis</i>
Jaeger beardtongue	<i>Penstemon thompsonae</i> var. <i>jaegeri</i>
Clokey mountain sage	<i>Salvia dorrii</i> var. <i>clokeyi</i>
Charleston kittentails	<i>Synthyris ranunculina</i>
Charleston grounddaisy	<i>Townsendia jonesii</i> var. <i>tumulosa</i>
Limestone (Charleston) violet	<i>Viola purpurea</i> var. <i>charlestonensis</i>
Dicranoweisia moss	<i>Dicranoweisia crispula</i>

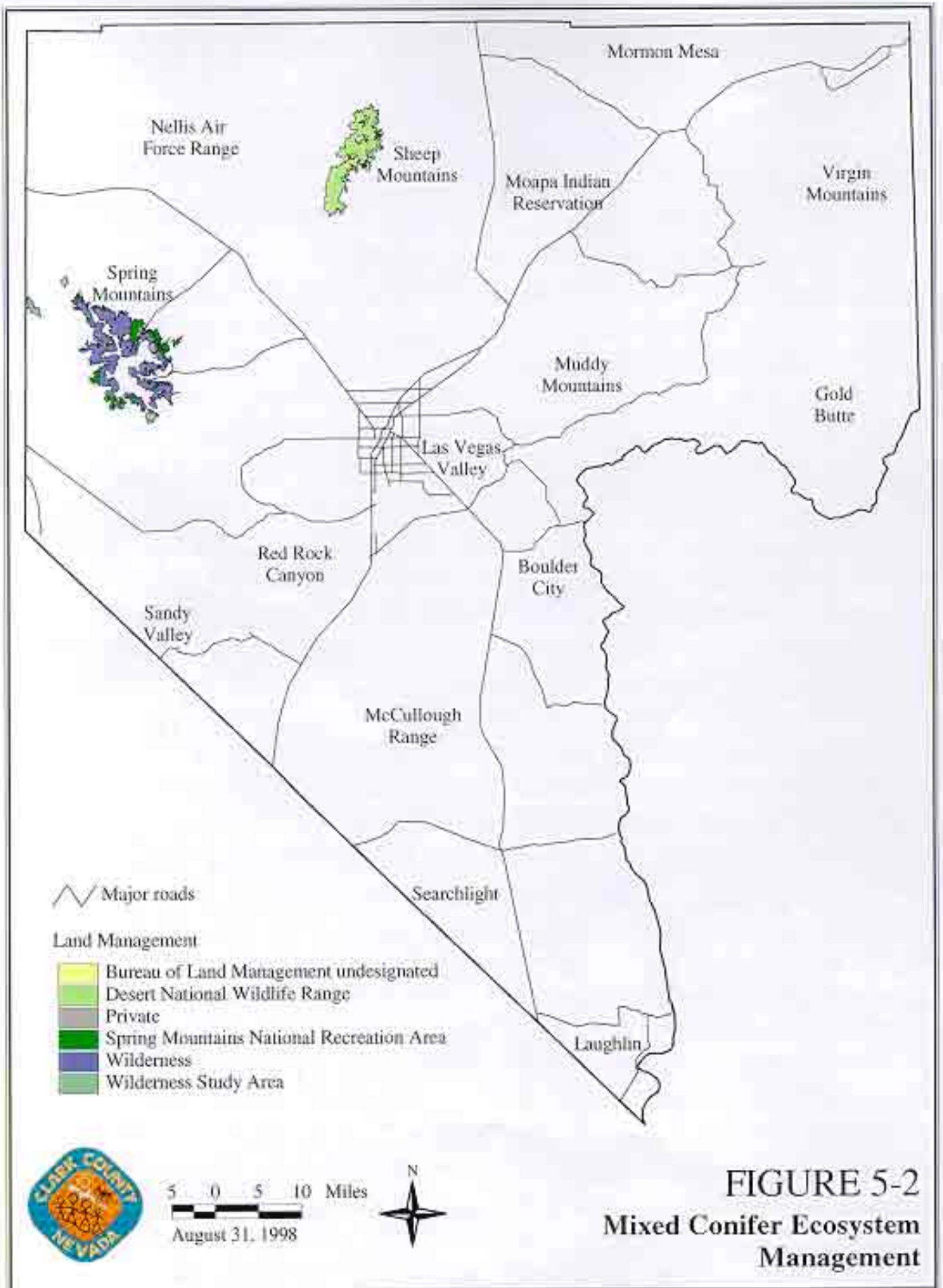
5.3 Potential Threats and Stressors

The primary ecosystem level threats and stressors in mixed conifer are:

- Commercial collection (reduction of populations **Threat 201**, habitat degradation **Threat 202**)
- Fires and fire management (habitat degradation **Threat 301**, vegetation community conversion **Threat 302**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, concentrated recreation **Threat 402**, casual use OHV activities **Threat 404**, rock climbing **Threat 405**, spelunking **Threat 407**)
- Highways, roads, and trails (highway mortality **Threat 501**, habitat fragmentation **Threat 503**, road construction and maintenance **Threat 504**)
- Pest control (pesticides and herbicides **Threat 602**)
- Grazing (wild horse and burro grazing and trampling **Threat 701** livestock grazing and trampling **Threat 703**)
- Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**)
- Woodcutting, (wood removal, snag collection **Threat 1001**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**)
- Utilities (collisions and electrocution with power lines **Threat 1201**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**, grazing and agriculture **Threat 1404**, overutilization by animals **Threat 1405**)
- Exotic and introduced species (introductions, competition, and encroachment of exotic species **Threat 1501**, increased risk of fire due to exotic plants **Threat 1503**)
- Feral animals (feral animals and uncontrolled pets **Threat 1601**)

5.4 Mixed Conifer Habitat Management

A total of 97.3 percent of the habitat is within the Spring Mountains NRA or the Desert National Wildlife Range (Figure 5-2, Table 5-2). Both of these areas are closed to mining, livestock grazing, and off-road motorized recreational vehicle use and are actively managed for ecosystem conservation. Within the habitat, 81.7 percent is managed as IMA (wilderness, WSA, or wildlife range) for primitive, non-motorized, dispersed recreational use. The remaining habitat located within the Spring Mountains NRA is managed as a LIMA for both conservation and a broader spectrum of recreational uses, including intensive recreational use areas, developed camping areas, hiking and biking trails, rock climbing areas, and designated motorized vehicle use roads and trails. The USFS has completed a conservation agreement with the USFWS to monitor, protect, and manage sensitive plants and wildlife and to research and educate the public about



conservation needs and values. The remaining 2.6 percent of the habitat is unmanaged in private holdings within the SMNRA, for which no conservation or management is assumed.

**TABLE 5-2
MANAGEMENT OF HABITAT IN THE MIXED CONIFER ECOSYSTEM**

Category	Manager	Management Classification	Acres	% of Habitat
IMA	USFS	Wilderness	24,700	43.7
	USFS	WSA	2,100	3.7
	USFWS	National Wildlife Range	19,300	34.2
IMA Total			46,100	81.7
LIMA	USFS	SMNRA	8,800	15.6
LIMA Total			8,800	15.6
UMA	Private		1,500	2.6
UMA Total			1,500	2.6
Grand Total			56,400	100.0

5.4.1 White Fir Community Management

Of the 7,500 acres of white fir habitat in Clark County, 58.6 percent is within the Mt. Charleston Wilderness and Carpenter Canyon RNA, with an additional 5.3 percent in the Spring Mountains NRA of the Humboldt-Toiyabe National Forest. Within the forest boundaries there are 100 acres of private holdings. The remaining 2,600 acres of habitat occurs in the Sheep Mountains in the DNWR.

5.4.2 Ponderosa Pine Community Management

Ponderosa pine forest is found within the Spring Mountains NRA of the Humboldt-Toiyabe National Forest (28,200 total acres, or 67.1% of the total habitat), of which 19,300 acres are within designated wilderness areas, 800 acres are in WSA, and 8,100 acres are in mixed use areas. The Sheep Mountains of DNWR occupy 12,500 acres (29.7%). Within the forest boundaries are private holdings totaling 1,300 acres (3.1% of the total).

5.4.3 Ponderosa Pine/Mountain Shrub Community Management

Of the 6,900 acres found in Clark County, 37.6 percent is within the Spring Mountains NRA of the Humboldt-Toiyabe National Forest and 60.8 percent is around the Sheep Mountains of the DNWR. There are a small number of holdings of private lands in the Spring Mountains.

5.5 Existing and Proposed Conservation Actions

Of the total of 56,400 acres of mixed conifer habitat, 63.1 percent is managed by USFS (Wilderness, WSA, and Spring Mountains NRA) and 34.3 percent by USFWS (DNWR). Within the forest, private inholdings total 2.6 percent.

A total of 97.4 percent of the 56,400 acres of mixed conifer habitat is managed by the USFS or USFWS within the Spring Mountains NRA or the Desert National Wildlife Range. Nearly 82 percent is managed (wilderness, WSA, or DNWR) for primitive, non-motorized, dispersed recreational use. The habitat located within the Spring Mountains NRA is managed for both conservation and a broader spectrum of recreational uses, including intensive recreational use areas, developed camping areas, hiking and biking trails, rock climbing areas, and designated motorized vehicle use roads and trails. Both of these areas are closed to new mining, livestock grazing, and off-road motorized recreational vehicle use and are actively managed for habitat conservation.

The CA for the Spring Mountains NRA identifies general management actions for high elevation habitats, including development and implementation of a monitoring program for assessing effects of recreational use on high elevation communities and the species that occur in these communities, implementation of an overnight wilderness permitting process that provides visitor education on sensitive resource issues, prohibition of camping in sensitive areas, as determined through monitoring, removal of selected informal high elevation campsites, wild horse and burro management, and implementation of a weed management strategy.

5.5.1 USFS

5.5.1.1 Protective Measures

USFS(37) Focus new recreation development (campgrounds, picnic areas, and other facilities), in the least sensitive areas at lower elevations, to lessen visitor impacts on the species of concern and other sensitive ecological resources. (CA-GC 4.0(1))

USFS(38) Encourage partnerships with volunteers to maintain and enhance natural resources in the NRA. (CA-GC 4.0(2))

USFS(39) Adhere to goals, objectives, standards and guidelines detailed in the Plan Amendment which promote protective management of the species of concern and other ecological resources. (CA-GC 4.0(3))

USFS(40) Identify specific areas of exceptional sensitivity where conservation management will be emphasized over recreation. (CA-GC 4.0(4))

USFS(41) Minimize clearing of undergrowth during construction of new facilities. (CA-GC 4.0(5))

USFS(42) Prior to use of pesticides and other chemicals, determine potential impacts to the species of concern (e.g., butterflies, bats), and implement strategies to avoid impacts to those species. (CA-GC 4.0(6))

*USFS(43) Protect habitat of the species of concern from dispersed recreation (e.g., heavy foot traffic, off-road vehicles, mountain bikes), and the adverse effects of wild horses and burros. (CA-GC 4.0(7))**

USFS(44) Develop and implement an overnight wilderness permitting process that provides education on sensitive resources. (CA4.1)

USFS(45) Develop and implement a climbing “self registration” process that encourages development of new routes away from ecologically sensitive areas. (CA4.2)

*USFS(46) Develop and implement a plan to protect bat roosts in mines and caves. The plan will address the following protective measures: Gating or closing mines and caves to protect bat roost sites, removing important bat roost mines and caves from future additions of NRA maps, avoiding identification of exact locations of maternity roosts, caves, and occupied mines to the general public, determining the need to close roads to mines and caves, and avoiding use of heavy equipment near mine and cave roosts. (CA4.3)**

USFS(47) Facilitate, with Clark County, enforcement of leash laws, and control of feral cats and dogs in areas where adverse effects on Palmer’s chipmunk and other wildlife have occurred, particularly areas adjacent to the private developments of Mt. Charleston, Deer Creek, and Lee Canyon. (CA4.4)

USFS(48) Coordinate with county health department in management of disease transmittal by animals to humans (e.g., hanta virus, plague) to ensure that control methods do not have adverse effects on populations of Palmer’s chipmunk or other species of concern. (CA4.5)

USFS(49) Manage wild horses and burros in the NRA to avoid damage to species of concern habitats, particularly in lower Lee Canyon, northwest Mount Stirling, Wheeler Pass, Wheeler Wash, Wood Canyon, Carpenter Canyon, and lower Deer Creek, and continue to quickly remove any stray horses at upper elevations, particularly in upper Lee Canyon, Deer Creek, and Kyle Canyon. (CA4.6)

*USFS(50) Develop and distribute information to equestrians on the importance of using pelletized feed within the NRA, and develop and distribute a weed-free feed policy for equestrians on Federal lands. (CA4.7)**

USFS(51) Sign closure order allowing USFS to prohibit camping within specific distance of water sources, based on species and habitat protection needs, and control dispersed, primitive camping in the NRA by enforcing the closure order. (CA4.8)

*USFS(52) Develop and implement plan to collect seed for endowment and cultivation of sensitive and rare plants. (CA4.9)**

USFS(54) Consider, and as appropriate, develop additional protective designations in the NRA to protect the species of concern and other ecological resources. (CA4.11)

USFS(55) Coordinate with owners of golf course in lower Kyle Canyon on procedures for use of pesticides, fertilizers, and other chemicals, to eliminate deleterious effects on endemic butterflies, rare plant pollinators, and other species of concern. (CA4.12)

*USFS(56) Ensure consistent law enforcement and ranger presence on the east side of the NRA, west side of the NRA, and in the Wilderness Area, a minimum of four days per week per area (including weekends and holidays) during the period April 15 - October 15, and a minimum of three days per week (including weekends and holidays) during the period October 15 - April 15. Enforcement will emphasize protection of the species of concern and their habitats (e.g., peregrine falcon eyries, bat roosts, and alpine species). Increased wilderness ranger presence in high elevation forests and alpine areas will provide a means to distribute information on species conservation needs, ecological resource sensitivity, and low impact recreation use practices. (CA4.13)**

*USFS(57) Remove brown-headed cowbirds where nest parasitism occurs during neotropical migratory bird inventories or other activities. (CA4.14)**

USFS(58) Work with utility companies to ensure poles are raptor-safe. (CA4.15)

USFS(59) Coordinate with Nevada Department of Transportation and USFS road crews to ensure that road maintenance activities (e.g., shoulder work, road salting) do not adversely affect the species of concern (in particular, Morand's checkerspot, acastus checkerspot, and rough angelica in Kyle Canyon, and acastus checkerspot along Deer Creek Highway). (CA 4.16)

USFS(60) Limit impacts of new administrative facilities on natural and heritage resources, and visual quality. (FS-OBJ-0.19)

*USFS(61) Manage all active claims and abandoned mines to minimize effects on natural, visual, and heritage resources and provide protection for the public. (FS-OBJ-0.34)**

*USFS(62) Maintain roads to a standard necessary for public safety and as needed to respond to resource management objectives, including resource protection and recreation, through maintenance of road surfaces and minimizing erosion. (FS-OBJ-0.37)**

USFS(63) New recreational facilities will be located and designed to ensure public safety, ecosystem health, and customer satisfaction. (FS-OBJ-0.44)

USFS(64) Continue to provide rock climbing opportunities while protecting resource values. (FS-OBJ-0.45)

*USFS(65) Acquire available land within the Spring Mountains National Recreation Area to protect natural resources, provide public recreation opportunities, and increase efficiency of land management. (FS-OBJ-0.52)**

USFS(66) Prohibit parking and camping within riparian areas. (FS-ST-0.3)

USFS(67) Where possible, maintain historic floodplain and channel width, slope, and gradient. (FS-GU-0.5)

USFS(68) Maintain/restore open pools of slow moving water (0.5 meter in diameter) at some historic water sources, well distributed throughout the range. Develop open pools of water at least 0.5 meter in diameter at newly developed/diverted water sources. (FS-GU-0.6)

USFS(69) Develop new perennial water sources, including guzzlers, only to benefit native species, to improve distribution of non-native species, where historic water sources have disappeared, or where access is limited. Only develop water sources in the Wilderness or WSAs to improve desert bighorn sheep habitat. These developments must protect wilderness character. (FS-GU-0.7)

USFS(70) When developing water sources, pipe water from a point downstream of the source if snails or other sensitive species are present, or if the spring source has not been previously developed. (FS-ST-0.8)

USFS(71) Collection of threatened, endangered, and sensitive plant species requires a permit from the Regional Forester, except for traditional use by American Indians. (FS-ST-0.28)

USFS(72) Work with Nevada Division of Wildlife, US Fish and Wildlife Service, the Audubon Society, and other interested agencies and organizations to control cowbird populations as monitoring identifies negative impacts to species of concern from this parasitic, non-native species. (FS-GU-0.30)

USFS(73) New roads, administrative facilities, and developed recreation sites other than low-impact facilities (trails, trailhead parking, signs, restrooms, etc.) will be outside a 100 yard buffer zone around known Clokey eggvetch and rough angelica populations or potential habitat, and outside biodiversity hotspots (defined as areas of particular diversity or sensitivity) (FS-ST-0.31)

USFS(76) Use temporary closures (roads, trails, dispersed areas) to protect important seasonal habitat for species of concern (animals, plants, insects), in coordination with appropriate state and local agencies. (FS-GU-0.34)

*USFS(77) Allow access to all caves only from the beginning of March through the end of May; and from the beginning of September through the end of October. Seasonal restrictions will remain in place until bat roosting/hibernating inventories have been completed. Long-term seasonal restrictions will be determined based on survey results. Allow year-round access to Robbers' Roost Cave. (FS-ST-0.51)**

*USFS(78) Gate cave or mine openings where needed for public safety and resource protection. (FS-GU-0.54)**

*USFS(79) Rock climbing within 100 yards of known active or recently active peregrine falcon nests will be allowed only from the beginning of July through the end of January. Specific routes may be signed as necessary to inform of seasonal closures if nests are identified. Monitor peregrine nesting success to determine if the 100-yard closure is effective. (FS-ST-0.57)**

*USFS(80) Develop and maintain a network of shaded fuelbreaks to interrupt continuous stands of fuel. Maintain 50 linear feet/acre of downed trees with a 12-inch diameter at breast height within the shaded fuelbreak (if fuelbreak is being managed ecologically for the late seral stage of Pinyon/juniper and Mixed Conifer Land Type Associations, or if managed for other seral stage within Palmers chipmunk habitat). Use existing road corridors and natural barriers. (FS-GU-0.91)**

USFS(81) Work cooperatively with interested groups to establish seasonal use periods for caves and to educate cave users. (FS-GU-0.103)

*USFS(82) Manage designated and informal use (unnumbered) trails that are causing resource damage to reduce damage and restrict use to a single trail. (FS-GU-0.123)**

*USFS(84) Lower Deer Creek is removed from the Spring Mountains Wild Horse and Burro Territory due to danger posed by this herd to traffic on Kyle and Lee Canyon highways. Appropriate Management Level for wild horses and burros in Cold Creek is: horses, 26; burros, 0 (based upon 1992 range analysis and estimated population). The analysis showed a downward trend in the vegetation community composition, and soil condition (erosion and compaction) within a one-mile radius of the ponds. Utilization on willow exceeded 40%. This is excessive utilization for a community in a downward trend. This Appropriate Management Level is therefore based upon 30% of 1993 population which was 92 wild horses. No burros use this area; therefore, Appropriate Management Level for burros is 0. (FS-OBJ-11.12)**

USFS(85) Future trail alignments in the developed canyons will emphasize public safety, resource protection, and customer satisfaction. (FS-OBJ-11.17)

*USFS(86) Provide protection of the riparian areas (in accordance with NV Revised Statute 503.660) at Cold and Willow Creeks through the use of new road alignments, vehicle barriers, and/or signage. Redirect parking and camping away from riparian corridors. Allow only day-use, walk-in activities to occur within the riparian corridor. (FS-ST-11.1)**

USFS(87) Allow day-use only in the meadow area in Lee Canyon. Use temporary closures to allow for resource restoration/rehabilitation. (FS-ST-11.4)

*USFS(88) Provide trail markers and post restrictions to bouldering in the vicinity of Robbers' Roost Cave to protect Jaeger ivesia and Clokey greasebush. Interpretive signage may be used as appropriate. (FS-GU-11.5)**

USFS(89) Construct fences in strategic locations to keep wild horses out of Kyle and Lee Canyons. (FS-GU-11.20)

USFS(90) Close the Bristlecone Trail to motorized vehicles. Place barriers to prohibit off-trail travel into populations of species of concern. Use signs to educate users to the importance of species of concern, and the threats to their existence. (FS-ST-11.33)

USFS(91) Address user conflicts on Bristlecone Trail through a site-specific planning involving US Fish and Wildlife Service, trail users, and interested groups. (FS-GU-11.35)

USFS(92) Work with recreation residence associations to maintain the character and quality of recreational residence areas (summer homes under permit on National Forest System lands) while protecting natural resource values. (FS-GU-11.44)

USFS(93) Only allow low standard recreation facilities, including small camping areas or restrooms to be developed in upper Kyle and Lee canyons west of State Highway 158

as a resource protection measure. Allow new campgrounds and picnic areas to be developed in lower Kyle and Lee canyons, east of State Highway 158. (FS-ST-11.54)

*USFS(94) Allow limited expansion of ski area in Lee Canyon and enhancement of skiing opportunities and facilities within the scope of an approved master development plan and under the following constraints: (FS-ST-11.57)**

- *Expansion occurs within the existing sub-basin.*
- *Does not impact any threatened, endangered, or sensitive species or species of concern, or its habitat.*
- *Expansion is commensurate with development of additional parking in the lower Lee Canyon area, and shuttle services.*
- *Expansion incorporates defensible space design and fire safe facilities.*
- *Where consistent with other standards and guidelines.*

USFS(95) Protect natural and heritage resources and natural processes that enhance backcountry/wilderness recreational opportunities, including prohibiting consumptive uses of wilderness resources except where authorized by law or regulation. (FS-OBJ-12.2)

*USFS(96) Protect wilderness resources, including live and dead bristlecone pines, from removal/cutting for fuel. (FS-OBJ-12.6)**

USFS(97) Keep wild horses and burros out of the Wilderness. (FS-OBJ-12.8)

USFS(99) Discourage foot-traffic and camping at Mummy Spring by removing visitor-made trails, trail signage, and restoring native vegetation in riparian areas. (FS-GU-12.6)

USFS(100) When maintaining upper North Divide Trail switch-backs, minimize ground disturbance to protect rare plants. (FS-GU-12.8)

*USFS(101) Relocate South Loop Trail away from meadow if practical, and if other resources will not be affected. (FS-GU-12.9)**

5.5.1.2 Restoration and Enhancement

USFS(102) Secure funding for restoration programs beyond those under the scope of Interagency Agreement # 14-48-0001-94605. (CA-GC 5.0(1))

USFS(103) Wherever possible, select only locally native species for restoration, and where appropriate, use seed from the plant species of concern and endemic butterfly host plants. (CA-GC 5.0(2))

USFS(104) Ensure that restoration projects focus on protection and enhancement of the species of concern and do not inadvertently cause irretrievable damage to the habitats of the species of concern (e.g., open water for bats, mud puddles for butterflies). (CA-GC 5.0(3))

USFS(105) Develop native plant material and seed list for restoration projects by plant community. The list will specifically identify larval and nectar host plants for the endemic butterflies. Develop plan to collect local seed for restoration efforts and establish and maintain a native seed bank. (CA5.1)

USFS(106) Restore habitat in accordance with Interagency Agreement # 14-48-0001-94605 between the USFS and USFWS for the Spring Mountains NRA. All restoration activities will be designed and implemented in coordination with the Technical Working Group (CA1.6) to avoid inadvertent adverse effects on the species of concern. Priorities identified to date are as follows: (CA5.2)

- *McFarland Spring - Improve fence, treat head cut, construct dry well - very high priority (CA5.2a)*
- *Mummy Spring - Remove informal trails - very high priority (CA5.2b)*
- *Carpenter Canyon - Close last ¼ mile of road, create parking area -very high priority (CA5.2c)**
- *Trough Spring - Close road, treat road bed, seed area - high priority (CA5.2d)*
- *Lost Cabin Spring - Close road, eliminate diversion, restore spring brook - high priority (CA5.2e)**
- *Big Timber Spring - Remove stock tank and stock pond - high priority (CA5.2f)**
- *Gold Spring - Remove stock tank, headbox, and pipeline - high priority (CA5.2h)**
- *Middle Mud Spring and East Mud Spring - Repair fence, remove headbox and pipeline -medium priority (CA5.2i)*
- *Buck Spring - Remove headbox, pipeline, and trough - medium priority (CA5.2j)**
- *Macks Canyon Spring - Extend exclosure - medium priority (CA5.2k)**

- *Younts Spring - Eliminate salt cedar, remove impoundment - medium priority (CA5.2l)**
- *Santa Cruz Spring - eliminate salt cedar, construct enclosure, dry well, and pipeline - medium priority (CA5.2m)**
- *Ninety-nine Spring - Discontinue dredging, construct enclosure, dry well, and pipeline - medium priority (CA5.2n)**
- *Mexican Spring - Discontinue dredging, construct enclosure, dry well, and pipeline - medium priority (CA5.2o)**
- *Cougar Spring - Construct enclosure, dry well, and pipeline - medium priority (CA5.2p)**

USFS(107) Work with private property owners to restore and enhance the Cold Creek area. This effort will include plans to relocate facilities (e.g., fences, patios, and sheds) outside the riparian zone, and to control camping and fires (to protect butterflies), and maintain habitats for the species of concern (e.g., mud and seeps). (CA5.3)

*USFS(108) Develop and begin implementing a comprehensive restoration plan for the Willow Creek area. This plan will include relocation of roads and campgrounds out of the riparian area, removal of unneeded spur roads, a walk-in day-use plan, protection and habitat enhancement for springsnails, butterflies (including mud), and phainopepla. The plan will emphasize opportunities for public participation. (CA5.4)**

USFS(109) Work with summer home residents on the NRA to ensure that all future improvements avoid adverse effects to the species of concern, and where possible, enhance their habitats and populations. (CA5.5)

*USFS(110) Work with Las Vegas Ski and Snowboard Resort to develop protective strategies for sensitive ecological resources. This will include investigating options for erosion control of the Lee Canyon ski slopes with native seed mixes, including *Astragalus calycosus* var. *mancus* to enhance butterfly habitat, management of herbicides and pesticides, and a plan for eventual elimination of non-native seeding, and management of the Three Springs area. (CA5.6)*

*USFS(111) Remove selected informal high-elevation and alpine campsites (particularly those within or near the habitats of the plant species of concern and butterfly host plants) encourage use of specific strategically placed campsites, and remove high elevation fire rings. (CA5.7)**

*USFS(112) Remove roads causing environmental damage: road to Cave Spring road to CC spring, road to Lost Cabin Spring, and identify additional roads for closure, particularly in biodiversity hotspots, and work with community groups to close them. (CA5.8)**

USFS(113) Organize volunteer work parties to manually remove exotic plants and noxious weeds along the ridgeline trail and other high elevation routes. (CA5.9)

*USFS(114) Develop and implement vegetation management and restoration plans for campgrounds and day use areas that enhance resources for Palmer's chipmunk, endemic butterflies, and rare plants. Priority areas include: (CA5.10)**

- Deer Creek Picnic Area - Move picnic tables out of the riparian zone, and revegetate the area to enhance habitat for Palmer's chipmunk, neotropical migratory birds, and bats. (CA5.10a)**
- Lee Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat. (CA5.10b)**
- Kyle Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat. (CA5.10c)**
- Gary Abbot Campground - Close campsite and restore area to enhance habitat of Clokey eggvetch and butterflies. (CA5.10d)*

USFS(115) Work with volunteers to provide nest boxes for cavity nesting western and mountain bluebirds and roosting bats to replace lost habitat. (CA5.11)

USFS(117) Remove existing water developments and debris from springs, providing they no longer serve their original purpose, are not critical to wildlife, and the items are not of historical significance. (FS-ST-0.13)

USFS(118) Use seed mixtures or seedlings for site rehabilitation, fire rehabilitation, or permit requirement in order of preference: 1) Native plants; 2) no seeding (only if erosion is not a serious concern and there is no cheatgrass invasion); 3) non-persistent (sterile) exotics; and 4) persistent exotics. (FS-GU-0.16)

*USFS(120) Provide a minimum of five wildlife cover sites per acre within developed or primitive recreation sites by maintaining or adding dead and down wood material or rocks at appropriate locations. (FS-ST-0.38)**

*USFS(121) Remove all structures related to grazing activities that are not necessary for current management, or of historic value. (FS-ST-0.49)**

*USFS(122) Close all undesignated spur roads in riparian areas; close other spur roads on a case by case basis, after site specific analysis. (FS-GU-0.63)**

*USFS(123) Relocate existing roads outside of washes, riparian areas, and 50-year floodplains if relocation will result in better resource conditions. Priority should be given to relocating roads when major maintenance is required and to roads that: 1) Are located in vital habitat for plant or animal species of concern, and 2) receive higher levels of use. (FS-GU-0.64)**

USFS(124) Require site/area rehabilitation upon completion/termination as part of all new permits. (FS-ST-0.126)

*USFS(125) Enhance developed sites where feasible to restore resource or wildlife values where recreation use has adversely affected resources. (FS-OBJ-11.5)**

*USFS(129) Provide water sources for wildlife adjacent to or within developed facilities. Maintain public restrooms to prevent access by wildlife (Palmer's chipmunk). (FS-GU-11.11)**

*USFS(130) Restore and maintain the natural, ecological, and visual character of the Wilderness. (FS-OBJ-12.1)**

*USFS(131) Restore water sources to historic flows in the Wilderness. (FS-OBJ-12.7)**

*USFS(132) Where possible, remove obvious exotic plants (dandelions, cheatgrass) in the Wilderness manually. (FS-GU-12.2)**

*USFS(133) Remove fire rings from the Wilderness. Emphasis should be placed on removing features which encourage use on degraded or sensitive sites. (FS-GU-12.4)**

5.5.1.3 Land Use Policies and Actions

USFS(182) Retain all snags that do not pose a threat to public safety or extreme fire danger. Snags are retained to provide habitat for cavity nesting animals and animals that feed upon the insects living within dead trees. Retain a minimum of 5 snags per acre in late seral stages of the Pinyon/juniper, Mixed Conifer, and Bristlecone Pine Land Type Associations in all cases. (FS-ST-0.36)

USFS(183) Retain a minimum of 50 linear feet/acre of downed trees with a minimum 12 inch diameter on sites being managed for late seral stage of the Pinyon/Juniper and

Mixed conifer Land Type Associations, to provide ground cover for small mammals, amphibians, reptiles, and invertebrates. Trim branches and limbs as necessary. Place downed trees in such a way as to not affect drainage patterns; impede traffic or use of recreation facilities; create a public safety problem; and where consistent with “defensible space.” (FS-ST-0.37)

USFS(195) Dead and down fuelwood collection areas may be designated in the Mixed Conifer Land Type Association (outside the Wilderness) when necessary to meet specific ecosystem health goals and objectives. As necessary, minimize impacts to Palmers chipmunk. (FS-GU-0.59)

5.5.2 USFWS

5.5.2.1 Protective Measures

USFWS(12) Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).

USFWS(13) Adopt and implement policies to protect plant species from dispersed or unregulated recreation (DNWR).

USFWS(14) Implement snag management in habitat areas, including limiting wood collection to down wood, and coordination of fire management activities within proposed wilderness areas of the DNWR (DNWR).

USFWS(15) Manage woodcutting, shrub clearing, and limit other human activity disturbance off existing roads within the DNWR (DNWR).

USFWS(17) Protect existing riparian habitat from the effects of recreational activities (DNWR).

USFWS(18) Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(20) Minimize clearing of undergrowth in construction of new facilities within the DNWR (DNWR).

USFWS(21) Prohibit access to caves for recreation (DNWR).

USFWS(22) Prohibit horses, burros, and livestock grazing (DNWR).

USFWS(24) Prohibit highway and road construction on the Refuge (DNWR).

USFWS(25) Retrofit roads to permit ingress and egress for a broad range of organisms (DNWR).

USFWS(26) Conduct biological surveys prior to road maintenance and retrofit activities, (DNWR).

USFWS(27) Ensure that roads are engineered to adequately spread runoff to minimize erosion (DNWR).

USFWS(28) Ensure that adequate law enforcement and ranger patrolling is implemented within the DNWR (DNWR).

USFWS(31) Maintain dead snags and fallen trees on slopes and canyon bottoms in the DNWR (DNWR).

USFWS(33) Evaluate effects of rock climbing on biological resources. Rock climbing is currently allowed, but is under investigation; if adverse impacts are found it will be prohibited on DNWR (DNWR).

5.5.2.2 Restoration and Enhancement Measures

USFWS(35) Create new open water resources for bats and other wildlife (DNWR).

USFWS(36) Expand the seed bank program to include populations in the Sheep Mountains areas (DNWR).

USFWS(38) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the DNWR (DNWR).

USFWS(40) Restore/rehabilitate all key access points of closed roads and areas (DNWR).

5.6 Adequacy of Existing and Proposed Management

About 97.4 percent of the habitat is within IMAs and LIMAs (USFS wilderness areas or in the Desert National Wildlife Range) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. Approximately 2.6 percent

is UMA (privately held) and may be used for more intensive recreation, including snow play, skiing, camping, and private residential and commercial recreational uses.

Implementation of existing USFWS management actions and the CA for the Spring Mountains NRA will adequately address the ecosystem level threats affecting Covered Species within the mixed conifer habitat, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

5.7 MSHCP Conservation Contributions

The mixed conifer forest habitat and the 33 Covered Species it supports will benefit from the MSHCP through general public education and information programs; potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

Chapter 6 Pinyon-Juniper Ecosystem

6.1 Description and Distribution

The pinyon-juniper ecosystem in Clark County includes mountain shrub, pinyon, pinyon-juniper, juniper, and intermixed grassland vegetation community types (Figure 6-1, Table 6-1). In Clark County, communities which compose the pinyon-juniper ecosystem are distributed as elevational bands around the Spring Mountains, Sheep Mountains, and Virgin Mountains with an island community in the McCullough Mountains at elevations ranging from 4,900 to 8,200 feet.

TABLE 6-1
VEGETATION COMMUNITIES IN THE PINYON-JUNIPER ECOSYSTEM

Vegetation Type	Acres	% of Ecosystem
Mountain shrub	108,400	38.4
Pinyon pine	56,200	19.9
Pinyon-juniper	106,300	37.7
Juniper	7,000	2.4
Grassland	3,900	1.3
Habitat Total	277,800	98.6
Ecosystem Total	281,700	100.0

6.1.1 Mountain Shrub Community

This deciduous shrubland (USU Code 47; CA WHR Code LSG–Low Sage) is principally dominated by oak (*Quercus* spp.), maple (*Acer* spp.), alder leaf mountain mahogany (*Cercocarpus montanus*), cliffrose (*Cowania mexicana*), bitterbrush (*Purshia tridentata*), serviceberry (*Amelanchier* spp.), buckbrush (*Ceanothus* spp.), snowberry (*Symphoricarpos* spp.), manzanita (*Arctostaphylos* spp.), ninebark (*Physocarpus alternans*), currant (*Ribes* spp.), squawbush (*Rhus* spp.), and little leaf mountain mahogany (*Cercocarpus intricatus*). Other associated shrub species include sagebrush (*Artemisia* spp.) and rabbitbrush (*Chrysothamnus* spp.).

6.1.2 Pinyon Pine Community

Conifer woodland and forest dominated by single leaf pinyon (*Pinus monophylla*) (USU Code 16,17; CA WHR Code PJN–Pinyon Juniper) with woodland canopies at less than

30 percent and forest canopies between 30 and 60 percent. Primary associated tree species include Utah juniper (*Juniperus osteosperma*), ponderosa pine (*Pinus ponderosa*), white fir (*Abies concolor*), and mountain mahogany (*Cercocarpus ledifolius*). Primary associated shrubs include sagebrush (*Artemisia* spp.), oak (*Quercus gambelii*), alder leaf mountain mahogany (*Cercocarpus montanus*), leaf mountain mahogany (*Cercocarpus intricatus*), cliffrose (*Cowania mexicana*), manzanita (*Arctostaphylos* spp.), shrub live oak (*Quercus turbinella*), and bitterbrush (*Purshia tridentata*). Pinyon is found above the more widespread pinyon-juniper association.

6.1.3 Pinyon-Juniper Community

The pinyon-juniper association (USU Code 18,19; CA WHR Code PJN–Pinyon-Juniper) is conifer woodland or forest codominated by single leaf pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) with woodland canopies at less than 30 percent and forest canopies between 30 and 60 percent. Primary associated tree species include mountain mahogany (*Cercocarpus ledifolius*). Primary associated shrubs include sagebrush (*Artemisia* spp.), rabbitbrush (*Chrysothamnus* spp.), oak (*Quercus gambelii*), alder leaf mountain mahogany (*Cercocarpus montanus*), bitterbrush (*Purshia tridentata*), little leaf mountain mahogany (*Cercocarpus intricatus*), and cliffrose (*Cowania mexicana*). It is intermediate to juniper and pinyon habitats.

6.1.4 Juniper Community

The juniper association (USU Code 8,9; CA WHR Code JUN–Juniper) is coniferous woodland and forest dominated by the Utah juniper (*Juniperus osteosperma*) at woodland canopies less than 30 percent or forest canopies below 60 percent cover. Primary associated trees include rocky mountain juniper (*Juniperus scopulorum*), western juniper (*Juniperus occidentalis*), and single leaf pinyon pine (*Pinus monophylla*). Primary associated shrub species include sagebrush (*Artemisia* spp.), rabbitbrush (*Chrysothamnus* spp.), and blackbrush (*Coleogyne ramosissima*).

6.2 MSHCP Species

MSHCP Covered Species are similar to the conifer forest associations but with lower-altitude species including seven reptiles. The plant list narrows with eight vascular and four non-vascular species. Covered species include the peregrine falcon which forages and nests in this habitat. There are also five Evaluation Species, including mammals,

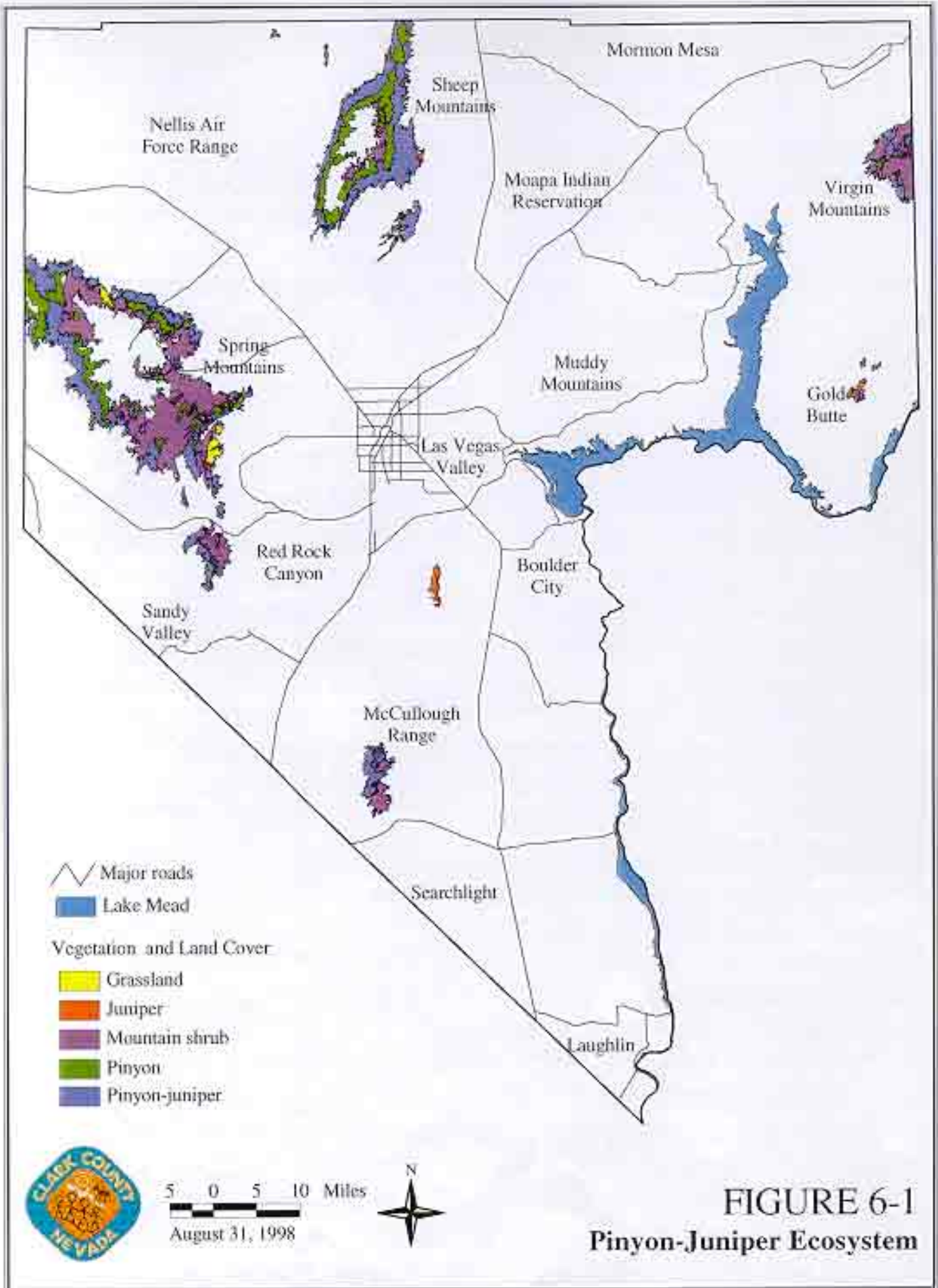


FIGURE 6-1
Pinyon-Juniper Ecosystem

birds, and reptiles. The mountain shrub habitat does not provide high-priority habitat for a number of covered and Evaluation Species otherwise found within the ecosystem, as are noted in the species list.

Covered Species:

Silver-haired bat	<i>Lasionycteris noctivagans</i> *
Long-eared myotis	<i>Myotis evotis</i> *
Long-legged myotis	<i>Myotis volans</i>
Palmer's chipmunk	<i>Tamias palmeri</i> *
American peregrine falcon	<i>Falco peregrinus anatum</i>
Banded gecko	<i>Coleonyx variegatus</i> ‡
Large-spotted leopard lizard	<i>Gambelia wislizenii wislizenii</i>
Great Basin collared lizard	<i>Crotaphytus insularis bicinctores</i>
Western red-tailed skink	<i>Eumeces gilberti rubricaudatus</i> *
Glossy snake	<i>Arizona elegans</i>
Sonoran lyre snake	<i>Timorphodon biscutatus lambda</i>
Speckled rattlesnake	<i>Crotalus mitchelli</i>
Dark blue butterfly	<i>Euphilotes enoptes purpurea</i> *
Spring Mountains icarioides blue	<i>Icaricia icarioides austinatorum</i>
Spring Mountains acastus checkerspot	<i>Chlosyne acastus robusta</i>
Morand's checkerspot butterfly	<i>Euphydryas anicia morandi</i>
Carole's silverspot butterfly	<i>Speyeria zerene carolae</i>
Nevada admiral	<i>Limenitis weidemeyerii nevadae</i>
Spring Mountains comma skipper	<i>Hesperia comma mojavensis</i> †
Clokey milkvetch	<i>Astragalus aequalis</i>
Clokey eggvetch	<i>Astragalus oophorus</i> var. <i>clokeyanus</i>
Spring Mountains milkvetch	<i>Astragalus remotus</i>
Inch high fleabane	<i>Erigeron uncialis</i> ssp. <i>Conjugans</i>
Smooth pungent (dwarf) greaseweb	<i>Glossopetalon pungens</i> var. <i>glabra</i>
Pungent dwarf greaseweb	<i>Glossopetalon pungens</i> var. <i>pungens</i>
Jaeger beardtongue	<i>Penstemon thompsonae</i> var. <i>jaegeri</i> ‡
Clokey mountain sage	<i>Salvia dorrii</i> var. <i>clokeyi</i> ‡
<i>Anacolia menziesii</i>	<i>Anacolia menziesii</i> *
<i>Claopodium whippleanum</i>	<i>Claopodium whippleanum</i> *
<i>Dicranoweisia crispula</i>	<i>Dicranoweisia crispula</i>
<i>Syntrichia princeps</i>	<i>Syntrichia princeps</i> *

High Priority Evaluation Species:

Kit fox	<i>Vulpes macrotus</i> *
Western burrowing owl	<i>Athene cunicularia hypugea</i>
Banded Gila monster	<i>Heloderma suspectum cinctum</i> §
Southern desert horned lizard	<i>Phrynosoma platyrhinos calidiarum</i> §
Curve-podded Mojave (halfring) milkvetch	<i>Astragalus mohavensis</i> var. <i>hemigyris</i>

*Does not occur in mountain shrub habitat.

†Only occurs in mountain shrub habitat.

‡Does not occur in juniper habitat.

§Only occurs in juniper habitat.

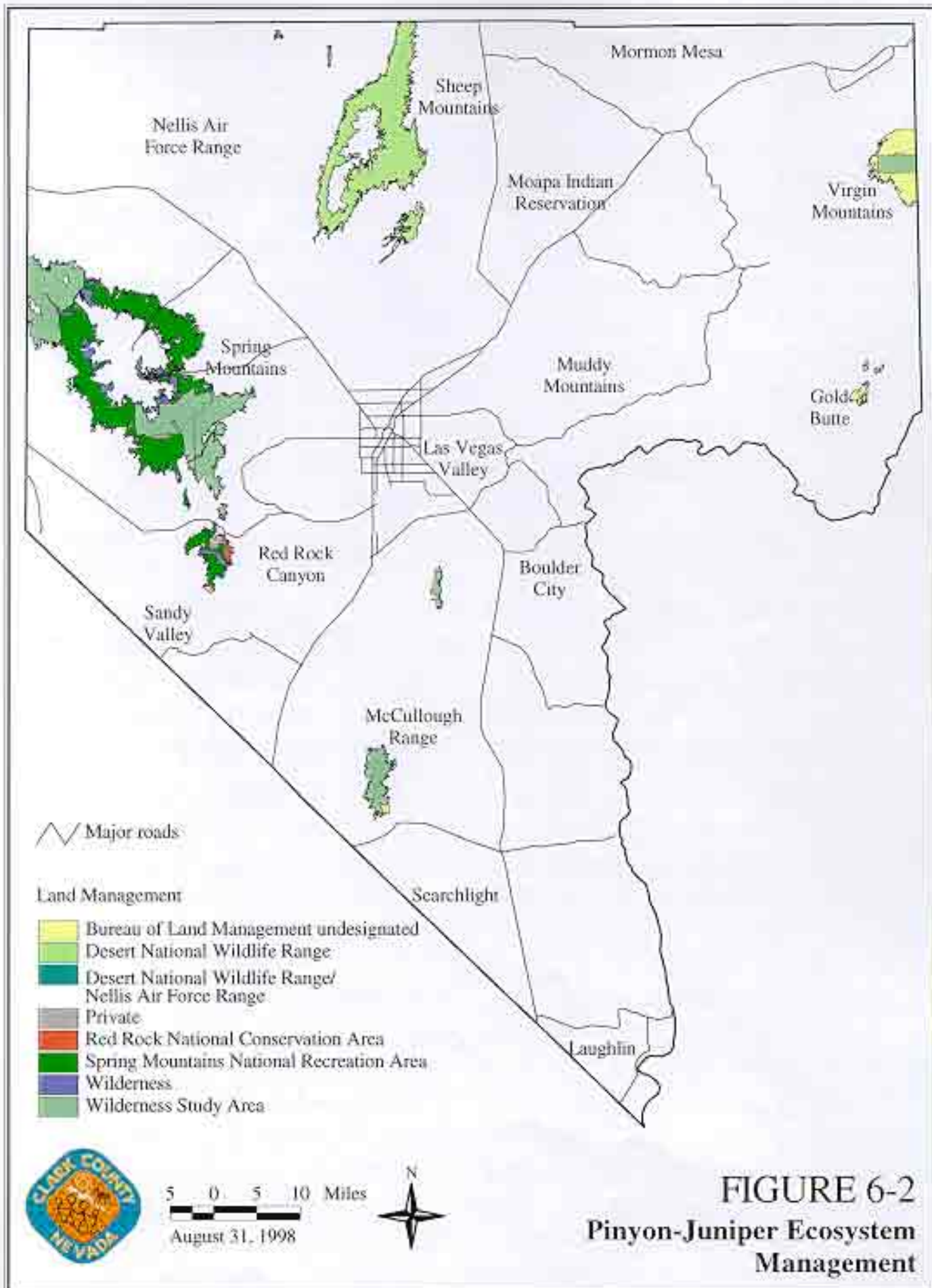
6.3 Potential Threats and Stressors

The primary ecosystem level threats and stressors in pinyon-juniper are:

- Commercial collection (reduction of populations **Threat 201**, habitat degradation **Threat 202**)
- Fires and fire management (habitat degradation **Threat 301**, vegetation community conversion **Threat 302**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, concentrated recreation **Threat 402**, competitive OHV races **Threat 403**, casual use OHV activities **Threat 404**, rock climbing **Threat 405**, indiscriminate recreational shooting **Threat 406**, spelunking **Threat 407**)
- Highways, roads, and trails (highway mortality **Threat 501**, habitat fragmentation **Threat 503**, road construction and maintenance **Threat 504**)
- Pest control (direct or indirect poisoning or trapping **Threat 601**, pesticides and herbicides **Threat 602**)
- Grazing (wild horse and burro grazing and trampling **Threat 701**, livestock grazing and trampling **Threat 703**)
- Military activities (target sites, roads, or other military access locations **Threat 801**, military facilities construction and maintenance **Threat 802**)
- Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**)
- Woodcutting, (wood removal, snag collection **Threat 1001**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**)
- Utilities (collisions and electrocution with power lines **Threat 1201**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**, grazing and agriculture **Threat 1404**, overutilization by animals **Threat 1405**)
- Exotic and introduced species (increased risk of fire due to exotic plants **Threat 1503**)
- Feral animals (feral animals and uncontrolled pets **Threat 1601**)
- Illegal or unauthorized activities (poaching, illegal collection, or killing of flora and fauna **Threat 1701**)

6.4 Pinyon-Juniper Habitat Management

The existing management includes designations of wilderness/WSA, conserved/critical habitat, and national wildlife range, which are considered IMAs totaling 173,800 acres, or 62.5 percent of the total habitat in Clark County (Figure 6-2, Table 6-2). The USFS lands designated as wilderness and WSA (Mount Stirling, Pine Creek, and La Madre Mountain) have substantial restrictions on public recreational uses, requiring permits for overnight stays (wilderness areas only), no developed recreational facilities, and hiking



on designated trails; with no or restricted motorized access; and with prohibitions on mining and grazing (except wild horse or burro management areas). The USFWS-managed Desert National Wildlife Range has comparably restrictive management policies with respect to road access and recreational uses.

BLM managed lands include those designated as conserved/critical habitat for the desert tortoise and WSAs. Less than 1 percent (800 acres) of the habitat area is designated as conserved habitat or is within critical habitat for the desert tortoise. These areas include management prescriptions for grazing, mining, and off-road vehicle recreation that were agreed to as part of the Section 10 Permit for the desert tortoise.

The BLM and USFS WSAs are a placeholder category for future management. WSAs must have their potential wilderness values maintained until they are formally classified as wilderness or declassified as non-wilderness areas by Congress. The BLM WSAs include the La Madre Mountain and Pine Creek areas adjacent to the Spring Mountains NRA within the Red Rock Canyon NCA (13,100 acres) and portions of the North (1,900 acres) and South (10,000 acres) McCullough Mountain WSAs totaling 9 percent of the habitat. About one-half of the La Madre Mountain and Pine Creek WSAs and one-third of South McCullough Mountain are recommended as wilderness, but the overlap within the habitat zone is unknown at this time. The BLM WSAs currently include management areas for wild horses and burros, livestock allotments, and mineral claims. Recreational uses are generally dispersed, with motorized uses restricted to designated roads and trails. New facilities or access, mining claims, or grazing would require permit review by BLM.

The remaining portions of the USFS Spring Mountains NRA (80,000 acres, or 28.7%) and the BLM Red Rock Canyon NCA (1,500 acres, or <1.0%) have a wider diversity of recreational use types and developed facilities and are classified as LIMAs. Mining is limited to existing claims and grazing is restricted to wild horse and burro management areas. There are developed facilities and intensive use recreation areas for group camping, hiking, horseback riding, rock climbing, and motorized and non-motorized vehicle use on existing roads and trails. The BLM lands without management designation (18,700 acres, or 6.7% of the ecosystem) have no specific management policies with respect to conservation other than those provided in existing state or Federal laws and are considered MUMAs.

Private lands (totaling 4,200 acres, or 1.5% of the habitat area) are generally found as inholdings in the Red Rock and Spring Mountains and along major roads into these areas. Uses include recreational or visitor serving commercial and residential. The only use restrictions assumed are those imposed by law and they are considered UMAs. There is conservation value in privately held open space; however, without agreements or easements, the value of the open space cannot be assured over the period of the Section 10(a) permit. There are also lands under long-term leases to private organizations (Boy

Scouts, Las Vegas Archers) and Clark County for recreational uses in the Spring Mountains area on lands held by the USFS.

**TABLE 6-2
MANAGEMENT OF HABITAT IN THE PINYON-JUNIPER ECOSYSTEM**

Category	Manager	Management Classification	Acres	% of Habitat
IMA	BLM	Conserved Habitat	300	<1.0
	BLM	Critical Habitat	500	<1.0
	BLM	WSA	37,100	13.3
	USFS	Wilderness	11,600	4.1
	USFS	WSA	47,500	17.1
	USFWS	DNWR	76,500	27.5
	USFWS/USAF	DNWR/NAFR	300	<1.0
	IMA Total			173,800
LIMA	BLM	NCA	1,500	<1.0
	USFS	SMNRA	80,000	28.7
LIMA Total			81,500	29.3
MUMA	BLM	Undesignated	18,700	6.7
MUMA Total			18,700	6.7
UMA	Private		4,200	1.5
UMA Total			4,200	1.5
Grand Total			277,800	100.0

6.4.1 Mountain Shrub Community Management

The largest area of mountain shrub habitat is in the Spring Mountains NRA of Humboldt-Toiyabe National Forest (66,500 acres, or 61.3% of the extent of this habitat). Of this, 26,800 acres are in designated wilderness or wilderness study areas (Mt. Charleston, La Madre Mountain, Pine Creek, and Mount Stirling) and the remaining 39,700 acres are in the West Side and Developed Canyons areas of the Spring Mountains NRA. BLM has jurisdiction over a total of 32,100 acres (29.6%); including 18,400 acres of mountain shrub habitat in WSAs La Madre Mountain, Pine Creek, Virgin Mountain, and South McCullough Mountain; 1,300 acres adjoining USFS lands in the Red Rock Canyon NCA; 800 acres in conserved or desert tortoise critical habitat areas in Gold Butte-Pakoon; and 11,600 acres on other BLM lands. The DNWR includes 6,600 acres in the Sheep Mountains. Approximately 3,400 acres occur on privately held lands, mostly in the Spring Mountains.

6.4.2 Pinyon Pine Community Management

Pinyon pine associations occur predominantly (66.0% of the total) in the Spring Mountains NRA of the Humboldt-Toiyabe National Forest and the Sheep Mountains in the DNWR. Of this, about 4.4 percent (2,500 acres) are within areas designated as wilderness and research natural areas, 22.4 percent (12,600 acres) are within WSAs, and 21.8 percent (12,300 acres) are within the NRA. About 44.1 percent (24,800 acres) are

found in the Sheep Mountains of the DNWR. An additional 3,800 acres is within the La Madre Mountain WSA managed by BLM and a small stand is found in the Virgin Mountains managed by BLM.

6.4.3 Pinyon-Juniper Community Management

Approximately 65.7 percent of the pinyon-juniper association occurs in the Spring Mountains NRA of the Humboldt-Toiyabe National Forest and the Sheep Mountains in the DNWR. Of this, about 16,900 acres (15.8%) are within areas managed as wilderness, research natural areas, or WSA by the Forest Service; 27,700 acres (26.1%) are within the Spring Mountains NRA; and 42,200 (39.6%) is within the DNWR. An additional 5,800-acre stand is found in the Virgin Mountains and 12,900 acres are located within BLM South McCullough WSA.

6.4.4 Juniper Community Management

The largest area of juniper woodland and forest occurs in the DNWR (2,800 acres, or 40%). There are 1,900 acres (27.1%) of habitat in the BLM's North McCullough WSA and 1,300 acres in the Gold Butte-Pakoon area. Approximately 700 acres of habitat are found in the Spring Mountains NRA of the Humboldt-Toiyabe National Forest.

6.5 Existing and Proposed Conservation Actions

Of the total of 277,800 acres of pinyon-juniper habitat, 50.0 percent is managed by USFS (Spring Mountains NRA, WSA, and in biodiversity hotspots managed as Wilderness), 27.5 percent by USFWS (DNWR), and 20.9 percent by BLM (WSA, undesignated, NCA, and conserved and critical habitat). Private holdings total 1.5 percent.

A total of 62.2 percent of the 277,800 acres of pinyon-juniper habitat is managed for primitive, non-motorized, dispersed recreational use (wilderness, WSA, or DNWR). The 29.3 percent of the habitat located within the Spring Mountains NRA and Red Rock Canyon NCA is managed for both conservation and a broader spectrum of recreational uses, including intensive recreational use areas, developed camping areas, hiking and biking trails, rock climbing areas, and designated motorized vehicle use roads and trails. Both of these areas are closed to new mining, livestock grazing, and off-road motorized recreational vehicle use and are actively managed for habitat conservation.

The CA for the Spring Mountains NRA identifies general management actions for mid elevation habitats, including recreation site monitoring, campground management, environmental education programs, fire management, focusing of recreation development

outside of sensitive areas, habitat restoration and enhancement at recreation sites, wild horse and burro management, and implementation of a weed management strategy.

6.5.1 USFS

6.5.1.1 Protective Measures

USFS(37) Focus new recreation development (campgrounds, picnic areas, and other facilities), in the least sensitive areas at lower elevations, to lessen visitor impacts on the species of concern and other sensitive ecological resources. (CA-GC 4.0(1))

USFS(38) Encourage partnerships with volunteers to maintain and enhance natural resources in the NRA. (CA-GC 4.0(2))

USFS(39) Adhere to goals, objectives, standards and guidelines detailed in the Plan Amendment which promote protective management of the species of concern and other ecological resources. (CA-GC 4.0(3))

USFS(40) Identify specific areas of exceptional sensitivity where conservation management will be emphasized over recreation. (CA-GC 4.0(4))

USFS(41) Minimize clearing of undergrowth during construction of new facilities. (CA-GC 4.0(5))

USFS(42) Prior to use of pesticides and other chemicals, determine potential impacts to the species of concern (e.g., butterflies, bats), and implement strategies to avoid impacts to those species. (CA-GC 4.0(6))

*USFS(43) Protect habitat of the species of concern from dispersed recreation (e.g., heavy foot traffic, off-road vehicles, mountain bikes), and the adverse effects of wild horses and burros. (CA-GC 4.0(7))**

USFS(44) Develop and implement an overnight wilderness permitting process that provides education on sensitive resources. (CA4.1)

USFS(45) Develop and implement a climbing “self registration” process that encourages development of new routes away from ecologically sensitive areas. (CA4.2)

USFS(46) Develop and implement a plan to protect bat roosts in mines and caves. The plan will address the following protective measures: Gating or closing mines and caves to protect bat roost sites, removing important bat roost mines and caves from future additions of NRA maps, avoiding identification of exact locations of maternity roosts,

*caves, and occupied mines to the general public, determining the need to close roads to mines and caves, and avoiding use of heavy equipment near mine and cave roosts. (CA4.3)**

USFS(47) Facilitate, with Clark County, enforcement of leash laws, and control of feral cats and dogs in areas where adverse effects on Palmer's chipmunk and other wildlife have occurred, particularly areas adjacent to the private developments of Mt. Charleston, Deer Creek, and Lee Canyon. (CA4.4)

USFS(48) Coordinate with county health department in management of disease transmittal by animals to humans (e.g., hanta virus, plague) to ensure that control methods do not have adverse effects on populations of Palmer's chipmunk or other species of concern. (CA4.5)

USFS(49) Manage wild horses and burros in the NRA to avoid damage to species of concern habitats, particularly in lower Lee Canyon, northwest Mount Stirling, Wheeler Pass, Wheeler Wash, Wood Canyon, Carpenter Canyon, and lower Deer Creek, and continue to quickly remove any stray horses at upper elevations, particularly in upper Lee Canyon, Deer Creek, and Kyle Canyon. (CA4.6)

*USFS(50) Develop and distribute information to equestrians on the importance of using pelletized feed within the NRA, and develop and distribute a weed-free feed policy for equestrians on Federal lands. (CA4.7)**

USFS(51) Sign closure order allowing USFS to prohibit camping within specific distance of water sources, based on species and habitat protection needs, and control dispersed, primitive camping in the NRA by enforcing the closure order. (CA4.8)

*USFS(52) Develop and implement plan to collect seed for endowment and cultivation of sensitive and rare plants. (CA4.9)**

USFS(54) Consider, and as appropriate, develop additional protective designations in the NRA to protect the species of concern and other ecological resources. (CA4.11)

USFS(55) Coordinate with owners of golf course in lower Kyle Canyon on procedures for use of pesticides, fertilizers, and other chemicals, to eliminate deleterious effects on endemic butterflies, rare plant pollinators, and other species of concern. (CA4.12)

*USFS(57) Remove brown-headed cowbirds where nest parasitism occurs during neotropical migratory bird inventories or other activities. (CA4.14)**

USFS(58) Work with utility companies to ensure poles are raptor-safe. (CA4.15)

USFS(59) Coordinate with Nevada Department of Transportation and USFS road crews to ensure that road maintenance activities (e.g., shoulder work, road salting) do not adversely affect the species of concern (in particular, Morand's checkerspot, acastus checkerspot, and rough angelica in Kyle Canyon, and acastus checkerspot along Deer Creek Highway). (CA 4.16)

USFS(60) Limit impacts of new administrative facilities on natural and heritage resources, and visual quality. (FS-OBJ-0.19)

*USFS(61) Manage all active claims and abandoned mines to minimize effects on natural, visual, and heritage resources and provide protection for the public. (FS-OBJ-0.34)**

*USFS(62) Maintain roads to a standard necessary for public safety and as needed to respond to resource management objectives, including resource protection and recreation, through maintenance of road surfaces and minimizing erosion. (FS-OBJ-0.37)**

USFS(63) New recreational facilities will be located and designed to ensure public safety, ecosystem health, and customer satisfaction. (FS-OBJ-0.44)

USFS(64) Continue to provide rock climbing opportunities while protecting resource values. (FS-OBJ-0.45)

*USFS(65) Acquire available land within the Spring Mountains National Recreation Area to protect natural resources, provide public recreation opportunities, and increase efficiency of land management. (FS-OBJ-0.52)**

USFS(66) Prohibit parking and camping within riparian areas. (FS-ST-0.3)

USFS(67) Where possible, maintain historic floodplain and channel width, slope, and gradient. (FS-GU-0.5)

USFS(68) Maintain/restore open pools of slow moving water (0.5 meter in diameter) at some historic water sources, well distributed throughout the range. Develop open pools of water at least 0.5 meter in diameter at newly developed/diverted water sources. (FS-GU-0.6)

USFS(69) Develop new perennial water sources, including guzzlers, only to benefit native species, to improve distribution of non-native species, where historic water sources have disappeared, or where access is limited. Only develop water sources in the Wilderness or WSAs to improve desert bighorn sheep habitat. These developments must protect wilderness character. (FS-GU-0.7)

USFS(70) When developing water sources, pipe water from a point downstream of the source if snails or other sensitive species are present, or if the spring source has not been previously developed. (FS-ST-0.8)

USFS(71) Collection of threatened, endangered, and sensitive plant species requires a permit from the Regional Forester, except for traditional use by American Indians. (FS-ST-0.28)

USFS(72) Work with Nevada Division of Wildlife, US Fish and Wildlife Service, the Audubon Society, and other interested agencies and organizations to control cowbird populations as monitoring identifies negative impacts to species of concern from this parasitic, non-native species. (FS-GU-0.30)

USFS(73) New roads, administrative facilities, and developed recreation sites other than low-impact facilities (trails, trailhead parking, signs, restrooms, etc.) will be outside a 100 yard buffer zone around known Clokey eggvetch and rough angelica populations or potential habitat, and outside biodiversity hotspots (defined as areas of particular diversity or sensitivity) (FS-ST-0.31)

USFS(76) Use temporary closures (roads, trails, dispersed areas) to protect important seasonal habitat for species of concern (animals, plants, insects), in coordination with appropriate state and local agencies. (FS-GU-0.34)

*USFS(77) Allow access to all caves only from the beginning of March through the end of May; and from the beginning of September through the end of October. Seasonal restrictions will remain in place until bat roosting/hibernating inventories have been completed. Long-term seasonal restrictions will be determined based on survey results. Allow year-round access to Robbers' Roost Cave. (FS-ST-0.51)**

*USFS(78) Gate cave or mine openings where needed for public safety and resource protection. (FS-GU-0.54)**

*USFS(79) Rock climbing within 100 yards of known active or recently active peregrine falcon nests will be allowed only from the beginning of July through the end of January. Specific routes may be signed as necessary to inform of seasonal closures if nests are identified. Monitor peregrine nesting success to determine if the 100-yard closure is effective. (FS-ST-0.57)**

USFS(80) Develop and maintain a network of shaded fuelbreaks to interrupt continuous stands of fuel. Maintain 50 linear feet/acre of downed trees with a 12-inch diameter at breast height within the shaded fuelbreak (if fuelbreak is being managed ecologically for the late seral stage of Pinyon/juniper and Mixed Conifer Land Type Associations, or if

*managed for other seral stage within Palmers chipmunk habitat). Use existing road corridors and natural barriers. (FS-GU-0.91)**

USFS(81) Work cooperatively with interested groups to establish seasonal use periods for caves and to educate cave users. (FS-GU-0.103)

*USFS(82) Manage designated and informal use (unnumbered) trails that are causing resource damage to reduce damage and restrict use to a single trail. (FS-GU-0.123)**

*USFS(84) Lower Deer Creek is removed from the Spring Mountains Wild Horse and Burro Territory due to danger posed by this herd to traffic on Kyle and Lee Canyon highways. Appropriate Management Level for wild horses and burros in Cold Creek is: horses, 26; burros, 0 (based upon 1992 range analysis and estimated population). The analysis showed a downward trend in the vegetation community composition, and soil condition (erosion and compaction) within a one-mile radius of the ponds. Utilization on willow exceeded 40%. This is excessive utilization for a community in a downward trend. This Appropriate Management Level is therefore based upon 30% of 1993 population which was 92 wild horses. No burros use this area; therefore, Appropriate Management Level for burros is 0. (FS-OBJ-11.12)**

USFS(85) Future trail alignments in the developed canyons will emphasize public safety, resource protection, and customer satisfaction. (FS-OBJ-11.17)

*USFS(86) Provide protection of the riparian areas (in accordance with NV Revised Statute 503.660) at Cold and Willow Creeks through the use of new road alignments, vehicle barriers, and/or signage. Redirect parking and camping away from riparian corridors. Allow only day-use, walk-in activities to occur within the riparian corridor. (FS-ST-11.1)**

USFS(87) Allow day-use only in the meadow area in Lee Canyon. Use temporary closures to allow for resource restoration/rehabilitation. (FS-ST-11.4)

*USFS(88) Provide trail markers and post restrictions to bouldering in the vicinity of Robbers' Roost Cave to protect Jaeger ivesia and Clokey greasebush. Interpretive signage may be used as appropriate. (FS-GU-11.5)**

USFS(89) Construct fences in strategic locations to keep wild horses out of Kyle and Lee Canyons. (FS-GU-11.20)

USFS(90) Close the Bristlecone Trail to motorized vehicles. Place barriers to prohibit off-trail travel into populations of species of concern. Use signs to educate users to the importance of species of concern, and the threats to their existence. (FS-ST-11.33)

USFS(91) Address user conflicts on Bristlecone Trail through a site-specific planning involving US Fish and Wildlife Service, trail users, and interested groups. (FS-GU-11.35)

USFS(92) Work with recreation residence associations to maintain the character and quality of recreational residence areas (summer homes under permit on National Forest System lands) while protecting natural resource values. (FS-GU-11.44)

USFS(93) Only allow low standard recreation facilities, including small camping areas or restrooms to be developed in upper Kyle and Lee canyons west of State Highway 158 as a resource protection measure. Allow new campgrounds and picnic areas to be developed in lower Kyle and Lee canyons, east of State Highway 158. (FS-ST-11.54)

*USFS(94) Allow limited expansion of ski area in Lee Canyon and enhancement of skiing opportunities and facilities within the scope of an approved master development plan and under the following constraints: (FS-ST-11.57)**

- *Expansion occurs within the existing sub-basin.*
- *Does not impact any threatened, endangered, or sensitive species or species of concern, or its habitat.*
- *Expansion is commensurate with development of additional parking in the lower Lee Canyon area, and shuttle services.*
- *Expansion incorporates defensible space design and fire safe facilities.*
- *Where consistent with other standards and guidelines.*

USFS(95) Protect natural and heritage resources and natural processes that enhance backcountry/wilderness recreational opportunities, including prohibiting consumptive uses of wilderness resources except where authorized by law or regulation. (FS-OBJ-12.2)

*USFS(96) Protect wilderness resources, including live and dead bristlecone pines, from removal/cutting for fuel. (FS-OBJ-12.6)**

USFS(97) Keep wild horses and burros out of the Wilderness. (FS-OBJ-12.8)

USFS(99) Discourage foot-traffic and camping at Mummy Spring by removing visitor-made trails, trail signage, and restoring native vegetation in riparian areas. (FS-GU-12.6)

USFS(100) When maintaining upper North Divide Trail switch-backs, minimize ground disturbance to protect rare plants. (FS-GU-12.8)

*USFS(101) Relocate South Loop Trail away from meadow if practical, and if other resources will not be affected. (FS-GU-12.9)**

6.5.1.2 Restoration and Enhancement

USFS(102) Secure funding for restoration programs beyond those under the scope of Interagency Agreement # 14-48-0001-94605. (CA-GC 5.0(1))

USFS(103) Wherever possible, select only locally native species for restoration, and where appropriate, use seed from the plant species of concern and endemic butterfly host plants. (CA-GC 5.0(2))

USFS(104) Ensure that restoration projects focus on protection and enhancement of the species of concern and do not inadvertently cause irretrievable damage to the habitats of the species of concern (e.g., open water for bats, mud puddles for butterflies). (CA-GC 5.0(3))

USFS(105) Develop native plant material and seed list for restoration projects by plant community. The list will specifically identify larval and nectar host plants for the endemic butterflies. Develop plan to collect local seed for restoration efforts and establish and maintain a native seed bank. (CA5.1)

USFS(106) Restore habitat in accordance with Interagency Agreement # 14-48-0001-94605 between the USFS and USFWS for the Spring Mountains NRA. All restoration activities will be designed and implemented in coordination with the Technical Working Group (CA1.6) to avoid inadvertent adverse effects on the species of concern. Priorities identified to date are as follows: (CA5.2)

- *McFarland Spring - Improve fence, treat head cut, construct dry well - very high priority (CA5.2a)*
- *Mummy Spring - Remove informal trails - very high priority (CA5.2b)*
- *Carpenter Canyon - Close last ¼ mile of road, create parking area -very high priority (CA5.2c)**
- *Trough Spring - Close road, treat road bed, seed area - high priority (CA5.2d)*
- *Lost Cabin Spring - Close road, eliminate diversion, restore spring brook - high priority (CA5.2e)**

- *Big Timber Spring - Remove stock tank and stock pond - high priority (CA5.2f)**
- *Gold Spring - Remove stock tank, headbox, and pipeline - high priority (CA5.2h)**
- *Middle Mud Spring and East Mud Spring - Repair fence, remove headbox and pipeline -medium priority (CA5.2i)*
- *Buck Spring - Remove headbox, pipeline, and trough - medium priority (CA5.2j)**
- *Macks Canyon Spring - Extend exclosure - medium priority (CA5.2k)**
- *Younts Spring - Eliminate salt cedar, remove impoundment - medium priority (CA5.2l)**
- *Santa Cruz Spring - eliminate salt cedar, construct exclosure, dry well, and pipeline - medium priority (CA5.2m)**
- *Ninety-nine Spring - Discontinue dredging, construct exclosure, dry well, and pipeline - medium priority (CA5.2n)**
- *Mexican Spring - Discontinue dredging, construct exclosure, dry well, and pipeline - medium priority (CA5.2o)**
- *Cougar Spring - Construct exclosure, dry well, and pipeline - medium priority (CA5.2p)**

USFS(107) Work with private property owners to restore and enhance the Cold Creek area. This effort will include plans to relocate facilities (e.g., fences, patios, and sheds) outside the riparian zone, and to control camping and fires (to protect butterflies), and maintain habitats for the species of concern (e.g., mud and seeps). (CA5.3)

*USFS(108) Develop and begin implementing a comprehensive restoration plan for the Willow Creek area. This plan will include relocation of roads and campgrounds out of the riparian area, removal of unneeded spur roads, a walk-in day-use plan, protection and habitat enhancement for springsnails, butterflies (including mud), and phainopepla. The plan will emphasize opportunities for public participation. (CA5.4)**

USFS(109) Work with summer home residents on the NRA to ensure that all future improvements avoid adverse effects to the species of concern, and where possible, enhance their habitats and populations. (CA5.5)

USFS(110) Work with Las Vegas Ski and Snowboard Resort to develop protective strategies for sensitive ecological resources. This will include investigating options for

erosion control of the Lee Canyon ski slopes with native seed mixes, including Astragalus calycosus var. mancus to enhance butterfly habitat, management of herbicides and pesticides, and a plan for eventual elimination of non-native seeding, and management of the Three Springs area. (CA5.6)

*USFS(112) Remove roads causing environmental damage: road to Cave Spring road to CC spring, road to Lost Cabin Spring, and identify additional roads for closure, particularly in biodiversity hotspots, and work with community groups to close them. (CA5.8)**

USFS(113) Organize volunteer work parties to manually remove exotic plants and noxious weeds along the ridgeline trail and other high elevation routes. (CA5.9)

*USFS(114) Develop and implement vegetation management and restoration plans for campgrounds and day use areas that enhance resources for Palmer's chipmunk, endemic butterflies, and rare plants. Priority areas include: (CA5.10)**

- Deer Creek Picnic Area - Move picnic tables out of the riparian zone, and revegetate the area to enhance habitat for Palmer's chipmunk, neotropical migratory birds, and bats. (CA5.10a)**
- Lee Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat. (CA5.10b)**
- Kyle Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat. (CA5.10c)**
- Gary Abbot Campground - Close campsite and restore area to enhance habitat of Clokey eggvetch and butterflies. (CA5.10d)*

USFS(115) Work with volunteers to provide nest boxes for cavity nesting western and mountain bluebirds and roosting bats to replace lost habitat. (CA5.11)

USFS(117) Remove existing water developments and debris from springs, providing they no longer serve their original purpose, are not critical to wildlife, and the items are not of historical significance. (FS-ST-0.13)

USFS(118) Use seed mixtures or seedlings for site rehabilitation, fire rehabilitation, or permit requirement in order of preference: 1) Native plants; 2) no seeding (only if erosion is not a serious concern and there is no cheatgrass invasion); 3) non-persistent (sterile) exotics; and 4) persistent exotics. (FS-GU-0.16)

*USFS(120) Provide a minimum of five wildlife cover sites per acre within developed or primitive recreation sites by maintaining or adding dead and down wood material or rocks at appropriate locations. (FS-ST-0.38)**

*USFS(121) Remove all structures related to grazing activities that are not necessary for current management, or of historic value. (FS-ST-0.49)**

*USFS(122) Close all undesignated spur roads in riparian areas; close other spur roads on a case by case basis, after site specific analysis. (FS-GU-0.63)**

*USFS(123) Relocate existing roads outside of washes, riparian areas, and 50-year floodplains if relocation will result in better resource conditions. Priority should be given to relocating roads when major maintenance is required and to roads that: 1) Are located in vital habitat for plant or animal species of concern, and 2) receive higher levels of use. (FS-GU-0.64)**

USFS(124) Require site/area rehabilitation upon completion/termination as part of all new permits. (FS-ST-0.126)

*USFS(125) Enhance developed sites where feasible to restore resource or wildlife values where recreation use has adversely affected resources. (FS-OBJ-11.5)**

*USFS(129) Provide water sources for wildlife adjacent to or within developed facilities. Maintain public restrooms to prevent access by wildlife (Palmer's chipmunk). (FS-GU-11.11)**

*USFS(130) Restore and maintain the natural, ecological, and visual character of the Wilderness. (FS-OBJ-12.1)**

*USFS(131) Restore water sources to historic flows in the Wilderness. (FS-OBJ-12.7)**

*USFS(132) Where possible, remove obvious exotic plants (dandelions, cheatgrass) in the Wilderness manually. (FS-GU-12.2)**

*USFS(133) Remove fire rings from the Wilderness. Emphasis should be placed on removing features which encourage use on degraded or sensitive sites. (FS-GU-12.4)**

6.5.1.3 Land Use Policies and Actions

USFS(182) Retain all snags that do not pose a threat to public safety or extreme fire danger. Snags are retained to provide habitat for cavity nesting animals and animals that feed upon the insects living within dead trees. Retain a minimum of 5 snags per acre

in late seral stages of the Pinyon/juniper, Mixed Conifer, and Bristlecone Pine Land Type Associations in all cases. (FS-ST-0.36)

USFS(183) Retain a minimum of 50 linear feet/acre of downed trees with a minimum 12 inch diameter on sites being managed for late seral stage of the Pinyon/Juniper and Mixed conifer Land Type Associations, to provide ground cover for small mammals, amphibians, reptiles, and invertebrates. Trim branches and limbs as necessary. Place downed trees in such a way as to not affect drainage patterns; impede traffic or use of recreation facilities; create a public safety problem; and where consistent with “defensible space.” (FS-ST-0.37)

6.5.2 USFWS

6.5.2.1 Protective Measures

USFWS(12) Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).

USFWS(13) Adopt and implement policies to protect plant species from dispersed or unregulated recreation (DNWR).

USFWS(14) Implement snag management in habitat areas, including limiting wood collection to down wood, and coordination of fire management activities within proposed wilderness areas of the DNWR (DNWR).

USFWS(15) Manage woodcutting, shrub clearing, and limit other human activity disturbance off existing roads within the DNWR (DNWR).

USFWS(17) Protect existing riparian habitat from the effects of recreational activities (DNWR).

USFWS(18) Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(20) Minimize clearing of undergrowth in construction of new facilities within the DNWR (DNWR).

USFWS(21) Prohibit access to caves for recreation (DNWR).

USFWS(22) Prohibit horses, burros, and livestock grazing (DNWR).

USFWS(24) Prohibit highway and road construction on the Refuge (DNWR).

USFWS(25) Retrofit roads to permit ingress and egress for a broad range of organisms (DNWR).

USFWS(26) Conduct biological surveys prior to road maintenance and retrofit activities, (DNWR).

USFWS(27) Ensure that roads are engineered to adequately spread runoff to minimize erosion (DNWR).

USFWS(28) Ensure that adequate law enforcement and ranger patrolling is implemented within the DNWR (DNWR).

USFWS(31) Maintain dead snags and fallen trees on slopes and canyon bottoms in the DNWR (DNWR).

USFWS(32) Limit collection of dead wood including yucca skeletons to within 100 feet of designated roads (DNWR).

USFWS(33) Evaluate effects of rock climbing on biological resources. Rock climbing is currently allowed, but is under investigation; if adverse impacts are found it will be prohibited on DNWR (DNWR).

USFWS(34) Work with BLM to restrict access to caves or regulate cave recreation policies as appropriate (Ecological Services).

6.5.2.2 Restoration and Enhancement Measures

USFWS(35) Create new open water resources for bats and other wildlife (DNWR).

USFWS(36) Expand the seed bank program to include populations in the Sheep Mountains areas (DNWR).

USFWS(38) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the DNWR (DNWR).

USFWS(40) Restore/rehabilitate all key access points of closed roads and areas (DNWR).

6.5.3 BLM

6.5.3.1 Protective Measures

BLM(39) Prohibit collection of plants, animals, and mineral materials in Red Rock Canyon NCA without a permit.

BLM(57) Allow backcountry camping only in designated areas of Red Rock Canyon NCA.

BLM(97) Restrict mountain bikes and other mechanized non-motorized vehicles to designated trails within the RRCNCA and only allow new trails consistent with the conservation of BLM sensitive species, including the Spring Mountains milkvetch.

BLM(44) Close portions of the Red Rock Canyon NCA to vehicle use or limit use to designated roads and trails.

BLM(71) Limit motorized vehicles in WSAs to existing roads and trails as listed in inventory maps, or as otherwise authorized. Close unauthorized roads in WSAs.

BLM(76) Prohibit OHV competitions within Red Rock Canyon NCA.

BLM(108) Maintain the existing closure of 3,360 acres in the Muddy Mountains to all motorized and mechanized vehicles.

BLM(48) Manage fires occurring in the WSAs to the lowest suppression intensity possible.

BLM(54) Require the use of a resource advisor for all fires within important habitats for covered and evaluation species.

BLM(51) Prohibit commercial collection of vegetative specimens within WSAs. Hobby collection may be allowed for personal use but not for commercial use, as long as the collection activity method meets the non-impairment criteria.

BLM(41) Prohibit commercial collection of cactus/yucca skeletons except in designated areas such as disposal areas, gravel pits, and sites associated with Federally approved projects that will result in the loss of surface vegetation. Casual collection of cactus/yucca skeletons is prohibited in tortoise ACECs. Casual collection outside these areas will be discouraged.

BLM(95) Prohibit the cutting of firewood in Red Rock Canyon NCA. Elsewhere permits are required on a discretionary basis consistent with the protection of sensitive species.

BLM(101) Protect snags as important habitat features.

BLM(79) Close WSAs to authorization/renewal of material site rights-of-way and mineral materials disposal until a decision is reached on their status.

BLM(89) Where feasible, proposals for saleable materials in essential habitats for special status species will be avoided.

BLM(96) Work with the Nevada Power Company and other utilities to modify existing powerline towers or poles to meet BLM standards for the prevention of raptor mortality (Olendorff et al. 1981 Raptor Research Report #4).

BLM(117) Protect key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey on public lands through mitigation of activities during National Environmental Policy Act compliance.

BLM(120) Determine water needs to meet management objectives. File for appropriative water rights on public and acquired lands in accordance with the State of Nevada water laws for those water sources that are not Federally reserved.

BLM(93) Using “best management practices” as identified by the State of Nevada, minimize contributions from both point and non-point sources of pollution (including salts) resulting from public land management actions. Where applicable, proposed management actions would comply with local, state, tribal and Federal air quality laws, regulations, and standards (Conformity; per 40 CFR 93.100 et seq.).

BLM(111) Prior to the disposal of identified public lands, an analysis will be conducted to determine their resource values, including the occurrence of Special Status Species and sensitive habitats such as riparian and aquatic habitats. Land disposal will be consistent with conservation of special status species unless there is an overriding public benefit.

BLM(301) Limit the construction of new roads for the development of utility lines within special status species habitat.

BLM(20) Improve aquatic, riparian and mesquite woodland habitats including Meadow Valley Wash.*

BLM(90) Provide protection (such as fencing) around springs and riparian habitats to prevent habitat degradation from excessive use by grazing animals.*

BLM(12) Identify, evaluate, manage and protect cave resources on public lands for the purpose of maintaining the unique, non-renewable, and fragile biological, scientific, and recreational values for present and future uses.*

BLM(103) Livestock grazing will be managed consistent with riparian objectives of reaching or maintaining proper functioning condition (PFC)*.

BLM(125) As grazing systems are developed for each allotment, ensure the system is consistent with the conservation of BLM special status species. Where conflicts occur, encourage Clark County to obtain grazing privileges on a willing seller basis.*

BLM(59) Manage wild horses and burros as necessary to maintain thriving ecological balance and consistent with the protection of special status species in important habitat areas.*

BLM(58,60) Wild horses and burros will be removed when herds have expanded beyond designated herd area boundaries or Appropriate Management Level is exceeded.*

BLM(98) Provide adequate law enforcement presence to ensure that management actions and restrictions are implemented for the conservation of covered and/or evaluation species.*

BLM(127,128) The livestock grazing program shall be managed to meet the Bureau's Standards and Guidelines as developed by the Southern Great Basin/Mojave Resource Advisory Committee.* The “standards” are listed below:

STANDARD 1. SOILS: Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity and sustain the hydrologic cycle.

STANDARD 2. ECOSYSTEM COMPONENTS: Watersheds should possess the necessary ecological components to achieve state water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristics of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

STANDARD 3. HABITAT AND BIOTA: Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to

appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

6.5.3.2 Restoration and Enhancement Measures

BLM(135) Implement reseedling with native plant species and other soil stabilization and habitat restoration actions following wildfires within areas important for the conservation of covered species and where the feasibility of success is reasonably certain.*

BLM(137) Cooperate with NPS, FS, USFWS, Clark County and others on a reclamation program which will include maintaining a seed bank and live plants for rehabilitation of disturbed or burned areas if necessary.*

BLM(109) In cooperation with NDOW, the USFWS, and ADC, monitor brown-headed cowbird and raven populations and implement population controls of these species where necessary for the conservation of covered species.*

BLM(121) Determine in-stream flow requirements and apply for the necessary water rights on the Virgin River and Meadow Valley.

BLM(106) Take appropriate protective actions to maintain or improve springsnail habitat, including the reestablishment of populations of springsnails.*

BLM(140) Improve riparian areas, giving priority to areas Functioning at Risk with a downward trend. Implement measures to protect riparian areas, such as fencing and/or alternate water sources away from the riparian area. Insure that the minimum requirement of Proper Functioning condition on all riparian areas is maintained or achieved.*

6.6 Adequacy of Existing Management

About 91.9 percent of the habitat is within IMAs and LIMAs (Spring Mountains NRA, the Desert National Wildlife Range, BLM WSA and critical habitat, USFS wilderness and WSA, and BLM NCA) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. Approximately 6.7 percent of the habitat is located in MUMA (BLM undesignated lands), and may be used for multiple use activities, within the constraints of existing BLM policies for management of these activities. Approximately 1.5 percent is UMA (privately held) and may be used for more intensive recreation, including snow play, camping, and private residential and commercial recreational uses.

Implementation of existing BLM and USFWS management actions and the CA for the Spring Mountains NRA (see Section 2.8) will adequately address the ecosystem level threats to Covered Species within the pinyon-juniper habitat, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

6.7 MSHCP Conservation Contributions

The pinyon-juniper habitat and the 31 Covered Species it supports will benefit from the MSHCP through general public education and information programs; potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

Chapter 7 Sagebrush Ecosystem

7.1 Description and Distribution

The sagebrush ecosystem in Clark County includes sagebrush, sagebrush/perennial grassland, and intermixed grassland vegetation community types (Figure 7-1, Table 7-1). Sagebrush communities are found in the Spring, Sheep, and Virgin Mountains, typically ranging in elevation from 4,900 to 9,200 feet.

TABLE 7-1
VEGETATION COMMUNITIES IN THE SAGEBRUSH ECOSYSTEM

Vegetation Type	Acres	% of Ecosystem
Sagebrush	132,000	94.9
Sagebrush/perennial grassland	2,700	1.9
Grassland	4,400	3.2
Habitat Total	134,600	96.8
Ecosystem Total	139,000	100.0

7.1.1 Sagebrush Community

Sagebrush shrubland (USU Code 48; CA WHR Code SGB–Sagebrush) typically occurs above 5,000 feet and is dominated by big sagebrush (*Artemisia tridentata*), low sagebrush (*A. arbuscula*), Bigelow sagebrush (*A. bigelovii*), or black sagebrush (*Artemisia nova*) depending on soil/rock type and elevation (Clokey 1951; McArthur and Plummer 1978; Turner 1982; Shultz 1993). At elevations below 9,200 feet in the Spring Mountains, big sagebrush can be found in pure stands and commonly in mixed communities with mountain mahogany (*Cercocarpus ledifolius*) and Utah juniper (*Juniperus osteosperma*) (Clokey 1951). Associated tree species are pinyon (*Pinus monophylla*) and ponderosa pine (*Pinus ponderosa*). Other shrub species that can also co-occur with sagebrush include rabbitbrush (*Chrysothamnus* spp.), snakeweed (*Gutierrezia sarothrae*), blackbrush (*Coleogyne ramosissima*), shadscale (*Atriplex confertifolia*), spiny hopsage (*Grayia spinosa*), and bitterbrush (*Purshia tridentata*). Associated grasses include wheatgrass (*Agropyron* spp.), the introduced cheat grass (*Bromus tectorum*), bluegrass (*Poa* spp.), needlegrass (*Stipa* spp.), fescues (*Festuca* spp.), and galleta (*Pleuraphis jamesii*). Grass species usually make up less than 25 percent cover. Covered MSHCP vascular plant species that occur in the sagebrush communities of Clark County include

Spring Mountains milkvetch (*Astragalus remotus*) and inch high fleabane (*Erigeron uncialis* ssp. *conjugans*).

7.1.2 Sagebrush/Perennial Grassland Community

Codominant sagebrush (*Artemisia* spp.) shrubland and perennial grassland (USU Code 49; CA WHR Code SGB/ABS–Sagebrush/Annual Grassland). Principal grasses include wheatgrass (*Agropyron* spp.), bluegrass (*Poa* spp.), needlegrass (*Stipa* spp.), fescues (*Festuca* spp.), ricegrass (*Oryzopsis hymenoides*), and galleta (*Hilaria jamesii*). Sagebrush typically occurs above 5,000 feet Primary associated shrubs include rabbitbrush (*Chrysothamnus* spp.) and cliffrose (*Cowania mexicana*). Other associated grasses include cheat grass (*Bromus tectorum*) and squirreltail (*Elymus elymoides*).

7.2 MSHCP Species

The sagebrush ecosystem provides habitat for 20 Covered Species and 5 High Priority Evaluation Species.

Covered Species:

Long-eared myotis	<i>Myotis evotis</i>
Long-legged myotis	<i>Myotis volans</i>
American peregrine falcon	<i>Falco peregrinus anatum</i>
Desert tortoise	<i>Gopherus agassizii</i>
Banded gecko	<i>Coleonyx variegatus</i>
Great Basin collared lizard	<i>Crotaphytus insularis bicinctores</i>
Large-spotted leopard lizard	<i>Gambelia wislizenii wislizenii</i>
Western red-tailed skink	<i>Eumeces gilberti rubricaudatus</i>
Speckled rattlesnake	<i>Crotalus mitchelli</i>
Dark blue butterfly	<i>Euphilotes enoptes purpurea</i> *
Spring Mountains icarioides blue	<i>Icaricia icarioides austinatorum</i>
Spring Mountains acastus checkerspot	<i>Chlosyne acastus robusta</i>
Carole's silverspot butterfly	<i>Speyeria zerene carolae</i>
Spring Mountains comma skipper	<i>Hesperia comma mojavensis</i> †
Clokey milkvetch	<i>Astragalus aequalis</i>
Spring Mountains milkvetch	<i>Astragalus remotus</i>
Inch-high fleabane	<i>Erigeron uncialis</i> ssp. <i>conjugans</i>
Smooth pungent (dwarf) greasebush	<i>Glossopetalon pungens</i> var. <i>glabra</i>
Pungent dwarf greasebush	<i>Glossopetalon pungens</i> var. <i>pungens</i>
<i>Anacolia menziesii</i>	<i>Anacolia menziesii</i>

High Priority Evaluation Species:

Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>
Kit fox	<i>Vulpes macrotus</i>
Western burrowing owl	<i>Athene cunicularia hypugea</i>
Southern desert horned lizard	<i>Phrynosoma platyrhinos calidiarum</i>
Curve-podded Mojave (halfing) milkvetch	<i>Astragalus mohavensis</i> var. <i>hemigyris</i>

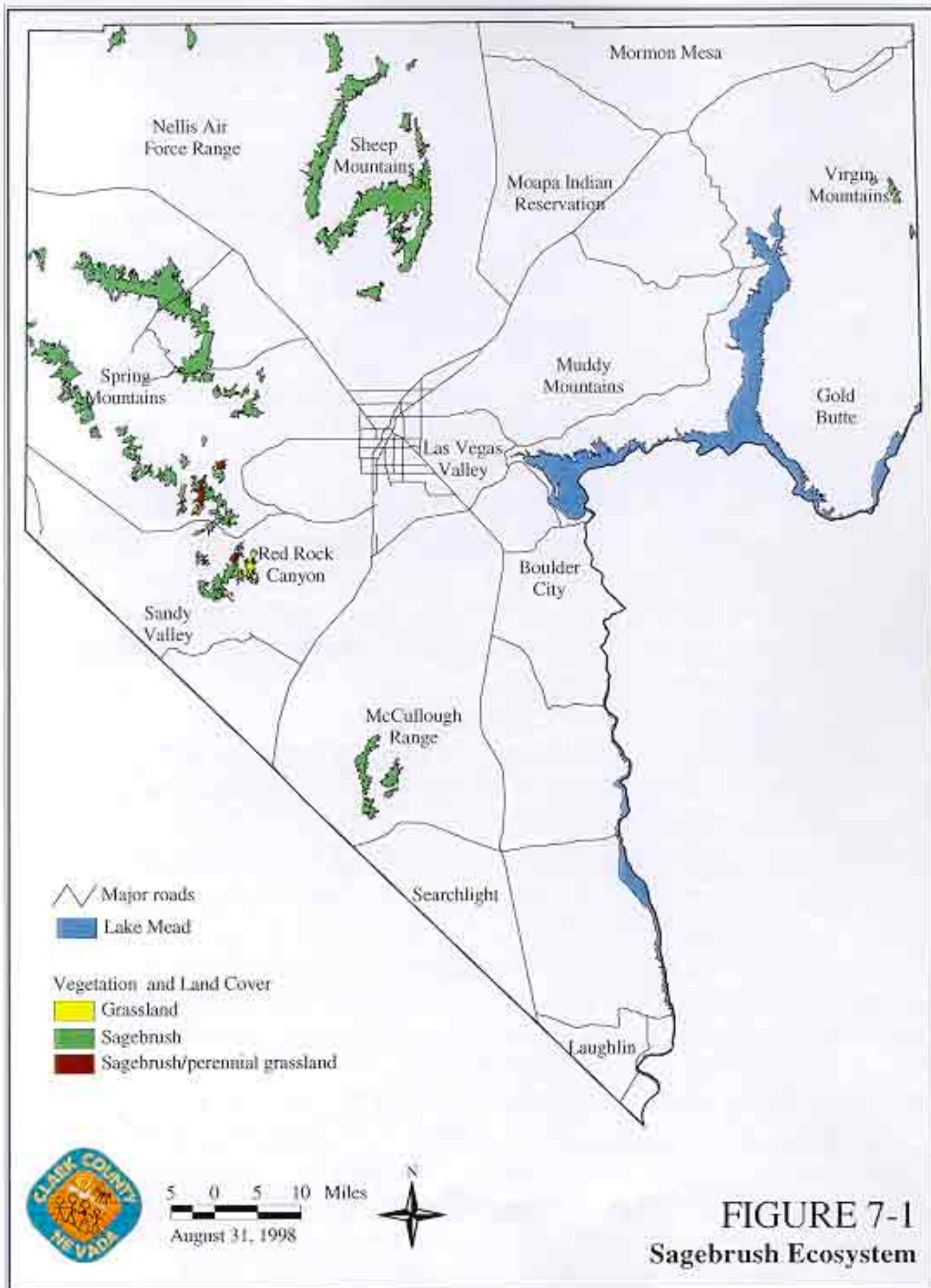


FIGURE 7-1
Sagebrush Ecosystem

7.3 Potential Threats and Stressors

The primary ecosystem level threats and stressors in sagebrush are:

- Commercial collection (reduction of populations **Threat 201**, habitat degradation **Threat 202**)
- Fires and fire management (habitat degradation **Threat 301**, vegetation community conversion **Threat 302**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, concentrated recreation **Threat 402**, competitive OHV races **Threat 403**, casual use OHV activities **Threat 404**, rock climbing **Threat 405**, indiscriminate recreational shooting **Threat 406**, spelunking **Threat 407**)
- Highways, roads, and trails (highway mortality **Threat 501**, habitat fragmentation **Threat 503**, road construction and maintenance **Threat 504**)
- Pest control (direct or indirect poisoning or trapping **Threat 601**, pesticides and herbicides **Threat 602**)
- Grazing (wild horse and burro grazing and trampling **Threat 701**, competition with cattle and equids **Threat 702**, livestock grazing and trampling **Threat 703**)
- Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**)
- Woodcutting, (wood removal, snag collection **Threat 1001**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**)
- Utilities (collisions and electrocution with power lines **Threat 1201**, provision of perch sites for ravens **Threat 1203**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**, grazing and agriculture **Threat 1404**, overutilization by animals **Threat 1405**)
- Exotic and introduced species (introductions, competition, and encroachment of exotic species **Threat 1501**, subsidized and parasitic species **Threat 1502**, increased risk of fire due to exotic plants **Threat 1503**)
- Illegal or unauthorized activities (poaching, illegal collection, or killing of flora and fauna **Threat 1701**, Introduction of an upper respiratory disease to wild desert tortoise populations possibly caused by the release of captive desert tortoises **Threat 1704**)

7.4 Sagebrush Habitat Management

Intensively Managed Areas comprise 78,200 acres, or 58.0 percent of the total habitat. The Desert National Wildlife Range and adjoining Nellis Air Force Range account for 55,500 acres (41.2%) of the habitat intensively managed for conservation of habitat value and wildlife (Figure 7-2, Table 7-2). The USFS has 4,900 acres (3.6%) in wilderness and WSAs and BLM has 17,800 acres (13.2%) in conserved habitat and WSAs. Management

for these areas includes no surface-disturbing activities; avoidance of new roads or rights-of-way; primitive or semi-primitive non-motorized recreation, with vehicles restricted to existing roads and trails as listed on inventories for the WSAs; closed to grazing of livestock; closed to new mining claims; and non-intensive fire suppression response.

Less Intensively Managed Areas include the Spring Mountains NRA (39,200 acres, or 29.1% of the habitat) and the Red Rock Canyon NCA (3,000 acres, or 2.2%), which are managed for mixed public recreational use and wildlife and habitat management. These areas are restricted in terms of livestock grazing, mining, and rights-of-way but have more intensive recreational uses.

Multiple Use Managed Areas are administered by BLM (16,300 acres, or 12.1% of the habitat) and have few management restrictions on public use or conservation measures for wildlife or habitat quality. These areas support grazing, mining, motorized vehicle use, and other intensive recreational use.

Un-Managed Areas are small private inholdings (900 acres) and are assumed to have no active management for conservation of wildlife or habitat quality.

**TABLE 7-2
MANAGEMENT OF HABITAT
IN THE SAGEBRUSH/PERENNIAL GRASSLAND ECOSYSTEM**

Category	Manager	Management Classification	Acres	% of Habitat
IMA	BLM	Conserved Habitat	300	<1.0
	BLM	WSA	17,500	13.0
	USFS	Wilderness	500	<1.0
	USFS	WSA	4,400	3.2
	USFWS	Wildlife Range	52,800	39.2
	USFWS/USAF	DNWR/NAFR	2,700	2.0
	IMA Total			78,200
LIMA	USFS	SMNRA	36,200	26.8
	BLM	NCA	3,000	2.2
LIMA Total			39,200	29.1
MUMA	BLM	Undesignated	16,300	12.1
MUMA Total			16,300	12.1
UMA	Private		900	<1.0
UMA Total			900	<1.0
Grand Total			134,600	100.0

7.4.1 Sagebrush Community Management

The DNWR has the largest area of sagebrush, comprising 52,800 acres, or 39.2 percent of the total. The Spring Mountains NRA and Red Rock Canyon NCA encompass 38,600 (29.1%) acres and is managed for mixed natural and recreational purposes. Within the Spring Mountains and Red Rock areas, there are an additional 15,800 acres (11.7%)

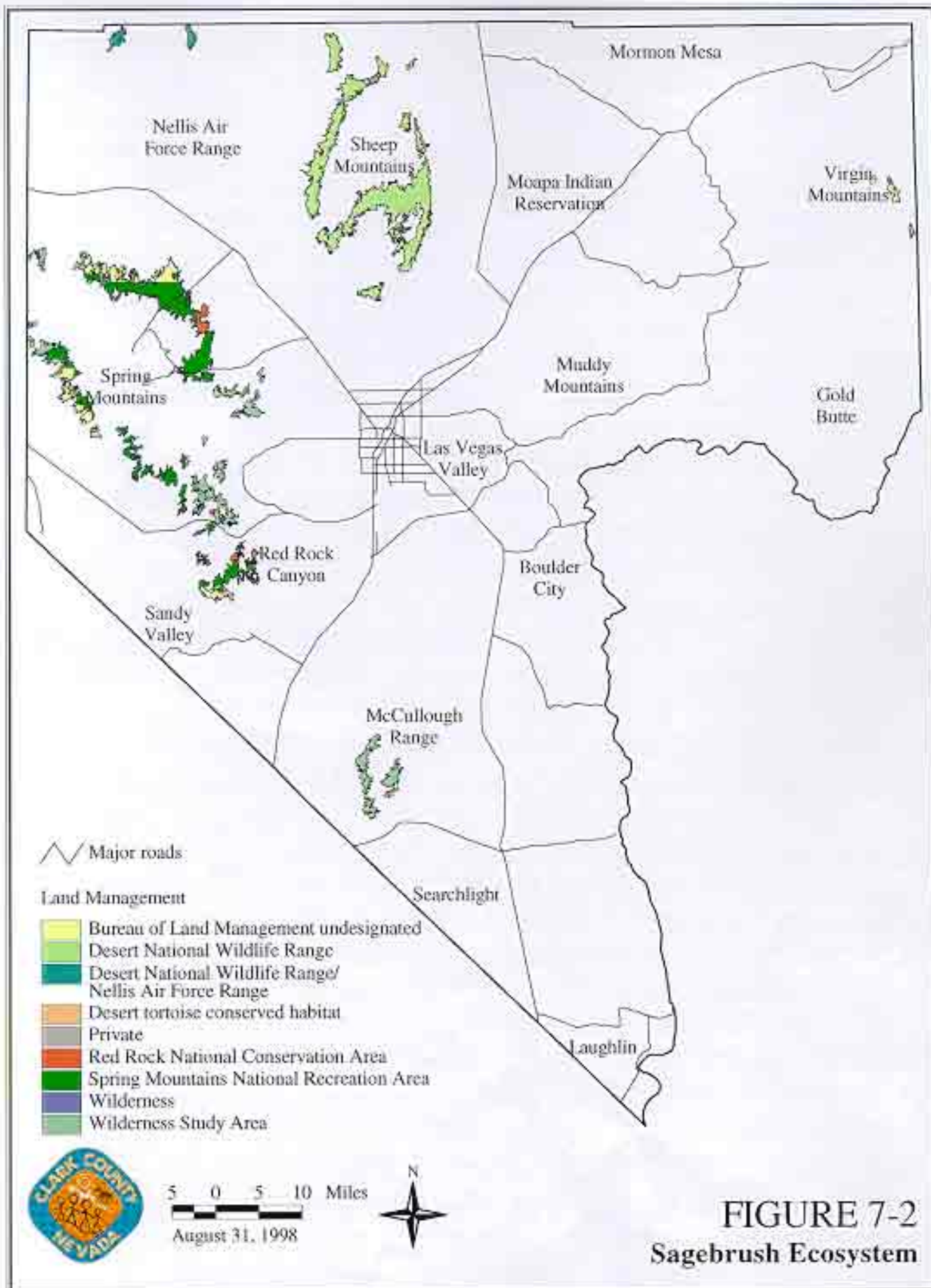


FIGURE 7-2
Sagebrush Ecosystem

managed as wilderness or wilderness study by the USFS and BLM. There are an additional 7,100 acres in the South McCullough Mountains WSA managed by BLM. About 12.1 percent of the total lie within BLM undesignated management areas, which afford less priority for native habitat management. Private inholdings are located around Red Rock and the Spring Mountains.

7.4.2 Sagebrush/Perennial Grassland Community Management

This relatively limited transitional habitat association is found primarily in the Spring Mountains NRA of the Humboldt-Toiyabe National Forest. A smaller area is located in the Red Rock Canyon recreation area managed by BLM.

7.5 Existing and Proposed Conservation Actions

Of the total of 134,600 acres of sagebrush habitat, 41.3 percent is managed by USFWS (DNWR, NAFR), 30.5 percent by USFS (Spring Mountains NRA, WSA, and Wilderness), and 27.5 percent by BLM (WSA, undesignated, NCA, and conserved habitat). Private holdings total <1.0 percent.

Approximately 57.9 percent of the 134,600 acres of sagebrush habitat is managed for primitive, non-motorized, dispersed recreational use (biodiversity hotspots managed as wilderness, WSA, or DNWR). The 29.1 percent of the habitat located within the Spring Mountains NRA and Red Rock Canyon NCA is managed for both conservation and a broader spectrum of recreational uses, including intensive recreational use areas, developed camping areas, hiking and biking trails, rock climbing areas, and designated motorized vehicle use roads and trails. Both of these areas are closed to new mining, livestock grazing, and off-road motorized recreational vehicle use and are actively managed for habitat conservation. BLM undesignated lands (12.1 percent) are managed to balance multiple uses, including mining, OHV activities, grazing, and other activities with maintenance of habitat and species values.

The CA for the Spring Mountains NRA identifies general management actions for mid elevation habitats, including recreation site monitoring, campground management, environmental education programs, fire management, focusing of recreation development outside of sensitive areas, habitat restoration and enhancement at recreation sites, and wild horse and burro management, and implementation of a weed management strategy.

7.5.1 USFS

7.5.1.1 Protective Measures

USFS(37) Focus new recreation development (campgrounds, picnic areas, and other facilities), in the least sensitive areas at lower elevations, to lessen visitor impacts on the species of concern and other sensitive ecological resources. (CA-GC 4.0(1))

USFS(38) Encourage partnerships with volunteers to maintain and enhance natural resources in the NRA. (CA-GC 4.0(2))

USFS(39) Adhere to goals, objectives, standards and guidelines detailed in the Plan Amendment which promote protective management of the species of concern and other ecological resources. (CA-GC 4.0(3))

USFS(40) Identify specific areas of exceptional sensitivity where conservation management will be emphasized over recreation. (CA-GC 4.0(4))

USFS(41) Minimize clearing of undergrowth during construction of new facilities. (CA-GC 4.0(5))

USFS(42) Prior to use of pesticides and other chemicals, determine potential impacts to the species of concern (e.g., butterflies, bats), and implement strategies to avoid impacts to those species. (CA-GC 4.0(6))

*USFS(43) Protect habitat of the species of concern from dispersed recreation (e.g., heavy foot traffic, off-road vehicles, mountain bikes), and the adverse effects of wild horses and burros. (CA-GC 4.0(7))**

USFS(44) Develop and implement an overnight wilderness permitting process that provides education on sensitive resources. (CA4.1)

USFS(45) Develop and implement a climbing “self registration” process that encourages development of new routes away from ecologically sensitive areas. (CA4.2)

*USFS(46) Develop and implement a plan to protect bat roosts in mines and caves. The plan will address the following protective measures: Gating or closing mines and caves to protect bat roost sites, removing important bat roost mines and caves from future additions of NRA maps, avoiding identification of exact locations of maternity roosts, caves, and occupied mines to the general public, determining the need to close roads to mines and caves, and avoiding use of heavy equipment near mine and cave roosts. (CA4.3)**

USFS(48) Coordinate with county health department in management of disease transmittal by animals to humans (e.g., hanta virus, plague) to ensure that control methods do not have adverse effects on populations of Palmer's chipmunk or other species of concern. (CA4.5)

*USFS(50) Develop and distribute information to equestrians on the importance of using pelletized feed within the NRA, and develop and distribute a weed-free feed policy for equestrians on Federal lands. (CA4.7)**

USFS(51) Sign closure order allowing USFS to prohibit camping within specific distance of water sources, based on species and habitat protection needs, and control dispersed, primitive camping in the NRA by enforcing the closure order. (CA4.8)

*USFS(52) Develop and implement plan to collect seed for endowment and cultivation of sensitive and rare plants. (CA4.9)**

USFS(54) Consider, and as appropriate, develop additional protective designations in the NRA to protect the species of concern and other ecological resources. (CA4.11)

USFS(55) Coordinate with owners of golf course in lower Kyle Canyon on procedures for use of pesticides, fertilizers, and other chemicals, to eliminate deleterious effects on endemic butterflies, rare plant pollinators, and other species of concern. (CA4.12)

*USFS(56) Ensure consistent law enforcement and ranger presence on the east side of the NRA, west side of the NRA, and in the Wilderness Area, a minimum of four days per week per area (including weekends and holidays) during the period April 15 - October 15, and a minimum of three days per week (including weekends and holidays) during the period October 15 - April 15. Enforcement will emphasize protection of the species of concern and their habitats (e.g., peregrine falcon eyries, bat roosts, and alpine species). Increased wilderness ranger presence in high elevation forests and alpine areas will provide a means to distribute information on species conservation needs, ecological resource sensitivity, and low impact recreation use practices. (CA4.13)**

*USFS(57) Remove brown-headed cowbirds where nest parasitism occurs during neotropical migratory bird inventories or other activities. (CA4.14)**

USFS(58) Work with utility companies to ensure poles are raptor-safe. (CA4.15)

USFS(59) Coordinate with Nevada Department of Transportation and USFS road crews to ensure that road maintenance activities (e.g., shoulder work, road salting) do not adversely affect the species of concern (in particular, Morand's checkerspot, acastus checkerspot, and rough angelica in Kyle Canyon, and acastus checkerspot along Deer Creek Highway). (CA 4.16)

USFS(60) Limit impacts of new administrative facilities on natural and heritage resources, and visual quality. (FS-OBJ-0.19)

*USFS(61) Manage all active claims and abandoned mines to minimize effects on natural, visual, and heritage resources and provide protection for the public. (FS-OBJ-0.34)**

*USFS(62) Maintain roads to a standard necessary for public safety and as needed to respond to resource management objectives, including resource protection and recreation, through maintenance of road surfaces and minimizing erosion. (FS-OBJ-0.37)**

USFS(63) New recreational facilities will be located and designed to ensure public safety, ecosystem health, and customer satisfaction. (FS-OBJ-0.44)

USFS(64) Continue to provide rock climbing opportunities while protecting resource values. (FS-OBJ-0.45)

*USFS(65) Acquire available land within the Spring Mountains National Recreation Area to protect natural resources, provide public recreation opportunities, and increase efficiency of land management. (FS-OBJ-0.52)**

USFS(66) Prohibit parking and camping within riparian areas. (FS-ST-0.3)

USFS(67) Where possible, maintain historic floodplain and channel width, slope, and gradient. (FS-GU-0.5)

USFS(68) Maintain/restore open pools of slow moving water (0.5 meter in diameter) at some historic water sources, well distributed throughout the range. Develop open pools of water at least 0.5 meter in diameter at newly developed/diverted water sources. (FS-GU-0.6)

USFS(69) Develop new perennial water sources, including guzzlers, only to benefit native species, to improve distribution of non-native species, where historic water sources have disappeared, or where access is limited. Only develop water sources in the Wilderness or WSAs to improve desert bighorn sheep habitat. These developments must protect wilderness character. (FS-GU-0.7)

USFS(70) When developing water sources, pipe water from a point downstream of the source if snails or other sensitive species are present, or if the spring source has not been previously developed. (FS-ST-0.8)

USFS(71) Collection of threatened, endangered, and sensitive plant species requires a permit from the Regional Forester, except for traditional use by American Indians. (FS-ST-0.28)

USFS(72) Work with Nevada Division of Wildlife, US Fish and Wildlife Service, the Audubon Society, and other interested agencies and organizations to control cowbird populations as monitoring identifies negative impacts to species of concern from this parasitic, non-native species. (FS-GU-0.30)

USFS(73) New roads, administrative facilities, and developed recreation sites other than low-impact facilities (trails, trailhead parking, signs, restrooms, etc.) will be outside a 100 yard buffer zone around known Clokey eggvetch and rough angelica populations or potential habitat, and outside biodiversity hotspots (defined as areas of particular diversity or sensitivity) (FS-ST-0.31)

USFS(74) Design new roads and motorized trails to maintain a minimum 0.5 mile distance from active or recently active desert tortoise burrows. (FS-GU-0.32)

USFS(75) For organized, motorized events on unpaved roads or trails within 0.5 mile of active desert tortoise burrows, require special permit provisions for desert tortoise protection. (FS-GU-0.33)

USFS(76) Use temporary closures (roads, trails, dispersed areas) to protect important seasonal habitat for species of concern (animals, plants, insects), in coordination with appropriate state and local agencies. (FS-GU-0.34)

*USFS(77) Allow access to all caves only from the beginning of March through the end of May; and from the beginning of September through the end of October. Seasonal restrictions will remain in place until bat roosting/hibernating inventories have been completed. Long-term seasonal restrictions will be determined based on survey results. Allow year-round access to Robbers' Roost Cave. (FS-ST-0.51)**

*USFS(78) Gate cave or mine openings where needed for public safety and resource protection. (FS-GU-0.54)**

*USFS(79) Rock climbing within 100 yards of known active or recently active peregrine falcon nests will be allowed only from the beginning of July through the end of January. Specific routes may be signed as necessary to inform of seasonal closures if nests are identified. Monitor peregrine nesting success to determine if the 100-yard closure is effective. (FS-ST-0.57)**

USFS(81) Work cooperatively with interested groups to establish seasonal use periods for caves and to educate cave users. (FS-GU-0.103)

*USFS(82) Manage designated and informal use (unnumbered) trails that are causing resource damage to reduce damage and restrict use to a single trail. (FS-GU-0.123)**

*USFS(84) Lower Deer Creek is removed from the Spring Mountains Wild Horse and Burro Territory due to danger posed by this herd to traffic on Kyle and Lee Canyon highways. Appropriate Management Level for wild horses and burros in Cold Creek is: horses, 26; burros, 0 (based upon 1992 range analysis and estimated population). The analysis showed a downward trend in the vegetation community composition, and soil condition (erosion and compaction) within a one-mile radius of the ponds. Utilization on willow exceeded 40%. This is excessive utilization for a community in a downward trend. This Appropriate Management Level is therefore based upon 30% of 1993 population which was 92 wild horses. No burros use this area; therefore, Appropriate Management Level for burros is 0. (FS-OBJ-11.12)**

USFS(85) Future trail alignments in the developed canyons will emphasize public safety, resource protection, and customer satisfaction. (FS-OBJ-11.17)

*USFS(86) Provide protection of the riparian areas (in accordance with NV Revised Statute 503.660) at Cold and Willow Creeks through the use of new road alignments, vehicle barriers, and/or signage. Redirect parking and camping away from riparian corridors. Allow only day-use, walk-in activities to occur within the riparian corridor. (FS-ST-11.1)**

USFS(87) Allow day-use only in the meadow area in Lee Canyon. Use temporary closures to allow for resource restoration/rehabilitation. (FS-ST-11.4)

*USFS(88) Provide trail markers and post restrictions to bouldering in the vicinity of Robbers' Roost Cave to protect Jaeger ivesia and Clokey greasebush. Interpretive signage may be used as appropriate. (FS-GU-11.5)**

USFS(89) Construct fences in strategic locations to keep wild horses out of Kyle and Lee Canyons. (FS-GU-11.20)

USFS(90) Close the Bristlecone Trail to motorized vehicles. Place barriers to prohibit off-trail travel into populations of species of concern. Use signs to educate users to the importance of species of concern, and the threats to their existence. (FS-ST-11.33)

USFS(91) Address user conflicts on Bristlecone Trail through a site-specific planning involving US Fish and Wildlife Service, trail users, and interested groups. (FS-GU-11.35)

USFS(92) Work with recreation residence associations to maintain the character and quality of recreational residence areas (summer homes under permit on National Forest System lands) while protecting natural resource values. (FS-GU-11.44)

USFS(93) Only allow low standard recreation facilities, including small camping areas or restrooms to be developed in upper Kyle and Lee canyons west of State Highway 158 as a resource protection measure. Allow new campgrounds and picnic areas to be developed in lower Kyle and Lee canyons, east of State Highway 158. (FS-ST-11.54)

*USFS(94) Allow limited expansion of ski area in Lee Canyon and enhancement of skiing opportunities and facilities within the scope of an approved master development plan and under the following constraints: (FS-ST-11.57)**

- *Expansion occurs within the existing sub-basin.*
- *Does not impact any threatened, endangered, or sensitive species or species of concern, or its habitat.*
- *Expansion is commensurate with development of additional parking in the lower Lee Canyon area, and shuttle services.*
- *Expansion incorporates defensible space design and fire safe facilities.*
- *Where consistent with other standards and guidelines.*

USFS(95) Protect natural and heritage resources and natural processes that enhance backcountry/wilderness recreational opportunities, including prohibiting consumptive uses of wilderness resources except where authorized by law or regulation. (FS-OBJ-12.2)

*USFS(96) Protect wilderness resources, including live and dead bristlecone pines, from removal/cutting for fuel. (FS-OBJ-12.6)**

USFS(97) Keep wild horses and burros out of the Wilderness. (FS-OBJ-12.8)

USFS(99) Discourage foot-traffic and camping at Mummy Spring by removing visitor-made trails, trail signage, and restoring native vegetation in riparian areas. (FS-GU-12.6)

*USFS(101) Relocate South Loop Trail away from meadow if practical, and if other resources will not be affected. (FS-GU-12.9)**

7.5.1.2 Restoration and Enhancement

USFS(102) Secure funding for restoration programs beyond those under the scope of Interagency Agreement # 14-48-0001-94605. (CA-GC 5.0(1))

USFS(103) Wherever possible, select only locally native species for restoration, and where appropriate, use seed from the plant species of concern and endemic butterfly host plants. (CA-GC 5.0(2))

USFS(104) Ensure that restoration projects focus on protection and enhancement of the species of concern and do not inadvertently cause irretrievable damage to the habitats of the species of concern (e.g., open water for bats, mud puddles for butterflies). (CA-GC 5.0(3))

USFS(105) Develop native plant material and seed list for restoration projects by plant community. The list will specifically identify larval and nectar host plants for the endemic butterflies. Develop plan to collect local seed for restoration efforts and establish and maintain a native seed bank. (CA5.1)

USFS(106) Restore habitat in accordance with Interagency Agreement # 14-48-0001-94605 between the USFS and USFWS for the Spring Mountains NRA. All restoration activities will be designed and implemented in coordination with the Technical Working Group (CA1.6) to avoid inadvertent adverse effects on the species of concern. Priorities identified to date are as follows: (CA5.2)

- *McFarland Spring - Improve fence, treat head cut, construct dry well - very high priority (CA5.2a)*
- *Mummy Spring - Remove informal trails - very high priority (CA5.2b)*
- *Carpenter Canyon - Close last ¼ mile of road, create parking area -very high priority (CA5.2c)**
- *Trough Spring - Close road, treat road bed, seed area - high priority (CA5.2d)*
- *Lost Cabin Spring - Close road, eliminate diversion, restore spring brook - high priority (CA5.2e)**
- *Big Timber Spring - Remove stock tank and stock pond - high priority (CA5.2f)**
- *Gold Spring - Remove stock tank, headbox, and pipeline - high priority (CA5.2h)**
- *Middle Mud Spring and East Mud Spring - Repair fence, remove headbox and pipeline -medium priority (CA5.2i)*
- *Buck Spring - Remove headbox, pipeline, and trough - medium priority (CA5.2j)**
- *Macks Canyon Spring - Extend exclosure - medium priority (CA5.2k)**

- *Younts Spring - Eliminate salt cedar, remove impoundment - medium priority (CA5.2l)**
- *Santa Cruz Spring - eliminate salt cedar, construct enclosure, dry well, and pipeline - medium priority (CA5.2m)**
- *Ninetynine Spring - Discontinue dredging, construct enclosure, dry well, and pipeline - medium priority (CA5.2n)**
- *Mexican Spring - Discontinue dredging, construct enclosure, dry well, and pipeline - medium priority (CA5.2o)**
- *Cougar Spring - Construct enclosure, dry well, and pipeline - medium priority (CA5.2p)**

USFS(107) Work with private property owners to restore and enhance the Cold Creek area. This effort will include plans to relocate facilities (e.g., fences, patios, and sheds) outside the riparian zone, and to control camping and fires (to protect butterflies), and maintain habitats for the species of concern (e.g., mud and seeps). (CA5.3)

*USFS(108) Develop and begin implementing a comprehensive restoration plan for the Willow Creek area. This plan will include relocation of roads and campgrounds out of the riparian area, removal of unneeded spur roads, a walk-in day-use plan, protection and habitat enhancement for springsnails, butterflies (including mud), and phainopepla. The plan will emphasize opportunities for public participation. (CA5.4)**

USFS(109) Work with summer home residents on the NRA to ensure that all future improvements avoid adverse effects to the species of concern, and where possible, enhance their habitats and populations. (CA5.5)

*USFS(112) Remove roads causing environmental damage: road to Cave Spring road to CC spring, road to Lost Cabin Spring, and identify additional roads for closure, particularly in biodiversity hotspots, and work with community groups to close them. (CA5.8)**

USFS(113) Organize volunteer work parties to manually remove exotic plants and noxious weeds along the ridgeline trail and other high elevation routes. (CA5.9)

*USFS(114) Develop and implement vegetation management and restoration plans for campgrounds and day use areas that enhance resources for Palmer's chipmunk, endemic butterflies, and rare plants. Priority areas include: (CA5.10)**

- *Deer Creek Picnic Area - Move picnic tables out of the riparian zone, and revegetate the area to enhance habitat for Palmer's chipmunk, neotropical migratory birds, and bats. (CA5.10a)**
- *Lee Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat. (CA5.10b)**
- *Kyle Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat. (CA5.10c)**
- *Gary Abbot Campground - Close campsite and restore area to enhance habitat of Clokey eggvetch and butterflies. (CA5.10d)*

USFS(115) Work with volunteers to provide nest boxes for cavity nesting western and mountain bluebirds and roosting bats to replace lost habitat. (CA5.11)

USFS(117) Remove existing water developments and debris from springs, providing they no longer serve their original purpose, are not critical to wildlife, and the items are not of historical significance. (FS-ST-0.13)

USFS(118) Use seed mixtures or seedlings for site rehabilitation, fire rehabilitation, or permit requirement in order of preference: 1) Native plants; 2) no seeding (only if erosion is not a serious concern and there is no cheatgrass invasion); 3) non-persistent (sterile) exotics; and 4) persistent exotics. (FS-GU-0.16)

*USFS(120) Provide a minimum of five wildlife cover sites per acre within developed or primitive recreation sites by maintaining or adding dead and down wood material or rocks at appropriate locations. (FS-ST-0.38)**

*USFS(121) Remove all structures related to grazing activities that are not necessary for current management, or of historic value. (FS-ST-0.49)**

*USFS(122) Close all undesignated spur roads in riparian areas; close other spur roads on a case by case basis, after site specific analysis. (FS-GU-0.63)**

*USFS(123) Relocate existing roads outside of washes, riparian areas, and 50-year floodplains if relocation will result in better resource conditions. Priority should be given to relocating roads when major maintenance is required and to roads that: 1) Are located in vital habitat for plant or animal species of concern, and 2) receive higher levels of use. (FS-GU-0.64)**

USFS(124) Require site/area rehabilitation upon completion/termination as part of all new permits. (FS-ST-0.126)

*USFS(125) Enhance developed sites where feasible to restore resource or wildlife values where recreation use has adversely affected resources. (FS-OBJ-11.5)**

*USFS(129) Provide water sources for wildlife adjacent to or within developed facilities. Maintain public restrooms to prevent access by wildlife (Palmer's chipmunk). (FS-GU-11.11)**

*USFS(130) Restore and maintain the natural, ecological, and visual character of the Wilderness. (FS-OBJ-12.1)**

*USFS(131) Restore water sources to historic flows in the Wilderness. (FS-OBJ-12.7)**

*USFS(132) Where possible, remove obvious exotic plants (dandelions, cheatgrass) in the Wilderness manually. (FS-GU-12.2)**

*USFS(133) Remove fire rings from the Wilderness. Emphasis should be placed on removing features which encourage use on degraded or sensitive sites. (FS-GU-12.4)**

7.5.2 USFWS

7.5.2.1 Protective Measures

USFWS(12) Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).

USFWS(13) Adopt and implement policies to protect plant species from dispersed or unregulated recreation (DNWR).

USFWS(14) Implement snag management in habitat areas, including limiting wood collection to down wood, and coordination of fire management activities within proposed wilderness areas of the DNWR (DNWR).

USFWS(15) Manage woodcutting, shrub clearing, and limit other human activity disturbance off existing roads within the DNWR (DNWR).

USFWS(17) Protect existing riparian habitat from the effects of recreational activities (DNWR).

USFWS(18) Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(20) Minimize clearing of undergrowth in construction of new facilities within the DNWR (DNWR).

USFWS(21) Prohibit access to caves for recreation (DNWR).

USFWS(22) Prohibit horses, burros, and livestock grazing (DNWR).

USFWS(23) Coordinate with the U.S. Air Force to minimize the footprint on the ground for congressionally mandated ordnance impacts (DNWR).

USFWS(24) Prohibit highway and road construction on the Refuge (DNWR).

USFWS(25) Retrofit roads to permit ingress and egress for a broad range of organisms (DNWR).

USFWS(26) Conduct biological surveys prior to road maintenance and retrofit activities, (DNWR).

USFWS(27) Ensure that roads are engineered to adequately spread runoff to minimize erosion (DNWR).

USFWS(28) Ensure that adequate law enforcement and ranger patrolling is implemented within the DNWR (DNWR).

USFWS(31) Maintain dead snags and fallen trees on slopes and canyon bottoms in the DNWR (DNWR).

USFWS(32) Limit collection of dead wood including yucca skeletons to within 100 feet of designated roads (DNWR).

USFWS(33) Evaluate effects of rock climbing on biological resources. Rock climbing is currently allowed, but is under investigation; if adverse impacts are found it will be prohibited on DNWR (DNWR).

USFWS(34) Work with BLM to restrict access to caves or regulate cave recreation policies as appropriate (Ecological Services).

7.5.2.2 Restoration and Enhancement Measures

USFWS(35) Create new open water resources for bats and other wildlife (DNWR).

USFWS(36) Expand the seed bank program to include populations in the Sheep Mountains areas (DNWR).

USFWS(38) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the DNWR (DNWR).

USFWS(39) If proposed actions will result in surface disturbance near a population of white bearpoppy, remove soil with seed source and relocate to a potential habitat site and monitor over time (DNWR).

USFWS(40) Restore/rehabilitate all key access points of closed roads and areas (DNWR).

7.5.3 BLM

7.5.3.1 Protective Measures

BLM(39) Prohibit collection of plants, animals, and mineral materials in Red Rock Canyon NCA without a permit.

BLM(57) Allow backcountry camping only in designated areas of Red Rock Canyon NCA.

BLM(97) Restrict mountain bikes and other mechanized non-motorized vehicles to designated trails within the RRCNCA and only allow new trails consistent with the conservation of BLM sensitive species, including the Spring Mountains milkvetch.

BLM(44) Close portions of the Red Rock Canyon NCA to vehicle use or limit use to designated roads and trails.

BLM(71) Limit motorized vehicles in WSAs to existing roads and trails as listed in inventory maps, or as otherwise authorized. Close unauthorized roads in WSAs.

BLM(76) Prohibit OHV competitions within Red Rock Canyon NCA.

BLM(108) Maintain the existing closure of 3,360 acres in the Muddy Mountains to all motorized and mechanized vehicles.

BLM(118) Do not allow competitive off-road vehicle events within ¼ mile of natural water sources and associated riparian areas.

BLM(48) Manage fires occurring in the WSAs to the lowest suppression intensity possible.

BLM(54) Require the use of a resource advisor for all fires within important habitats for covered and evaluation species.

BLM(51) Prohibit commercial collection of vegetative specimens within WSAs. Hobby collection may be allowed for personal use but not for commercial use, as long as the collection activity method meets the non-impairment criteria.

BLM(41) Prohibit commercial collection of cactus/yucca skeletons except in designated areas such as disposal areas, gravel pits, and sites associated with Federally approved projects that will result in the loss of surface vegetation. Casual collection of cactus/yucca skeletons is prohibited in tortoise ACECs. Casual collection outside these areas will be discouraged.

BLM(95) Prohibit the cutting of firewood in Red Rock Canyon NCA. Elsewhere permits are required on a discretionary basis consistent with the protection of sensitive species.

BLM(101) Protect snags as important habitat features.

BLM(79) Close WSAs to authorization/renewal of material site rights-of-way and mineral materials disposal until a decision is reached on their status.

BLM(89) Where feasible, proposals for saleable materials in essential habitats for special status species will be avoided.

BLM(96) Work with the Nevada Power Company and other utilities to modify existing powerline towers or poles to meet BLM standards for the prevention of raptor mortality (Olendorff et al. 1981 Raptor Research Report #4).

BLM(100) Manage caves to ensure that important bat roosting sites and hibernacula are not negatively impacted by recreational use. If gating is necessary to protect cave resources, ensure that the gates will allow for bat ingress and egress.

BLM(115) Manage all cave resources as wild systems, free from commercial or show cave type developments. Special Recreation Permits for commercially guided trips by qualified cave experts may be considered if environmental studies show that cave resources will not be impacted.

BLM(117) Protect key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey on public lands through mitigation of activities during National Environmental Policy Act compliance.

BLM(120) Determine water needs to meet management objectives. File for appropriative water rights on public and acquired lands in accordance with the State of Nevada water laws for those water sources that are not Federally reserved.

BLM(93) Using “best management practices” as identified by the State of Nevada, minimize contributions from both point and non-point sources of pollution (including salts) resulting from public land management actions. Where applicable, proposed management actions would comply with local, state, tribal and Federal air quality laws, regulations, and standards (Conformity; per 40 CFR 93.100 et seq.).

BLM(111) Prior to the disposal of identified public lands, an analysis will be conducted to determine their resource values, including the occurrence of Special Status Species and sensitive habitats such as riparian and aquatic habitats. Land disposal will be consistent with conservation of special status species unless there is an overriding public benefit.

BLM(119) Close the Sunrise Mountain and Nellis Dunes Special Recreation Management Areas to casual recreational shooting in accordance with Clark County's designated no shooting zone.

BLM(301) Limit the construction of new roads for the development of utility lines within special status species habitat.

BLM(90) Provide protection (such as fencing) around springs and riparian habitats to prevent habitat degradation from excessive use by grazing animals.*

BLM(12) Identify, evaluate, manage and protect cave resources on public lands for the purpose of maintaining the unique, non-renewable, and fragile biological, scientific, and recreational values for present and future uses.*

BLM(103) Livestock grazing will be managed consistent with riparian objectives of reaching or maintaining proper functioning condition (PFC)*.

BLM(125) As grazing systems are developed for each allotment, ensure the system is consistent with the conservation of BLM special status species. Where conflicts occur, encourage Clark County to obtain grazing privileges on a willing seller basis.*

BLM(59) Manage wild horses and burros as necessary to maintain thriving ecological balance and consistent with the protection of special status species in important habitat areas.*

BLM(58,60) Wild horses and burros will be removed when herds have expanded beyond designated herd area boundaries or Appropriate Management Level is exceeded.*

BLM(98) Provide adequate law enforcement presence to ensure that management actions and restrictions are implemented for the conservation of covered and/or evaluation species.*

BLM(127,128) The livestock grazing program shall be managed to meet the Bureau's Standards and Guidelines as developed by the Southern Great Basin/Mojave Resource Advisory Committee.* The "standards" are listed below:

STANDARD 1. SOILS: Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity and sustain the hydrologic cycle.

STANDARD 2. ECOSYSTEM COMPONENTS: Watersheds should possess the necessary ecological components to achieve state water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristics of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

STANDARD 3. HABITAT AND BIOTA: Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

7.5.3.2 Restoration and Enhancement Measures

BLM(123) Within desert tortoise critical habitat/ACECs, Las Vegas bearpoppy habitat, and other important habitats for covered and evaluation species, require reclamation of activities which result in loss or degradation of habitat, with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. If necessary subsequent seeding or transplanting efforts may be required, should monitoring indicate that the original effort was not successful.

BLM(143) Rehabilitate, reclaim or revegetate areas subjected to surface-disturbing activities where feasible. When rehabilitating disturbed areas, first manage for optimum

species diversity by seeding native species, except where non-native species are appropriate.*

BLM(303) Implement a program to rehab surface disturbances including the first hundred feet or so of "closed" roads and trails within proposed desert tortoise ACECs, Las Vegas bear poppy habitat, and other areas important for special status species.*

BLM(135) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following wildfires within areas important for the conservation of covered species and where the feasibility of success is reasonably certain.*

BLM(137) Cooperate with NPS, FS, USFWS, Clark County and others on a reclamation program which will include maintaining a seed bank and live plants for rehabilitation of disturbed or burned areas if necessary.*

BLM(109) In cooperation with NDOW, the USFWS, and ADC, monitor brown-headed cowbird and raven populations and implement population controls of these species where necessary for the conservation of covered species.*

BLM(140) Improve riparian areas, giving priority to areas Functioning at Risk with a downward trend. Implement measures to protect riparian areas, such as fencing and/or alternate water sources away from the riparian area. Insure that the minimum requirement of Proper Functioning Condition on all riparian areas is maintained or achieved.*

7.6 Adequacy of Existing Management

About 87.2 percent of the habitat is within IMAs and LIMAs (DNWR, Spring Mountains NRA, BLM WSA and critical habitat, USFS wilderness and WSA, and BLM NCA) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. Approximately 12.1 percent of the habitat is in MUMA (BLM undesignated lands) and may be used for multiple use activities, within the constraints of existing BLM policies for management of these activities. Fewer than 1.0 percent is UMA (privately held) and may be used for more intensive activities.

Implementation of existing USFWS and BLM management actions, the provisions of the BLM Las Vegas RMP, and the CA for the Spring Mountains NRA (see Section 2.8) will adequately address the ecosystem level threats to Covered Species within the sagebrush habitat, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

7.7 MSHCP Conservation Contributions

The sagebrush habitat and the 20 Covered Species it supports will benefit from the MSHCP through general public education and information programs. Additional benefits will derive from the purchase, maintenance, and management of grazing allotments; water rights; potential funding or assistance in inventory, monitoring, and management activities that result from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

Chapter 8 Blackbrush Ecosystem

8.1 Description and Distribution

Although the blackbrush community is typically considered a part of the Mojave desert scrub ecosystem, for management purposes it is considered and will be managed at the ecosystem level. In Clark County the blackbrush ecosystem occupies 831,500 acres on upper bajadas, slopes, and valleys below 5,900 feet (Figure 8-1, Table 8-1).

TABLE 8-1
VEGETATION COMMUNITIES IN THE BLACKBRUSH ECOSYSTEM

Vegetation Type	Acres	% of Ecosystem
Blackbrush	819,500	98.6
Grassland	6,800	0.8
Hopsage	5,200	0.6
Habitat Total	824,700	99.2
Ecosystem Total	831,500	100.0

8.1.1 Blackbrush Community

Shrubland dominated by blackbrush (*Coleogyne ramosissima*). (USU Code 40; CA WHR Code SGB/DSC–Sagebrush/Desert Scrub) It is typically a transitional habitat between Mojave and Great Basin ecosystems, occurring at elevations between 4,100 to 5,000 feet, usually north of the range of creosote-bursage associations. Primary associated trees include juniper (*Juniperus osteosperma*). Primary associated shrubs include spiny hopsage (*Grayia spinosa*), mormon tea (*Ephedra* spp.), shadscale (*Atriplex confertifolia*), desert thorn (*Lycium* spp.), snakeweed (*Gutierrezia sarothrae*), and creosote (*Larrea tridentata*). Other associated species include Joshua tree (*Yucca brevifolia*) and yucca (*Yucca* spp.)

8.1.2 Hopsage Community

Shrubland characterized by the occurrence of hopsage (*Grayia spinosa*), (USU Code 43; CA WHR Code DSC/SGB–Desert Scrub/Sagebrush), typically with desert thorn (*Lycium* spp.), rabbitbrush (*Chrysothamnus* spp.), tea (*Ephedra* spp.), and shadscale (*Atriplex*

confertifolia). Other associated shrubs include sagebrush (*Artemisia* spp.), blackbrush, (*Coleogyne ramosissima*), winterfat (*Ceratoides lanata*), ratany (*Krameria erecta*), bursage (*Ambrosia dumosa*), and creosote (*Larrea tridentata*). This shrubland is transitional between Mojave and Great Basin ecosystems.

8.2 MSHCP Species

The 11 Covered and 7 Evaluation Species are listed below.

Covered Species:

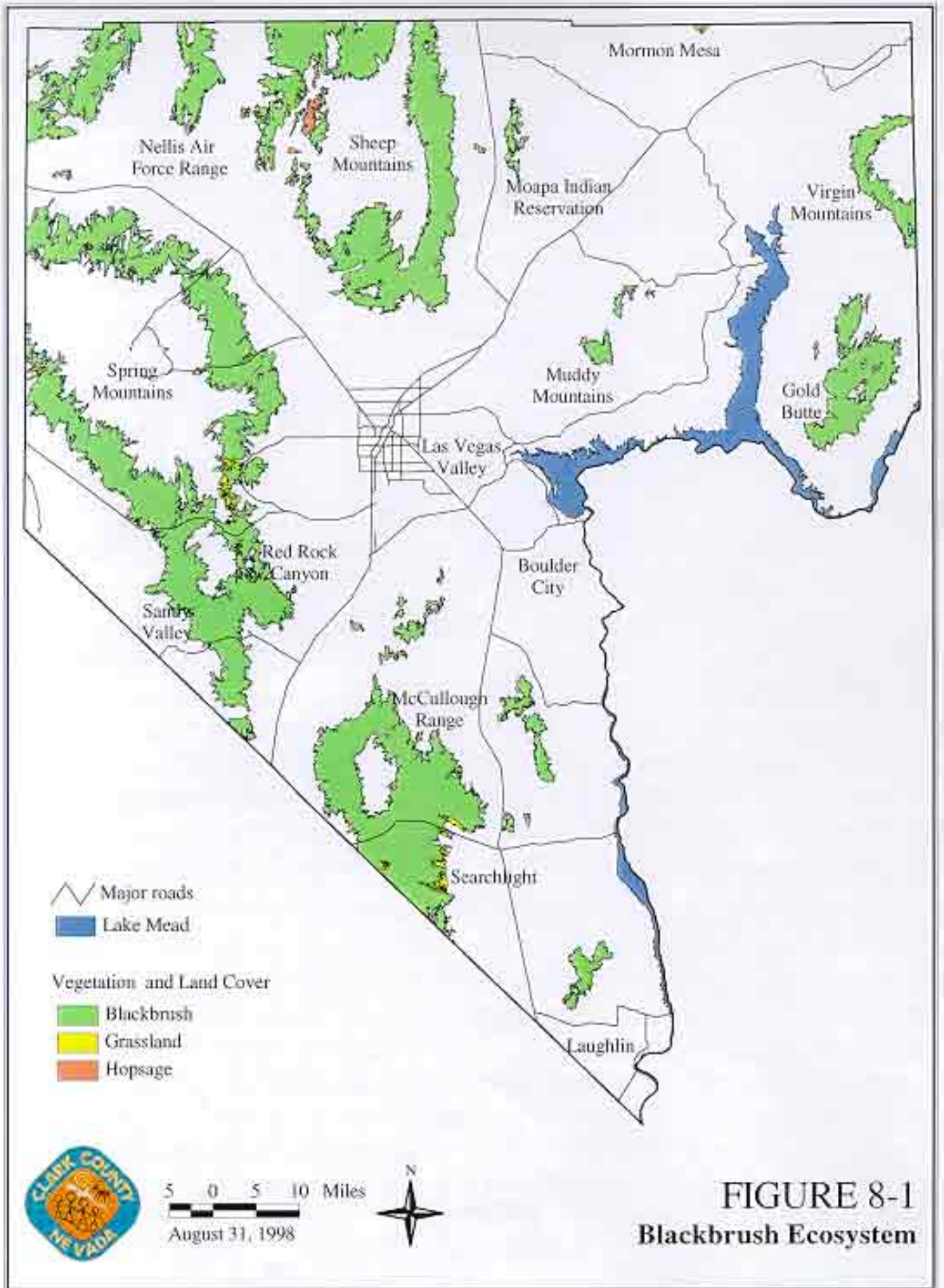
Desert tortoise	<i>Gopherus agassizii</i>
Banded gecko	<i>Coleonyx variegatus</i>
Western chuckwalla	<i>Sauromalus obesus obesus</i>
Great Basin collared lizard	<i>Crotaphytus insularis bicinctores</i>
Large-spotted leopard lizard	<i>Gambelia wislizenii wislizenii</i>
Western red-tailed skink	<i>Eumeces gilberti rubricaudatus</i>
Speckled rattlesnake	<i>Crotalus mitchelli</i>
Mojave green rattlesnake	<i>Crotalus scutulatus scutulatus</i>
Spring Mountains milkvetch	<i>Astragalus remotus</i>
White-margined beardtongue (penstemon)	<i>Penstemon albomarginatus</i>
White bearpoppy	<i>Arctomecon merriamii</i>

High Priority Evaluation Species:

Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>
Kit fox	<i>Vulpes macrotus</i>
Desert kangaroo rat	<i>Dipodomys deserti</i>
Banded Gila monster	<i>Heloderma suspectum cinctum</i>
Southern desert horned lizard	<i>Phrynosoma platyrhinos calidiarum</i>
Curve-podded Mojave (halfring) milkvetch	<i>Astragalus mohavensis</i> var. <i>hemigyris</i>
Yellow twotone beardtongue	<i>Penstemon bicolor</i> ssp. <i>bicolor</i>

8.3 Potential Threats and Stressors

The existing management policies and actions for each agency are derived from the USFS General Management Plan and the Draft Final Conservation Agreement between the USFS and USFWS for the SMNRA; BLM Management Framework Plan (MFP) and Interim Management Plan (IMP) for WSAs; the BLM Interim General Management Plan for the Red Rock Canyon NCA; the IMP for Special Status Plants; the GMP and Resource Management Plan (RMP) for the Lake Mead NRA; and the Boulder City Conservation Easement. Additional policies for the DNWR and State Parks were provided by those agencies.



The primary ecosystem level threats and stressors in blackbrush are:

- Commercial collection (reduction of populations **Threat 201**, habitat degradation **Threat 202**)
- Fires and fire management (habitat degradation **Threat 301**, vegetation community conversion **Threat 302**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, concentrated recreation **Threat 402**, competitive OHV races **Threat 403**, casual use OHV activities **Threat 404**, rock climbing **Threat 405**, indiscriminate recreational shooting **Threat 406**, spelunking **Threat 407**)
- Highways, roads, and trails (highway mortality **Threat 501**, habitat fragmentation **Threat 503**, road construction and maintenance **Threat 504**)
- Pest control (direct or indirect poisoning or trapping **Threat 601**, pesticides and herbicides **Threat 602**)
- Grazing (wild horse and burro grazing and trampling **Threat 701**, competition with cattle and equids **Threat 702**, livestock grazing and trampling **Threat 703**) Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**, landfills **Threat 1103**)
- Utilities (facility construction and maintenance **Threat 1202**, provision of perch sites for ravens **Threat 1203**)
- Water development, use, and flood control in riparian areas (channelization **Threat 1301**, water diversion and groundwater pumping **Threat 1302**, decreased water availability **Threat 1303**, grazing and agriculture **Threat 1304**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**, grazing and agriculture **Threat 1404**, overutilization by animals **Threat 1405**)
- Exotic and introduced species (introductions, competition, and encroachment of exotic species **Threat 1501**, subsidized and parasitic species **Threat 1502**, increased risk of fire due to exotic plants **Threat 1503**)
- Feral animals (feral animals and uncontrolled pets **Threat 1601**)
- Illegal or unauthorized activities (poaching, illegal collection, or killing of flora and fauna **Threat 1701**, introduction of an upper respiratory disease to wild desert tortoise populations possibly caused by the release of captive desert tortoises **Threat 1704**)

8.4 Blackbrush Habitat Management

Intensively Managed Areas: Of the total 824,700 acres of habitat, 262,200 acres (31.8%) are within the DNWR and adjacent lands managed by USFWS/USAF; 93,300 acres (11.3%) are within WSAs in the Spring Mountains managed by the USFS or BLM; 81,300 acres (9.9%) are within BLM conserved habitat for the desert tortoise; and 3,100

acres (<1.0%) are NPS Lake Mead National Recreation Area lands within conserved or critical habitat for desert tortoise (Figure 8-2, Table 8-2). These lands are managed for habitat and wildlife conservation, in general, to maintain their potential wilderness qualities or, specifically, for desert tortoise under the Desert Conservation Plan. BLM-managed critical habitat for desert tortoise is not actively managed but is subject to the constraints of Sections 4, 7, and 9 of the ESA. BLM and USFS management policies for WSAs are interim, however.

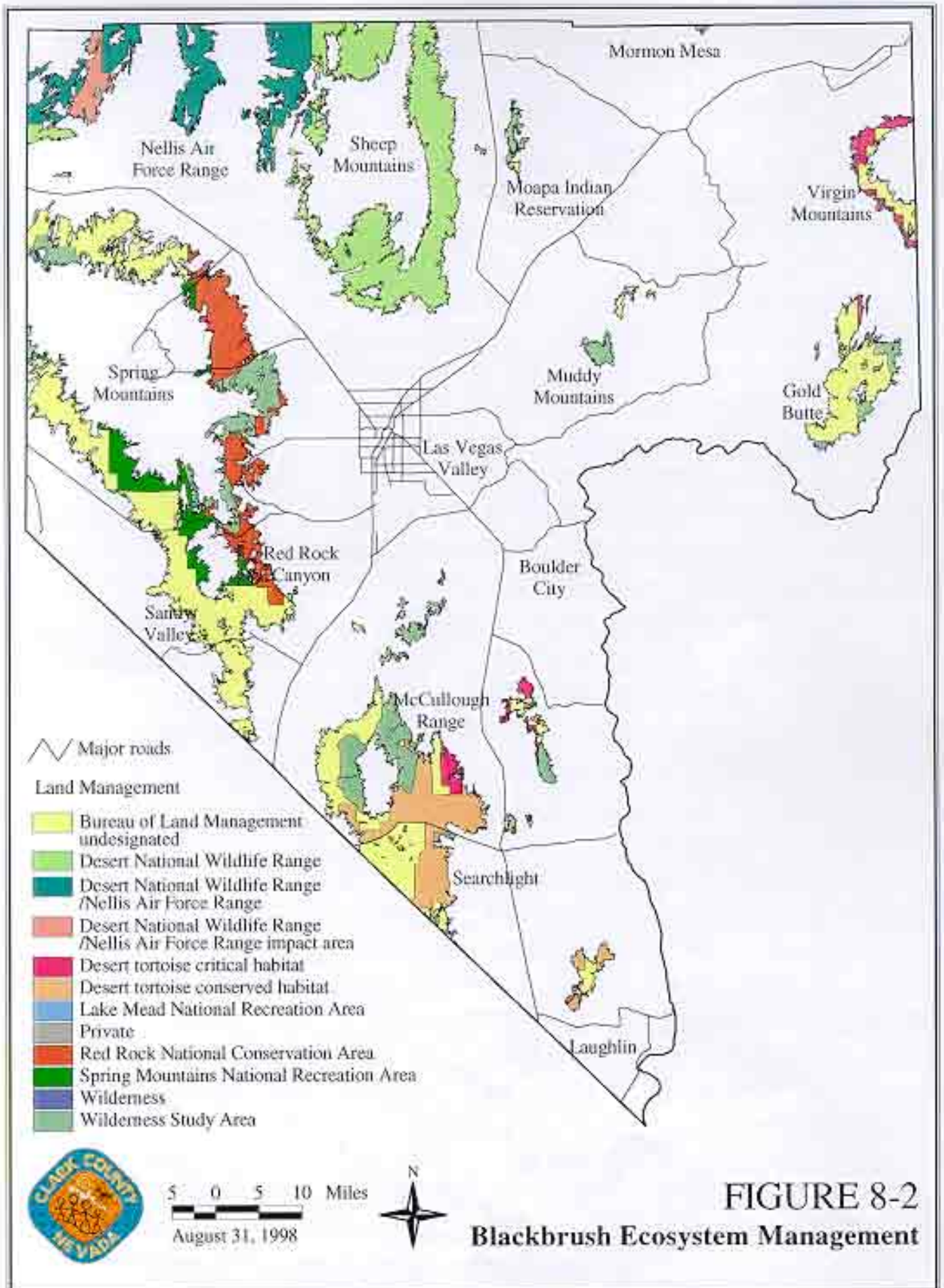
Less Intensively Managed Areas: BLM manages an additional 62,000 acres (7.5%) within the Red Rock Canyon NCA and the USFS SMNRA has 34,500 acres (4.1%), which, while providing some intensive recreational use opportunities, have specific management policies regarding public recreational use for the benefit of wildlife. The USFWS/USAF jointly manage 15,000 acres within the DNWR/NAFR.

Multiple Use Managed Areas: The remaining 279,600 acres (33.9%) within BLM lands do not have specific management policies for conservation of habitat or wildlife.

Un-Managed Areas: About 8,700 acres (1.1%) are within private and USAF landholdings for which no active habitat or conservation measures are assumed.

**TABLE 8-2
MANAGEMENT OF HABITAT IN THE BLACKBRUSH ECOSYSTEM**

Category	Manager	Management Classification	Acres	% of Habitat
IMA	BLM	Conserved Habitat	58,600	7.1
	BLM	Critical Habitat	22,700	2.8
	BLM	WSA	84,800	10.3
	USFS	Wilderness	100	<1.0
	USFS	WSA	8,500	1.0
	USFWS	Wildlife Range	166,900	20.2
	USFWS/USAF	DNWR/NAFR	80,300	9.7
	NPS	LMNRA	3,100	<1.0
IMA Total			425,000	51.5
LIMA	BLM	NCA	62,000	7.5
	USFS	SMNRA	34,500	4.1
	USFWS/USAF	DNWR/NAFR	15,000	1.8
LIMA Total			111,500	13.5
MUMA	BLM	Undesignated	279,600	33.9
MUMA Total			279,600	33.9
UMA	Private		8,500	1.0
	USAF	ISAFAF	200	<1.0
UMA Total			8,700	1.0
Grand Total			824,700	100.0



8.4.1 Blackbrush Community Management

Blackbrush has an extensive distribution and occurs within each Federal jurisdiction in Clark County. BLM manages approximately 507,700 acres, or 61.5 percent, of the overall habitat. The BLM habitat includes the Piute-Eldorado conserved habitat area managed for the desert tortoise; the Gold Butte-Pakoon and Virgin Mountain areas of critical habitat for desert tortoise (81,300 acres, or 9.8%); and a number of BLM Wilderness Study Areas: South McCullough Mountain (30,300 acres), La Madre Mountain (21,300 acres), North McCullough Mountain (6,700 acres), Muddy Mountains (4,700 acres), and Arrow Canyon, Ireteba Peak, and Million Hills, totaling 84,800 acres, or 10.3 percent of the habitat. Approximately 62,000 acres (7.5%) are within the Red Rock Canyon NCA. The remaining 278,800 acres (33.8% of total) are widely distributed. The DNWR includes 163,700 acres (19.9%) of blackbrush habitat with an additional 94,100 acres (11.4%) of lands managed by the USFWS/USAF. The Humboldt-Toiyabe National Forest has 34,500 acres (4.2%) within the Spring Mountains NRA and 14,600 acres (1.8%) in the Pine Creek, La Madre Mountains, and Mount Stirling wilderness areas. The Lake Mead NRA contains 3,100 acres.

8.4.2 Hopsage Community Management

Hopsage is a non-extensive transitional habitat association that occurs around the Sheep Mountains and Spring Mountains. About 4,400 acres (84.6%) is within the DNWR or USFWS/USAF lands and are managed for native habitat and plant and wildlife conservation. The remaining areas are under BLM jurisdiction and are managed for mixed use.

8.5 Existing and Proposed Conservation Actions

Of the total of 824,700 acres of blackbrush habitat, 61.5 percent is managed by BLM (undesignated, WSA, NCA, and conserved habitat), 31.7 percent by USFWS (DNWR and NAFR), and 5.2 percent by USFS (Spring Mountains NRA and WSA), and less than 1 percent by NPS (Lake Mead NRA). Private holdings and portions of the USAF ISAFAF total 1.0 percent.

A total of 43.1 percent of the 824,700 acres of blackbrush habitat is managed for primitive, non-motorized, dispersed recreational use (wilderness, WSA, or DNWR). The 11.7 percent of the habitat located within the Spring Mountains NRA and Red Rock Canyon NCA is managed for both conservation and a broader spectrum of recreational uses, including intensive recreational use areas, developed camping areas, hiking and biking trails, rock climbing areas, and designated motorized vehicle use roads and trails.

Both of these areas are closed to new mining, livestock grazing, and off-road motorized recreational vehicle use and are actively managed for habitat conservation. BLM undesignated lands (33.9 percent) are managed to balance multiple uses, including mining, OHV activities, grazing, and other activities with maintenance of habitat and species values.

8.5.1 USFS

8.5.1.1 Protective Measures

USFS(37) Focus new recreation development (campgrounds, picnic areas, and other facilities), in the least sensitive areas at lower elevations, to lessen visitor impacts on the species of concern and other sensitive ecological resources. (CA-GC 4.0(1))

USFS(38) Encourage partnerships with volunteers to maintain and enhance natural resources in the NRA. (CA-GC 4.0(2))

USFS(39) Adhere to goals, objectives, standards and guidelines detailed in the Plan Amendment which promote protective management of the species of concern and other ecological resources. (CA-GC 4.0(3))

USFS(40) Identify specific areas of exceptional sensitivity where conservation management will be emphasized over recreation. (CA-GC 4.0(4))

USFS(41) Minimize clearing of undergrowth during construction of new facilities. (CA-GC 4.0(5))

USFS(42) Prior to use of pesticides and other chemicals, determine potential impacts to the species of concern (e.g., butterflies, bats), and implement strategies to avoid impacts to those species. (CA-GC 4.0(6))

*USFS(43) Protect habitat of the species of concern from dispersed recreation (e.g., heavy foot traffic, off-road vehicles, mountain bikes), and the adverse effects of wild horses and burros. (CA-GC 4.0(7))**

USFS(44) Develop and implement an overnight wilderness permitting process that provides education on sensitive resources. (CA4.1)

USFS(45) Develop and implement a climbing “self registration” process that encourages development of new routes away from ecologically sensitive areas. (CA4.2)

*USFS(46) Develop and implement a plan to protect bat roosts in mines and caves. The plan will address the following protective measures: Gating or closing mines and caves to protect bat roost sites, removing important bat roost mines and caves from future additions of NRA maps, avoiding identification of exact locations of maternity roosts, caves, and occupied mines to the general public, determining the need to close roads to mines and caves, and avoiding use of heavy equipment near mine and cave roosts. (CA4.3)**

USFS(49) Manage wild horses and burros in the NRA to avoid damage to species of concern habitats, particularly in lower Lee Canyon, northwest Mount Stirling, Wheeler Pass, Wheeler Wash, Wood Canyon, Carpenter Canyon, and lower Deer Creek, and continue to quickly remove any stray horses at upper elevations, particularly in upper Lee Canyon, Deer Creek, and Kyle Canyon. (CA4.6)

*USFS(50) Develop and distribute information to equestrians on the importance of using pelletized feed within the NRA, and develop and distribute a weed-free feed policy for equestrians on Federal lands. (CA4.7)**

USFS(51) Sign closure order allowing USFS to prohibit camping within specific distance of water sources, based on species and habitat protection needs, and control dispersed, primitive camping in the NRA by enforcing the closure order. (CA4.8)

*USFS(52) Develop and implement plan to collect seed for endowment and cultivation of sensitive and rare plants. (CA4.9)**

USFS(54) Consider, and as appropriate, develop additional protective designations in the NRA to protect the species of concern and other ecological resources. (CA4.11)

*USFS(57) Remove brown-headed cowbirds where nest parasitism occurs during neotropical migratory bird inventories or other activities. (CA4.14)**

USFS(58) Work with utility companies to ensure poles are raptor-safe. (CA4.15)

USFS(60) Limit impacts of new administrative facilities on natural and heritage resources, and visual quality. (FS-OBJ-0.19)

*USFS(61) Manage all active claims and abandoned mines to minimize effects on natural, visual, and heritage resources and provide protection for the public. (FS-OBJ-0.34)**

*USFS(62) Maintain roads to a standard necessary for public safety and as needed to respond to resource management objectives, including resource protection and recreation, through maintenance of road surfaces and minimizing erosion. (FS-OBJ-0.37)**

USFS(63) New recreational facilities will be located and designed to ensure public safety, ecosystem health, and customer satisfaction. (FS-OBJ-0.44)

*USFS(65) Acquire available land within the Spring Mountains National Recreation Area to protect natural resources, provide public recreation opportunities, and increase efficiency of land management. (FS-OBJ-0.52)**

USFS(66) Prohibit parking and camping within riparian areas. (FS-ST-0.3)

USFS(67) Where possible, maintain historic floodplain and channel width, slope, and gradient. (FS-GU-0.5)

USFS(68) Maintain/restore open pools of slow moving water (0.5 meter in diameter) at some historic water sources, well distributed throughout the range. Develop open pools of water at least 0.5 meter in diameter at newly developed/diverted water sources. (FS-GU-0.6)

USFS(69) Develop new perennial water sources, including guzzlers, only to benefit native species, to improve distribution of non-native species, where historic water sources have disappeared, or where access is limited. Only develop water sources in the Wilderness or WSAs to improve desert bighorn sheep habitat. These developments must protect wilderness character. (FS-GU-0.7)

USFS(70) When developing water sources, pipe water from a point downstream of the source if snails or other sensitive species are present, or if the spring source has not been previously developed. (FS-ST-0.8)

USFS(71) Collection of threatened, endangered, and sensitive plant species requires a permit from the Regional Forester, except for traditional use by American Indians. (FS-ST-0.28)

USFS(72) Work with Nevada Division of Wildlife, US Fish and Wildlife Service, the Audubon Society, and other interested agencies and organizations to control cowbird populations as monitoring identifies negative impacts to species of concern from this parasitic, non-native species. (FS-GU-0.30)

USFS(74) Design new roads and motorized trails to maintain a minimum 0.5 mile distance from active or recently active desert tortoise burrows. (FS-GU-0.32)

USFS(75) For organized, motorized events on unpaved roads or trails within 0.5 mile of active desert tortoise burrows, require special permit provisions for desert tortoise protection. (FS-GU-0.33)

USFS(76) Use temporary closures (roads, trails, dispersed areas) to protect important seasonal habitat for species of concern (animals, plants, insects), in coordination with appropriate state and local agencies. (FS-GU-0.34)

*USFS(77) Allow access to all caves only from the beginning of March through the end of May; and from the beginning of September through the end of October. Seasonal restrictions will remain in place until bat roosting/hibernating inventories have been completed. Long-term seasonal restrictions will be determined based on survey results. Allow year-round access to Robbers' Roost Cave. (FS-ST-0.51)**

USFS(78) Gate cave or mine openings where needed for public safety and resource protection. (FS-GU-0.54)*

USFS(81) Work cooperatively with interested groups to establish seasonal use periods for caves and to educate cave users. (FS-GU-0.103)

*USFS(82) Manage designated and informal use (unnumbered) trails that are causing resource damage to reduce damage and restrict use to a single trail. (FS-GU-0.123)**

*USFS(84) Lower Deer Creek is removed from the Spring Mountains Wild Horse and Burro Territory due to danger posed by this herd to traffic on Kyle and Lee Canyon highways. Appropriate Management Level for wild horses and burros in Cold Creek is: horses, 26; burros, 0 (based upon 1992 range analysis and estimated population). The analysis showed a downward trend in the vegetation community composition, and soil condition (erosion and compaction) within a one-mile radius of the ponds. Utilization on willow exceeded 40%. This is excessive utilization for a community in a downward trend. This Appropriate Management Level is therefore based upon 30% of 1993 population which was 92 wild horses. No burros use this area; therefore, Appropriate Management Level for burros is 0. (FS-OBJ-11.12)**

USFS(85) Future trail alignments in the developed canyons will emphasize public safety, resource protection, and customer satisfaction. (FS-OBJ-11.17)

*USFS(86) Provide protection of the riparian areas (in accordance with NV Revised Statute 503.660) at Cold and Willow Creeks through the use of new road alignments, vehicle barriers, and/or signage. Redirect parking and camping away from riparian corridors. Allow only day-use, walk-in activities to occur within the riparian corridor. (FS-ST-11.1)**

USFS(87) Allow day-use only in the meadow area in Lee Canyon. Use temporary closures to allow for resource restoration/rehabilitation. (FS-ST-11.4)

USFS(89) Construct fences in strategic locations to keep wild horses out of Kyle and Lee Canyons. (FS-GU-11.20)

USFS(92) Work with recreation residence associations to maintain the character and quality of recreational residence areas (summer homes under permit on National Forest System lands) while protecting natural resource values. (FS-GU-11.44)

8.5.1.2 Restoration and Enhancement

USFS(102) Secure funding for restoration programs beyond those under the scope of Interagency Agreement # 14-48-0001-94605. (CA-GC 5.0(1))

USFS(103) Wherever possible, select only locally native species for restoration, and where appropriate, use seed from the plant species of concern and endemic butterfly host plants. (CA-GC 5.0(2))

USFS(104) Ensure that restoration projects focus on protection and enhancement of the species of concern and do not inadvertently cause irretrievable damage to the habitats of the species of concern (e.g., open water for bats, mud puddles for butterflies). (CA-GC 5.0(3))

USFS(105) Develop native plant material and seed list for restoration projects by plant community. The list will specifically identify larval and nectar host plants for the endemic butterflies. Develop plan to collect local seed for restoration efforts and establish and maintain a native seed bank. (CA5.1)

USFS(106) Restore habitat in accordance with Interagency Agreement # 14-48-0001-94605 between the USFS and USFWS for the Spring Mountains NRA. All restoration activities will be designed and implemented in coordination with the Technical Working Group (CA1.6) to avoid inadvertent adverse effects on the species of concern. Priorities identified to date are as follows: (CA5.2)

- *McFarland Spring - Improve fence, treat head cut, construct dry well - very high priority (CA5.2a)*
- *Mummy Spring - Remove informal trails - very high priority (CA5.2b)*
- *Carpenter Canyon - Close last ¼ mile of road, create parking area -very high priority (CA5.2c)**
- *Trough Spring - Close road, treat road bed, seed area - high priority (CA5.2d)*

- *Lost Cabin Spring - Close road, eliminate diversion, restore spring brook - high priority (CA5.2e)**
- *Big Timber Spring - Remove stock tank and stock pond - high priority (CA5.2f)**
- *Gold Spring - Remove stock tank, headbox, and pipeline - high priority (CA5.2h)**
- *Middle Mud Spring and East Mud Spring - Repair fence, remove headbox and pipeline -medium priority (CA5.2i)*
- *Buck Spring - Remove headbox, pipeline, and trough - medium priority (CA5.2j)**
- *Macks Canyon Spring - Extend exclosure - medium priority (CA5.2k)**
- *Younts Spring - Eliminate salt cedar, remove impoundment - medium priority (CA5.2l)**
- *Santa Cruz Spring - eliminate salt cedar, construct exclosure, dry well, and pipeline - medium priority (CA5.2m)**
- *Ninetynine Spring - Discontinue dredging, construct exclosure, dry well, and pipeline - medium priority (CA5.2n)**
- *Mexican Spring - Discontinue dredging, construct exclosure, dry well, and pipeline - medium priority (CA5.2o)**
- *Cougar Spring - Construct exclosure, dry well, and pipeline - medium priority (CA5.2p)**

USFS(107) Work with private property owners to restore and enhance the Cold Creek area. This effort will include plans to relocate facilities (e.g., fences, patios, and sheds) outside the riparian zone, and to control camping and fires (to protect butterflies), and maintain habitats for the species of concern (e.g., mud and seeps). (CA5.3)

*USFS(108) Develop and begin implementing a comprehensive restoration plan for the Willow Creek area. This plan will include relocation of roads and campgrounds out of the riparian area, removal of unneeded spur roads, a walk-in day-use plan, protection and habitat enhancement for springsnails, butterflies (including mud), and phainopepla. The plan will emphasize opportunities for public participation. (CA5.4)**

USFS(109) Work with summer home residents on the NRA to ensure that all future improvements avoid adverse effects to the species of concern, and where possible, enhance their habitats and populations. (CA5.5)

*USFS(112) Remove roads causing environmental damage: road to Cave Spring road to CC spring, road to Lost Cabin Spring, and identify additional roads for closure, particularly in biodiversity hotspots, and work with community groups to close them. (CA5.8)**

USFS(113) Organize volunteer work parties to manually remove exotic plants and noxious weeds along the ridgeline trail and other high elevation routes. (CA5.9)

USFS(115) Work with volunteers to provide nest boxes for cavity nesting western and mountain bluebirds and roosting bats to replace lost habitat. (CA5.11)

USFS(117) Remove existing water developments and debris from springs, providing they no longer serve their original purpose, are not critical to wildlife, and the items are not of historical significance. (FS-ST-0.13)

USFS(118) Use seed mixtures or seedlings for site rehabilitation, fire rehabilitation, or permit requirement in order of preference: 1) Native plants; 2) no seeding (only if erosion is not a serious concern and there is no cheatgrass invasion); 3) non-persistent (sterile) exotics; and 4) persistent exotics. (FS-GU-0.16)

*USFS(119) Develop a seed supply of native species produced from seed sources on the SMNRA. (FS-GU-0.17)**

*USFS(120) Provide a minimum of five wildlife cover sites per acre within developed or primitive recreation sites by maintaining or adding dead and down wood material or rocks at appropriate locations. (FS-ST-0.38)**

*USFS(121) Remove all structures related to grazing activities that are not necessary for current management, or of historic value. (FS-ST-0.49)**

*USFS(122) Close all undesignated spur roads in riparian areas; close other spur roads on a case by case basis, after site specific analysis. (FS-GU-0.63)**

*USFS(123) Relocate existing roads outside of washes, riparian areas, and 50-year floodplains if relocation will result in better resource conditions. Priority should be given to relocating roads when major maintenance is required and to roads that: 1) Are located in vital habitat for plant or animal species of concern, and 2) receive higher levels of use. (FS-GU-0.64)**

USFS(124) Require site/area rehabilitation upon completion/termination as part of all new permits. (FS-ST-0.126)

*USFS(130) Restore and maintain the natural, ecological, and visual character of the Wilderness. (FS-OBJ-12.1)**

8.5.2 USFWS

8.5.2.1 Protective Measures

USFWS(12) Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).

USFWS(13) Adopt and implement policies to protect plant species from dispersed or unregulated recreation (DNWR).

USFWS(14) Implement snag management in habitat areas, including limiting wood collection to down wood, and coordination of fire management activities within proposed wilderness areas of the DNWR (DNWR).

USFWS(15) Manage woodcutting, shrub clearing, and limit other human activity disturbance off existing roads within the DNWR (DNWR).

USFWS(17) Protect existing riparian habitat from the effects of recreational activities (DNWR).

USFWS(18) Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(20) Minimize clearing of undergrowth in construction of new facilities within the DNWR (DNWR).

USFWS(21) Prohibit access to caves for recreation (DNWR).

USFWS(22) Prohibit horses, burros, and livestock grazing (DNWR).

USFWS(23) Coordinate with the U.S. Air Force to minimize the footprint on the ground for congressionally mandated ordnance impacts (DNWR).

USFWS(24) Prohibit highway and road construction on the Refuge (DNWR).

USFWS(25) Retrofit roads to permit ingress and egress for a broad range of organisms (DNWR).

USFWS(26) Conduct biological surveys prior to road maintenance and retrofit activities, (DNWR).

USFWS(27) Ensure that roads are engineered to adequately spread runoff to minimize erosion (DNWR).

USFWS(28) Ensure that adequate law enforcement and ranger patrolling is implemented within the DNWR (DNWR).

USFWS(31) Maintain dead snags and fallen trees on slopes and canyon bottoms in the DNWR (DNWR).

USFWS(32) Limit collection of dead wood including yucca skeletons to within 100 feet of designated roads (DNWR).

USFWS(33) Evaluate effects of rock climbing on biological resources. Rock climbing is currently allowed, but is under investigation; if adverse impacts are found it will be prohibited on DNWR (DNWR).

USFWS(34) Work with BLM to restrict access to caves or regulate cave recreation policies as appropriate (Ecological Services).

8.5.2.2 Restoration and Enhancement Measures

USFWS(35) Create new open water resources for bats and other wildlife (DNWR).

USFWS(36) Expand the seed bank program to include populations in the Sheep Mountains areas (DNWR).

USFWS(38) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the DNWR (DNWR).

USFWS(39) If proposed actions will result in surface disturbance near a population of white bearpoppy, remove soil with seed source and relocate to a potential habitat site and monitor over time (DNWR).

USFWS(40) Restore/rehabilitate all key access points of closed roads and areas (DNWR).

8.5.3 BLM

8.5.3.1 Protective Measures

BLM(39) Prohibit collection of plants, animals, and mineral materials in Red Rock Canyon NCA without a permit.

BLM(57) Allow backcountry camping only in designated areas of Red Rock Canyon NCA.

BLM(97) Restrict mountain bikes and other mechanized non-motorized vehicles to designated trails within the RRCNCA and only allow new trails consistent with the conservation of BLM sensitive species, including the Spring Mountains milkvetch.

BLM(71) Limit motorized uses in the Piute/Eldorado "Conserved Habitat" to designated roads and trails.

BLM(44) Close portions of the Red Rock Canyon NCA to vehicle use or limit use to designated roads and trails.

BLM(71) Limit motorized vehicles in WSAs to existing roads and trails as listed in inventory maps, or as otherwise authorized. Close unauthorized roads in WSAs.

BLM(76) Prohibit OHV competitions within Red Rock Canyon NCA.

BLM(108) Maintain the existing closure of 3,360 acres in the Muddy Mountains to all motorized and mechanized vehicles.

BLM(118) Do not allow competitive off-road vehicle events within ¼ mile of natural water sources and associated riparian areas.

BLM(48) Manage fires occurring in the WSAs to the lowest suppression intensity possible.

BLM(54) Require the use of a resource advisor for all fires within important habitats for covered and evaluation species.

BLM(51) Prohibit commercial collection of vegetative specimens within WSAs. Hobby collection may be allowed for personal use but not for commercial use, as long as the collection activity method meets the non-impairment criteria.

BLM(41) Prohibit commercial collection of cactus/yucca skeletons except in designated areas such as disposal areas, gravel pits, and sites associated with Federally approved

projects that will result in the loss of surface vegetation. Casual collection of cactus/yucca skeletons is prohibited in tortoise ACECs. Casual collection outside these areas will be discouraged.

BLM(95) Prohibit the cutting of firewood in Red Rock Canyon NCA. Elsewhere permits are required on a discretionary basis consistent with the protection of sensitive species.

BLM(79) Close WSAs to authorization/renewal of material site rights-of-way and mineral materials disposal until a decision is reached on their status.

BLM(89) Where feasible, proposals for saleable materials in essential habitats for special status species will be avoided.

BLM(96) Work with the Nevada Power Company and other utilities to modify existing powerline towers or poles to meet BLM standards for the prevention of raptor mortality (Olendorff et al. 1981 Raptor Research Report #4).

BLM(100) Manage caves to ensure that important bat roosting sites and hibernacula are not negatively impacted by recreational use. If gating is necessary to protect cave resources, ensure that the gates will allow for bat ingress and egress.

BLM(115) Manage all cave resources as wild systems, free from commercial or show cave type developments. Special Recreation Permits for commercially guided trips by qualified cave experts may be considered if environmental studies show that cave resources will not be impacted.

BLM(117) Protect key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey on public lands through mitigation of activities during National Environmental Policy Act compliance.

BLM(120) Determine water needs to meet management objectives. File for appropriative water rights on public and acquired lands in accordance with the State of Nevada water laws for those water sources that are not Federally reserved.

BLM(93) Using “best management practices” as identified by the State of Nevada, minimize contributions from both point and non-point sources of pollution (including salts) resulting from public land management actions. Where applicable, proposed management actions would comply with local, state, tribal and Federal air quality laws, regulations, and standards (Conformity; per 40 CFR 93.100 et seq.).

BLM(111) Prior to the disposal of identified public lands, an analysis will be conducted to determine their resource values, including the occurrence of Special Status Species and

sensitive habitats such as riparian and aquatic habitats. Land disposal will be consistent with conservation of special status species unless there is an overriding public benefit.

BLM(119) Close the Sunrise Mountain and Nellis Dunes Special Recreation Management Areas to casual recreational shooting in accordance with Clark County's designated no shooting zone.

BLM(301) Limit the construction of new roads for the development of utility lines within special status species habitat.

BLM(90) Provide protection (such as fencing) around springs and riparian habitats to prevent habitat degradation from excessive use by grazing animals.*

BLM(12) Identify, evaluate, manage and protect cave resources on public lands for the purpose of maintaining the unique, non-renewable, and fragile biological, scientific, and recreational values for present and future uses.*

BLM(103) Livestock grazing will be managed consistent with riparian objectives of reaching or maintaining proper functioning condition (PFC)*.

BLM(125) As grazing systems are developed for each allotment, ensure the system is consistent with the conservation of BLM special status species. Where conflicts occur, encourage Clark County to obtain grazing privileges on a willing seller basis.*

BLM(59) Manage wild horses and burros as necessary to maintain thriving ecological balance and consistent with the protection of special status species in important habitat areas.*

BLM(58,60) Wild horses and burros will be removed when herds have expanded beyond designated herd area boundaries or Appropriate Management Level is exceeded.*

BLM(98) Provide adequate law enforcement presence to ensure that management actions and restrictions are implemented for the conservation of covered and/or evaluation species.*

BLM(127,128) The livestock grazing program shall be managed to meet the Bureau's Standards and Guidelines as developed by the Southern Great Basin/Mojave Resource Advisory Committee.* The "standards" are listed below:

STANDARD 1. SOILS: Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity and sustain the hydrologic cycle.

STANDARD 2. ECOSYSTEM COMPONENTS: Watersheds should possess the necessary ecological components to achieve state water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristics of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

STANDARD 3. HABITAT AND BIOTA: Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

8.5.3.2 Restoration and Enhancement Measures

BLM(123) Within desert tortoise critical habitat/ACECs, Las Vegas bearpoppy habitat, and other important habitats for covered and evaluation species, require reclamation of activities which result in loss or degradation of habitat, with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. If necessary subsequent seeding or transplanting efforts may be required, should monitoring indicate that the original effort was not successful.

BLM(143) Rehabilitate, reclaim or revegetate areas subjected to surface-disturbing activities where feasible. When rehabilitating disturbed areas, first manage for optimum species diversity by seeding native species, except where non-native species are appropriate.*

BLM(303) Implement a program to rehab surface disturbances including the first hundred feet or so of "closed" roads and trails within proposed desert tortoise ACECs, Las Vegas bear poppy habitat, and other areas important for special status species.*

BLM(135) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following wildfires within areas important for the conservation of covered species and where the feasibility of success is reasonably certain.*

BLM(137) Cooperate with NPS, FS, USFWS, Clark County and others on a reclamation program which will include maintaining a seed bank and live plants for rehabilitation of disturbed or burned areas if necessary.*

BLM(109) In cooperation with NDOW, the USFWS, and ADC, monitor brown-headed cowbird and raven populations and implement population controls of these species where necessary for the conservation of covered species.*

BLM(140) Insure that all riparian areas (springs, seeps, and streams) are in proper functioning condition (PFC) as defined in the "Riparian-wetland Initiative for the 90s." Use appropriate measures as necessary to achieve PFC which may include fencing and/or the development of alternative water sources away from the riparian area.*

8.5.4 NPS

8.5.4.1 Protective Measures

NPS(22) Prohibit destructive collecting techniques such as breaking off rock flakes and rolling cap rocks to uncover lizards.

NPS(23) Monitor burro populations to ensure they stay within levels prescribed in the burro management plan.

NPS(24) Manage burro populations under the burro management plan to ensure resources are protected consistent with NPS policies.

NPS(25) Prohibit commercial collection of fauna and flora.

NPS(26) Implement Fire Management Plan, including prescribed natural fires on undeveloped portions of the Park.

NPS(27) Prohibit recreational shooting.

NPS(28) Implement NPS Integrated Pest Management Plan.

NPS(29) Prohibit woodcutting and shrub clearing and limit other human disturbance off existing roadways.

NPS(30) Remove feral animals and uncontrolled domestic animals.

NPS(31) Conduct NEPA review and analysis for development of new areas for intense recreational use.

NPS(32) Ensure that adequate law enforcement is implemented within the LMNRA.

NPS(34) Assure long-term implementation of existing management policies and actions benefiting Covered Species through amendment of the GMP.

NPS(35) Manage rock climbing, if necessary, to protect sensitive resources.

NPS(36) Enforce existing prohibition of collecting and deter poaching through increased routine ranger patrols.

NPS(37) Include MSHCP Covered Species as sensitive species in evaluations of road construction or maintenance activities on Federal lands.

NPS(38) Work with the Nevada Power Company (and other utilities) to be sure that support towers and poles are “raptor-safe.”

NPS(40) Install fencing or other protection of springs in identified sensitive habitat, where required to exclude cattle, wild horses, or burros.

NPS(42) Prohibit commercial OHV tours and events in IMAs and LIMAs.

8.5.4.2 Restoration and Enhancement Measures

NPS(43) Where appropriate, implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the LMNRA.

NPS(48) Continue to monitor brown-headed cowbird populations and initiate control by trapping and removing the offending cowbirds, when and if this becomes necessary.

NPS(50) Restore/rehabilitate all key access points of closed roads and areas, except Road 106 and 1B, which were closed due to road hazards and not resource damage.

8.6 Adequacy of Existing Management

About 65.0 percent of the habitat is within IMAs and LIMAs (DNWR, BLM WSA, NCA, and critical habitat, Spring Mountains NRA, USFS wilderness and WSA, and Lake Mead NRA) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. Approximately 33.9 percent of the habitat is in MUMA (BLM undesignated lands), and may be used for multiple use activities, within the constraints of existing BLM policies for management of these activities. Approximately 1.1 percent is UMA (privately held and USAF ISAFAF) and may be used for more intensive uses.

Implementation of existing USFWS and BLM management actions, the provisions of the BLM Las Vegas RMP, and the CA for the Spring Mountains NRA (see Section 2.8) will adequately address the ecosystem level threats to Covered Species within the sagebrush habitat, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

8.7 MSHCP Conservation Contributions

The blackbrush habitat and the 11 Covered Species it supports will benefit from the MSHCP through general public education and information programs. Additional benefits will derive from the purchase, maintenance, and management of grazing allotments; water rights; potential funding or assistance in inventory, monitoring, and management activities that result from the recommendations of the AMP and land managers, and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

Chapter 9 Salt Desert Scrub Ecosystem

9.1 Description and Distribution

In Clark County the salt desert scrub ecosystem (208,600 acres) occurs between 3,250 feet and 5,800 feet elevation and is found in a mosaic pattern within stands of creosote-bursage and blackbrush communities (Figure 9-1, Table 9-1). Saltbush is commonly found on playas, intermountain basins, and localized depressions where poorly draining, silty loam soils develop into desert pavement. The salt desert scrub ecosystem is composed of playa (barren, undrained desert basins), areas of urban development, and salt desert scrub vegetation.

TABLE 9-1
VEGETATION COMMUNITIES IN THE SALT DESERT SCRUB ECOSYSTEM

Vegetation Type	Acres	% of Habitat
Playa	16,800	8.1
Urban	1,000	<1.0
Salt desert scrub	190,700	91.4
Habitat Total	190,700	91.4
Ecosystem Total	208,600	100.0

Broad, abundant shrubland occurring below 5,000 feet, salt desert scrub (USU Code 50; CA WHR Code ASC–Alkali Desert Scrub) is principally dominated by one or more of the following: shadscale (*Atriplex confertifolia*), desert holly (*Atriplex hymenelytra*), Bailey’s greasewood (*Sarcobatus baileyi*), desert thorn (*Lycium* spp.), Torrey saltbush (*Atriplex torreyi*), winterfat (*Ceratoides lanata*), bursage (*Artemisia spinescens*), fourwing saltbush (*Atriplex canescens*), mormon tea (*Ephedra* spp.), horsebrush (*Tetradymia canescens*), and snakeweed (*Gutierrezia sarothrae*). Other primary shrubs include greasewood (*Sarcobatus vermiculatus*), sagebrush (*Artemisia* spp.), blackbrush (*Coleogyne ramosissima*), iodine bush (*Allenrolfea occidentalis*), and creosote (*Larrea tridentata*). Primary associated forbs include halogeton (*Halogeton glomeratus*). Primary associated grasses include saltgrass (*Distichlis spicata*) and cheat grass (*Bromus tectorum*).

The majority (62.3%) of the habitat is found within DNWR/NAFR (118,800 acres), managed by the USFWS. BLM manages 48,700 acres (25.5%) of the total habitat. Of this, 2,000 acres (1.0%) are within conserved habitat (Piute-Eldorado) and 700 acres are in critical habitat; 5,100 acres (2.6%) are within the Red Rock Canyon NCA; and 1,400 acres are within WSAs (La Madre, Mount Stirling, and Muddy Mountains). The remaining 39,500 acres (20.7%) of habitat are within BLM undesignated management areas (Las Vegas Valley, Jean/Roach Lake). An additional 18,500 acres (9.7%) are in private landholdings. Other than the DNWR and areas on the north side of the Spring Mountains, the habitat is patchy and widely dispersed across the plan area.

9.2 MSHCP Species

The salt desert scrub ecosystem provides habitat for 17 Covered Species and 4 High Priority Evaluation Species.

Covered Species:

Silver-haired bat	<i>Lasionycteris noctivagans</i>
Long-eared myotis	<i>Myotis evotis</i>
Desert tortoise	<i>Gopherus agassizii</i>
Desert iguana	<i>Dipsosaurus dorsalis</i>
Western chuckwalla	<i>Sauromalus obesus obesus</i>
Great Basin collared lizard	<i>Crotaphytus insularis bicinctores</i>
Large-spotted leopard lizard	<i>Gambelia wislizenii wislizenii</i>
California (common) kingsnake	<i>Lampropeltis getulus californiae</i>
Glossy snake	<i>Arizona elegans</i>
Western long-nosed snake	<i>Rhinocheilus lecontei lecontei</i>
Western leaf-nosed snake	<i>Phyllorhynchus decurtatus</i>
Sidewinder	<i>Crotalus cerastes</i>
Sticky ringstem	<i>Anulocaulis leisolenus</i>
Las Vegas bearpoppy	<i>Arctomecon californica</i>
White bearpoppy	<i>Arctomecon merriamii</i>
Forked (Pahrump Valley) buckwheat	<i>Eriogonum bifurcatum*</i>
Parish's phacelia	<i>Phacelia parishii*</i>

High Priority Evaluation Species:

Kit fox	<i>Vulpes macrotus</i>
Desert kangaroo rat	<i>Dipodomys deserti</i>
Desert pocket mouse	<i>Chaetodipus penicillatus sobrinus</i>
Southern desert horned lizard	<i>Phrynosoma platyrhinos calidiarum</i>

*Salt desert scrub dependent species.

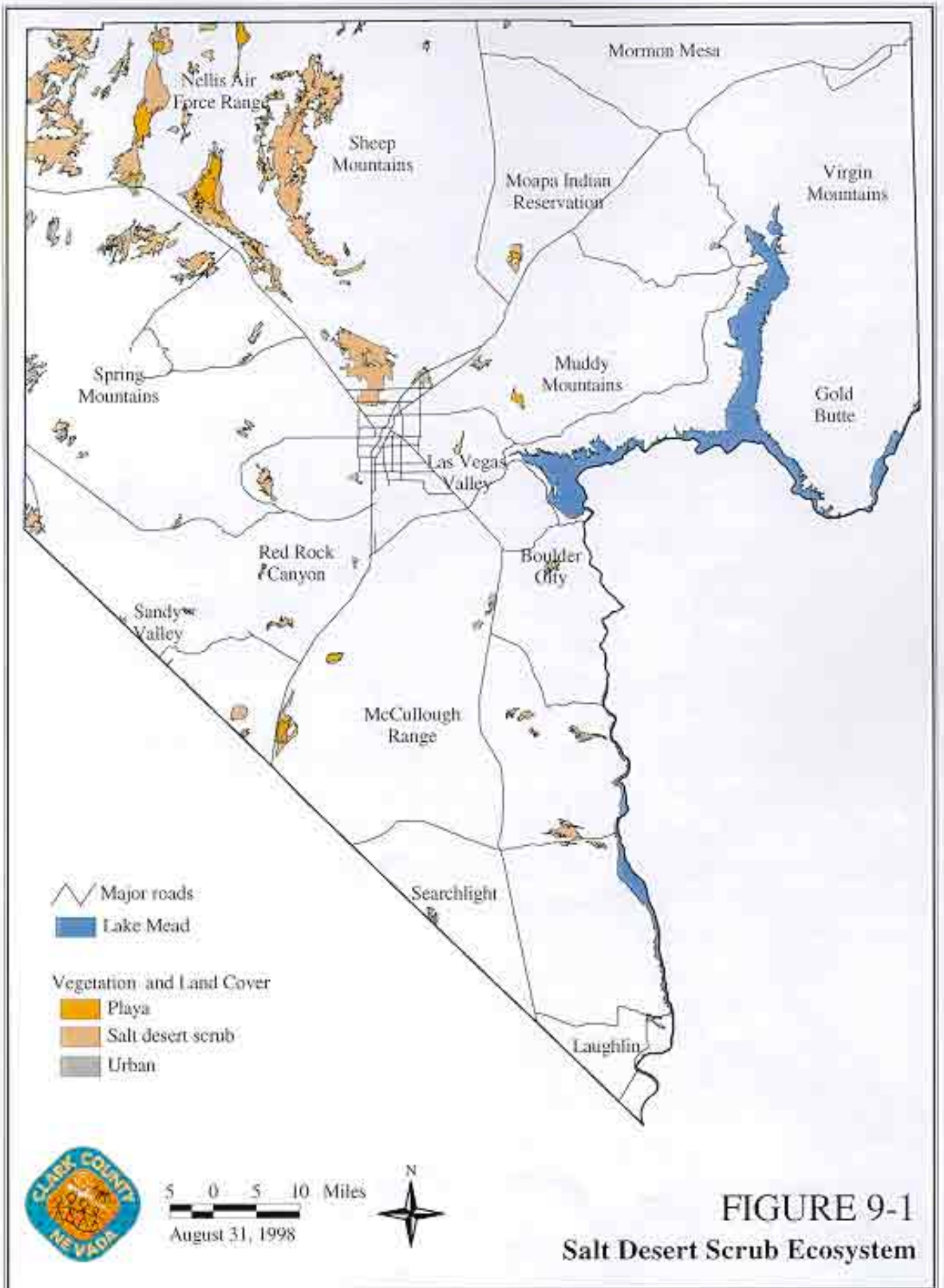


FIGURE 9-1
Salt Desert Scrub Ecosystem

9.3 Potential Threats and Stressors

The existing management policies and actions for each agency are derived from the BLM MFP and IMP for WSAs; the Interim GMP for the Red Rock Canyon NCA; the IMP for Special Status Plants; the GMP and RMP for the Lake Mead NRA; and the Boulder City Conservation Easement. References to LAME-N-000 programs are current programs within the Lake Mead RMP. Additional policies for the DNWR and State Parks were provided by those agencies. The Desert Conservation Plan also has policies and actions that pertain to desert tortoise habitat managed by the BLM and NPS.

The primary ecosystem level threats and stressors in salt desert scrub are:

- Commercial collection (reduction of populations **Threat 201**, habitat degradation **Threat 202**)
- Fires and fire management (habitat degradation **Threat 301**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, concentrated recreation **Threat 402**, competitive OHV races **Threat 403**, casual use OHV activities **Threat 404**, rock climbing **Threat 405**, indiscriminate recreational shooting **Threat 406**, spelunking **Threat 407**)
- Highways, roads, and trails (highway mortality **Threat 501**, habitat fragmentation **Threat 503**, road construction and maintenance **Threat 504**)
- Pest control (direct or indirect poisoning or trapping **Threat 601**, pesticides and herbicides **Threat 602**)
- Grazing (wild horse and burro grazing and trampling **Threat 701**, competition with cattle and equids **Threat 702**, livestock grazing and trampling **Threat 703**)
- Military activities (target sites, roads, or other military access locations **Threat 801**, military facilities construction and maintenance **Threat 802**)
- Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**, toxic waste ponds **Threat 903**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**, landfills **Threat 1103**)
- Utilities (provision of perch sites for ravens **Threat 1203**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**)
- Exotic and introduced species (introductions, competition, and encroachment of exotic species **Threat 1501**, subsidized and parasitic species **Threat 1502**)
- Illegal or unauthorized activities (poaching, illegal collection, or killing of flora and fauna **Threat 1701**, illegal waste ponds, dumping, and waste disposal **Threat 1702**, introduction of an upper respiratory disease to wild desert tortoise populations possibly caused by the release of captive desert tortoises **Threat 1704**)

9.4 Salt Desert Scrub Habitat Management

Intensively Managed Areas: Habitat within the DNWR and adjoining USAF lands managed by the USFWS, BLM WSAs, and NPS LMNRA comprise 112,300 acres (58.9%) of the habitat (Figure 9-2, Table 9-2). These areas are Wilderness Study Areas and are managed for no loss of wilderness values as well as protection of habitat quality and sensitive species. An additional 2,700 acres (1.4%) are within BLM conserved/critical habitat for the desert tortoise. Habitat within these areas are also managed to the benefit of co-occurring Covered Species and maintenance of habitat quality.

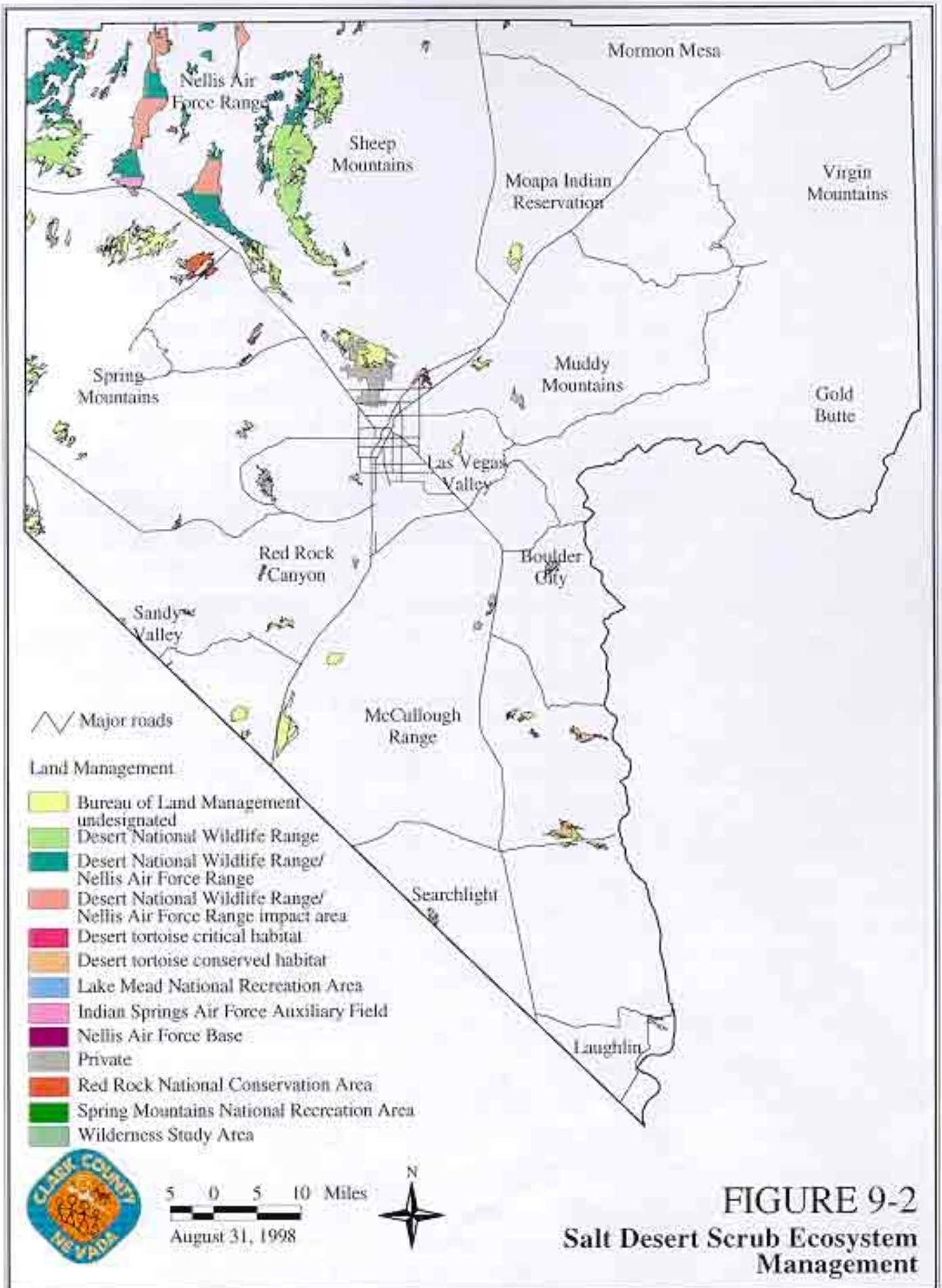
Less Intensively Managed Areas: Approximately 5,500 acres (2.8%) of the habitat is within the Red Rock Canyon NCA or SMNRA. An additional 13,500 acres (7.1%) are managed by the USFWS/USAF within the DNWR/NAFR. These areas are managed for conservation but also include public recreation as a focus.

Multiple Use Managed Areas: BLM lands that are under general multiple use management comprise 39,500 acres (20.7%). The largest block of habitat is in the north Las Vegas Valley.

Un-Managed Areas: Privately held habitat totals 18,500 acres (9.7%).

**TABLE 9-2
MANAGEMENT OF HABITAT IN THE SALT DESERT SCRUB ECOSYSTEM**

Category	Manager	Management Classification	Acres	% of Habitat
IMA	BLM	Conserved Habitat	2,000	1.0
		Critical Habitat	700	<1.0
		WSA	1,400	<1.0
	NPS	Conserved Habitat	2,800	1.4
	USFWS	Wildlife Range	53,600	28.1
	USFWS/USAF	DNWR/NAFR	51,700	27.1
IMA Total			112,300	58.8
LIMA	BLM	NCA	5,100	2.6
	USFS	SMNRA	400	<1.0
	USFWS/USAF	DNWR/NAFR	13,500	7.1
LIMA Total			19,000	9.9
MUMA	BLM	Undesignated	39,500	20.7
	NPS	Lake Mead NRA	100	<1.0
MUMA Total			39,600	20.7
UMA	Private		18,500	9.7
	USAF	ISAF/NAFB	1,300	<1.0
UMA Total			19,800	10.3
Grand Total			190,700	100.0



9.5 Existing and Proposed Conservation Actions

Of the total of 190,700 acres of salt desert scrub habitat, 62.2 percent is managed by USFWS (DNWR and NAFR), 25.5 percent by BLM (undesignated, WSA, NCA, and conserved habitat), 1.5 percent by NPS (Lake Mead NRA), and less than 1 percent by USFS (Spring Mountains NRA). Private holdings and portions of the USAF ISAF and NAFB total 11 percent.

Approximately 56.0 percent of the 190,700 acres of salt desert scrub habitat is managed for primitive, non-motorized, dispersed recreational use (wilderness, WSA, or DNWR). An additional 7.0 percent of the habitat is managed by USFWS in the DNWR and is very restricted in access but is within impact areas used by the USAF. BLM undesignated lands (20.7 percent) are managed to balance multiple uses, including mining, OHV activities, grazing, and other activities with maintenance of ecosystem and species values. The 2.9 percent of the habitat located within the Spring Mountains NRA and Red Rock Canyon NCA is managed for both conservation and a broader spectrum of recreational uses, including intensive recreational use areas, developed camping areas, hiking and biking trails, rock climbing areas, and designated motorized vehicle use roads and trails. Both of these areas are closed to new mining, livestock grazing, and off-road motorized recreational vehicle use and are actively managed for habitat conservation.

9.5.1 USFWS

9.5.1.1 Protective Measures

USFWS(12) Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).

USFWS(13) Adopt and implement policies to protect plant species from dispersed or unregulated recreation (DNWR).

USFWS(18) Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(20) Minimize clearing of undergrowth in construction of new facilities within the DNWR (DNWR).

USFWS(21) Prohibit access to caves for recreation (DNWR).

USFWS(22) Prohibit horses, burros, and livestock grazing (DNWR).

USFWS(23) Coordinate with the U.S. Air Force to minimize the footprint on the ground for congressionally mandated ordnance impacts (DNWR).

USFWS(24) Prohibit highway and road construction on the Refuge (DNWR).

USFWS(25) Retrofit roads to permit ingress and egress for a broad range of organisms (DNWR).

USFWS(26) Conduct biological surveys prior to road maintenance and retrofit activities, (DNWR).

USFWS(27) Ensure that roads are engineered to adequately spread runoff to minimize erosion (DNWR).

USFWS(28) Ensure that adequate law enforcement and ranger patrolling is implemented within the DNWR (DNWR).

USFWS(29) Develop a conservation agreement for white-margined beardtongue (penstemon) (Ecological Services).

USFWS(30) Implement the memorandum of agreement between USFWS and managing agencies for Las Vegas bearpoppy (Ecological Services).

9.5.1.2 Restoration and Enhancement Measures

USFWS(36) Expand the seed bank program to include populations in the Sheep Mountains areas (DNWR).

USFWS(38) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the DNWR (DNWR).

USFWS(39) If proposed actions will result in surface disturbance near a population of white bearpoppy, remove soil with seed source and relocate to a potential habitat site and monitor over time (DNWR).

USFWS(40) Restore/rehabilitate all key access points of closed roads and areas (DNWR).

9.5.2 BLM

9.5.2.1 Protective Measures

BLM(39) Prohibit collection of plants, animals, and mineral materials in Red Rock Canyon NCA without a permit.

BLM(57) Allow backcountry camping only in designated areas of Red Rock Canyon NCA.

BLM(97) Restrict mountain bikes and other mechanized non-motorized vehicles to designated trails within the RRCNCA and only allow new trails consistent with the conservation of BLM sensitive species, including the Spring Mountains milkvetch.

BLM(71) Limit motorized uses in the Piute/Eldorado "Conserved Habitat" to designated roads and trails.

BLM(44) Close portions of the Red Rock Canyon NCA to vehicle use or limit use to designated roads and trails.

BLM(71) Limit motorized vehicles in WSAs to existing roads and trails as listed in inventory maps, or as otherwise authorized. Close unauthorized roads in WSAs.

BLM(76) Prohibit OHV competitions within Red Rock Canyon NCA.

BLM(54) Require the use of a resource advisor for all fires within important habitats for covered and evaluation species.

BLM(51) Prohibit commercial collection of vegetative specimens within WSAs. Hobby collection may be allowed for personal use but not for commercial use, as long as the collection activity method meets the non-impairment criteria.

BLM(41) Prohibit commercial collection of cactus/yucca skeletons except in designated areas such as disposal areas, gravel pits, and sites associated with Federally approved projects that will result in the loss of surface vegetation. Casual collection of cactus/yucca skeletons is prohibited in tortoise ACECs. Casual collection outside these areas will be discouraged.

BLM(95) Prohibit the cutting of firewood in Red Rock Canyon NCA. Elsewhere permits are required on a discretionary basis consistent with the protection of sensitive species.

BLM(79) Close WSAs to authorization/renewal of material site rights-of-way and mineral materials disposal until a decision is reached on their status.

BLM(89) Where feasible, proposals for saleable materials in essential habitats for special status species will be avoided.

BLM(96) Work with the Nevada Power Company and other utilities to modify existing powerline towers or poles to meet BLM standards for the prevention of raptor mortality (Olendorff et al. 1981 Raptor Research Report #4).

BLM(117) Protect key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey on public lands through mitigation of activities during National Environmental Policy Act compliance.

BLM(93) Using “best management practices” as identified by the State of Nevada, minimize contributions from both point and non-point sources of pollution (including salts) resulting from public land management actions. Where applicable, proposed management actions would comply with local, state, tribal and Federal air quality laws, regulations, and standards (Conformity; per 40 CFR 93.100 et seq.).

BLM(99) Enter into conservation agreements or easements with the U.S. Fish and Wildlife Service and the State of Nevada, that if implemented, could reduce the necessity of future listings of the species in question. Conservation agreements may include, but not be limited to, the following: Las Vegas bearpoppy, white-margined penstemon, and phainopepla.

BLM(111) Prior to the disposal of identified public lands, an analysis will be conducted to determine their resource values, including the occurrence of Special Status Species and sensitive habitats such as riparian and aquatic habitats. Land disposal will be consistent with conservation of special status species unless there is an overriding public benefit.

BLM(119) Close the Sunrise Mountain and Nellis Dunes Special Recreation Management Areas to casual recreational shooting in accordance with Clark County's designated no shooting zone.

BLM(107) Allow no net loss of Las Vegas bearpoppy habitat on Public Land from Federally approved projects through mitigative actions including avoidance and rehabilitation.

BLM(301) Limit the construction of new roads for the development of utility lines within special status species habitat.

BLM(59) Manage wild horses and burros as necessary to maintain thriving ecological balance and consistent with the protection of special status species in important habitat areas.*

BLM(58,60) Wild horses and burros will be removed when herds have expanded beyond designated herd area boundaries or Appropriate Management Level is exceeded.*

BLM(98) Provide adequate law enforcement presence to ensure that management actions and restrictions are implemented for the conservation of covered and/or evaluation species.*

BLM(127,128) The livestock grazing program shall be managed to meet the Bureau's Standards and Guidelines as developed by the Southern Great Basin/Mojave Resource Advisory Committee.* The "standards" are listed below:

STANDARD 1. SOILS: Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity and sustain the hydrologic cycle.

STANDARD 2. ECOSYSTEM COMPONENTS: Watersheds should possess the necessary ecological components to achieve state water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristics of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

STANDARD 3. HABITAT AND BIOTA: Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

9.5.2.2 Restoration and Enhancement Measures

BLM(123) Within desert tortoise critical habitat/ACECs, Las Vegas bearpoppy habitat, and other important habitats for covered and evaluation species, require reclamation of activities which result in loss or degradation of habitat, with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling

shrubs. If necessary subsequent seeding or transplanting efforts may be required, should monitoring indicate that the original effort was not successful.

BLM(143) Rehabilitate, reclaim or revegetate areas subjected to surface-disturbing activities where feasible. When rehabilitating disturbed areas, first manage for optimum species diversity by seeding native species, except where non-native species are appropriate.*

BLM(303) Implement a program to rehab surface disturbances including the first hundred feet or so of "closed" roads and trails within proposed desert tortoise ACECs, Las Vegas bear poppy habitat, and other areas important for special status species.*

BLM(135) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following wildfires within areas important for the conservation of covered species and where the feasibility of success is reasonably certain.*

BLM(137) Cooperate with NPS, FS, USFWS, Clark County and others on a reclamation program which will include maintaining a seed bank and live plants for rehabilitation of disturbed or burned areas if necessary.*

BLM(304) Maintain and/or improve 45,750 acres of Las Vegas bearpoppy habitat in four bear poppy management areas: Sunrise, Lovell Wash, Bitter Spring, and Gold Butte. Protect Las Vegas bearpoppy habitat within the Apex land sale area in cooperation with Clark County.*

9.5.3 USAF

9.5.3.1 Protective Measures

USAF(9) Coordinate with DNWR to minimize the footprint on the ground for actual ordnance impact, remediate upland sites no longer used, control aerial overflights to specific routes and elevation, and provide support for investigative activities on NAFR.

USAF(10) Create a Special Botanical Area for Las Vegas bearpoppy on NAFB.

USAF(11) Work with the Nature Conservancy to evaluate the need for long-term protection of Parish's phacelia, white bearpoppy, and other rare taxa occurring on NAFB.

USAF(12) Prohibit collection of fauna and flora on any NAFR, NAFB, NSAR, and ISAFAF.

USAF(13) Prohibit outdoor recreation on NAFR, NAFB, NSAR, and ISAFAF except for providing access for hunting on the DNWR.

USAF(14) There are no highways on NAFB, NAFR, NSAR, and ISAFAF.

USAF(15) Fence and patrol NAFB, NAFR, and NSAR, and ISAFAF to limit and restrict access.

USAF(16) Require base personnel and contractors who could impact desert tortoise and other natural resources to participate in conservation awareness training.

USAF(17) Prohibit off-road travel, except for the clean-up of target sites.

USAF(18) No pesticides are used on the NSAR or NAFR. Pesticide use on the NAFB and ISAFAF is in compliance with an Integrated Pest Management Plan.

USAF(19) Prohibit livestock grazing on NAFB, NAFR, NSAR, and ISAFAF. Wild horses and burros straying onto NAFR are removed.

USAF(20) Re-use existing target sites on NAFR to the extent practicable.

USAF(21) Prohibit mining on NAFR, NAFB, NSAR, and ISAFAF.

USAF(22) Avoid future development on the NAFB in Las Vegas bearpoppy areas identified for protection in the memorandum of agreement.

USAF(23) Remove all domestic waste off-site to the Clark County Landfill. The onsite landfill contains only construction waste and is fenced.

9.5.3.2 Restoration and Enhancement Measures

USAF(24) Eradicate tamarisk or other exotic plants as appropriate.

9.5.4 NPS

9.5.4.1 Protective Measures

NPS(21) Implement the conservation agreement between USFWS and managing agencies for Las Vegas bearpoppy.

NPS(22) Prohibit destructive collecting techniques such as breaking off rock flakes and rolling cap rocks to uncover lizards.

NPS(23) Monitor burro populations to ensure they stay within levels prescribed in the burro management plan.

NPS(24) Manage burro populations under the burro management plan to ensure resources are protected consistent with NPS policies.

NPS(25) Prohibit commercial collection of fauna and flora.

NPS(26) Implement Fire Management Plan, including prescribed natural fires on undeveloped portions of the Park.

NPS(27) Prohibit recreational shooting.

NPS(28) Implement NPS Integrated Pest Management Plan.

NPS(30) Remove feral animals and uncontrolled domestic animals.

NPS(31) Conduct NEPA review and analysis for development of new areas for intense recreational use.

NPS(32) Ensure that adequate law enforcement is implemented within the LMNRA.

NPS(34) Assure long-term implementation of existing management policies and actions benefiting Covered Species through amendment of the GMP.

NPS(36) Enforce existing prohibition of collecting and deter poaching through increased routine ranger patrols.

NPS(37) Include MSHCP Covered Species as sensitive species in evaluations of road construction or maintenance activities on Federal lands.

NPS(38) Work with the Nevada Power Company (and other utilities) to be sure that support towers and poles are “raptor-safe.”

NPS(42) Prohibit commercial OHV tours and events in IMAs and LIMAs.

9.5.4.2 Restoration and Enhancement Measures

NPS(43) Where appropriate, implement reseedling with native plant species and other soil Stabilization and habitat restoration actions following fires within the LMNRA.

NPS(50) Restore/rehabilitate all key access points of closed roads and areas, except Road 106 and 1B, which were closed due to road hazards and not resource damage.

9.6 Adequacy of Existing Management

About 68.8 percent of the habitat is within IMAs and LIMAs (DNWR, NAFR, BLM NCA, WSA, and critical habitat, Spring Mountains NRA, and Lake Mead NRA) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. Approximately 20.7 percent of the habitat is in MUMA (BLM undesignated lands), and may be used for multiple use activities, within the constraints of existing BLM policies for management of these activities. Approximately 10.4 percent is UMA (privately held and USAF ISAFAF and NAFB) and may be used for more intensive activities.

Implementation of existing USFWS and BLM management actions, the provisions of the BLM Las Vegas RMP, and the CA for the Spring Mountains NRA (see Section 2.8) will adequately address the ecosystem level threats to Covered Species within the salt desert scrub habitat, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

9.7 MSHCP Conservation Contributions

The salt desert scrub habitat and the 17 Covered Species it supports will benefit from the MSHCP through general public education and information programs; potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

Chapter 10 Mojave Desert Scrub Ecosystem

10.1 Description and Distribution

The Mojave desert is the smallest of the four North American deserts and is intermediate both geographically and floristically between the Great Basin desert to the north and the Sonoran desert to the south (Turner 1982). Although smaller than the other desert biomes, it is the most widespread ecosystem in Clark County. Shrublands in this ecosystem occur below 4,000 feet and include two major plant communities, Mojave mixed scrub and creosote-bursage (Figure 10-1, Table 10-1). The Mojave desert scrub ecosystem includes creosote-bursage and Mojave mixed scrub vegetation communities, invasive, transitional grasslands, as well as, large tracts of urban development; and small areas of barren land; and agricultural development.

TABLE 10-1
VEGETATION COMMUNITIES IN THE MOJAVE DESERT SCRUB ECOSYSTEM

Vegetation Type	Acres	% of Ecosystem
Creosote-bursage	2,456,000	70.8
Mojave mixed scrub	817,100	23.6
Grasslands	2000	<1.0
Urban	190,400	5.5
Agricultural	600	<1.0
Barren land	400	<1.0
Habitat Total	3,273,100	94.4
Ecosystem Total	3,466,500	100.0

10.1.1 Mojave Mixed Scrub Community

Scrublands (USU Code 45; CA WHR Code DSC–Desert Scrub), characterized by the occurrence of creosote (*Larrea tridentata*), in association with bursage (*Ambrosia dumosa*), indigo bush (*Psoralea fremontii*), desert thorn (*Lycium* spp.), shadscale (*Atriplex confertifolia*), hopsage (*Grayia spinosa*), ratany (*Krameria erecta*), and mormon tea (*Ephedra* spp.), typically on slopes, washes, or upland areas in the Mojave desert. Primary associated shrubs include blackbrush (*Coleogyne ramosissima*), brittlebush (*Encelia farinosa*), burro bush (*Hymenoclea salsola*), bebbia (*Bebbia juncea*), desert

saltbush (*Atriplex polycarpa*), and desert holly (*Atriplex hymenelytra*). Other associated species include Joshua tree (*Yucca brevifolia*), yucca (*Yucca* spp.), teddybear cholla (*Opuntia bigelovii*), and hedgehog cacti (*Echinocereus* spp.).

10.1.2 Creosote-Bursage Community

This shrubland association, (USU Code 41; CA WHR Code DSC–Desert Scrub), is the most widespread in Clark County and occurs below 4,000 feet in valley bottoms and lowlands of mild slope aspect. It is principally dominated by creosote (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Primary associated shrub species include blackbrush (*Coleogyne ramosissima*), mormon tea (*Ephedra* spp.), indigo bush (*Psoralea fremontii*), shadscale (*Atriplex confertifolia*), hopsage (*Grayia spinosa*), desert thorn (*Lycium* spp.), ratany (*Krameria erecta*), burro bush (*Hymenoclea salsola*), honey mesquite (*Prosopis glandulosa*), and brittlebush (*Encelia farinosa*). Other associated species include Joshua tree (*Yucca brevifolia*), yucca (*Yucca* spp.), and prickly pear (*Opuntia basilaris*).

10.2 MSHCP Species

The Mojave desert scrub ecosystem provides habitat for 23 Covered Species and 8 High Priority Evaluation Species.

Covered Species:

Desert tortoise	<i>Gopherus agassizii</i>
Banded gecko	<i>Coleonyx variegatus</i>
Desert iguana	<i>Dipsosaurus dorsalis</i>
Western chuckwalla	<i>Sauromalus obesus obesus</i>
Great Basin collared lizard	<i>Crotaphytus insularis bicinctores</i>
Large-spotted leopard lizard	<i>Gambelia wislizenii wislizenii</i>
California (common) kingsnake	<i>Lampropeltis getulus californiae</i>
Glossy snake	<i>Arizona elegans</i>
Western long-nosed snake	<i>Rhinocheilus lecontei lecontei</i>
Western leaf-nosed snake	<i>Phyllorhynchus decurtatus</i>
Sonoran lyre snake	<i>Trimorphodon biscutatus lambda</i>
Sidewinder	<i>Crotalus cerastes</i>
Speckled rattlesnake	<i>Crotalus mitchelli</i>
Mojave green rattlesnake	<i>Crotalus scutulatus scutulatus</i>
Blue Diamond cholla	<i>Opuntia whipplei</i> var. <i>multigeniculata</i>
Sticky ringstem	<i>Anulocaulis leisolenus</i>
Las Vegas bearpoppy	<i>Arctomecon californica</i>
White bearpoppy	<i>Arctomecon merriamii</i>
Threecorner milkvetch	<i>Astragalus geyeri</i> var. <i>triquetrus</i>
Spring Mountains milkvetch	<i>Astragalus remotus</i> *
Alkali mariposa lily	<i>Calochortus striatus</i>
Sticky buckwheat	<i>Eriogonum viscidulum</i>
White-margined beardtongue (penstemon)	<i>Penstemon albomarginatus</i>

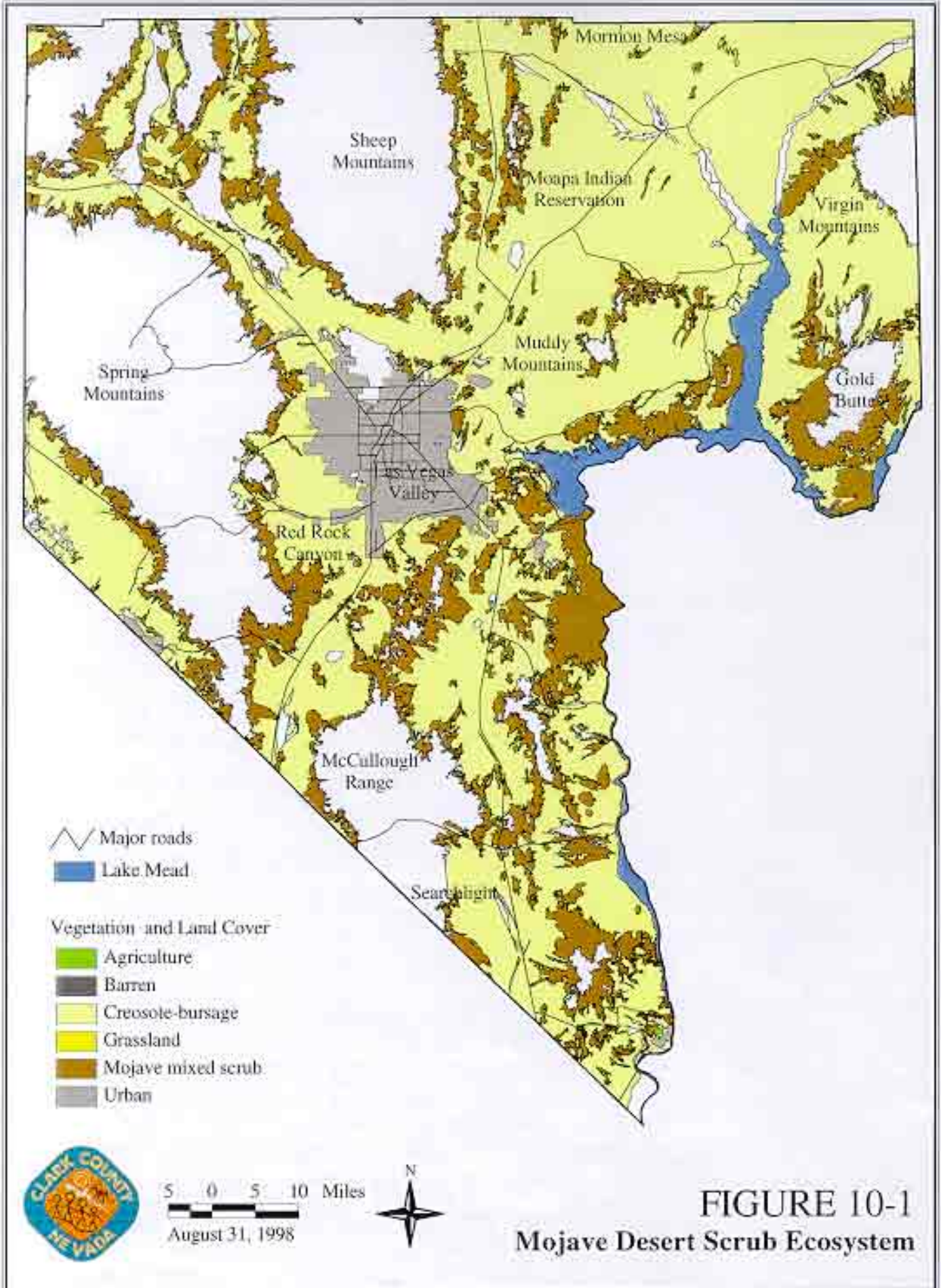


FIGURE 10-1
Mojave Desert Scrub Ecosystem

High Priority Evaluation Species:

Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>
Kit fox	<i>Vulpes macrotus</i>
Desert kangaroo rat	<i>Dipodomys deserti</i>
Desert pocket mouse	<i>Chaetodipus penicillatus sobrinus</i>
Western burrowing owl	<i>Athene cunicularia hypugea</i>
Banded Gila monster	<i>Heloderma suspectum cinctum</i>
Southern desert horned lizard	<i>Phrynosoma platyrhinos calidiarum</i>
Yellow twotone beartongue	<i>Penstemon bicolor ssp. bicolor</i>

*Mojave mixed scrub only.

10.3 Potential Threats and Stressors

This lowland ecosystem is the most extensive in Clark County and has a wide range of potential threats and stressors. It is the primary ecosystem type for desert tortoise, comprising over one-half of its range and encompassing the majority of conserved and critical habitat. The primary ecosystem level threats and stressors in Mojave desert scrub are:

- Commercial collection (reduction of populations **Threat 201**, habitat degradation **Threat 202**)
- Fires and fire management (vegetation community conversion **Threat 302**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, concentrated recreation **Threat 402**, competitive OHV races **Threat 403**, casual use OHV activities **Threat 404**, rock climbing **Threat 405**, indiscriminate recreational shooting **Threat 406**, spelunking **Threat 407**)
- Highways, roads, and trails (highway mortality **Threat 501**, habitat fragmentation **Threat 503**, road construction and maintenance **Threat 504**)
- Pest control (direct or indirect poisoning or trapping **Threat 601**, pesticides and herbicides **Threat 602**)
- Grazing (wild horse and burro grazing and trampling **Threat 701**, competition with cattle and equids **Threat 702**, livestock grazing and trampling **Threat 703**)
- Military activities (target sites, roads, or other military access locations **Threat 801**, military facilities construction and maintenance **Threat 802**)
- Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**)
- Woodcutting, (wood removal, snag collection **Threat 1001**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**, landfills **Threat 1103**)
- Utilities (facility construction and maintenance **Threat 1202**, provision of perch sites for ravens **Threat 1203**)
- Water development, use, and flood control in riparian areas (water diversion and groundwater pumping **Threat 1302**)

- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**)
- Exotic and introduced species (introductions, competition, and encroachment of exotic species **Threat 1501**, subsidized and parasitic species **Threat 1502**, increased risk of fire due to exotic plants **Threat 1503**)
- Feral animals (feral animals and uncontrolled pets **Threat 1601**)
- Illegal or unauthorized activities (poaching, illegal collection, or killing of flora and fauna **Threat 1701**)

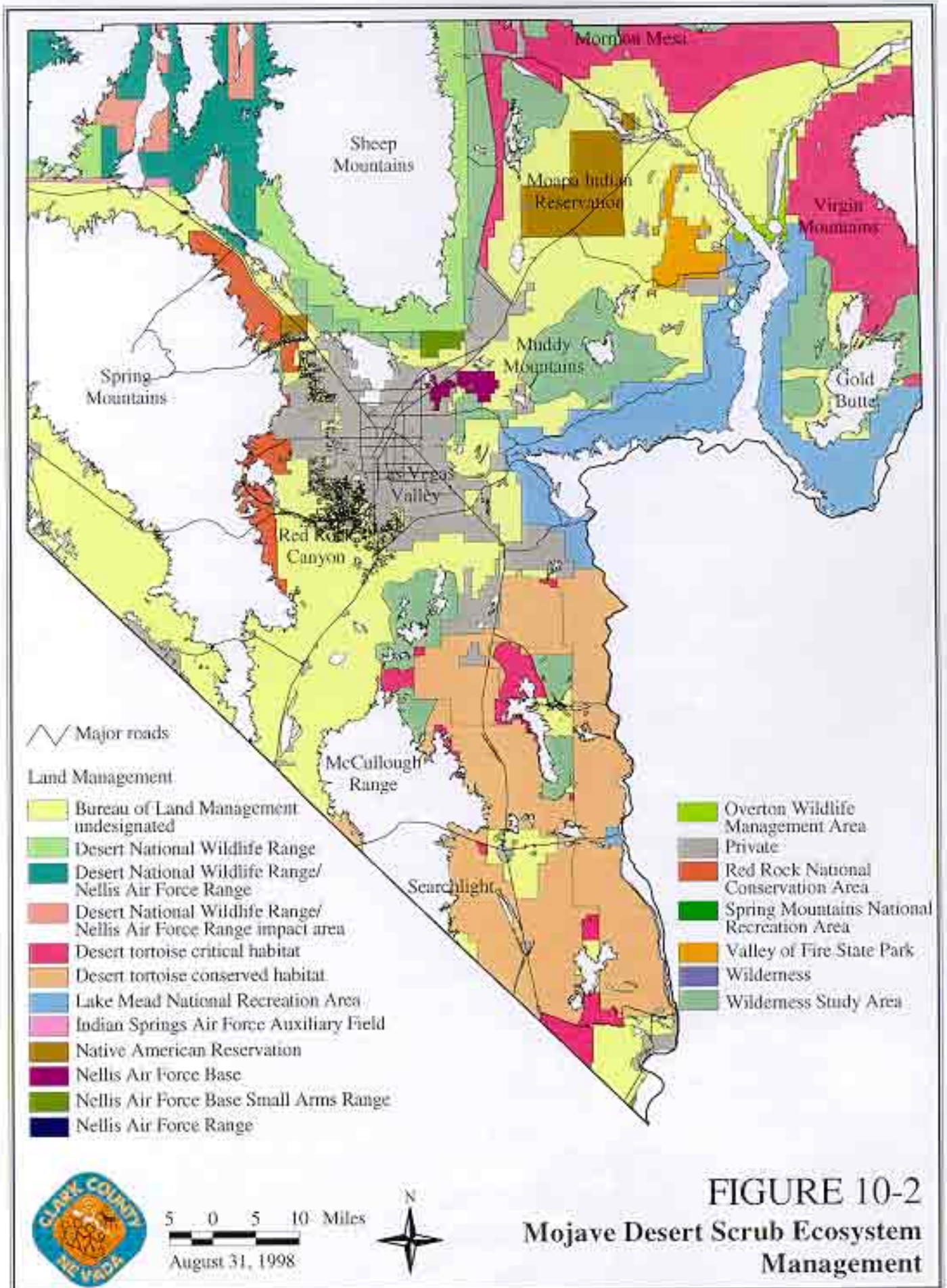
10.4 Mojave Desert Scrub Habitat Management

Intensively Managed Areas: Approximately 1,770,600 acres (54.0% of the total habitat) is within IMAs, including conserved or critical habitat for the desert tortoise and WSAs managed by BLM, the DNWR, NPS LMNRA, and the Boulder City Conservation Easement area (Figure 10-2, Table 10-2). The conserved and critical habitat managed by BLM comprises 594,000 acres (18.1%). The BLM conserved habitat is actively managed for desert tortoise. BLM critical habitat is subject to the DCP agreement but is not otherwise actively managed for conservation. In addition, the DNWR and adjacent USFWS/USAF use lands comprise 303,200 acres (9.3%) and the Boulder City Conservation Easement for desert tortoise adds 86,700 acres (2.6%), which also benefits other Covered Species. BLM WSAs comprise 340,500 acres (10.4%) and the state of Nevada maintains 32,400 acres (1.0%), which managed to maintain current wilderness values.

Less Intensively Managed Areas: BLM has jurisdiction over 59,800 acres (1.8%) within the Red Rock Canyon NCA, which includes habitat for the alkali mariposa lily. While these areas have public recreation as a focus, conservation of habitat and sensitive species are also included in the management policies.

Multiple Use Managed Areas: BLM multiple use areas cover 1,109,600 acres (33.9%), which do not have specialized management for habitat or plants and wildlife. Some of these areas, such as Jean Lake, do incorporate management actions including fencing of springs with sensitive species, exclosure of an 80-acre area of white-margined penstemon habitat, and a grazing management plan.

Un-Managed Areas: 74,900 acres (2.2%) are within Native American reservations and 198,400 acres (6.1%) are in private lands. No conservation-related management policies or actions are assumed for these areas.



**TABLE 10-2
MANAGEMENT OF HABITAT IN THE MOJAVE DESERT SCRUB ECOSYSTEM**

Category	Manager	Management Classification	Acres	% of Habitat
IMA	BLM	Conserved Habitat	223,600	6.8
	BLM	Critical Habitat	370,400	11.3
	BLM	WSA	340,500	10.4
	NPS	LMNRA	440,400	13.4
	USFWS/USAF	DNWR/NAFR	135,900	4.1
	USFWS	Wildlife Range	124,100	3.8
	Boulder City	Conservation Easement	86,700	2.6
	NDOW	Overton WMA	8,700	<1.0
	State Parks	State Park	32,400	1.0
	USAF	NAFR/NSAR	8,200	<1.0
IMA Total			1,770,600	54.0
LIMA	BLM	NCA	59,800	1.8
	USFWS/USAF	DNWR/NAFR	43,200	1.3
	NPS	Lake Mead NRA	2,600	<1.0
LIMA Total			105,600	3.2
MUMA	BLM	Undesignated	1,109,600	33.9
	NPS	Lake Mead NRA	2,300	<1.0
MUMA Total			1,111,800	33.9
UMA	Private		198,400	6.1
	Native American		74,900	2.3
	USAF	ISAF/NAFB	11,700	<1.0
UMA Total			285,000	8.7
Grand Total			3,273,100	100.0

10.4.1 Mojave Mixed Scrub Community Management

Mojave mixed scrub is widespread and under multiple ownerships and management policies. BLM has jurisdiction over 452,300 acres (55.3%) of the total habitat. Of this, about 111,300 acres, or 13.6 percent of habitat, are within conserved habitat (Piute-Eldorado) or critical habitat (Coyote Springs, Mormon Mesa, Gold Butte, and Hidden Valley) areas and 107,700 acres (13.2%) are within WSAs (North McCullough Mountain, primarily, but also including Arrow Canyon, Eldorado, Muddy Mountains, South McCullough Mountain, Ireteba Peaks, Million Hills, and La Madre Mountain), which are managed for conservation of native habitats and wildlife. The remaining BLM habitat is within Red Rock Canyon (23,400 acres, or 2.8%) and other areas (209,900 acres, or 25.6%) including Jean/Roach Lake, Las Vegas Valley, Muddy Mountains, and Laughlin.

Lake Mead NRA has 172,100 acres (21.0%) within NPS jurisdiction; the DNWR has 59,300 acres (7.3%) and the USFWS/USAF has 80,400 acres (9.8%). Other smaller holdings include the Boulder City Conservation Easement (17,700 acres, or 2.1%), Valley of Fire State Park, and the Moapa and Paiute Indian Reservations.

10.4.2 Creosote-Bursage Community Management

The creosote-bursage community is predominantly managed by BLM, with 1,651,600 acres (67.2%). Of this, 482,700 acres (19.6% of the total) are within conserved (Piute-Eldorado) or critical habitat for the desert tortoise (Mormon Mesa, Coyote Springs, Gold Butte, Hidden Valley, and Virgin Mountain areas, primarily). An additional 232,800 acres (9.4%) are within WSAs (Muddy Mountain, Million Hills, North McCullough Mountain, and South McCullough Mountain). The remaining BLM lands are distributed widely within the study area. The National Park Service is the second largest Federal jurisdiction with 273,200 acres (11.1%) within the Lake Mead NRA. The DNWR/NAFR (98,700 acres) and DNWR (64,800 acres) comprise 6.6 percent of the habitat. Additional habitat is located within the Boulder City Conservation Easement (69,000 acres, or 2.8%), State lands (31,800 acres, or 1.3%), the Moapa and Paiute Indian Reservations (74,200 acres, or 3.0%), and privately held lands (168,500 acres, or 6.9%).

10.5 Existing and Proposed Conservation Actions

Mojave desert scrub is widespread and under multiple ownerships and management policies. Of the total of 3,273,100 acres of Mojave desert scrub habitat, 64.2 percent is managed by BLM (undesignated, WSA, NCA, and conserved habitat), 13.6 percent by NPS (Lake Mead NRA), 9.2 percent by USFWS (DNWR and NAFR), 2.6 percent by Boulder City (Boulder City easement), less than 1.0 percent by the State of Nevada (State Parks), and less than 1 percent by NDOW (Overton Wildlife Management Area [WMA]) and USFS (Spring Mountains NRA). Private holdings, Native American reservations, and portions of the USAF ISAFAF and NAFB total 8.7 percent.

A total of 18.3 percent of the 3,273,100 acres of Mojave desert scrub habitat is managed for primitive, non-motorized, dispersed recreational use (WSA or DNWR). An additional 1.3 percent of the habitat is managed by USFWS in the DNWR and is very restricted in access but is within impact areas used by the USAF. BLM undesignated lands (33.9 percent) are managed to balance multiple uses, including mining, OHV activities, grazing, and other activities with maintenance of ecosystem and species values. The 37.4 percent of the habitat located within the BLM critical habitat, Boulder City easement, Overton WMA, Lake Mead NRA, State Parks, and Red Rock Canyon NCA is managed for both conservation and a broader spectrum of recreational uses, including intensive recreational use areas, developed camping areas, hiking and biking trails, rock climbing areas, and designated motorized vehicle use roads and trails.

10.5.1 USFWS

10.5.1.1 Protective Measures

USFWS(12) Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).

USFWS(13) Adopt and implement policies to protect plant species from dispersed or unregulated recreation (DNWR).

USFWS(14) Implement snag management in habitat areas, including limiting wood collection to down wood, and coordination of fire management activities within proposed wilderness areas of the DNWR (DNWR).

USFWS(15) Manage woodcutting, shrub clearing, and limit other human activity disturbance off existing roads within the DNWR (DNWR).

USFWS(18) Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(20) Minimize clearing of undergrowth in construction of new facilities within the DNWR (DNWR).

USFWS(21) Prohibit access to caves for recreation (DNWR).

USFWS(22) Prohibit horses, burros, and livestock grazing (DNWR).

USFWS(23) Coordinate with the U.S. Air Force to minimize the footprint on the ground for congressionally mandated ordnance impacts (DNWR).

USFWS(24) Prohibit highway and road construction on the Refuge (DNWR).

USFWS(25) Retrofit roads to permit ingress and egress for a broad range of organisms (DNWR).

USFWS(26) Conduct biological surveys prior to road maintenance and retrofit activities, (DNWR).

USFWS(27) Ensure that roads are engineered to adequately spread runoff to minimize erosion (DNWR).

USFWS(28) Ensure that adequate law enforcement and ranger patrolling is implemented within the DNWR (DNWR).

USFWS(29) Develop a conservation agreement for white-margined beardtongue (penstemon) (Ecological Services).

USFWS(30) Implement the memorandum of agreement between USFWS and managing agencies for Las Vegas bearpoppy (Ecological Services).

USFWS(32) Limit collection of dead wood including yucca skeletons to within 100 feet of designated roads (DNWR).

USFWS(33) Evaluate effects of rock climbing on biological resources. Rock climbing is currently allowed, but is under investigation; if adverse impacts are found it will be prohibited on DNWR (DNWR).

USFWS(34) Work with BLM to restrict access to caves or regulate cave recreation policies as appropriate (Ecological Services).

10.5.1.2 Restoration and Enhancement Measures

USFWS(35) Create new open water resources for bats and other wildlife (DNWR).

USFWS(36) Expand the seed bank program to include populations in the Sheep Mountains areas (DNWR).

USFWS(38) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the DNWR (DNWR).

USFWS(39) If proposed actions will result in surface disturbance near a population of white bearpoppy, remove soil with seed source and relocate to a potential habitat site and monitor over time (DNWR).

USFWS(40) Restore/rehabilitate all key access points of closed roads and areas (DNWR).

USFWS(41) Rehabilitate and restore adjacent upland and tributary systems to the Muddy River on Moapa Valley National Wildlife Refuge (DNWR).

10.5.2 BLM

10.5.2.1 Protective Measures

BLM(39) Prohibit collection of plants, animals, and mineral materials in Red Rock Canyon NCA without a permit.

BLM(57) Allow backcountry camping only in designated areas of Red Rock Canyon NCA.

BLM(97) Restrict mountain bikes and other mechanized non-motorized vehicles to designated trails within the RRCNCA and only allow new trails consistent with the conservation of BLM sensitive species, including the Spring Mountains milkvetch.

BLM(71) Limit motorized uses in the Piute/Eldorado "Conserved Habitat" to designated roads and trails.

BLM(44) Close portions of the Red Rock Canyon NCA to vehicle use or limit use to designated roads and trails.

BLM(71) Limit motorized vehicles in WSAs to existing roads and trails as listed in inventory maps, or as otherwise authorized. Close unauthorized roads in WSAs.

BLM(76) Prohibit OHV competitions within Red Rock Canyon NCA.

BLM(102) Do not allow OHV speed events within ¼ mile of mesquite woodlands (as identified on the attached map from February 1 to August 1.

BLM(108) Maintain the existing closure of 3,360 acres in the Muddy Mountains to all motorized and mechanized vehicles.

BLM(118) Do not allow competitive off-road vehicle events within ¼ mile of natural water sources and associated riparian areas.

BLM(48) Manage fires occurring in the WSAs to the lowest suppression intensity possible.

BLM(54) Require the use of a resource advisor for all fires within important habitats for covered and evaluation species.

BLM(51) Prohibit commercial collection of vegetative specimens within WSAs. Hobby collection may be allowed for personal use but not for commercial use, as long as the collection activity method meets the non-impairment criteria.

BLM(41) Prohibit commercial collection of cactus/yucca skeletons except in designated areas such as disposal areas, gravel pits, and sites associated with Federally approved projects that will result in the loss of surface vegetation. Casual collection of cactus/yucca skeletons is prohibited in tortoise ACECs. Casual collection outside these areas will be discouraged.

BLM(95) Prohibit the cutting of firewood in Red Rock Canyon NCA. Elsewhere permits are required on a discretionary basis consistent with the protection of sensitive species.

BLM(79) Close WSAs to authorization/renewal of material site rights-of-way and mineral materials disposal until a decision is reached on their status.

BLM(89) Where feasible, proposals for saleable materials in essential habitats for special status species will be avoided.

BLM(96) Work with the Nevada Power Company and other utilities to modify existing powerline towers or poles to meet BLM standards for the prevention of raptor mortality (Olendorff et al. 1981 Raptor Research Report #4).

BLM(100) Manage caves to ensure that important bat roosting sites and hibernacula are not negatively impacted by recreational use. If gating is necessary to protect cave resources, ensure that the gates will allow for bat ingress and egress.

BLM(115) Manage all cave resources as wild systems, free from commercial or show cave type developments. Special Recreation Permits for commercially guided trips by qualified cave experts may be considered if environmental studies show that cave resources will not be impacted.

BLM(117) Protect key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey on public lands through mitigation of activities during National Environmental Policy Act compliance.

BLM(114) Manage public lands adjacent to the Ash Meadows ACEC and Moapa National Wildlife Refuge to compliment spring and aquatic habitat for special status species, including projects that may affect ground water levels or spring flows.

BLM(120) Determine water needs to meet management objectives. File for appropriative water rights on public and acquired lands in accordance with the State of Nevada water laws for those water sources that are not Federally reserved.

BLM(93) Using “best management practices” as identified by the State of Nevada, minimize contributions from both point and non-point sources of pollution (including

salts) resulting from public land management actions. Where applicable, proposed management actions would comply with local, state, tribal and Federal air quality laws, regulations, and standards (Conformity; per 40 CFR 93.100 et seq.).

BLM(99) Enter into conservation agreements or easements with the U.S. Fish and Wildlife Service and the State of Nevada, that if implemented, could reduce the necessity of future listings of the species in question. Conservation agreements may include, but not be limited to, the following: Las Vegas bearpoppy, white-margined penstemon, and phainopepla.

BLM(111) Prior to the disposal of identified public lands, an analysis will be conducted to determine their resource values, including the occurrence of Special Status Species and sensitive habitats such as riparian and aquatic habitats. Land disposal will be consistent with conservation of special status species unless there is an overriding public benefit.

BLM(119) Close the Sunrise Mountain and Nellis Dunes Special Recreation Management Areas to casual recreational shooting in accordance with Clark County's designated no shooting zone.

BLM(107) Allow no net loss of Las Vegas bearpoppy habitat on Public Land from Federally approved projects through mitigative actions including avoidance and rehabilitation.

BLM(301) Limit the construction of new roads for the development of utility lines within special status species habitat.

BLM(90) Provide protection (such as fencing) around springs and riparian habitats to prevent habitat degradation from excessive use by grazing animals.*

BLM(12) Identify, evaluate, manage and protect cave resources on public lands for the purpose of maintaining the unique, non-renewable, and fragile biological, scientific, and recreational values for present and future uses.*

BLM(103) Livestock grazing will be managed consistent with riparian objectives of reaching or maintaining proper functioning condition (PFC)*.

BLM(125) As grazing systems are developed for each allotment, ensure the system is consistent with the conservation of BLM special status species. Where conflicts occur, encourage Clark County to obtain grazing privileges on a willing seller basis.*

BLM(59) Manage wild horses and burros as necessary to maintain thriving ecological balance and consistent with the protection of special status species in important habitat areas.*

BLM(58,60) Wild horses and burros will be removed when herds have expanded beyond designated herd area boundaries or Appropriate Management Level is exceeded.*

BLM(81) Implement actions in the Blue Diamond Cholla Conservation Agreement to ensure the long-term viability of the species.*

BLM(98) Provide adequate law enforcement presence to ensure that management actions and restrictions are implemented for the conservation of covered and/or evaluation species.*

BLM(127,128) The livestock grazing program shall be managed to meet the Bureau's Standards and Guidelines as developed by the Southern Great Basin/Mojave Resource Advisory Committee.* The "standards" are listed below:

STANDARD 1. SOILS: Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity and sustain the hydrologic cycle.

STANDARD 2. ECOSYSTEM COMPONENTS: Watersheds should possess the necessary ecological components to achieve state water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristics of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

STANDARD 3. HABITAT AND BIOTA: Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

10.5.2.2 Restoration and Enhancement Measures

BLM(123) Within desert tortoise critical habitat/ACECs, Las Vegas bearpoppy habitat, and other important habitats for covered and evaluation species, require reclamation of activities which result in loss or degradation of habitat, with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. If necessary subsequent seeding or transplanting efforts may be required, should monitoring indicate that the original effort was not successful.

BLM(143) Rehabilitate, reclaim or revegetate areas subjected to surface-disturbing activities where feasible. When rehabilitating disturbed areas, first manage for optimum species diversity by seeding native species, except where non-native species are appropriate.*

BLM(303) Implement a program to rehab surface disturbances including the first hundred feet or so of "closed" roads and trails within proposed desert tortoise ACECs, Las Vegas bear poppy habitat, and other areas important for special status species.*

BLM(135) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following wildfires within areas important for the conservation of covered species and where the feasibility of success is reasonably certain.*

BLM(137) Cooperate with NPS, FS, USFWS, Clark County and others on a reclamation program which will include maintaining a seed bank and live plants for rehabilitation of disturbed or burned areas if necessary.*

BLM(109) In cooperation with NDOW, the USFWS, and ADC, monitor brown-headed cowbird and raven populations and implement population controls of these species where necessary for the conservation of covered species.*

BLM(140) Improve riparian areas, giving priority to areas Functioning at Risk with a downward trend. Implement measures to protect riparian areas, such as fencing and/or alternate water sources away from the riparian area. Insure that the minimum requirement of Proper Functioning Condition on all riparian areas is maintained or achieved.*

10.5.3 USAF

10.5.3.1 Protective Measures

USAF(9) Coordinate with DNWR to minimize the footprint on the ground for actual ordnance impact, remediate upland sites no longer used, control aerial overflights to specific routes and elevation, and provide support for investigative activities on NAFR.

USAF(11) Work with the Nature Conservancy to evaluate the need for long-term protection of Parish's phacelia, white bearpoppy, and other rare taxa occurring on NAFB.

USAF(12) Prohibit collection of fauna and flora on any NAFR, NAFB, NSAR, and ISAFAF.

USAF(13) Prohibit outdoor recreation on NAFR, NAFB, NSAR, and ISAFAF except for providing access for hunting on the DNWR.

USAF(14) There are no highways on NAFB, NAFR, NSAR, and ISAFAF.

USAF(15) Fence and patrol NAFB, NAFR, and NSAR, and ISAFAF to limit and restrict access.

USAF(16) Require base personnel and contractors who could impact desert tortoise and other natural resources to participate in conservation awareness training.

USAF(17) Prohibit off-road travel, except for the clean-up of target sites.

USAF(18) No pesticides are used on the NSAR or NAFR. Pesticide use on the NAFB and ISAFAF is in compliance with an Integrated Pest Management Plan.

USAF(19) Prohibit livestock grazing on NAFB, NAFR, NSAR, and ISAFAF. Wild horses and burros straying onto NAFR are removed.

USAF(20) Re-use existing target sites on NAFR to the extent practicable.

USAF(21) Prohibit mining on NAFR, NAFB, NSAR, and ISAFAF.

USAF(23) Remove all domestic waste off-site to the Clark County Landfill. The onsite landfill contains only construction waste and is fenced.

10.5.3.2 Restoration and Enhancement Measures

USAF(24) Eradicate tamarisk or other exotic plants as appropriate.

10.5.4 NPS

10.5.4.1 Protective Measures

NPS(22) Prohibit destructive collecting techniques such as breaking off rock flakes and rolling cap rocks to uncover lizards.

NPS(23) Monitor burro populations to ensure they stay within levels prescribed in the burro management plan.

NPS(24) Manage burro populations under the burro management plan to ensure resources are protected consistent with NPS policies.

NPS(25) Prohibit commercial collection of fauna and flora.

NPS(26) Implement Fire Management Plan, including prescribed natural fires on undeveloped portions of the Park.

NPS(27) Prohibit recreational shooting.

NPS(28) Implement NPS Integrated Pest Management Plan.

NPS(29) Prohibit woodcutting and shrub clearing and limit other human disturbance off existing roadways.

NPS(30) Remove feral animals and uncontrolled domestic animals.

NPS(31) Conduct NEPA review and analysis for development of new areas for intense recreational use.

NPS(32) Ensure that adequate law enforcement is implemented within the LMNRA.

NPS(34) Assure long-term implementation of existing management policies and actions benefiting Covered Species through amendment of the GMP.

NPS(35) Manage rock climbing, if necessary, to protect sensitive resources.

NPS(36) Enforce existing prohibition of collecting and deter poaching through increased routine ranger patrols.

NPS(37) Include MSHCP Covered Species as sensitive species in evaluations of road construction or maintenance activities on Federal lands.

NPS(38) Work with the Nevada Power Company (and other utilities) to be sure that support towers and poles are “raptor-safe.”

NPS(39) Monitor and protect water sources, including springs, seeps, and streams.

NPS(40) Install fencing or other protection of springs in identified sensitive habitat, where required to exclude cattle, wild horses, or burros.

NPS(41) Implement conservation measures for bats and other species including limiting caving, and rock climbing to areas away from bat roosts.

NPS(42) Prohibit commercial OHV tours and events in IMAs and LIMAs.

10.5.4.2 Restoration and Enhancement Measures

NPS(43) Where appropriate, implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the LMNRA.

NPS(48) Continue to monitor brown-headed cowbird populations and initiate control by trapping and removing the offending cowbirds, when and if this becomes necessary.

NPS(50) Restore/rehabilitate all key access points of closed roads and areas, except Road 106 and 1B, which were closed due to road hazards and not resource damage.

10.5.5 Boulder City

10.5.5.1 Protective Measures

BCCE(1) Manage, use, and allow activities which do not impair the conservation, protection, restoration and enhancement of the natural resource values of the easement, including desert tortoise and other native flora and fauna and their habitats.

BCCE(2) Prohibit all motorized vehicle activity, including all competitive and organized events, except on designated roads and trails.

BCCE(3) Prohibit all military maneuvers, clearing for agriculture, land fills, and any other surface disturbance that diminishes the capacity of the land to support desert tortoises and other native flora and fauna.

BCCE(4) Prohibit grazing by cattle, burros, horses, and domestic sheep.

BCCE(5) Prohibit commercial flora harvest and fauna collection.

BCCE(6) Prohibit non-commercial vegetation harvest, except by permit.

BCCE(7) Prohibit non-commercial collection of biological specimens, except by permit.

BCCE(8) Prohibit dumping, refuse disposal, littering, and use of herbicides or biocides.

BCCE(9) Prohibit depositing of captive or displaced desert tortoises or other animals, except pursuant to translocation research projects authorized by the USFWS.

BCCE(10) Prohibit uncontrolled dogs out of vehicles.

BCCE(11) Prohibit the construction of any physical improvement, except specified utility improvements.

BCCE(12) Prohibit the discharge of firearms, except in connection with hunting or trapping from September through March,

BCCE(13) Enact and enforce ordinances and regulations as necessary to allow enforcement of restricted activities through law enforcement activities.

BCCE(14) Allow the posting of signs to adequately inform the public of those uses which are prohibited and permitted on the property.

BCCE(15) Contract with state and/or federal land managers or resource agencies to provide law enforcement activities consistent with the terms of the easement.

BCCE(16) Provide law enforcement to monitor activities permitted by the City, such as organized off highway vehicle events on designated roads and trails.

10.5.6 State Parks

10.5.6.1 Protective Measures

NSP(5) Prohibit off-road driving and post signs to that effect throughout Valley of Fire State Park.

NSP(6) Prohibit collection or destruction of vegetation, including dead and down material.

NSP(7) Prohibit collection or destruction of rocks or other minerals.

NSP(8) Prohibit hunting, collection (other than for scientific research), or harassment of any wildlife.

NSP(9) Conduct routine Park Ranger patrols daily to protect and preserve resources.

NSP(10) Limit trails to areas that are sparsely vegetated, mainly in natural washes. Other trails will be developed by using “social trails” where vegetation has already been removed.

NSP(11) Prohibit open campfires.

NSP(12) Limit camping to areas provided. No overflow camping is permitted.

NSP(13) Require approval of the Supervisor or their representative for all “special recreation” (hang gliding, rock climbing, equestrian, etc.).

NSP(14) Fence and close to the public sensitive areas of the Park, except for during interpretive hikes.

NSP(15) Prohibit use of pitons, chocks, or other such climbing devices or any magnesium carbonate chalk in climbing the formations, except for rescue operations, in Valley of Fire State Park.

NSP(16) Prohibit unconstrained pets or domestic animals.

10.5.6.2 Restoration and Enhancement Measures

NSP(17) Where possible, establish erosion control in areas that present problems.

10.5.7 NDOW

10.5.7.1 Protective Measures

NDOW(15) Prohibit driving off-road in OWMA.

NDOW(16) Prohibit camping at OWMA except at designated camp sites.

NDOW(17) Regulate hobby collection and hobby possession of authorized unprotected reptiles and amphibians.

NDOW(18) Evaluate the need to regulate commercial collection of wildlife species.

NDOW(19) Increase enforcement of regulations prohibiting camping within 100 feet of key water sources, as defined through the adaptive management process.

NDOW(20) Evaluate and seek reclassification as protected of Covered and Evaluation Species under State regulation based on classification criteria in NAC 503.103 and 503.104.

NDOW(21) Support only those public land disposals that would not significantly impact Covered or Evaluation Species found in Clark County during consultations with Federal land managers.

10.5.7.2 Restoration and Enhancement Measures

NDOW(23) In cooperation with USFWS and others, support efforts to eradicate tamarisk and/or restore native vegetation communities on public and private lands.

10.6 Adequacy of Existing Management

About 57.3 percent of the habitat is within IMAs and LIMAs (DNWR, NAFR, BLM NCA, WSA, and critical habitat, Spring Mountains NRA, Boulder City easement, Overton WMA, State Parks, and Lake Mead NRA) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. Approximately 33.9 percent of the habitat is in MUMA (BLM undesignated lands and the Lake Mead NRA) and may be used for multiple use activities, within the constraints of existing BLM and NPS policies for management of these activities. Approximately 13 percent is UMA (privately held, Native American reservation, and USAF ISAFAF and NAFB) and may be used for more intensive uses.

Implementation of existing USFWS, BLM, NPS, NDOW, State Parks management actions, and the provisions of the BLM Las Vegas RMP (see Section 2.8) will adequately address the ecosystem level threats to Covered Species within the Mojave desert scrub habitat, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

10.7 MSHCP Conservation Contributions

The Mojave desert scrub habitat and the 23 Covered Species it supports will benefit from the MSHCP through general public education and information programs; the purchase, maintenance, and management of grazing allotments and water rights; potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers, and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

Chapter 11 Mesquite/Catclaw Ecosystem

11.1 Description and Distribution

Although the mesquite (*Prosopis glandulosa*) and catclaw (*Acacia greggii*) community is clearly nested within Mojave desert scrub biogeographically, for management purposes it is considered and will be managed at the ecosystem level. Mesquite-dominated communities typically inhabit the edges of large watercourses such as rivers and perennial streams, but they can also be found growing in scattered clumps on sandy hummocks and near desert springs as well. Well-developed mesquite forests, or bosques, the Spanish word for forest, were once much more common in the Southwest, but recent disturbances such as fuel gathering, agricultural development, and hydrologic changes including the downcutting of arroyos and groundwater pumping have eliminated these forests in many desert drainages. Catclaw-dominated communities occur along intermittent streams and sandy washes in both the Mojave and Sonoran deserts. Catclaw is typically associated with shrub species such as burro bush (*Hymenoclea salsola*), bebbia (*Bebbia juncea*), and sandpaper plant (*Petalonyx nitidus*). Mesquite and catclaw dominated communities provide excellent wildlife habitat.

The distribution of habitats within the mesquite/catclaw ecosystem is shown on Figure 11-1 and Table 11-1. Areas that have been converted to agricultural use (12,400 acres) or urbanized, (400 acres), (37.1% of the total ecosystem) are also shown but are not analyzed for future conservation management potential.

**TABLE 11-1
VEGETATION COMMUNITIES IN THE MESQUITE/CATCLAW ECOSYSTEM**

Vegetation Type	Acres	% of Ecosystem
Agricultural	12,400	35.9
Urban	400	1.2
Mesquite	13,900	40.3
Catclaw	7,700	22.3
Total Habitat	21,600	62.6
Total Ecosystem	34,500	100.0

11.1.1 Mesquite Community

Shrubland (USU Code 44; CA WHR Code DRI/DSW–Desert Riparian/Desert Wash), dominated by mesquite (*Prosopis* spp.), it is found in the western Mojave desert in scattered clumps, usually associated with streambeds or washes. Primary associated shrub species include non-native tamarisk (*Tamarix ramosissima*), fourwing saltbush (*Atriplex canescens*), quailbush (*Atriplex lentiformis*), wolfberry (*Lycium* sp.), arrowweed (*Pluchea sericea*), and creosote (*Larrea tridentata*).

11.1.2 Catclaw Community

Catclaw is widely scattered across Clark County, occurring along the Virgin and Muddy Rivers, Las Vegas Valley, Sandy Valley, Piute Valley, Eldorado Canyon, and Laughlin.

11.2 MSHCP Species

The mesquite/catclaw ecosystem provides habitat for 11 Covered Species and 5 High Priority Evaluation Species.

Covered Species:

Silver-haired bat	<i>Lasionycteris noctivagans</i>
Long-eared myotis	<i>Myotis evotis</i>
Phainopepla	<i>Phainopepla nitens</i>
Vermilion flycatcher	<i>Pyrocephalus rubinus</i>
Banded gecko	<i>Coleonyx variegatus</i>
Desert iguana	<i>Dipsosaurus dorsalis</i>
Western chuckwalla	<i>Sauromalus obesus obesus</i>
Great Basin collared lizard	<i>Crotaphytus insularis bicinctores</i>
Western red-tailed skink	<i>Eumeces gilberti rubricaudatus</i>
Sidewinder	<i>Crotalus cerastes</i>
Pahrump Valley buckwheat	<i>Eriogonum bifurcatum</i>

High Priority Evaluation Species:

Kit fox	<i>Vulpes macrotus</i>
Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>
Desert pocket mouse	<i>Chaetodipus penicillatus sobrinus</i>
Banded Gila monster	<i>Heloderma suspectum cinctum</i>
Southern desert horned lizard	<i>Phrynosoma platyrhinos calidiarum</i>

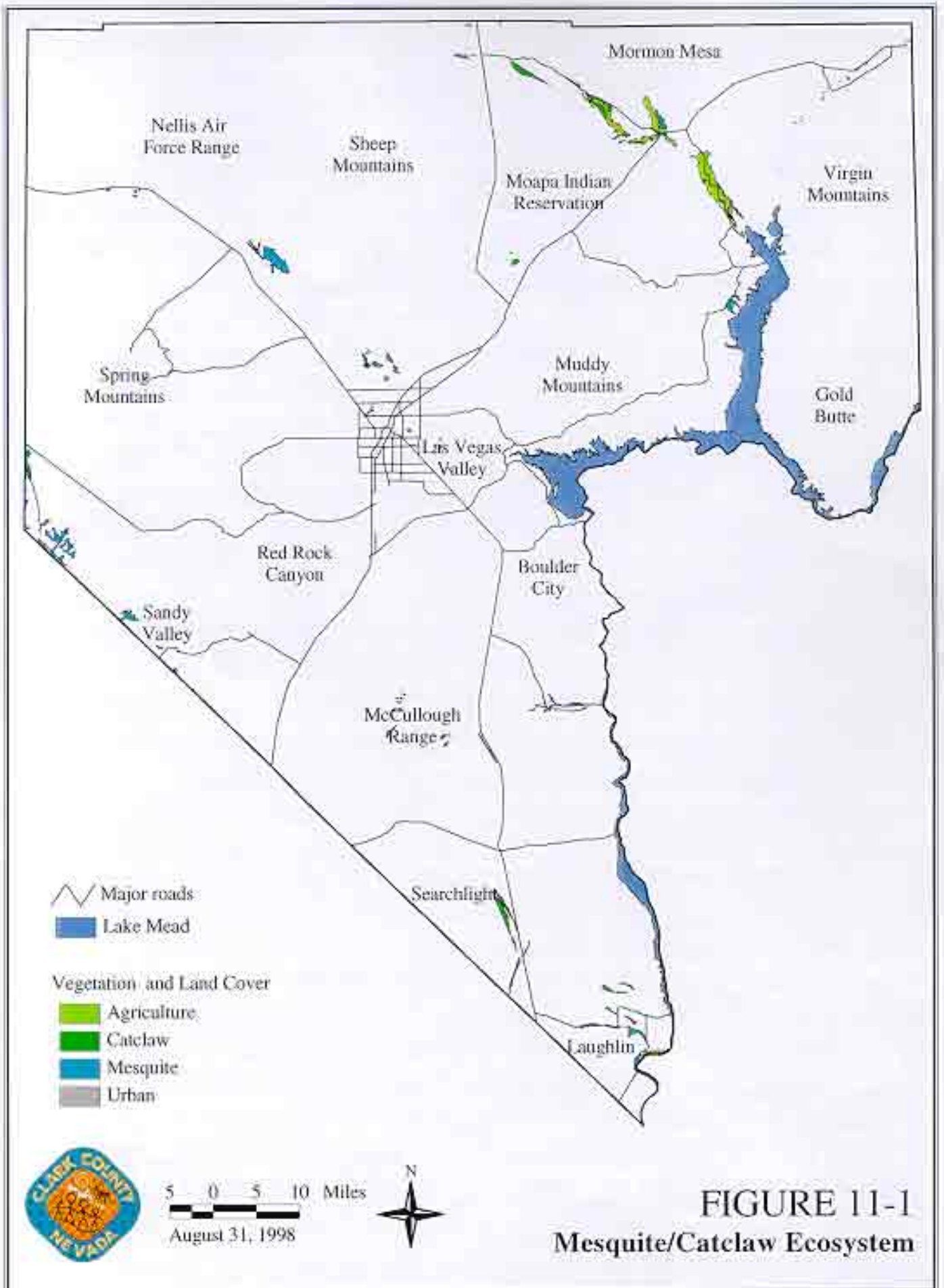


FIGURE 11-1
Mesquite/Catclaw Ecosystem

11.3 Potential Threats and Stressors

The primary ecosystem level threats and stressors in mesquite/catclaw are:

- Commercial collection (reduction of populations **Threat 201**, habitat degradation **Threat 202**)
- Fires and fire management (habitat degradation **Threat 301**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, competitive OHV races **Threat 403**, casual use OHV activities **Threat 404**, rock climbing **Threat 405**, indiscriminate recreational shooting **Threat 406**, spelunking **Threat 407**)
- Highways, roads, and trails (highway mortality **Threat 501**, habitat fragmentation **Threat 503**, road construction and maintenance **Threat 504**)
- Pest control (direct or indirect poisoning or trapping **Threat 601**, pesticides and herbicides **Threat 602**)
- Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**)
- Woodcutting, (wood removal, snag collection **Threat 1001**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**, landfills **Threat 1103**)
- Water development, use, and flood control in riparian areas (channelization **Threat 1301**, water diversion and groundwater pumping **Threat 1302**, grazing and agriculture **Threat 1304**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**, grazing and agriculture **Threat 1404**)
- Illegal or unauthorized activities (illegal waste ponds, dumping, and waste disposal **Threat 1702**)

11.4 Mesquite/Catclaw Habitat Management

Intensively Managed Areas: BLM lands (3,900 acres, or 17.9%) and portions of Lake Mead NRA (900 acres, or 4.1%) are within conserved/critical habitat for the desert tortoise and are managed to provide desert tortoise protection and associated habitat conservation measures which may benefit other MSHCP Covered Species. The remaining IMAs include BLM WSAs (700 acres, or 3.2%), the DNWR (2,200 acres, or 10.1%), and the remainder of the Lake Mead NRA (800 acres, or 3.6%), for a total of 8,700 acres, or 40.1 percent of the habitat (Figure 11-2, Table 11-2).

Multiple Use Management Areas are managed by BLM (8,000 acres, or 36.8%) and have no specific conservation-related management associated. These areas are generally open

to OHV use, grazing, sand and gravel and other mineral extraction, rights-of-way and a broad spectrum of recreational uses.

Un-managed Areas include privately held lands (4,800 acres, or 22.1%) along with 100 acres of habitat within the Fort Mojave Indian Reservation, for which no conservation-related management is assumed. Mesquite wood is an economic commodity.

**TABLE 11-2
MANAGEMENT OF HABITAT IN THE MESQUITE/CATCLAW ECOSYSTEM**

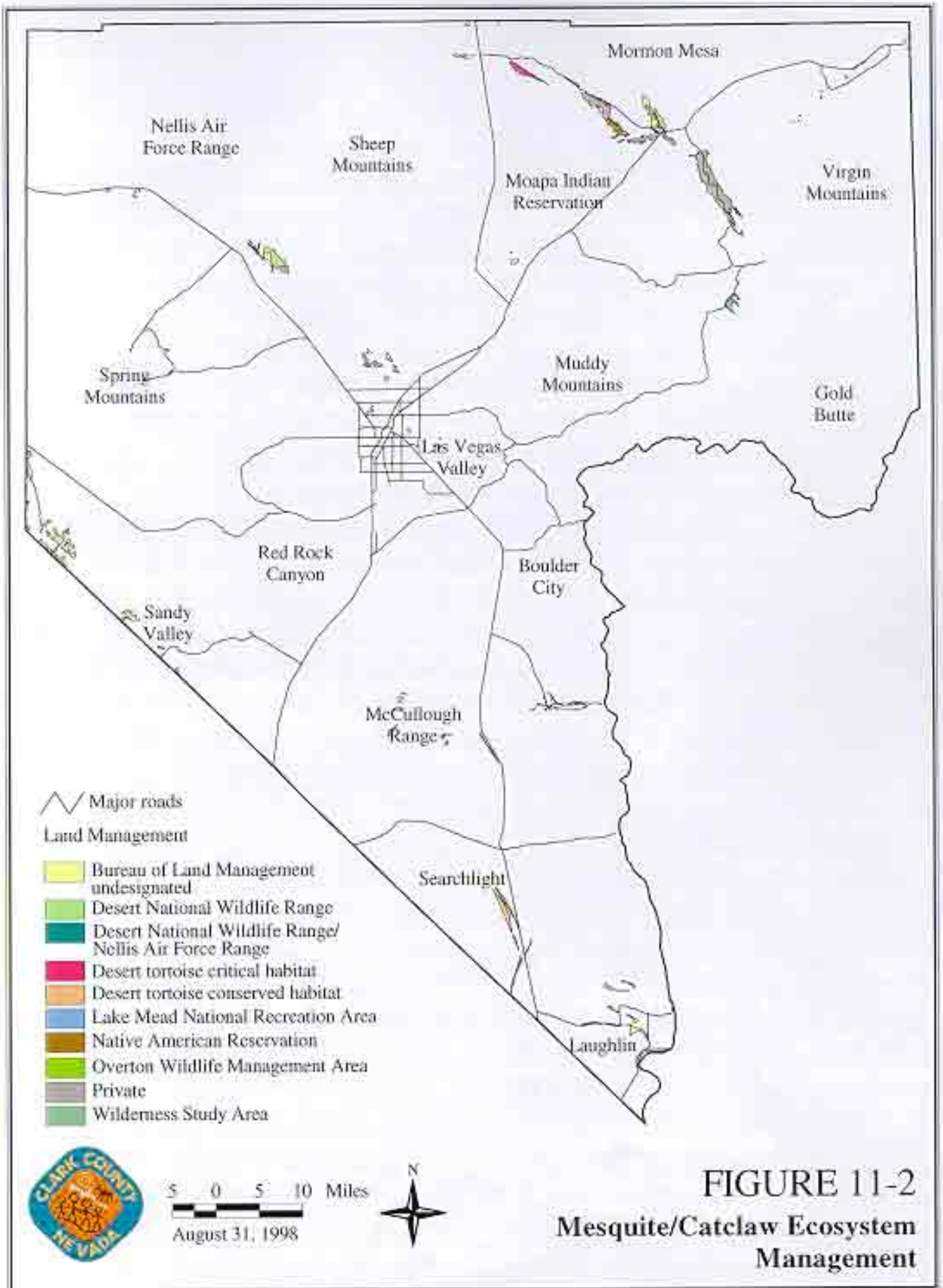
Category	Manager	Management Classification	Acres	% of Habitat
IMA	BLM	Conserved	2,300	10.6
	BLM	Critical	1,600	7.4
	BLM	WSA	700	3.2
	NPS	LMNRA	1,700	7.8
	USFWS	DNWR	2,200	10.1
	USFWS/USAF	DNWR/NAFR	100	<1.0
	NDOW	Overton WMA	100	<1.0
IMA Total			8,700	40.1
MUMA	BLM	Undesignated	8,000	36.8
MUMA Total			8,000	36.8
UMA	Private		4,800	22.1
	Native American		100	<1.0
UMA Total			5,000	23.0
Grand Total			21,700	100.0

11.4.1 Mesquite Community Management

Mesquite is widely scattered across Clark County, occurring along the Virgin and Muddy Rivers, Las Vegas Valley, Sandy Valley, Piute Valley, Eldorado Canyon, and Laughlin. BLM has jurisdiction over (6,600 acres, or 47.4%) of the mapped patches of habitat. Additional habitat patches are located in the DNWR (2,200 acres, or 15.8%) and Lake Mead NRA (1,200 acres, or 8.6%). There are 3,500 acres (25.1%) of mesquite in private ownership scattered across the study area and 100 acres within Native American reservation lands.

11.4.2 Catclaw Community Management

BLM has jurisdiction over (6,000 acres, or 76.9%) of the mapped patches of catclaw habitat. Additional habitat patches are located in the Lake Mead NRA (500 acres, or 6.4%). There are 1,300 acres (16.6%) of mesquite in private ownership scattered across the study area.



Nellis Air Force Range

Sheep Mountains

Mormon Mesa

Moapa Indian Reservation

Virgin Mountains

Spring Mountains

Muddy Mountains

Gold Butte

Las Vegas Valley

Red Rock Canyon

Boulder City

Sandy Valley

McCullough Range

Searchlight

Laughlin

11.5 Existing and Proposed Conservation Actions

Mesquite/catclaw is widely scattered across Clark County, occurring along the Virgin and Muddy Rivers, Las Vegas Valley, Sandy Valley, Piute Valley, Eldorado Canyon, and Laughlin. Of the total of 21,700 acres of mesquite/catclaw ecosystem, 58.0 percent is managed by BLM (undesignated, WSA, and conserved habitat), 7.8 percent by NPS (Lake Mead NRA), 10.6 percent by USFWS (DNWR and NAFR), and less than 1.0 percent by NDOW (Overton WMA). Private holdings and Native American reservations total 22.5 percent.

A total of 13.8 percent of the 21,700 acres of mesquite/catclaw ecosystem is managed for primitive, non-motorized, dispersed recreational use (WSA or DNWR). BLM undesignated lands (36.8 percent) are managed to balance multiple uses, including mining, OHV activities, grazing, and other activities with maintenance of ecosystem and species values. The 26.2 percent of the ecosystem located within the BLM critical habitat, Overton WMA, and Lake Mead NRA is managed for both conservation and a broader spectrum of recreational uses, including intensive recreational use areas, developed camping areas, hiking and biking trails, rock climbing areas, and designated motorized vehicle use roads and trails.

BLM is proposing specific monitoring and protective actions for mesquite habitat within its management including monitoring, inventory, and management of OHV, mineral extraction, and grazing impacts.

11.5.1 USFWS

11.5.1.1 Protective Measures

USFWS(12) Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).

USFWS(13) Adopt and implement policies to protect plant species from dispersed or unregulated recreation (DNWR).

USFWS(14) Implement snag management in habitat areas, including limiting wood collection to down wood, and coordination of fire management activities within proposed wilderness areas of the DNWR (DNWR).

USFWS(15) Manage woodcutting, shrub clearing, and limit other human activity disturbance off existing roads within the DNWR (DNWR).

USFWS(16) Protect existing stands of mesquite and catclaw (DNWR).

USFWS(17) Protect existing riparian habitat from the effects of recreational activities (DNWR).

USFWS(18) Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(20) Minimize clearing of undergrowth in construction of new facilities within the DNWR (DNWR).

USFWS(22) Prohibit horses, burros, and livestock grazing (DNWR).

USFWS(23) Coordinate with the U.S. Air Force to minimize the footprint on the ground for congressionally mandated ordnance impacts (DNWR).

USFWS(24) Prohibit highway and road construction on the Refuge (DNWR).

USFWS(25) Retrofit roads to permit ingress and egress for a broad range of organisms (DNWR).

USFWS(26) Conduct biological surveys prior to road maintenance and retrofit activities, (DNWR).

USFWS(27) Ensure that roads are engineered to adequately spread runoff to minimize erosion (DNWR).

USFWS(28) Ensure that adequate law enforcement and ranger patrolling is implemented within the DNWR (DNWR).

USFWS(31) Maintain dead snags and fallen trees on slopes and canyon bottoms in the DNWR (DNWR).

USFWS(32) Limit collection of dead wood including yucca skeletons to within 100 feet of designated roads (DNWR).

11.5.1.2 Restoration and Enhancement Measures

USFWS(35) Create new open water resources for bats and other wildlife (DNWR).

USFWS(36) Expand the seed bank program to include populations in the Sheep Mountains areas (DNWR).

USFWS(37) Enhance mesquite and catclaw stands by removing the competing tamarisk and replacing with native species (DNWR).

USFWS(38) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the DNWR (DNWR).

USFWS(40) Restore/rehabilitate all key access points of closed roads and areas (DNWR).

USFWS(41) Rehabilitate and restore adjacent upland and tributary systems to the Muddy River on Moapa Valley National Wildlife Refuge (DNWR).

11.5.2 BLM

11.5.2.1 Inventory (Status)

BLM(19) Inventory and monitor mesquite and acacia habitats in Amargosa Valley Area, Stump Springs, Pahrump Valley, Hiko Wash, Piute Wash, Meadow Valley Wash and other areas determined to be important as resting and/or nesting habitat for resident and neo-tropical migrants.*

11.5.2.2 Monitoring (Trends)

BLM(35) Monitor water table levels at the Pahrump, Moapa, Stewart Valley, and Stump Springs mesquite woodlands.

BLM(36) Monitor water sources including springs, seeps and streams to assess condition and trend.

11.5.2.3 Protective Measures

BLM(71) Limit motorized uses in the Piute/Eldorado "Conserved Habitat" to designated roads and trails.

BLM(102) Do not allow OHV speed events within ¼ mile of mesquite woodlands (as identified on the attached map from February 1 to August 1.

BLM(118) Do not allow competitive off-road vehicle events within ¼ mile of natural water sources and associated riparian areas.

BLM(54) Require the use of a resource advisor for all fires within important habitats for covered and evaluation species.

BLM(51) Prohibit commercial collection of vegetative specimens within WSAs. Hobby collection may be allowed for personal use but not for commercial use, as long as the collection activity method meets the non-impairment criteria.

BLM(41) Prohibit commercial collection of cactus/yucca skeletons except in designated areas such as disposal areas, gravel pits, and sites associated with Federally approved projects that will result in the loss of surface vegetation. Casual collection of cactus/yucca skeletons is prohibited in tortoise ACECs. Casual collection outside these areas will be discouraged.

BLM(101) Protect snags as important habitat features.

BLM(91) Harvesting mesquite will require a permit (for green or dead and down) consistent with sustaining the plant communities in a healthy and vigorous state, and also consistent with sustaining viable wildlife populations.

BLM(79) Close WSAs to authorization/renewal of material site rights-of-way and mineral materials disposal until a decision is reached on their status.

BLM(89) Where feasible, proposals for saleable materials in essential habitats for special status species will be avoided.

BLM(96) Work with the Nevada Power Company and other utilities to modify existing powerline towers or poles to meet BLM standards for the prevention of raptor mortality (Olendorff et al. 1981 Raptor Research Report #4).

BLM(117) Protect key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey on public lands through mitigation of activities during National Environmental Policy Act compliance.

BLM(114) Manage public lands adjacent to the Ash Meadows ACEC and Moapa National Wildlife Refuge to compliment spring and aquatic habitat for special status species, including projects that may affect ground water levels or spring flows.

BLM(120) Determine water needs to meet management objectives. File for appropriative water rights on public and acquired lands in accordance with the State of Nevada water laws for those water sources that are not Federally reserved.

BLM(93) Using “best management practices” as identified by the State of Nevada, minimize contributions from both point and non-point sources of pollution (including

salts) resulting from public land management actions. Where applicable, proposed management actions would comply with local, state, tribal and Federal air quality laws, regulations, and standards (Conformity; per 40 CFR 93.100 et seq.).

BLM(99) Enter into conservation agreements or easements with the U.S. Fish and Wildlife Service and the State of Nevada, that if implemented, could reduce the necessity of future listings of species in question. Conservation agreements may include, but not be limited to, the following: Las Vegas bearpoppy, white-margined penstemon, and phainopepla.

BLM(111) Prior to the disposal of identified public lands, an analysis will be conducted to determine their resource values, including the occurrence of Special Status Species and sensitive habitats such as riparian and aquatic habitats. Land disposal will be consistent with conservation of special status species unless there is an overriding public benefit.

BLM(301) Limit the construction of new roads for the development of utility lines within special status species habitat.

BLM(20) Improve aquatic, riparian and mesquite woodland habitats including Meadow Valley Wash.*

BLM(90) Provide protection (such as fencing) around springs and riparian habitats to prevent habitat degradation from excessive use by grazing animals.*

BLM(103) Livestock grazing will be managed consistent with riparian objectives of reaching or maintaining proper functioning condition (PFC)*.

BLM(125) As grazing systems are developed for each allotment, ensure the system is consistent with the conservation of BLM special status species. Where conflicts occur, encourage Clark County to obtain grazing privileges on a willing seller basis.*

BLM(59) Manage wild horses and burros as necessary to maintain thriving ecological balance and consistent with the protection of special status species in important habitat areas.*

BLM(58,60) Wild horses and burros will be removed when herds have expanded beyond designated herd area boundaries or Appropriate Management Level is exceeded.*

BLM(98) Provide adequate law enforcement presence to ensure that management actions and restrictions are implemented for the conservation of covered and/or evaluation species.*

BLM(302) Protect important resting/nesting habitat such as riparian areas and mesquite/acacia woodlands. Do not allow projects that may adversely impact the water table supporting these plant communities.*

BLM(127,128) The livestock grazing program shall be managed to meet the Bureau's Standards and Guidelines as developed by the Southern Great Basin/Mojave Resource Advisory Committee.* The “standards” are listed below:

STANDARD 1. SOILS: Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity and sustain the hydrologic cycle.

STANDARD 2. ECOSYSTEM COMPONENTS: Watersheds should possess the necessary ecological components to achieve state water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristics of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

STANDARD 3. HABITAT AND BIOTA: Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

11.5.2.4 Restoration and Enhancement Measures

BLM(123) Within desert tortoise critical habitat/ACECs, Las Vegas bearpoppy habitat, and other important habitats for covered and evaluation species, require reclamation of activities which result in loss or degradation of habitat, with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. If necessary subsequent seeding or transplanting efforts may be required, should monitoring indicate that the original effort was not successful.

BLM(143) Rehabilitate, reclaim or revegetate areas subjected to surface-disturbing activities where feasible. When rehabilitating disturbed areas, first manage for optimum species diversity by seeding native species, except where non-native species are appropriate.*

BLM(303) Implement a program to rehab surface disturbances including the first hundred feet or so of "closed" roads and trails within proposed desert tortoise ACECs, Las Vegas bear poppy habitat, and other areas important for special status species.*

BLM(135) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following wildfires within areas important for the conservation of covered species and where the feasibility of success is reasonably certain.*

BLM(137) Cooperate with NPS, FS, USFWS, Clark County and others on a reclamation program which will include maintaining a seed bank and live plants for rehabilitation of disturbed or burned areas if necessary.*

BLM(109) In cooperation with NDOW, the USFWS, and ADC, monitor brown-headed cowbird and raven populations and implement population controls of these species where necessary for the conservation of covered species.*

BLM(142) Control and/or eradicate tamarisk. Rehabilitate the area with native species to help reduce the potential for tamarisk reestablishment and improve ecosystem health.*

BLM(121) Determine in-stream flow requirements and apply for the necessary water rights on the Virgin River and Meadow Valley.

BLM(141) Improve approximately 400 acres of aquatic and riparian habitat on the Virgin River, Muddy River, and Meadow Valley Wash from its existing poor to fair condition to good or better condition by replacing tamarisk with native species.*

11.5.2.5 Land Use Policies and Actions

BLM(221) Limit vehicular use to designated roads and trails in and around mesquite woodlands.

BLM(222) Designate significant mesquite woodlands as ACECs. The management of multiple uses within mesquite woodlands will be consistent with managing for the long-term viability of these habitats and the wildlife they support.

11.5.3 NPS

11.5.3.1 Inventory (Status)

NPS(9) Inventory and monitor mesquite and acacia habitat that may be important as resting and/or nesting habitat for resident and neo-tropical migrants.

11.5.3.2 Monitoring (Trends)

NPS(19) Monitor water diversions and water table levels adjacent to significant mesquite and catclaw stands.

11.5.3.3 Protective Measures

NPS(23) Monitor burro populations to ensure they stay within levels prescribed in the burro management plan.

NPS(24) Manage burro populations under the burro management plan to ensure resources are protected consistent with NPS policies.

NPS(25) Prohibit commercial collection of fauna and flora.

NPS(26) Implement Fire Management Plan, including prescribed natural fires on undeveloped portions of the Park.

NPS(27) Prohibit recreational shooting.

NPS(28) Implement NPS Integrated Pest Management Plan.

NPS(29) Prohibit woodcutting and shrub clearing and limit other human disturbance off existing roadways.

NPS(30) Remove feral animals and uncontrolled domestic animals.

NPS(31) Conduct NEPA review and analysis for development of new areas for intense recreational use.

NPS(32) Ensure that adequate law enforcement is implemented within the LMNRA.

NPS(33) Protect existing stands of mesquite and catclaw.

NPS(34) Assure long-term implementation of existing management policies and actions benefiting Covered Species through amendment of the GMP.

NPS(36) Enforce existing prohibition of collecting and deter poaching through increased routine ranger patrols.

NPS(37) Include MSHCP Covered Species as sensitive species in evaluations of road construction or maintenance activities on Federal lands.

NPS(38) Work with the Nevada Power Company (and other utilities) to be sure that support towers and poles are “raptor-safe.”

NPS(39) Monitor and protect water sources, including springs, seeps, and streams.

NPS(42) Prohibit commercial OHV tours and events in IMAs and LIMAs.

11.5.3.4 Restoration and Enhancement Measures

NPS(43) Where appropriate, implement reseeding with native plant species and other soil stabilization and habitat restoration actions following fires within the LMNRA.

NPS(46) Enhance mesquite and catclaw stands by removing the competing tamarisk and replacing with native species.

NPS(48) Continue to monitor brown-headed cowbird populations and initiate control by trapping and removing the offending cowbirds, when and if this becomes necessary.

NPS(49) Coordinate with MRREIAC in tamarisk control and possible conservation easements with private and public landowners to allow mutually beneficial habitat management activities.

NPS(50) Restore/rehabilitate all key access points of closed roads and areas, except Road 106 and 1B, which were closed due to road hazards and not resource damage.

11.5.4 NDOW

11.5.4.1 Protective Measures

NDOW(15) Prohibit driving off-road in OWMA.

NDOW(16) Prohibit camping at OWMA except at designated camp sites.

NDOW(17) Regulate hobby collection and hobby possession of authorized unprotected reptiles and amphibians.

NDOW(19) Increase enforcement of regulations prohibiting camping within 100 feet of key water sources, as defined through the adaptive management process.

NDOW(20) Evaluate and seek reclassification as protected of Covered and Evaluation Species under State regulation based on classification criteria in NAC 503.103 and 503.104.

NDOW(21) Support only those public land disposals that would not significantly impact Covered or Evaluation Species found in Clark County during consultations with Federal land managers.

11.6 Adequacy of Existing Management

About 40.1 percent of the habitat is within IMAs (BLM WSA, and critical habitat, DNWR, NAFR, Lake Mead NRA, and Overton WMA) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. Approximately 36.8 percent of the ecosystem is in MUMA (BLM undesignated lands), and may be used for multiple use activities, within the constraints of existing BLM policies for management of these activities. A total of 22.5 percent is UMA (privately held, Native American reservation, and USAF ISAFAF and NAFB) and may be used for more intensive uses.

Implementation of existing BLM, USFWS, NPS, and NDOW management actions, and the provisions of the BLM Las Vegas RMP (see Section 2.8) will adequately address the ecosystem level threats to Covered Species within the mesquite/catclaw ecosystem, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

11.7 MSHCP Conservation Contributions

The mesquite/catclaw ecosystem and the 11 Covered Species it supports will benefit from the MSHCP through general public education and information programs. Additional benefits will derive from the purchase, maintenance, and management of grazing allotments; water rights; funding of local rehabilitation and enhancement projects; potential funding or assistance in inventory, monitoring, and management activities that result from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

Chapter 12 Desert Riparian/Aquatic Ecosystem

12.1 Description and Distribution

Lowland riparian areas (USU Code 58; CA WHR Code DRI–Desert Riparian), are generally lower than 4,000 feet with localized vegetation influenced by an abundance of water in contrast to the surrounding landscape. In Clark County lowland riparian habitat is found along the Virgin and Muddy Rivers, Las Vegas Valley wash, and the Colorado River. Principal tree species include Fremont cottonwood (*Populus fremontii*) and black cottonwood (*Populus trichocarpa*). Principal shrub species include non-native tamarisk (*Tamarix ramosissima*), sandbar willow (*Salix exigua*), Goodding willow (*S. gooddingii*), velvet ash (*Fraxinus velutina*), desert willow (*Chilopsis linearis*), and mesquite (*Prosopis glandulosa*).

The desert riparian ecosystem provides essential cover, water, food, and breeding sites for many wildlife species in this otherwise arid environment. Unfortunately, these valuable wildlife resources have probably been the most negatively impacted by humans of any ecosystem in the southwestern deserts. Therefore, much of the former productivity and biodiversity has been either lost or severely reduced. These winter-deciduous communities are relicts of a more mesic period which have contracted to favorable sites (i.e., river and stream systems) as the Southwest became more arid (Minckley and Brown 1982). Degradations of stream and river systems have occurred from disturbances such as woodcutting and clearing for agriculture and human-induced hydrologic changes such as downcutting of arroyos and lowered water tables due to groundwater pumping. This has contributed to the decline of a number of riparian-dependant birds in the Southwest.

The distribution of the lowland riparian habitat element of the desert aquatic ecosystem is shown on Figure 12-1, as well as the location of the Virgin and Muddy Rivers and Las Vegas Wash. The desert riparian/aquatic ecosystem additionally contains areas of agricultural development and urbanization (Table 12-1).

TABLE 12-1
VEGETATION COMMUNITIES IN THE DESERT RIPARIAN/AQUATIC ECOSYSTEM

Vegetation Type	Acres	% of Ecosystem
Agriculture	4,400	20.3
Urban	300	1.4
Lowland riparian	16,900	78.2
Total Habitat	16,900	78.2
Total Ecosystem	21,600	100.0

12.2 MSHCP Species

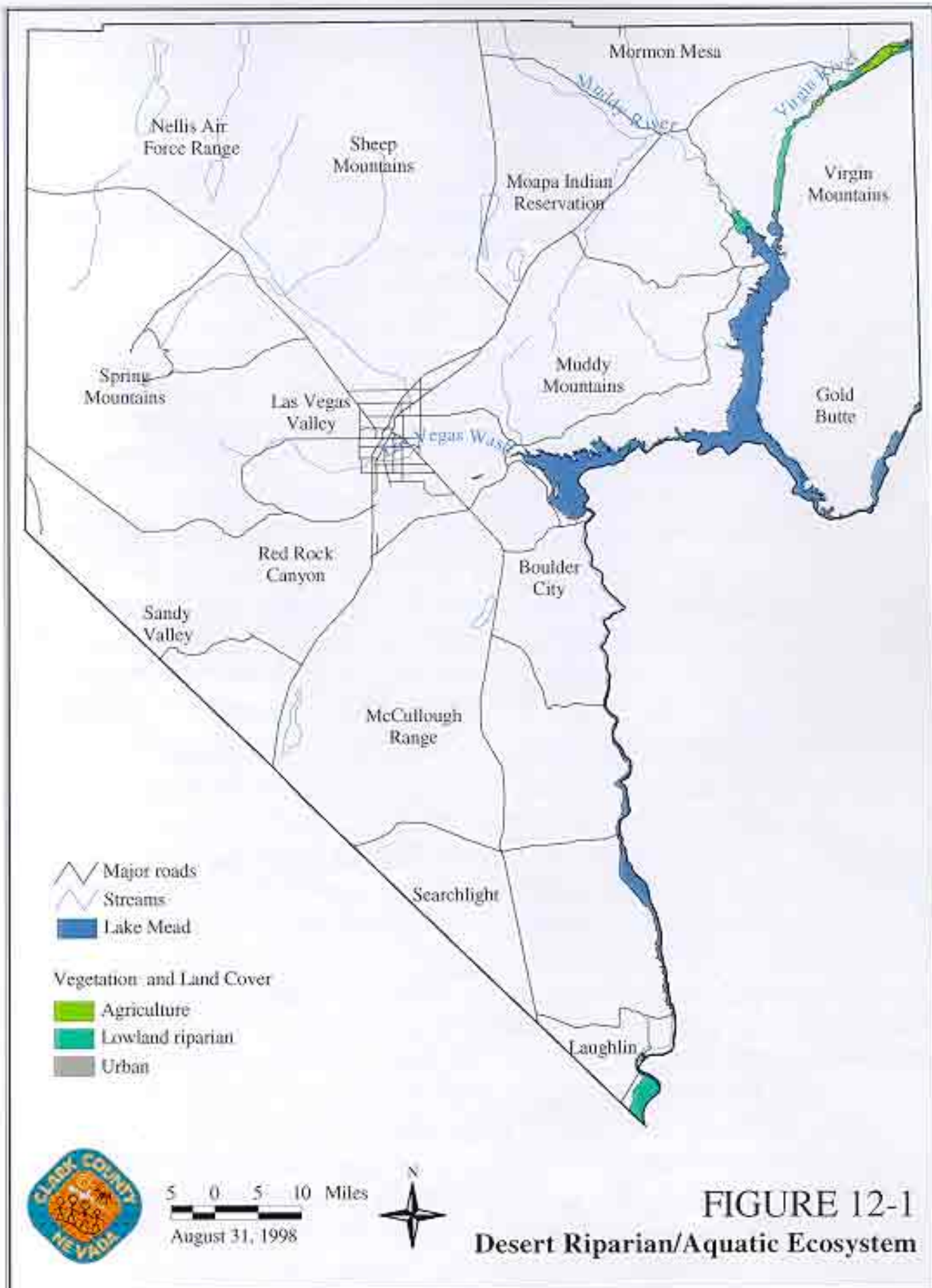
The desert riparian/aquatic ecosystem provides habitat for 14 Covered Species and 12 High Priority Evaluation Species. Seven of the Covered Species and 9 of the High Priority Evaluation Species are water dependent and exclusively or primarily associated with the lowland riparian or aquatic ecosystem.

Covered Species:

Silver-haired bat	<i>Lasionycteris noctivagans</i>
Long-eared myotis	<i>Myotis evotis</i>
American peregrine falcon	<i>Falco peregrinus anatum</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Vermilion flycatcher	<i>Pyrocephalus rubinus</i>
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>
Phainopepla	<i>Phainopepla nitens</i>
Summer tanager	<i>Piranga rubra</i>
Blue grosbeak	<i>Guiraca caerulea</i>
Arizona Bell's vireo	<i>Vireo bellii arizonae</i>
Banded gecko	<i>Coleonyx variegatus</i>
Great Basin collared lizard	<i>Crotaphytus insularis bicinctores</i>
Western red-tailed skink	<i>Eumeces gilberti rubricaudatus</i>
Relict leopard frog	<i>Rana onca</i>

High Priority Evaluation Species:

Kit fox	<i>Vulpes macrotus</i>
Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>
Banded Gila monster	<i>Heloderma suspectum cinctum</i>
Arizona (southwestern) toad	<i>Bufo microscaphus microscaphus</i>
Moapa dace	<i>Moapa coriacea</i>
Woundfin	<i>Plagopterus argentissimus</i>
Virgin River chub	<i>Gila seminuda</i>
Virgin River chub (Muddy River population)	<i>Gila seminuda</i>
Desert sucker	<i>Catostomus clarki</i>
Flannelmouth sucker	<i>Catostomus latipinnis</i>
Moapa White River springfish	<i>Crenichthys baileyi moapae</i>
MacNeil sooty wing skipper	<i>Hesperopsis graciellae</i>



12.3 Potential Threats and Stressors

The primary ecosystem level threats and stressors in the desert riparian/aquatic ecosystem are:

- Commercial collection (reduction of populations **Threat 201**, habitat degradation **Threat 202**)
- Fires and fire management (habitat degradation **Threat 301**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, competitive OHV races **Threat 403**, casual use OHV activities **Threat 404**, indiscriminate recreational shooting **Threat 406**)
- Highways, roads, and trails (highway mortality **Threat 501**, habitat fragmentation **Threat 503**, road construction and maintenance **Threat 504**, habitat degradation from highway runoff **Threat 505**.)
- Pest control (direct or indirect poisoning or trapping **Threat 601**, pesticides and herbicides **Threat 602**)
- Grazing (livestock grazing and trampling **Threat 703**)
- Military activities (target sites, roads, or other military access locations **Threat 801**, military facilities construction and maintenance **Threat 802**)
- Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**)
- Woodcutting, (wood removal, snag collection **Threat 1001**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**)
- Utilities (collisions and electrocution with power lines **Threat 1201**)
- Water development, use, and flood control in riparian areas (channelization **Threat 1301**, water diversion and groundwater pumping **Threat 1302**, decreased water availability **Threat 1303**, grazing and agriculture **Threat 1304**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**, grazing and agriculture **Threat 1404**, overutilization by animals **Threat 1405**)
- Exotic and introduced species (introductions, competition, and encroachment of exotic species **Threat 1501**, subsidized and parasitic species **Threat 1502**)
- Feral animals (feral animals and uncontrolled pets **Threat 1601**)
- Illegal or unauthorized activities (poaching, illegal collection, or killing of flora and fauna **Threat 1701**, illegal waste ponds, dumping, and waste disposal **Threat 1702**)

12.4 Desert Riparian/Aquatic Habitat Management

Intensively Managed Areas: 30.7 percent of the habitat (5,200 acres) is within IMAs under the jurisdiction of NDOW in the Overton Wildlife Management Area (Figure 12-2,

Table 12-2). Specific management policies and actions for habitat and species conservation are provided on these lands.

Multiple Use Management Areas: 5,700 acres, or 33.7 percent, of the habitat are BLM holdings which are not specifically managed for conservation and are subject to generally applicable BLM land use policies. This includes approximately 8.2 linear miles of shoreline along the Virgin River Natural Area and 0.75 mile along the Muddy River.

Un-managed Areas: The remaining habitat is within Native American reservation (3,300 acres, or 19.5% of habitat) and private ownership (2,700 acres, or 15.9%). Native American reservation lands include 2.3 miles of frontage along the Muddy River. Private lands include 12.8 miles of frontage along the Virgin River and 26.6 miles along the Muddy River. Private land uses along the Muddy River (actual river frontage) are 44 percent residential, 30 percent agricultural, 14 percent vacant land, and 12 percent commercial/industrial. The Muddy River (and West Creek fork) have levees for a reach of approximately 2.4 miles upstream from the Nevada Division of Wildlife dam at Overton. Private land uses along the Virgin River are 64 percent agricultural, 29 percent vacant, and 7 percent developed residential. No active wildlife or habitat conservation management or land use restrictions are assumed for these holdings.

TABLE 12-2
MANAGEMENT OF HABITAT IN THE DESERT RIPARIAN/AQUATIC ECOSYSTEM

Category	Manager	Management Classification	Acres	% of Habitat
IMA	NDOW	Overton WMA	5,200	30.7
IMA Total			5,200	30.7
MUMA	BLM	Undesignated	5,700	33.7
MUMA Total			5,700	33.7
UMA	Native American		3,300	19.5
	Private		2,700	15.9
UMA Total			6,000	35.5
Grand Total			16,900	100.0

12.5 Existing and Proposed Conservation Actions

Of the total of 16,900 acres of desert riparian/aquatic ecosystem, 33.7 percent is managed by BLM (undesignated), and 30.7 percent by NDOW (Overton WMA). Private holdings and Native American reservations total 35.5 percent.

BLM undesignated lands (33.7 percent) are managed to balance multiple uses, including mining, OHV activities, grazing, and other activities with maintenance of ecosystem and species values. The 30.7 percent of habitat located within the Overton WMA is managed for both conservation and a broader spectrum of recreational uses, including hunting.

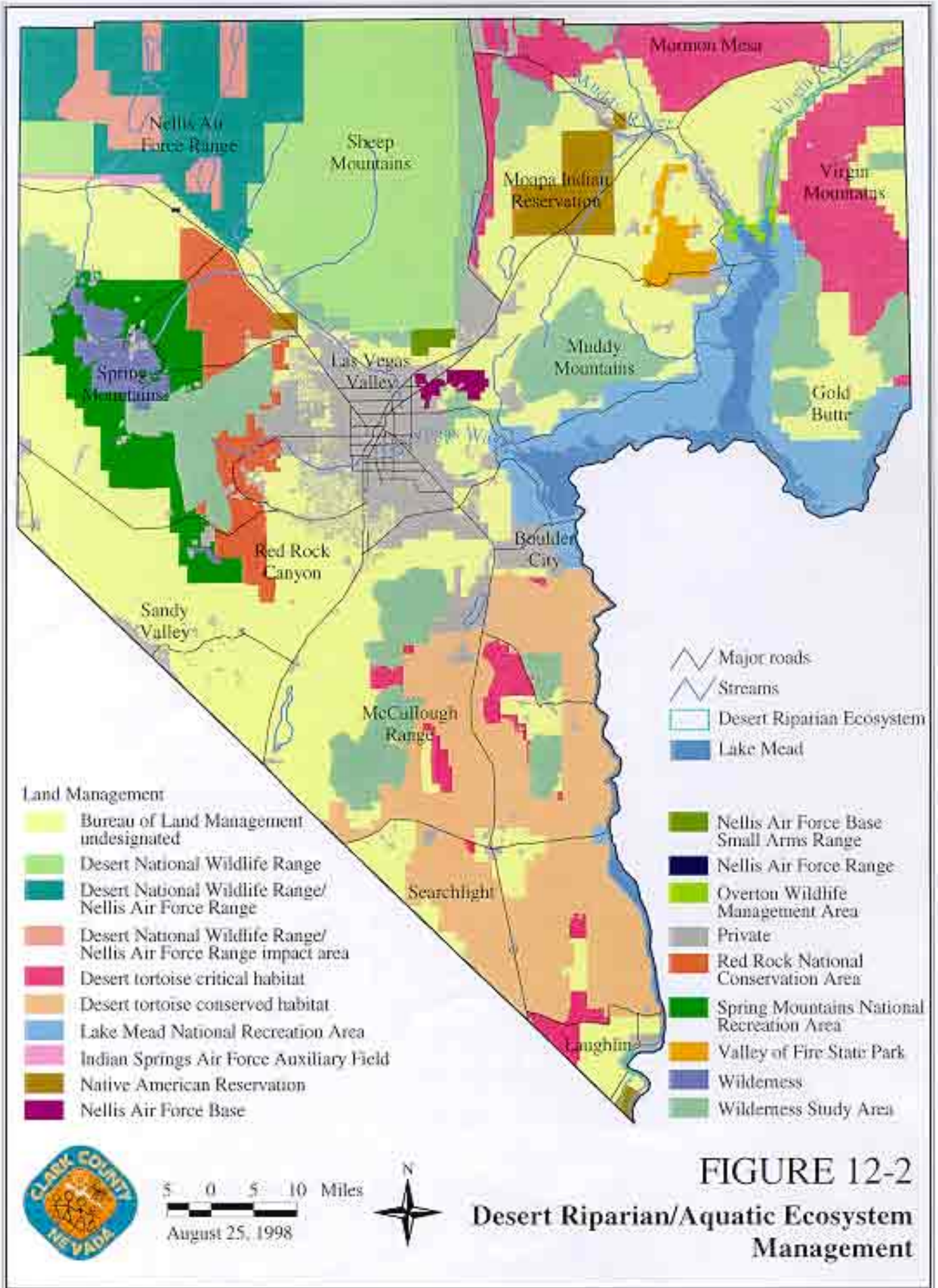


FIGURE 12-2
Desert Riparian/Aquatic Ecosystem
Management

BLM has specific management policies for riparian habitat within its management including restoration and enhancement, monitoring, inventory, and management of OHV, mineral extraction, and grazing impacts.

In addition, the majority of the desert riparian/aquatic habitat in Clark County is subject to the Federal Clean Water Act and the “no net loss” policies established for wetlands habitats. These apply to wetlands on both Federal and non-Federal lands, including Native American reservation and private lands, and generally require avoidance, minimization, or mitigation of any impacts to this habitat.

12.5.1 USFWS

12.5.1.1 Protective Measures

USFWS(41) Rehabilitate and restore adjacent upland and tributary systems to the Muddy River on Moapa Valley National Wildlife Refuge (DNWR).

12.5.2 BLM

12.5.2.1 Monitoring (Trends)

BLM(36) Monitor water sources including springs, seeps and streams to assess condition and trend.

12.5.2.2 Protective Measures

BLM(71) Limit motorized vehicles in WSAs to existing roads and trails as listed in inventory maps, or as otherwise authorized. Close unauthorized roads in WSAs.

BLM(118) Do not allow competitive off-road vehicle events within ¼ mile of natural water sources and associated riparian areas.

BLM(48) Manage fires occurring in the WSAs to the lowest suppression intensity possible.

BLM(54) Require the use of a resource advisor for all fires within important habitats for covered and evaluation species.

BLM(51) Prohibit commercial collection of vegetative specimens within WSAs. Hobby collection may be allowed for personal use but not for commercial use, as long as the collection activity method meets the non-impairment criteria.

BLM(95) Prohibit the cutting of firewood in Red Rock Canyon NCA. Elsewhere permits are required on a discretionary basis consistent with the protection of sensitive species.

BLM(101) Protect snags as important habitat features.

BLM(91) Harvesting mesquite will require a permit (for green or dead and down) consistent with sustaining the plant communities in a healthy and vigorous state, and also consistent with sustaining viable wildlife populations.

BLM(79) Close WSAs to authorization/renewal of material site rights-of-way and mineral materials disposal until a decision is reached on their status.

BLM(86) Whenever possible, avoid surface occupancy in riparian zones.

BLM(89) Where feasible, proposals for saleable materials in essential habitats for special status species will be avoided.

BLM(96) Work with the Nevada Power Company and other utilities to modify existing powerline towers or poles to meet BLM standards for the prevention of raptor mortality (Olendorff et al. 1981 Raptor Research Report #4).

BLM(117) Protect key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey on public lands through mitigation of activities during National Environmental Policy Act compliance.

BLM(114) Manage public lands adjacent to the Ash Meadows ACEC and Moapa National Wildlife Refuge to compliment spring and aquatic habitat for special status species, including projects that may affect ground water levels or spring flows.

BLM(120) Determine water needs to meet management objectives. File for appropriative water rights on public and acquired lands in accordance with the State of Nevada water laws for those water sources that are not Federally reserved.

BLM(93) Using “best management practices” as identified by the State of Nevada, minimize contributions from both point and non-point sources of pollution (including salts) resulting from public land management actions. Where applicable, proposed management actions would comply with local, state, tribal and Federal air quality laws, regulations, and standards (Conformity; per 40 CFR 93.100 et seq.).

BLM(99) Enter into conservation agreements or easements with the U.S. Fish and Wildlife Service and the State of Nevada, that if implemented, could reduce the necessity of future listings of the species in question. Conservation agreements may include, but

not be limited to, the following: Las Vegas bearpoppy, white-margined penstemon, and phainopepla.

BLM(111) Prior to the disposal of identified public lands, an analysis will be conducted to determine their resource values, including the occurrence of Special Status Species and sensitive habitats such as riparian and aquatic habitats. Land disposal will be consistent with conservation of special status species unless there is an overriding public benefit.

BLM(301) Limit the construction of new roads for the development of utility lines within special status species habitat.

BLM(20) Improve aquatic, riparian and mesquite woodland habitats including Meadow Valley Wash.*

BLM(90) Provide protection (such as fencing) around springs and riparian habitats to prevent habitat degradation from excessive use by grazing animals.*

BLM(103) Livestock grazing will be managed consistent with riparian objectives of reaching or maintaining proper functioning condition (PFC)*.

BLM(125) As grazing systems are developed for each allotment, ensure the system is consistent with the conservation of BLM special status species. Where conflicts occur, encourage Clark County to obtain grazing privileges on a willing seller basis.*

BLM(59) Manage wild horses and burros as necessary to maintain thriving ecological balance and consistent with the protection of special status species in important habitat areas.*

BLM(58,60) Wild horses and burros will be removed when herds have expanded beyond designated herd area boundaries or Appropriate Management Level is exceeded.*

BLM(98) Provide adequate law enforcement presence to ensure that management actions and restrictions are implemented for the conservation of covered and/or evaluation species.*

BLM(302) Protect important resting/nesting habitat such as riparian areas and mesquite/acacia woodlands. Do not allow projects that may adversely impact the water table supporting these plant communities.*

BLM(127,128) The livestock grazing program shall be managed to meet the Bureau's Standards and Guidelines as developed by the Southern Great Basin/Mojave Resource Advisory Committee.* The "standards" are listed below:

STANDARD 1. SOILS: Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity and sustain the hydrologic cycle.

STANDARD 2. ECOSYSTEM COMPONENTS: Watersheds should possess the necessary ecological components to achieve state water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristics of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

STANDARD 3. HABITAT AND BIOTA: Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

12.5.2.3 Restoration and Enhancement Measures

BLM(123) Within desert tortoise critical habitat/ACECs, Las Vegas bearpoppy habitat, and other important habitats for covered and evaluation species, require reclamation of activities which result in loss or degradation of habitat, with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. If necessary subsequent seeding or transplanting efforts may be required, should monitoring indicate that the original effort was not successful.

BLM(143) Rehabilitate, reclaim or revegetate areas subjected to surface-disturbing activities where feasible. When rehabilitating disturbed areas, first manage for optimum species diversity by seeding native species, except where non-native species are appropriate.*

BLM(303) Implement a program to rehab surface disturbances including the first hundred feet or so of "closed" roads and trails within proposed desert tortoise ACECs, Las Vegas bear poppy habitat, and other areas important for special status species.*

BLM(135) Implement reseeding with native plant species and other soil stabilization and habitat restoration actions following wildfires within areas important for the conservation of covered species and where the feasibility of success is reasonably certain.*

BLM(137) Cooperate with NPS, FS, USFWS, Clark County and others on a reclamation program which will include maintaining a seed bank and live plants for rehabilitation of disturbed or burned areas if necessary.*

BLM(109) In cooperation with NDOW, the USFWS, and ADC, monitor brown-headed cowbird and raven populations and implement population controls of these species where necessary for the conservation of covered species.*

BLM(142) Control and/or eradicate tamarisk. Rehabilitate the area with native species to help reduce the potential for tamarisk reestablishment and improve ecosystem health.*

BLM(121) Determine instream flow requirements and apply for the necessary water rights on the Virgin River and Meadow Valley.*

BLM(138) Cooperate with the U.S. Fish and Wildlife Service and others in the implementation of the Virgin River Fishes Recovery Plan and the Recovery Plan for the Rare Aquatic Species of the Muddy River Ecosystem.*

BLM(106) Take appropriate protective actions to maintain or improve springsnail habitat, including the reestablishment of populations of springsnails.*

BLM(140) Improve riparian areas, giving priority to areas Functioning at Risk with a downward trend. Implement measures to protect riparian areas, such as fencing and/or alternate water sources away from the riparian area. Insure that the minimum requirement of Proper Functioning Condition on all riparian areas is maintained or achieved.*

BLM(141) Improve approximately 400 acres of aquatic and riparian habitat on the Virgin River, Muddy River, and Meadow Valley Wash from its existing poor to fair condition to good or better condition by replacing tamarisk with native species.*

BLM(136) In cooperation and coordination with the Nevada Division of Wildlife, the U.S. Fish and Wildlife Service, and others, assist with the elimination of exotic fish and invertebrates from springs and streams where necessary for the conservation of covered species.*

12.5.2.4 Land Use Policies and Actions

BLM(164) The following are land acquisition priorities on a willing seller basis: *

- 1) Private lands required to meet management objectives within designated ACECs, WSAs, T&E habitat and areas containing special status species.

- 2) Private lands along the Virgin River south of Riverside Bridge.
- 3) Lands not specifically identified for acquisition could be acquired on a case-by-case basis for the following reasons: a) protection of T&E and special status species; b) to provide resource protection; c) to facilitate implementation of the Resource Management Plan; d) to provide a more manageable land ownership pattern; or e) to maintain or enhance public uses and values.

BLM(201) Withdraw from locatable mineral entry and close to all solid mineral leasing within ¼ mile of natural springs, the floodplain of the Virgin and Muddy Rivers, and all ACECs.

BLM(202) Allow fluid mineral leasing, subject to No Surface Occupancy stipulations within areas having important cultural, geological, and riparian resources; special status species plant and animal habitat; Areas of Critical Environmental Concern; administrative sites; and Special Recreation Management Areas. (See the RMP ROD for a list of ACECs and acreages which includes 866,000 acres.)

12.5.3 NDOW

12.5.3.1 Protective Measures

NDOW(15) Prohibit driving off-road in OWMA.

NDOW(16) Prohibit camping at OWMA except at designated camp sites.

NDOW(17) Regulate hobby collection and hobby possession of authorized unprotected reptiles and amphibians.

NDOW(19) Increase enforcement of regulations prohibiting camping within 100 feet of key water sources, as defined through the adaptive management process.

12.5.3.2 Restoration and Enhancement Measures

NDOW(22) Convert tamarisk to waterfowl forage or native vegetation at Overton Wildlife Management Area.

NDOW(23) In cooperation with USFWS and others, support efforts to eradicate tamarisk and/or restore native vegetation communities on public and private lands.

NDOW(24) Where appropriate and within available budget allocations, pursue acquisition or reservation of water rights and in-stream flows for maintenance of aquatic habitats for wildlife.

NDOW(25) In cooperation with USFWS and recovery teams, pursue additional funding and implement actions for non-native aquatic species eradication and aquatic habitat restoration efforts on the Virgin and Muddy Rivers.

12.5.3.3 Research

NDOW(9) Conduct and/or support life history and aquatic habitat assessments for native fish species in the Virgin and Muddy rivers, within constraints of budget allocations.

12.5.4 NDOT

12.5.4.1 Protective Measures

NDOT(18) Restrict spraying herbicides or other chemicals that are toxic to aquatic organisms 100 feet from the aquatic habitats, such as well developed riparian areas, wetlands or perennial waters, including tributaries to such lands. Use mechanical and/or herbicides/chemicals non-toxic to aquatic organisms when working in such lands. No herbicide spraying within 100 feet of known covered invertebrate habitat.

NDOT(19) Install highway runoff pollution control devices in areas where Covered aquatic species may be impacted by highway runoff.

12.5.4.2 Restoration and Enhancement Measures

NDOT(26) Within NDOT property along the Muddy River, remove tamarisk and replant with willow poles when abandonment of the Glendale maintenance station occurs. This is expected by January 2000. Continue hazardous waste and monitoring plan that is currently in place at this station until abandonment of the site has occurred.

12.5.4.3 Land Use Policies and Actions

NDOT(28) If possible, plan construction/maintenance projects that occur in aquatic habitat, as mentioned above, during times when spawning/nesting is unlikely. In general, the colder winter months are when such work is preferred. Best management practices should be employed during such activities. Implement any other U.S. Army Corps of Engineers terms and conditions required by the specific permit.

12.6 Adequacy of Existing Management

A total of 30.7 percent of the habitat is within IMAs (Overton WMA) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. Another 33.7 percent of habitat is within MUMA (BLM undesignated lands) and may be used for multiple use activities, within the constraints of existing BLM

policies for management of these activities in riparian habitats. The remaining habitat (35.5 percent) is UMA (privately held, Native American reservation, and USAF ISAF AF and NAFB) and may be used for more intensive activities.

Implementation of existing BLM and NDOW management actions, the provisions of the BLM Las Vegas RMP, and the provisions of the Clean Water Act (Section 404) (see Section 2.8) will adequately address the ecosystem level threats to Covered Species within the desert riparian/aquatic habitat, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

12.7 MSHCP Conservation Contributions

The desert riparian/aquatic habitats and the species they support will benefit from the MSHCP through general public education and information programs. Additional benefits will derive from the purchase, maintenance, and management of grazing allotments and water rights; funding of local rehabilitation and enhancement projects; potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

In addition, the resolution of the conservation needs of this habitat through the development of watershed-based management plans for the Muddy and Virgin Rivers, as well as integration of the Las Vegas Wash habitat restoration activities, are among the highest priorities for Phase 2 of the MSHCP.

Chapter 13 Spring Ecosystems

13.1 Description and Distribution

In southern Nevada, perennial springs are widely distributed from the high mountains to the low deserts (Figure 13-1, Table 13-1). The greatest density of springs occur in the Spring, Virgin, Newberry, and McCullough Mountains and Lake Mead NRA, Gold Butte, and Moapa Valley. Biogeographic evidence based on the distribution of fish species indicate that springs east of the Spring Mountains range were once connected to streams flowing into the Colorado River and are considered part of the Colorado River drainage system (Hubbs and Miller 1948). Springs on the western slopes of the Spring Mountains are within the Great Basins internal drainage. In general, springs form when faulting or erosion expose cavernous systems in limestone, fractures in the earth allow subsurface water to seep out, or when the water table intersects the land surface (Hershey 1989; Rinne 1991). Springs are recharged by winter snow melt, summer thunderstorms, and discharge from local aquifer systems. In large valleys, groupings of several localized springs may be connected by an aquifer system to form spring complexes. Most of the springs in Clark County are cold water springs that vary greatly in size. They range from small isolated pools with short springbrooks to larger spring fed watercourses such as the Muddy River. Riparian vegetation along springbrooks and river banks range from sedges and grasses to well-developed woodland communities (Sada et al. 1996).

A smaller number of desert springs are classified as thermal springs where the water is derived from deep sources and charged with salts and various gasses. Water temperature is warm and relatively constant, only changing a few degrees throughout the year. Soils of thermal springs generally have a high salt concentration so growth near these springs is restricted to species adapted to saline conditions such as saltgrass (*Distichlis stricta*), iodine bush (*Allenrolfea occidentalis*), and ink weed (*Suaeda torreyana*) (Bradley and Deacon 1965). Other aquatic vegetation usually surrounds the spring source forming small marshes around the spring complexes.

Many animal species are restricted to springs or habitat adjacent to spring systems. Bats rely on springs for drinking sites and may roost in limestone crevices, caves, and dead trees adjacent to springs (Ramsey 1997). In the Spring Mountains all bat roosts were found near water (Ramsey 1997). Several butterflies endemic to the Spring Mountains are attracted to areas with surface water and utilize host plants and nectar sources adjacent to

springs (Weiss et al. 1995). Permanent stream systems in Clark County provide habitat for many MSHCP Covered and Evaluation bird, fish, and amphibian species.

Springs occur in high elevation (bristlecone pine to pinyon-juniper habitats) and low elevation (sagebrush to Mojave desert scrub habitats, including mesquite and desert riparian habitats) and anthropogenic habitats (agriculture, grasslands, and urban areas within these ecosystems. Of a total of 506 recorded springs, 121 (23.9%) are found in high elevations and 385 (76.1%) are in low elevation habitats. Anthropogenic areas have 30 springs (5.9%). The low elevation blackbrush habitat accounts for 142 springs, or 28.1 percent of the total; while the high elevation pinyon-juniper habitat has 96 springs, or 18.9 percent of the total. Ponds are man-made impoundments or naturally occurring areas of open water. These occur predominately in lower elevation areas, most often within anthropogenic areas. The 1998 EPA database lists 64 intermittent ponds, 128 permanent ponds and catchments, and 20 mining, industrial, and sewage ponds.

**TABLE 13-1
DISTRIBUTION WITHIN THE SPRINGS ECOSYSTEM**

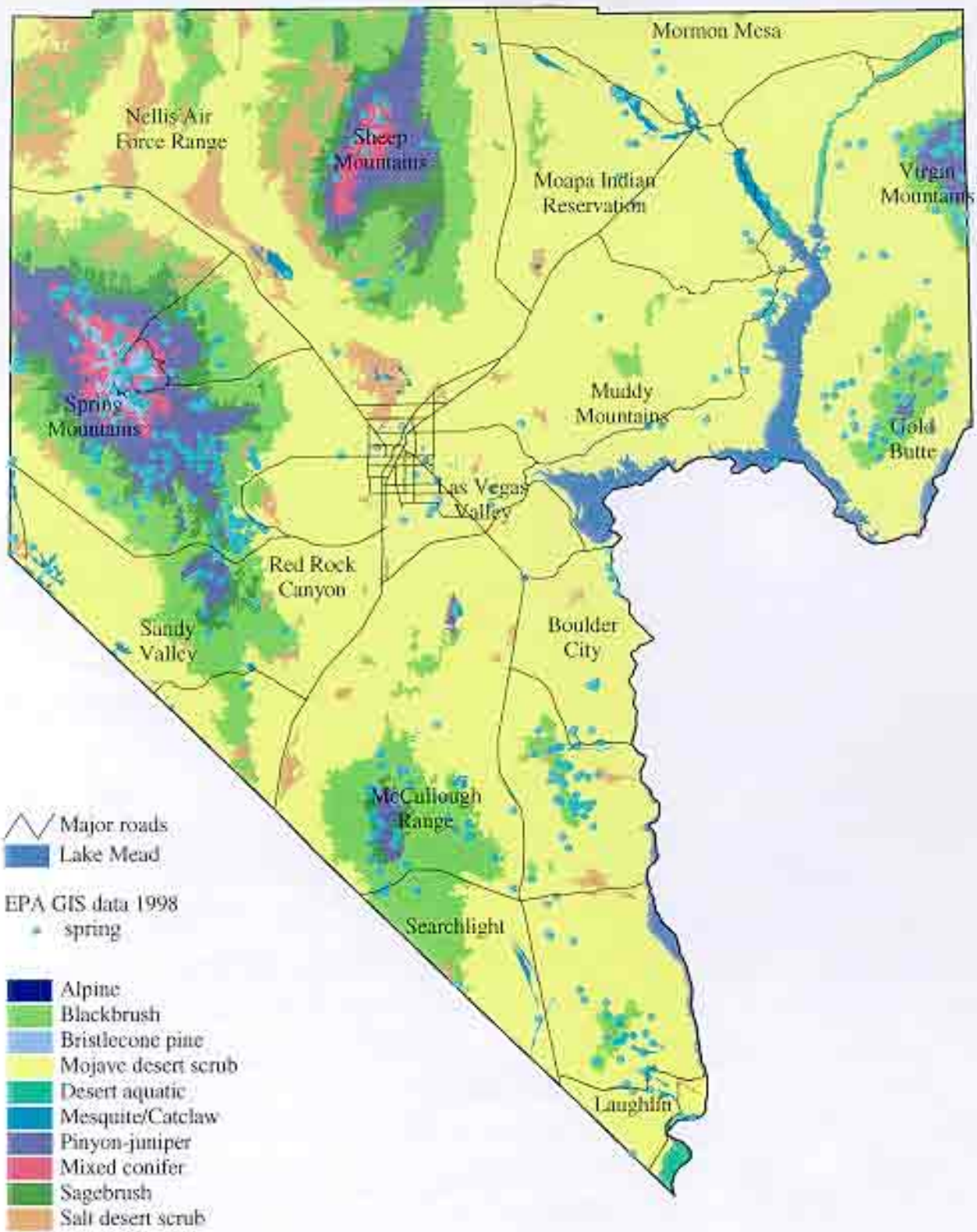
Vegetation Type	Reservoir	Marsh	Catchment	Pond	Springs	Total
Bristlecone pine	0	0	0	0	14	14
Mixed conifer forest	1	0	1	2	34	37
Pinyon-juniper	1	0	4	0	96	101
Sagebrush	0	0	6	0	27	33
Blackbrush	10	1	9	0	142	161
Salt desert scrub	2	0	13	0	4	19
Mojave desert scrub	37	3	77	18	157	292
Mesquite/catclaw	11	0	17	0	30	60
Desert riparian	2	0	1	0	2	5
Total	64	4	128	20	506	722

13.2 MSHCP Species

There are 13 Covered Species and 5 High Priority Evaluation Species associated with springs within the various habitats in Clark County, which are listed below. [An asterisk indicates spring-dependent species or endemics to spring systems.]

Covered Species:

Silver-haired bat	<i>Lasionycteris noctivagans</i>
Long-eared myotis	<i>Myotis evotis</i>
Long-legged myotis	<i>Myotis volans</i>
Relict leopard frog*	<i>Rana onca</i>
Dark blue butterfly	<i>Euphilotes enoptes purpurea</i>
Spring Mountains icarioides blue	<i>Icaricia icarioides austinatorum</i>
Nevada admiral	<i>Limenitus weidemeyerii nevadae</i>
Spring Mountains comma skipper	<i>Hesperia comma mojavensis</i>



5 0 5 10 Miles
August 31, 1998



FIGURE 13-1
Spring Ecosystem

Spring Mountains springsnail*	<i>Pyrgulopsis deaconi</i>
Southeast Nevada springsnail*	<i>Pyrgulopsis turbatrix</i>
Rough angelica	<i>Angelica scabrida</i>
Alkali mariposa lily	<i>Calochortus striatus</i>
Clokey thistle	<i>Cirsium clokeyi</i>

High Priority Evaluation Species:

Arizona (southwestern) toad*	<i>Bufo microscaphus microscaphus</i>
Moapa dace*	<i>Moapa coriacea</i>
Moapa White River springfish*	<i>Crenichthys baileyi moapae</i>
Triangle lobe moonwort	<i>Botrychium ascendens</i>
Dainty moonwort	<i>Botrychium crenulatum</i>

13.3 Potential Threats and Stressors

The primary ecosystem level threats and stressors to spring ecosystems are:

- Commercial collection (reduction of populations **Threat 201**)
- Fires and fire management (habitat degradation **Threat 301**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, concentrated recreation **Threat 402**, competitive OHV races **Threat 403**, casual use OHV activities **Threat 404**)
- Highways, roads, and trails (road construction and maintenance **Threat 504**, habitat degradation from highway runoff **Threat 505**)
- Pest control (pesticides and herbicides **Threat 602**)
- Grazing (wild horse and burro grazing and trampling **Threat 701**, livestock grazing and trampling **Threat 703**)
- Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**)
- Urban and agricultural development (urban and rural development **Threat 1101**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**, grazing and agriculture **Threat 1404**, overutilization by animals **Threat 1405**)
- Exotic and introduced species (introductions, competition, and encroachment of exotic species **Threat 1501**, subsidized and parasitic species **Threat 1502**)
- Illegal or unauthorized activities (poaching, illegal collection, or killing of flora and fauna **Threat 1701**)

13.4 Springs Habitat Management

The distribution by conservation management categories is IMA, 248 springs (49.0% of the total); LIMA, 76 springs (15.0% of the total); BLM MUMA, 104 springs (20.5% of the total); and UMA, 78 springs (15.4% of the total) (Figure 13-2, Table 13-2). BLM has

jurisdiction over 287 springs (56.7%); USFS has 115 springs (22.7%); the DNWR and NAFR areas include 28 springs (5.5%); NPS has 36 springs (7.1%) within the LMNRA; and 74 springs (14.6%) occur within private lands.

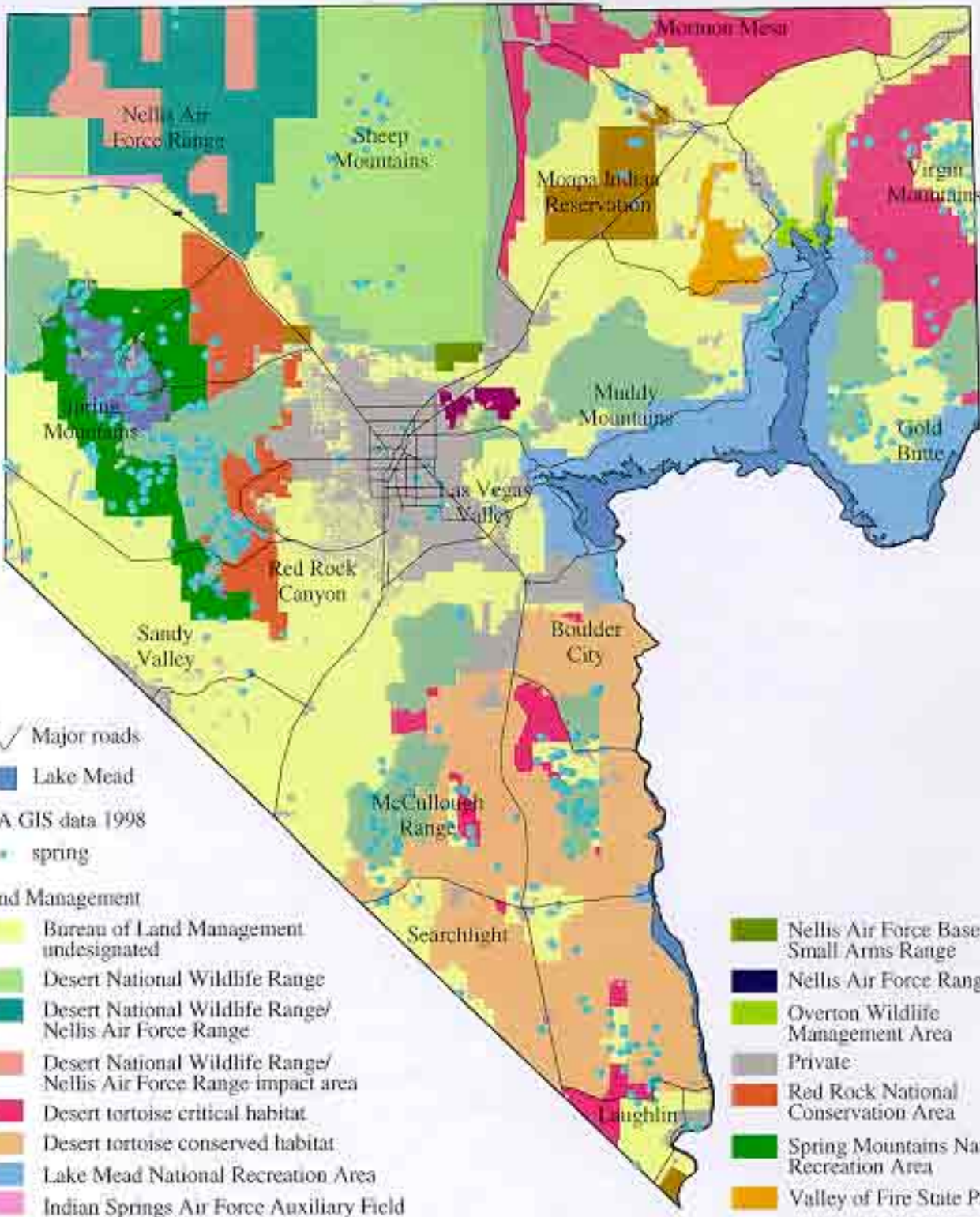
**TABLE 13-2
SPRINGS HABITAT MANAGEMENT**

Category	Manager	Management Classification	Total
IMA	BLM	Conserved Habitat	14
	BLM	Critical Habitat	24
	BLM	WSA	79
	Boulder City		3
	NDOW	Overton WMA	2
	NPS	Lake Mead NRA	36
	State Lands		1
	USFS	Wilderness	37
	USFS	WSA	24
	USFWS	DNWR	26
	USFWS/USAF	DNWR/NAFR	2
	IMA Total		
LIMA	BLM	NCA	22
	USFS	SMNRA	54
LIMA Total			76
MUMA	BLM	Undesignated	104
MUMA Total			104
UMA	Private	Private	74
	Native American	Native American	4
UMA Total			78
Grand Total			506

13.5 Existing and Proposed Conservation Actions

Of the total of 506 identified springs in Clark County, 243 are managed by BLM (undesignated, WSA, conserved habitat), 115 by USFS (Spring Mountains NRA, WSA, wilderness), 36 by NPS (Lake Mead NRA), 28 by USFWS (DNWR, NAFR), 3 by Boulder City (Boulder City easement), 2 by NDOW (Overton WMA), and 1 by State Parks. At least 74 springs occur on private holdings and 4 on Native American reservations.

Approximately 99 of the springs are in areas managed for primitive, non-motorized, dispersed recreational use (wilderness, WSA, or DNWR). The 115 springs located within the Spring Mountains NRA, Red Rock Canyon NCA, Overton WMA, Lake Mead NRA, and State Parks are on land managed for both conservation and a broader spectrum of recreational uses, including intensive recreational use areas, developed camping areas, hiking and biking trails, rock climbing areas, and designated motorized vehicle use roads



Major roads

Lake Mead

EPA GIS data 1998

spring

Land Management

- Bureau of Land Management undesignated
- Desert National Wildlife Range
- Desert National Wildlife Range/ Nellis Air Force Range
- Desert National Wildlife Range/ Nellis Air Force Range impact area
- Desert tortoise critical habitat
- Desert tortoise conserved habitat
- Lake Mead National Recreation Area
- Indian Springs Air Force Auxiliary Field
- Native American Reservation
- Nellis Air Force Base

- Nellis Air Force Base Small Arms Range
- Nellis Air Force Range
- Overton Wildlife Management Area
- Private
- Red Rock National Conservation Area
- Spring Mountains National Recreation Area
- Valley of Fire State Park
- Wilderness
- Wilderness Study Area



5 0 5 10 Miles
August 31, 1998



FIGURE 13-2
Spring Ecosystem Management

and trails. These areas are actively managed for habitat conservation. BLM undesignated lands (104 springs) are managed to balance multiple uses, including mining, OHV activities, grazing, and other activities with maintenance of ecosystem and species values.

The CA for the Spring Mountains NRA identifies general and specific management actions for springs and associated species including the development of a plan to monitor spring and riparian function and habitat condition, restoration actions where habitat damage is occurring, environmental education programs, road closures, fencing, and other protective measures.

13.5.1 USFS

13.5.1.1 Public Information and Education

USFS(10) Design and install information and educational signs in accordance with Interagency Agreement # 14-48-0001-94605 between the USFS and USFWS for the Spring Mountains NRA (Appendix H). Signs will be located outside the Wilderness Area, at trailheads or near sensitive habitats, and will provide information on low impact recreation and ecological resource protection. Priorities include the following: (CA7.7)

Fused PVC color signs:

*Cathedral Rock
Mary Jane Falls Trailhead
Deer Creek Picnic Area
Bristlecone Trailhead
Robbers Roost Trailhead*
Fletcher Canyon Trailhead*
Trail Canyon Trailhead*
North Loop Trailhead*
Bonanza Trailhead*
Harris Spring Trailhead*
Carpenter Canyon**

Smaller signs:

*Mummy Springs
Stanley B Spring
CC Spring
Trough Spring
Cave Spring
Macks Canyon Spring*

13.5.1.2 Monitoring

*USFS(29) Develop and implement a plan to monitor springsnail populations and habitats at Kiup Spring, Willow Creek, and Cold Creek. (CA3.5)**

USFS(32) Develop and implement a program to monitor selected biodiversity hotspots and species of concern habitats not covered in 3.1 through 3.7, based on periodic biologist site visits and/or photo points to document habitat conditions. This program will provide information needed to assess management suitability and the need to modify management practices in these areas. Priorities species and habitats include the following (indicates photo point will be established) (CA3.8)**

- *Deer Creek (Palmer's chipmunk, bats, butterflies, plants, riparian stream corridor); Upper Kyle Canyon, including Mary Jane Falls (Palmer's chipmunk, butterflies, plants, riparian areas and **spring sources**); Upper Lee Canyon, including Three Springs* (Palmer's chipmunk, butterflies, plants), and; Macks Canyon, Macks Canyon Spring*, and Macks Road (Palmer's chipmunk, bats, plants) - annual visit (CA3.8b)*
- *Willow Creek (butterflies, **spring snails**, plants, riparian stream corridor); Camp Bonanza and North Divide Trail, including McFarland and Whiskey springs (bats, plants); and, Cold Creek (butterflies, **spring snails**, riparian stream corridor) - annual visit (CA3.8c)*
- *Wheeler Well (bats, plants), and Trough Spring (to monitor habitat following restoration) - annual visit. (CA3.8d)*
- *Stanley B Spring (plants, riparian area) - annual visit (CA3.8e)*
- *Fletcher Canyon and Spring (bats and plants), Mummy Spring*, and lower North Loop Trail (plants) - periodic visit. (CA3.8f)*
- *Lost Cabin Spring*, CC Spring*, and Cave Spring (to monitor habitat condition following restoration) - periodic visit. (CA3.8h)*
- *Peak Spring (plants) - periodic visit (CA3.8i)*
- *Harris Mountain and Saddle (plants) - occasional visit (CA3.8j)*
- *Mud Springs area (plants) - occasional visit (CA3.8k)*
- *Big Timber and Rock Spring (to monitor habitat condition following restoration) - occasional visit (CA3.8l)*

- *Roses Spring (to monitor habitat condition following restoration) - occasional visit (CA3.8m)*

13.5.1.3 Protective Measures

USFS(40) Identify specific areas of exceptional sensitivity where conservation management will be emphasized over recreation. (CA-GC 4.0(4))

*USFS(43) Protect habitat of the species of concern from dispersed recreation (e.g., heavy foot traffic, off-road vehicles, mountain bikes), and the adverse effects of wild horses and burros. (CA-GC 4.0(7))**

USFS(51) Sign closure order allowing USFS to prohibit camping within specific distance of water sources, based on species and habitat protection needs, and control dispersed, primitive camping in the NRA by enforcing the closure order. (CA4.8)

USFS(67) Where possible, maintain historic floodplain and channel width, slope, and gradient. (FS-GU-0.5)

USFS(68) Maintain/restore open pools of slow moving water (0.5 meter in diameter) at some historic water sources, well distributed throughout the range. Develop open pools of water at least 0.5 meter in diameter at newly developed/diverted water sources. (FS-GU-0.6)

USFS(69) Develop new perennial water sources, including guzzlers, only to benefit native species, to improve distribution of non-native species, where historic water sources have disappeared, or where access is limited. Only develop water sources in the Wilderness or WSAs to improve desert bighorn sheep habitat. These developments must protect wilderness character. (FS-GU-0.7)

USFS(70) When developing water sources, pipe water from a point downstream of the source if snails or other sensitive species are present, or if the spring source has not been previously developed. (FS-ST-0.8)

USFS(99) Discourage foot-traffic and camping at Mummy Spring by removing visitor-made trails, trail signage, and restoring native vegetation in riparian areas. (FS-GU-12.6)

13.5.1.4 Restoration and Enhancement Measures

USFS(106) Restore habitat in accordance with Interagency Agreement # 14-48-0001-94605 between the USFS and USFWS for the Spring Mountains NRA. All restoration activities will be designed and implemented in coordination with the Technical Working

Group (CA1.6) to avoid inadvertent adverse effects on the species of concern. Priorities identified to date are as follows: (CA5.2)

- *McFarland Spring - Improve fence, treat head cut, construct dry well - very high priority (CA5.2a)*
- *Mummy Spring - Remove informal trails - very high priority (CA5.2b)*
- *Carpenter Canyon - Close last ¼ mile of road, create parking area -very high priority (CA5.2c)**
- *Trough Spring - Close road, treat road bed, seed area - high priority (CA5.2d)*
- *Lost Cabin Spring - Close road, eliminate diversion, restore spring brook - high priority (CA5.2e)**
- *Big Timber Spring - Remove stock tank and stock pond - high priority (CA5.2f)**
- *Gold Spring - Remove stock tank, headbox, and pipeline - high priority (CA5.2h)**
- *Middle Mud Spring and East Mud Spring - Repair fence, remove headbox and pipeline -medium priority (CA5.2i)*
- *Buck Spring - Remove headbox, pipeline, and trough - medium priority (CA5.2j)**
- *Macks Canyon Spring - Extend exclosure - medium priority (CA5.2k)**
- *Younts Spring - Eliminate salt cedar, remove impoundment - medium priority (CA5.2l)**
- *Santa Cruz Spring - eliminate salt cedar, construct exclosure, dry well, and pipeline - medium priority (CA5.2m)**
- *Ninetynine Spring - Discontinue dredging, construct exclosure, dry well, and pipeline - medium priority (CA5.2n)**
- *Mexican Spring - Discontinue dredging, construct exclosure, dry well, and pipeline - medium priority (CA5.2o)**
- *Cougar Spring - Construct exclosure, dry well, and pipeline - medium priority (CA5.2p)**

*USFS(108) Develop and begin implementing a comprehensive restoration plan for the Willow Creek area. This plan will include relocation of roads and campgrounds out of the riparian area, removal of unneeded spur roads, a walk-in day-use plan, protection and habitat enhancement for springsnails, butterflies (including mud), and phainopepla. The plan will emphasize opportunities for public participation. (CA5.4)**

USFS(116) Use native species when restoring riparian areas. (FS-ST-0.1)

USFS(117) Remove existing water developments and debris from springs, providing they no longer serve their original purpose, are not critical to wildlife, and the items are not of historical significance. (FS-ST-0.13)

*USFS(131) Restore water sources to historic flows in the Wilderness. (FS-OBJ-12.7)**

13.5.1.5 Land Use Policies and Actions

USFS(155) Maintain or restore the health and size of riparian areas at natural water sources, and at human-made water sources where native and desired non-native species have become accustomed to using them (e.g., broken pipelines). (FS-OBJ-0.2)

USFS(159) Maintain historic/natural operation of floodplains, where possible. (FS-OBJ-0.6)

USFS(160) Maintain historic conditions of water chemistry, temperature, clarity, and surface flow. (FS-OBJ-0.7)

USFS(172) Assert claims to water that benefit recreation development, in-stream flow, wildlife, threatened, endangered, and sensitive species, species of concern, and wild horse and burro populations. (FS-ST-0.9)

USFS(173) Divert 25% or less of the surface flow from new developments at springs, seeps, and streams. (FS-ST-0.11)

USFS(215) Construct any new roads outside riparian areas, washes, and the 50-year floodplain; and at least 100 yards away from existing water sources, except at crossings perpendicular to the water course. (FS-ST-0.141)

USFS(222) Allow surface flows to return to ecosystem use in developed canyons. (FS-OBJ-11.4)

13.5.2 USFWS

13.5.2.1 Monitoring (Trends)

USFWS(6) *Monitor and protect water sources and water flows (springs, seeps, and streams) to assure adequate water is provided for sensitive species (DNWR).*

13.5.2.2 Protective Measures

USFWS(12) *Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).*

USFWS(13) *Adopt and implement policies to protect plant species from dispersed or unregulated recreation (DNWR).*

USFWS(17) *Protect existing riparian habitat from the effects of recreational activities (DNWR).*

USFWS(18) *Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).*

USFWS(19) *Focus recreation activities into less sensitive areas (DNWR).*

USFWS(20) *Minimize clearing of undergrowth in construction of new facilities within the DNWR (DNWR).*

USFWS(22) *Prohibit horses, burros, and livestock grazing (DNWR).*

USFWS(28) *Ensure that adequate law enforcement and ranger patrolling is implemented within the DNWR (DNWR).*

13.5.2.3 Restoration and Enhancement Measures

USFWS(35) *Create new open water resources for bats and other wildlife (DNWR).*

USFWS(41) *Rehabilitate and restore adjacent upland and tributary systems to the Muddy River on Moapa Valley National Wildlife Refuge (DNWR).*

13.5.3 BLM

13.5.3.1 Public Information and Education

BLM(6) On a case by case basis, BLM will install signs at springs explaining the need for their protection and to reiterate State law that prohibits camping within 100 yards of water sources.*

13.5.3.2 Monitoring (Trends)

BLM(36) Monitor water sources including springs, seeps and streams to assess condition and trend.

13.5.3.3 Protective Measures

BLM(39) Prohibit collection of plants, animals, and mineral materials in Red Rock Canyon NCA without a permit.

BLM(57) Allow backcountry camping only in designated areas of Red Rock Canyon NCA.

BLM(118) Do not allow competitive off-road vehicle events within ¼ mile of natural water sources and associated riparian areas.

BLM(51) Prohibit commercial collection of vegetative specimens within WSAs. Hobby collection may be allowed for personal use but not for commercial use, as long as the collection activity method meets the non-impairment criteria.

BLM(86) Whenever possible, avoid surface occupancy in riparian zones.

BLM(89) Where feasible, proposals for saleable materials in essential habitats for special status species will be avoided.

BLM(114) Manage public lands adjacent to the Ash Meadows ACEC and Moapa National Wildlife Refuge to compliment spring and aquatic habitat for special status species, including projects that may affect ground water levels or spring flows.

BLM(120) Determine water needs to meet management objectives. File for appropriative water rights on public and acquired lands in accordance with the State of Nevada water laws for those water sources that are not Federally reserved.

BLM(93) Using “best management practices” as identified by the State of Nevada, minimize contributions from both point and non-point sources of pollution (including

salts) resulting from public land management actions. Where applicable, proposed management actions would comply with local, state, tribal and Federal air quality laws, regulations, and standards (Conformity; per 40 CFR 93.100 et seq.).

BLM(99) Enter into conservation agreements or easements with the U.S. Fish and Wildlife Service and the State of Nevada, that if implemented, could reduce the necessity of future listings of the species in question. Conservation agreements may include, but not be limited to, the following: Las Vegas bearpoppy, white-margined penstemon, and phainopepla.

BLM(111) Prior to the disposal of identified public lands, an analysis will be conducted to determine their resource values, including the occurrence of Special Status Species and sensitive habitats such as riparian and aquatic habitats. Land disposal will be consistent with conservation of special status species unless there is an overriding public benefit.

BLM(301) Limit the construction of new roads for the development of utility lines within special status species habitat.

BLM(20) Improve aquatic, riparian and mesquite woodland habitats including Meadow Valley Wash.*

BLM(90) Provide protection (such as fencing) around springs and riparian habitats to prevent habitat degradation from excessive use by grazing animals.*

BLM(103) Livestock grazing will be managed consistent with riparian objectives of reaching or maintaining proper functioning condition (PFC)*.

BLM(125) As grazing systems are developed for each allotment, ensure the system is consistent with the conservation of BLM special status species. Where conflicts occur, encourage Clark County to obtain grazing privileges on a willing seller basis.*

BLM(59) Manage wild horses and burros as necessary to maintain thriving ecological balance and consistent with the protection of special status species in important habitat areas.*

BLM(58,60) Wild horses and burros will be removed when herds have expanded beyond designated herd area boundaries or Appropriate Management Level is exceeded.*

BLM(98) Provide adequate law enforcement presence to ensure that management actions and restrictions are implemented for the conservation of covered and/or evaluation species.*

BLM(302) Protect important resting/nesting habitat such as riparian areas and mesquite/acacia woodlands. Do not allow projects that may adversely impact the water table supporting these plant communities.*

BLM(127,128) The livestock grazing program shall be managed to meet the Bureau's Standards and Guidelines as developed by the Southern Great Basin/Mojave Resource Advisory Committee.* The “standards” are listed below:

STANDARD 1. SOILS: Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity and sustain the hydrologic cycle.

STANDARD 2. ECOSYSTEM COMPONENTS: Watersheds should possess the necessary ecological components to achieve state water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristics of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

STANDARD 3. HABITAT AND BIOTA: Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

13.5.3.4 Restoration and Enhancement Measures

BLM(123) Within desert tortoise critical habitat/ACECs, Las Vegas bearpoppy habitat, and other important habitats for covered and evaluation species, require reclamation of activities which result in loss or degradation of habitat, with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. If necessary subsequent seeding or transplanting efforts may be required, should monitoring indicate that the original effort was not successful.

BLM(143) Rehabilitate, reclaim or revegetate areas subjected to surface-disturbing activities where feasible. When rehabilitating disturbed areas, first manage for optimum species diversity by seeding native species, except where non-native species are appropriate.*

BLM(135) Implement reseedling with native plant species and other soil stabilization and habitat restoration actions following wildfires within areas important for the conservation of covered species and where the feasibility of success is reasonably certain.*

BLM(142) Control and/or eradicate tamarisk. Rehabilitate the area with native species to help reduce the potential for tamarisk reestablishment and improve ecosystem health.*

BLM(121) Determine instream flow requirements and apply for necessary water rights on the Virgin River and Meadow Valley.

BLM(138) Cooperate with the U.S. Fish and Wildlife Service and others in the implementation of the Virgin River Fishes Recovery Plan and the Recovery Plan for the Rare Aquatic Species of the Muddy River Ecosystem.*

BLM(106) Take appropriate protective actions to maintain or improve springsnail habitat, including the reestablishment of populations of springsnails.*

BLM(140) Improve riparian areas, giving priority to areas Functioning at Risk with a downward trend. Implement measures to protect riparian areas, such as fencing and/or alternate water sources away from the riparian area. Insure that the minimum requirement of Proper Functioning Condition on all riparian areas is maintained or achieved.*

BLM(141) Improve approximately 400 acres of aquatic and riparian habitat on the Virgin River, Muddy River, and Meadow Valley Wash from its existing poor to fair condition to good or better condition by replacing tamarisk with native species.*

BLM(136) In cooperation and coordination with the Nevada Division of Wildlife, the U.S. Fish and Wildlife Service, and others, assist with the elimination of exotic fish and invertebrates from springs and streams where necessary for the conservation of covered species.*

13.5.3.5 Land Use Policies and Actions

BLM(201) Withdraw from locatable mineral entry and close to all solid mineral leasing within ¼ mile of natural springs, the floodplain of the Virgin and Muddy Rivers, and all ACECs.

BLM(202) Allow fluid mineral leasing, subject to No Surface Occupancy stipulations within areas having important cultural, geological, and riparian resources; administrative sties; and Special Recreation Management Areas. (See the RMP ROD for a list of ACECs and acreages which includes 866,000 acres.)

13.5.4 USAF

13.5.4.1 Protective Measures

USAF(11) Work with the Nature Conservancy to evaluate the need for long-term protection of Parish's phacelia, white bearpoppy, and other rare taxa occurring on NAFB.

USAF(12) Prohibit collection of fauna and flora on any NAFR, NAFB, NSAR, and ISAFAF.

USAF(13) Prohibit outdoor recreation on NAFR, NAFB, NSAR, and ISAFAF except for providing access for hunting on the DNWR.

USAF(14) There are no highways on NAFB, NAFR, NSAR, and ISAFAF.

USAF(15) Fence and patrol NAFB, NAFR, and NSAR, and ISAFAF to limit and restrict access.

USAF(16) Require base personnel and contractors who could impact desert tortoise and other natural resources to participate in conservation awareness training.

USAF(18) No pesticides are used on the NSAR or NAFR. Pesticide use on the NAFB and ISAFAF is in compliance with an Integrated Pest Management Plan.

USAF(19) Prohibit livestock grazing on NAFB, NAFR, NSAR, and ISAFAF. Wild horses and burros straying onto NAFR are removed.

USAF(20) Re-use existing target sites on NAFR to the extent practicable.

USAF(21) Prohibit mining on NAFR, NAFB, NSAR, and ISAFAF.

13.5.4.2 Restoration and Enhancement Measures

USAF(24) Eradicate tamarisk or other exotic plants as appropriate.

13.5.5 NPS

13.5.5.1 Public Information and Involvement

NPS(2) On a case-by-case basis, install signs at springs explaining the need for their protection and to reiterate state law that prohibits camping within 100 feet of water sources.

13.5.5.2 Protective Measures

NPS(23) Monitor burro populations to ensure they stay within levels prescribed in the burro management plan.

NPS(24) Manage burro populations under the burro management plan to ensure resources are protected consistent with NPS policies.

NPS(25) Prohibit commercial collection of fauna and flora.

NPS(28) Implement NPS Integrated Pest Management Plan.

NPS(30) Remove feral animals and uncontrolled domestic animals.

NPS(31) Conduct NEPA review and analysis for development of new areas for intense recreational use.

NPS(32) Ensure that adequate law enforcement is implemented within the LMNRA.

NPS(34) Assure long-term implementation of existing management policies and actions benefiting Covered Species through amendment of the GMP.

NPS(36) Enforce existing prohibition of collecting and deter poaching through increased routine ranger patrols.

NPS(37) Include MSHCP Covered Species as sensitive species in evaluations of road construction or maintenance activities on Federal lands.

NPS(39) Monitor and protect water sources, including springs, seeps, and streams.

NPS(40) Install fencing or other protection of springs in identified sensitive habitat, where required to exclude cattle, wild horses, or burros.

13.5.5.3 Restoration and Enhancement Measures

NPS(44) Evaluate the potential for reintroduction of relict leopard frog populations into managed areas (such as Las Vegas Wash Wetlands and Park, Boulder City Wetlands Park, and Big Springs Refugium).

NPS(45) Where necessary, enhance stands of willow and cottonwood by removing the competing tamarisk and replacing with native species.

NPS(47) Eliminate exotic fish and plant species in and around springs where appropriate and feasible.

NPS(49) Coordinate with MRREIAC in tamarisk control and possible conservation easements with private and public landowners to allow mutually beneficial habitat management activities.

13.5.6 State Parks

13.5.6.1 Public Information and Involvement

NSP(1) Provide rules in brochure and signs throughout the park to remind people of rules and regulations.

NSP(4) Provide discussion concerning protection of resources during interpretive programs.

13.5.6.2 Protective Measures

NSP(6) Prohibit collection or destruction of vegetation, including dead and down material.

NSP(8) Prohibit hunting, collection (other than for scientific research), or harassment of any wildlife.

NSP(9) Conduct routine Park Ranger patrols daily to protect and preserve resources.

NSP(10) Limit trails to areas that are sparsely vegetated, mainly in natural washes. Other trails will be developed by using “social trails” where vegetation has already been removed.

NSP(14) Fence and close to the public sensitive areas of the Park, except for during interpretive hikes.

NSP(16) Prohibit unconstrained pets or domestic animals.

13.5.6.3 Restoration and Enhancement Measures

NSP(17) Where possible, establish erosion control in areas that present problems.

13.5.6.4 Land Use Policies and Actions

NSP(18) To the extent feasible, ensure that minimal impacts occur to resources during the planning stages for projects.

13.5.7 NDOW

13.5.7.1 Restoration and Enhancement Measures

NDOW(22) Convert tamarisk to waterfowl forage or native vegetation at Overton Wildlife Management Area.

NDOW(23) In cooperation with USFWS and others, support efforts to eradicate tamarisk and/or restore native vegetation communities on public and private lands.

NDOW(24) Where appropriate and within available budget allocations, pursue acquisition or reservation of water rights and in-stream flows for maintenance of aquatic habitats for wildlife.

NDOW(25) In cooperation with USFWS and recovery teams, pursue additional funding and implement actions for non-native aquatic species eradication and aquatic habitat restoration efforts on the Virgin and Muddy Rivers.

13.5.7.2 Research

NDOW(9) Conduct and/or support life history and aquatic habitat assessments for native fish species in the Virgin and Muddy rivers, within constraints of budget allocations.

13.5.8 NDOT

13.5.8.1 Protective Measures

NDOT(18) Restrict spraying herbicides or other chemicals that are toxic to aquatic organisms 100 feet from the aquatic habitats, such as well developed riparian areas, wetlands or perennial waters, including tributaries to such lands. Use mechanical and/or herbicides/chemicals non-toxic to aquatic organisms when working in such lands. No herbicide spraying within 100 feet of known covered invertebrate habitat.

NDOT(19) Install highway runoff pollution control devices in areas where Covered aquatic species may be impacted by highway runoff.

13.6 Adequacy of Existing Management

A total of 248 springs are within IMAs and 76 within LIMAs, primarily managed by BLM (137), USFS (115), USFWS (69), and NPS (41). Another 104 springs are within MUMAs, all managed by BLM. At least 78 springs are identified in UMAs on private lands and Native American lands.

Implementation of existing BLM, USFWS, NPS, NDOW, State Parks, and Boulder City easement management actions and the CA for the Spring Mountains NRA (see Section 2.8) will adequately address the ecosystem level threats to Covered Species within the spring ecosystem, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

13.7 MSHCP Conservation Contributions

The spring habitats and the 13 Covered Species they support will benefit from the MSHCP through general public education and information programs. Additional benefits will derive from the purchase, maintenance, and management of grazing allotments and water rights; funding of local rehabilitation and enhancement projects; potential funding or assistance in inventory, monitoring, and management activities that result from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

Chapter 14 Other Communities

14.1 Bats

14.1.1 Description and Distribution

Bats are wide-ranging and make use of all ecosystems throughout Clark County. Landscape features that are particularly important include cliffs, caves, streams, springs, forested areas, mines, and buildings and other structures in urban areas. The three Covered bat species are primarily high elevation species.

14.1.2 MSHCP Species

There are 3 Covered bat species and 1 High Priority Evaluation bat. In addition, the MSHCP lists 9 other bats as Evaluation or Watch List Species.

Common Name	Scientific Name	Status
Silver-haired bat	<i>Lasiurus noctivagans</i>	Covered
Long-eared myotis	<i>Myotis evotis</i>	Covered
Long-legged myotis	<i>Myotis volans</i>	Covered
Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>	Evaluation High
Small-footed myotis	<i>Myotis ciliolabrum</i>	Evaluation Medium
Fringed myotis	<i>Myotis thysanodes</i>	Evaluation Medium
California leaf-nosed bat	<i>Macrotus californicus</i>	Watch List
Spotted bat	<i>Euderma maculatum</i>	Watch List
Allen's big-eared (lappet-browed) bat	<i>Idionycteris phyllotis</i>	Watch List
Southwestern cave myotis	<i>Myotis velifer brevis</i>	Watch List
Yuma myotis	<i>Myotis yumanensis</i>	Watch List
Greater western mastiff-bat	<i>Eumops perotis californicus</i>	Watch List
Big free-tailed bat	<i>Nyctinomops macrotis</i>	Watch List

14.1.3 Potential Threats and Stressors

The primary ecosystem level threats and stressors on bats are:

- Fires and fire management (habitat degradation **Threat 301**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, rock climbing **Threat 405**, spelunking **Threat 407**)

- Highways, roads, and trails (road construction and maintenance **Threat 504**)
- Pest control (pesticides and herbicides **Threat 602**)
- Mining (mineral exploration **Threat 901**, extraction of minerals **Threat 902**)
- Urban and agricultural development (urban and rural development **Threat 1101**)
- Water development, use and flood control at springs (spring diversion and modification **Threat 1401**, spring outflow diversion **Threat 1402**, groundwater pumping **Threat 1403**)

14.1.4 Existing and Proposed Conservation Actions

Of the total of 5,056,100 acres of native vegetation in Clark County, 55.6 percent is managed by BLM (undesignated, WSA, NCA, and conserved habitat), 16.8 percent by USFWS (DNWR and NAFR), 8.9 percent by NPS (Lake Mead NRA), 5.4 percent by USFS (Spring Mountains NRA, wilderness, and WSA), 1.7 percent by Boulder City (Boulder City easement), less than 1 percent by State Parks, and less than 1 percent by NDOW (Overton WMA) and USAF (NAFB, ISAFAF). Private holdings total 8.3 percent and Native American reservations 1.5 percent.

Implementation of existing USFWS and BLM management actions, the provisions of the BLM Las Vegas RMP, and the CA for the Spring Mountains NRA (see Section 2.8) will adequately address the ecosystem level threats to Covered bat species, when combined with implementation of the MSHCP. Species specific threats to Covered Species are addressed by the measures detailed for each species in Appendix B.

The CA for the Spring Mountains NRA identifies general and specific management actions for bats and associated habitat features (springs, cliff faces, caves) including the development of a plan to monitor spring and riparian function and habitat condition, restoration actions where habitat damage is occurring, environmental education programs, management of rock climbing and other recreation activities, and other protective measures.

14.1.4.1 USFS

a. Monitoring

*USFS(19) Conduct research on the species of concern and ecological communities of the Spring Mountains NRA by prioritizing research needs and identifying funding sources. Priority research needs include the following: (CA6.2)**

- *Fire ecology and disturbance regimes of plant communities, particularly as pertaining to maintenance of populations and habitat for rare plants, butterflies and their host plants, Palmer's chipmunk, bats, and other species. (CA6.2c)**

- *Effects of human disturbance, including caving, climbing, and other forms of recreation on bats. (CA6.2h)**
- *Winter habits of bats: Migration patterns and destinations, habits of bats that overwinter and hibernate in the NRA. (CA6.2i)**

USFS(20) Inventory for populations of rare flora and fauna on an annual basis. A Native Species Site Survey Report (Appendix G) will be used to record new records of species occurrence, and copies of this form will be provided to the Nevada Natural Heritage Program. Species and area priorities identified to date are as follows: (CA2.1)

- *Townsend's big-eared bat - very high priority (CA2.1d)*
- *Bat roosts - Column Cave (summer, winter), Pinnacle Cave (spring, fall, winter) - very high priority (CA2.1f)**
- *Bats – Allen's lappet-browed bat - high priority (CA2.1i)**
- *Bat roosts (cliff climbing areas) - Imagination Wall, Cathedral Rock, Echo Cliff, unnamed wall east of South Loop Trail, The Hood - high priority (CA2.1k)**
- *Bat water sources - unsurveyed springs - high priority (CA2.1l)**
- *Fringed myotis - medium to low priority (CA2.1p)**

*USFS(28) Develop a bat monitoring plan, emphasizing roost site and water source monitoring for known occurrences of bats. Frequency and intensity of monitoring identified in plan will be based on species occurrence, habitat suitability, and threats. Conduct periodic monitoring for bats, using methods described in the bat monitoring plan. (CA3.4)**

USFS(32) Develop and implement a program to monitor selected biodiversity hotspots and species of concern habitats not covered in 3.1 through 3.7, based on periodic biologist site visits and/or photo points to document habitat conditions. This program will provide information needed to assess management suitability and the need to modify management practices in these areas. Determination of features that should be managed in these areas will be based, in part, on information provided in the report "Spring Mountains National Recreation Area Biodiversity Hotspots and Management Recommendations" (TNC 1996). A form for recording basic monitoring information will be developed with the technical assistance of TNC. Because it will not be logistically feasible to annually visit all known areas for these species, site visits will be most frequent in the most vulnerable or sensitive areas (typically, areas most accessible by

people). Where appropriate, photo points will also be established. Priorities species and habitats include the following (* indicates photo point will be established) (CA3.8)*

- Carpenter Canyon (Palmer's chipmunk, **bats**, Lahontan cutthroat trout, butterflies, plants, riparian stream corridor) - annual visit (CA3.8a)
- Deer Creek (Palmer's chipmunk, **bats**, butterflies, plants, riparian stream corridor); Upper Kyle Canyon, including Mary Jane Falls (Palmer's chipmunk, butterflies, plants, riparian areas and spring sources); Upper Lee Canyon, including Three Springs* (Palmer's chipmunk, butterflies, plants), and; Macks Canyon, Macks Canyon Spring*, and Macks Road (Palmer's chipmunk, **bats**, plants) - annual visit (CA3.8b)
- Willow Creek (butterflies, springsnails, plants, riparian stream corridor); Camp Bonanza and North Divide Trail, including McFarland and Whiskey springs (**bats**, plants); and, Cold Creek (butterflies, springsnails, riparian stream corridor) - annual visit (CA3.8c)
- Wheeler Well (**bats**, plants), and Trough Spring (to monitor habitat following restoration) - annual visit. (CA3.8d)
- Fletcher Canyon and Spring (**bats** and plants), Mummy Spring*, and lower North Loop Trail (plants) - periodic visit. (CA3.8f)

b. Land Use Policies and Actions

USFS(170) Manage cave resources within the SMNRA to protect resources, provide for public safety, and provide recreational opportunities as set forth in the Federal Cave Resources Protection Act of 1988. (FS-OBJ-0.18)

USFS(171) Develop new relationships/partnerships and strengthen existing efforts with user groups, including hunters, trappers, rock climbers, cavers, trail users, summer home and special use permittees, and American Indians, to help manage the SMNRA and protect resources. (FS-OBJ-0.29)

USFS(191) Construction above or in the vicinity of a cave will be designed in a way to insure protection of the cave resources. Diversion of surface drainage into caves is prohibited. (FS-ST-0.52)

USFS(192) Where possible, maintain native vegetation around cave openings for a minimum distance of 100 yards. (FS-GU-0.53)

USFS(193) All gates on caves and mines will be designed to provide for unrestricted access for bats. Temporary (test) gates of PVC or other light, impermanent material will be constructed first to determine bats' reaction to gate design, prior to final design and construction of permanent gates. (FS-ST-0.55)

USFS(194) Prohibit alteration of cave and mine entrance (except for gating to protect cave resources) or their use as disposal sites for slash, spoils, or other refuse. (FS-ST-0.56)

USFS(205) Allow development of new bolted climbing routes under a voluntary route registration system. After development of more than 5 routes, new climbing areas in Wilderness and WSAs will require site survey before additional routes are developed. (FS-ST-0.106)

*USFS(206) Develop or realign trails into climbing areas as appropriate to provide for public safety and resource protection. (FS-GU-0.108)**

*USFS(207) Abandoned mine entrances may be closed for public safety after surveys to determine the locations of biological and heritage resources have been conducted. (FS-GU-0.114)**

14.1.4.2 USFWS

a. Protective Measures

USFWS(14) Implement snag management in habitat areas, including limiting wood collection to down wood, and coordination of fire management activities within proposed wilderness areas of the DNWR (DNWR).

USFWS(18) Manage pesticide use consistent with integrated pest management program. Apply only approved pesticides, with certified applicators, and according to label instructions (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(21) Prohibit access to caves for recreation (DNWR).

USFWS(33) Evaluate effects of rock climbing on biological resources. Rock climbing is currently allowed, but is under investigation; if adverse impacts are found it will be prohibited on DNWR (DNWR).

USFWS(34) Work with BLM to restrict access to caves or regulate cave recreation policies as appropriate (Ecological Services).

b. Restoration and Enhancement Measures

USFWS(35) Create new open water resources for bats and other wildlife (DNWR).

14.1.4.3 BLM**a. Public Information and Education**

BLM(4) Promote an awareness among users and managers of caves on public lands through development of informational and educational materials concerning conservation methods and potential hazards.*

b. Land Use Policies and Actions

BLM(11) Survey abandoned mines for the presence of bats before authorization of mine closures. If use of the mine by bats is documented, consider installing bat gates to ensure that the habitat continues to be suitable for bats, while promoting public safety. Total closure of abandoned mines known to support bats should be considered only as a last resort.

14.1.4.4 USAF**a. Inventory (Status)**

USAF(6) Coordinate with other MSHCP Participants in bat surveys, as appropriate.

14.1.4.5 NPS**a. Inventory (Status)**

NPS(7) Inventory bat populations in selected areas, with priority given to proposed project sites (existing).

b. Monitoring (Trends)

NPS(18) Monitor priority bat roosting and foraging sites and success of management actions targeted at bat protection.

14.1.4.6 NDOW**a. Research**

NDOW(7) Coordinate in efforts to inventory bat roosts (including mines prior to closure) and foraging areas to aid in the understanding of bat ecology in Clark County.

14.1.5 Adequacy of Existing Management

A total of 59.9 percent of Clark County is within IMAs and LIMAs (DNWR, BLM WSA, NCA, and critical habitat, Spring Mountains NRA, USFS wilderness and WSA, Boulder city easement, Overton WMA, State Parks, and Lake Mead NRA) and is not anticipated to be affected by future development of facilities for recreation or other infrastructure. A further 29.7 percent of the County is in MUMA (BLM undesignated lands) and may be used for multiple use activities, within the constraints of existing BLM policies for management of these activities. The remaining 10.2 percent is UMA (privately held, Native American reservations, and USAF ISAFAF and NAFB) and may be used for more intensive activities.

The bat community in Clark County will benefit from specific management actions undertaken by BLM, USFWS, NPS, and USFS, as well as implementation of the MSHCP through general public education and information programs and potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

14.1.6 MSHCP Conservation Contributions

The bat community will benefit from the MSHCP through general public education and information programs; the purchase, maintenance, and management of grazing allotments and water rights; funding of local rehabilitation and enhancement projects; potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

14.2 Mojave Desert Lizards and Snakes

The Mojave desert ecosystems provide habitat for a diverse suite of lizards and snakes. The MSHCP includes 21 species: 14 Covered Species, 3 High Priority Evaluation Species, 3 Medium Priority Evaluation Species, and 1 Watch List Species.

Covered Species:

Banded gecko	<i>Coleonyx variegatus</i>
Desert iguana	<i>Dipsosaurus dorsalis</i>
Western chuckwalla	<i>Sauromalus obesus obesus</i>
Great Basin collared lizard	<i>Crotaphytus insularis bicinctores</i>
Large-spotted leopard lizard	<i>Gambelia wislizenii wislizenii</i>
Western red-tailed skink	<i>Eumeces gilberti rubricaudatus</i>
California (common) kingsnake	<i>Lampropeltis getulus californiae</i>

Glossy snake	<i>Arizona elegans</i>
Western long-nosed snake	<i>Rhinocheilus lecontei lecontei</i>
Western leaf-nosed snake	<i>Phyllorhynchus decurtatus</i>
Sonoran lyre snake	<i>Trimorphodon biscutatus lambda</i>
Sidewinder	<i>Crotalus cerastes</i>
Speckled rattlesnake	<i>Crotalus mitchelli</i>
Mojave green rattlesnake	<i>Crotalus scutulatus scutulatus</i>

High Priority Evaluation Species:

Banded Gila monster	<i>Heloderma suspectum cinctum</i>
Southern desert horned lizard	<i>Phrynosoma platyrhinos calidiarum</i>
Desert night lizard	<i>Xantusia vigilis</i>

Medium Priority Evaluation Species:

Sonoran Mountain kingsnake	<i>Lampropeltis pyromelana</i>
Regal ringneck snake	<i>Diadophis punctatus regalis</i>
Western diamondback	<i>Crotalus atrox</i>

Watch List Species:

Common zebra-tailed lizard	<i>Callisaurus draconoides draconoides</i>
----------------------------	--

In addition to the ecosystem level threats and stressors identified for the Mojave desert ecosystems, the primary threats and stressors to these species are:

- Factors related to population dynamics and life history (susceptibility to stochastic events of narrow endemics and limited distribution species **Threat 101**, unknown population trends **Threat 102**)
- Commercial collection (reduction of populations **Threat 201**, habitat degradation **Threat 202**)
- Recreation activities and development (dispersed recreational activities **Threat 401**, concentrated recreation **Threat 402**, competitive OHV races **Threat 403**, casual use OHV activities **Threat 404**, rock climbing **Threat 405**, indiscriminate recreational shooting **Threat 406**)
- Highways, roads, and trails (highway mortality **Threat 501**, habitat fragmentation **Threat 503**, road construction and maintenance **Threat 504**)
- Urban and agricultural development (urban and rural development **Threat 1101**, fragmentation by urban/rural development **Threat 1102**, landfills **Threat 1103**)
- Utilities (facility construction and maintenance **Threat 1202**, provision of perch sites for ravens **Threat 1203**)
- Illegal or unauthorized activities (poaching, illegal collection, or killing **Threat 1701**)

Mojave desert lizards and snakes will benefit from the MSHCP through general public education and information programs; the purchase, maintenance, and management of grazing allotments and water rights; potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process. The prohibition of commercial collection these species and the implementation of conservation actions in concordance with AMP would provide adequate conservation coverage for most, if not all of these species.

14.2.1 USFWS

14.2.1.1 Protective Measures

USFWS(12) Allow collection by permit only; permits granted only for scientific research that furthers the USFWS mission (DNWR).

USFWS(19) Focus recreation activities into less sensitive areas (DNWR).

USFWS(23) Coordinate with the U.S. Air Force to minimize the footprint on the ground for congressionally mandated ordnance impacts (DNWR).

USFWS(24) Prohibit highway and road construction on the Refuge (DNWR).

14.2.2 BLM

14.2.2.1 Protective Measures

BLM(39) Prohibit collection of plants, animals, and mineral materials in Red Rock Canyon NCA without a permit.

BLM(71) Limit motorized uses in the Piute/Eldorado “Conserved Habitat” to designated roads and trails.

BLM(41) Prohibit commercial collection of cactus/yucca skeletons except in designated areas such as disposal areas, gravel pits, and sites associated with Federally approved projects that will result in the loss of surface vegetation. Casual collection of cactus/yucca skeletons is prohibited in tortoise ACECs. Casual collection outside these areas will be discouraged.

BLM(301) Limit the construction of new roads for the development of utility lines within special status species habitat.

14.2.2.2 Land Use Policies and Actions

BLM(208) Within desert tortoise ACECs, do not allow commercial collection of flora. Only allow commercial collection of wildlife upon completion of either a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat, as determined by NDOW. This action will not affect hunting, trapping, or casual collection as permitted by the State. Limit collection or sale of desert vegetation and other vegetative resources for public use to approved areas including disposal areas, rights-of-way and gravel pits.

BLM(210) Do not allow OHV speed events, mountain bike races, horse endurance rides, four-wheel drive hill climbs, mini events, publicity rides, high speed testing, and other similar speed based events within tortoise ACECs. These restrictions apply to other ACECs except that horse endurance rides and mountain bike events may be allowed on a case-by-case basis.

BLM(211) Designate 1,107,800 acres as limited to designated roads and trails for all motorized and mechanized vehicles within desert tortoise ACECs, Rainbow Garden ACEC, and areas adjacent to Red Rock Canyon NCA and Spring Mountains NRA.

BLM(212) Bureau of Land Management shall consider, with respect to rural roads, the following measures which have been proposed by the I & M Committee and specifically those members of the I & M Committee who represent the interests of the environmental groups, the rural communities, and the OHV community:

Relax permitting restrictions on non-speed OHV events, to the extent that such relaxation does not threaten other resource values and is consistent with law, policy, and procedures as hereinafter provided.

Impose the conditions described below for organized OHV events during the first three years of the MSHCP or until the recommendation of the rural roads component of the AMP has been completed, whichever last occurs. Members of the OHV community and the environmental community recognize and agree that after completion of the rural roads component of the AMP, these rules and regulations may be modified to reflect the results of the AMP process, including the scientific component as well the socioeconomic and sociopolitical elements, and that conditions within Conserved Areas may be either more or less restrictive than those set forth herein:

Utilizing a streamlined permit process as described below a permit shall be required for all non-speed OHV events with 26 or more vehicles within desert tortoise ACECs and 50 vehicles outside desert tortoise ACECs.

Within desert tortoise ACECs:

A maximum of five permitted non-speed events and non-speed portions of speed-based events are permitted in each desert tortoise ACEC during the period of March 1 through March 15 and June 15 through August 31. No OHV non-speed events, or non-speed portions of speed-based events, will be permitted from March 16 through June 14 and from September 1 through October 15. (The September through October dates may vary up to three days to allow a full weekend [i.e., Saturday and Sunday] for an event. A maximum of 60 permitted non-speed events and non-speed portions of speed-based events are permitted cumulatively in desert tortoise ACECs during the period of October 16 through February 28 (29 in leap year) subject to additional restrictions described below (see Appendix I maps):

- a. events with 76 to 150 vehicles shall count as two events. Events with 151 to 225 vehicles will count as three events, and events with 226 to 300 vehicles will count as four events.
- b. no OHV events are permitted in the Piute/Eldorado ACEC west of US 95 during any part of the year.
- c. events within the Gold Butte ACEC shall only be permitted on and east of the existing paved road between the Riverside Bridge and Whitney Pockets and on and north of the unpaved road between Whitney Pockets and the Arizona State line.
- d. events within the Mormon Mesa ACEC shall only be allowed on the Carp/Elgin Road, Halfway Wash Road and the East Halfway Wash Road.
- e. no OHV events are permitted in the Coyote Springs ACEC.
- f. up to six non-speed OHV events are permitted in that area east of US 95 and south of SR164 during the tortoise inactive season only (October 16 through February 28).
- g. vehicles shall not exceed the legal speed limit (posted or unposted) of the roads used during events. Clark County speed limit for unposted roads is 25 miles per hour. If the speed limit is not posted, the speed limit shall be 25 miles per hour.

Outside ACECs:

BLM agrees to pre-approve 10 non-speed OHV events annually outside of desert tortoise ACECs where there are more than 49 entries or vehicles (thus requiring a permit) by January 1, 2000. The BLM also agrees to waive all insurance requirements and the County agrees to pay the permit fee (\$80.00 per event). The OHV promoter shall ensure that all permissions necessary from private landowners or rights-of-way grant holders are obtained prior to the BLM approving the particular courses in question. Once the applicant has provided to the BLM the appropriate permissions and proposed course, the BLM will approve or deny the permit within 45 days. These permits shall then be granted to non-speed OHV event organizers on a first come basis.

Other Terms and Conditions:

The BLM will develop a pamphlet or similar product for distribution to the public, suggesting places to go outside ACECs and other environmentally sensitive areas. A potential target for this type of information may include rental car agencies that rent four-wheel-drive vehicles. Maps of desert tortoise ACECs should be included.

Outside desert tortoise ACECs and Rainbow Garden ACEC non-speed events and non-speed portions of speed-based events may occur on existing roads, trails, and dry washes. For the purposes of this proposal, dry washes are defined as: the channel of a flat-floored ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

14.2.3 USAF

14.2.3.1 Protective Measures

USAF(9) Coordinate with DNWR to minimize the footprint on the ground for actual ordnance impact, remediate upland sites no longer used, control aerial overflights to specific routes and elevation, and provide support for investigative activities on NAFR.

USAF(12) Prohibit collection of fauna and flora on any NAFR, NAFB, NSAR, and ISAFAF.

USAF(15) Fence and patrol NAFB, NAFR, and NSAR, and ISAFAF to limit and restrict access.

USAF(16) Require base personnel and contractors who could impact desert tortoise and other natural resources to participate in conservation awareness training.

14.2.4 NPS

14.2.4.1 Protective Measures

NPS(22) Prohibit destructive collecting techniques such as breaking off rock flakes and rolling cap rocks to uncover lizards.

NPS(25) Prohibit commercial collection of fauna and flora.

NPS(35) Manage rock climbing, if necessary, to protect sensitive resources.

NPS(36) Enforce existing prohibition of collecting and deter poaching through increased routine ranger patrols.

14.2.5 Boulder City

14.2.5.1 Protective Measures

BCCE(1) Manage, use, and allow activities which do not impair the conservation, protection, restoration and enhancement of the natural resource values of the easement, including desert tortoise and other native flora and fauna and their habitats.

BCCE(2) Prohibit all motorized vehicle activity, including all competitive and organized events, except on designated roads and trails.

BCCE(3) Prohibit all military maneuvers, clearing for agriculture, land fills, and any other surface disturbance that diminishes the capacity of the land to support desert tortoises and other native flora and fauna.

BCCE(5) Prohibit commercial flora harvest and fauna collection.

BCCE(7) Prohibit non-commercial collection of biological specimens, except by permit.

BCCE(8) Prohibit dumping, refuse disposal, littering, and use of herbicides or biocides.

BCCE(9) Prohibit depositing of captive or displaced desert tortoises or other animals, except pursuant to translocation research projects authorized by the USFWS.

14.2.6 State Parks

14.2.6.1 Protective Measures

NSP(5) Prohibit off-road driving and post signs to that effect throughout Valley of Fire State Park.

NSP(7) Prohibit collection or destruction of rocks or other minerals.

NSP(8) Prohibit hunting, collection (other than for scientific research), or harassment of any wildlife.

NSP(9) Conduct routine Park Ranger patrols daily to protect and preserve resources.

14.2.6.2 Land Use Policies and Actions

NSP(18) To the extent feasible, ensure that minimal impacts occur to resources during the planning stages for projects.

14.2.7 NDOW

14.2.7.1 Inventory (Status)

NDOW(13) Pursue additional funding to conduct inventories of evaluation and watch species where needed.

NDOW(14) Coordinate with the Adaptive Management Program in setting species priorities, selecting survey methods, and evaluation of data collected.

NDOW(17) Regulate hobby collection and hobby possession of authorized unprotected reptiles and amphibians.

NDOW(18) Evaluate the need to regulate commercial collection of wildlife species.

NDOW(20) Evaluate and seek reclassification as protected of Covered and Evaluation Species under State regulation based on classification criteria in NAC 503.103 and 503.104.

14.3 Butterflies

The 8 Covered butterfly species occur primarily within the Spring Mountains NRA, while 2 High Priority Evaluation Species occur in desert riparian habitats.

Covered Species:

Dark blue butterfly	<i>Euphilotes enoptes purpurea</i>
Spring Mountains icarioides blue	<i>Icaricia icarioides austinatorum</i>
Mt. Charleston blue butterfly	<i>Icaricia shasta charlestonensis</i>
Spring Mountains acastus checkerspot	<i>Chlosyne acastus robusta</i>
Morand's checkerspot butterfly	<i>Euphydryas anicia morandi</i>
Carole's silverspot butterfly	<i>Speyeria zerene carolae</i>
Nevada admiral	<i>Limenitis weidemeyerii nevadae</i>
Spring Mountains comma skipper	<i>Hesperia comma mojavensis</i>

High Priority Evaluation Species:

Bret's blue butterfly	<i>Euphilotes battoides</i> sp.
MacNeil sooty wing skipper	<i>Hesperopsis graciellae</i>

The CA for the Spring Mountains NRA identifies general management actions for high elevation species, including development and implementation of a monitoring program for assessing effects of recreational use on high elevation communities and the species that occur in these communities; implementation of an overnight wilderness permitting process that provides visitor education on sensitive resource issues; prohibition of camping in sensitive areas, as determined through monitoring; removal of selected informal high elevation and alpine campsites; and implementation of a weed management strategy. In addition, the CA provides specific conservation actions for butterfly species and their habitat and host species.

The development of watershed based conservation actions for desert riparian/aquatic resources on the Muddy River could provide coverage for the 2 High Priority Evaluation Species.

14.3.1 USFS**14.3.1.1 Research**

*USFS(19) Conduct research on the species of concern and ecological communities of the Spring Mountains NRA by prioritizing research needs and identifying funding sources. Priority research needs include the following: (CA6.2)**

- *Fire ecology and disturbance regimes of plant communities, particularly as pertaining to maintenance of populations and habitat for rare plants, butterflies and their host plants, Palmer's chipmunk, bats, and other species. (CA6.2c)*

USFS(20) Inventory for populations of rare flora and fauna on an annual basis. A Native Species Site Survey Report (Appendix G) will be used to record new records of

species occurrence, and copies of this form will be provided to the Nevada Natural Heritage Program. Species and area priorities identified to date are as follows: (CA2.1)

- *Butterfly habitats - Foxtail Canyon, Mt. Potosi - very high priority (CA2.1e)**
- *Butterflies - Spring Mountains acastus checkerspot, dark blue butterfly, Morand's checkerspot, Mt. Charleston blue - high priority (CA2.1h)**
- *Butterfly habitats - Mummy Mountain, Harris Mountain, Fletcher Peak, West side of Mount Stirling, Trail Canyon/North Loop intersection, Mud Springs, Wallace Canyon - high priority (CA2.1j)**
- *Butterfly habitat - Wood Spring - medium to low priority (CA2.1q)*

USFS(26) Develop a butterfly monitoring plan, emphasizing population, host plant and habitat monitoring. Frequency and intensity of monitoring identified in plan will be based on population status, abundance, and threats. Conduct annual monitoring for high priority butterfly species, using methods described in the butterfly monitoring plan. At present, Bret's blue, Morand's checkerspot, Mt. Charleston blue butterfly, Spring Mountains acastus checkerspot, and the dark blue are the highest priority species. Conduct periodic monitoring for medium priority butterfly species, using methods described in the butterfly monitoring plan. At present, Spring Mountains comma skipper, Nevada admiral, Spring Mountains icarioides blue, and Carole's silverspot are medium priority species. (CA3.2)

USFS(32) Develop and implement a program to monitor selected biodiversity hotspots and species of concern habitats not covered in 3.1 through 3.7, based on periodic biologist site visits and/or photo points to document habitat conditions. This program will provide information needed to assess management suitability and the need to modify management practices in these areas. Priorities species and habitats include the following (indicates photo point will be established) (CA3.8)**

- *Carpenter Canyon (Palmer's chipmunk, bats, Lahontan cutthroat trout, **butterflies**, plants, riparian stream corridor) - annual visit (CA3.8a)*
- *Deer Creek (Palmer's chipmunk, bats, **butterflies**, plants, riparian stream corridor); Upper Kyle Canyon, including Mary Jane Falls (Palmer's chipmunk, **butterflies**, plants, riparian areas and spring sources); Upper Lee Canyon, including Three Springs* (Palmer's chipmunk, **butterflies**, plants), and; Macks Canyon, Macks Canyon Spring*, and Macks Road (Palmer's chipmunk, bats, plants) - annual visit (CA3.8b)*

- *Willow Creek (butterflies, springsnails, plants, riparian stream corridor); Camp Bonanza and North Divide Trail, including McFarland and Whiskey springs (bats, plants); and, Cold Creek (butterflies, springsnails, riparian stream corridor) - annual visit (CA3.8c)*

14.4 Rock Outcrops, Cliffs, Boulder Fields, and Lava Flows

Rock outcrops occur in all of the communities discussed previously. Plant species include representatives of each community as well as a distinct flora dependent on the elevation where found. Covered Species that are dependent on these features are all high elevation plants, and are included in the CA for the Spring Mountains NRA. A number of Evaluation reptiles make extensive use of boulders and rock outcrops in desert ecosystems in Clark County.

Rock outcrops, cliffs, boulder fields, and lava flows in Clark County and the species they support will benefit from the MSHCP through general public education and information program and potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations from the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

14.4.1 USFS

USFS(205) Allow development of new bolted climbing routes under a voluntary route registration system. After development of more than 5 routes, new climbing areas in Wilderness and WSAs will require site survey before additional routes are developed. (FS-ST-0.106)

*USFS(206) Develop or realign trails into climbing areas as appropriate to provide for public safety and resource protection. (FS-GU-0.108)**

14.4.2 USFWS

USFWS(33) Evaluate effects of rock climbing on biological resources. Rock climbing is currently allowed, but is under investigation; if adverse impacts are found it will be prohibited on DNWR.

14.4.3 NPS

NPS(22) Prohibit destructive collecting techniques such as breaking off rock flakes and rolling cap rocks to uncover lizards.

NPS(35) Manage rock climbing, if necessary, to protect sensitive resources.

14.5 Sand Dunes

Sand dunes in the desert are associated with playas, remnant lakes of arid lowland basins, and intermittent watercourses. Compared to other habitats, taxon density in sand dunes is low, but desert dunes have a high rate of endemism. Thus, as the MSHCP continues to develop, sand dunes will be evaluated to determine if endemic plants or insects are present and need management attention.

The dune systems in Clark County and the species they support will benefit from the MSHCP through general public education and information programs and potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

14.6 Gypsum Soils

Gypsum soils consist of a weathered layer of parent material, containing sponge gypsum, over massive rock gypsum or gypsum thin-bedded with limestone, mudstones, and shales. The surface is typically hard or has a cryptogamic crust. Saline gypsum sites are similar but are exposed to salt-charged groundwater at the surface near the site.

Gypsum sites have less dense vegetation with fewer annuals than alluvial sites. Saline gypsum soils have almost no annuals and few short-lived species. However, gypsum soils in the eastern Mojave desert are characterized by a suite of endemic species restricted to gypsum soils, such as Las Vegas bearpoppy. Thus, as the MSHCP continues to develop, areas with gypsum soils will be evaluated to determine if there are endemics in need of management attention.

Covered Species:

Las Vegas bearpoppy
Blue Diamond cholla
Sticky ringstem

Arctomecon californica
Opuntia whipplei var. *multigeniculata*
Anulocaulis leisolenus

Evaluation Species:

Mojave gypsum bee
Mojave poppy bee

Andrena balsamorhizae
Perdita meconis

Areas of gypsum soils in Clark County and the species they support will benefit from implementation of conservation agreements for the Las Vegas bearpoppy. Gypsum-dependent species will additionally benefit from general measures in the MSHCP and through general public education and information programs. Potential funding or assistance in inventory, monitoring, and management activities may result from the recommendations of the AMP and land managers. Increased interagency coordination of conservation activities will result from the I & M Committee review process. In addition, NPS will provide specific monitoring for gypsiferous species:

NPS(16) Manage Mojave poppy bee and other gypsiferous soil species consistent with Las Vegas bearpoppy populations. The relationship between pollinators and species should be monitored; the populations may be mutually dependent and both necessary for successful conservation management.

14.7 Dry Lake Beds and Playas

A distinguishing feature of much of the Great Basin–Mojave Desert region is that its waters drain into terminal basins rather than into the ocean. This results in isolated terminal lakes, marshes, and playas, many of which support unique species. Most are small and only occasionally filled with water; these habitat areas are critically important to the biological diversity and ecology of the region.

During most years, these playas and dry lake beds support a limited diversity of species adapted to high salt levels in the soil. When playas fill from rare rains or snow melt, a rich invertebrate fauna consisting of various crustaceans and insects develops in them that, in turn, supports large populations of migratory waterbirds. This fauna has been little studied and may include a number of undescribed species. Two Covered plant species are associated with playas and salt desert scrub habitats:

Covered Species:

Forked (Pahrump Valley) buckwheat
Parish's phacelia

Eriogonum bifurcatum
Phacelia parishii

The impacts of off-highway vehicles on these systems are unknown but potentially detrimental.

The dry lake beds and playas and the species they support will benefit from the MSHCP through general public education and information programs and potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers; and increased interagency coordination of conservation activities resulting from the I & M Committee review process.

14.8 Boreal Islands

The Spring Mountains, and to a lesser extent the Sheep Range, McCullough Range, and the Virgin Mountains, are boreal islands of Great Basin and high elevation habitats surrounded by lower elevation Mojave desert. Populations of high elevation plants and animals on these areas are isolated from similar populations, primarily to the north, by the hot, dry desert. These habitats and populations were previously coextensive but have become isolated during the interglacial period. As a result of this isolation, relict or derived populations occur, particularly in the Spring Mountains, exemplified by the Palmer's chipmunk and the unique butterfly fauna and plant flora of this area. In addition, a number of populations of species that are common elsewhere occur in isolated populations in the Spring Mountains, including several small mammal species.

Covered Species:

Silver-haired bat	<i>Lasionycteris noctivagans</i>
Long-eared myotis	<i>Myotis evotis</i>
Long-legged myotis	<i>Myotis volans</i>
Palmer's chipmunk	<i>Tamias palmer</i>
Great Basin collared lizard	<i>Crotaphytus insularis bicinctores</i>
Large-spotted leopard lizard	<i>Gambelia wislizenii wislizenii</i>
Western red-tailed skink	<i>Eumeces gilberti rubricaudatus</i>
Glossy snake	<i>Arizona elegans</i>
Sonoran lyre snake	<i>Trimorphodon biscutatus lambda</i>
Speckled rattlesnake	<i>Crotalus mitchelli</i>
Dark blue butterfly	<i>Euphilotes enoptes purpurea</i>
Spring Mountains icarioides blue	<i>Icaricia icarioides austinatorum</i>
Mt. Charleston blue butterfly	<i>Icaricia shasta charlestonensis</i>
Spring Mountains acastus checkerspot	<i>Chlosyne acastus robusta</i>
Morand's checkerspot butterfly	<i>Euphydryas anicia morandi</i>
Carole's silverspot butterfly	<i>Speyeria zerene carolae</i>
Nevada admiral	<i>Limenitis weidemeyerii nevadae</i>
Spring Mountains comma skipper	<i>Hesperia comma mojavensis</i>
Spring Mountains springsnail	<i>Pyrgulopsis deaconi</i>
Southeast Nevada springsnail	<i>Pyrgulopsis turbatrix</i>
Clokey eggvetch	<i>Astragalus oophorus</i> var. <i>clokeyanus</i>
Rough angelica	<i>Angelica scabrida</i>
Charleston pussytoes	<i>Antennaria soliceps</i>
Rosy king sandwort	<i>Arenaria kingii</i> ssp. <i>rosea</i>
Clokey milkvetch	<i>Astragalus aequalis</i>
Clokey paintbrush	<i>Castilleja martinii</i> var. <i>clokeyi</i>
Clokey thistle	<i>Cirsium clokeyi</i>

Jaeger whitlowgrass	<i>Draba jaegeri</i>
Charleston draba	<i>Draba paucifruca</i>
Inch high fleabane	<i>Erigeron uncialis</i> ssp. <i>conjugans</i>
Clokey greasebush	<i>Glossopetalon (Forsellesia) clokeyi</i>
Smooth pungent (dwarf) greasebush	<i>Glossopetalon pungens</i> var. <i>glabra</i>
Pungent dwarf greasebush	<i>Glossopetalon pungens</i> var. <i>pungens</i>
Hidden ivesia	<i>Ivesia cryptocaulis</i>
Jaeger ivesia	<i>Ivesia jaegeri</i>
Hitchcock bladderpod	<i>Lesquerella hitchcockii</i>
Charleston pinewood lousewort	<i>Pedicularis semibarbata</i> var. <i>charlestonensis</i>
Charleston beardtongue	<i>Penstemon leiophyllus</i> var. <i>keckii</i>
Jaeger beardtongue	<i>Penstemon thompsonae</i> var. <i>jaegeri</i>
Clokey mountain sage	<i>Salvia dorrii</i> var. <i>clokeyi</i>
Clokey catchfly	<i>Silene clokeyi</i>
Charleston tansy	<i>Sphaeromeria compacta</i>
Charleston kittentails	<i>Synthyris ranunculina</i>
Charleston grounddaisy	<i>Townsendia jonesii</i> var. <i>tumulosa</i>
Limestone (Charleston) violet	<i>Viola purpurea</i> var. <i>charlestonensis</i>

Evaluation Species:

Inyo shrew	<i>Sorex tenellus</i>
Small-footed myotis	<i>Myotis ciliolabrum</i>
Fringed myotis	<i>Myotis thysanodes</i>
Golden-mantled ground squirrel	<i>Spermophilus lateralis certus</i>
Hidden Forest Uinta chipmunk	<i>Tamias umbrinus nevadensis</i>
Panamint kangaroo rat	<i>Dipodomys panamintinus caudatus</i>
Bushy tailed woodrat	<i>Neotoma cinerea lucida</i>
Long-tailed weasel	<i>Mustela erminea</i>
Short-tailed weasel	<i>Mustela frenata</i>
Nuttall's cottontail	<i>Sylvilagus nuttallii</i>
Chisel-toothed kangaroo rat	<i>Dipodomys microps occidentalis</i>
Spring Mountains ant	<i>Lasius nevadensis</i>
Black wooly-pod	<i>Astragalus funereus</i>
Triangle lobe moonwort	<i>Botrychium ascendens</i>
Dainty moonwort	<i>Botrychium crenulatum</i>
Silverleaf sunray	<i>Enceliopsis argophylla</i>
Nevada willowherb	<i>Epilobium nevadense</i>
Ackerman milkvetch	<i>Astragalus ackermanii</i>
Sheep Mountain milkvetch	<i>Astragalus amphioxys</i> var. <i>musimonum</i>
Mokiak milkvetch	<i>Astragalus mokiensis</i>
Remote rabbitbrush	<i>Chrysothamnus eremobius</i>
Unusual catseye	<i>Cryptantha insolita</i>
Ripley's biscuitroot	<i>Cymopterus ripleyi</i> var. <i>saniculoides</i>
Sheep fleabane	<i>Erigeron ovinus</i>
Desert (Clark) parsley	<i>Lomatium graveolens</i> var. <i>clarkii</i>
Pygmy poreleaf	<i>Porophyllum pygmaeum</i>

Watch List Species:

Northern goshawk	<i>Accipiter gentilis</i>
Ferruginous hawk	<i>Buteo regalis</i>
Golden eagle	<i>Aquila chrysaetos</i>

Flammulated owl	<i>Otus flammeolus</i>
Northern saw-whet owl	<i>Aegolius acadicus</i>
Northern pygmy owl	<i>Glaucidium gnoma</i>
Western screech owl	<i>Otus kennicotti</i>
Pacific tree frog	<i>Hyla regilla</i>
One-leaflet Torrey milkvetch	<i>Astragalus calycosus</i> var. <i>monophyllidius</i>
Clokey pincushion	<i>Coryphantha vivipara</i> ssp. <i>rosea</i>
Hoffman's cryptantha	<i>Cryptantha hoffmannii</i> (= <i>C. virginensis</i>)
New York Mountains catseye	<i>Cryptantha tumulosa</i>
Chalk liveforever	<i>Dudleya pulverulenta</i>
Clokey fleabane	<i>Erigeron clokeyi</i>
Nevada greasebush	<i>Glossopetalon nevadensis</i>
Rosy twotone beardtongue	<i>Penstemon bicolor</i> var. <i>roseus</i>

Because this area encompasses several ecosystems as delineated in the MSHCP and because of its uniqueness, it will be important to adequately address species issues that transcend ecosystem boundaries and management boundaries to maintain the overall diversity of species.

The MSHCP, through potential funding or assistance in inventory, monitoring, and management activities resulting from the recommendations of the AMP and land managers and increased interagency coordination of conservation activities resulting from the I & M Committee review process, provides a mechanism for the consideration of conservation of the boreal island communities within the context of the implementation of conservation actions in the CA for the Spring Mountains NRA and BLM management of the Red Rock Canyon NCA, the primary land managers of the habitats that constitute the boreal island centered on the Spring Mountains, and the implementation of conservation actions by USFWS in the DNWR for the high elevation habitat in the Sheep Range.