

**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 B: Individual Species Analyses

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Appendix B:

Individual Species Analyses

The following document presents a summary of key information for each of the Covered and Evaluation Species considered in this plan, as well as a listing of the species on the Watch List.

The individual species discussion is organized by major taxonomic group. The discussion of each Covered and Evaluation Species provides information on:

- Specific or subspecific common and scientific name. There was (and is) considerable difference of opinion among the participating biologists as to the appropriateness of analysis at the species or at the subspecies level in dealing with unlisted species. For listed organisms, the plan considers the listed taxon. Any residual inconsistencies in nomenclature in this document will be addressed in subsequent drafts.
- Status: Federal or state listed, The Nature Conservancy ranking, USFWS, USFS, BLM sensitive species.
- Clark County MSHCP status: Covered or Evaluation (high, medium, or low priority).
- Range: The overall North American distribution of the species or subspecies, with map, if available.
- Clark County distribution: The distribution of the species in Clark County based on (1) existing location data from a variety of sources, including the NNHP database, BRRC at UNR, NDOW, BLM, NPS, UNLV, and other cited sources; (2) inferred distribution based on known habitat associations, habitat descriptions from the literature or participating biologists, or, for vertebrates, the Wildlife Habitat Relationships database model applied to the vegetation community mapping in Clark County. The distribution is presented as specific locational information, if available, and a map of high, medium, and low potential for occurrence. The high, medium, and low potential for occurrence rating is adapted from the WHR database species-specific habitat index. The rating is a measure of relative importance of the habitat for vertebrate species or the likelihood of occurrence of other species based on GIS analysis of actual distribution of point locations within the vegetation communities.
- Population trends: Clark County or rangewide population trend information, if available.

- **Habitat:** A description of the habitat(s) used by the species in Clark County and a tabulation of the acres of high, medium, and low potential habitat by ecosystem and vegetation community. Vegetation communities are those identified in the Utah State University classification.
- **Ecosystem level threats:** A listing of the general and ecosystem-wide factors that potentially threaten the species in Clark County.
- **Species specific threats:** A listing of any species specific factors that potentially threaten the species in Clark County.
- **Existing and proposed conservation actions:** A brief description of existing management within the Clark County distribution of the species. For Covered Species, this includes a tabulation of acres by conservation management category and management.
- **Adequacy of existing management (Covered Species):** A brief analysis of the adequacy of existing management policies to reduce or eliminate the effect of the potential threats on the species. Adequacy is primarily defined on the basis of the proportion and configuration of the potential range of the species occurring within IMAs and LIMAs, but also taking into consideration other species-specific factors.
- **Additional conservation needs (High Priority Evaluation Species):** A list of the management actions necessary to deal with any potential threats that would affect the species not dealt with by existing management policies and actions.
- **References:** A list of references cited or selected sources used in the development of the information provided.

Nevada Natural Heritage Program Global Rank System

The Nevada Natural Heritage Program uses a ranking system to quickly communicate global rarity of species and ecosystems: The NNHP specializes in tracking rare species and ecosystems and has established an index of rarity and vulnerability to extinction called a “Global Rank” (or G-Rank) that can be applied to rare species or ecosystems to describe how rare and imperiled they are on a global scale. The lower the number, the rarer or more vulnerable the species. In addition to the Global Ranks, there are State Ranks (S-Ranks) that focus on the status of a species or ecosystem within the boundaries of a state. Finally, for dealing with rare subspecies, varieties, or other recognized taxa below the species level, NNHP assigns a Taxon Rank (T-Rank) that applies the typical global ranking criteria at the appropriate taxonomic level

Global Ranks:

G1: Critically imperiled globally because of extreme rarity or factors that make them especially vulnerable to extinction rangewide. Typically, a G1 species has a total global population of fewer than 1,000 or there are fewer than five known populations or occurrences. There is one exception: if it is thought that ALL occurrences of a species or ecosystem are immediately threatened with extinction, that element is assigned a G1 rank, even if >5 occurrences are known or total population size >1,000.

G2: Imperiled globally because of factors making them very vulnerable to extinction rangewide. The criteria for this rank are 6-20 occurrences or 1,000-3,000 individuals remaining.

G3: Restricted to local range; typically these are endemic species or ecosystems vulnerable to extinction rangewide. The criteria are 21-100 occurrences or 3,000-10,000 individuals remaining.

G4: Widespread and probably globally secure for the present. The criteria for this rank are >100 occurrences or >10,000 individuals globally.

G5: Widespread and demonstrably secure. These species and ecosystems are well-represented, wide-ranging, and not threatened with rangewide extinction, although peripheral or local populations may become threatened.

GH: Historic records only (not seen in the last 15 years), but some possibility of rediscovery.

GX: Extinct species, no recent observations, and no expectation of rediscovery.

Taxon Ranks:

Subspecies receive a T-Rank attached to the G-Rank. With the subspecies, the G-Rank reflects the condition of the entire species whereas the T-Rank reflects the situation of the subspecies or variety.

State Ranks:

The State Rank is assigned in much the same way as the Global Ranking.

S1: Designates a species that is critically endangered, having fewer than 6 viable populations or occurrences OR fewer than 1,000 individuals OR is restricted to fewer than 2,000 acres.

S2: Designates species restricted to 6 to 20 viable populations or occurrences OR limited to 1,000-3,000 individuals OR is restricted to 2,000 to 10,000 acres.

S3: Designates species found in 21 to 100 viable populations or occurrences OR having 3,000-10,000 individuals OR inhabiting between 10,000 and 50,000 acres.

S4: Apparently secure; this rank is clearly more secure than S-3 but factors exist to cause some concern; for example, if there is some threat of a somewhat narrow habitat.

S2.2: Six to 20 occurrences, the majority not immediately threatened, but threats developing.

S2.3: Six to 20 occurrences, the majority not immediately threatened, and some examples apparently secure. For example, a rare plant with some populations in a national park and receiving protective management such as fencing, weed control, etc.

1.0 Mammals

The MSHCP includes a total of 28 species of mammals:

Covered	4
High Priority Evaluation	4
Medium Priority Evaluation	9
Low Priority Evaluation	2
Watch List	9

Two groups of mammals require special considerations in the development of the AMP: bats and boreal island species. Bats present a more specific need to understand what makes particular habitats suitable for populations of bats. It is necessary to know how each species of bat will respond to future habitat perturbations. Although it is important to know the distribution of populations and individuals, the understanding of their true status will require an understanding of what features must be present in a local system to assure survival of identified populations.

Distinct boreal island populations of mammals, such as those in the Spring Mountains, should be considered vulnerable, as a group. The flagship species is Palmer's chipmunk, but it is important to develop a lot more about population connectivity (historical and current), demographics, and ecology for this entire assemblage in order to understand the vulnerability of Clark County populations. The bats and nine or ten of the mammals should be viewed as a historically cohesive, island mammal assemblage in the Spring Range, without high probability of rescue from any adjacent populations.

1.1 Covered Mammal Species

Covered mammal species include:

- Silver-haired bat, *Lasionycteris noctivagans*
- Long-eared myotis, *Myotis evotis*
- Long-legged myotis, *Myotis volans*
- Palmer's chipmunk, *Tamias palmeri*

The potential impacts, management, rationale for coverage, and measurable biological goals for each of the mammal species proposed for coverage in the MSHCP are summarized in Table 1-1.

TABLE 1-1
COVERED SPECIES CONSERVATION EVALUATIONS

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Silver-haired bat <i>Lasiorycteris noctivagans</i>	93% of potential habitat	6% of potential habitat	2% of potential habitat	USFS SMNRA USFWS (DNWR) BLM Red Rock Cyn NCA	North American species, occurring in Clark Co primarily at high elevations. 93% of primary habitat in IMAs and LIMAs; management actions in SMNRA through the CA and on DNWR.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Long-eared myotis <i>Myotis evotis</i>	97% of potential habitat	7% of potential habitat	1% of potential habitat	USFS SMNRA USFWS (DNWR) BLM Red Rock Cyn NCA BLM RMP	Western North American species, occurring in Clark Co primarily at high elevations. 97% of primary habitat in IMAs and LIMAs; management actions in SMNRA through the CA and on DNWR.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Long-legged myotis <i>Myotis volans</i>	93% of potential habitat	6% of potential habitat	2% of potential habitat	USFS SMNRA USFWS (DNWR) BLM Red Rock Cyn NCA	Western North American species, occurring in Clark Co primarily at high elevations. 93% of primary habitat in IMAs and LIMAs; management actions in SMNRA through the CA and on DNWR.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Palmer's chipmunk <i>Tamias palmeri</i>	97% of potential habitat	none	3% of potential habitat	USFS SMNRA	Spring Mtns endemic. 97% of habitat in IMAs and LIMAs; management actions in SMNRA through the CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers

¹In all cases, projected potential impacts represent the "worst case" analysis.

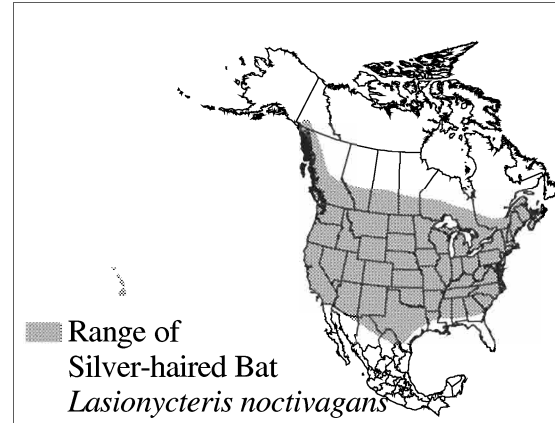
1.1.1 Silver-haired bat, *Lasionycteris noctivagans*

Status: None.

Clark County MSHCP Status: Covered.

Range: Occurs from northern Mexico throughout the U.S. to southern Canada and is widely distributed in Nevada. Migrates northward in spring from wintering sites in the southern portion of its range. Migratory summer resident in montane forests. Locally common.

Clark County Distribution: The potential Clark County distribution of the silver-haired bat is shown in Figure 1-1, based on habitat preferences of the species.



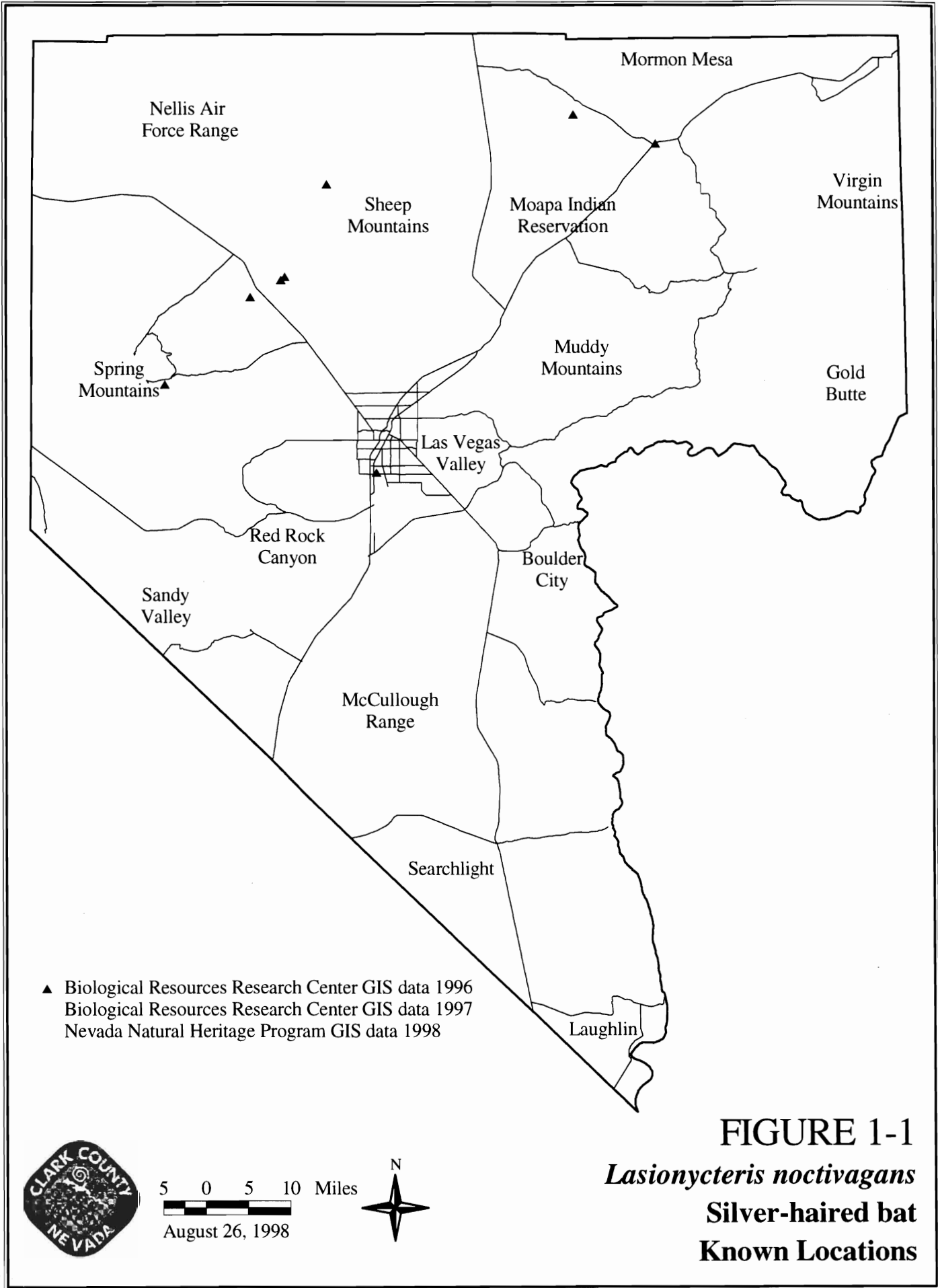
Habitat: Mixed conifer, pinyon-juniper, and high-elevation riparian habitats below 9,000 feet are summer habitat for this species. Summer roost sites are in hollow trees, snags, and under bark; winter roosts in rock crevices, caves, and buildings. Maternity roosts are generally in woodpecker holes. Uses multiple roost sites and switches roosts frequently. Feeds on moths and other soft-bodied insects above open forest streams, ponds, and open brushy areas.

Population Trends: Unknown.

Ecosystem Level Threats:

- habitat degradation and modification due to fire suppression and fuels management, post fire suppression, and fuels management, historical fires management, and fire. **Threat 301**
- habitat degradation and modification and indirect effects on species due to dispersed recreational activities in riparian habitat associated with ponds and streams within the mixed conifer ecosystem. **Threat 401**
- increased use of pesticides and herbicides associated with golf course maintenance. **Threat 602**
- habitat degradation from wood removal, collection of downed logs and snags within the mixed conifer ecosystem. **Threat 1001**

Species Specific Threats: None identified.



Existing and Proposed Conservation Actions: General and ecosystem conservation actions are identified in Appendix A. See chapters on mixed conifer, pinyon-juniper, boreal islands, and bats. 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. The CA also identifies management actions for cliffs and in rocky areas, including distribution of educational materials to climbers and surveys prior to development of new climbing routes. USFS, BLM, and NPS include education, inventory, and monitoring programs for bats throughout Clark County as well as programs for conservation of bats in caves and during the mine closure process.

Adequacy of Existing Management: Approximately 81% of the potential habitat for this species occurs on lands categorized as IMA and LIMA. Implementation of existing and proposed management actions in the IMAs will adequately address the primary threats to this species.

Most forested lands occur on lands under management of USFS (Spring Mountains National Recreation Area) and USFWS (Desert National Wildlife Range). The potential habitat for this species occurs on 71% of lands managed by the USFS, and 26% on USFWS lands.

The AMP should specifically include studies to:

- Determine significance of watering, foraging, and roost site spatial association.
- Analyze population genetic connectivity between Clark County and surrounding populations.

References: Barbour and Davis 1969; Hall 1981; Hoffmeister 1986; Ramsey 1994, 1996, 1997; Southern Nevada Water Authority 1995.

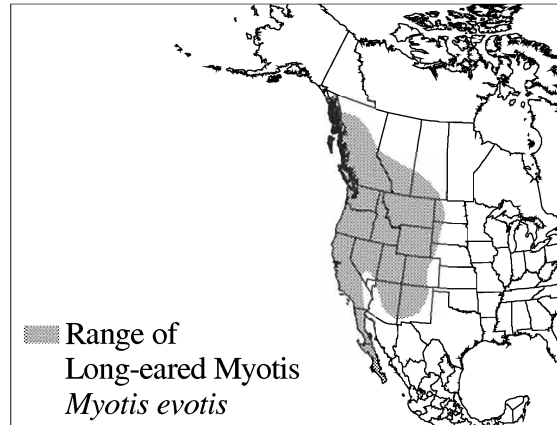
1.1.2 Long-eared myotis, *Myotis evotis*

Status: Nevada Special Status Species, Nevada Natural Heritage Program Global Rank G5 and State Rank S3.

Clark County MSHCP Status: Covered.

Range: Found throughout the state and is thought to be fairly common in southern Nevada with the exception of the extreme southern portion of the state.

Clark County Distribution: Long-eared myotis were captured regularly in mist nets during a survey of candidate bat species in Clark County conducted in the summers of 1992-1994 in White Rock, Potosi Spring, Wheeler Well, Carpenter Canyon, Fletcher Canyon, Mack's Canyon, and Deer Creek. Also noted in crevices in train tunnels east of the LMNRA and in the River and Black Mountains. The potential distribution of this species is shown in Figure 1-2.



Habitat: Long-eared myotis primarily occur in **mixed conifer, pinyon-juniper, and sagebrush**. This species is occasionally found in **salt desert scrub, mesquite/catclaw, lowland riparian** habitats and agricultural areas. Long-eared myotis are associated with springs and rivers. Day roosts have been found in buildings, snags, mines, caves, and crevices and beneath bark. Night roosts are located in caves, mines, and under bridges. Foraging often occurs over lakes or ponds and among trees in forested areas. They primarily eat moths but are also known to eat beetles, flies, flying ants, wasps, and true bugs.

Population Trends: Unknown.

Ecosystem Level Threats:

- Disturbance of roosts from recreational activities. **Threats 401, 405, 407**
- Bridge replacement. **Threat 504**
- Effects of insecticides on prey base or on bats directly. **Threat 602**
- Loss of roosts through mining activities or mine closures. **Threats 901, 902**
- Building demolition. **Threat 1101**
- Loss of foraging habitat or access to water sources in species habitat. **Threats 1401-1403**

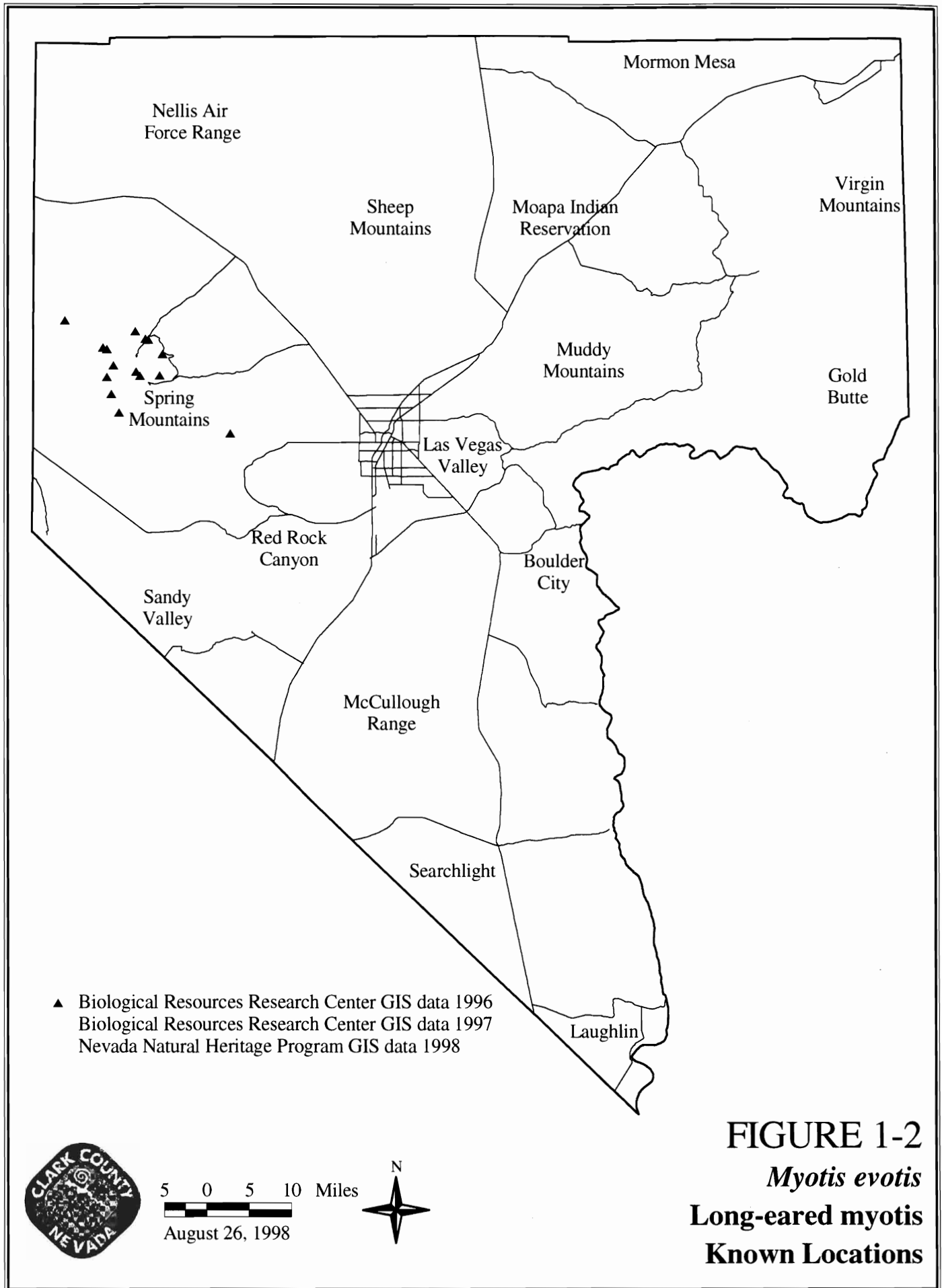


FIGURE 1-2
Myotis evotis
Long-eared myotis
Known Locations

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem conservation actions are identified in Appendix A. See chapters on mixed conifer, pinyon-juniper, sagebrush, and bats. 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. The CA also identifies management actions for cliffs and in rocky areas, including distribution of educational materials to climbers and surveys prior to development of new climbing routes. USFS, BLM, and NPS include education, inventory, and monitoring programs for bats throughout Clark County as well as programs for conservation of bats in caves and during the mine closure process.

Adequacy of Existing Management: Approximately 81% of the potential habitat for this species occurs on lands categorized as IMA and LIMA. Implementation of existing and proposed management actions in the IMAs will adequately address the primary threats to this species. Medium to high potential habitat for this species occurs on 48% of USFS lands (Spring Mountains National Recreation Area), 39% of USFWS lands (Desert National Wildlife Range), and 12% of lands managed by the BLM (Virgin Mountains).

The AMP should specifically include studies to:

- Determine significance of watering, foraging, and roost site spatial association.
- Analyze population genetic connectivity between Clark County and surrounding populations.

References: Barbour and. Davis 1969; Hall 1981; Hoffmeister 1986; Ramsey 1994, 1996, 1997; Southern Nevada Water Authority 1995.

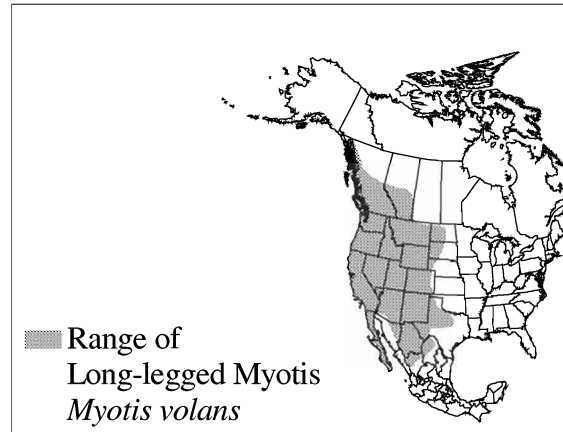
1.1.3 Long-legged myotis, *Myotis volans*

Status: Nevada Special Status Species, Nevada Natural Heritage Program Global Rank G5 and State Rank S3.

Clark County MSHCP Status: Covered.

Range: Ranges throughout western North America and is found throughout Nevada with the exception of the southeastern corner of the state in low desert habitat. Probably a year-round resident.

Clark County Distribution: Long-legged myotis were captured during surveys in Clark County conducted in 1992-1994 at White Rock, Potosi Spring, Wheeler Well, Carpenter Canyon, Fletcher Canyon, and Deer Creek. This species is also known from crevices in the train tunnels located east of the LMNRA Visitor Center and sites in the River and Black Mountains. Foraging occurs along Las Vegas Wash, Lake Mead, and other water features. The potential distribution of this species is shown in Figure 1-3.



Habitat: Long-legged myotis are found in virtually all habitats in Clark County in low numbers, but primary habitat for this species includes **mixed conifer** and **pinyon-juniper** above 4,000 feet in elevation. Other frequently used habitats are ponderosa pine/mountain shrub, juniper, sagebrush, and sagebrush/perennial grassland. Day roosts are primarily in hollow trees, in particular large-diameter snags, under bark, or live trees with lightning scars, but also in rock crevices, mines, and buildings. Caves and mines may serve as night roosts. Hibernacula are generally mines or caves. Foraging occurs in Great Basin scrub and less commonly in arid grassland and desert habitats. Their diet consists primarily of small moths. Long-legged myotis are dependent upon the presence of a consistent source of water and are associated with rivers and springs.

Population Trends: Unknown.

Ecosystem Level Threats:

- Disturbance of roosts from recreational activities. **Threats 401, 405, 407**
- Effects of insecticides on prey base or on bats directly. **Threat 602**
- Loss of roosts through mining activities or mine closures. **Threats 901, 902**

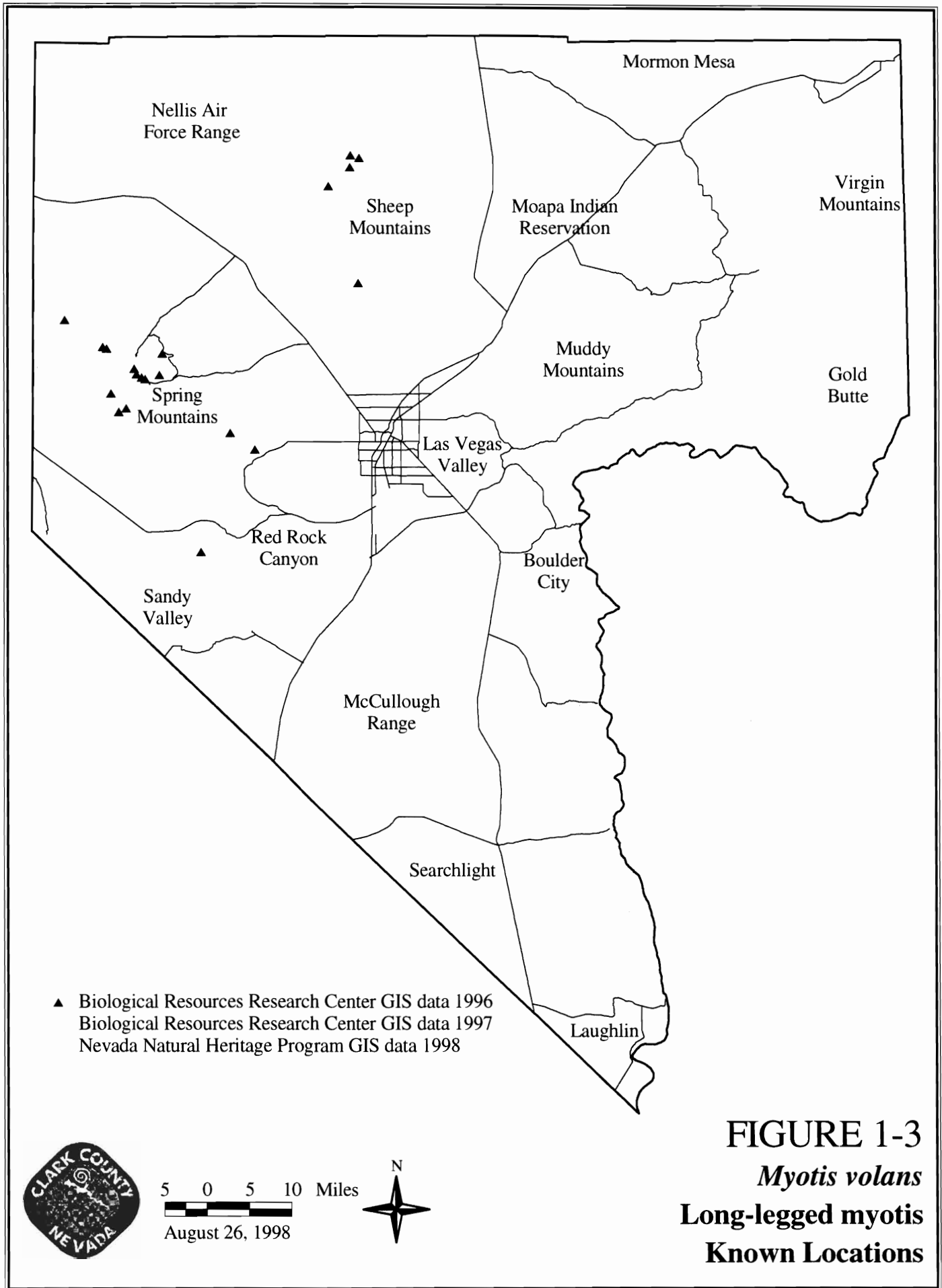


FIGURE 1-3
Myotis volans
Long-legged myotis
Known Locations

- Loss of foraging habitat or access to water sources in species habitat. **Threats 1401-1403**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem conservation actions are identified in Appendix A. See chapters on mixed conifer, pinyon-juniper, and bats. 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. The CA also identifies management actions for cliffs and in rocky areas, including distribution of educational materials to climbers and surveys prior to development of new climbing routes. USFS, BLM, and NPS include education, inventory, and monitoring programs for bats throughout Clark County as well as programs for conservation of bats in caves and during the mine closure process.

Adequacy of Existing Management: Approximately 81% of the potential habitat for this species occurs on lands categorized as IMA and LIMA. Implementation of existing and proposed management actions in the IMAs will adequately address the primary threats to this species. Medium to high potential habitat occurs on 41% of lands managed by the USFS (Spring Mountains NRA), 39% on USFWS lands (Desert National Wildlife Range), and 17% on lands managed by the BLM (Virgin Mountains).

The AMP should specifically include studies to:

- Determine significance of watering, foraging, and roost site spatial association.
- Analyze population genetic connectivity between Clark County and surrounding populations.

References: Barbour and Davis 1969; Hall 1981; Hoffmeister 1986; Schmidly 1991; Ramsey 1994, 1996, 1997; Southern Nevada Water Authority 1995.

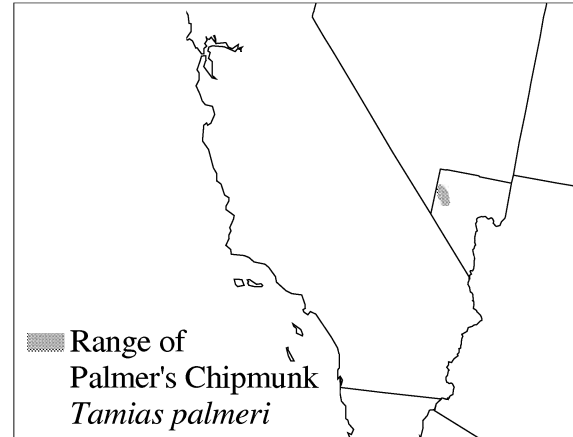
1.1.4 Palmer's chipmunk, *Tamias palmeri*

Status: Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Palmer's chipmunk is endemic to the Spring Mountains range of southern Nevada and is found in a small, isolated area of the Charleston Mountains (Figure 1-4). The highest densities of Palmer's chipmunk occur at the main and north forks of Deer Creek, on the east side of the Spring Mountains range.

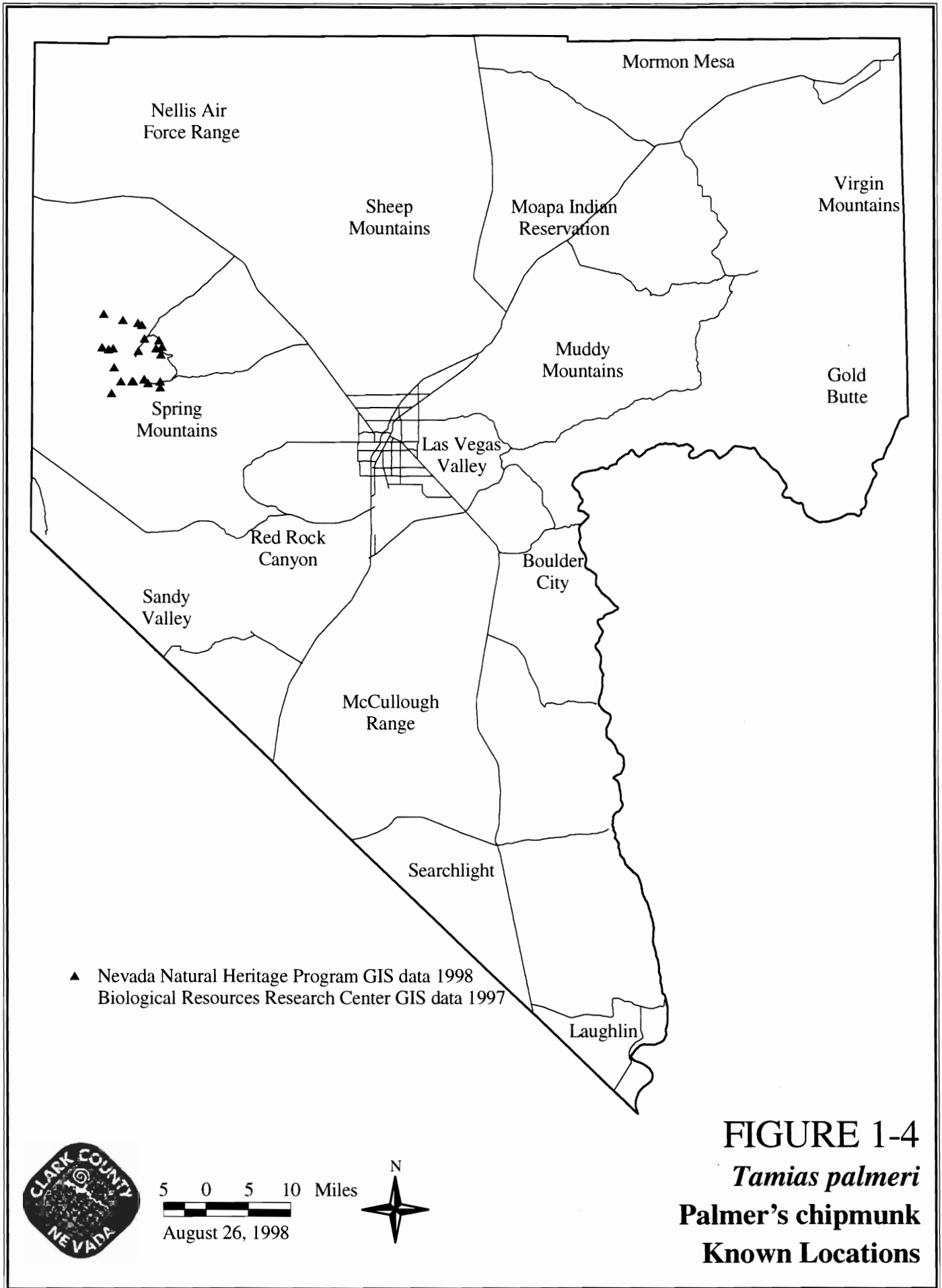


Habitat: Palmer's chipmunk prefers **bristlecone pine, mixed conifer, and pinyon-juniper** habitats with rocky slopes or areas with free-flowing water. Juniper habitats are sometimes used. The chipmunk appears to select cool, deep, mesic canyons along the lower portion of slopes which are not subject to human use, as well as the canyon floors where felled logs, large rocks, and small caves and crevices in cliffs provide shelter.

Population Trends: It appears that populations are either locally increasing or decreasing, depending on uses and disturbances occurring in specific areas (especially recreational development and use).

Ecosystem Level Threats:

- habitat degradation and modification due to fire suppression and fuels management, post fire suppression and fuels management, historical fire management, fire. **Threat 301**
- 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 401**
- habitat degradation and modification resulting from concentrated recreation (camping, ski area expansion, facilities development). **Threat 402**
- habitat degradation from wood removal. **Threat 1001**



Species Specific Threats:

- susceptibility to stochastic events of narrow endemics and limited distribution species (boreal island species). **Threat 101**
- reduction of populations resulting from commercial collection of small mammals. **Threat 201**
- predation by feral animals and uncontrolled pets. **Threat 1601**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on mixed conifer, pinyon-juniper, and boreal islands). 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, and habitat restoration and enhancement at recreation sites. The following existing or proposed conservation actions are essential to address threats to Palmer's chipmunk:

CC(2.8.3.4) Develop brochures on Palmer's chipmunk ecology, threats, and conservation.

*USFS(11) Design and install signs specifically addressing Palmer's chipmunk conservation at all developed recreation sites located within its habitat. (CA7.8)**

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)

The following conservation actions will potentially enhance populations of the Palmer's chipmunk:

USFS(6) Provide information to summer home residents on Palmer's chipmunk and rough angelica conservation. (CA7.3)

*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)*

- *Palmer's chipmunk: Features of movements and home ranges, dispersal patterns, and behavioral interactions between Palmer's chipmunk and golden mantled ground squirrel as related to habitat condition. (CA6.2j)*

*USFS(27) Develop a Palmer's chipmunk monitoring plan, emphasizing population and habitat monitoring. Conduct periodic monitoring for the Palmer's chipmunk, using methods described in the Palmer's chipmunk monitoring plan. (CA3.3)**

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)

Adequacy of Existing Management: Almost the entire potential habitat for Palmer's chipmunk is within IMA or LIMA lands (97%) with specific management actions for the species. Implementation of existing and proposed management commitments, will provide adequate conservation of the species and its habitat. The majority (90%) of the potential habitat for this species occurs on lands under management of the USFS (Spring Mountains National Recreation Area) managed under the terms of the GMP. Approximately 9% occurs on BLM managed lands and 2% on private inholdings within the forest.

Palmer's chipmunk would also benefit from prioritization of acquisition or exchanges of inholdings with chipmunk habitat in the forest, on a willing-seller/willing-buyer basis.

References: Hall 1946; WESTEC Services, Inc. 1980; NDOW 1996.

1.2 Evaluation Mammal Species

High Priority

- Pale Townsend's big-eared bat, *Corynorhinus townsendii pallescens*
- Kit fox, *Vulpes macrotus arsipus*
- Desert kangaroo rat, *Dipodomys deserti*
- Desert pocket mouse, *Chaetodipus penicillatus sobrinus*

Medium Priority

- Inyo shrew, *Sorex tenellus*
- Small-footed myotis, *Myotis ciliolabrum*
- Fringed myotis, *Myotis thysanodes*
- Golden-mantled ground squirrel, *Spermophilus lateralis certus*
- Hidden Forest Uinta chipmunk, *Tamias umbrinus nevadensis*
- Panamint kangaroo rat, *Dipodomys panamintinus caudatus*
- Bushy tail woodrat, *Neotoma cinerea lucida*
- Short-tailed weasel, *Mustela erminea*
- Long-tailed weasel, *Mustela frenata*

Low Priority

- Nuttall's cottontail, *Sylvilagus nuttallii*
- Chisel-toothed kangaroo rat, *Dipodomys microps occidentalis*

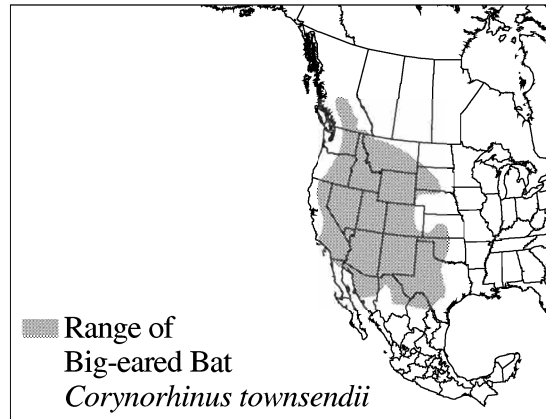
1.2.1 Pale Townsend's big-eared bat, *Corynorhinus townsendii pallescens*

Status: Nevada Special Status Species, USFS Region 4 sensitive species, Nevada Natural Heritage Program Global Rank G4 and State Rank S3.

Clark County MSHCP Status: Evaluation - high priority.

Range: Occurs throughout much of western North America (Figure 1-5). Year-round resident of Nevada, occurring throughout the state.

Clark County Distribution: This species was captured at various locations during a survey of bat species in Clark County in 1992-1994, including Deer Creek, Potosi Spring, Calico Hills, White Rock Spring, Grapevine Spring, Fletcher Canyon, Deer Creek Picnic Area, and Wheeler Well, in areas near known caves or mines. It has been observed near the eastern end of Lake Mead and in the Newberry Mountains.



Habitat: This species can be found in a variety of habitats but is associated with sagebrush, sagebrush/perennial grassland, hopsage, blackbrush, Mojave mixed scrub, creosote-bursage, mesquite, and lowland riparian habitats. Daytime roosts are principally mine tunnels and caves and occasionally in cliffs, cracks, or crevices. Nighttime roosts are often in abandoned buildings. Their diet consists primarily of small moths, but other small insects also are consumed.

Population Trends: Populations may be decreasing throughout its range, and the population may already be low in the Spring Mountains.

Ecosystem Level Threats:

- Loss of roosts through mining activities or mine closures. **Threats 901, 902**
- Effects of insecticides on prey base or on bats directly. **Threat 602**
- Disturbance of roosts from recreational activities. **Threats 401, 405, 407**
- Loss of foraging habitat or access to water sources in species habitat. **Threats 1401-1403**

Species Specific Threats: None identified.

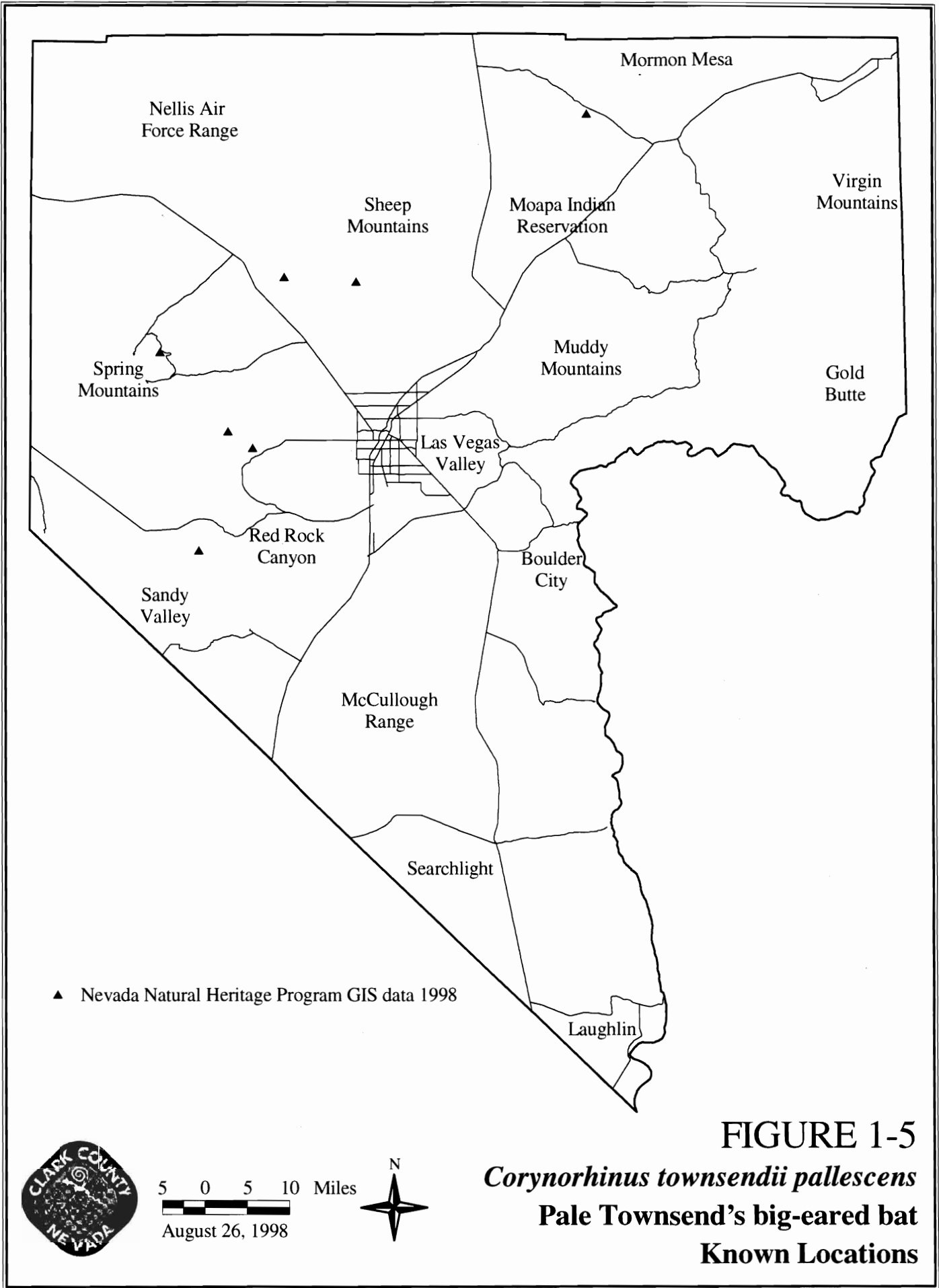


FIGURE 1-5

Corynorhinus townsendii pallescens
Pale Townsend's big-eared bat
Known Locations

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on sagebrush, blackbrush, Mojave desert scrub, mesquite/catclaw, lowland riparian, and bats.

Additional Conservation Needs:

- Conduct surveys and map habitat types in Clark County to determine the status of this species.
- Educate the public about the role of bats in the ecosystem and the importance of leaving roost sites undisturbed.
- Locate maternity and hibernacula roosts.
- Protect known roost sites, especially when in use.
- Fence or gate mines susceptible to human disturbance or of public safety concern.
- Close access roads to bat roosts where this does inhibit not access to other resources.
- Avoid the use of heavy equipment near known mine or cave roosts.
- Monitor and protect water sources, especially those in proximity to hibernacula and maternity roosts.
- Keep water sources used by bats and other wildlife accessible.
- Protect and maintain water quality.
- Manage insecticide, pesticide, or herbicide use near roosts and foraging areas.

References: Arizona Game and Fish Department 1992; Barbour and Davis 1969; USFWS 1993; Hall 1981; Handley 1959; Hoffmeister 1986; National Park Service 1995; Pierson, Rainey, and Koontz 1991.

1.2.2 Kit fox, *Vulpes macrotus arsipus*

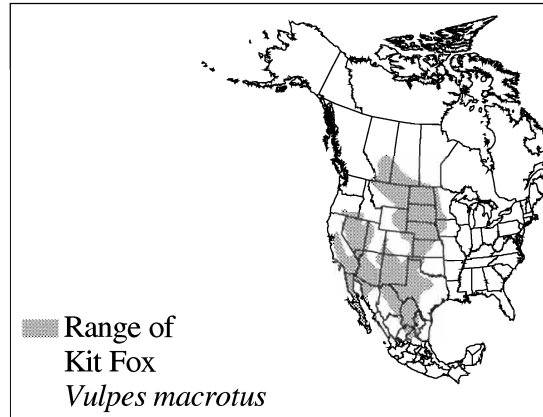
Status: Nevada fur-bearing animal.

Clark County MSHCP Status: Evaluation - high priority.

Range: Kit fox is widespread in the western Great Plains region of North America, northern Mexico, and into the southwestern deserts. This subspecies occurs from southern Nevada through the Mojave and Sonoran deserts (Figure 1-6).

Clark County Distribution: Distribution inferred from habitat preferences.

Habitat: Primary habitat is **blackbrush, salt desert scrub, and Mojave desert scrub**. Kit fox are also found in sagebrush, mesquite, lowland riparian, barren, and grassland habitats. Other habitats used are pinyon, pinyon-juniper, juniper, sagebrush/perennial grassland, and agriculture.

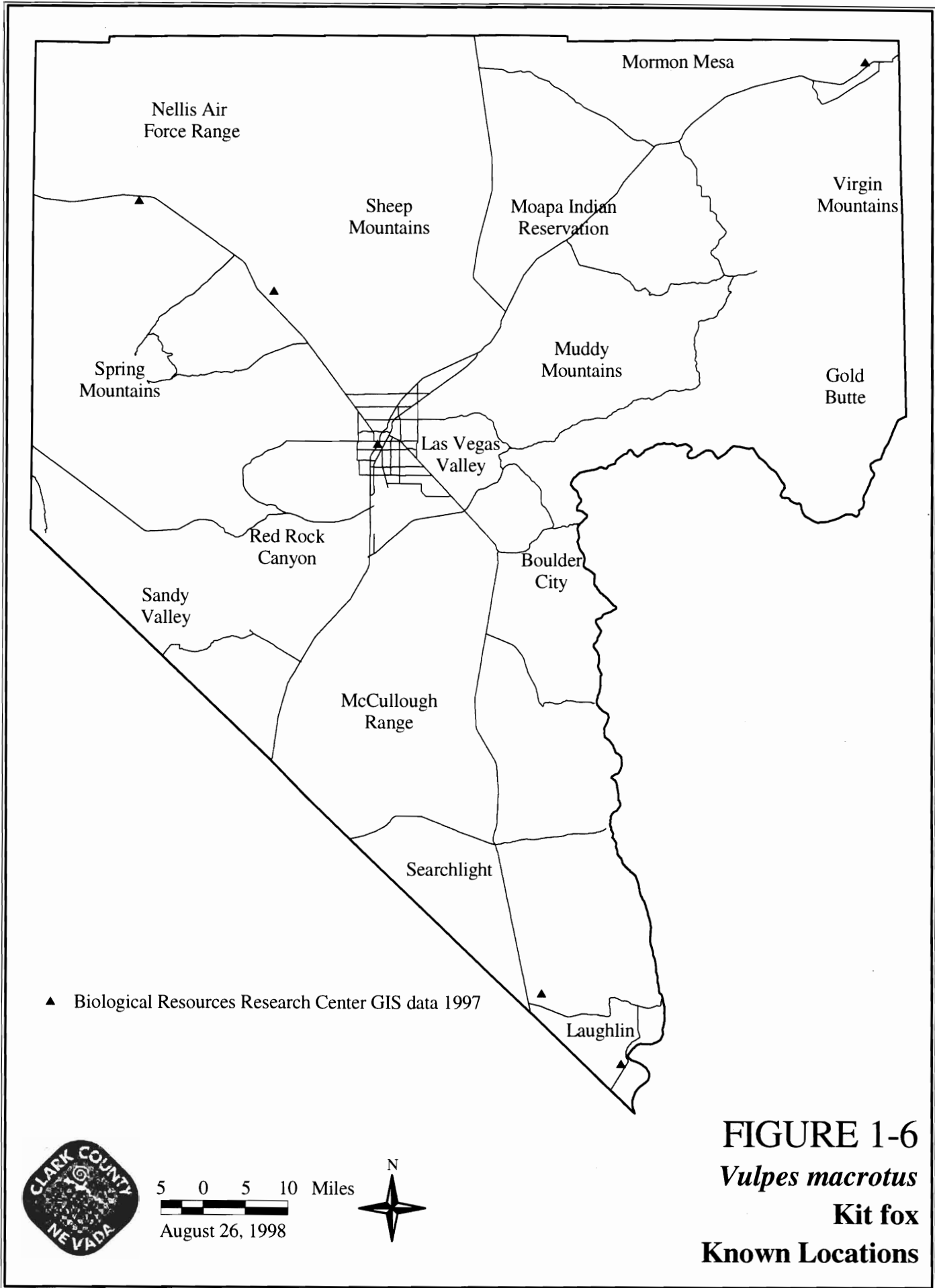


Population Trends: Unknown

Ecosystem Level Threats:

- habitat degradation resulting from urban and rural development. **Threat 1101**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- mortality of non-target species through direct or indirect poisoning or trapping for small mammals or pest species. **Threat 601**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat modification and degradation and wildlife mortality from non-competitive non-commercial OHV activities. **Threat 404**
- reduction of fauna populations by indiscriminate recreational shooting. **Threat 406**
- poaching, illegal collection, or killing of flora and fauna. **Threat 1701**

Species Specific Threats: None identified.



Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on blackbrush, salt desert scrub, and Mojave desert scrub.

Additional Conservation Needs:

- Conservation needs of this species cannot be adequately defined until a better understanding of the species distribution and population trends is developed.
- An assessment of the current distribution and population status of the species needs to be conducted.
- An evaluation of the area necessary to maintain a minimum viable population of the species in the county should be conducted.
- A management plan that deals with identified threats should be devised.
- The County could develop a permitted relocation program, including identification of host sites for translocation.
- Because much of this species distribution overlaps the desert wildlife management areas being managed for desert tortoise, conservation of the kit fox might be adequately dealt with by the management in these areas, although this is uncertain given the lack of population trend and distribution data for the species in Clark County.

References: Egoscue 1962; Ingles 1965; Laughrin 1970; Morrell 1971, 1972; Orloff et al. 1986; Zeiner et al. 1990.

1.2.3 Desert kangaroo rat, *Dipodomys deserti*

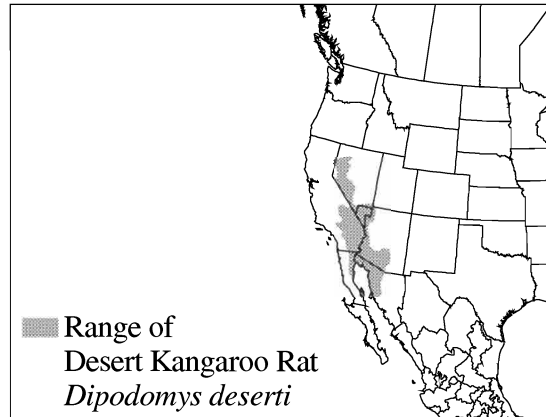
Status: None.

Clark County MSHCP Status: Evaluation - high priority.

Range: Southwestern desert endemic associated with dunes and other fine sand habitat (Figure 1-7).

Clark County Distribution: Distribution is inferred from habitat preferences.

Habitat: Found in hopsage, blackbrush, Mojave mixed scrub, creosote-bursage, and salt desert scrub habitats associated with wind-drifted sand, probably at least 20 inches deep. Likely overlaps with distribution of *Penstemon albomarginatus*.



Population Trends: Unknown.

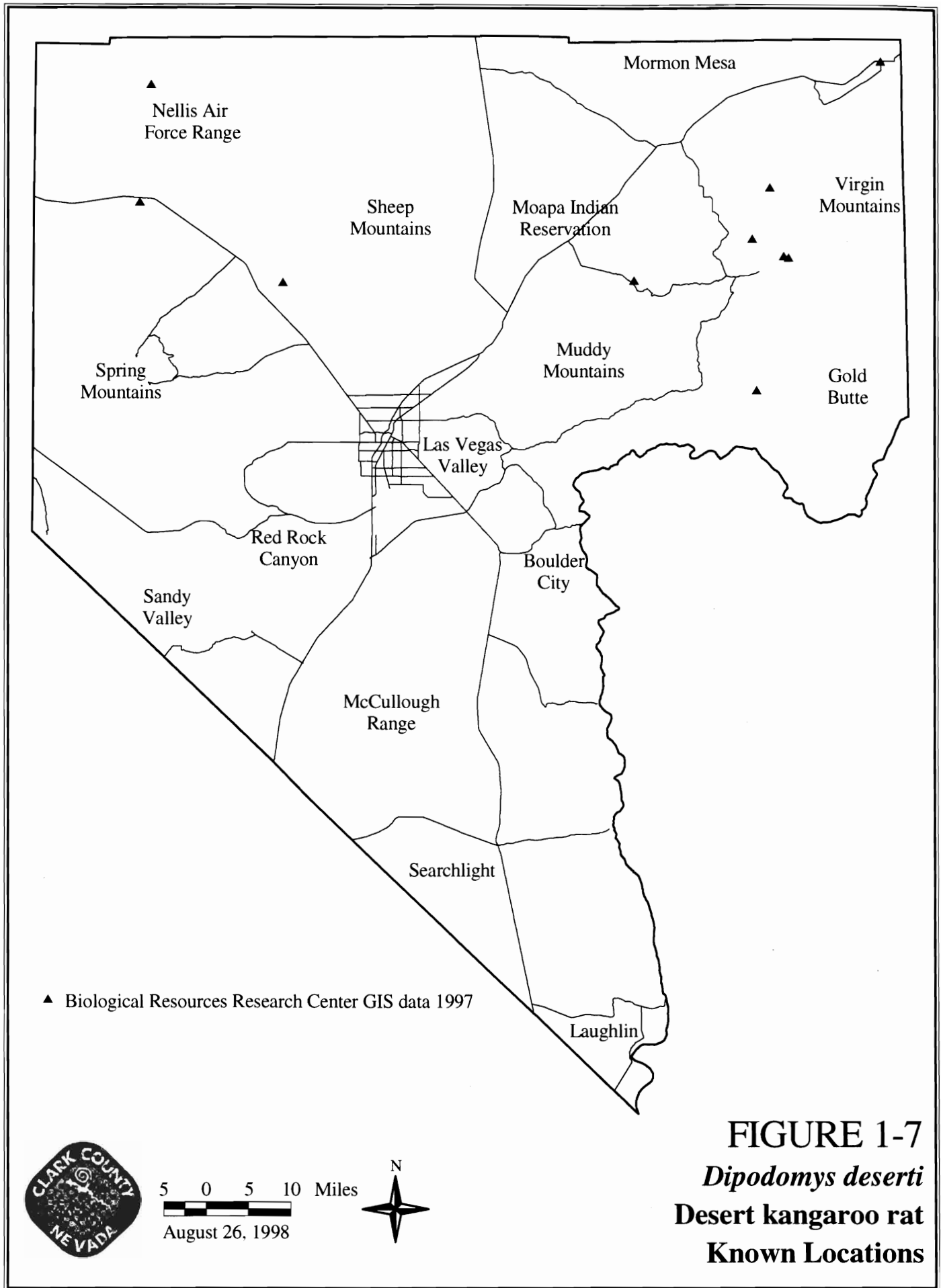
Ecosystem Level Threats:

- susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**
- unknown population trends. **Threat 102**
- reduction of populations resulting from commercial collection. **Threat 201**

Species Specific Threats: None identified.

Additional Conservation Needs: Evaluation of current distribution, potential threats, and population trends.

References: Grinnell 1937; Hall 1946; Butterworth 1961; Miller and Stebbins 1964; Haley 1964; Brown and Lieberman 1973; Beatley 1976a, 1976b; Hall and Kelson 1959; Zeiner et al. 1990.



1.2.4 Desert pocket mouse, *Chaetodipus penicillatus* *sobrinus*

Status: None.

Clark County MSHCP Status: Evaluation - high priority.

Range: Southwestern desert endemic associated with dunes and other fine sand habitat (Figure 1-8).

Clark County Distribution: Distribution is inferred from habitat preferences.

Habitat: Found in **mesquite/catclaw**, **Mojave desert scrub**, and **salt desert scrub** habitats associated with wind-drifted sand, probably at least 20 inches deep. Likely overlaps with distribution of *Penstemon albomarginatus*.

Population Trends: Unknown.

Ecosystem Level Threats:

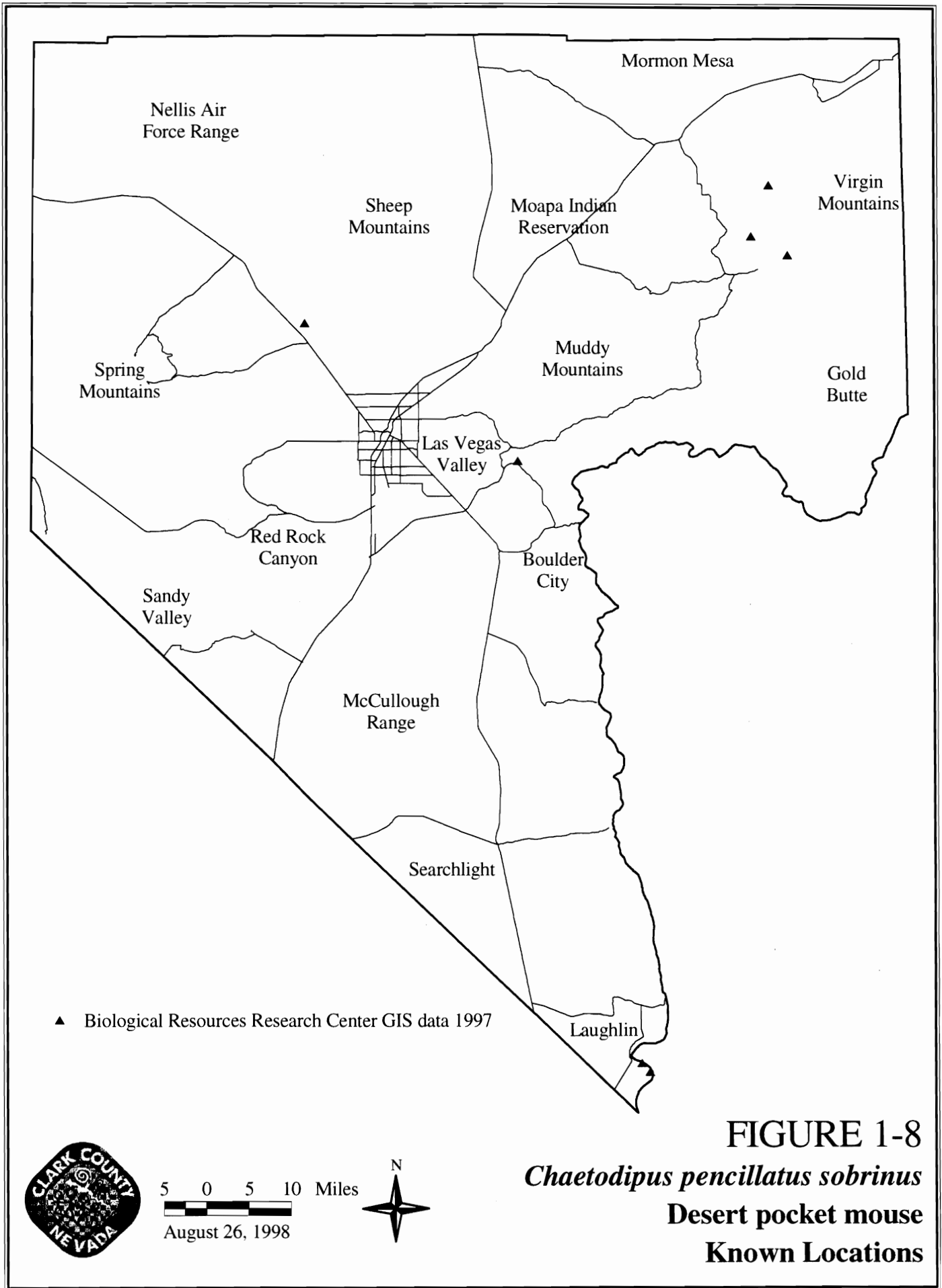
- susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**
- unknown population trends. **Threat 102**
- loss of remaining habitat on private property along the Virgin and Muddy Rivers. **Threat 1101**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on blackbrush, Mojave desert scrub, and salt desert scrub.

Additional Conservation Needs: Evaluation of current distribution, potential threats, and population trends.

References:



1.3 Watch List Mammal Species

- California leaf-nosed bat, *Macrotus californicus*
- Spotted bat, *Euderma maculatum*
- Allen's big-eared (lapped-browed) bat, *Idionycteris phyllotis*
- Southwestern cave myotis, *Myotis velifer brevis*
- Yuma myotis, *Myotis yumanensis*
- Greater western mastiff-bat, *Eumops perotis californicus*
- Big free-tailed bat, *Nyctinomops macrotis*
- Spiny pocket mouse, *Chaetodipus spinatus spinatus*
- Desert bighorn sheep, *Ovis canadensis nelsoni*

2.0 Birds

The MSHCP includes a total of 30 species of birds:

Covered	8
High Priority Evaluation	1
Medium Priority Evaluation	3
Low Priority Evaluation	3
Watch List	15

The majority of the Covered birds are associated with lowland riparian (desert aquatic) or mesquite/catclaw ecosystems.

2.1 Covered Bird Species

- American peregrine falcon, *Falco peregrinus anatum*
- Yellow-billed cuckoo, *Coccyzus americanus*
- Vermilion flycatcher, *Pyrocephalus rubinus*
- Southwestern willow flycatcher, *Empidonax traillii extimus*
- Phainopepla, *Phainopepla nitens*
- Summer tanager, *Piranga rubra*
- Blue grosbeak, *Guiraca caerulea*
- Arizona Bell's vireo, *Vireo bellii arizonae*

The potential impacts, management, rationale for coverage, and measurable biological goals for each of the bird species proposed for coverage in the MSHCP are summarized in Table 2-1.

TABLE 2-1
COVERED SPECIES CONSERVATION EVALUATIONS

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
American peregrine falcon <i>Falco peregrinus anatum</i> Endangered (delisted 8/99)	60% of potential habitat	30% of potential habitat	<5% of potential habitat	BLM RMP NPS GMP NDOW (Overton WMA) USFWS (DNWR)	Southern North American species. 90% of habitat in IMA, LIMA, and MUMAs. Management and monitoring of eyries by USFWS and NDOW; with specific monitoring by NPS & USFS.	<ul style="list-style-type: none"> Monitor and protect existing eyrie sites on private, state, and Federal lands Maintain stable or increasing population numbers
Yellow-billed cuckoo <i>Coccyzus americanus</i>	24% of potential habitat	30% of potential habitat	46% of potential habitat	BLM RMP NPS GMP NDOW (Overton WMA)	Riparian dependent species of North America. Actions proposed for southwestern willow flycatcher will provide adequate management. Protection of additional suitable habitat on Virgin & Muddy Rivers and Las Vegas Wash.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Vermilion flycatcher <i>Pyrocephalus rubinus</i>	25% of potential habitat	29% of potential habitat	46% of potential habitat	BLM RMP NPS GMP NDOW (Overton WMA)	Riparian dependent species of southwestern US and Mexico. Actions proposed for southwestern willow flycatcher will provide adequate management. Protection of additional suitable habitat on Virgin & Muddy Rivers and Las Vegas Wash.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Phainopepla <i>Phainopepla nitens</i>	28% of potential habitat	48% of potential habitat	26% of potential habitat	BLM RMP NPS GMP NDOW (Overton WMA) USFWS (DNWR)	Northernmost edge of species range in southwestern US and Mexico. 10,200 ac (74%) of potential habitat in Clark Co and all known key populations in IMAs or MUMAs (Newberry Mtns, Moapa, Corn Creek, Sandy Valley); BLM specific management plan for mesquite in MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & MUMAs Maintain stable or increasing population numbers in key areas

TABLE 2-1
COVERED SPECIES CONSERVATION EVALUATIONS
(continued)

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Southwestern willow flycatcher <i>Empidonax traillii eximius</i> Federal Endangered	24% of potential habitat	30% of potential habitat	46% of potential habitat	USFWS BLM RMP NPS GMP NDOW (Overton WMA)	Riparian dependent species of southwestern US and northwestern Mexico. MSHCP provides mechanisms to protect and manage additional suitable habitat on the Virgin & Muddy Rivers and Las Vegas Wash as defined by the AMP.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of occupied habitat Maintain stable or increasing population numbers
Summer tanager <i>Piranga rubra</i>	24% of potential habitat	30% of potential habitat	46% of potential habitat	BLM RMP NPS GMP NDOW (Overton WMA)	Riparian dependent species of southern US and Mexico. Actions proposed for southwestern willow flycatcher will provide adequate management. Protection of additional suitable habitat on Virgin & Muddy Rivers and Las Vegas Wash.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Blue grosbeak <i>Guiraca caerulea</i>	24% of potential habitat	30% of potential habitat	46% of potential habitat	BLM RMP NPS GMP NDOW (Overton WMA)	Riparian dependent species of southern US and Mexico. Actions proposed for southwestern willow flycatcher will provide adequate management.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers Protection of additional suitable habitat on Virgin & Muddy Rivers & Las Vegas Wash
Arizona bell's vireo <i>Vireo bellii arizonae</i>	24% of potential habitat	30% of potential habitat	46% of potential habitat	BLM RMP NPS GMP NDOW (Overton WMA)	Riparian dependent species of south central US and Mexico. Actions proposed for southwestern willow flycatcher will provide adequate management.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers Protection of additional suitable habitat on Virgin & Muddy Rivers & Las Vegas Wash

¹In all cases, projected potential impacts represent the "worst case" analysis.

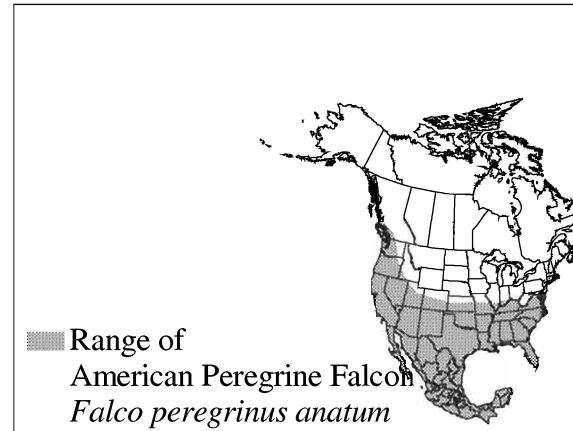
2.1.1 American peregrine falcon, *Falco peregrinus anatum*

Status: USFWS Endangered, BLM Nevada Sensitive Species, Nevada National Heritage Program Global Rank G3 and State Rank S1, Nevada State Protected.

Clark County MSHCP Status: Covered.

Range: The peregrine falcon occurs throughout the southern half of North America.

Clark County Distribution: The NDOW database has records of peregrine falcons from 1972 through 1995 at the Spring Mountains, Logandale, Overton State Wildlife Management Area, Newberry Mountains, Desert National Wildlife Range, Black Mountains, Mormon Farm, Henderson, Lake Mead, and Black Canyon (nesting). There have been various reports of peregrine falcons in urban settings throughout the Las Vegas Valley. Figure 2-1 shows the distribution of the peregrine falcon.



Habitat: Peregrines inhabit **mixed conifer, pinyon-juniper, sagebrush, lowland riparian, and grassland habitats, as well as agricultural and urban areas.** They feed primarily on medium-sized birds such as pigeons and doves, up to the size of ducks, and forage most intensively within one mile of the nest site. Nests are shallow hollows in soil, decomposed rock ledges or small caves on high cliffs, old raptor nests or tree cavities near lakes, rivers, and marshes. Peregrine falcons also have nested on various man-made structures within Las Vegas Valley.

Population Trends: This species was once considered to be extirpated from Nevada. Nesting peregrines have been documented north and south of Hoover Dam at Lakes Mead and Mojave. At least five pairs have been documented within Black Canyon, Hoover Dam. Nesting occurs in Nevada and Arizona in these areas. The population status of the American peregrine falcon is noted as “improving” with recovery plan objectives 51 to 75 percent achieved. Evidence collected in recent years shows that a combination of lingering residues of organochlorines in North America and contamination resulting from the continued use of organochlorines in Latin America has not prevented a widespread and substantial recovery of American peregrine falcons.

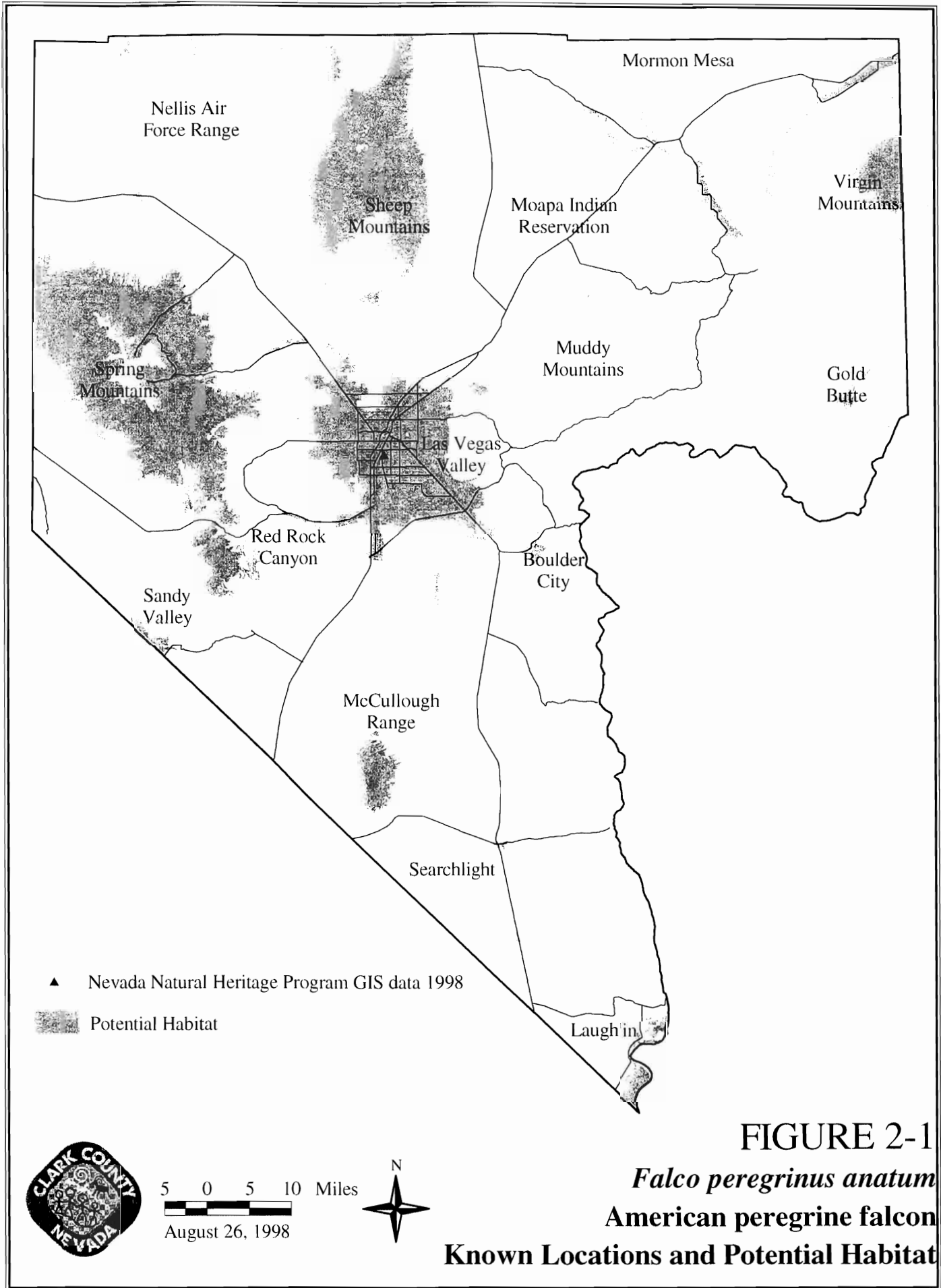


FIGURE 2-1

Falco peregrinus anatum
American peregrine falcon

Known Locations and Potential Habitat

Ecosystem Level Threats:

- Rock climbing and other associated recreational activities during the breeding season, disturb nesting activities. **Threat 405**
- Populations of the American peregrine falcon declined drastically in the 1960s and 1970s. This decline was attributed primarily to pesticide contamination (from DDT and its derivatives) and habitat degradation. Numerous references detail the effects of organochlorines on falcons (egg breakage, eggshell thinning, addling, hatching failure, abnormal reproductive behavior by the parent birds, etc.). Due to use restrictions, this threat has been significantly decreased. **Threat 602**
- Power lines pose a risk to peregrine falcons (and other raptors) through electrocution. **Threat 1201**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapters on mixed conifer, pinyon-juniper, sagebrush, springs, and butterflies) that would benefit this species include environmental education programs, implementation of a prescribed fire plan, snag management, habitat restoration and enhancement at recreation sites and in riparian areas, and coordination with NDOT and other outside entities on use of pesticides and herbicides. In addition, the following existing or proposed conservation actions are essential to address threats to the peregrine falcon.

*USFS(20) Inventory for populations of rare flora and fauna on an annual basis. Species and area priorities identified to date are as follows: (CA2.1): Raptor inventory - high priority (CA2.1n)**

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

*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)**

NPS(12) Monitor peregrine falcon nest occupancy and production.

Adequacy of Existing Management: Populations of peregrine falcon have increased in North America as the result of implementation of the recovery plan for the species. Continued Federal ESA protection, management activities, maintenance of the extensive acreage of potential habitat available for this species in all conservation management

categories, and implementation of the additional actions outlined above provide adequate conservation for this species.

This species had been found on private (urbanized Las Vegas), state (Overton State Wildlife Management Area), and Federal lands under the management of the following agencies: U.S. Fish and Wildlife Service (Desert National Wildlife Range), Bureau of Land Management (Red Rock Canyon NCA), U.S. Forest Service (Spring Mountains), and NPS (Lake Mead National Recreation Area). Approximately 31% of medium to high potential habitat is on USFS land, 26% is on private, 21% is on USFWS and 19% is on BLM managed land. Because this species makes use of habitat in all of the conservation management categories, potential habitat is available throughout the county, limited primarily by the availability of eyrie sites.

References: Alcorn 1988; Bent 1938; Farrand 1983; USFWS 1995; Herron et al. 1985.

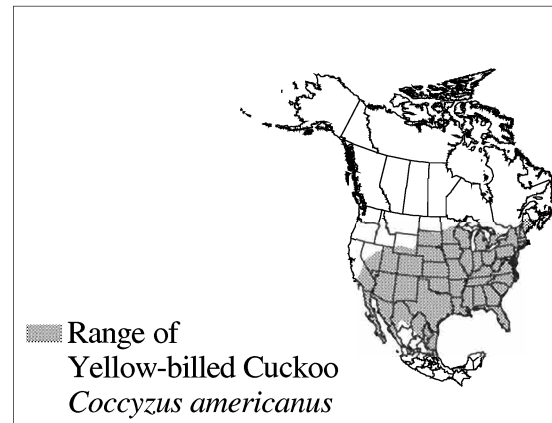
2.1.2 Yellow-billed cuckoo, *Coccyzus americanus*

Status: Nevada National Heritage Program: Global Rank G5T2T3, State Rank S1; Nevada State Protected.

Clark County MSHCP Status: Covered.

Range: This species occurs throughout much of the United States.

Clark County Distribution: Inferred distribution is based upon habitat preferences (Figure 2-2). Potential habitat for this species is found along the Virgin, Muddy, and Colorado River systems; Las Vegas Valley Wash; and Corn Creek. The species has been sighted recently (1995, 1997) along the Virgin River.



Habitat: Yellow-billed cuckoos are associated with desert **riparian** habitat and prefer mature cottonwood/willow associations. Approximately 16,000 acres of lowland riparian habitat are mapped in Clark County, primarily along the Virgin and Muddy Rivers, the Colorado River near the southern tip of the county, and in a number of small localities associated with springs and creeks. This species inhabits densely foliated, deciduous riparian thickets and shrubs usually containing willows but also mesquite close to slow-moving watercourses or seeps. Foraging preferences primarily include grasshoppers, caterpillars, or other large insects and occasionally include frogs and lizards or fruits. Yellow-billed cuckoos require a high-humidity environment for breeding.

Population Trends: This species is a rare resident and transient in Clark County. Yellow-billed cuckoos are thought to be declining in the southwestern states due to extensive loss of riparian habitat (Anderson and Ohmart 1984; Peterson 1990).

Ecosystem Level Threats:

- Reduction or degradation of riparian habitat, including river channelization. **Threat 1301**
- Reduced water availability to support riparian areas. **Threat 1302**
- Livestock grazing around riparian areas, and use of pesticides. **Threat 1304**
- Exotic plant encroachment (tamarisk). **Threat 1501**
- Brown-headed cowbird nest parasitism. **Threat 1502**

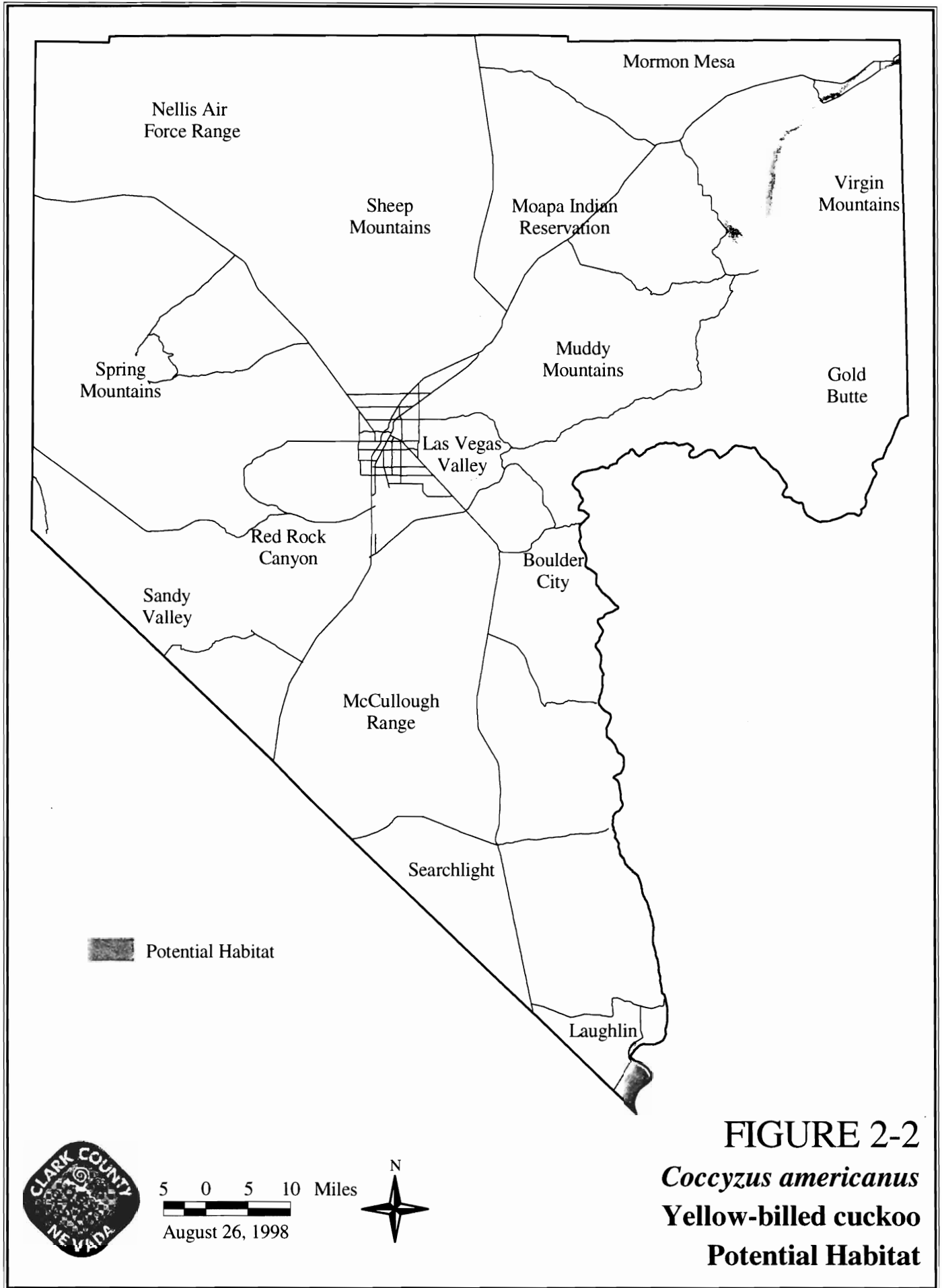


FIGURE 2-2
Coccyzus americanus
 Yellow-billed cuckoo
 Potential Habitat

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapter on lowland riparian), including riparian habitat protection, monitoring, restoration and enhancement, and acquisition from willing sellers. In addition, the following existing or proposed conservation actions are essential to address threats to the yellow-billed cuckoo.

BLM(15) Cooperate with the Nevada Division of Wildlife and Clark County I & M Committee to implement surveys to determine the distribution, abundance, and potential threats, including the effects of casual OHV activity, on the yellow-billed cuckoo, southwestern willow flycatcher, phainopepla, summer tanager, blue grosbeak, and Arizona Bell's vireo.

NPS(8) Develop information on the population distribution of yellow-billed cuckoo, summer tanager, blue grosbeak, and Arizona Bell's vireo, in the study area. Surveys are needed in the spring to document breeding and nesting activity in southern Nevada. Protect existing riparian habitat.

Adequacy of Existing Management: Implementation of conservation actions outlined above, protection of habitat for the southwestern willow flycatcher, and the provisions of Section 404 of the Clean Water Act with respect to wetlands protection will provide adequate conservation for the yellow-billed cuckoo.

Approximately 31% of the high potential habitat for this species occurs in MUMA on BLM lands, 23% occurs in UMA on Native American lands (Fort Mojave Indian Reservation) and 18% occurs in UMA on private lands. Approximately 7% is in LIMA (Overton State Wildlife Management Area) and 21% is in IMA (NPS, Lake Mead National Recreation Area, Virgin River National Recreation Lands). Based on the GIS analysis, approximately 19% is within the mapped boundary of water along the Colorado River and in the Overton Arm of Lake Mead.

References: Alcorn 1988; Andersen and Ohmart 1984; Bent 1940; Grinnell and Miller 1944; Gaines 1974, 1977; Garrett and Dunn 1981; Laymon and Halterman 1987; Peterson 1990; Zeiner et al. 1990; Biowest 1996.

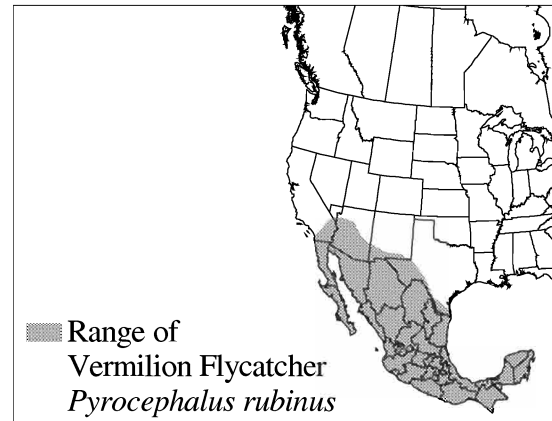
2.1.3 Vermilion flycatcher, *Pyrocephalus rubinus*

Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern deserts into Mexico.

Clark County Distribution: Rare yearlong resident along the Colorado River, Virgin River system, and desert oases. Winter resident in desert scrub, permanent resident in riparian areas (Austin 1971). Figure 2-3 shows distribution.



Habitat: Inhabits **desert riparian** areas consisting of cottonwoods and willows. Approximately 16,900 acres of lowland riparian habitat are identified in Clark County. May also be found in **mesquite/catclaw** habitats adjacent to mesic areas including irrigated fields, ditches, and pastures. Feeds on flying insects, especially bees, frequently near the water's surface.

Population Trends: Declining sharply along the lower Colorado River due to loss of habitat.

Ecosystem Level Threats:

- Reduction or degradation of riparian habitat, including river channelization. **Threat 1301**
- Reduced water availability to support riparian areas. **Threat 1302**
- Livestock grazing around riparian areas, and use of pesticides. **Threat 1304**
- Exotic plant encroachment (tamarisk). **Threat 1501**
- Brown-headed cowbird nest parasitism. **Threat 1502**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on lowland riparian habitat and mesquite/catclaw), including riparian and mesquite habitat protection, monitoring, restoration and enhancement, and acquisition from willing sellers.

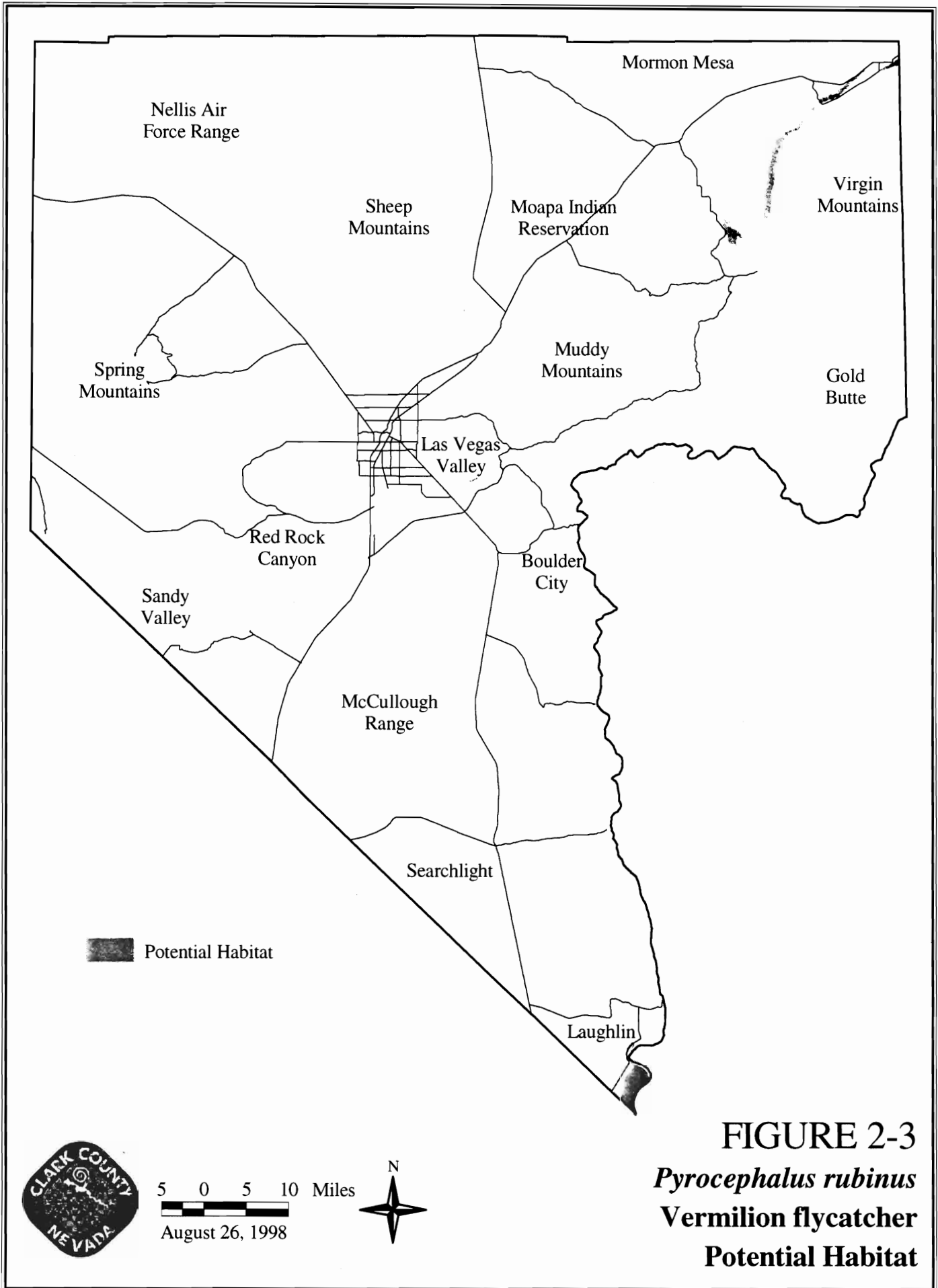


FIGURE 2-3
Pyrocephalus rubinus
 Vermilion flycatcher
 Potential Habitat

Adequacy of Existing Management: Implementation of conservation actions outlined above, protection of habitat for the southwestern willow flycatcher, and the provisions of Section 404 of the Clean Water Act with respect to wetlands protection will provide adequate conservation for the vermilion flycatcher.

Approximately 31% of the potential habitat for this species occurs in MUMA on BLM lands, 23% occurs in UMA on Native American lands (Fort Mojave Indian Reservation), and 18% occurs in UMA on private lands. Approximately 7% is in LIMA (Overton State Wildlife Management Area) and 21% is in IMA (NPS, Lake Mead National Recreation Area, Virgin River National Recreation Lands). Based on the GIS analysis, approximately 19% is within the mapped boundary of water along the Colorado River and in the Overton Arm of Lake Mead.

References: Austin 1971; Grinnell and Miller 1944; Gaines 1977; Remsen 1978; Garrett and Dunn 1981; Zeiner et al. 1990.

2.1.4 Southwestern willow flycatcher, *Empidonax traillii extimus*

Status: USFWS Endangered, BLM Nevada Special Species, USFS Endangered, Nevada National Heritage Program Global Rank G5T2 and State Rank S1, Nevada State Protected.

Clark County MSHCP Status: Covered.

Range: Southern Nevada, southern California, Arizona, New Mexico, southern Utah, western Texas, northwestern Mexico, and possibly southwestern Colorado. Critical habitat designations for the southwestern willow flycatcher include riparian areas in southern California, Arizona, and New Mexico.

Clark County Distribution: The southwestern willow flycatcher was observed along the Virgin River in 1997. None of the currently proposed critical habitat is in Nevada. Clark County's known habitat includes the Virgin River. Other riverine areas with potential habitat include Meadow Valley Wash, the Muddy River, Las Vegas Wash, and the Colorado River system (Figure 2-4).

Habitat: Southwestern willow flycatchers are restricted to **desert riparian** habitats along rivers, streams, or other wetlands. Approximately 16,900 acres of desert riparian woodland are mapped in Clark County, although much of this is actually non-native tamarisk. This species prefers areas where growths of willows, *Baccharis*, tamarisk, or other riparian vegetation are present, and sometimes is found in areas with a scattered overstory of cottonwood. Habitat occurs along the Virgin and Muddy Rivers, and there is potentially suitable habitat along the Las Vegas Wash.

Population Trends: At least a dozen territories were identified on the Virgin River in Nevada as of 1997 (NDOW, Biowest). Historically, the species has been documented in Clark County at Indian Spring, Colorado River (at the southern tip of the state), and Corn Creek. It is a summer resident in riparian areas and a transient in woodland and montane forest areas. Because of population declines throughout its range, it was listed as endangered on February 27, 1995.

Ecosystem Level Threats:

- The habitat rarity and small, isolated populations of southwestern willow flycatcher make remaining birds susceptible to local extirpation through stochastic events.
Threat 101
- Reduction or degradation of riparian habitat, particularly cottonwood-willow riparian habitats, including river channelization. **Threat 1301**

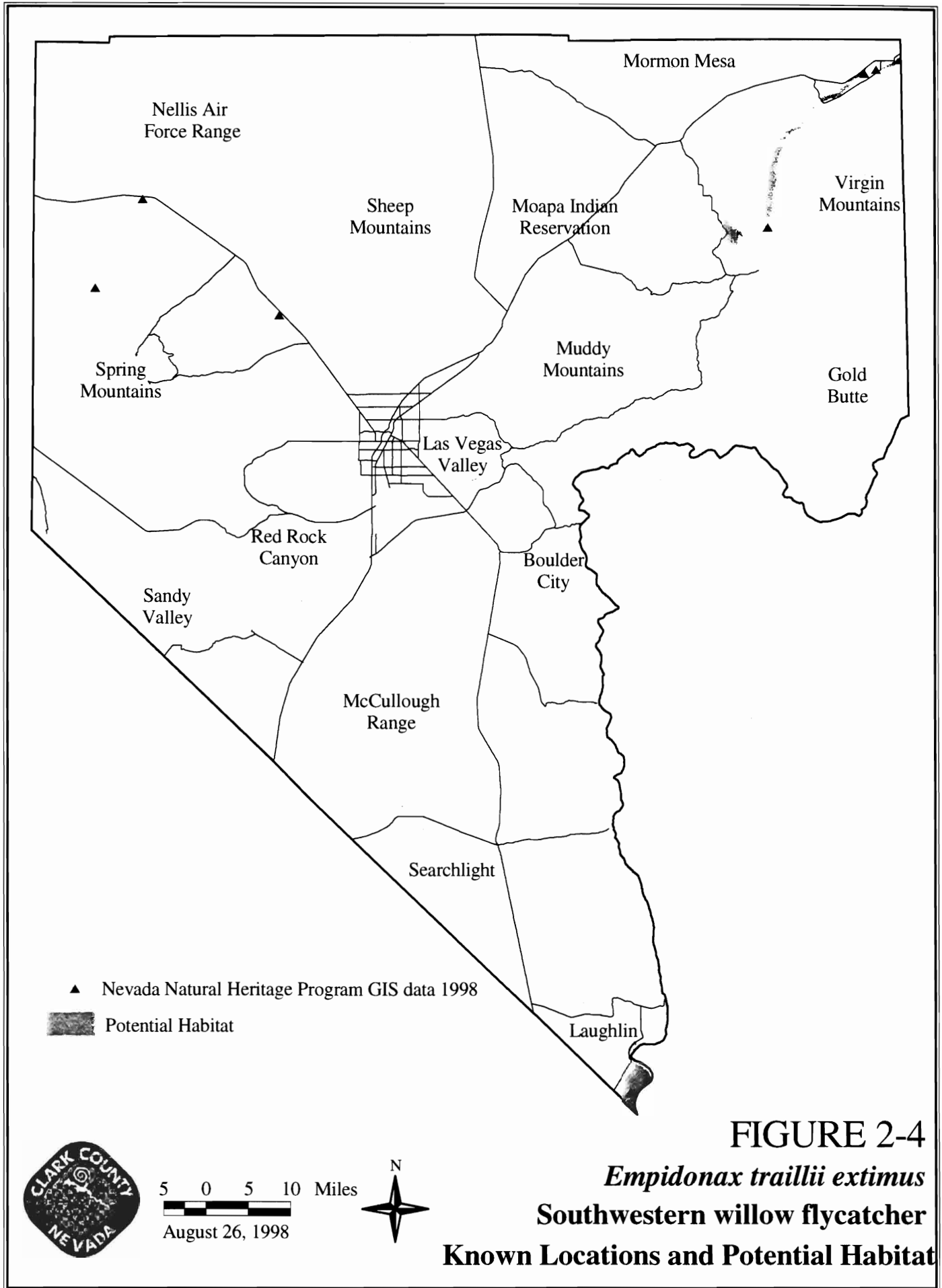


FIGURE 2-4

Empidonax traillii extimus

Southwestern willow flycatcher

Known Locations and Potential Habitat

- Reduced water availability to support riparian areas. **Threat 1302**
- Livestock grazing around riparian areas, and use of pesticides. **Threat 1304**
- Exotic plant encroachment (tamarisk). **Threat 1501**
- Brown-headed cowbird nest parasitism. **Threat 1502**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapter on desert riparian habitat), including riparian habitat protection, monitoring, restoration and enhancement, and acquisition from willing sellers. In addition, the following existing or proposed conservation actions are essential to address threats to southwestern willow flycatchers.

BLM(15) Cooperate with the Nevada Division of Wildlife and Clark County I & M Committee to implement surveys to determine the distribution, abundance, and potential threats, including the effects of casual OHV activity, on the southwestern willow flycatcher, phainopepla, summer tanager, Arizona Bell's vireo, yellow-billed cuckoo, and blue grosbeak.

USACE(1) Habitat used by this species is normally within the floodplain of larger streams and rivers and as such may be under the jurisdiction of the U.S. Army Corps of Engineers (USACE) under the terms of Section 404 of the Clean Water Act. The USACE reviews proposed actions on non-Federal lands within 404 jurisdiction and may require permits under the authority of Section 404. As part of the review process, the USACE must consult with the USFWS if any proposed action may affect a listed species, such as the willow flycatcher. All proposed actions which may affect the willow flycatcher on Federal lands will require Section 7 consultation with the USFWS. Section 7 consultation provides for avoidance, minimization, or mitigation of any impacts to listed or candidate species.

Adequacy of Existing Management: Implementation of conservation actions outlined above and the provisions of Section 404 of the Clean Water Act with respect to wetlands protection will provide adequate conservation for the southwestern willow flycatcher. The AMP will address the protection, enhancement, and restoration of potential habitat for this and other riparian-dependent species on non-Federal lands, in conjunction with recovery efforts and watershed-based planning for the Muddy and Virgin Rivers and the Las Vegas Wash. These efforts should include:

- Development of conservation agreements with willing private and public landowners to implement appropriate management activities in potential willow flycatcher habitat on the Virgin and Muddy Rivers.

- Coordination with MRREIAC or similar efforts in tamarisk control and possible conservation easements with willing private and public landowners to allow mutually beneficial habitat management activities.

Potential habitat for this species occurs in UMA on private (18%) and Native American lands (23%) (Fort Mojave Indian Reservation) and in MUMA on BLM lands (31%). Approximately 7% is in LIMA (Overton State Wildlife Management Area) and 21% is in IMA (NPS, Lake Mead National Recreation Area, Virgin River National Recreation Lands). Based on the GIS analysis, approximately 19% is within the mapped boundary of water along the Colorado River and in the Overton Arm of Lake Mead.

The only habitat known to be occupied by this species on private lands is near Mesquite on the Virgin River. Discussions are currently under way between the County, BLM, and the property owner of this site, with the goal of willing acquisition or exchange.

References: Alcorn 1988; Farrand 1983; Southern Nevada Water Authority 1995; Southwest Wetlands Consortium 1998; Steve W. Carothers & Associates, Inc., 1999, 2000; USFWS 1993, 1995, 1997; NDOW 1995.

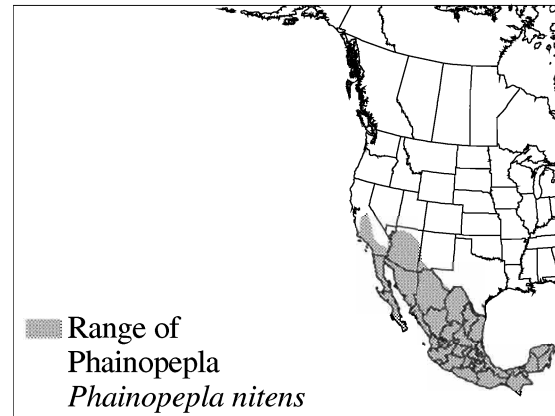
2.1.5 Phainopepla, *Phainopepla nitens*

Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern desert endemic.

Clark County Distribution: Resident in southern part of the state, limited to the Mojave desert region (Figure 2-5). The NDOW and Red Rock Audubon databases include records of 96 observations of phainopepla in Clark County from 1969-1997; NPS database for the Lake Mead NRA includes 34 observations from 1936-1985.



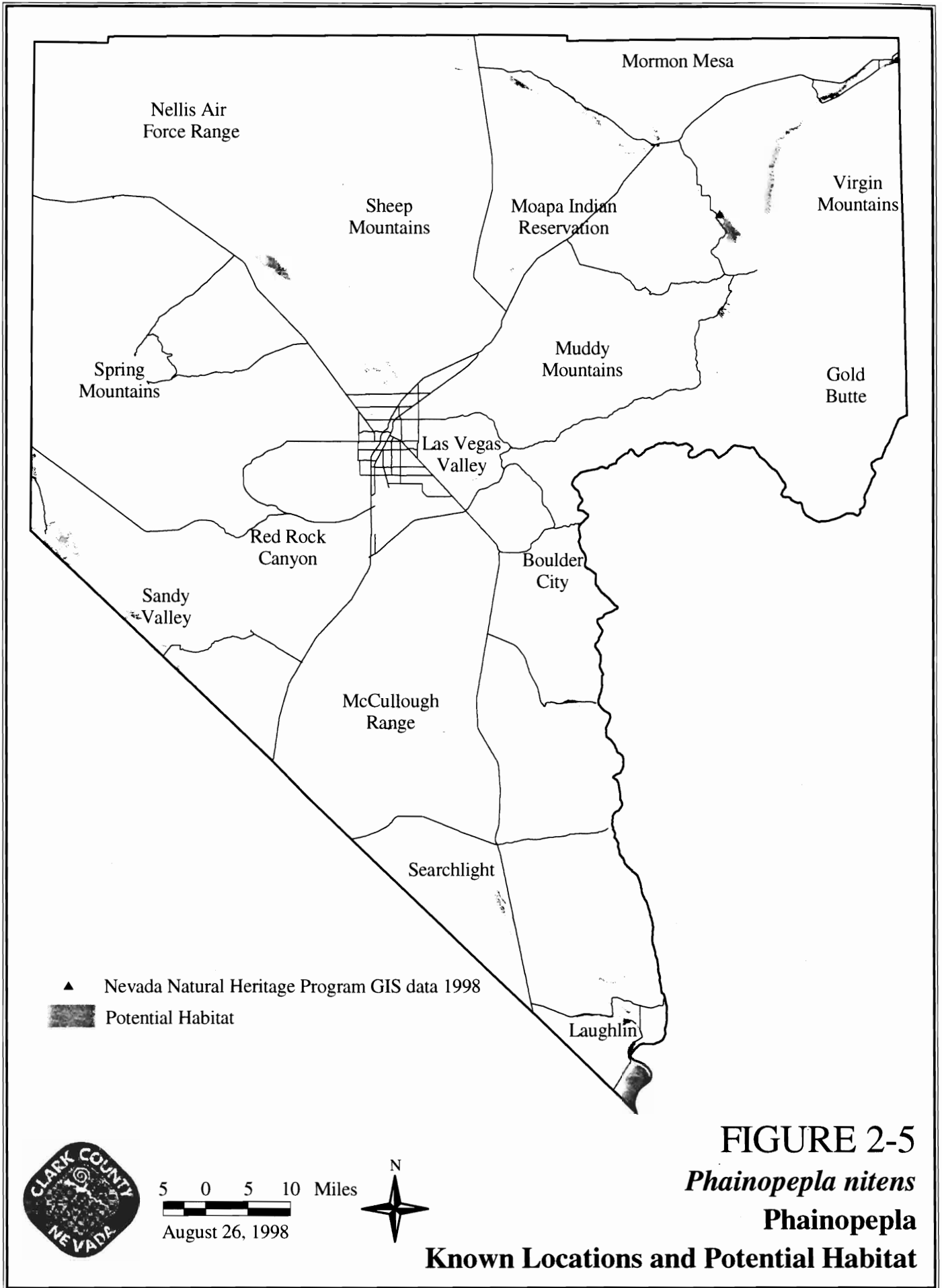
Habitat: Phainopepla are found in **lowland riparian** and **mesquite/catclaw** habitats, also in agriculture fields. In deserts they are found primarily in washes, riparian areas, and other habitats that support brushy growth of mesquite, catclaw, ironwood, and palo verde. They feed heavily on mistletoe berries and are often found concentrated around mistletoe clumps.

They also eat berries of buckthorn, juniper, wolfberry, and elder. During the breeding season the birds become insectivores, feeding on caterpillars, flies, and beetles.

Population Trends: Clark County populations are near edge of range. It is suspected that the phainopepla is declining within its range. Populations are subject to relatively large-scale fluctuations dependent upon drought cycles. Highly dependent upon the distribution of mistletoe in mesquite and catclaw associations. Observations of phainopepla have declined in the Las Vegas Valley.

Ecosystem Level Threats:

- Loss of habitat due to dispersed recreation activity **Threats 401**
- Loss of habitat due to OHV activity **Threats 403** and operation of gravel pits **Threat 902**
- Increases in fires caused by human activities **Threat 301**, resulting in replacement of mesquite and acacia by tamarisk **Threat 1501**
- Loss of mesquite habitat due to legal and illegal harvest of mesquite for firewood. **Threats 1001, 1701**



- Direct loss of habitat in the Las Vegas Valley due to increasing urbanization. **Threat 1101**
- Loss of streamside habitats due to diversion of water for agricultural purposes and pumping groundwater. **Threat 1302**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: In addition to general and ecosystem level conservation actions identified in Appendix A (see chapters on lowland riparian habitat and mesquite/catclaw), including riparian and mesquite habitat protection, monitoring, restoration and enhancement, and acquisition from willing sellers. In addition, the following existing or proposed conservation actions are essential to address threats to phainopepla.

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).

BLM(15) Cooperate with the Nevada Division of Wildlife and Clark County I & M Committee to implement surveys to determine the distribution, abundance, and potential threats, including the effects of casual OHV activity, on the southwestern willow flycatcher, phainopepla, summer tanager, Arizona Bell's vireo, yellow-billed cuckoo, and blue grosbeak.

NPS(17) Develop and implement long-term population surveys to assess the trend of southwestern willow flycatcher and phainopepla populations and to develop population goals.

Adequacy of Existing Management: Approximately 62% of the mapped potential habitat for this species is in IMAs and another 17% in LIMAs. Phainopepla populations that need specific management are (1) Piute Wash, Newberry Mountains, Hiko Wash; (2) Moapa, Muddy River, Meadow Valley Wash confluence; (3) Corn Creek; and (4) Sandy Valley, Pahrump. Implementation of the measures outlined above will provide adequate protection for phainopepla populations in Clark County. The development of the AMP should include:

- Long-term surveys to assess population trends, document breeding and nesting activity in southern Nevada in the spring, and to assess occurrence in southern Nevada during the summer months. This should include mid-elevation riparian areas in the Spring Mountains and Red Rock.
- Investigate the potential to acquire and protect stands of mesquite and catclaw in Lincoln and Nye Counties as mitigation for habitat loss in Clark County.

Desert wash (mesquite) habitat is primarily under management of the BLM. Lowland riparian managed by BLM, NPS (Lake Mead National Recreation Area), and Fort Mojave Indian Reservation.

References: Alcorn 1988; Bent 1950; Farrand 1983; NDOW 1993, 1995; Terres 1982; Jones 1990.

2.1.6 Summer tanager, *Piranga rubra*

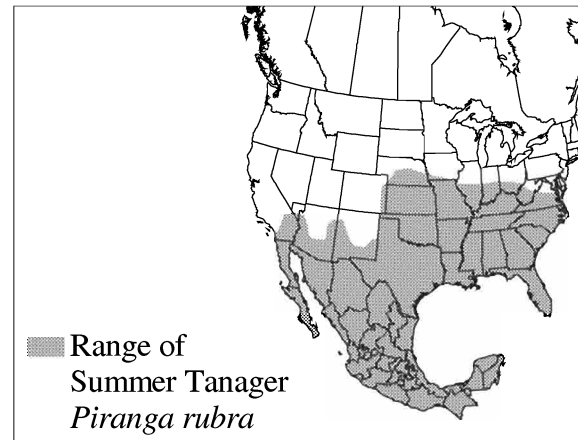
Status: None.

Clark County MSHCP Status: Covered.

Range: Throughout the southwestern deserts into Mexico.

Clark County Distribution: Inferred distribution based upon habitat preferences (Figure 2-6).

Habitat: Summer tanagers are found in **desert riparian** habitat, particularly mature desert riparian habitat favoring cottonwood-willow associations along streams. Feeds on insects, cicadas, spiders, bees, wasps, and small fruits.



Population Trends: An uncommon summer resident at edge of its range (April to October) in riparian areas of Clark County; observed at Pine Creek, Corn Creek, Las Vegas Wash, and Blue Diamond.

Ecosystem Level Threats:

- Reduction or degradation of riparian habitat, including river channelization. **Threat 1301**
- Reduced water availability to support riparian areas. **Threat 1302**
- Livestock grazing around riparian areas, and use of pesticides. **Threat 1304**
- Exotic plant encroachment (tamarisk). **Threat 1501**
- Brown-headed cowbird nest parasitism. **Threat 1502**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapter on desert riparian habitat), including riparian habitat protection, monitoring, restoration and enhancement, and acquisition from willing sellers. In addition, the following existing or proposed conservation actions are essential to address threats to summer tanagers.

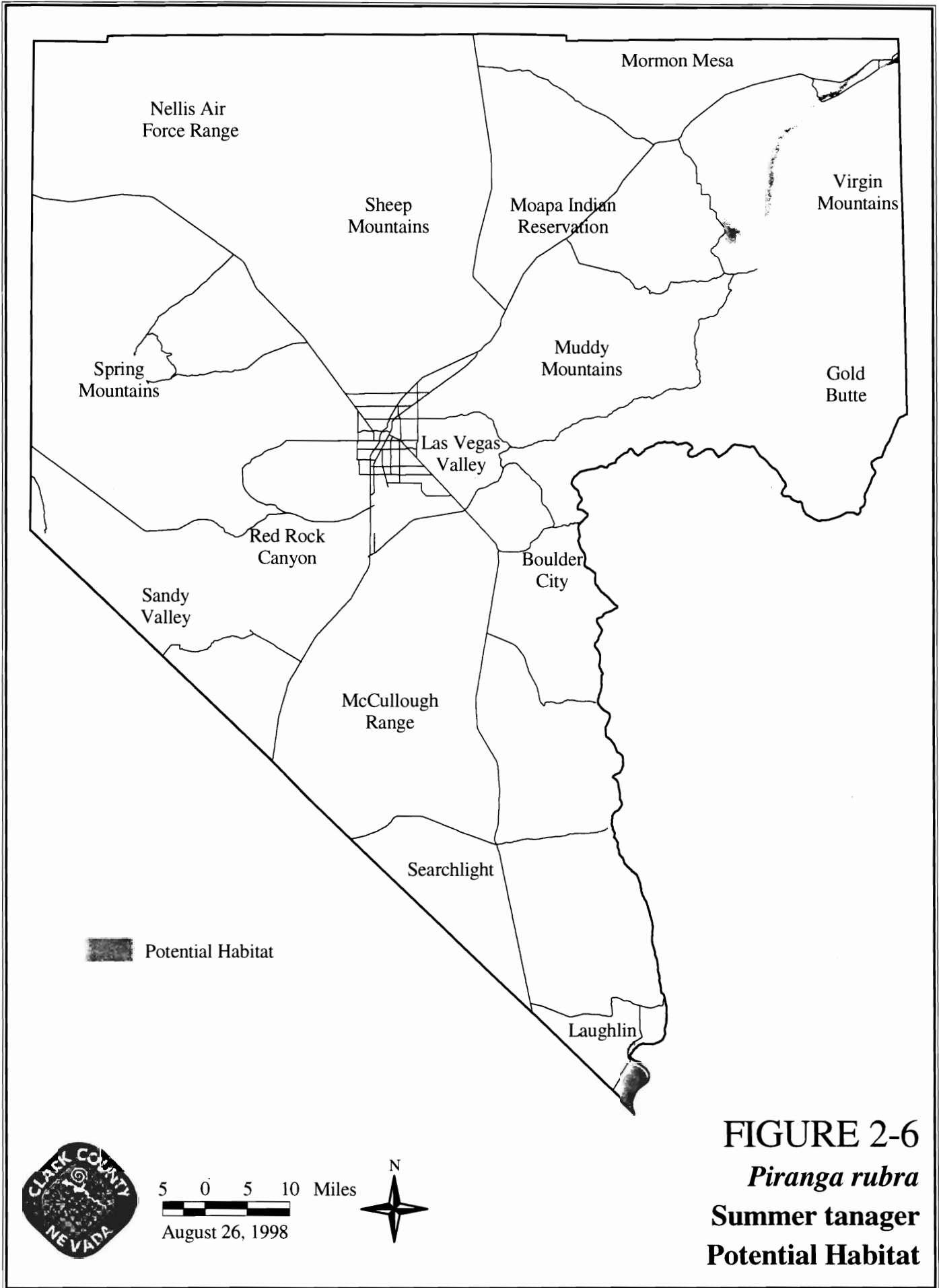


FIGURE 2-6
Piranga rubra
Summer tanager
Potential Habitat

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).

BLM(15) Cooperate with the Nevada Division of Wildlife and Clark County I & M Committee to implement surveys to determine the distribution, abundance, and potential threats, including the effects of casual OHV activity, on the southwestern willow flycatcher, phainopepla, summer tanager, Arizona Bell's vireo, yellow-billed cuckoo, and blue grosbeak.

Adequacy of Existing Management: Implementation of conservation actions outlined above, protection of habitat for the southwestern willow flycatcher, and the provisions of Section 404 of the Clean Water Act with respect to wetlands protection will provide adequate conservation for the summer tanager.

Almost half (46%) of the medium to high potential habitat for this species occurs on lands managed by the BLM. Approximately 22% occurs on private, 13% on NPS, 9% on Native American lands, 6% on USFWS, and 3% on State lands. The potential habitat for this species overlaps the distribution of the riparian-dependent species and the phainopepla.

References: Austin and Bradley 1971; Grinnell and Miller 1944; Bent 1958; Remsen 1978; McKaskie et al. 1979; Garrett and Dunn 1981; Zeiner et al. 1990.

2.1.7 Blue grosbeak, *Guiraca caerulea*

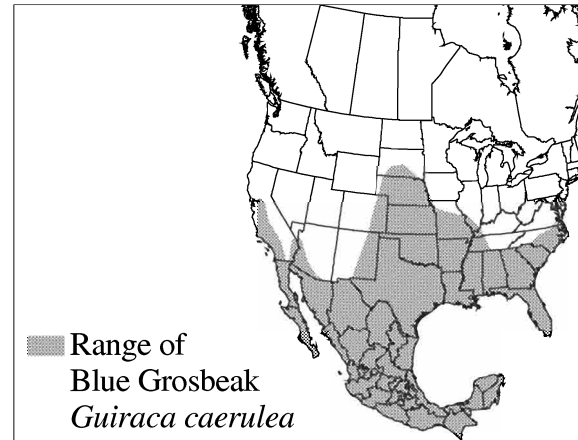
Status: None.

Clark County MSHCP Status: Covered.

Range: Southern U.S. into Mexico.

Clark County Distribution: Inferred distribution based upon habitat preferences (Figure 2-7). Potential habitat for this species is found along the Virgin, Muddy, and Colorado River systems and Las Vegas Valley Wash.

Habitat: Blue grosbeak reside in **desert riparian** and **grassland habitats** and **agricultural** and **urban** areas. They are primarily found in riparian habitat, such as thickets of willow, young cottonwood, arrowweed, tamarisk along watercourses or oases and forage in adjacent openings, grasslands, and croplands. Their diet consists of large insects (grasshoppers, cicadas, and beetles) but also snails, seeds, grains, and fruits.



Population Trends: Summer resident in riparian areas (April to September). Probably declining in southern Nevada due to loss of riparian habitat.

Ecosystem Level Threats:

- Reduction or degradation of riparian habitat, including river channelization. **Threat 1301**
- Reduced water availability to support riparian areas. **Threat 1302**
- Livestock grazing around riparian areas, and use of pesticides. **Threat 1304**
- Exotic plant encroachment (tamarisk). **Threat 1501**
- Brown-headed cowbird nest parasitism. **Threat 1502**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapter on desert riparian habitat), including riparian habitat protection, monitoring, restoration and enhancement, and acquisition from willing sellers. In addition, the following existing or proposed conservation actions are essential to address threats to blue grosbeak.

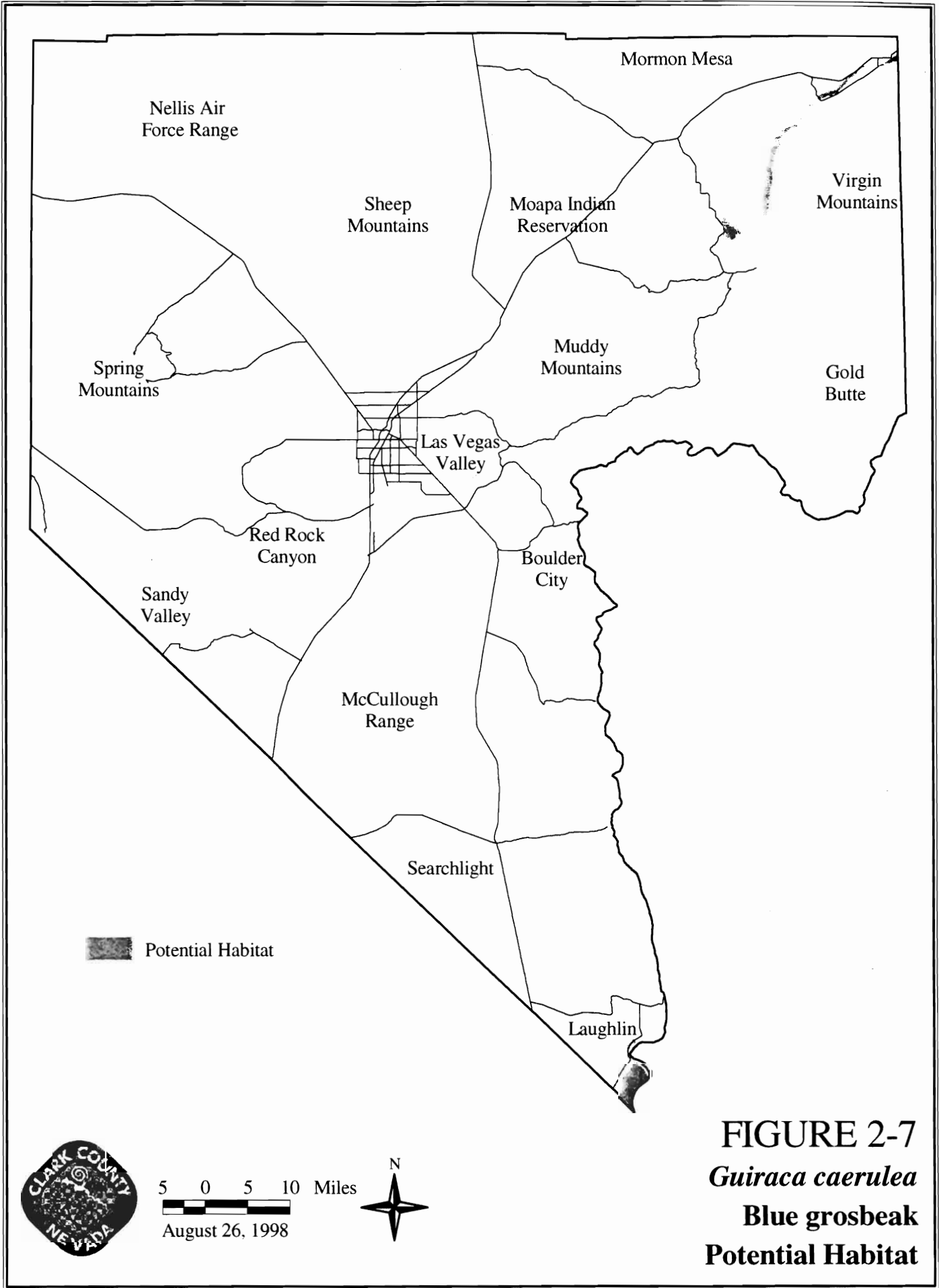


FIGURE 2-7
Guiraca caerulea
 Blue grosbeak
 Potential Habitat

BLM(15) Cooperate with the Nevada Division of Wildlife and Clark County I & M Committee to implement surveys to determine the distribution, abundance, and potential threats, including the effects of casual OHV activity, on the southwestern willow flycatcher, phainopepla, summer tanager, Arizona Bell's vireo, yellow-billed cuckoo, and blue grosbeak.

NPS(8) Develop information on the population distribution of summer tanager, Arizona Bell's vireo, yellow-billed cuckoo, and blue grosbeak in the study area. Surveys are needed in the spring to document breeding and nesting activity in southern Nevada. Protect existing riparian habitat.

Adequacy of Existing Management: Implementation of conservation actions outlined above, protection of habitat for the southwestern willow flycatcher, and the provisions of Section 404 of the Clean Water Act with respect to wetlands protection will provide adequate conservation for the blue grosbeak.

Approximately 41% of high potential habitat for this species occurs on lands managed by the BLM, 34% on private lands, and the remaining on state lands (Overton State Wildlife Management Area), Native American lands (Fort Mojave Indian Reservation), NPS (Lake Mead National Recreation Area), USFS lands, and USFWS managed lands.

References: Austin and Bradley 1971; Andersen and Ohmart 1984; Grinnell and Miller 1944; McCaskie et al. 1979; Garrett and Dunn 1981; Ehrlich et al. 1988; Zeiner et al. 1990.

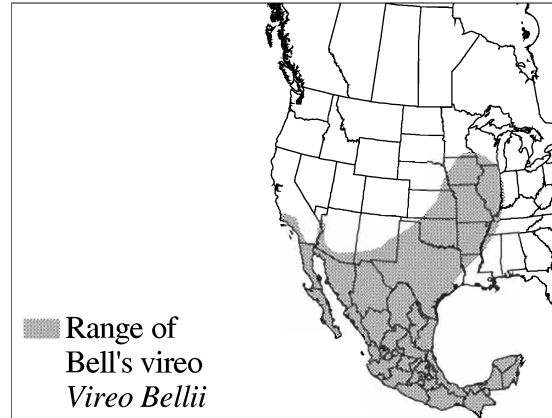
2.1.8 Arizona Bell's vireo, *Vireo bellii arizonae*

Status: None.

Clark County MSHCP Status: Covered.

Range: Bell's vireo occur throughout central and southwestern U.S. into Mexico. The Arizona subspecies occurs along the Colorado River and in riparian and mesic habitats in southern Arizona and northern Mexico.

Clark County Distribution: Locally rare and declining summer resident along Colorado River, Virgin and Muddy Rivers, and isolated springs in southern Nevada (Figure 2-8).



Habitat: Inhabits **desert riparian** communities, of which approximately 16,900 are mapped in Clark County. Requires low, dense riparian areas along water or intermittent streams; typically with willow, cottonwood, *Baccharis*, wild blackberry, tamarisk, or mesquite. Nests in thickets of willows or other low shrubs. Primarily feeds on insects and some fruits.

Population Trends: Unknown.

Ecosystem Level Threats:

- Reduction or degradation of riparian habitat, including river channelization. **Threat 1301**
- Reduced water availability to support riparian areas. **Threat 1302**
- Livestock grazing around riparian areas, and use of pesticides. **Threat 1304**
- Exotic plant encroachment (tamarisk). **Threat 1501**
- Brown-headed cowbird nest parasitism. **Threat 1502**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapter on desert riparian habitat), including riparian habitat protection, monitoring, restoration and enhancement, and

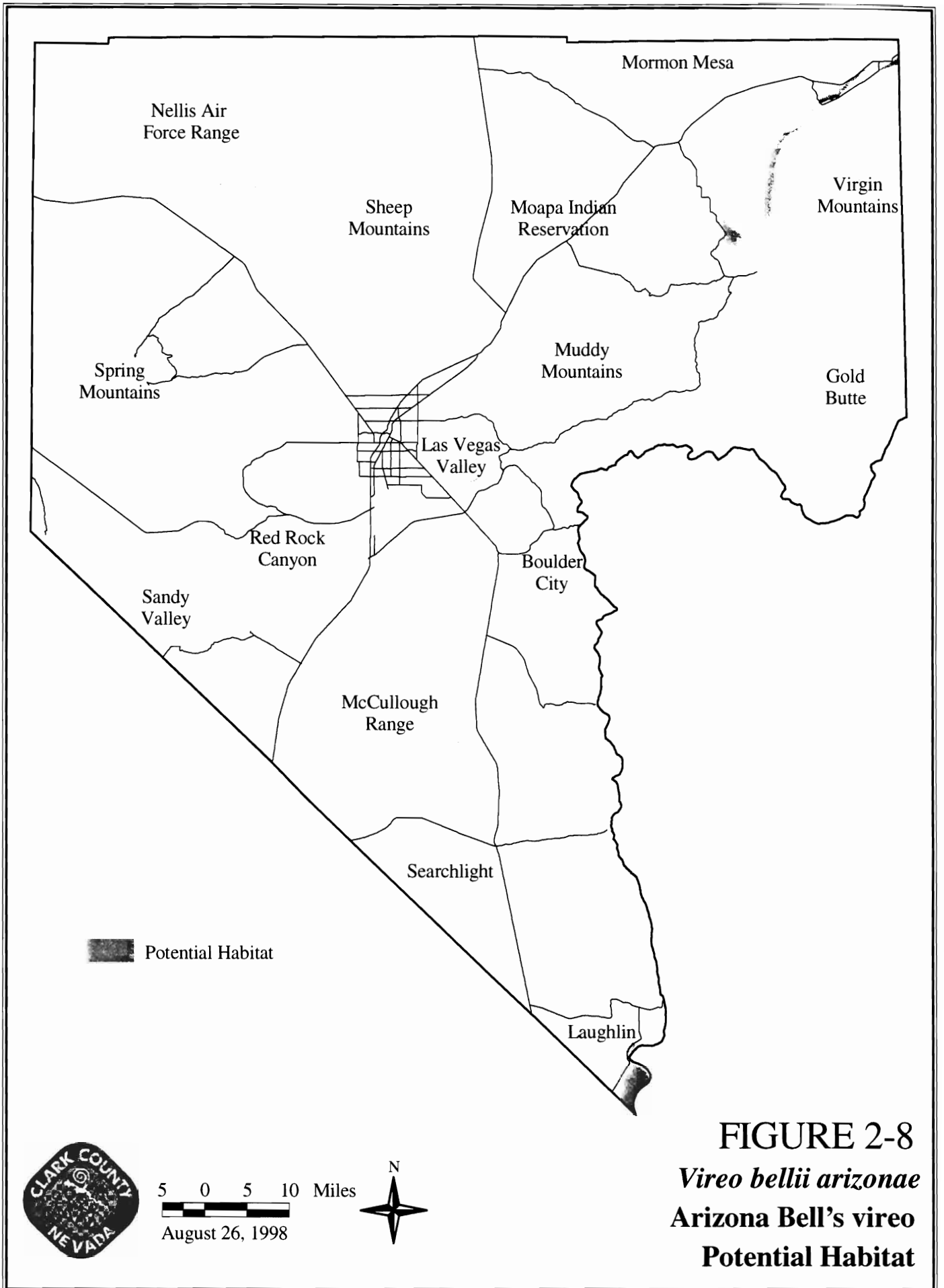


FIGURE 2-8
Vireo bellii arizonae
 Arizona Bell's vireo
Potential Habitat

acquisition from willing sellers. In addition, the following existing or proposed conservation actions are essential to address threats to Arizona Bell's vireo.

BLM(15) Cooperate with the Nevada Division of Wildlife and Clark County I & M Committee to implement surveys to determine the distribution, abundance, and potential threats, including the effects of casual OHV activity, on the southwestern willow flycatcher, phainopepla, summer tanager, Arizona Bell's vireo, yellow-billed cuckoo, and blue grosbeak.

NPS(8) Develop information on the population distribution of summer tanager, Arizona Bell's vireo, yellow-billed cuckoo, and blue grosbeak in the study area. Surveys are needed in the spring to document breeding and nesting activity in southern Nevada. Protect existing riparian habitat.

Adequacy of Existing Management: Implementation of conservation actions outlined above, protection of habitat for the southwestern willow flycatcher, and the provisions of Section 404 of the Clean Water Act with respect to wetlands protection will provide adequate conservation for the Arizona's Bell's vireo.

Potential habitat for this species occurs under private, state (Overton State Wildlife Management Area), and Federal management (NPS, Lake Mead National Recreation Area, and BLM, Virgin River National Recreation Lands).

References: Grinnell and Miller 1944; Bent 1950; Cink 1977; Remsen 1978; Goldwasser et al. 1980; Garrett and Dunn 1981; Zeiner 1990.

2.2 Evaluation Bird Species

High Priority

- Western burrowing owl, *Athene cunicularia hypugea*

Medium Priority

- Bendire's thrasher, *Toxostoma bendirei*
- LeConte's thrasher, *Toxostoma lecontei*
- Gray vireo, *Vireo vicinior*

Low Priority

- Loggerhead shrike, *Lanius ludovicianus*
- Crissal thrasher, *Toxostoma dorsale*
- Western bluebird, *Sialia mexicana*

2.2.1 Western burrowing owl, *Athene cunicularia hypugea*

Status: None.

Clark County MSHCP Status: Evaluation - high priority.

Range: Nevada: Occurring throughout state, western and midwestern U.S., Central and South America; scattered at low elevations (Figure 2-9).

Clark County Distribution: Throughout the county in the Mojave Desert and lower elevations of the Great Basin units in appropriate habitat.

Habitat: Yearlong resident in open, dry, **grassland** and **Mojave desert scrub, sagebrush/perennial grassland**, and open shrub stages of **pinyon-juniper** and **mixed conifer** habitats. The diet of these birds is varied and includes large insects, reptiles, amphibians, and small rodents.

Population Trends: Western U.S. and Florida south into Central America. Populations have been identified as declining in the eastern U.S. and increasing in the western U.S., except in urbanizing areas. Status in Clark County not known at this time, although anecdotally fewer sightings noted in past decade.

Ecosystem Level Threats:

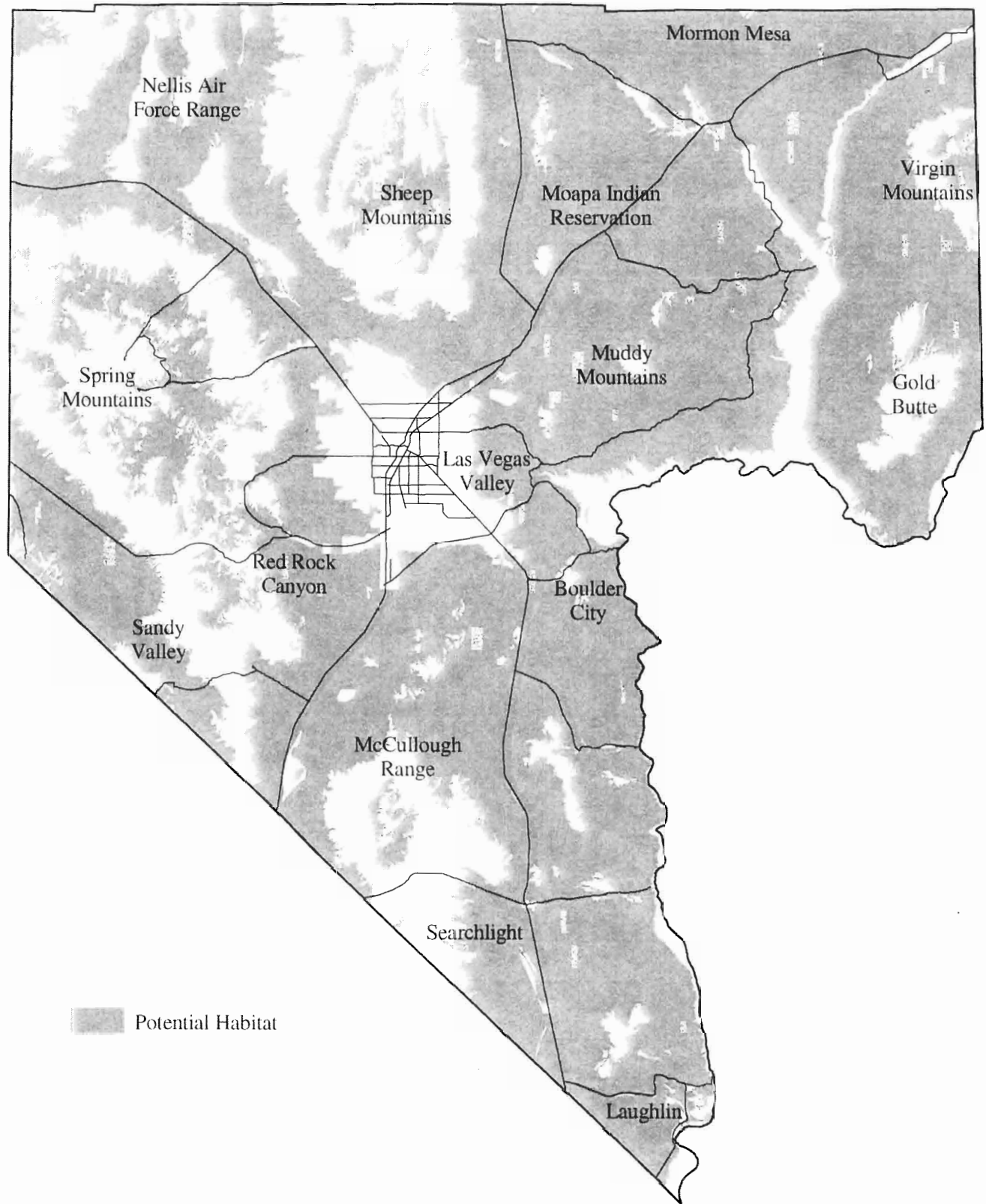
- Loss of habitat, particularly in the Las Vegas Valley due to land development. **Threat 1101**
- Poisoning of prey species **Threat 601** and highway mortality **Threat 501** have likely contributed to population declines in the county.

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on Mojave desert scrub, sagebrush, pinyon-juniper and mixed conifer. Approximately 20% of its range in Clark County is Federal lands with restrictive management plans. Over half (57%) of the medium to high potential habitat is on lands managed by the BLM.

Additional Conservation Needs:

- Conservation needs of this species cannot be adequately defined until a better understanding of the species distribution and population trends is developed. To



5 0 5 10 Miles
 August 26, 1998



FIGURE 2-9
Speotyto cunicularia hypugea
 Western burrowing owl
 Potential Habitat

change the status of the burrowing owl to a Covered Species will require an assessment of the current distribution and population status of the species; an evaluation of the area necessary to maintain a minimum viable population of the species in the county; and assurances that this area is managed appropriately to deal with identified threats.

- This species' distribution overlaps the DWMA's being managed for desert tortoise; conservation of the owl might be adequately dealt with by the management in these areas, although this is uncertain given the lack of population trend and distribution data for the species.
- The County could develop a permitted relocation program under the Migratory Bird Treaty Act and ESA, including the identification for host sites for translocation.

References: Robertson 1929; Bent 1938; Grinnell and Miller 1944; Herron et al. 1985; Coulombe 1971; Thomsen 1971; Martin 1973; Zarn 1974; Remsen 1978.

2.3 Watch List Bird Species

- Green-backed heron, *Butorides striatus*
- Western least bittern, *Ixobrychus exilis hesperis*
- White-faced ibis, *Plegadis chihi*
- Yuma clapper rail, *Rallus longirostris yumanensis*
- Northern goshawk, *Accipiter gentilis*
- Ferruginous hawk, *Buteo regalis*
- Golden eagle, *Aquila chrysaetos*
- Bald eagle, *Haliaeetus leucocephalus*
- Flammulated owl, *Otus flammeolus*
- Northern saw-whet owl, *Aegolius acadicus*
- Northern pygmy-owl, *Glaucidium gnoma*
- Western screech-owl, *Otus kennicotti*
- Cactus wren, *Campylorhynchus brunneicapillus*
- Canyon wren, *Cathartes mexicanus*
- Scott's oriole, *Icterus parisorum*

3.0 Reptiles and Amphibians

The MSHCP includes a total of 29 species of reptiles and amphibians:

Covered	16
High Priority Evaluation	4
Medium Priority Evaluation	4
Low Priority Evaluation	1
Watch List	4

3.1 Covered Reptile and Amphibian Species

- Desert tortoise, *Gopherus agassizii*
- Banded gecko, *Coleonyx variegatus*
- Desert iguana, *Dipsosaurus dorsalis*
- Western chuckwalla, *Sauromalus obesus obesus*
- Great Basin collared lizard, *Crotaphytus insularis bicinctores*
- Large-spotted leopard lizard, *Gambelia wislizenii wislizenii*
- Western red-tailed skink, *Eumeces gilberti rubricaudatus*
- Western leaf-nosed snake, *Phyllorhynchus decurtatus*
- Glossy snake, *Arizona elegans*
- California (common) kingsnake, *Lampropeltis getulus californiae*
- Western long-nosed snake, *Rhinocheilus lecontei lecontei*
- Sonoran lyre snake, *Trimorphodon biscutatus lambda*
- Speckled rattlesnake, *Crotalus mitchelli*
- Sidewinder, *Crotalus cerastes*
- Mojave green rattlesnake, *Crotalus scutulatus scutulatus*
- Relict leopard frog, *Rana onca*

The potential impacts, management, rationale for coverage, and measurable biological goals for each of the reptile species proposed for coverage in the MSHCP are summarized in Table 3-1.

TABLE 3-1
COVERED SPECIES CONSERVATION EVALUATIONS

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Desert tortoise <i>Gopherus agassizii</i> Federal Threatened	56% of potential habitat	33% of potential habitat	11% of potential habitat	BLM RMP NPS GMP USFWS (DNNWR)	Mojave desert endemic. 90% of potential habitat in Clark Co in IMAs, LIMAs (>2 million ac), or MUMAs (>1.4 million ac).	<ul style="list-style-type: none"> • Implementation of the DCP goals in IMAs, LIMAs, & MUMAs • Maintain stable or increasing population numbers
Banded gecko <i>Coleonyx variegatus</i>	56% of potential habitat; 37% of cited locations	33% of potential habitat; 53% of cited locations	11% of potential habitat; 11% of cited locations	BLM RMP NPS GMP USFWS (DNNWR)	Southwestern desert endemic. 90% of potential habitat in Clark Co (>3.6 million ac) and cited locations in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> • No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs • Maintain stable or increasing population numbers
Desert iguana <i>Dipsosaurus dorsalis</i>	55% of potential habitat; 28% of cited locations	32% of potential habitat; 44% of cited locations	13% of potential habitat; 28% of cited locations	BLM RMP NPS GMP USFWS (DNNWR)	Southwestern desert endemic. 87% of potential habitat in Clark Co (>3 million ac) in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> • No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs • Maintain stable or increasing population numbers
Western chuckwalla <i>Sauromalus obesus</i>	57% of potential habitat; 23% of cited locations	33% of potential habitat; 69% of cited locations	11% of potential habitat; 9% of cited locations	BLM RMP NPS GMP USFWS (DNNWR)	Southwestern desert endemic. 89% of potential habitat in Clark Co (>2 million acres) and 91% of cited locations in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> • No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs • Maintain stable or increasing population numbers
Western red-tailed skink <i>Eumeces gilberti rubricaudatus</i>	92% of potential habitat	7% of potential habitat	1% of potential habitat	USFS SMNRA USFWS (DNNWR) BLM Red Rock Cyn NCA BLM RMP	Eastern Mojave desert endemic. 92% of potential habitat in Clark Co (>250,000 ac) in IMAs & LIMAs.	<ul style="list-style-type: none"> • No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs • Maintain stable or increasing population numbers
Large-spotted leopard lizard <i>Gambelia wislizenii wislizenii</i>	55% of potential habitat; 34% of cited locations	32% of potential habitat; 58% of cited locations	13% of potential habitat; 8% of cited locations	BLM RMP NPS GMP USFWS (DNNWR)	Great Basin, southwestern desert endemic. 87% of potential habitat in Clark Co (>2.9 million acres) and 92% of cited locations in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> • No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs • Maintain stable or increasing population numbers

TABLE 3-1
COVERED SPECIES CONSERVATION EVALUATIONS
(continued)

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Great Basin collared lizard <i>Crotaphytus insularis bicinctores</i>	60% of potential habitat; 30% of cited locations	30% of potential habitat; 59% of cited locations	10% of potential habitat; 11% of cited locations	BLM RMP NPS GMP USFS SMNRA BLM Red Rock Cyn NCA USFWS (DNRW)	Great Basin, southwestern desert endemic. 90% of potential habitat in Clark Co (>2.9 million acres) and cited locations in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
California (common) kingsnake <i>Lampropeltis getulus californiae</i>	55% of potential habitat; 38% of cited locations	32% of potential habitat; 57% of cited locations	13% of potential habitat; 5% of cited locations	BLM RMP NPS GMP USFWS (DNRW)	Southwestern desert and Pacific coast species. 87% of potential habitat in Clark Co (>2.9 million acres) and 95% of cited locations in IMAs, LIMAs, MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
Glossy snake <i>Arizona elegans</i>	55% of potential habitat; 57% of cited locations	32% of potential habitat; 23% of cited locations	13% of potential habitat; 20% of cited locations	BLM RMP NPS GMP USFWS (DNRW)	Southwestern desert endemic. 87% of potential habitat in Clark Co (>2.9 million acres) and cited locations in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
Western long-nosed snake <i>Rhinocheilus lecontei</i>	55% of potential habitat; 20% of cited locations	32% of potential habitat; 68% of cited locations	13% of potential habitat; 11% of cited locations	BLM RMP NPS GMP USFWS (DNRW)	Southwestern desert endemic. 87% of potential habitat in Clark Co (>2.9 million acres) and 89% of cited locations in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
Western leaf-nosed snake <i>Phyllorhynchus decurtatus</i>	55% of potential habitat	32% of potential habitat	13% of potential habitat	BLM RMP NPS GMP USFWS (DNRW)	Southwestern desert endemic. 87% of potential habitat in Clark Co (>2.9 million acres) in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
Sonoran lyre snake <i>Trimorphodon biscutatus lambda</i>	60% of potential habitat	30% of potential habitat	10% of potential habitat	BLM RMP NPS GMP USFS SMNRA BLM Red Rock Cyn NCA USFWS (DNRW)	Sonoran and east Mojave desert species. 90% of potential habitat in Clark Co (>4.2 million acres) in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers

**TABLE 3-1
COVERED SPECIES CONSERVATION EVALUATIONS
(continued)**

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Sidewinder <i>Crotalus cerastes</i>	55% of potential habitat; 34% of cited locations	32% of potential habitat; 46% of cited locations	13% of potential habitat; 20% of cited locations	BLM RMP NPS GMP USFWS (DNR)	Mojave desert endemic. 87% of potential habitat in Clark Co (>2.9 million acres) in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
Speckled rattlesnake <i>Crotalus michelli</i>	59% of potential habitat; 25% of cited locations	31% of potential habitat; 75% of cited locations	10% of potential habitat	BLM RMP NPS GMP USFWS (DNR) USFS SMNRA BLM Red Rock Cyn NCA	Southwestern desert endemic. 90% of potential habitat in Clark Co (>4.2 million acres) and all cited locations in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
Mojave green rattlesnake <i>Crotalus scutulatus</i>	56% of potential habitat; 64% of cited locations	33% of potential habitat; 21% of cited locations	11% of potential habitat; 14% of cited locations	BLM RMP NPS GMP USFWS (DNR)	Southwestern desert endemic. 89% of potential habitat in Clark Co (>4.2 million acres) and 86% of cited locations in IMAs, LIMAs, or MUMAs.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
Relict leopard frog <i>Rana onca</i>	Both extant populations; 76% of cited locations	19% of cited locations	5% of cited locations	NPS GMP	Clark County/northwestern Arizona endemic. Both extant populations in Clark County managed by NPS.	<ul style="list-style-type: none"> Increase the number of springs with populations through reintroduction in appropriate locations Maintain stable or increasing populations at extant springs Develop and implement relict leopard frog management plan

¹In all cases, projected potential impacts represent the “worst case” analysis.

3.1.1 Desert tortoise, *Gopherus agassizii*

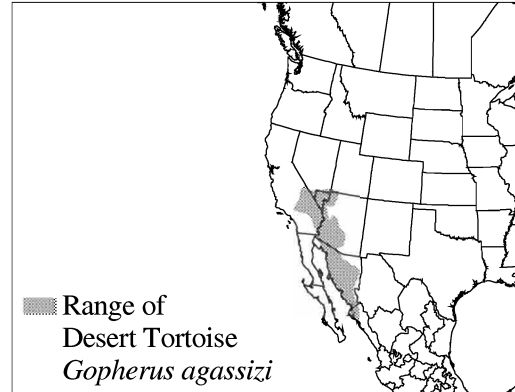
Status: USFWS Threatened, Nevada.

Clark County MSHCP Status: Covered.

Range: Mojave Desert endemic (Figure 3-1).

Clark County Distribution: Throughout desert valley habitat in Clark County generally below 4,500 ft.

Habitat: Most common in desert scrub and desert wash habitats including **Mojave desert scrub** and **blackbrush** communities in valleys and on bajadas and hills below 4,500 ft. Uncommonly found in **sagebrush** and perennial **grasslands**. An important habitat requirement is the presence of annual wildflowers and native grasses as forage.



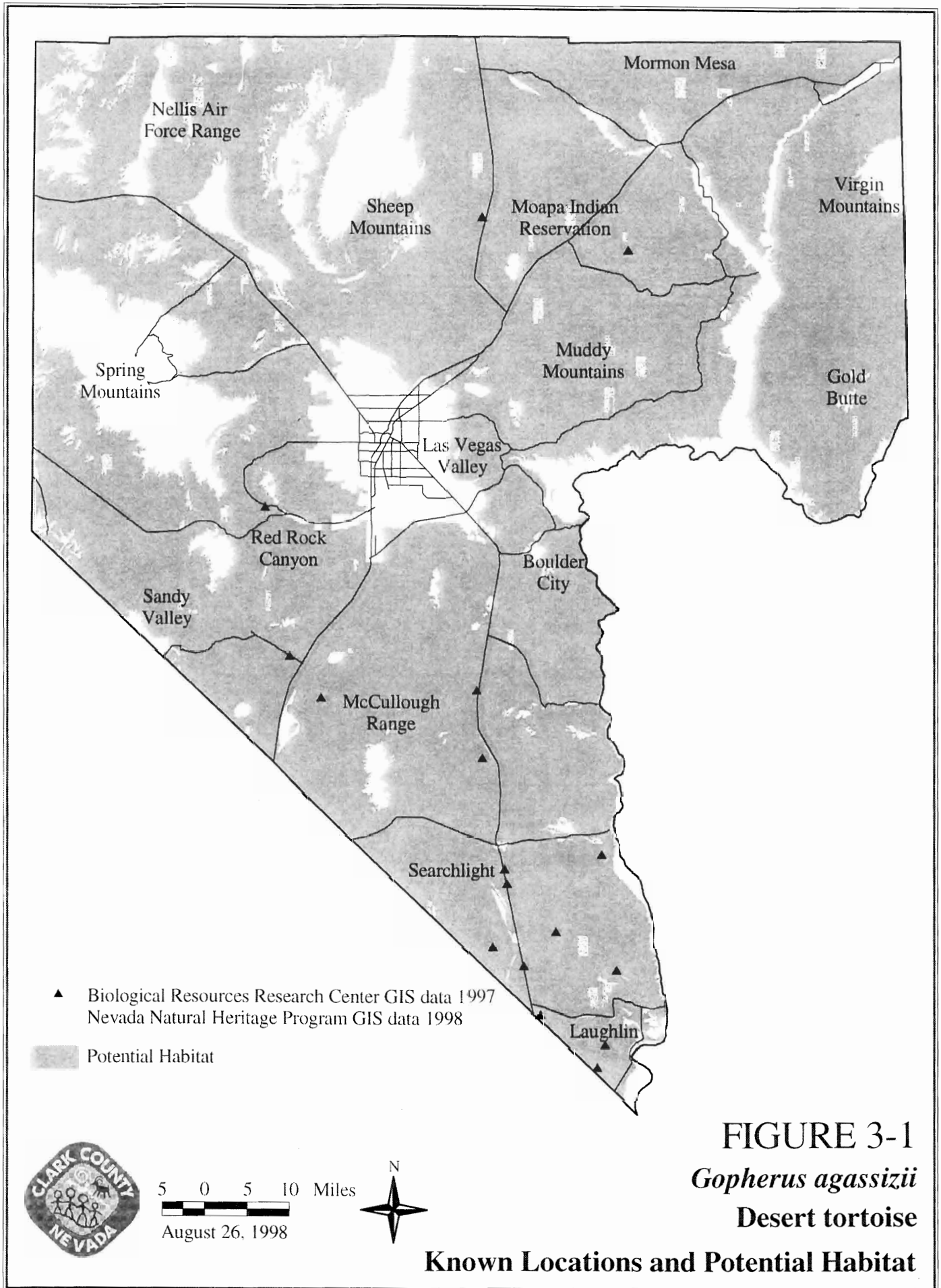
Population Trends: Unknown; presumed declining.

Ecosystem Level Threats:

- competition of herbivores with cattle and equids. **Threat 702**
- habitat degradation by livestock grazing and trampling. **Threat 703**
- habitat degradation and wildlife displacement from extraction of minerals. **Threat 902**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat modification and degradation and wildlife mortality from non-competitive non-commercial OHV activities, including use of wash habitat. **Threat 404**
- habitat degradation resulting from urban and rural development. **Threat 1101**
- habitat fragmentation by urban/rural development. **Threat 1102**
- habitat fragmentation by roads and trails. **Threat 503**
- provision of perch sites for ravens (tortoise predators). **Threat 1203**
- Raven predation of young. **Threat 1502**

Species Specific Threats:

- Upper respiratory tract disease possibly caused by release of captive tortoises.
- poaching, illegal collection, or killing of flora and fauna. **Threat 1701**



Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, blackbrush, and sagebrush), including BLM, USFWS, and NPS management actions under the Recovery Plan for the species and the terms of the DCP. In addition, the following existing or proposed conservation actions are essential to address threats to desert tortoise.

CC(8) Translocation of Desert Tortoises.

CC(9) Fencing of highways.

CC(10) Development and Implementation of an AMP including incorporation of monitoring of desert tortoise populations to determine if populations are progressing towards recovery.

Adequacy of Existing Management: The provisions of the DCP are incorporated into the MSHCP and provide conservation for the species throughout Clark County. These include continued implementation of the DCP including designation and conservation of ACECs and implementation of measures to minimize, monitor, and mitigate take and habitat loss:

Currently managed in Clark County under the terms of the DCP. Over half of the potential habitat is on land managed by the BLM, although substantial areas are also managed by USFWS, NPS, and Boulder City.

References: Auffenberg and Franz 1978; Clark County 1995; Grover and DeFalco 1995; Trotter 1980.

3.1.2 Banded gecko, *Coleonyx variegatus*

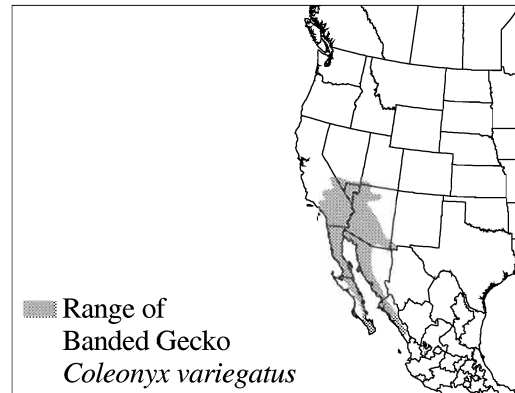
Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern desert endemic.

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County (Figure 3-2).

Habitat: The banded gecko inhabits **blackbrush, Mojave desert scrub, and mesquite/catclaw** habitats. Less commonly found in **pinyon-juniper, sagebrush, and desert riparian** habitats. Rocks, crevices, fallen logs, limbs, and rubbish piles provide shelter. Typically common nocturnal desert lizard in areas of good potential habitat. They are active at night and feed on arthropods; mainly insects and spiders.



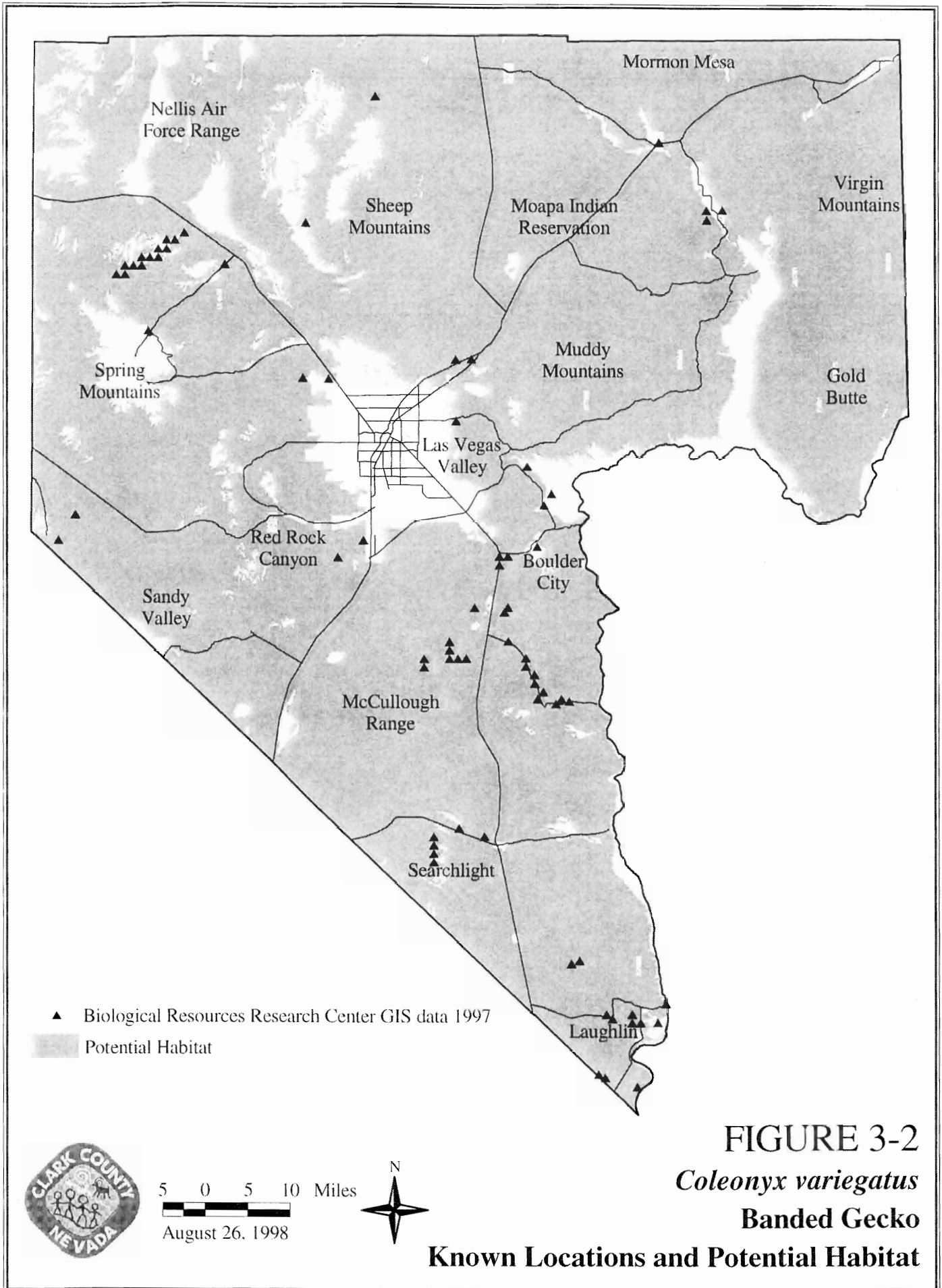
Population Trends: Unknown

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- Collection of dead wood including yuccas skeletons. **Threat 1001**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**
- habitat degradation and wildlife displacement from extraction of minerals. **Threat 902**

Species Specific Threats: Not yet identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, mesquite/catclaw, blackbrush, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise. In addition, the following existing or proposed conservation actions are essential to address threats to the banded gecko.



NPS(22) Prohibit destructive collecting techniques such as breaking off rock flakes and rolling cap rocks to uncover lizards.

NDOW(17) Regulate hobby collection and hobby possession of authorized unprotected reptiles and amphibians.

Adequacy of Existing Management: The majority of the potential habitat for this species in Clark County is on BLM undesignated lands, although significant blocks of habitat occur in areas managed for the desert tortoise (more than 900,000 acres), and managed by NPS and USFWS. The AMP will evaluate road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Dixon 1970; Huey and Pianka 1983; Klauber 1945; Miller and Stebbins 1985; Parker 1972; Stebbins 1954; Zeiner et al. 1990.

3.1.3 Desert iguana, *Dipsosaurus dorsalis*

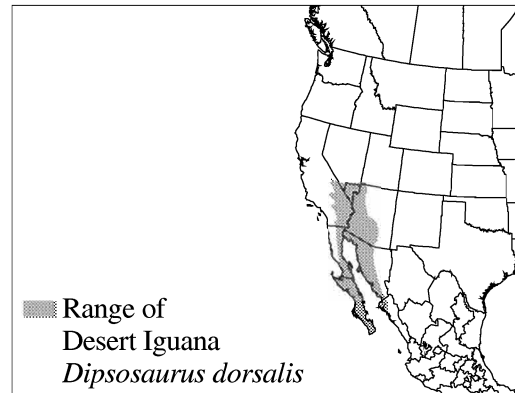
Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern desert endemic

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County (Figure 3-3).

Habitat: Mojave desert scrub flats with sandy hummocks, mesquite, and salt desert scrub habitats are most common, but also found in rocky stream beds, on bajadas, and in rocky hilly areas below 5,000 feet. Primarily herbivorous, also eats insects and carrion.



Population Trends: Unknown.

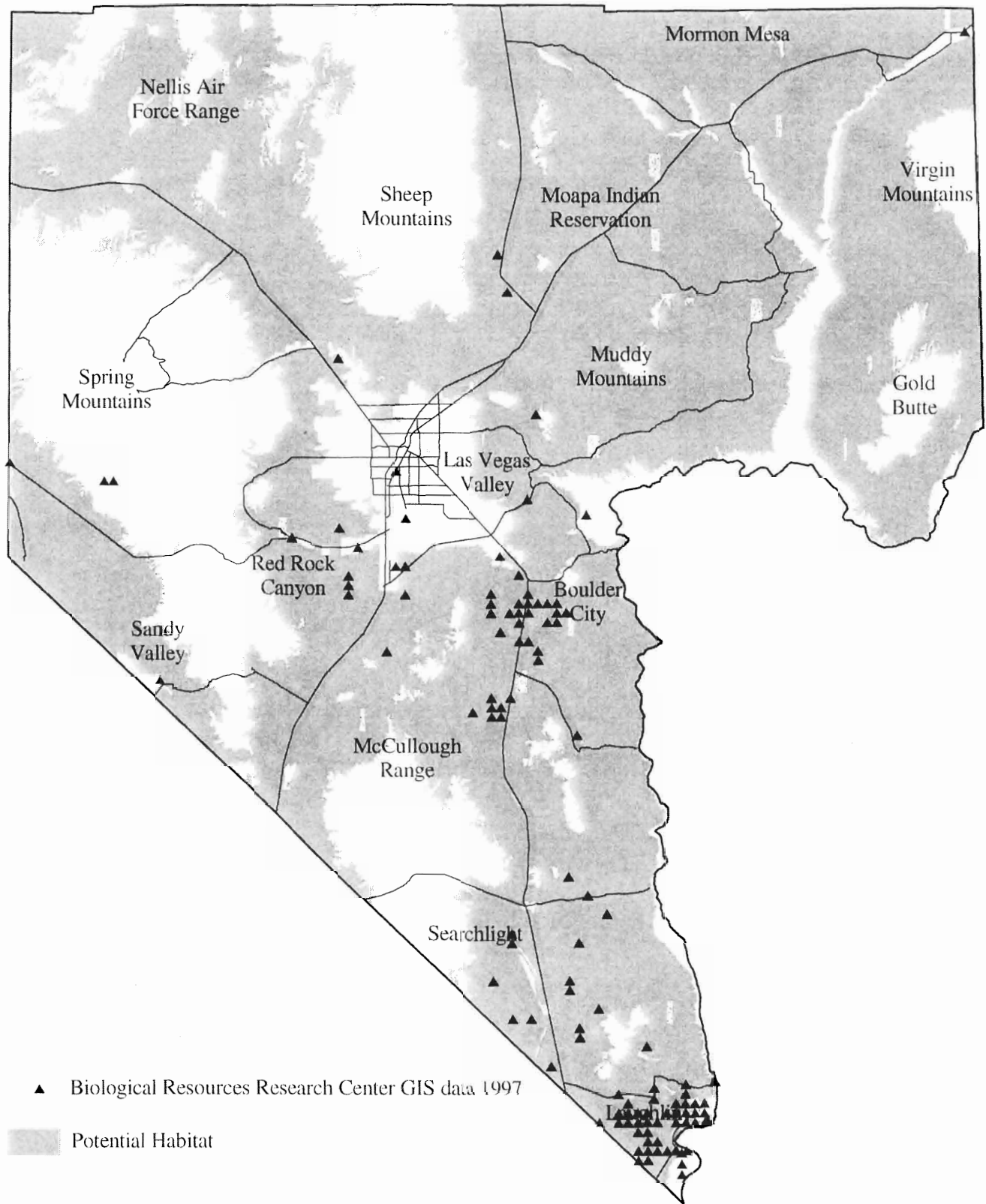
Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, mesquite/catclaw, salt desert scrub, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the measures outlined below would provide for adequate conservation of the species. The



▲ Biological Resources Research Center GIS data 1997

■ Potential Habitat



5 0 5 10 Miles



August 26, 1998



FIGURE 3-3

Dipsosaurus dorsalis

Desert iguana

Known Locations and Potential Habitat

AMP should evaluate road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Hulse 1992; Mayhew 1971; Muth 1977; Norris 1953; Stebbins 1954; Zeiner et al. 1990.

3.1.4 Western chuckwalla, *Sauromalus obesus obesus*

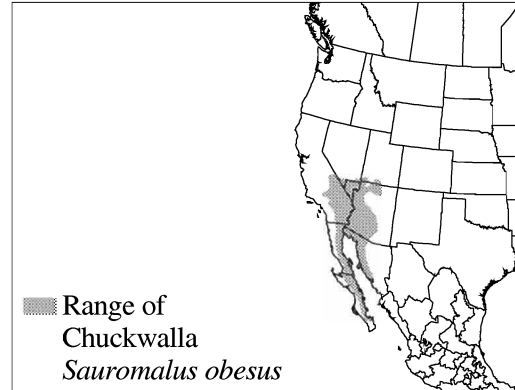
Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern desert endemic.

Distribution: Widely distributed in Clark County. Recent (1995) surveys identified populations at 24 historic localities and 91 previously unsurveyed sites (Figure 3-4).

Habitat: Found within desert scrub including **Mojave desert scrub, blackbrush, salt desert scrub, and mesquite/catclaw**, on areas with rocky cover or boulder outcrops typically on slopes and open flats below 1,860 m elevation (6,100 ft). Requires shady, well-drained soil for nests. Primarily herbivorous, feeding on flowers, fruits, leaves of creosote, and some insects.



Population Trends: In Clark County, suffered population losses from filling of Lake Mead and development of the Las Vegas Valley. Much of the rocky terrain inhabited by the chuckwalla is found in hills and mountain ranges that surround the valley.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation resulting from commercial collection. **Threat 202**
- habitat degradation resulting from urban and rural development. **Threat 1101**
- habitat degradation and wildlife displacement from extraction of minerals. **Threat 902**
- reduction of fauna populations by indiscriminate recreational shooting. **Threat 406**
- landfills, associated non-native species, and subsidized species such as ravens and coyotes. **Threat 1103**
- poaching, illegal collection, or killing of flora and fauna. **Threat 1701**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, salt desert scrub, blackbrush, mesquite/catclaw, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro

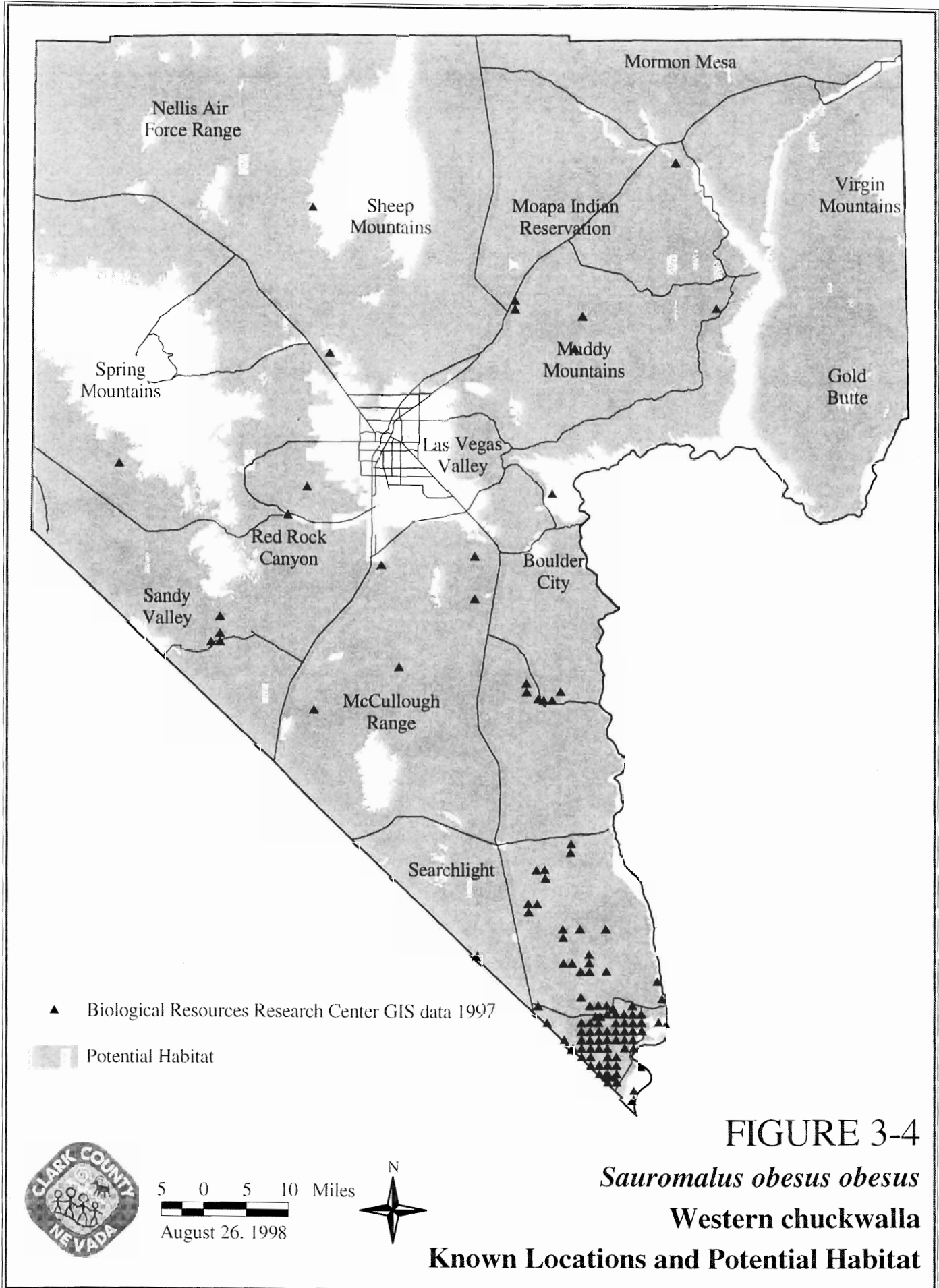


FIGURE 3-4

Sauromalus obesus obesus
Western chuckwalla

Known Locations and Potential Habitat

management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the measures outlined above would provide for adequate conservation of the species.

References: Berry 1974; Burroughs 1997; Johnson 1965; Montanucci 1997; Shaw 1939; Stebbins 1954; Zeiner et al. 1990.

3.1.5 Great Basin collared lizard, *Crotaphytus insularis bicinctores*

Status: None.

Clark County MSHCP Status: Covered.

Range: Great Basin and southwestern desert endemic.

Clark County Distribution: Great Basin, Mojave desert species. Inferred from habitat preferences, probably widespread in Clark County (Figure 3-5).

Habitat: Found in **Mojave desert scrub, salt desert scrub, mesquite/catclaw, desert riparian, blackbrush, sagebrush,** and **pinyon-juniper** habitats in rocky terrain: arroyos, hill slopes, washes with sparse vegetative cover, up to 2,280 m elevation (7,500 ft). Feeds on arthropods, lizards, and berries.

Population Trends: Unknown.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: Not yet identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, mesquite/catclaw, salt desert scrub, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the measures outlined below would provide for adequate conservation of the species. The AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management

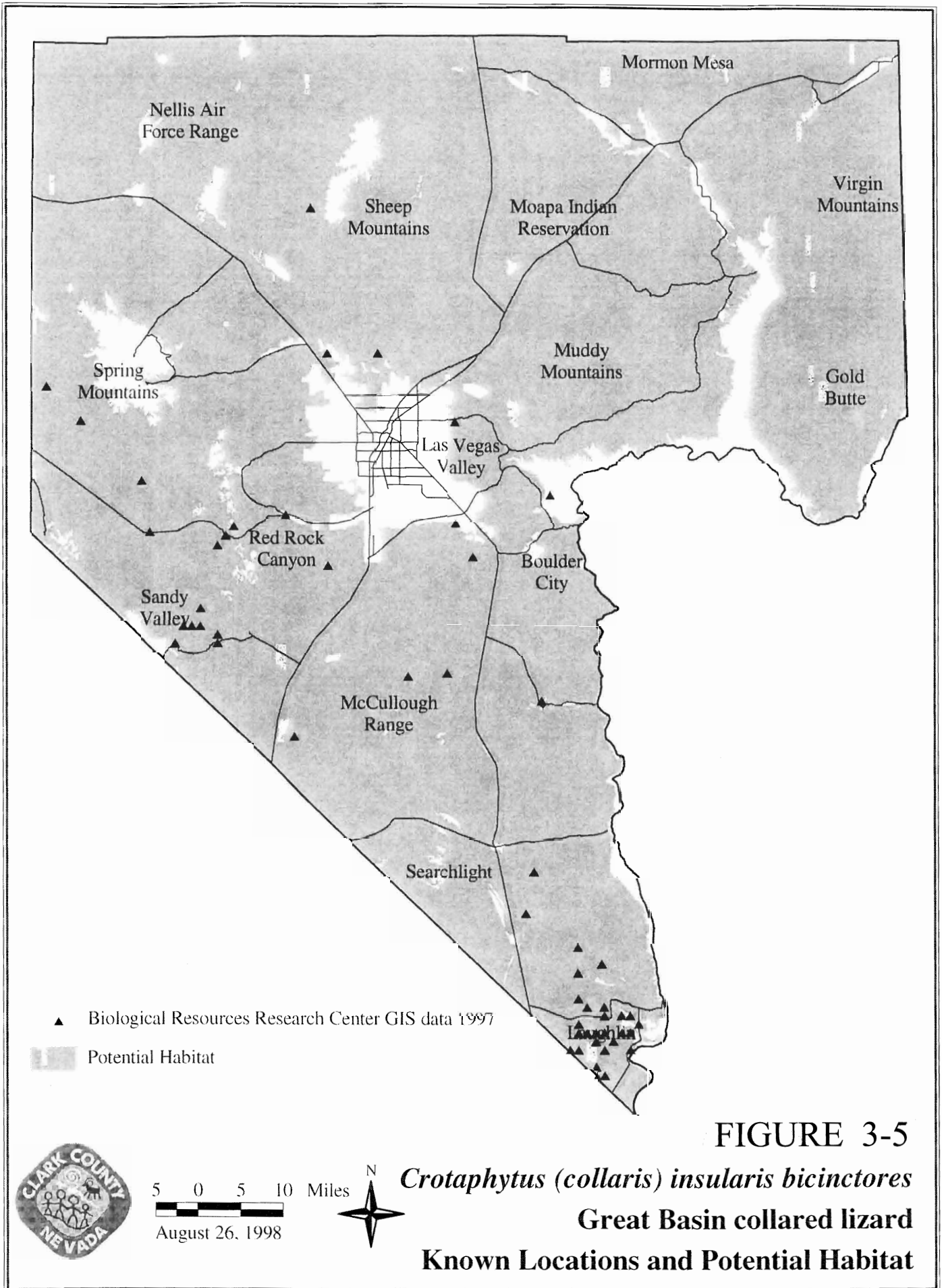


FIGURE 3-5

Crotaphytus (collaris) insularis bicinctores
Great Basin collared lizard
Known Locations and Potential Habitat

areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Heindl 1997; Medica 1997; Stebbins 1985; Zeiner et al. 1988.

3.1.6 Large-spotted leopard lizard, *Gambelia wislizenii wislizenii*

Status: None.

Clark County MSHCP Status: Covered.

Range: Great Basin, southwestern desert endemic into northern Mexico.

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County (Figure 3-6).

Habitat: Inhabits primarily **Mojave desert scrub** and salt desert scrub, but also occurs in blackbrush, sagebrush, and pinyon-juniper habitats. Prefers hardpan, gravelly, or sandy open ground where vegetation is sparse or in small clumps below 1,830 m elevation (6,000 ft). Feeds during the day on insects, small lizards, and some plant materials.

Population Trends: Unknown.

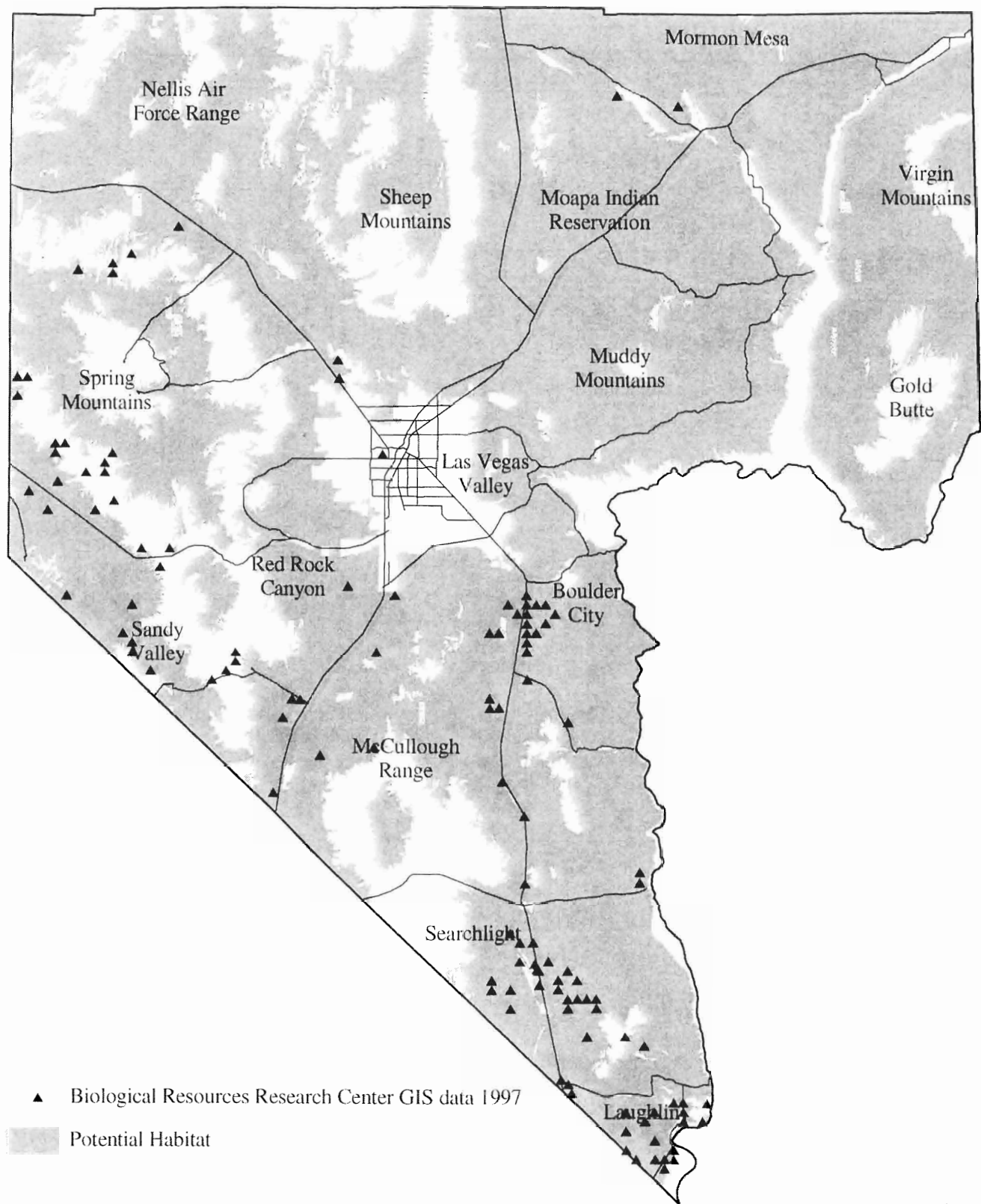
Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: Not yet identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, mesquite/catclaw, salt desert scrub, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the measures outlined below would provide for adequate conservation of the species. The AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management



5 0 5 10 Miles
August 26, 1998



FIGURE 3-6

Gambelia wislizenii wislizenii
Large-spotted leopard lizard

Known Locations and Potential Habitat

areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Dixon 1967; Stebbins 1954; Tollestrup 1979, 1983; Turner, Lannom, Medica, and Hoddenbach 1969; Zeiner et al. 1990.

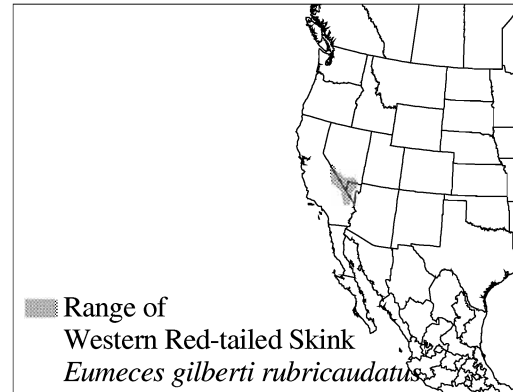
3.1.7 Western red-tailed skink, *Eumeces gilberti rubricaudatus*

Status: None.

Clark County MSHCP Status: Covered.

Range: Found in southern Nevada in isolated montane populations and in the eastern Mojave Desert in limited montane habitats.

Clark County Distribution: Known from Spring, Sheep, and Newberry Mountains (Figure 3-7). Distribution inferred from habitat preferences.



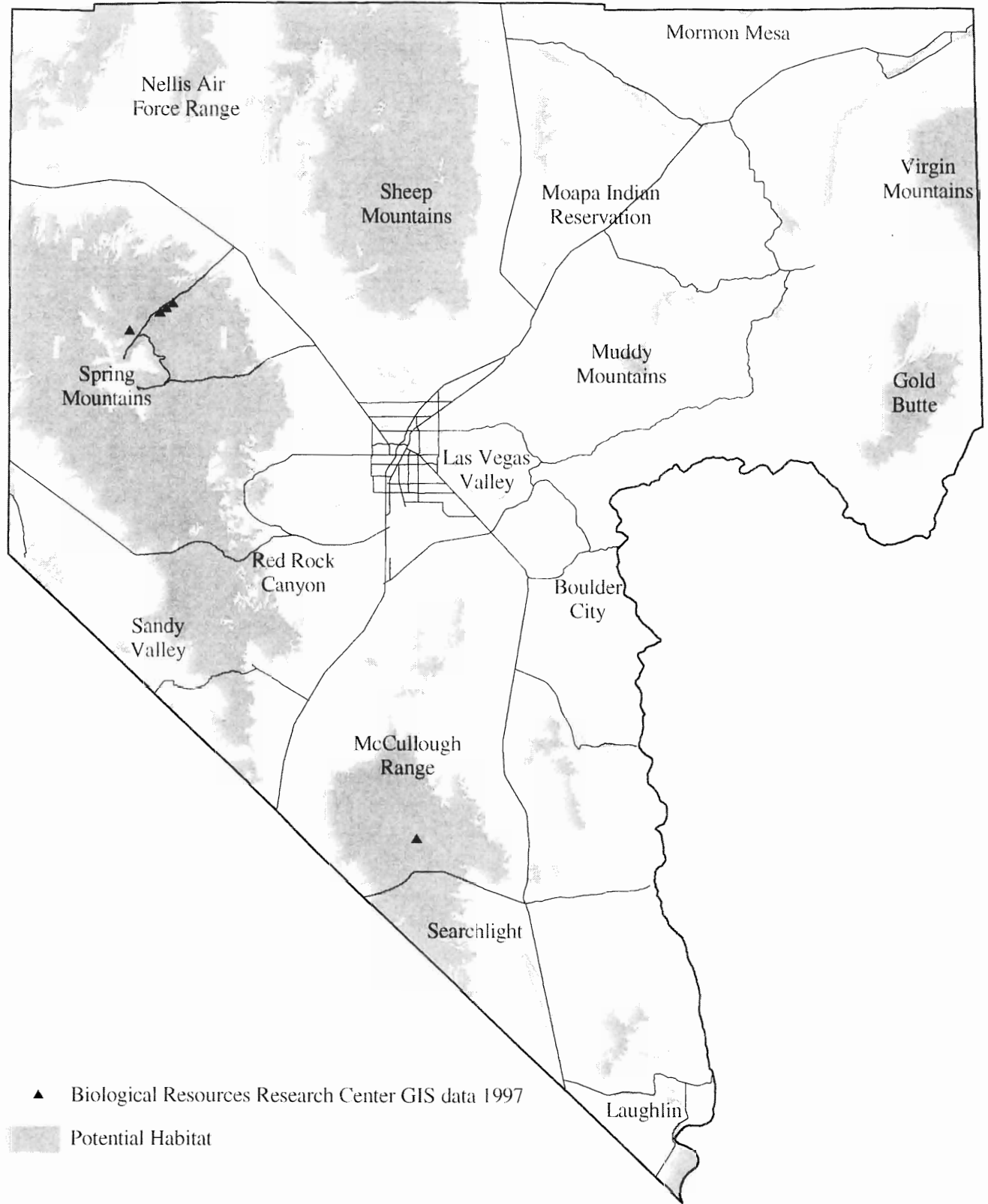
Habitat: Primarily inhabit **pinyon-juniper** and riparian habitat including canyon bottoms near water. Less common in higher-elevation habitats including **mixed conifer**, **sagebrush**, **blackbrush**, **mesquite/catclaw**, and **desert riparian** habitats in rocky areas or where logs or leaf cover are proximate to permanent or intermittent streams. Feeds primarily on insects and spiders.

Population Trends: Unknown.

Ecosystem Level Threats:

- habitat modification and degradation resulting from commercial collection. **Threat 202**
- habitat degradation and modification due to fire suppression and fuels management, post fire suppression and fuels management, historical fire management, fire. **Threat 301**
- 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 401**
- reduction of wildlife populations (especially reptiles) through highway mortality on high-elevation paved roads. **Threat 502**
- habitat degradation and wildlife displacement from extraction of minerals. **Threat 902**
- habitat degradation from wood removal. **Threat 1001**
- changes in spring water quality from grazing and agriculture (pesticides, herbicides, and fertilizer). **Threat 1404**
- reduced spring flow from overutilization by animals. **Threat 1405**

Species Specific Threats: Not yet identified.



▲ Biological Resources Research Center GIS data 1997

■ Potential Habitat



5 0 5 10 Miles



August 26, 1998



FIGURE 3-7

Eumeces gilberti rubricaudatus

Western red-tailed (Gilbert's) skink

Known Locations and Potential Habitat

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on pinyon-juniper habitat, boreal islands, and lizards and snakes). Conservation actions include environmental education programs, snag management, campground management, environmental education programs, fire management, focusing of recreation development outside of sensitive areas, habitat restoration and enhancement at recreation sites, livestock, wild horse and burro management, OHV management, road and trail consolidation, and utility corridor consolidation.

Adequacy of Existing Management: The dependence of this species on downed logs and leaf litter along stream sides makes it likely that the implementation of existing and proposed conservation measures and the conservation measures outlined for Palmer's chipmunk will directly benefit the western red-tailed skink (although the skink likely ranges to a lower minimum elevation than does the chipmunk).

Most habitat is within Humboldt-Toiyabe National Forest or USFWS Desert National Wildlife Range. Almost half (40%) of the potential habitat is on USFS land, 38% is on USFWS land, and 16% is on land managed by the BLM.

References: Burroughs 1997; Fitch and von Achen 1977; Jones 1985; Medica, Haworth, and Kelly 1990; Stebbins 1954; Tanner 1943, 1957; Zeiner et al. 1990.

3.1.8 Western leaf-nosed snake, *Phyllorhynchus decurtatus*

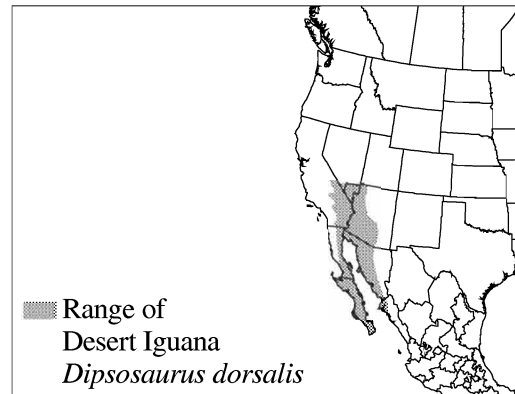
Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern desert endemic

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County.

Habitat: Mojave desert scrub and salt desert scrub habitats in rocky areas and sandy flats. Primarily preys on geckos (*Coleonyx*) and is similarly distributed.



Population Trends: Common in appropriate habitat throughout range.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, salt desert scrub, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the measures outlined below would provide for adequate conservation of the species. The

AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Mayhew 1971; McCleary and McDiarmid 1993; Muth 1977; Norris 1953; Stebbins 1954; Zeiner et al. 1990.

3.1.9 Glossy snake, *Arizona elegans*

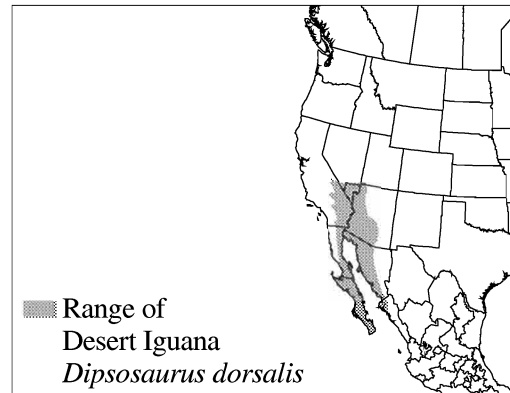
Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern desert endemic

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County.

Habitat: Mojave desert scrub and salt desert scrub habitats with open sandy surface, scattered brush, and rocky areas; extending into grasslands and pinyon-juniper habitats to 7,000 ft. Nocturnal predators of desert iguanas and zebra-tailed lizards.



Population Trends: Unknown.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, salt desert scrub, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the measures outlined below would provide for adequate conservation of the species. The

AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Dixon and Fleet 1976; Mayhew 1971; Muth 1977; Norris 1953; Stebbins 1954; Zeiner et al. 1990.

3.1.10 California (common) kingsnake, *Lampropeltis getulus californiae*

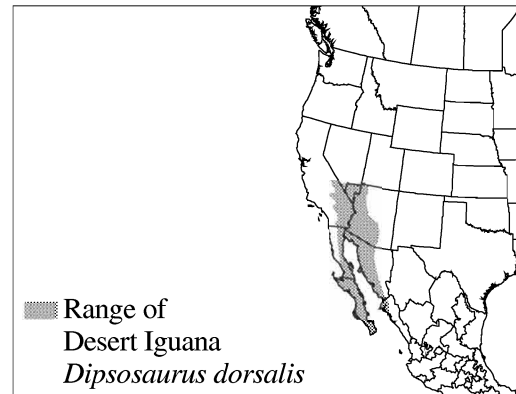
Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern , Pacific Coast species

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County.

Habitat: Wide ranging, most commonly found in **Mojave desert scrub** and **salt desert** habitats in the vicinity of rock outcrops or clumps of vegetation; can range up to 7,000 ft. Feeds on small mammals, lizards, snakes, and eggs.



Population Trends: Unknown.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, salt desert scrub, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the measures outlined below would provide for adequate conservation of the species. The AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Mayhew 1971; Muth 1977; Norris 1953; Stebbins 1954; Zeiner et al. 1990.

3.1.11 Western long-nosed snake, *Rhinocheilus lecontei lecontei*

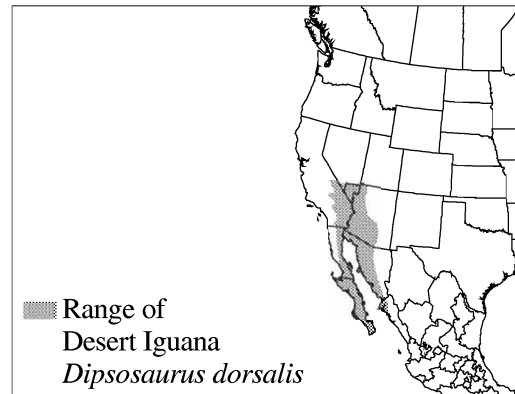
Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern desert endemic

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County.

Habitat: Mojave desert scrub and salt desert scrub with open sandy surface, scattered brush, and in rocky areas below 1,520 m elevation (5,000 ft). Nocturnal predator on lizards, small mammals, eggs, and insects.



Population Trends: Unknown.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, salt desert scrub, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the measures outlined below would provide for adequate conservation of the species. The AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Davis and Medica 1981; Mayhew 1971; Medica 1975; Muth 1977; Norris 1953; Stebbins 1954; Zeiner et al. 1990.

3.1.12 Sonoran lyre snake, *Trimorphodon biscutatus lambda*

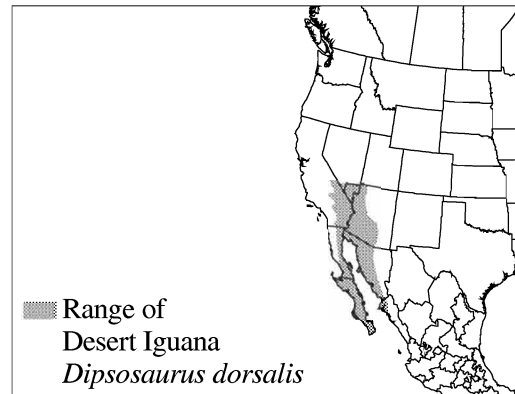
Status: None.

Clark County MSHCP Status: Covered.

Range: Sonoran and eastern Mojave desert endemic

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County.

Habitat: Rocky areas in **Mojave desert scrub, pinyon-juniper, and mixed conifer** habitat in lowlands, mesas, and lower mountain slopes up to 7,400ft.



Population Trends: Unknown.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, pinyon-juniper, mixed conifer, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the

measures outlined below would provide for adequate conservation of the species. The AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Mayhew 1971; Muth 1977; Norris 1953; Scott 1984; Stebbins 1954; Zeiner et al. 1990.

3.1.13 Speckled rattlesnake, *Crotalus mitchelli*

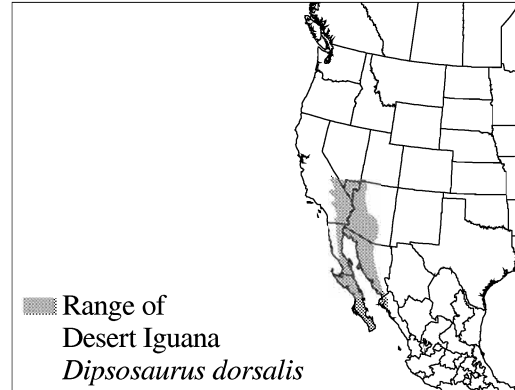
Status: None.

Clark County MSHCP Status: Covered.

Range: Southwestern desert endemic

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County.

Habitat: Pinyon-juniper, sagebrush, Mojave desert scrub, and blackbrush habitats up to 7,800 ft. Primarily found in rocky terrain on outcrops and boulders, but also occupies loose soil and sand. Preys upon small rodents, lizards, and birds during the day in spring and fall, and at night in the summer..



Population Trends: Unknown.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on pinyon-juniper, sagebrush, Mojave desert scrub, and blackbrush, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the

measures outlined below would provide for adequate conservation of the species. The AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Mayhew 1971; McCrystal and McCoid 1986; Muth 1977; Norris 1953; Stebbins 1954; Zeiner et al. 1990.

3.1.14 Sidewinder, *Crotalus cerastes*

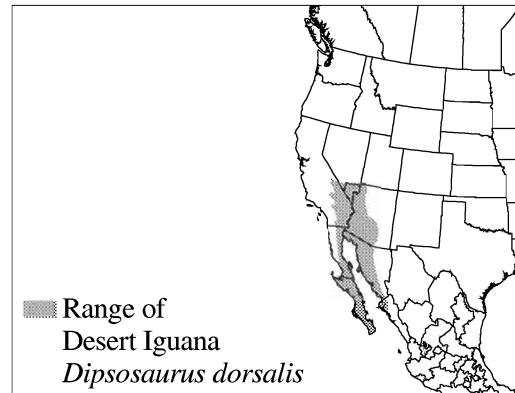
Status: None.

Clark County MSHCP Status: Covered.

Range: Mojave desert endemic

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County.

Habitat: Mojave desert scrub, mesquite/catclaw, and salt desert scrub habitats are most common, but also found in rocky stream beds, on bajadas, hardpan, barren dunes, and in rocky areas below 1,680 m elevation (5,500 ft).



Population Trends: Unknown.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, mesquite/catclaw, salt desert scrub, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the measures outlined below would provide for adequate conservation of the species. The

AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Mayhew 1971; Muth 1977; Norris 1953; Stebbins 1954; Zeiner et al. 1990.

3.1.15 Mojave green rattlesnake, *Crotalus scutulatus scutulatus*

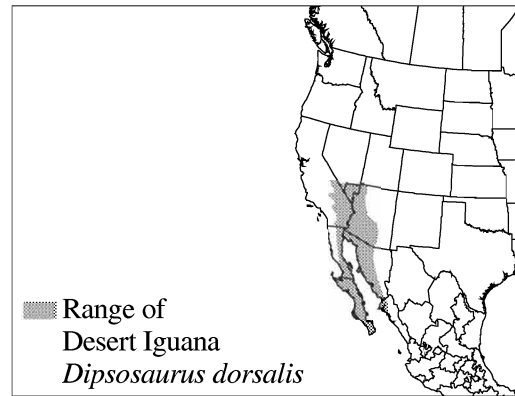
Status: None.

Clark County MSHCP Status: Covered.

Range: Mojave, Sonoran deserts into central Mexico

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County.

Habitat: Mojave desert scrub and blackbrush flats. Preys upon small mammals (esp. *Dipodomys*), lizards, snakes, birds, and eggs.



Population Trends: Unknown.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat fragmentation by urban/rural development. **Threat 1102**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on Mojave desert scrub, blackbrush, and lizards and snakes). Conservation actions include environmental education programs, livestock, wild horse and burro management, OHV management, road and trail consolidation, utility corridor consolidation, and habitat protection for the desert tortoise.

Adequacy of Existing Management: Although no management focusing on this species is currently in place, the extent of habitat in the county along with implementation of the

measures outlined below would provide for adequate conservation of the species. The AMP should evaluate the effects of commercial collection as well as road density impacts on populations of reptiles to develop guidelines for road density, average daily trips, vehicle speed, and requirements for berms adjacent to paved roads in core management areas. This should be developed during the first 2-4 years of the MSHCP as a Clark County Road Management Plan, incorporating the results of previous work on the desert tortoise.

References: Mayhew 1971; Muth 1977; Norris 1953; Price 1982; Stebbins 1954; Zeiner et al. 1990.

3.1.16 Relict leopard frog, *Rana onca*

Status: Nevada Natural Heritage Program Global Rank G1, Nevada State Rank S1.

Clark County MSHCP Status: Covered.

Range: Clark County endemic (except for one leopard frog population near Littlefield, Arizona, that is thought to be this species).

Clark County Distribution: In Clark County populations remain within small areas on NPS Lands, in the Rogers/Blue Point Springs area south of Overton, and in springs in Black Canyon below Hoover Dam (Figure 3-8).

Habitat: Desert riparian habitat along permanent streams, tributaries, and springs and other water impoundments up to 2,500 ft elevation. Primarily nocturnal, uses water and grassy banks as cover.

Population Trend: This species is a narrow lower Virgin River–Las Vegas Valley endemic with very low numbers and has undergone significant decline historically.

Ecosystem Level Threats:

- lowland riparian habitat degradation and modification associated with channelization. **Threat 1301**
- changes in riparian habitat quality due to changes in water flows (quantity, quality, seasonality) resulting from water diversion and groundwater pumping. **Threat 1302**
- decreased water availability to support riparian habitat. **Threat 1303**
- changes in water quality in riparian areas from grazing and agriculture (pesticides, herbicides, and fertilizer). **Threat 1304**
- habitat degradation resulting from spring diversion and modification. **Threat 1401**
- habitat degradation resulting from spring outflow diversion. **Threat 1402**
- decreased spring flows resulting from groundwater pumping. **Threat 1403**
- changes in spring water quality from grazing and agriculture (pesticides, herbicides, and fertilizer). **Threat 1404**
- reduced spring flow from overutilization by animals. **Threat 1405**
- habitat degradation and population decreases resulting from introductions, competition, and encroachment of exotic plant species (such as tamarisk, *Vallsineria*, fan palm invasion [upper Muddy], and other species). **Threat 1501**
- population decreases due to exotic species (starling, red shiners, Tilapia, and other species), nest parasitism (e.g., brown-headed cowbirds) and rates of nest parasitism on various host species. **Threat 1502**
- poaching, illegal collection, or killing of flora and fauna. **Threat 1701**

Species Specific Threats: Not yet identified.

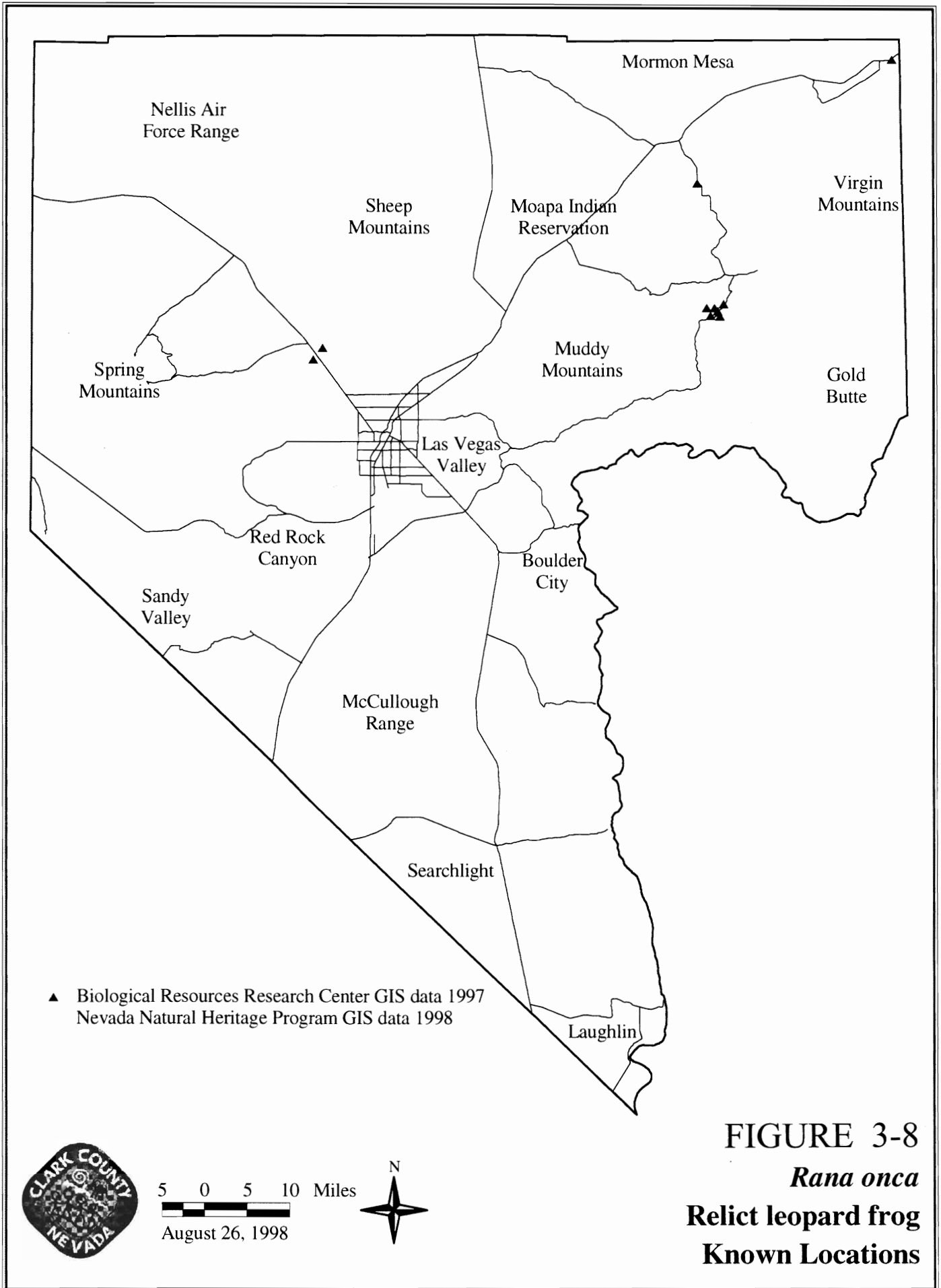


FIGURE 3-8
Rana onca
Relict leopard frog
Known Locations

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A (see chapters on desert riparian habitat), including environmental education programs; riparian habitat and spring protection, restoration, and enhancement; livestock, wild horse, and burro management, and potential reestablishment of extirpated populations. In addition, the following existing or proposed conservation actions are essential to address threats to the relic leopard frog.

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.

NPS(5) Inventory populations of relic leopard frog and other amphibians, as time allows.

NPS(14) Monitor populations of relic leopard frog and other amphibians, as time allows.

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(54) Develop and implement an NPS management plan in order to ensure long-term protection and conservation of relict leopard frog populations. The plan should address measures to monitor the remaining populations, grazing management, conservation agreements, conservation easements with private landowners, deterrence of poaching through regular ranger patrols, assessment of the need for refugia, and control of exotic fish and bullfrog populations.

Adequacy of Existing Management Presently, only known to occur on Lake Mead National Recreation Area, administered by the National Park Service, and in a small area on private land adjacent to the Virgin River near Littlefield, Arizona. NPS personnel currently monitor the remaining springs where this species persists.

Existing and proposed management appears to be adequate to provide protection of existing populations but does not provide for long-term management. The AMP should include:

- Studies to evaluate the effects of exotic fish, wild burros, and bullfrogs on relict leopard frog populations; and to characterize breeding habitat for the species.
- Evaluation of taxonomic status, including additional cladistic analysis at the nuclear level.

References: Behler 1996; Bradford 1997; Burroughs 1997; Hayes and Jennings 1986; Jennings 1988; Jennings et al. 1995; Linsdale 1940; Stebbins 1985; Platz 1984.

3.2 Evaluation Reptile and Amphibian Species

High Priority

- Banded Gila monster, *Heloderma suspectum cinctum*
- Southern desert horned lizard, *Phrynosoma platyrhinos calidiarum*
- Arizona (southwestern) toad, *Bufo microscaphus microscaphus*
- Desert night lizard, *Xantusia vigilis*

Medium Priority

- Sonoran mountain kingsnake, *Lampropeltis pyromelana*
- Regal ringneck snake, *Diadophis punctatus regalis*
- Western diamondback, *Crotalus atrox*
- Red-spotted toad, *Bufo punctatus*

Low Priority

- Southern plateau lizard, *Sceloporus undulatus tristichus*

3.2.1 Banded Gila monster, *Heloderma suspectum cinctum*

Status: BLM Sensitive, Nevada Natural Heritage Program Global Rank G4T3, State Rank S2, State protected under NRS 501.

Clark County MSHCP Status: Evaluation - high priority.

Range: Eastern Mojave–northern Sonora desert endemic. County status unknown.

Clark County Distribution: Distribution inferred from habitat preferences. Has been collected historically in both Clark and Lincoln Counties, Nevada (Figure 3-9).

Habitat: Frequents **Mojave desert scrub, mesquite/catclaw, blackbrush, pinyon-juniper, and desert riparian** habitats. Found on the lower slopes of rocky canyons, mesic areas, and flats with grassland or succulents; uses rocks and burrows of other animals for cover. Searches for prey items, such as eggs of ground-nesting birds, reptiles, lizards, and insects, primarily at night, although may be active during the day. May focus feeding efforts on locating desert tortoise eggs.

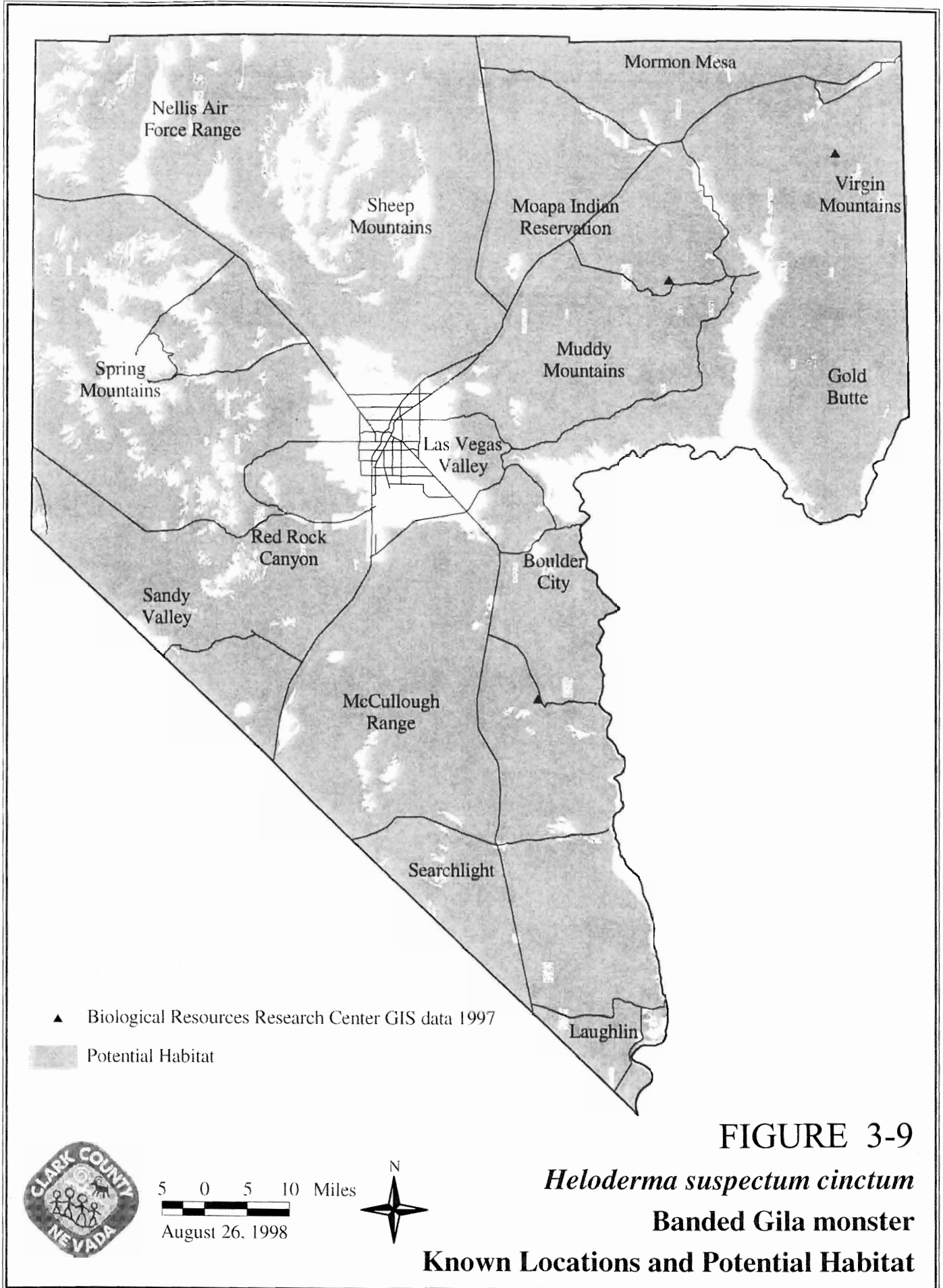
Population Trends: Unknown.

Ecosystem Level Threats:

- poaching, illegal collection, or killing of flora and fauna. **Threat 1701**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat modification and degradation and wildlife mortality from non-competitive non-commercial OHV activities. **Threat 404**
- mortality of non-target species through direct or indirect poisoning or trapping for small mammals or pest species. **Threat 601**
- habitat degradation from locatable, leasable, and saleable mineral development. **Threat 901**
- habitat degradation and wildlife displacement from extraction of minerals. **Threat 902**
- predation by feral animals and uncontrolled pets. **Threat 1601**

Species Specific Threats: Not yet identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on Mojave desert scrub, mesquite/catclaw, blackbrush, pinyon-juniper, desert riparian, boreal islands, and lizards and snakes.



Adequacy of Existing Management: Unknown.

Most potential habitat for this species is found on BLM lands. Potential habitat also occurs on NPS, USFWS, and Boulder City lands. Only state protection (no open season for collection); no habitat protection or Federal protection under ESA. Protected by NPS regulations.

Additional Conservation Needs:

- Develop effective survey methods to determine status and distribution of this species.
- Increase coordination among all agencies to minimize negative effects to the species and its habitat; Federal, state, and local agencies should address, minimize, or avoid impacts to the species in biological evaluations or environmental reviews for land use planning and action.
- Increase awareness of law enforcement and land management staff on the potential collection of Gila monsters, particularly in areas most accessible by collectors and suitable for the species.
- Conduct studies to better understand the life history, distribution, feeding patterns. Utilizing radiotracking in studies will allow investigators to determine the habitat use and activity patterns of this species.
- Minimize mortality by conducting extensive surveys prior to surface disturbance; capture and relocate individuals in area of impact in accordance with NDOW protocol.
- Avoid designating roads and trails in washes in potential habitat areas, where feasible.
- Feral animal control in potential habitat areas.

- **References:** Shaw 1950; Stebbins 1954, 1985; Bogert and Del Campo 1956; Zeiner et al. 1990; Brown and Carmony 1991.

3.2.2 Southern desert horned lizard, *Phrynosoma platyrhinos calidiarum*

Status: None.

Clark County MSHCP Status: Evaluation - high priority.

Range: Southwestern desert endemic.

Clark County Distribution: Inferred from habitat preferences, probably widespread in Clark County (Figure 3-10).

Habitat: Found among woody shrubs, cacti, and yuccas primarily in **Mojave desert scrub**, typically on sandy flats, alluvial fans, washes, and dunes below 1,980 m elevation (6,500 ft). Also occurs in **mesquite/catclaw**, **salt desert scrub**, **blackbrush**, **sagebrush**, and **pinyon-juniper** habitats. Diurnal, feeding primarily on ants and less frequently on other insects and plants.

Population Trends: Unknown.

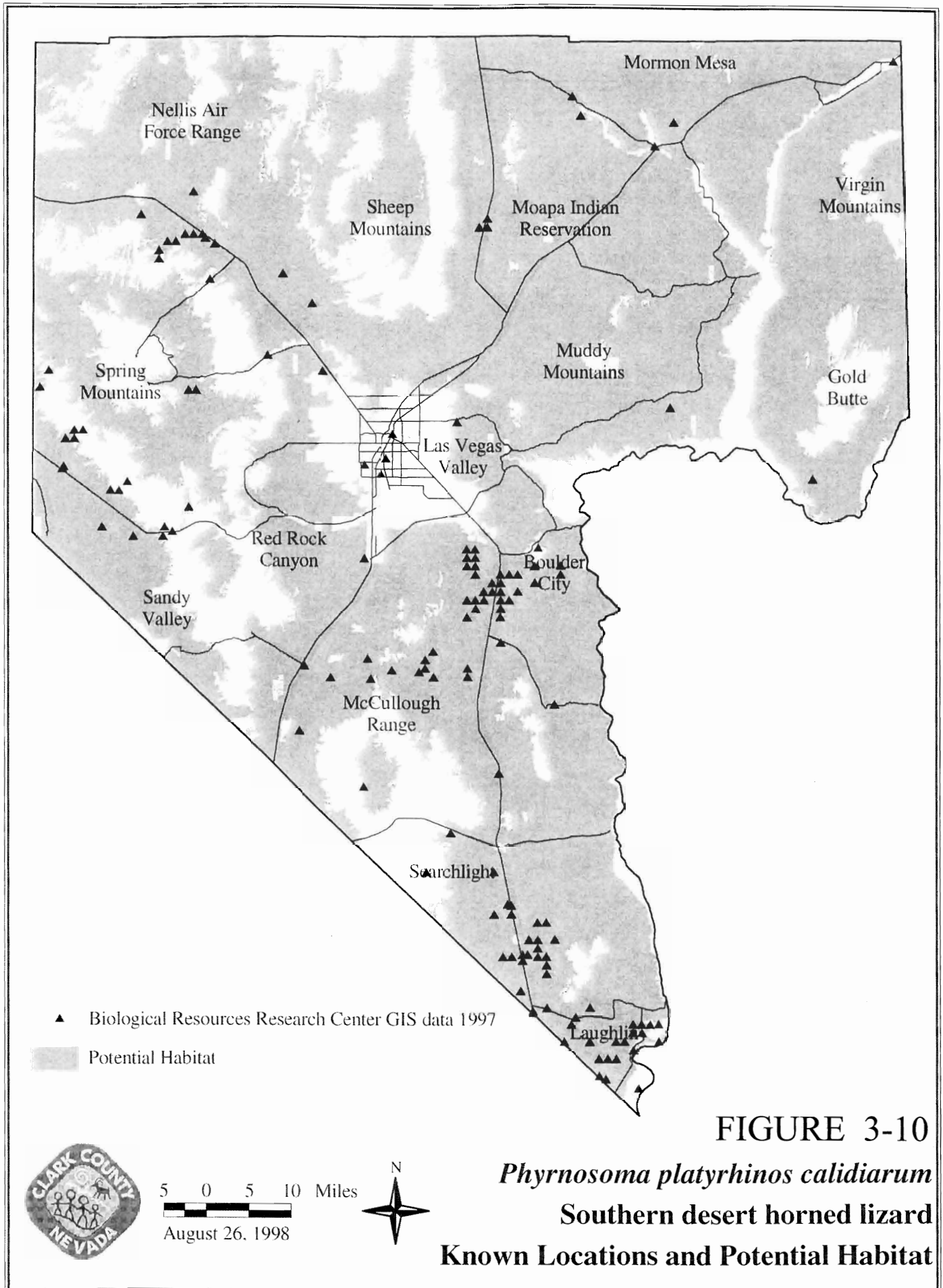
Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- habitat modification and degradation and wildlife mortality from competitive OHV races. **Threat 403**
- habitat modification and degradation and wildlife mortality from non-competitive non-commercial OHV activities. **Threat 404**
- reduction of wildlife populations through highway mortality. **Threat 501**
- habitat fragmentation by roads and trails. **Threat 503**
- habitat degradation from locatable, leasable, and saleable mineral development. **Threat 901**
- habitat degradation and wildlife displacement from extraction of minerals. **Threat 902**

Species Specific Threats: Not yet identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on Mojave desert scrub, boreal islands, and lizards and snakes.

Adequacy of Existing Management: Unknown.



Additional Conservation Needs:

- Prohibit commercial collection of reptiles.

References: Shaw 1950; Stebbins 1954; Lawrence and Wilholt 1958; Leviton 1971; Tanner and Krogh 1973; Pianka and Parker 1975; Zeiner et al. 1990.

3.2.3 Arizona (southwestern) toad, *Bufo microscaphus microscaphus*

Status: BLM Sensitive, Nevada Natural Heritage Program Global Rank G4T3, State Rank SU.

Clark County MSHCP Status: Evaluation - high priority.

Range: Found in scattered localities along tributaries of the Colorado River in the Nevada, southwestern Utah, central Arizona, southwestern New Mexico, and in northern Mexico.

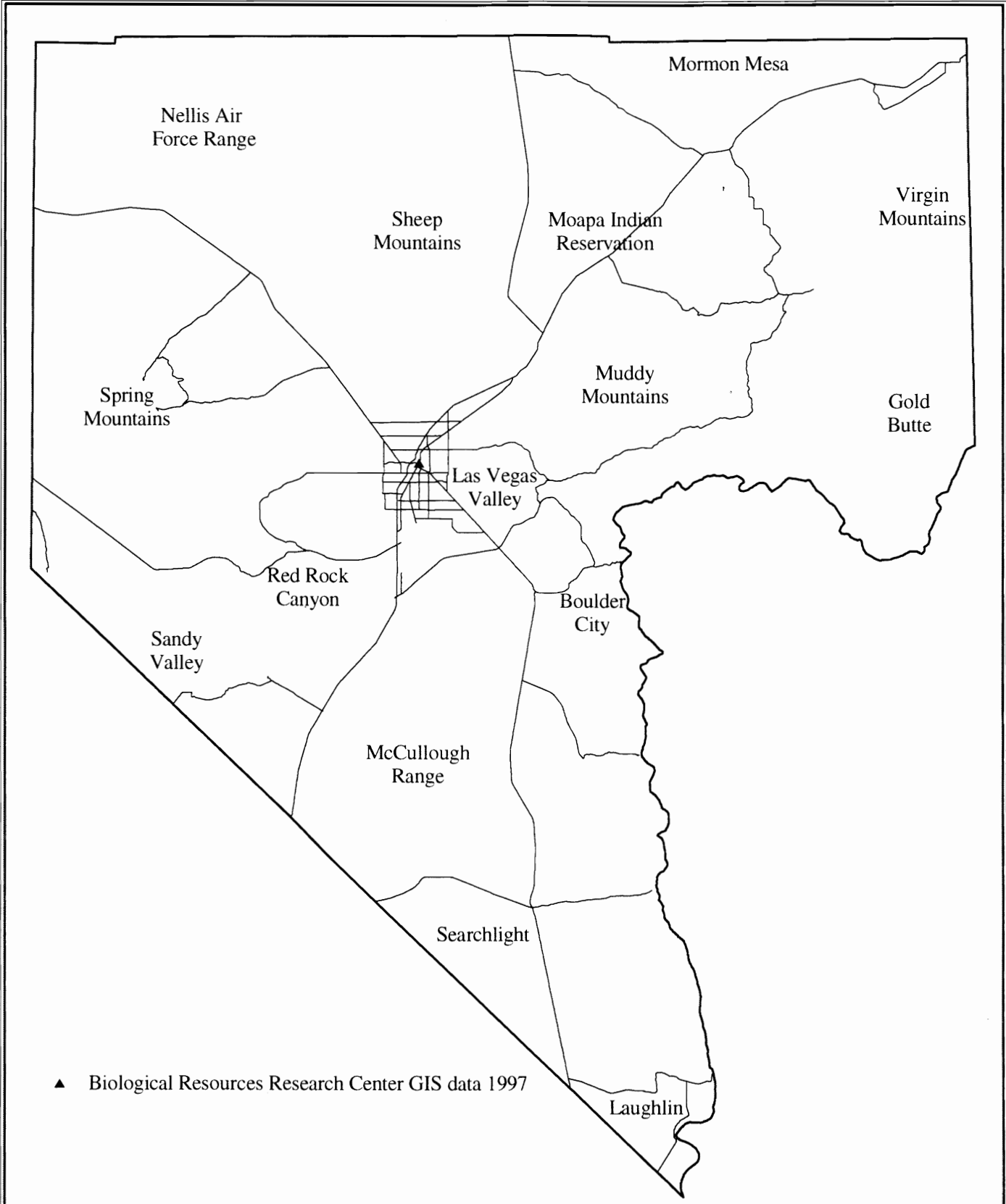
Clark County Distribution: Along the Virgin and Muddy Rivers, Meadow Valley Wash, and Colorado River to Hoover Dam. Prior sightings at Virgin, Bitter, Rogers, and Hiko Springs and Cabin Creek (Figure 3-11).

Habitat: Across its range, this toad inhabits a range of habitats including riparian washes, rocky streams, basins, agricultural, and urban areas up to 6,000 ft. They burrow in loose gravelly areas and sandy banks and range up to 500 ft from water. Adults are primarily nocturnal except during breeding season.

Population Trends: Decreasing due to habitat degradation.

Ecosystem Level Threats:

- reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- lowland riparian habitat degradation and modification associated with channelization. **Threat 1301**
- changes in riparian habitat quality due to changes in water flows (quantity, quality, seasonality) resulting from water diversion and groundwater pumping. **Threat 1302**
- decreased water availability to support riparian habitat. **Threat 1303**
- changes in water quality in riparian areas from grazing and agriculture (pesticides, herbicides, and fertilizer). **Threat 1304**
- habitat degradation resulting from spring diversion and modification. **Threat 1401**
- habitat degradation resulting from spring outflow diversion. **Threat 1402**
- decreased spring flows resulting from groundwater pumping. **Threat 1403**
- changes in spring water quality from grazing and agriculture (pesticides, herbicides, and fertilizer). **Threat 1404**
- reduced spring flow from overutilization by animals. **Threat 1405**
- habitat degradation and population decreases resulting from introductions, competition, and encroachment of exotic plant species (such as tamarisk, *Vallsineria*, fan palm invasion [upper Muddy], and other species). **Threat 1501**



▲ Biological Resources Research Center GIS data 1997



5 0 5 10 Miles
August 26, 1998



FIGURE 3-11
Bufo microscaphus microscaphus
Arizona (southwestern) toad
Known Locations

- Expansion of range of *Bufo woodhousii*, which may result in competition or hybridization (*Bufo microscaphus* may hybridize with *Bufo woodhousii* in the Virgin and Colorado Rivers). **Threat 1502**
- habitat degradation and wildlife displacement from extraction of minerals. **Threat 902**

Species Specific Threats: Not yet identified.

Existing and Potential Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See sections on desert riparian habitat.

Adequacy of Existing Management: Unknown. Most potential habitat for this species occurs on land managed by the BLM., NPS, and USFWS.

Additional Conservation Needs:

- Further investigate the distribution of this species in Clark County.
- Delineate and preserve remaining habitat in the Meadow Valley Wash from disturbance such as sand and gravel mining.
- Conservation actions identified under the Virgin and Muddy River recovery plans would benefit this species.
- Enhance habitat to favor the Arizona southwestern toad over Woodhouse toad.

References: Stebbins 1954, 1972, 1985; Brattstorm 1963; Mayhew 1968; Behler and King 1979; Zeiner et al. 1990; Bradford, pers. com. 1997, Yingling 1980.

3.2.4 Desert night lizard, *Xantusia vigilis*

Status: None.

Clark County MSHCP Status: Evaluation - high priority.

Range: Widely distributed in the Mojave and Colorado deserts.

Clark County Distribution: Widely distributed in the Mojave and Colorado deserts (Figure 3-12).

Habitat: Most commonly in **blackbrush**, **Mojave desert scrub**, and **mesquite/catclaw** habitats. Less commonly found in **pinyon-juniper** and **sagebrush** habitats. Associated with Joshua tree, yucca, digger pine, chamise, pinyon pine, and juniper. Dependent upon cover, primarily downed yucca logs.

Population Trends: Unknown.

Ecosystem Level Threats:

- poaching, illegal collection, or killing of flora and fauna. **Threat 1701**
- Collection of dead wood including yuccas skeletons. **Threat 1001**

Species Specific Threats: Not yet identified.

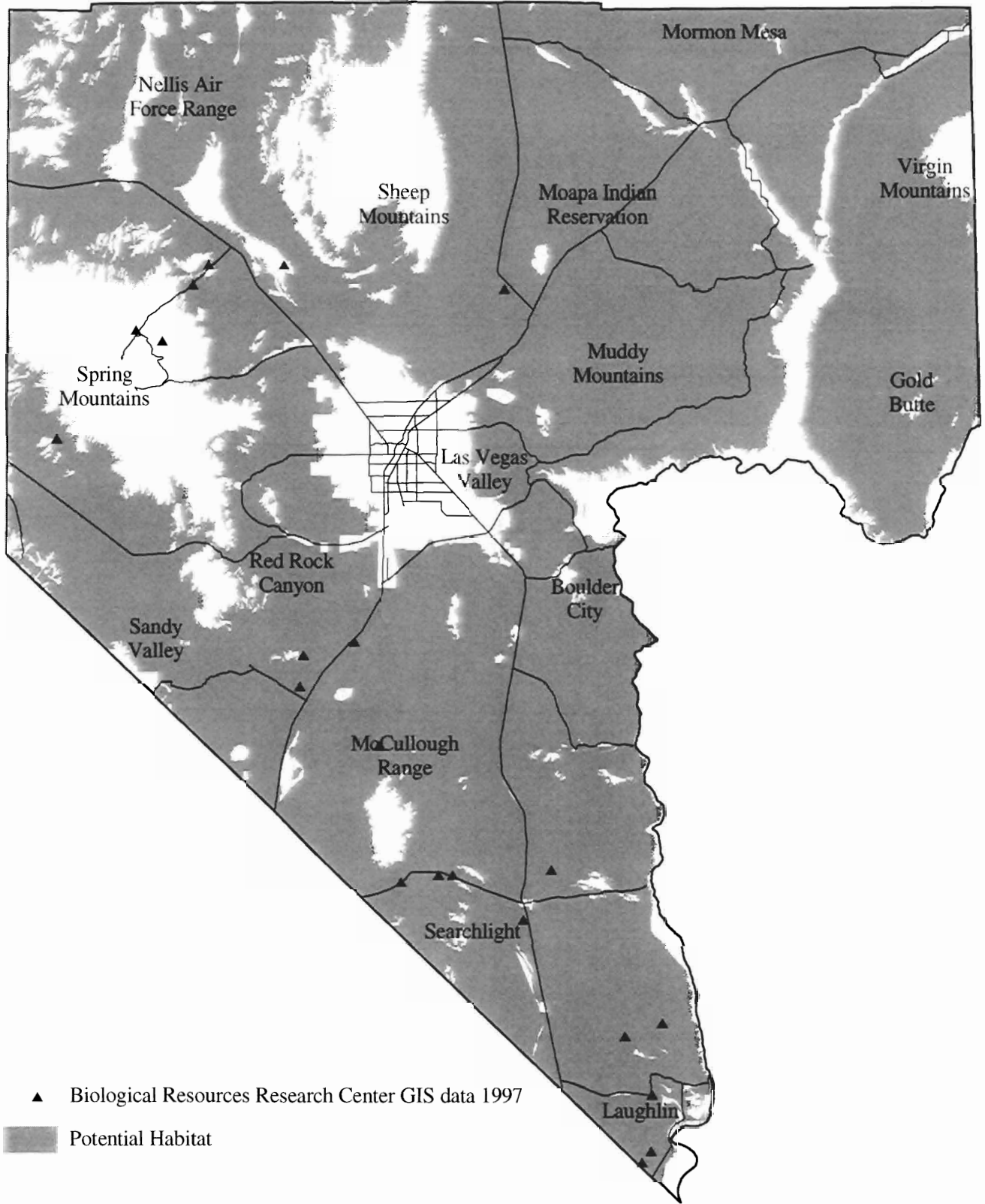
Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on Mojave desert scrub, mesquite/catclaw, blackbrush, pinyon-juniper, boreal islands, and lizards and snakes. In addition, the following existing or proposed conservation actions are essential to address threats to the desert night lizard.

NPS(22) Prohibit destructive collecting techniques such as breaking off rock flakes and rolling cap rocks to uncover lizards.

NDOW(17) Regulate hobby collection and hobby possession of authorized unprotected reptiles and amphibians.

Adequacy of Existing Management: The majority of the potential habitat for this species in Clark County is on BLM undesignated lands, although significant blocks of habitat occur in areas managed for the desert tortoise (more than 900,000 acres), and managed by NPS and USFWS.

References: Stebbins 1985; Medica 1997; Zeiner et al. 1988.



▲ Biological Resources Research Center GIS data 1997

■ Potential Habitat



5 0 5 10 Miles
August 26, 1998



FIGURE 3-12
Xantusia vigilis
Desert night lizard
Known Locations and Potential Habitat

3.3 Watch List Reptile and Amphibian Species

- Common zebra-tailed lizard, *Callisaurus draconoides draconoides*
- Pacific tree frog, *Hyla regilla*
- Plains toad, *Bufo cognatus*
- Woodhouse toad, *Bufo woodhousii*

4.0 Fish

The MSHCP includes a total of 9 species of fishes:

Covered	0
High Priority Evaluation	7
Medium Priority Evaluation	1
Low Priority Evaluation	0
Watch List	1

4.1 Covered Fish Species

There are no fish species proposed to be covered in Phase 1 of the MSHCP. However, ongoing conservation actions by BLM, USFWS, and NDOW provide some of the benefits identified in recovery plan documents for the Virgin and Muddy River systems. Section 404 of the Clean Water Act requires the U.S. Army Corps of Engineers to evaluate proposed activities that could result in modifications of habitat under their jurisdiction (waters of the U.S.) and to require that proposed activities avoid, minimize, and mitigate any significant impacts.

The development of watershed based conservation plans for the Virgin and Muddy Rivers will be among the highest priorities of Phase 2 of the MSHCP. These watershed-based plans will incorporate and build upon the existing conservation actions of BLM, USFWS, NDOW, and MRREIAC and focus on the integration of measures for the conservation of covered fish, birds, amphibians, invertebrates, and plants with local land use and resource issues.

4.2 Evaluation Fish Species

A total of eight fishes are included in the MSHCP as Evaluation Species. All inhabit the Muddy or Virgin Rivers, which drain into the Colorado River.

- Moapa dace, *Moapa coriacea*
- Woundfin, *Plagopterus argentissimus*
- Virgin River chub, *Gila seminuda*
- Virgin River chub (Muddy River population), *Gila seminuda*
- Desert sucker, *Catostomus clarki utahensis*
- Flannelmouth sucker, *Catostomus latipinnis*
- Moapa White River springfish, *Crenichthys baileyi moapae*
- Moapa speckled dace, *Rhinichthys osculus moapae*

4.2.1 Moapa dace, *Moapa coriacea*

Status: USFWS Endangered; NRS Endangered; Nevada Natural Heritage Program Global Rank G1 and State Rank S1.

Clark County MSHCP Status: Evaluation: High Priority.

Range: Springs and outflows and the headwaters of the Muddy River.

Clark County Distribution: The Moapa dace occurs in nearly 6 miles of stream and spring outflow habitat along the upper Muddy River and within five thermal headwater spring systems (Apcar, Baldwin, Cardy Lamb, and Muddy Spring on private lands and the Refuge spring system originating in the Moapa Valley National Wildlife Refuge).

Habitat: Adult Moapa dace inhabit spring pools, tributaries, and the main stem of the river but only reproduce in tributary thermal (86 to 89.5 degrees Fahrenheit) spring outflows. Juveniles occur in spring pools and outflows. Moapa dace are omnivorous drift feeders.

Population Trends: Federally listed endangered in 1967 with a revised recovery plan issued in 1996. Surveys in 1994 found 3,841 adults rangewide. This species was listed as endangered because of threats from habitat alteration which eliminated access to and/or destroyed spawning, nursery, and foraging areas; water loss; impoundments; and introductions of nonnative fishes and parasites.

Ecosystem Level Threats:

- The introduction and proliferation of non-native fishes and associated parasites and diseases. **Threat 1502**
- Reduced in-stream flows from numerous diversions. **Threat 1302**
- Impoundments that have negatively affected in-stream flow rates and changed substrate, aquatic vegetation, and fish species compositions. **Threat 1303**
- Physical alteration of spring, spring-outflow, and river habitats, which restrict fish access and modify natural flow, temperature, and sediment regimes. **Threat 1301, Threat 1401**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A that are beneficial to Moapa dace include conducting environmental education programs; monitoring and protecting water sources and flows; restoring habitat in adjacent uplands, tributaries, and the Muddy River; eradicating non-native species; and restricting pesticide/herbicide use near aquatic habitats. See also chapter on desert riparian habitat.

Adequacy of Existing Management: A Recovery Plan for the Rare Aquatic Species of the Muddy River Ecosystem has been developed to direct rangewide management efforts for Moapa dace. Recently, management actions for Moapa dace have been confined to the Moapa Valley NWR, including the headwaters of Muddy River. Approximately 95 percent of the existing Moapa dace habitat is in private ownership; only 5 percent is in public ownership within the Moapa Valley NWR. In addition, the USFWS and NDOW are implementing control of nonnative fishes in the spring systems in cooperation with private landowners.

Additional Conservation Needs: Adequate management of this species will require development of a coordinated management plan for the headwaters of the Muddy River including Federal, state, and private interests along the river. The management plan should include full implementation of the Recovery Plan actions outlined below that are central to the conservation of the Moapa dace:

- Protect and restore habitat through conservation agreements, easements, land purchases, or exchanges.
- Minimize non-native fish impacts.
- Develop and implement habitat restoration and management plans.
- Monitor the population.
- Provide public information and education.
- Implement other actions necessary to meet the USFWS down-listing and delisting criteria.

Moapa dace will be considered for down-listing from endangered to threatened when:

- Existing in-stream flows and historical habitat in three of the five occupied spring systems and the upper Muddy River have been protected through conservation agreements, easements, or fee title acquisition.
- 4,500 adult Moapa dace are present among the five spring systems and the upper Muddy River.
- The Moapa dace population is comprised of three or more age classes, and reproduction and recruitment are documented from three spring systems.

Moapa dace will be considered for delisting when all of the down-listing criteria are met and:

- 6,000 adult Moapa dace are present among the five spring systems and the upper Muddy River for five consecutive years.
- 75 percent of the historical habitat in the five spring systems and the upper Muddy River provide Moapa dace spawning, nursery, cover, and/or foraging habitat.
- Nonnative fishes and parasites no longer adversely affect the long-term survival of Moapa dace.

References: Hubbs and Miller 1948; LaRivers 1962; Scoppettone et al. 1987; USFWS 1996.

4.2.2 Woundfin, *Plagopterus argentissimus*

Status: USFWS Endangered; NRS Endangered; Nevada Natural Heritage Program Global Rank G1 and State Rank S1.

Clark County MSHCP Status: Evaluation: High Priority.

Range: The historic range of the woundfin included the lower Colorado River, Virgin River, and the Salt, Verde, and Gila Rivers in Arizona. Currently only found along the Virgin River from Pah Tempe Springs in Utah to Lake Mead.

Clark County Distribution: 25.9 miles along the Virgin River.

Habitat: Woundfin are most often collected in run and quiet water regimes adjacent to riffles with sand substrates. They are omnivorous feeders, their diet including algae, detritus, tamarisk seeds, and insects.

Population Trends: Woundfin have been extirpated from all of their historic range except in the Virgin River.

Ecosystem Level Threats:

- Riparian habitat degradation and modification associated with channelization. **Threat 1301**
- Physical alteration of spring, spring-outflow, and river habitats, which restrict fish access and modify natural flow, temperature, and sediment regimes. **Threat 1301, Threat 1401**
- Reduced in-stream flows from numerous diversions. **Threat 1302**
- Impoundments that have negatively affected in-stream flow rates and changed substrate, aquatic vegetation, and fish species compositions. **Threat 1303**
- Changes in water quality from grazing and agriculture (pesticides, herbicides, and fertilizer). **Threat 1404**
- The introduction and proliferation of non-native fishes and associated parasites and diseases. **Threat 1502**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on desert riparian habitat and springs.

Adequacy of Existing Management: Recovery plans were prepared in 1979 and 1985 and later revised in the 1995 Virgin River Fishes Recovery Plan. Approximately 25.9 miles of potential woundfin habitat occurs along the Virgin River in Clark County. This represents 27.3 percent of the total potential habitat for the species along the Virgin River system. In Clark County, approximately 9.9 miles (38 percent) of potential habitat is found on private land along the Virgin River; the remaining 16 miles (62 percent) of potential habitat occurs on public lands. Within the 16 miles, 3.3 miles are in state ownership and 12.7 miles are located on Federally managed lands (BLM, NPS). The Virgin River Basin Integrated Resource Management and Recovery Plan and Virgin River Fishes Recovery Plan provide a framework for conservation of woundfin and other species on the Virgin River. NDOW also has a program for the reintroduction of woundfin.

Current conservation activities benefit the species, but adequate conservation will require development and implementation of a coordinated management plan for the Virgin River incorporating some or all of the measures identified below.

Additional Conservation Needs: Develop a coordinated management plan for the Virgin River incorporating conservation needs identified in the Recovery Plan including:

- Conduct research into the ecology of the species' habitat.
- Protect, maintain, and enhance the native fish communities.
- Minimize non-native fish species and establish fish barriers for red shiner.
- Reestablish native fishes from below Johnson diversion to Lake Mead.
- Monitor existing habitats and develop and implement habitat improvements.
- Monitor in-stream flows.
- Acquire high-priority water rights or enter into agreements to maintain in-stream flows.
- Acquire land or protective conservation easements along the Virgin River for preservation of important habitats.
- Implement and monitor reintroduction programs.
- Establish additional populations within its historic range.
- Develop and implement educational and public informational programs about the species and recovery plans and actions.
- Establish two additional self-sustaining populations within its historical range.
- Legally protect essential habitats, important migration routes, required stream flows, and water quality of both the Virgin River and the habitat of the transplanted populations.
- Remove other significant threats associated with physical, chemical, or biological modifications that might make the habitat unsuitable for the endangered fish.

References: Hubbs 1955; Miller and Hubbs 1960; Deacon and Bradley 1972; Hickman 1987; USFWS 1995.

4.2.3 Virgin River chub, *Gila seminuda*

Status: USFWS Endangered; NRS Endangered; BLM Sensitive; Nevada Natural Heritage Program Global Rank G3 and State Rank S1.

Clark County MSHCP Status: Evaluation: High Priority.

Range: Virgin River chub historically occurred within the Virgin River between Pah Tempe Springs in Utah to the confluence with the Colorado River. They are currently found along the Virgin River between Pah Tempe Springs and the Mesquite diversion.

Clark County Distribution: Within 25.9 miles of the Virgin River; there is also a distinct population of this species in the Muddy River.

Habitat: Deep runs or pools of slow to moderate velocities with large boulders and in-stream cover.

Population Trends: Unknown.

Ecosystem Level Threats:

- Channelization and encroachment into the floodplain. **Threat 1301**
- Physical alteration of stream habitats, resulting in alterations to the natural flow, temperature, and sediment regimes. **Threat 1302**
- Dewatering from numerous diversion projects for agricultural purposes, impoundments, and urban development. The Virgin River has been modified to accommodate human needs, which include irrigation, municipal and industrial uses, recreation, and limited hydropower production. **Threat 1303**
- Localized grazing within the stream channel. **Threat 1304**
- The introduction and proliferation of non-native fishes. **Threat 1501**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on desert riparian habitat and springs.

Adequacy of Existing Management: Approximately 25.9 miles of potential Virgin River chub habitat occurs along the Virgin River in Clark County. This represents 27.3 percent of the total potential habitat for the species along the Virgin River system. In Clark County, approximately 9.9 miles (38 percent) of potential habitat is found on private land along the Virgin River; the remaining 16 miles (62 percent) of potential

habitat occurs on public lands. Within the 16 miles, 3.3 miles are in state ownership and 12.7 miles are located on Federally managed lands. The Virgin River Basin Integrated Resource Management and Recovery Plan and Virgin River Fishes Recovery Plan provide a framework for conservation of Virgin River chub and other species on the Virgin River.

Adequate management for this species will require development of a coordinated management plan for the Virgin River in Clark County, including Federal, state, and private interests along the river. The management plan should incorporate full implementation of the Virgin River Fishes Recovery Plan outlined below.

Additional Conservation Needs: Develop a coordinated management plan for the Virgin River incorporating conservation actions identified in the Virgin River Fishes Recovery Plan:

- Conduct research into the ecology of the species' habitat.
- Protect, maintain, and enhance the native fish communities.
- Minimize non-native fish species and establish fish barriers for red shiner.
- Reestablish native fishes from below Johnson diversion to Lake Mead.
- Monitor existing habitats and develop and implement habitat improvements.
- Monitor in-stream flows.
- Acquire high-priority water rights or enter into agreements to maintain in-stream flows.
- Acquire land or protective conservation easements along the Virgin River for preservation of important habitats.
- Implement and monitor reintroduction programs.
- Establish additional populations within its historic range.
- Develop and implement educational and public informational programs about the species and recovery plans and actions.

References: USFWS 1994, 1995; DeMarais et al. 1992; Deacon 1988; Gregory and Deacon 1994.

4.2.4 Virgin River chub (Muddy River population), *Gila seminuda*

Status: No USFWS status; NRS Protected; Nevada Natural Heritage Program Global Rank G3T1 and State Rank S1.

Clark County MSHCP Status: Evaluation: High Priority.

Range: Historically Virgin River chub were distributed throughout the Muddy River. Their range is now restricted to between the Warm Springs area and the Wells Siding Diversion to Bowman Reservoir.

Clark County Distribution: Virgin River chub occur in a distinct population within the Muddy River. A separate population occurs in the Virgin River.

Habitat: Deep runs or pools of slow to moderate velocities with sand, large rocks, and cover in the form of overhanging banks and tree roots.

Population Trends: Chub abundance decreased by as much as 83 percent in some reaches between 1938 and 1963. Between 1964 and 1968, chub distribution shifted upstream. By 1974-75, chub had been eliminated from the lower Muddy River and were further reduced in abundance in the middle river. Approximately 30,000 individuals remained in the river and spring systems as of 1995. Surveys in 1998 have documented the extirpation of chub in the spring systems and a substantial population decline in the river since 1995.

Ecosystem Level Threats:

- Chub habitat in the Muddy River has been destroyed or adversely modified by impoundments, channelization, water diversions, and reduced water flow. **Threat 1301**
- Chub population declines also likely related to changes in water quality and quantity and changes in river substrate. **Threat 1302**
- The introduction and proliferation of non-native fishes. **Threat 1501**
- Parasitism is an issue in this population; Asian fish tapeworms (with oriental snails and birds as intermediary hosts), nematodes, and anchor worms are identified parasites of the Virgin River chub. **Threat 1502**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A that are beneficial to Virgin River chub

include conducting environmental education programs; monitoring and protecting water sources and flows; restoring habitat in adjacent uplands, tributaries, and the Muddy River; eradicating non-native species; conducting life history and habitat assessments; and restricting pesticide/herbicide use near aquatic habitats. See chapters on desert riparian habitat and springs.

Adequacy of Existing Management: Approximately 16.5 miles of chub habitat still occurs along the Muddy River in Clark County. This represents 100 percent of remaining habitat for the Muddy River population of this species. Approximately 83 percent of the habitat is found on private land, 14 percent occurs on tribal lands, and 3 percent on Federal lands. The Recovery Plan for the Rare Aquatic Species of the Muddy River Ecosystem provides a framework for conservation of the Muddy River population of the Virgin River chub.

The Muddy River population of Virgin River chub is included in the Recovery Plan for the Rare Aquatic Species of the Muddy River Ecosystem. Adequate management of this species will require development of a coordinated management plan for the Muddy River, including Federal, state, and private interests along the river. The management plan should include full implementation of the Recovery Plan conservation actions outlined for other species below as well as measures for this population of the chub.

Additional Conservation Needs: Develop a coordinated management plan for the Muddy River including conservation needs specific to Virgin River chub, along with the actions recommended for other Covered Species including:

- Conduct research into the ecology of the species' habitat.
- Protect, maintain, and enhance the native fish communities.
- Minimize non-native fish impacts.
- Monitor existing habitats and develop and implement habitat improvements.
- Monitor in-stream flows and water quality.
- Acquire high-priority water rights or enter into agreements to maintain in-stream flows.
- Enter into conservation agreements, easements, land purchases, or exchanges along the Muddy River for preservation of important habitats.
- Develop and implement educational and public informational programs about the species and recovery actions.
- Develop refugium population.

References: USFWS 1996; Scopettone et al. 1996; Deacon and Bradley 1972; Cross 1976; Wilson et al. 1966; Scopettone et al. n.d. (unpublished data).

4.2.5 Desert sucker, *Catostomus clarki utahensis*

Status: None.

Clark County MSHCP Status: Evaluation: High Priority.

Range: Lower Colorado River drainage, and in tributaries in Nevada, Utah, and Arizona.

Clark County Distribution: Known from the Virgin River in Clark County.

Population Trends: Unknown.

Habitat: Small to moderately large streams with pools and riffles, mainly over bottom of gravel-rubble with sandy silt. Large adults remain in pools during the day, then move to riffles at night or in turbid conditions. Young tend to stay in quieter water along banks. Feeds on diatoms and other algae, detritus, and small invertebrates.

Ecosystem Level Threats: Relatively intolerant of low dissolved oxygen conditions, red shiner, and other predatory species. This species may have thermal preferences which limit its distribution.

- Channelization of the river and floodplain encroachment. **Threat 1301**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on desert riparian habitat and springs.

Adequacy of Existing Management: Adequate management of this species will require development of a coordinated management plan for the Virgin River, including Federal, state, and private interests along the river. The management plan should include full implementation of the Virgin River Fishes Recovery Plan conservation actions for other species.

Additional Conservation Needs: Develop a coordinated management plan for the Virgin River incorporating conservation needs identified in the Recovery Plan including:

- A continuous flow of information on population status, habitat requirements, and biotic interactions that must be integrated into the numerous water management activities in the system.

- Management plans must include efforts to provide for aesthetic values and wildlife habitat as well as providing water as a commodity for human consumption.
- Plans for native southwestern fishes should in part address (a) securing habitats, (b) species management strategies, and (c) ecosystem or landscape versus project or target, management of natural resources.
- Conservation easements or agreements.

References: Siegler and Siegler 1987; Cross 1976; Crabtree and Buth 1987; Clarkson and Minclay 1988; Smith 1992.

4.2.6 Flannelmouth sucker, *Catostomus latipinnis*

Status: BLM Sensitive; no USFWS status; Nevada Natural Heritage Program Global Rank G3G4 and State Rank S1.

Clark County MSHCP Status: Evaluation: High Priority.

Range: In Clark County the flannelmouth sucker is still common in the Virgin River and is found in the Colorado River basin, including some of its tributaries, but is infrequently collected in Lake Mead.

Clark County Distribution: The status of the flannelmouth sucker is unknown, but the species is considered to be extant throughout the Virgin River in Clark County.

Habitat: This bottom feeder is found in moderate to large rivers, seldom in small creeks, and is absent from impoundments. Typically found in pools and deeper runs and often enters the mouths of small tributaries; also found in riffles and backwaters. Reported to feed on algae, detritus, seeds, and benthic invertebrates. Spawns in riffles, usually over a substrate of coarse gravel; the young are generally found in shallower water than adults.

Population Trends: The extant populations of the species appear to be stable at this time. This species was previously used as a bait fish.

Ecosystem Level Threats: Threats at this time are considered to be low.

- Floodplain encroachment and channelization of the river. **Threat 1301**
- Potential threat due to predation by other fish and competition with non-native fish. **Threat 1501**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on desert riparian habitat and springs.

Adequacy of Existing Management: In Clark County the Virgin River habitat of the flannelmouth sucker consists of approximately 10 miles of private land and 16 miles of public land. The flannelmouth sucker is considered a species of concern in the lower Colorado River, but not in the Virgin River.

Adequate management of this species will require development of a coordinated management plan for the Virgin River, including Federal, state, and private interests

along the river. The management plan should include full implementation of the Virgin River Fishes Recovery Plan conservation actions for other species.

Additional Conservation Needs:

- Develop a coordinated management plan for the Virgin River incorporating conservation needs identified in the Recovery Plan including measures identified in the recovery plan for the Virgin River chub and woundfin which may benefit the flannelmouth sucker as well as actions developed for this species.

References: Sigler and Miller 1963; Sublette et al. 1990; Lee et al. 1980.

4.2.7 Moapa White River springfish, *Crenichthys baileyi moapae*

Status: No USFWS status; NRS Protected; Nevada Natural Heritage Program Global Rank G2T2 and State Rank S2.

Clark County MSHCP Status: Evaluation: High Priority.

Range: Muddy River endemic.

Clark County Distribution: Moapa White River springfish occur in stream habitat along the upper Muddy River and in five thermal headwater spring systems (Apcar, Baldwin, Cardy Lamb, and Muddy Springs on private lands, and the Refuge spring system originating on Moapa Valley NWR).

Habitat: Springfish occur in spring heads and in pools and backwaters along spring outflow streams and the upper Muddy River. They primarily feed on filamentous algae but also eat aquatic insects.

Population Trends: Unknown. The springfish population in the headwater spring systems was estimated at 25,000 in 1984, with additional springfish in the upper river.

Ecosystem Level Threats:

- Physical alteration of spring, spring outflow and river habitats, and resulting alterations to the natural flow, temperature, and sediment regimes. **Threat 1302**
- Reduced flows from numerous diversion projects for agricultural purposes. **Threat 1304**
- The introduction and proliferation of non-native fishes. **Threat 1501**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A that are beneficial to Moapa White River springfish include conducting environmental education programs; monitoring and protecting water sources and flows; restoring habitat in adjacent uplands, tributaries, and the Muddy River; eradicating non-native species; and restricting pesticide/herbicide use near aquatic habitats. See chapters on desert riparian habitat and springs.

Adequacy of Existing Management: Approximately 95 percent of the existing Moapa White River springfish habitat is in private ownership; only 5 percent is in public ownership within Moapa Valley NWR.

Adequate management of this species will require development of a coordinated management plan for the Muddy River, including Federal, state, and private interests along the river. The management plan should include full implementation of the Recovery Plan conservation actions outlined for other species below as well as measures for Moapa White River springfish.

Additional Conservation Needs: Develop a coordinated management plan for the Muddy River including actions to:

- Protect and restore Moapa White River springfish habitat.
- Enter into conservation agreements, land purchases, or exchanges.
- Minimize nonnative fish impacts.
- Develop and implement habitat restoration and management plans.
- Monitor the population.
- Provide public information and education.

References: Deacon and Bradley 1972; Cross 1976; Scopettone et al. 1987; USFWS 1995.

4.2.8 Moapa speckled dace, *Rhinichthys osculus moapae*

Status: No USFWS status; Nevada Natural Heritage Program Global Rank G5T1 and State Rank S1.

Clark County MSHCP Status: Evaluation: Medium Priority.

Range: Muddy River endemic.

Clark County Distribution: This species is found in the middle Muddy River upstream of Interstate 15.

Habitat: Typically live on the bottom in shallow, cobble riffles, hiding in low-flow velocity areas behind rocks. Spawning habitat consists of small patches of bare rocks and pebbles cleared of debris.

Population Trends: Population size is unknown, but they are thought to occur in relatively low numbers. A total of 706 Moapa speckled dace were captured on the Muddy River during a 1994 survey. Population numbers appear to be stable or possibly increasing based on 1998 survey data.

Ecosystem Level Threats:

- The introduction and proliferation of non-native fishes. **Threat 1501**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A that are beneficial to Moapa speckled dace include conducting environmental education programs; monitoring and protecting water sources and flows; restoring habitat in adjacent uplands, tributaries, and the Muddy River; eradicating non-native species; conducting life history and habitat assessments; and restricting pesticide/herbicide use near aquatic habitats. See chapters on desert riparian habitat and springs.

Adequacy of Existing Management: Habitat for this species is on both public and private lands along approximately 10.4 miles of the Muddy River between Warm Springs Road bridge and Interstate 15.

The Recovery Plan for Rare Aquatic Species of the Muddy River Ecosystem provides the framework for conservation of this species. Adequate conservation will require implementation of some or all of the measures below.

Additional Conservation Needs: Management of aquatic species in the Muddy River requires:

- A continuous flow of information on population status and habitat and biotic requirements.
- Management plans for native southwestern fishes should in part address (a) protecting habitats, (b) species management strategies, and (c) ecosystem or landscape versus project or target, management of natural resources.
- Conservation easements or agreements should be developed.

References: Deacon 1988; Gregory and Deacon 1994; Siegler and Siegler 1987; Cross 1976; Deacon and Bradley 1972; USFWS 1996; Scopettone et al. n.d. (unpublished data).

4.3 Watch List Fish Species

One fish species is included as a Watch List Species:

- Virgin spinedace, *Lepidomeda mollispinis mollispinis*

5.0 Invertebrates

The MSHCP includes a total of 52 species of invertebrates:

Covered	10
High Priority Evaluation	10
Medium Priority Evaluation	22
Low Priority Evaluation	0
Watch List	10

The Covered invertebrate species are primarily endemic high-elevation butterflies of the Spring Mountains and two endemic snails. The High Priority Evaluation Species are primarily associated with the springs and desert aquatic habitat of the Muddy River, although they also include recently described endemic high-elevation Spring Mountains ant and butterfly species. The remainder of the Evaluation Species are bee species.

5.1 Covered Invertebrate Species

Covered invertebrate species include:

- Dark blue butterfly, *Euphilotes enoptes purpurea*
- Spring Mountains icarioides blue, *Icaricia icarioides austinatorum*
- Mt. Charleston blue butterfly, *Icaricia shasta charlestonensis*
- Spring Mountains acastus checkerspot, *Chlosyne acastus robusta*
- Morand's checkerspot butterfly, *Euphydryas anicia morandi*
- Carole's silverspot butterfly, *Speyeria zerene carolae*
- Nevada admiral, *Limenitis weidemeyerii nevadae*
- Spring Mountains comma skipper, *Hesperia comma mojavensis*
- Spring Mountains springsnail, *Pyrgulopsis deaconi*
- Southeast Nevada springsnail, *Pyrgulopsis turbatrix*

The potential impacts, management, rationale for coverage, and measurable biological goals for each of the invertebrate species proposed for coverage in the MSHCP are summarized in Table 5-1.

TABLE 5-1
COVERED SPECIES CONSERVATION EVALUATIONS

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Dark blue butterfly <i>Euphilotes enoptes</i> ssp.	All known population and cited locations	none	none	USFS SMNRA	Spring Mtns endemic. Monitored and managed as part of the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss of larval host plant or nectar plant species habitat in SMNRA Maintain stable or increasing population numbers and host and larval plant species
Spring Mountains icarioides blue <i>Icaricia icarioides</i> ssp.	All known populations	none	none	USFS SMNRA	Spring Mtns endemic. All known habitat monitored and managed as part of the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss of larval host plant or nectar plant species habitat in SMNRA Maintain stable or increasing population numbers and host and larval plant species
Mt. Charleston blue butterfly <i>Icaricia shasta charlestonensis</i>	All known population and cited locations	none	none	USFS SMNRA	Spring Mtns endemic. All known habitat monitored and managed as part of the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss of larval host plant or nectar plant species habitat in SMNRA Maintain stable or increasing population numbers and host and larval plant species
Spring Mountains acastus checkerspot <i>Chlosyne acastus</i>	All known population and cited locations	none	none	USFS SMNRA	Spring Mtns endemic. All known habitat monitored and managed as part of the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss of larval host plant or nectar plant species habitat in SMNRA Maintain stable or increasing population numbers and host and larval plant species
Morand's checkerspot butterfly <i>Euphydryas anicia morandi</i>	All known population and cited locations	none	none	USFS SMNRA	Spring Mtns endemic. All known habitat monitored and managed as part of the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss of larval host plant or nectar plant species habitat in SMNRA Maintain stable or increasing population numbers and host and larval plant species
Carole's silverspot butterfly <i>Speyeria zerene carolae</i>	All known population and cited locations	none	none	USFS SMNRA	Spring Mtns endemic. All known habitat monitored and managed as part of the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss of larval host plant or nectar plant species habitat in SMNRA Maintain stable or increasing population numbers and host and larval plant species
Nevada admiral <i>Limnitis weidemeyeri nevadae</i>	All known population and cited locations	none	none	USFS SMNRA BLM Red Rock Cyn NCA USFWS (DNRW)	Southern Nevada endemic (Spring Mtns, Sheep Range). All known habitat monitored and managed as part of the Spring Mtns CA, BLM management actions for Red Rock Cyn, or USFWS management of the DNRW.	<ul style="list-style-type: none"> No net unmitigated loss of larval host plant or nectar plant species habitat in SMNRA or Sheep Range Maintain stable or increasing population numbers and host and larval plant species

TABLE 5-1
COVERED SPECIES CONSERVATION EVALUATIONS
(continued)

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Spring Mountains comma skipper <i>Hesperia comma</i> ssp.	All known populations	none	none	USFS SMNRA BLM Red Rock Cyn NCA	Spring Mtns endemic. All known habitat monitored and managed as part of the Spring Mtns CA or BLM management actions for Red Rock Cyn.	<ul style="list-style-type: none"> • No net unmitigated loss of larval host plant or nectar plant species habitat in SMNRA • Maintain stable or increasing population numbers and host and larval plant species
Spring Mountains springsnail <i>Pyrgulopsis deaconi</i>	2 extant and 1 extirpated population	none	none	USFS SMNRA BLM Red Rock Cyn NCA	Southern Nevada endemic with 2 of 3 extant populations in Clark Co within IMAs with specific management actions; only other population in Nye County.	<ul style="list-style-type: none"> • Increase number of springs with populations through reintroduction in Red Rock • Maintain stable or increasing populations at extant springs
Southeast Nevada springsnail <i>Pyrgulopsis turbatrix</i>	5 extant and 1 extirpated population	none	none	USFS SMNRA BLM Red Rock Cyn NCA	Red Rock endemic with 5 extant populations in IMA or LJMA lands managed by USFS and BLM.	<ul style="list-style-type: none"> • Increase number of springs with populations through reintroduction in Willow Springs • Maintain stable or increasing populations at extant springs

¹In all cases, projected potential impacts represent the “worst case” analysis.

5.1.1 Dark blue butterfly, *Euphilotes enoptes purpurea*

Status: Spring Mountains Species of Concern, BLM Sensitive, Nevada Natural Heritage Program Global Rank G5T3 and State Rank S3.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Spring Mountains endemic found at mid elevations (5,900 to 8,200 feet) (Figure 5-1). Known from 11 areas, including Willow and Cold Creek, Kyle Canyon, Carpenter Canyon, Mount Stirling, Coal Springs, and Lovell Canyon.

Habitat: Primarily **mixed conifer** and **pinyon-juniper**; also uses **sagebrush** and wet areas near high-elevation **springs**. Larval host plants: *Eriogonum umbellatum* var. *subaridum*; known nectar species: *E. umbellatum*. Requires water for puddling. The larval host plant is widespread but rarely locally abundant in the open pinyon-juniper and mixed conifer forest belts.

Population Trends: Unknown; believed to be stable.

Ecosystem Level Threats:

- Habitat modification or destruction could threaten populations. **Threat 202**
- Unregulated/uncontrolled fires in the Cold Creek and Willow Creek areas could threaten this species. **Threat 301**
- Effects of dispersed recreation, such as trampling of host plants or immature life stages. **Threat 401**
- Unregulated camping, expansion of campgrounds or increased human activity around campgrounds, especially at Cold Creek and Willow Creek, could result in trampling of host plants or immature life stages. **Threat 402**
- OHV activities in the lower elevations could result in destruction of host plants or immature life stages. **Threat 404**
- Maintenance along Kyle and Lee Canyon Highways, if inappropriately timed, could result in the loss or reduction of populations (e.g., mowing of adult nectar sources between July 15 and November 30). **Threat 504**
- Use of insecticides near populations and herbicides near host plants (and, possibly nectar sources) and mowing could result in the loss or reduction of populations. The population near the golf course could be particularly vulnerable if insecticides are used, as wet areas of the course are likely to attract the dark blue. **Threat 602**
- Grazing could result in destruction of host plants or trampling of immature life stages. **Threats 701 and 703**

Butterfly Sampling Locations

- Butterfly present
- Butterfly absent

- 200m topographic contours
- 1000m topographic contours
- Spring Mountains National Recreation Area (SMNRA) boundary within Clark County

Butterfly data collected by George Austin,
Nevada State Museum and Stuart Weiss, CCB-Stanford
Map adapted from: Final Report on Endemic Butterflies of the
Spring Mountains. Center for Conservation Biology, Stanford
University 1996. Prepared for U.S. Fish and Wildlife Service.



2 0 2 4 Miles

August 27, 1998



FIGURE 5-1
Euphilotes enoptes ssp.
Dark blue butterfly
Sampled Butterfly Distributions

- Development into occupied habitat could reduce or eliminate populations. Populations in the Cold Creek and Willow Creek area could be threatened by development of private property in the area. **Threat 1101**
- This species obtains water from muddy areas near springs; diversion or modifications which preclude this could reduce populations. **Threat 1401**

Species Specific Threats:

- Stochastic events since only 11 sites are known. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapters on mixed conifer, pinyon-juniper, sagebrush, springs, and butterflies) that would benefit this species include environmental education programs, implementation of a prescribed fire plan, habitat restoration and enhancement at recreation sites and in riparian areas, mowing, and coordination with NDOT and other outside entities on use of pesticides and herbicides. In addition, the following existing or proposed conservation actions are essential to address threats to the dark blue butterfly.

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)

- Relationships of ants and the larval stages of Bret's blue, Mt. Charleston blue, dark blue, and Spring Mountains icarioides blue. (CA6.2f)
- Habitat requirements of Morand's checkerspot, Mt. Charleston blue, Spring Mountains acastus checkerspot, and dark blue, to determine why the taxa are not distributed across the range of their host plants. (CA6.2g)

USFS(20) Inventory for populations of rare flora and fauna on an annual basis. Species and area priorities identified to date are as follows: (CA2.1)

- Butterflies - Spring Mountains acastus checkerspot, dark blue butterfly, Morand's checkerspot, Mt. Charleston blue - high priority (CA2.1h)

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)

Adequacy of Existing Management: The range of this species is almost entirely within IMA and LIMA lands managed by USFS.

Implementation of existing management, including BLM management and the provisions of the conservation agreement for the Spring Mountains NRA, should provide adequate conservation for this species. While the USFS will be working with private property owners within the SMNRA, Clark County could assist by developing a conservation agreement with residents to protect the dark blue butterfly, particularly near Cold Creek and Willow Creek.

References: Austin 1985; Austin and Austin 1980; Weiss et al. 1995 and 1997.

5.1.2 Spring Mountains *icarioides* blue, *Icaricia icarioides austinorum*

Status: Spring Mountains NRA Species of Concern, BLM Sensitive, Nevada National Heritage Program Global Rank G5T2 and State Rank S2

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Found at 23 sites in the central massif of the Spring Mountains at elevations of 5,900 to more than 9,800 feet. It was common in Kyle and Lee Canyons in 1994 (Figure 5-2). Predicted distribution is across much of the Spring Mountains, including Mount Stirling and Mt. Potosi. Common along the crest from Griffith Peak to upper Trout Canyon.

Habitat: In open stands and open meadows, primarily in **bristlecone pine** and **mixed conifer**; also uses **pinyon-juniper**, **sagebrush**, and wet areas near high-elevation **springs**. Larval host plants: *Lupinus argenteus*, common in disturbed areas, such as road cuts and campsites, but also occurs in the mixed conifer forest belt. Known nectar species: *Eriogonum umbellatum*, *Chaenactis douglasii*, *Potentilla* sp., *Lupinus* sp., *Linum lewisii*, *Melilotus albus*, *Erigeron* sp., *Senecio douglasii*. Requires water for puddling.

Population Trends: Unknown, but believed to be stable based on current distribution and historic records of disturbance.

Ecosystem Level Threats:

- Habitat modification or destruction could threaten populations. **Threat 202**
- The host plant of this species is common in disturbed areas, such as road cuts and campsites, but is not found in recent burn areas. Therefore fire could have a detrimental effect on this species. **Threat 301**
- Effects of dispersed recreation, such as trampling of host plants or immature life stages. **Threat 401**
- While the host plant benefits from some disturbance, expansion of campgrounds that eliminates habitat or results in extensive trampling of host plants or immature life stages would be detrimental. **Threat 402**
- OHV activities in the lower elevations could result in destruction of host plants or immature life stages. **Threat 404**
- Maintenance along Lee Canyon and the Kyle Canyon Highway, if inappropriately timed, could result in the loss or reduction of populations (e.g., mowing of adult nectar sources between July 15 and November 30). **Threat 504**

Butterfly Sampling Locations

- Butterfly present
- Butterfly absent

- 200m topographic contours
- 1000m topographic contours
- Spring Mountains National Recreation Area (SMNRA) boundary within Clark County

Butterfly data collected by George Austin, Nevada State Museum and Stuart Weiss, CCB-Stanford
Map adapted from: Final Report on Endemic Butterflies of the Spring Mountains. Center for Conservation Biology, Stanford University 1996. Prepared for U.S. Fish and Wildlife Service.



August 27, 1998



FIGURE 5-2

Plebejus icarioides ssp.
Spring Mountains icarioides blue
Sampled Butterfly Distributions

- Use of insecticides near populations and herbicides near host plants (and, possibly nectar sources) and mowing could result in the loss or reduction of populations. **Threat 602**
- Grazing could result in destruction of host plants or trampling of immature life stages. **Threats 701 and 703**
- Development into occupied habitat could reduce or eliminate populations. **Threat 1101**
- This species obtains water from muddy areas near springs; diversion or modifications which preclude this could reduce populations. **Threat 1401**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapters on bristlecone pine habitat, mixed conifer, springs, and butterflies) that would benefit this species include environmental education programs, implementation of a prescribed fire plan, habitat restoration and enhancement at recreation sites and in riparian areas, mowing, and coordination with NDOT and other outside entities on use of pesticides and herbicides. In addition, the following existing or proposed conservation actions are essential to address threats to the Spring Mountains icarioides blue butterfly.

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)
- Relationships of ants and the larval stages of Bret's blue, Mt. Charleston blue, dark blue, and Spring Mountains icarioides blue. (CA6.2f)

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)

Adequacy of Existing Management: The range of this species is almost entirely within IMA and LIMA lands managed by USFS.

Implementation of existing management, including BLM management and the provisions of the conservation agreement for the Spring Mountains NRA, should provide adequate conservation for this species.

References: Austin 1985; Austin and Austin 1980; Weiss et al. 1995 and 1997.

5.1.3 Mt. Charleston blue butterfly, *Icaricia shasta charlestonensis*

Status: Spring Mountains NRA Species of Concern, Nevada National Heritage Program Global Rank G5T1S1.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Seventeen documented occurrences in the Spring Mountains, including Lee Canyon, Wallace Canyon, and the ridgeline at 6,600 feet and above (Figure 5-3).

Habitat: Primarily **bristlecone pine**, but also in **mixed conifer** between 6,000 and 8,000 ft. Known larval host species: *Astragalus calycosus* var. *mancus*, which prefers shallow rocky soils. Nectar plants: *Hymenoxys lemmonii*, *Aster* sp., and *Eriogonum* sp.

Population Trends: Unknown.

Ecosystem Level Threats:

- Population trends are unknown. **Threat 102**
- Extirpated from several historic sites, but was newly discovered at several less accessible sites in 1995. **Threat 201**
- Habitat modification or destruction could threaten populations. **Threat 202**
- The host plant of this species is found in open areas and may require some disturbance to maintain those openings. Thus, it is possible that fire suppression would make habitat less suitable for this species. **Threat 301**
- The *Melilotus* sp. used for erosion control on the ski slope may overgrow the host plant, limiting available food for the larvae. **Threat 302**
- Effects of dispersed recreation, such as trampling of host plants or immature life stages. **Threat 401**
- Expansion of the ski slopes or increased human activity around campsites could result in destruction of host plants and/or immature life stages. **Threat 402**
- OHV activities in the lower elevations could result in destruction of host plants or immature life stages. **Threat 404**
- Although not currently found along roads, historic populations were located adjacent to roads. If these populations are to be reestablished road maintenance should be timed to avoid impacts to local populations. **Threat 504**

Butterfly Sampling Locations

- Butterfly present
- Butterfly absent

- 200m topographic contours
- 1000m topographic contours
- Spring Mountains National Recreation Area (SMNRA) boundary within Clark County

Butterfly data collected by George Austin,
Nevada State Museum and Stuart Weiss, CCB-Stanford
Map adapted from: Final Report on Endemic Butterflies of the
Spring Mountains. Center for Conservation Biology, Stanford
University 1996. Prepared for U.S. Fish and Wildlife Service.



2 0 2 4 Miles

August 27, 1998



FIGURE 5-3

Plebejus shasta charlestonensis
Mt. Charleston blue butterfly
Sampled Butterfly Distributions

- Use of insecticides near populations and herbicides near host plants (and, possibly nectar sources) and mowing could result in the loss or reduction of populations. **Threat 602**
- Grazing could result in destruction of host plants or trampling of immature life stages. **Threats 701 and 703**
- Development into occupied habitat could reduce or eliminate populations. **Threat 1101**

Species Specific Threats:

- Stochastic events since only 17 sites are known. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapters on bristlecone pine habitat, mixed conifer, and butterflies) that would benefit this species include environmental education programs, implementation of a prescribed fire plan, habitat restoration and enhancement at recreation sites and in riparian areas, mowing, and coordination with NDOT and other outside entities on use of pesticides and herbicides. In addition, the following existing or proposed conservation actions are essential to address threats to the Mt. Charleston blue butterfly.

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)
- Metapopulation dynamics of Mt. Charleston blue and Morand's checkerspot (including spatial limits of Wallace Canyon population), and genetic distinctiveness of three phenotypes of Morand's checkerspot. (CA6.2e)
- Relationships of ants and the larval stages of Bret's blue, Mt. Charleston blue, dark blue, and Spring Mountains icarioides blue. (CA6.2f)
- Habitat requirements of Morand's checkerspot, Mt. Charleston blue, Spring Mountains acastus checkerspot, and dark blue, to determine why the taxa are not distributed across the range of their host plants. (CA6.2g)

USFS(20) Inventory for populations of rare flora and fauna on an annual basis. Species and area priorities identified to date are as follows: (CA2.1)

- Butterflies - Spring Mountains acastus checkerspot, dark blue butterfly, Morand's checkerspot, Mt. Charleston blue - high priority (CA2.1h)

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)

Adequacy of Existing Management: The range of this species is almost entirely within IMA and LIMA lands managed by USFS.

Implementation of existing management, including the provisions of the conservation agreement for the Spring Mountains NRA should provide adequate conservation for this species.

References: USFWS 1996; Weiss et al. 1997; Weiss et al. 1995.

5.1.4 Spring Mountains acastus checkerspot, *Chlosyne acastus robusta*

Status: Spring Mountains NRA Species of Concern, BLM Sensitive, Nevada National Heritage Program Global Rank G1S1.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Spring Mountains, including Kyle Canyon wash, north side of Mount Stirling, west slope at Clark Canyon, and north side of Mt. Potosi (Figure 5-4). It was recorded from Coal Springs in the 1990s. Twelve documented occurrences.

Habitat: Primarily found in **mixed conifer** and **pinyon-juniper**; also found in **sagebrush**. Larval host plants: previously believed to be *Chrysanthamus*; however, current research indicates other species may be used; nectar species: *Viguiera multiflora*.

Population Trends: Unknown; may be declining due to development in or near habitat.

Ecosystem Level Threats:

- Population trends are unknown. **Threat 102**
- Habitat modification or destruction could threaten populations. **Threat 202**
- The host plant of this species prefers open areas and is abundant along washes and roadsides, increasing after disturbance. Many known occurrences are in burned or disturbed areas. Therefore, fire suppression may lead to the decline of the host plant, and consequently the species. **Threat 301**
- Effects of dispersed recreation, such as trampling of host plants or immature life stages. **Threat 401**
- Expansion of campgrounds or increased human activity around campgrounds could result in trampling of host plants or immature life stages. **Threat 402**
- OHV activities in the lower elevations could result in destruction of host plants or immature life stages. **Threat 404**
- Maintenance along the Deer Creek Highway, if inappropriately timed, could result in the loss or reduction of populations (e.g., mowing of adult nectar sources between July 15 and November 30). **Threat 504**
- Use of insecticides near populations and herbicides near host plants (and, possibly nectar sources) and mowing could result in the loss or reduction of populations. **Threat 602**

Butterfly Sampling Locations

- Butterfly present
- Butterfly absent

- 200m topographic contours
- 1000m topographic contours
- Spring Mountains National Recreation Area (SMNRA) boundary within Clark County

Butterfly data collected by George Austin, Nevada State Museum and Stuart Weiss, CCB-Stanford
Map adapted from: Final Report on Endemic Butterflies of the Spring Mountains. Center for Conservation Biology, Stanford University 1996. Prepared for U.S. Fish and Wildlife Service.

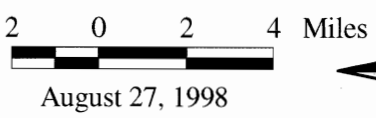


FIGURE 5-4

Chlosyne acastus

Spring Mountains acastus checkerspot
Sampled Butterfly Distributions

- Grazing could result in destruction of host plants or trampling of immature life stages. **Threats 701 and 703**
- Development into occupied habitat could reduce or eliminate populations. **Threat 1101**

Species Specific Threats:

- Stochastic events since only 12 sites are known. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapters on mixed conifer, pinyon juniper, and butterflies) that would benefit this species include environmental education programs, implementation of a prescribed fire plan, habitat restoration and enhancement at recreation sites and in riparian areas, mowing, and coordination with NDOT and other outside entities on use of pesticides and herbicides. In addition, the following existing or proposed conservation actions are essential to address threats to the Spring Mountains acastus checkerspot.

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)

Adequacy of Existing Management: The range of this species is almost entirely within IMA and LIMA lands managed by USFS.

Implementation of existing management, including BLM management and the provisions of the conservation agreement for the Spring Mountains NRA, should provide adequate conservation for this species. Additionally, the Boy Scout Camp management should be notified of the existence and needs of this species. Clark County should provide information on positive steps that can be taken to help this species and pursue the development of a conservation agreement or easement.

References: Austin 1990; Weiss et al. 1995; Weiss 1997.

5.1.5 Morand's checkerspot butterfly, *Euphydryas anicia morandi*

Status: Spring Mountains NRA Species of Concern, Nevada National Heritage Program Global Rank G5T5 and State Rank S1.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

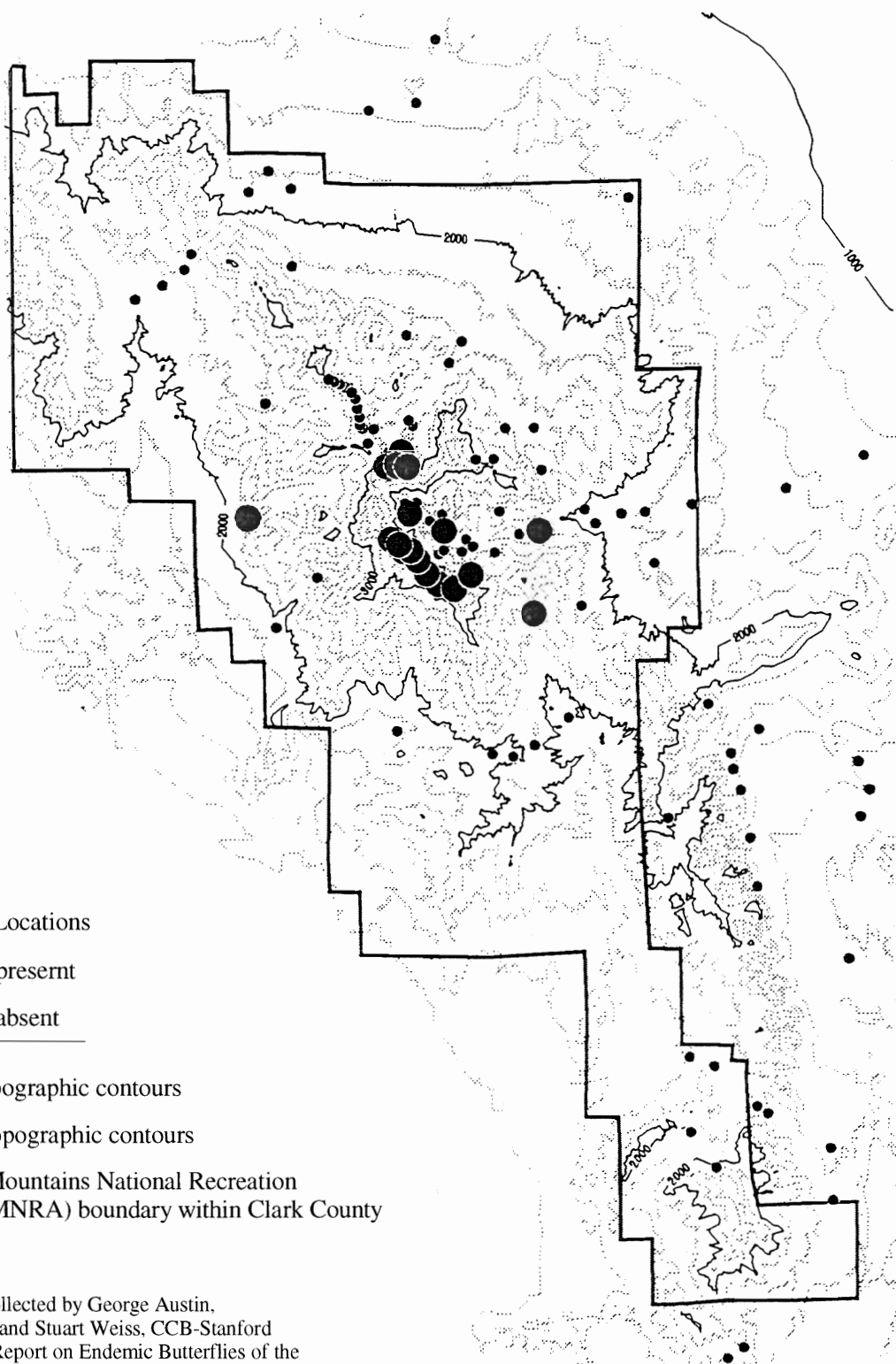
Clark County Distribution: Spring Mountains in meadows on the ridge to Charleston Peak and above the Lee Canyon ski area from 6,800 to 11,280 ft (Figure 5-5). General locations include Lee, Kyle, Wheeler, Wallace, Carpenter, and Trail Canyons and from Griffith Peak to Upper Carpenter Canyon along the ridgeline in 1995.

Habitat: Primarily meadows within **bristlecone pine**; also occurs in **mixed conifer** and **pinyon-juniper**. Larval host plants: *Castilleja lineriaefolia* and *C. martinii* var. *clokeyi*, and possibly *Penstemon* sp. (not observed). Known nectar species: *Taraxacum officinale*, *Erysimum asperum*.

Population Trends: Unknown.

Ecosystem Level Threats:

- Habitat modification or destruction could threaten populations. **Threat 202**
- This species may require some disturbance, including fire, for its survival, as many populations are associated with fire or avalanche chutes. **Threat 301**
- Effects of dispersed recreation, such as trampling of host plants or immature life stages. **Threat 401**
- Expansion of the Kyle Canyon campground or increased human activity around the campground could result in trampling of host plants or immature life stages. Any expansion of the Lee Canyon Ski area could threaten this species and should be reviewed carefully. **Threat 402**
- OHV activities in the lower elevations could result in destruction of host plants or immature life stages. **Threat 404**
- Maintenance along the Kyle and Lee Canyon Highways, if inappropriately timed, could result in the loss or reduction of populations (e.g., mowing of adult nectar sources between July 15 and November 30). **Threat 504**
- Use of insecticides near populations and herbicides near host plants (and, possibly nectar sources) and mowing could result in the loss or reduction of populations. **Threat 602**



Butterfly Sampling Locations

- Butterfly present
- Butterfly absent

- 200m topographic contours
- 1000m topographic contours
- Spring Mountains National Recreation Area (SMNRA) boundary within Clark County

Butterfly data collected by George Austin,
 Nevada State Museum and Stuart Weiss, CCB-Stanford
 Map adapted from: Final Report on Endemic Butterflies of the
 Spring Mountains. Center for Conservation Biology, Stanford
 University 1996. Prepared for U.S. Fish and Wildlife Service.



August 27, 1998



FIGURE 5-5

Euphydryas anicia morandi
Morand's checkerspot butterfly
Sampled Butterfly Distributions

- Grazing could result in destruction of host plants or trampling of immature life stages. **Threats 701 and 703**
- Development into occupied habitat could reduce or eliminate populations. **Threat 1101**

Species Specific Threats:

- Stochastic events since only 9 sites are known. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapters on bristlecone pine habitat, mixed conifer, pinyon juniper, and butterflies) that would benefit this species include environmental education programs, implementation of a prescribed fire plan, habitat restoration and enhancement at recreation sites and in riparian areas, mowing, and coordination with NDOT and other outside entities on use of pesticides and herbicides. In addition, the following existing or proposed conservation actions are essential to address threats to Morand's checkerspot.

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)
- Metapopulation dynamics of Mt. Charleston blue and Morand's checkerspot (including spatial limits of Wallace Canyon population), and genetic distinctiveness of three phenotypes of Morand's checkerspot. (CA6.2e)
- Habitat requirements of Morand's checkerspot, Mt. Charleston blue, Spring Mountains acastus checkerspot, and dark blue, to determine why the taxa are not distributed across the range of their host plants. (CA6.2g)

USFS(20) Inventory for populations of rare flora and fauna on an annual basis. Species and area priorities identified to date are as follows: (CA2.1)

- Butterflies - Spring Mountains acastus checkerspot, dark blue butterfly, Morand's checkerspot, Mt. Charleston blue - high priority (CA2.1h)

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)

Adequacy of Existing Management: The range of this species is almost entirely within IMA and LIMA lands managed by USFS.

Implementation of existing management, including the provisions of the conservation agreement for the Spring Mountains NRA, and measures proposed by NDOT for the MSHCP, should provide adequate conservation for this species.

References: Austin 1985; Austin and Austin 1980, Weiss, et al. 1995, 1997.

5.1.6 Carole's silverspot butterfly, *Speyeria zerene carolae*

Status: Spring Mountains NRA Species of Concern, BLM Sensitive, Nevada National Heritage Program Global Rank G5T2 and State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Widely distributed (37 sites) around the central massif of the Spring Mountains from 5,000 to 10,500 ft (Figure 5-6). Also known from Mount Stirling, Mount Potosi, and Lowell Wash.

Habitat: Primarily **bristlecone pine**; also occurs in **mixed conifer, pinyon-juniper, and sagebrush**. Larval host plants: *Viola purpurea* var. *charlestonensis*. Known nectar species: *Cirsium arizonicum*, *Erysimum asperum*, *Apocynum androsaemifolium*, *Rosa woodsii*, *Angelica scabrida*, *Chaenactis* sp., *Lupinus* sp.

Population Trends: Unknown, but believed to be stable based on current distribution and historic records of occurrence.

Ecosystem Level Threats:

- Habitat modification or destruction could threaten populations. **Threat 202**
- Most sites where the host plant of this species is found are old burned areas. Therefore, fire suppression may lead to the decline of the host plant, and consequently the species. **Threat 301**
- Effects of dispersed recreation, such as trampling of host plants or immature life stages. **Threat 401**
- Expansion of campgrounds or increased human activity around campgrounds could result in trampling of host plants or immature life stages. **Threat 402**
- OHV activities in the lower elevations could result in destruction of host plants or immature life stages. **Threat 404**
- Maintenance along Lee Canyon, Deer Creek, and the Kyle Canyon Highway, if inappropriately timed, could result in the loss or reduction of populations (e.g., mowing of adult nectar sources between July 15 and November 30). **Threat 504**
- Use of insecticides near populations and herbicides near host plants (and, possibly nectar sources) and mowing could result in the loss or reduction of populations. **Threat 602**

Butterfly Sampling Locations

- Butterfly present
- Butterfly absent

- 200m topographic contours
- 1000m topographic contours
- Spring Mountains National Recreation Area (SMNRA) boundary within Clark County

Butterfly data collected by George Austin,
Nevada State Museum and Stuart Weiss, CCB-Stanford
Map adapted from: Final Report on Endemic Butterflies of the
Spring Mountains. Center for Conservation Biology, Stanford
University 1996. Prepared for U.S. Fish and Wildlife Service.



2 0 2 4 Miles

August 27, 1998



FIGURE 5-6
Speyeria zerene carolae
Carole's silverspot butterfly
Sampled Butterfly Distributions

- Grazing could result in destruction of host plants or trampling of immature life stages. **Threats 701 and 703**
- Development into occupied habitat could reduce or eliminate populations. **Threat 1101**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapters on bristlecone pine habitat, mixed conifer, pinyon juniper, sagebrush, and butterflies) that would benefit this species include environmental education programs, implementation of a prescribed fire plan, habitat restoration and enhancement at recreation sites and in riparian areas, mowing, and coordination with NDOT and other outside entities on use of pesticides and herbicides. In addition, the following existing or proposed conservation actions are essential to address threats to Carole's silverspot.

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)

Adequacy of Existing Management: The range of this species is almost entirely within IMA and LIMA lands managed by USFS.

Implementation of existing management, including the BLM management and provisions of the conservation agreement for the Spring Mountains NRA, should provide adequate conservation for this species. The AMP should include a protocol to conduct additional surveys for *Viola purpurea* var. *charlestonensis*, the larval host plant, to determine if it is more widespread than currently known to be.

References: Austin and Austin 1980; Savage 1989; Weiss et al. 1995; Weiss 1996; Nevada Natural Heritage Program 1989.

5.1.7 Nevada admiral, *Limenitus weidemeyeri nevadae*

Status: Spring Mountains NRA Species of Concern, BLM Sensitive, Nevada National Heritage Program Global Rank G5T2 and State Rank S2.

Clark County MSHCP Status: Covered.

Range: Southern Nevada endemic (Spring and Sheep Mountains)

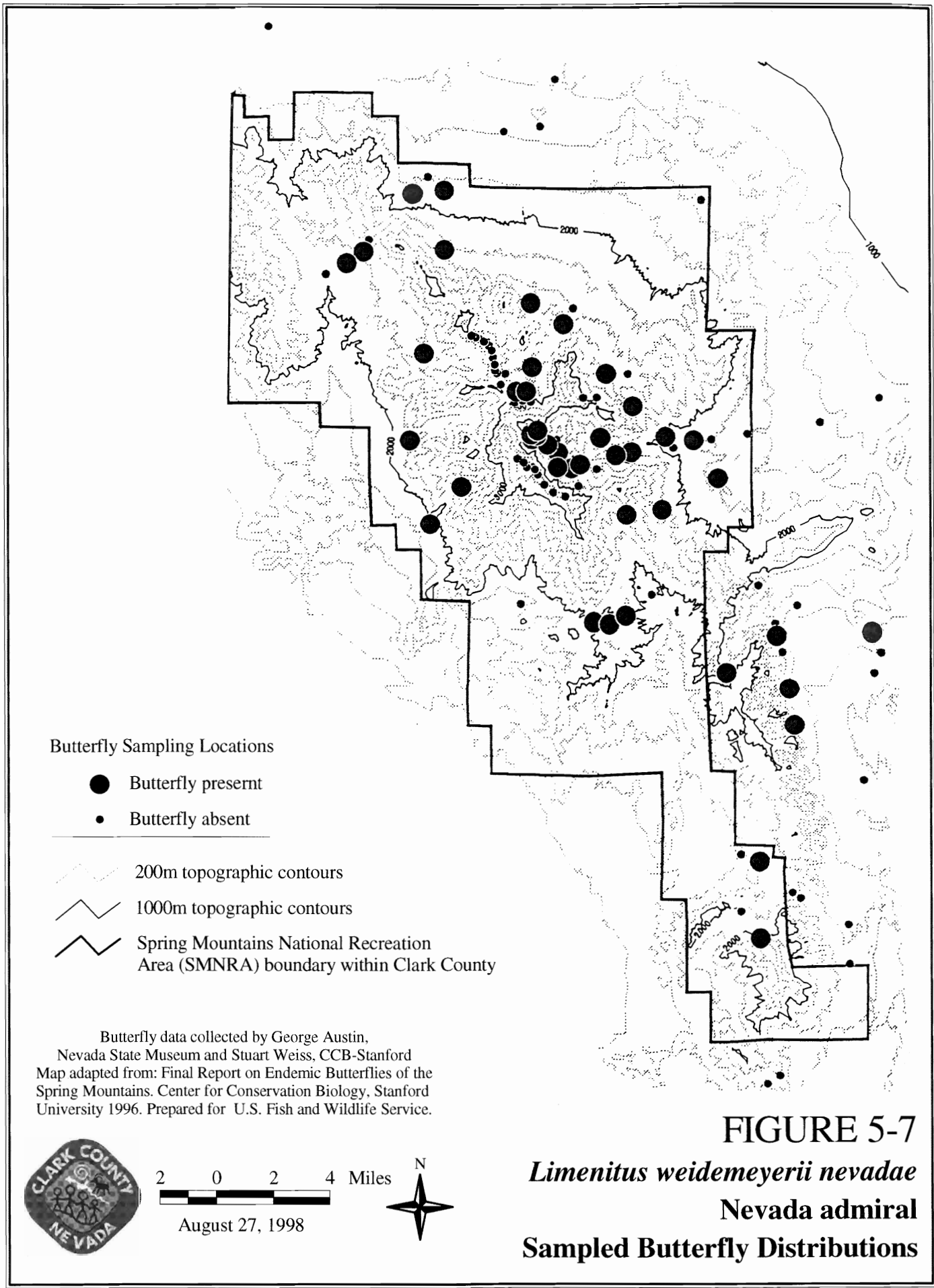
Clark County Distribution: Known from 46 sites, between 3,000 and 9,200 ft from Mt. Potosi to Mount Stirling in the Spring Mountains and in the Sheep Range (Figure 5-7).

Habitat: Primarily **bristlecone pine**, but also **mixed conifer, pinyon-juniper**, and wet areas near high-elevation **springs**. Larval host plants: *Populus tremuloides*, *Salix* sp., *Prunus virginiana*, and *Amelanchier utahensis*, and possibly *Populus angustifolia* and/or *P. fremontii*. Nectar species: *Eriodictyon angustifolium*, *Cirsium* sp., *Clematis liquiticiifolia*, *Marrubium vulgare*.

Population Trends: Unknown, but believed to be stable based on current distribution and historic records of occurrence.

Ecosystem Level Threats:

- Habitat modification or destruction could threaten populations. **Threat 202**
- Use of fire suppressant is suspected of causing a die-off of willows at Willow Creek, which reduced the butterfly population there. **Threat 301**
- Effects of dispersed recreation, such as trampling of host plants or immature life stages. **Threat 401**
- Expansion of campgrounds or increased human activity around campgrounds could result in trampling of host plants or immature life stages. **Threat 402**
- OHV activities in the lower elevations could result in destruction of host plants or immature life stages. **Threat 404**
- Maintenance along Lee Canyon, Deer Creek, and the Kyle Canyon Highways, if inappropriately timed, could result in the loss or reduction of populations (cutting of Willow branches at any time of year or mowing of adult nectar sources between July 15 and November 30). **Threat 504**
- Use of insecticides near populations and herbicides near host plants (and, possibly nectar sources) and mowing could result in the loss or reduction of populations. **Threat 602**
- Grazing could result in destruction of host plants or trampling of immature life stages. **Threats 701 and 703**



Butterfly Sampling Locations

- Butterfly present
- Butterfly absent

- 200m topographic contours
- 1000m topographic contours
- Spring Mountains National Recreation Area (SMNRA) boundary within Clark County

Butterfly data collected by George Austin,
 Nevada State Museum and Stuart Weiss, CCB-Stanford
 Map adapted from: Final Report on Endemic Butterflies of the
 Spring Mountains. Center for Conservation Biology, Stanford
 University 1996. Prepared for U.S. Fish and Wildlife Service.



2 0 2 4 Miles

August 27, 1998



FIGURE 5-7

Limenitis weidemeyerii nevadae
 Nevada admiral
 Sampled Butterfly Distributions

- Development into occupied habitat could reduce or eliminate populations. **Threat 1101**
- Diversions or modifications at Cold or Willow Creek, which reduce the ability to support willows could result in population declines of Nevada admiral. **Threat 1401**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapters on bristlecone pine habitat, mixed conifer, pinyon juniper, springs, and butterflies) that would benefit this species include environmental education programs, implementation of a prescribed fire plan, habitat restoration and enhancement at recreation sites and in riparian areas, mowing, and coordination with NDOT and other outside entities on use of pesticides and herbicides. In addition, the following existing or proposed conservation actions are essential to address threats to the Nevada admiral.

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)

Adequacy of Existing Management: The range of this species is almost entirely within IMA and LIMA lands managed by USFS and BLM.

Implementation of existing management, including BLM management and the provisions of the conservation agreement for the Spring Mountains NRA, should provide adequate conservation for this species.

References: Weiss et al. 1995, 1997.

5.1.8 Spring Mountains comma skipper, *Hesperia comma mojavensis*

Status: Spring Mountains NRA Species of Concern, BLM Sensitive, Nevada National Heritage Program Global Rank G5T2 and State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Clark and Nye Counties, Spring Mountains endemic. Found at 45 sites in the Spring Mountains woodland and forest belts at elevations of 5,000 to 11,300 ft in 1994 and 1995 (Figure 5-8).

Habitat: Primarily **bristlecone pine**; also occurs in **mixed conifer, pinyon-juniper, sagebrush**, and wet areas near high-elevation **springs**. Larval host plants: perennial grasses/*Carex*, which are common in the Spring Mountains. Known nectar species: *Cirsium* sp., *Chaenactis douglasii*, *Apocynum androsaemifolium*, *Chrysothamnus* sp., *Taraxacum officinale*, *Sarcostemma cyachoides*, *Penstemon palmeri*, *Erysimum asperum*. Uses water for puddling.

Population Trends: Unknown, but believed to be stable based on current distribution and historic records of occurrence.

Ecosystem Level Threats:

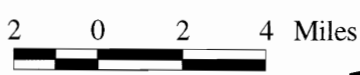
- Mountain meadows likely require disturbance to be maintained, therefore fire suppression could result in habitat loss. **Threat 301**
- Effects of dispersed recreation, such as trampling of host plants or immature life stages. **Threat 401**
- Expansion of campgrounds into occupied areas could result in population reductions. **Threat 402**
- OHV activities in the lower elevations could result in destruction of host plants or immature life stages. **Threat 404**
- Maintenance along roads, if inappropriately timed, could result in the loss or reduction of populations (e.g., mowing of adult nectar sources between July 15 and November 30). **Threat 504**
- Use of insecticides near populations and herbicides near host plants (and, possibly nectar sources) and mowing could result in the loss or reduction of populations. **Threat 602**
- Grazing could result in destruction of host plants or trampling of immature life stages. **Threats 701 and 703**

Butterfly Sampling Locations

- Butterfly present
- Butterfly absent

- 200m topographic contours
- 1000m topographic contours
- Spring Mountains National Recreation Area (SMNRA) boundary within Clark County

Butterfly data collected by George Austin,
Nevada State Museum and Stuart Weiss, CCB-Stanford
Map adapted from: Final Report on Endemic Butterflies of the
Spring Mountains. Center for Conservation Biology, Stanford
University 1996. Prepared for U.S. Fish and Wildlife Service.



August 27, 1998



FIGURE 5-8

Hesperia comma ssp.
Spring Mountains comma skipper
Sampled Butterfly Distributions

- Development into occupied habitat could reduce or eliminate populations. **Threat 1101**
- This species obtains water from muddy areas near springs; diversion or modifications which preclude this could reduce populations. **Threat 1401**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapters on bristlecone pine habitat, mixed conifer, springs, and butterflies) that would benefit this species include environmental education programs, implementation of a prescribed fire plan, habitat restoration and enhancement at recreation sites and in riparian areas, mowing, and coordination with NDOT and other outside entities on use of pesticides and herbicides. In addition, the following existing or proposed conservation actions are essential to address threats to the Spring Mountains comma skipper.

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)

Adequacy of Existing Management: The range of this species is almost entirely within IMA and LIMA lands managed by USFS and BLM.

Implementation of existing management, including BLM management and the provisions of the conservation agreement for the Spring Mountains NRA, should provide adequate conservation for this species. The AMP should include a protocol to evaluate the impacts of wild horse grazing on this species.

References: Austin 1990; Austin 1985; Austin and Austin 1980; Weiss et al. 1995 and 1997.

5.1.9 Spring Mountains springsnail, *Pyrgulopsis deaconi*

Status: USFS Species of Concern, BLM Sensitive.

Clark County MSHCP Status: Covered.

Range: Southern Nevada endemic.

Clark County Distribution: Willow and Red Springs in Red Rock Canyon NCA, Kiup Spring in the Spring Mountains NRA, and in Pahrump Spring on private land in Nye County.

Habitat: Spring habitat at dispersed locations: Kiup, Willow (extirpated), Red and Pahrump springs (extirpated).

Population Trends: Unknown.

Ecosystem Level Threats:

- Habitat degradation and modification resulting from concentrated recreation (camping, ski area expansion, facilities development). **Threat 402**
- Habitat degradation by wild horse and burro grazing and trampling. **Threat 701**
- Habitat degradation resulting from spring diversion and modification. **Threat 1401**
- Habitat degradation resulting from spring outflow diversion. **Threat 1402**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**

Adequacy of Existing Management: Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapter on springs) that would benefit this species include environmental education programs; riparian protection, restoration, and enhancement; and reestablishment of extirpated springsnail populations. In addition, specific conservation actions for springsnails include:

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 other actions. This program will provide

information needed to assess management suitability and the need to modify management practices in these area, including: 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)

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)

BLM(106) Take appropriate protective actions to maintain or improve springsnail habitat, including the reestablishment of populations of springsnails.

Adequacy of Existing Management: Implementation of existing management, including the provisions of the conservation agreement for the Spring Mountains NRA and implementation of the BLM measures outlined above should provide adequate conservation for this species. Willow and Red Springs are within the Red Rock Canyon NCA, Kiup is in the Spring Mountains NRA, and Pahrump is on private land. The two extant springs are managed to minimize impacts of recreation activities. Habitat for this species is almost entirely within IMA lands managed by the USFS and BLM.

References: USFWS 1996.

5.1.10 Southeast Nevada springsnail, *Pyrgulopsis turbatrix*

Status: USFS Species of Concern, BLM Sensitive.

Clark County MSHCP Status: Covered.

Range: Red Rock endemic.

Clark County Distribution: Springs on east slopes of Spring Mountains.

Habitat: Lost Creek, Willow Creek, Cold Creek, Grapevine Springs, La Madre, and Willow Springs (extirpated) in Red Rock Canyon NCA.

Population Trends: Stable.

Ecosystem Level Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**
- Reduction of populations of flora and fauna resulting from commercial collection. **Threat 201**
- Habitat modification and degradation resulting from commercial collection. **Threat 202**
- Habitat degradation and modification resulting from concentrated recreation (camping, ski area expansion, facilities development). **Threat 402**
- Increased use of pesticides and herbicides (resulting in mortality in non-targets species, eggshell thinning, and other inadvertent consequences). **Threat 602**
- Habitat degradation by wild horse and burro grazing and trampling. **Threat 701**
- Habitat degradation resulting from spring diversion and modification. **Threat 1401**
- Habitat degradation resulting from spring outflow diversion. **Threat 1402**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions identified in Appendix A (see chapter on springs) that would benefit this species include environmental education programs; riparian protection, restoration, and enhancement; and reestablishment of extirpated springsnail populations. In addition, specific conservation actions for springsnails include:

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 other actions. This program will provide information needed to assess management suitability and the need to modify management practices in these area, including: 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)

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)

BLM(106) Take appropriate protective actions to maintain or improve springsnail habitat, including the reestablishment of populations of springsnails.

Adequacy of Existing Management: Implementation of existing management, including the provisions of the conservation agreement for the Spring Mountains NRA and implementation of the BLM measures outlined above should provide adequate conservation for this species. The springs are primarily in the Red Rock Canyon NCA. The springs are managed to minimize impacts of recreation activities. Habitat for this species is almost entirely within IMA lands managed by the USFS and BLM..

References: USFWS 1996.

5.2 Evaluation Invertebrate Species

Evaluation Species below are subject to change. Also, a number of bee species are included as Evaluation Species but insufficient detail is available at this time.

High Priority

- Bret's blue butterfly, *Euphilotes battoides* sp.
- MacNeil sooty wing skipper, *Hesperopsis graciellae*
- Mojave gypsum bee, *Andrena balsamorhizae*
- Mojave poppy bee, *Perdita meconis*
- Spring Mountains ant, *Lasius nevadensis*
- Moapa riffle beetle,
- Moapa skater/waterstrider, *Rhagovellia becki*
- Naucorid bug, *Usingerina moapensis*
- Moapa pebblesnail, *Pyrgulopsis avernalis*
- Moapa turban snail, *Pyrgulopsis carinefera*
- Grated tryonia, *Tryonia clathrata*
- Undescribed tryonia, *Tryonia* sp.
- Dry lake bed species

Medium Priority

- Dalea blister bee, *Ancylandrena koebelei*
- Red-legged beardtongue bee, *Atoposmia rufifemur* sp. nov.
- Virgin River globemallow bee, *Diadasia proridens*
- Red-tailed blazing star bee, *Megandrena mentzeliae*
- Two-tone perdita (bee), *Perdita bipicta* sp. nov.
- Mojave twilight bee, *Perdita celadona* sp. nov.
- Big-headed perdita (bee), *Perdita cephalotes*
- Las Vegas perdita (bee), *Perdita cracens*
- Virgin River perdita (bee), *Perdita crotonis caerulea*
- Spurge-loving perdita (bee), *Perdita euphorbiana* sp. nov.
- Tiquilia perdita (bee), *Perdita exusta* sp. nov.
- Apache plume perdita (bee), *Perdita fallugiae*
- Yellow-headed perdita (bee), *Perdita flaviceps*
- Moapa perdita (bee), *Perdita fulvescens*
- Unadorned perdita (bee), *Perdita inornata*
- Valley of Fire perdita (bee), *Perdita nevadiana*
- Virgin River twilight bee, *Perdita vespertina* sp. nov.
- Mojave mountain perdita (bee), *Perdita vicina*
- Desert loving perdita (bee), *Perdita xerophila discrepans*
- Crawling water beetle, *Haliphus eremicus*
- Moapa riffle beetle, *Microcylloepus moapus moapus*
- Amargosa (Pahrnagat) naucorid, *Pelocoris shoshone shoshone*

5.2.1 MacNeil sooty wing skipper, *Hesperopsis graciellae*

Status: BLM Sensitive.

Clark County MSHCP Status: Evaluation: High Priority.

Range: Along the Lower Colorado River in California and Arizona, and Lower Colorado River and tributaries in Utah, and along the Muddy River in Nevada.

Clark County Distribution: Clark County along the Muddy River in Moapa Valley from Hidden Valley to south of Overton is the only known location. Observed in 1988, absent in 1989 from Logandale. Other localities include Bowman Reservoir, 1977, and Hidden Valley, 1977. Extensive searching of host plant stands in Las Vegas Valley and Laughlin-Davis Dam area failed to find any butterflies.

Habitat: In desert riparian areas where its host plant, *Atriplex lentiformis*, quail bush is present. Host plant prefers flat, deep soil. Known nectar species: *Tamarix pentandra* (Tamaricaceae), *Heliotropium curassavicum* (Boraginaceae), and *Medicago sativa* (Fabaceae).

Population Trends: Unknown.

Ecosystem Level Threats:

- Habitat modification or destruction could threaten populations; conversion of habitat to agricultural lands is a threat as MacNeil sooty wing skipper habitat is ideal for agriculture. **Threat 202**
- Use of insecticides near populations and herbicides near host plants (and, possibly nectar sources) could result in the loss or reduction of populations. Particular care should be taken in planning tamarisk removal projects. **Threat 602**
- Grazing in areas with MacNeil sooty wing skipper populations could result in destruction of host plants or trampling of immature life stages. **Threat 703**
- Development into occupied habitat could reduce or eliminate populations. **Threat 1101**

Species Specific Threats:

- Stochastic events since only 3 locations are known in Nevada. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on desert riparian habitat, springs, and butterflies.

Adequacy of Existing Management: Inadequate for long-term conservation. Much of the potential habitat for this species is currently not managed for conservation.

Additional Conservation Needs:

- Obtain conservation agreements or easements, for suitable habitat to assure management does not harm population.
- Continue to work with the MRREIAC to assure habitat restoration along the Muddy River meets the needs of this species.
- Periodic monitoring to determine status.
- Additional surveys of potentially suitable habitat (e.g., Virgin River near Mesquite, Nevada; St. George, Utah; and Littlefield, Arizona).
- Ecological studies to determine any additional needs of the species beyond host plant and nectar sources.
- Avoid widespread or aerial applications of non-specific insecticides or herbicides near existing populations.

References: Austin and Austin 1980; Austin 1985; Tilden and Smith 1986; Savage 1989; Weiss et al. 1995.

5.3 Watch List Invertebrate Species

- Red-legged lava bee, *Ashmeadiella picticus* sp. nov.
- Flat-faced cactus bee, *Lithurge listrota*
- Beck's perdita (bee), *Perdita becki*
- Rock nettle perdita (bee), *Perdita eucnides eucnides*
- Banded perdita (bee) , *Perdita vittata conformis*
- Koso phacelia bee, *Protodufourea koso* sp. nov.
- Michener's phacelia bee, *Xeroheriades michener*
- Corn Creek springsnail, *Pyrgulopsis* sp.
- Blue Point springsnail, *Pyrgulopsis* sp.
- Undescribed Blue Point tryonia, *Tryonia* sp.

6.0 Vascular Plant Species

The MSHCP includes a total of 67 species of vascular plants:

Covered	37
High Priority Evaluation	7
Medium Priority Evaluation	10
Low Priority Evaluation	3
Watch List	10

The majority of the Covered plant species occur at high elevations in the Spring Mountains or in the Spring and Sheep Mountains.

6.1 Covered Plant Species

- Clokey eggvetch, *Astragalus oophorus* var. *clokeyanus*
- Blue Diamond cholla, *Opuntia whipplei* var. *multigeniculata*
- Rough angelica, *Angelica scabrida*
- Charleston pussytoes, *Antennaria soliceps*
- Sticky ringstem, *Anulocaulis leisolenus*
- Las Vegas bearpoppy, *Arctomecon californica*
- White bearpoppy, *Arctomecon merriamii*
- Rosy king sandwort, *Arenaria kingii* ssp. *rosea*
- Clokey milkvetch, *Astragalus aequalis*
- Threecorner milkvetch, *Astragalus geyeri* var. *triquetrus*
- Spring Mountains milkvetch, *Astragalus remotus*
- Alkali mariposa lily, *Calochortus striatus*
- Clokey paintbrush, *Castilleja martinii* var. *clokeyi*
- Clokey thistle, *Cirsium clokeyi*
- Jaeger whitlowgrass, *Draba jaegeri*
- Charleston draba, *Draba paucifruita*
- Inch high fleabane, *Erigeron uncialis* ssp. *conjugans*
- Forked (Pahrump Valley) buckwheat, *Eriogonum bifurcatum*
- Sticky buckwheat, *Eriogonum viscidulum*
- Clokey greasbush (forsellesia), *Glossopetalon* (= *Forsellesia*) *clokeyi*
- Smooth pungent (dwarf) greasbush, *Glossopetalon pungens* var. *glabra*
- Pungent dwarf greasbush, *Glossopetalon pungens* var. *pungens*

- Red Rock Canyon aster, *Ionactis caelestis*
- Hidden ivesia, *Ivesia cryptocaulis*
- Jaeger ivesia, *Ivesia jaegeri*
- Hitchcock bladderpod, *Lesquerella hitchcockii*
- Charleston pinewood lousewort, *Pedicularis semibarbata* var. *charlestonensis*
- White-margined beardtongue (penstemon), *Penstemon albomarginatus*
- Charleston beardtongue, *Penstemon leiophyllus* var. *keckii*
- Jaeger beardtongue, *Penstemon thompsoneae* var. *jaegeri*
- Parish's phacelia, *Phacelia parishii*
- Clokey mountain sage, *Salvia dorrii* var. *clokeyi*
- Clokey catchfly, *Silene clokeyi*
- Charleston tansy, *Sphaeromeria compacta*
- Charleston kittentails, *Synthyris ranunculina*
- Charleston grounddaisy, *Townsendia jonesii* var. *tumulosa*
- Limestone (Charleston) violet, *Viola purpurea* var. *charlestonensis*

The potential impacts, management, rationale for coverage, and measurable biological goals for each of the vascular plant species proposed for coverage in the MSHCP are summarized in Table 6-1.

TABLE 6-1
COVERED SPECIES CONSERVATION EVALUATIONS

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Clokey eggvetch <i>Astragalus oophorus</i> var. <i>clokeyanus</i>	93% of potential habitat; 13 of 14 cited locations	6% of potential habitat	1% of potential habitat	USFS SMNRA	Southern Nevada endemic with more than 99% of populations in SMNRA with specific management actions.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Blue Diamond cholla <i>Opuntia whipplei</i> var. <i>multigeniculata</i> State of Nevada Critically Endangered, Federal Candidate	95% of known habitat	none	5% of known habitat	BLM Red Rock Cyn NCA	Blue Diamond Hills endemic. Approximately 95% of the habitat for this species will be on Federal land managed under the terms of a conservation agreement.	<ul style="list-style-type: none"> No loss of Blue Diamond cholla in the management area Maintain stable or increasing population numbers Harvest and stockpile mature seeds to conserve a seed bank for propagation studies
Rough angelica <i>Angelica scabrida</i>	91% of cited locations	none	9% of cited locations	USFS SMNRA	Spring Mtns endemic with more than 90% of populations in SMNRA with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Sticky ringstem <i>Anulocaulis leisolenus</i>	22% of potential habitat	60% of potential habitat	17% of potential habitat	BLM RMP NPS GMP	Southwestern US. More than 80% of widespread habitat in IMA, LIMA, and MUMAs. Protection for the coextensive Las Vegas bearpoppy provides protection for this species.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
Charleston pussytoes <i>Antennaria soliceps</i>	96% of cited locations	4% of cited locations	4% of cited locations	USFS SMNRA	Spring Mtns endemic with more than 96% of populations in SMNRA with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers

TABLE 6-1
COVERED SPECIES CONSERVATION EVALUATIONS
(continued)

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Las Vegas bearpoppy <i>Arctomecon californica</i> State of Nevada Critically Endangered	22% of cited locations	60% of cited locations	17% of cited locations	BLM RMP NPS GMP	Southern Nevada and northeastern Arizona endemic. The majority (82%) of potential habitat, including 3 populations in Las Vegas Valley, will be managed under the terms of the Las Vegas Bearpoppy Memorandum of Agreement. In addition to designation of ACECs for the species, BLM will develop and implement a habitat management plan for the species on BLM land, including MUMAs.	<ul style="list-style-type: none"> Conserve populations on the North Las Vegas Airport, NAFB Area 3, and SNWA North Well Field No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain and/or improve bearpoppy habitat in 4 BLM management areas: Sumrisc, Lovell Wash, Bitter Spring, Gold Butte
White bearpoppy <i>Arctomecon merriamii</i>	84% of cited locations	3% of cited locations	13% of cited locations	USFS SMNRA USFWS (DNWR)	Mojave desert endemic. 83% of cited locations in IMAs and LIMAs; 60% of potential habitat on DNWR.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Rosy king sandwort <i>Arenaria kingii</i> ssp. <i>rosea</i>	88% of known locations	none	12% of known locations	USFS SMNRA	Spring Mtns endemic. 15 of 17 sites in IMA managed under terms of Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Clokey milkvetch <i>Astragalus aequalis</i>	96% of cited locations	none	4% of cited locations	USFS SMNRA	Spring Mtns endemic with more than 96% of populations in SMNRA with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Threecorner milkvetch <i>Astragalus geyeri</i> var. <i>iriqueirus</i> State of Nevada Critically Endangered	18% of cited locations	82% of cited locations	<1% of cited locations	BLM RMP NPS GMP NDF NRS 527.270	Southeastern Mojave desert endemic with 99% of potential habitat in Clark Co and all but 6 of 825 cited locations in IMAs, LIMAs, or MUMAs protected by NRS.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs & MUMAs Maintain stable or increasing population numbers
Spring Mountain milkvetch <i>Astragalus remotus</i>	98% of cited locations	none	2% of cited locations	USFS SMNRA	Spring Mtns endemic with more than 98% of populations in SMNRA with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers

TABLE 6-1
COVERED SPECIES CONSERVATION EVALUATIONS
(continued)

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Alkali mariposa lily <i>Calochortus striatus</i>	88% of cited locations	none	12% of cited locations	BLM Red Rock Cyn NCA	Eastern Mojave desert endemic. Almost 90% of cited locations in IMAs & LIMAs, primarily in Red Rock Cyn NCA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers Develop an activities plan for the NCA including management for this species
Clokey paintbrush <i>Castilleja martinii</i> var. <i>clokeyi</i>	88% of cited locations	none	13% of cited locations	USFS SMNRA USFWS (DNWR)	Eastern Mojave desert mountains endemic with almost 90% of populations in SMNRA and DNWR with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Clokey thistle <i>Cirsium clokeyi</i>	88% of cited locations	none	13% of cited locations	USFS SMNRA	Spring Mtns endemic with almost 90% of populations in SMNRA with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Jaeger whitlowgrass <i>Draba jaegeri</i>	All cited locations	none	none	USFS SMNRA	Spring Mtns endemic with all known populations in SMNRA with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Charleston draba <i>Draba pauciflora</i>	All cited locations	none	none	USFS SMNRA	Spring Mtns endemic with all known populations in SMNRA with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Inch high fleabane <i>Erigeron uncialis</i> ssp. <i>Conjugans</i>	All cited locations	none	none	USFS SMNRA	Southern Nevada endemic with all known populations in SMNRA and DNWR with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Forked buckwheat <i>Eriogonum bifurcatum</i>	none	Unknown proportion of habitat	Unknown proportion of habitat	BLM RMP	Pahrump Valley (eastern Mojave desert) endemic. Most of the habitat for this ephemeral species appears to be on BLM land. BLM management should preclude further loss of habitat.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat on public lands Maintain stable or increasing population numbers on public lands Develop inventory of extant populations in Pahrump and Sandy Valley

TABLE 6-1
COVERED SPECIES CONSERVATION EVALUATIONS
(continued)

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Sticky buckwheat <i>Eriogonum viscidulum</i> State of Nevada Critically Endangered	30% of cited locations	67% of cited locations	4% of cited locations	BLM RMP NPS GMP NDF NRS 527.270	Eastern Mojave desert endemic with 97% of potential habitat in Clark Co and all but 3 of 84 cited locations in IMAs, LIMAs, or MUMAs protected by NRS.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers
Clokey greasebush <i>Glossopetalon clokeyi</i>	All cited locations	none	none	USFS SMNRA	Spring Mtns endemic with all known populations in SMNRA with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Smooth pungent greasebush <i>Glossopetalon pungens</i> var. <i>glabra</i>	All cited locations	none	none	USFS SMNRA BLM Red Rock Cyn NCA USFWS (DNWR)	Eastern Mojave desert mountains endemic. All habitat for this species in IMAs and LIMAs managed by USFS (Spring Mtns CA), USFWS, and BLM (Bridge Mtn Monitoring Plan).	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Pungent dwarf greasebush <i>Glossopetalon pungens</i> var. <i>pungens</i>	All cited locations	none	none	USFS SMNRA BLM Red Rock Cyn NCA USFWS (DNWR)	Southern Nevada endemic. All habitat for this species in IMAs and LIMAs managed by USFS (Spring Mtns CA), USFWS, and BLM (Bridge Mtn Monitoring Plan).	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Red Rock Canyon aster <i>Ionactis caelestis</i>	All cited locations	none	none	BLM Red Rock Cyn NCA	Red Rock Cyn endemic. Single, remote population managed under the Red Rock Cyn NCA GMP.	<ul style="list-style-type: none"> No loss or disturbance of habitat in Red Rock Cyn NCA Maintain stable or increasing population numbers
Hidden ivesia <i>Ivesia cryptocaulis</i>	All cited locations	none	none	USFS SMNRA	Spring Mtns endemic with all known populations in SMNRA with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers

TABLE 6-1
COVERED SPECIES CONSERVATION EVALUATIONS
(continued)

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
<i>Jaeger ivesia</i> <i>Ivesia jaegeri</i>	95% of cited locations	none	5% of cited locations	USFS SMNRA BLM Red Rock Cyn NCA	Spring Mtns (NV) and Clark Mtns (CA) endemic. 95% of cited populations in SMNRA and BLM Red Rock Cyn NCA, with specific management actions in Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Hitchcock bladderpod <i>Lesquerella hitchcockii</i>	93% of cited locations	none	7% of cited locations	USFS SMNRA USFWS (DNRW)	Nevada endemic with 95% of Clark Co populations in SMNRA and DNRW, with specific management actions in Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Charleston pinewood lousewort <i>Pedicularis semibarbata</i> var. <i>charlestonensis</i>	97% of potential habitat	none	3% of potential habitat	USFS SMNRA USFWS (DNRW)	Southern Nevada endemic with 97% of Clark Co populations in SMNRA and DNRW, with specific management actions in Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
White-margined beardtongue <i>Penstemon albomarginatus</i>	30% of cited locations	70% of cited locations	<1% of cited locations	BLM RMP	Eastern Mojave desert endemic. Less than 1% of populations on private lands. BLM is conducting experimental grazing exclosure study to evaluate grazing impacts to this species.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs, LIMAs, & MUMAs Maintain stable or increasing population numbers Implement modifications to grazing practices as indicated by exclosure study on Jean Lake and Hidden Valley
Charleston beardtongue <i>Penstemon leiophyllus</i> var. <i>keckii</i>	>90% of cited locations	none	<10% of cited locations	USFS SMNRA	Spring Mtns endemic with >90% of known populations in SMNRA with specific management actions in Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Jaeger beardtongue <i>Penstemon thompsonae</i> var. <i>jaegeri</i>	All cited locations	none	none	USFS SMNRA	Southern Nevada endemic with all known populations in SMNRA with specific management actions in Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers

TABLE 6-1
COVERED SPECIES CONSERVATION EVALUATIONS
(continued)

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
Parish's phacelia <i>Phacelia parishii</i>	>90% of cited locations	none	<10% of cited locations	USFWS (DNRW)	Mojave desert endemic with >90% of Clark Co populations in IMAs and LIMAs on DNWR.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Clokey mountain sage <i>Salvia dorrii</i> var. <i>clokeyi</i>	All cited locations	none	none	USFS SMNRA BLM GMP USFWS (DNRW)	Southern Nevada endemic with all known populations in SMNRA with specific management actions in Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Clokey catchfly <i>Silene clokeyi</i>	96% of cited locations	none	4% of cited locations	USFS SMNRA	Spring Mtns endemic with >96% of known populations in SMNRA with specific management actions in Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Charleston tansy <i>Sphaeromeria compacta</i>	>90% of cited locations	none	<10% of cited locations	USFS SMNRA	Spring Mtns endemic with >90% of known populations in SMNRA with specific management actions in Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Charleston kittentails <i>Synthyris ranunculina</i>	All cited locations	none	none	USFS SMNRA	Spring Mtns endemic with all known populations in SMNRA with specific management actions in Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Charleston grounddaisy <i>Townsendia jonesii</i> var. <i>tumulosa</i>	>90% of cited locations	none	<10% of cited locations	USFS SMNRA BLM Red Rock Cyn NCA USFWS (DNRW)	Southern Nevada endemic. >90% of habitat for this species in IMAs and LIMAs managed by USFS (Spring Mtns CA), USFWS, and BLM (Bridge Mtn Monitoring Plan).	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
Limestone violet <i>Viola purpurea</i> var. <i>charlestonensis</i>	All known locations	none	none	USFS SMNRA BLM GMP USFWS (DNRW)	Southwestern desert endemic with all known populations in IMAs and LIMAs with specific management actions in the Spring Mtns CA.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers

¹In all cases, projected potential impacts represent the "worst case" analysis.

6.1.1 Clokey eggvetch, *Astragalus oophorus* var. *clokeyanus*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G4T1, State Rank S1.

Clark County MSHCP Status: Covered.

Range: Spring Mountains NRA, Nevada Test Site (Nye County), Belted Range (NAFR, Nye County).

Clark County Distribution: The taxon is known primarily from the Spring Mountains, Clark County, at 10 locations on approximately 3.0 acres at elevations of 6,200 to 9,000 feet (Figure 6-1). The two general areas where it occurs are upper Lee and Clark Canyons and the Wheeler Pass area; in addition, it was recently discovered in Nye County in the Belted Range, on Nellis Air Force Base, and in several locations on the Nevada Test Site.

Habitat: Pinyon-juniper and mixed conifer communities; found on moist to dry, often disturbed gravelly soils in openings of forests, shrublands, and woodlands.

Population Trends: Unknown, may be declining due to long-term fire suppression activities.

Ecosystem Level Threats:

- Dispersed recreation in Lee Canyon and along Bristlecone and Bonanza Trails. **Threat 401**
- Concentrated recreation development associated with ski area use and development. **Threat 402**
- Habitat modification and damage from wild horse and burro trampling. **Threat 701**
- Weed encroachment from erosion control activities on ski slopes. **Threat 1501**
- Fire suppression in mixed conifer forest. **Threat 301**

Species Specific Threats:

- Susceptibility to stochastic events, including seed predation by unknown factors. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on pinyon-juniper and mixed conifer. The CA for the SMNRA identifies general management actions for mid-

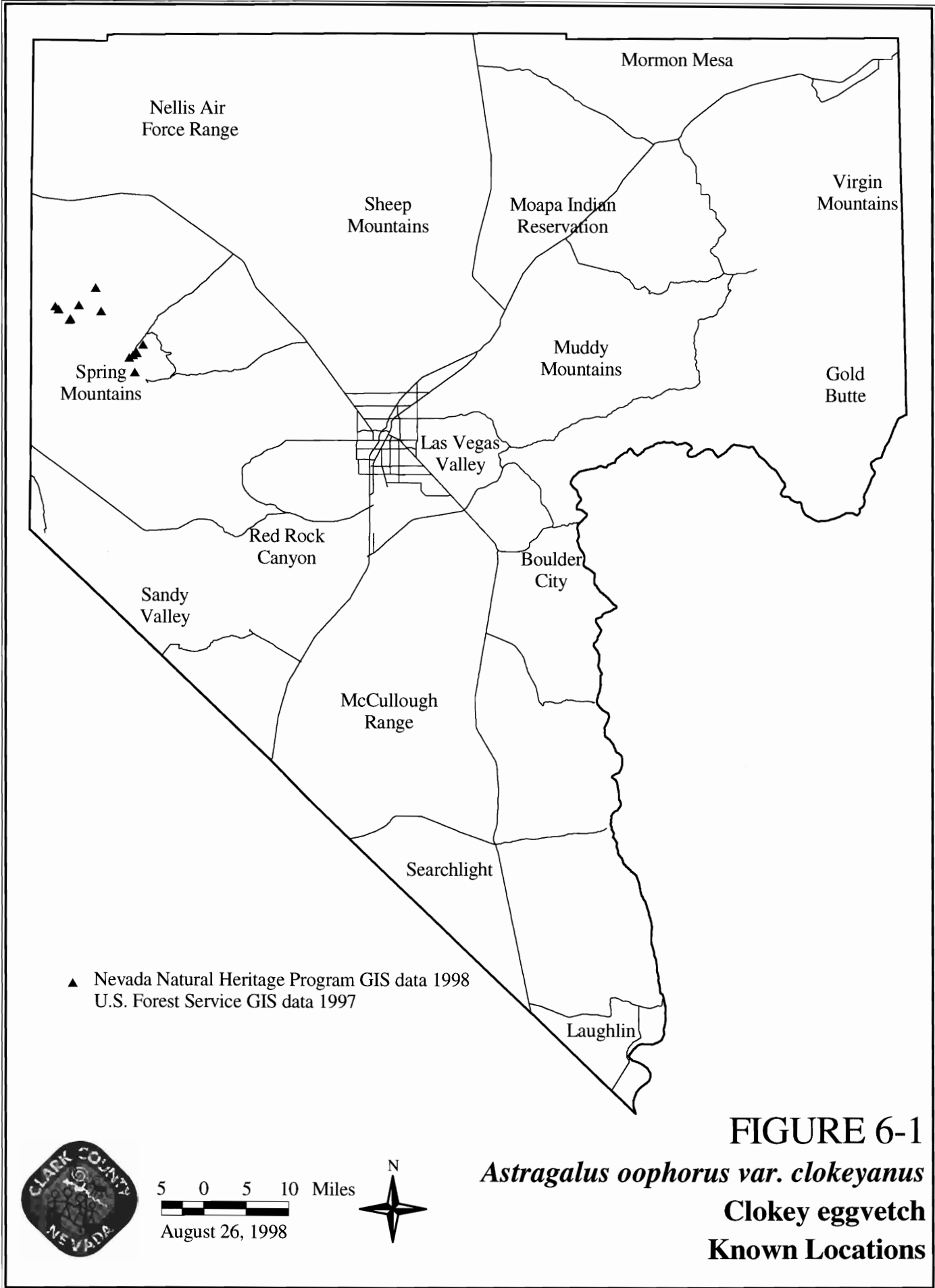


FIGURE 6-1
Astragalus oophorus var. *clokeyanus*
Clokey eggvetch
Known Locations

elevation plants, such as this species, including campground management, environmental education programs, fire management, focusing of recreation development outside of sensitive areas, restoration of campgrounds, and wild horse and burro management. Species specific conservation for this species include:

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. 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)

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)*

- Seed germination and other habitat requirements of Clokey eggvetch, including analysis of factors such as seed caching and predation by rodents and insects, fire, and other perturbations (CA6.2a).

USFS(25) Conduct annual monitoring of (a) Clokey eggvetch and (b) rough angelica. Monitoring efforts will be in accordance with the protocol developed by TNC in cooperation with USFWS and USFS (Nachlinger and Combs 1996a, 1996b). (CA3.1)

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(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)

- Gary Abbot Campground - Close campsite and restore area to enhance habitat of Clokey eggvetch and butterflies. (CA5.10d)

Adequacy of Existing Management: Most of the potential habitat for this species occurs within IMAs and LIMAs on USFS and BLM lands, with a small amount on private lands. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Morefield 1992; The Nature Conservancy 1994; Nachlinger and Sheldon 1995; Nachlinger and Combs 1996b; USFS, NDCNR, USFWS 1998.

6.1.2 Blue Diamond cholla, *Opuntia whipplei* var. *multigeniculata*

Status: State of Nevada Critically Endangered (NRS 527.270), Federal Candidate, Nevada Natural Heritage Program Global Rank G2?T1, State Rank S1.

Clark County MSHCP Status: Covered.

Range: Endemic to the Blue Diamond Hills west of Las Vegas.

Clark County Distribution: Blue Diamond Hills west of Las Vegas; ten populations with 6,200 individuals (Figure 6-2). Estimated proportion of habitat occupied in Clark County is 100 percent.

Habitat: Restricted to dry limestone hills, underlain by gypsum, occurring mostly on north-facing slopes and exposed ridges. **Mojave desert scrub** habitat in an area of approximately 312 acres. This cholla species forms part of a distinctive, unusual, and rare plant community, succulent scrub. This community is characterized and dominated by a wide diversity of cactus, yucca, and agave species.

Population Trends: Unknown, presumed stable.

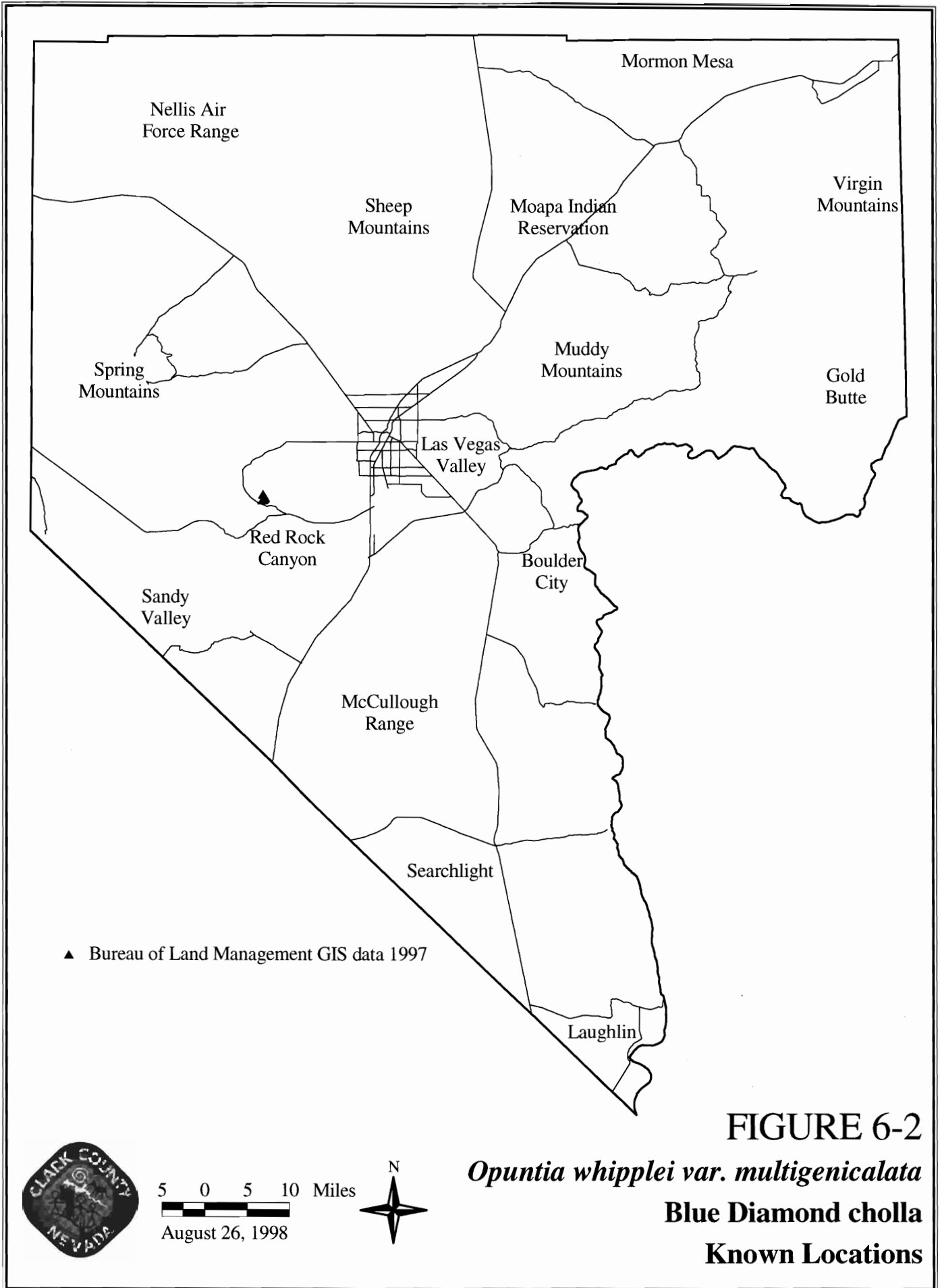
Ecosystem Level Threats:

- Wildfire as a result of proliferation of red brome. **Threat 302**
- Wild burros. **Threat 701**
- Mining activities, especially gypsum mining, associated road expansion, and past dumping of overburden on habitat. **Threats 901, 902**
- Indirect effects of hydroelectric development (fugitive dust, etc.). **Threat 1202**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**
- Unknown population trends **Threat 102**
- Illegal collection. **Threat 1701**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on Mojave desert scrub.



Species specific conservation actions are identified in the Conservation Agreement for the Blue Diamond cholla (BLM, NDF, USFWS, James Hardie Gypsum Company 1998) (Appendix H) and include:

- The BLM will complete a land exchange with James Hardie Gypsum of Blue Diamond cholla habitats on private patented lands for adjacent BLM inholdings within the patented lands. BLM will incorporate the exchanged lands into the NCA, at which time these lands will be withdrawn from mining. After the exchange is completed, less than 5 percent of Blue Diamond cholla habitat will occur on private patented lands.
- The BLM will map both potential habitat and existing disturbance along the main access road. The BLM and James Hardie Gypsum will maintain the current condition of the main access road and adjacent areas. The BLM will also rehabilitate, as needed, any disturbed Blue Diamond cholla habitat, and will insure that harmful activities, including overburden dumping, do not occur on the habitat.
- The BLM will limit casual use to the extent possible by maintaining the "Restricted Access" sign at the entrance to the main access road. If necessary, the gate will be kept locked to restrict public access.
- The BLM, in order to document regular public use, will increase law enforcement patrols along the access road if the gate is left open. Levels of patrol activity will be documented, and findings summarized annually in a report to the NCA manager, BLM botanist, and NDF. Any incidents on Blue Diamond Hill will be reported to the NCA manager so that corrective action may be taken.
- The BLM and NDF will investigate the development, feasibility, and benefits of pre-treating the area for fire prevention (e.g., fuel breaks on exposed slopes).
- The BLM and NDF will harvest and stockpile mature seeds from a variety of sites to conserve a seed bank and for use in propagation studies.
- The BLM and USFWS will pursue propagation, pollination, germination, monitoring, and taxonomic studies to elucidate the ecology, life history, and taxonomy of Blue Diamond cholla.
- The BLM, NDF, and USFWS will develop and implement monitoring protocol for the species to document population status trends.
- The USFWS and NDF will review all management plans and status reports and provide comments on them, and will provide technical assistance in all aspects of implementation of this CA, as requested by BLM or James Hardie Gypsum.

- The NDF will be apprised in advance by the other parties to the CA of any land disturbance anticipated within the habitat of the Blue Diamond cholla so that a determination can be made regarding the need for a State permit to disturb or destroy Blue Diamond cholla under NRS 527.270.
- The BLM, NDF, USFWS, and James Hardie Gypsum will meet annually, or when mutually determined necessary, to evaluate progress made on conservation of the taxon and to determine the need to modify, expand, or reduce the scope of this CA. Modifications to this CA will be implemented only upon agreement by all parties.

Adequacy of Existing Management: The majority of habitat for this species is within Red Rock Canyon NCA. Implementation of the terms of the Conservation Agreement, enforcement of existing NDF permit requirements, and existing management should provide adequate protection for this species. Approximately 95 percent of the habitat for this species will be under Federal management after the proposed land exchange (currently 83 percent is on Federal lands).

References: BLM, NDF, USFWS, James Hardie Gypsum Company 1998; Knight 1994; Morefield 1992.

6.1.3 Rough angelica, *Angelica scabrida*

Status: USFS Sensitive, BLM Sensitive, Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Rough angelica is known only from the 18 sites in the Spring Mountains, where it occurs in two general areas (Figure 6-3). In the core area, it is known from Kyle Canyon, at elevations ranging between 6,600 and 9,200 feet. It is also known from the Red Rock Canyon NCA, where it occurs at elevations ranging between slopes in montane riparian and ponderosa pine and aspen forest.

Habitat: This species occurs in **mixed conifer** communities and near **springs**, on moist gravelly soils of washes, ephemeral streams, gullies, montane slopes, and avalanche chutes. At lower elevations in wash margins in riparian woodlands and shrublands; at higher elevations along stream courses and adjacent areas.

Population Trend: Unknown, presumed stable.

Ecosystem Level Threats: The major threats to the species are:

- Habitat modification and indirect effects due to dispersed recreational activities, including hiking, equestrian use, and collection of wildflowers. **Threat 401**
- Habitat modification resulting from concentrated recreation, including campground and backcountry camping, picnicking, trailhead and popular trail use, and visitation to spring and seep sites, in Kyle Canyon and Red Rock Canyon NCA. **Threat 402**
- Habitat degradation from highway and road construction or maintenance in Kyle Canyon. **Threat 501**
- Habitat degradation from trampling and grazing by wild horses. **Threat 701**
- Habitat degradation or fragmentation resulting from recreational facility and mountain home development, improvement, and upkeep in Kyle Canyon. **Threats 1101, 1102**
- Habitat degradation and population decreases resulting from competition and encroachment of exotic species. **Threat 1501**

Species Specific Threats: None identified.

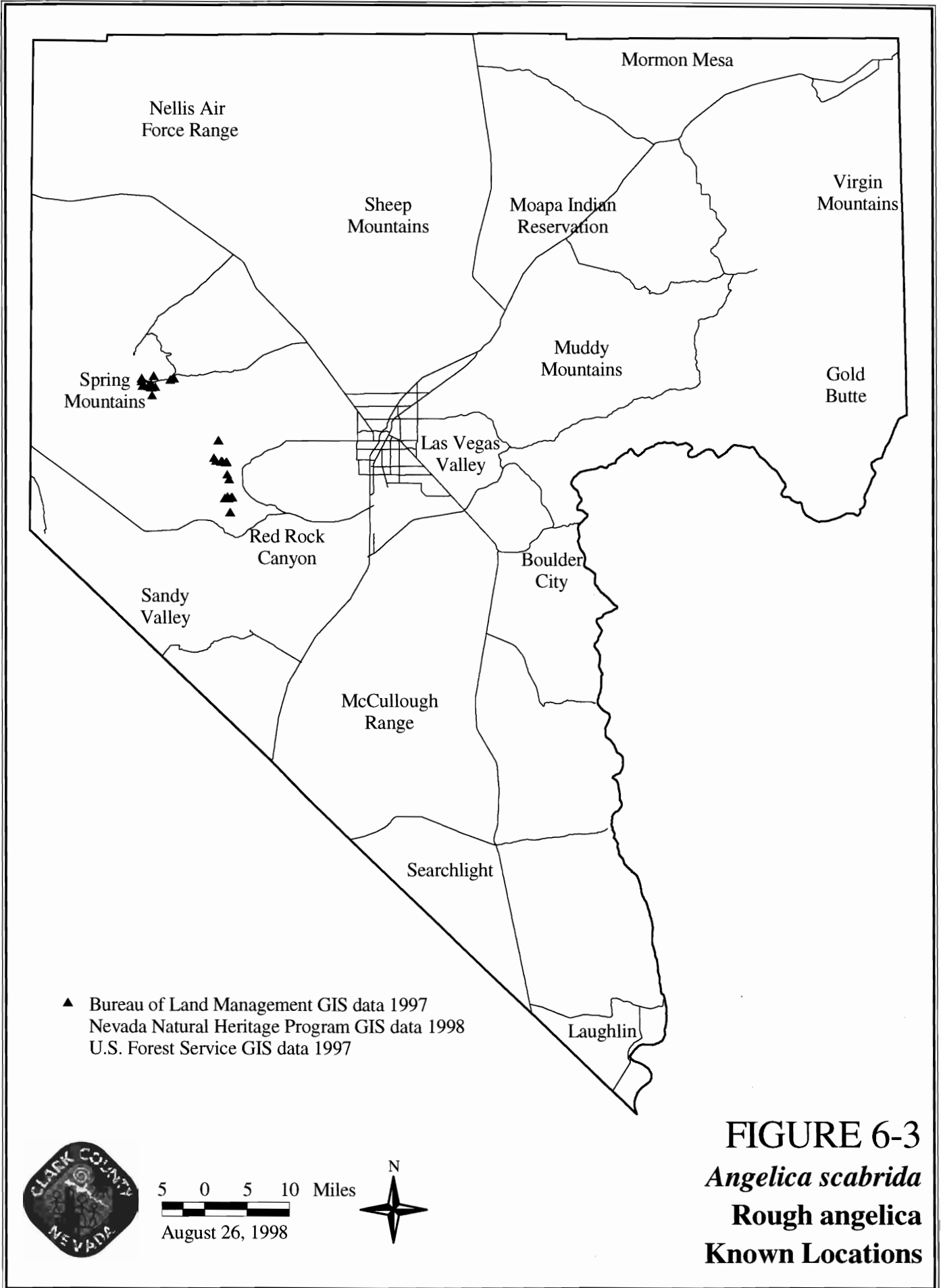


FIGURE 6-3
Angelica scabrida
Rough angelica
Known Locations

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on mixed conifer habitat. This species is included in the Red Rock NCA Bridge Mountain Monitoring Plan. The CA for the Spring Mountains NRA identifies general management actions for mid-elevation plants, such as this species, 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.

Species specific management actions proposed for this species include

USFS(6) Provide information to summer home residents on Palmer's chipmunk and **rough angelica** conservation. (CA7.3)

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. 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. (CA7.7)

USFS(25) Conduct annual monitoring of (a) Clokey eggvetch and (b) **rough angelica**. Monitoring efforts will be in accordance with the protocol developed by TNC in cooperation with USFWS and USFS (Nachlinger and Combs 1996a, 1996b). (CA3.1)

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 (CA3.8)

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(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)

Adequacy of Existing Management: The majority of populations occur in lands categorized as IMA or LIMA within the Spring Mountains NRA and the Red Rock Canyon NCA. Implementation of existing management and the provisions of the CA for

the Spring Mountains NRA and the Red Rock NCA GMP should provide adequate conservation for this species.

References: Nachlinger 1994; Nachlinger and Combs 1996a; The Nature Conservancy 1994, USFS, NDCNR, USFWS 1998.

6.1.4 Charleston pussytoes, *Antennaria soliceps*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G1, State Rank S1.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic, all of range in Clark County.

Clark County Distribution: 22 populations on 188 acres at high elevations of Spring Mountains (Figure 6-4).

Habitat: **Alpine** and **bristlecone pine** habitat on gravelly, open ridge slopes at elevations from 8,700 feet to near timberline at 11,600 feet.

Population Trends: Unknown, presumed stable

Ecosystem Level Threats:

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

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on alpine and bristlecone pine habitat. The CA for the Spring Mountains NRA identifies general management actions for high-elevation plants, such as this 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.

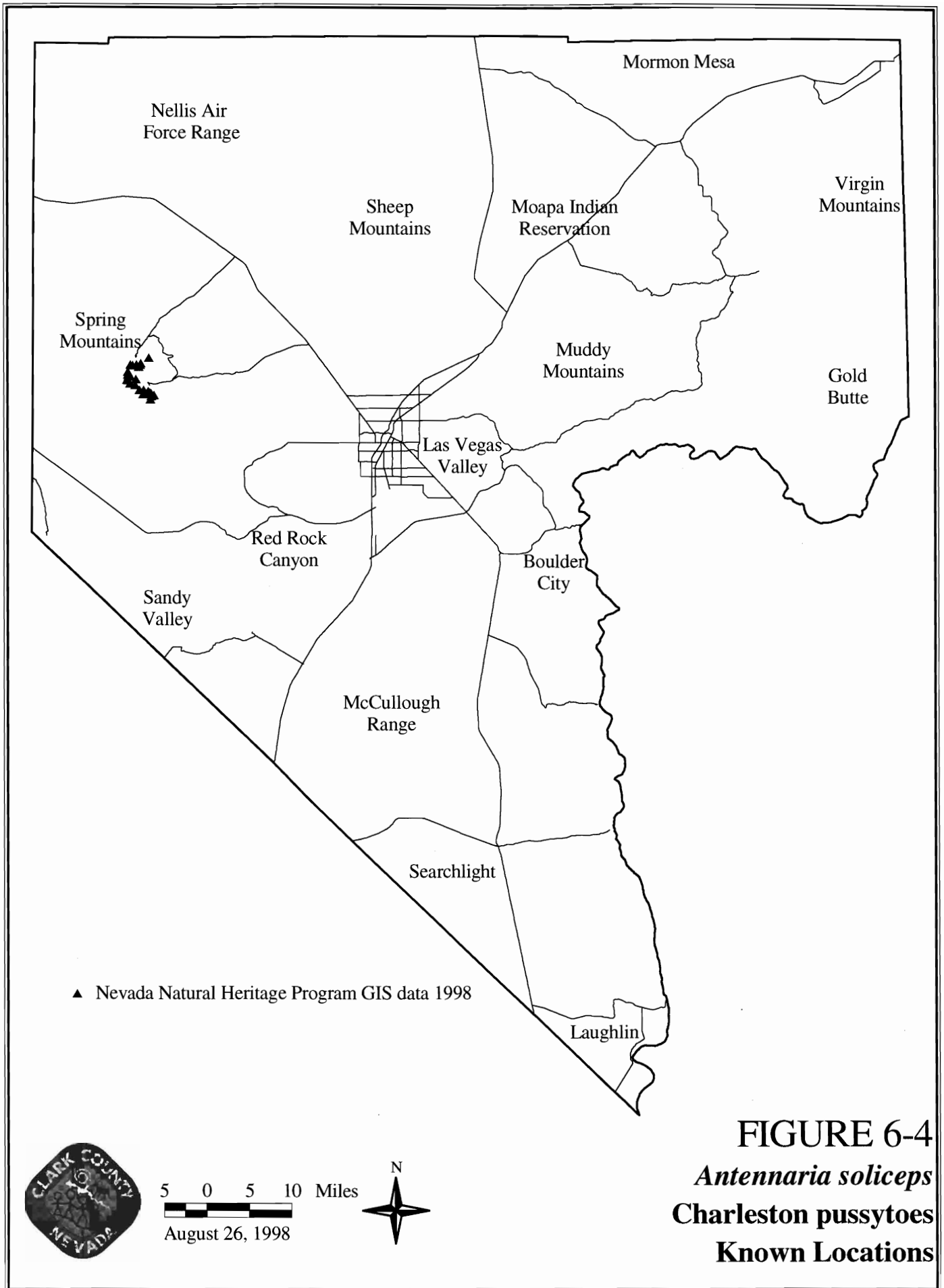


FIGURE 6-4
Antennaria soliceps
Charleston pussytoes
Known Locations

Species specific management proposed for this species includes:

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. 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)

Adequacy of Existing Management: Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species. All known populations occur on USFS lands categorized as IMA (87%) or LIMA (7%) within the SMNRA.

References: Knight 1992; Smith 1995b; USFS, NDCNR, USFWS 1998.

6.1.5 Sticky ringstem, *Anulocaulis leisolenus*

Status: BLM Sensitive.

Clark County MSHCP Status: Covered.

Range: Southwestern endemic, Texas, New Mexico, Arizona, southern Nevada.

Clark County Distribution: Patchy distribution, primarily in Frenchman Mountain area east of Las Vegas and further east to Muddy Mountains and Gold Butte.

Habitat: Mojave desert scrub and salt desert scrub, on gypsiferous soils on rolling hills and terraces. Common associate of the Las Vegas bearpoppy.

Population Trends: Unknown.

Ecosystem Level Threats:

- Dispersed recreation activities. **Threat 401**
- Off-highway vehicle activities. **Threats 403, 404**
- Highway development and road proliferation in backcountry areas. **Threats 503, 504**
- Habitat fragmentation due to urbanization. **Threats 503, 1102**
- Cattle, wild horse, and burro trampling. **Threats 701, 703**
- Mining activities. **Threat 902**
- Loss of habitat due to urbanization. **Threat 1101**
- Soil and cryptogamic crust loss. **Threat 1101**

Species Specific Threats: None identified.

Existing and Proposed Conservation Measures: General and ecosystem level conservation actions are identified in Appendix A. See chapters on Mojave desert scrub and salt desert scrub. The memorandum of agreement (MOA) developed for Las Vegas bearpoppy includes management objectives that would also benefit this species. In addition, the following BLM action provides species specific benefits for sticky ringstem:

BLM(220)² 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).

Adequacy of Existing and Proposed Conservation Measures: The habitat for this species occurs primarily on lands under the management of NPS and BLM categorized as IMA, and LIMA. Implementation of existing management should provide adequate conservation for this species.

References: Kartesz 1988.

6.1.6 Las Vegas bearpoppy, *Arctomecon californica*

Status: BLM Sensitive, State of Nevada Critically Endangered (NRS 527.270), Nevada Natural Heritage Program Global Rank G3, State Rank S3.

Clark County MSHCP Status: Covered.

Range: Endemic to the eastern Mojave Desert in southeastern Nevada and northwestern Arizona. The majority of the populations occur in Clark County, Nevada. However, several small populations and one very large population occur in northwest Arizona.

Clark County Distribution: Distribution is patchy, across low “badland” hills and sometimes on ridges and benches. Major populations occur in Las Vegas Valley and on gypsum soils associated with the Colorado River drainage (Figure 6-5).

Habitat: Primarily within **Mojave desert scrub** and **salt desert scrub** habitats on gypsum outcrops.

Population Trends: Populations of the Las Vegas bearpoppy have been observed to be declining across a substantial portion of its range, particularly in the rapidly developing Las Vegas Valley and public lands on the urban fringe of the valley. There have been 108 populations recorded as of January 1996; 12 percent are presumed extirpated mainly due to urban development in the Las Vegas Valley, and an additional 16 percent is likely to be extirpated in the near future. Las Vegas bearpoppies have not been successfully propagated or transplanted.

Ecosystem Level Threats:

- Dispersed recreation activities, including collection of wildflowers. **Threat 401**
- Off-highway vehicle activities. **Threats 403, 404**
- Habitat degradation for facility construction **Threat 502**
- Highway development and road proliferation in backcountry areas. **Threats 503, 504**
- Cattle, wild horse, and burro trampling. **Threats 701, 703**
- Mining activities. **Threat 902**
- Soil and cryptogamic crust loss, and loss of habitat due to urbanization. **Threat 1101**
- Habitat fragmentation due to urbanization. **Threats 1102**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: The BLM has developed a habitat management plan for this species and is implementing the actions consistent with its HMP. An MOA to provide management for this species has been facilitated by the

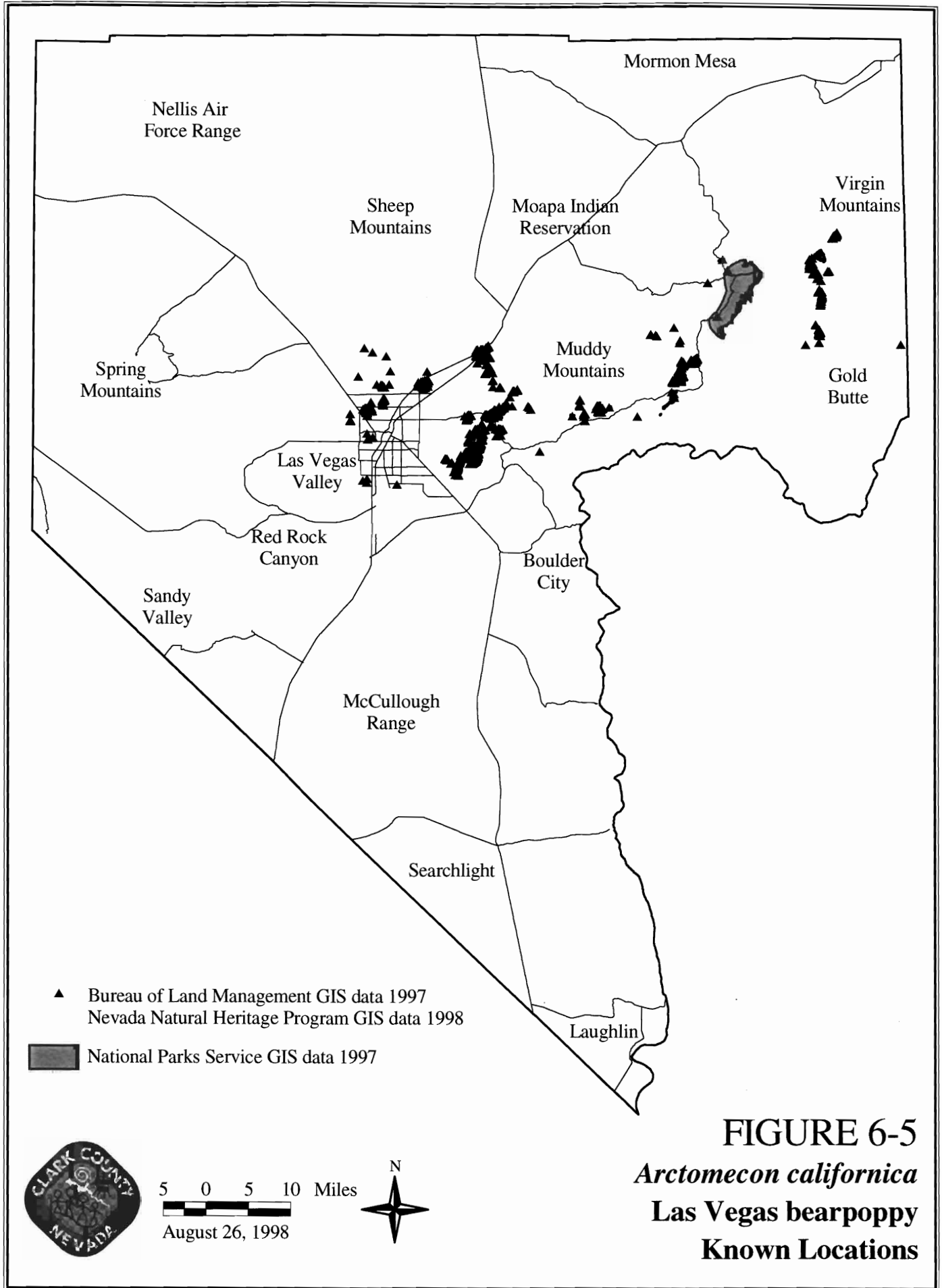


FIGURE 6-5
Arctomecon californica
 Las Vegas bearpoppy
 Known Locations

USFWS and is expected to be signed by the USAF, Las Vegas Valley Water District, Clark County, BLM, NPS, USFWS, NNHP, NDF, NDOT, and TNC to manage populations of this species in key areas of its distribution (Appendix F). The USAF, BLM, NPS, Las Vegas Valley Water District, and Clark County have implemented specific interim measures to protect these key populations. The MOA provides for the implementation of the following actions for the Las Vegas bearpoppy:

- Clark County Department of Aviation, BLM, TNC, and USFWS will investigate opportunities for establishing a conservation area and will develop strategies for protection of the Las Vegas bearpoppy on the North Las Vegas Airport property.
- Nellis, USFWS, and TNC will investigate opportunities for establishing a conservation area and will attempt to develop a strategy that is mutually acceptable to Nellis, USFWS, and TNC for protection of the Las Vegas bearpoppy population on portions of Area 3 of the NAFB.
- The District, USFWS, and TNC will investigate opportunities for establishing a conservation area and will develop strategies for protection of the Las Vegas bearpoppy population on the North Well Field.
- NDF and Heritage will form a workgroup and develop strategies for administering NRS 527.270 more effectively. This workgroup will consider development of an outreach plan, landowner notification strategies, and mitigation techniques.
- BLM will implement the Habitat Management Plan and implement those portions of the plan to the extent allowable under the existing Management Framework Plan. Additional actions proposed in the Bearpoppy HMP that are consistent only with the proposed Resource Management Plan will be implemented after the RMP is finalized. Additional actions proposed in the Bearpoppy HMP that are not consistent with the final RMP will be proposed as amendments to the RMP, or alternative actions will be found that meet the same goal.
- BLM and USFWS will identify actions that should be accomplished in the near future on BLM lands to avert the declining species status trend, and develop the mechanisms to implement such actions.
- NDOT will coordinate with USFWS, NDF, TNC, and Heritage in developing mitigation measures to offset the adverse effects of highway development and maintenance on the Las Vegas bearpoppy.
- NPS and USFWS will identify management actions needed for the Las Vegas bearpoppy on Lake Mead National Recreation Area lands and develop appropriate mechanisms for implementing these management actions.

- TNC and Heritage will provide scientific expertise and advice to the other signatories to this agreement in development of conservation strategies and actions for the Las Vegas bearpoppy.
- All signatories to this agreement will work together to identify the need and potential sources of funding for additional research, including genetic and pollinator studies.
- All signatories to this agreement will periodically discuss progress in accomplishment of actions outlined above.
- All signatories to this agreement will, as deemed necessary for long-term species conservation, work towards development of a signed Conservation Agreement detailing specific on-the-ground actions and commitment towards Las Vegas bearpoppy protection.

In addition, BLM, NPS, and USAF management includes the following species specific management actions:

BLM(32) Develop and implement a monitoring program for the Las Vegas bearpoppy in cooperation with the Lake Mead National Recreation Area. The presence or absence of known pollinators will be documented as a part of the monitoring study

BLM(34) Continue monitoring traffic levels in desert tortoise ACECs, Las Vegas bearpoppy management areas, and WSAs.

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(99) Enter into conservation agreements or easements with the U.S. Fish and Wildlife Service and other willing parties, that if implemented, could negate or reduce the necessity of future listings of Covered and Evaluation Species or recover Federally listed species. Conservation agreements may include, but not be limited to, the following: Las Vegas bearpoppy, white-margined penstemon, and phainopepla.

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) Where feasible, rehabilitate, reclaim or revegetate areas subjected to surface-disturbing activities with emphasis on habitat for Covered Species including the Las Vegas bearpoppy. When rehabilitating disturbed areas, first manage for optimum species diversity by seeding native species or use non-native species only where appropriate.

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.

BLM(305) Implement "conservation agreements" as agreed to between BLM, the U.S. Fish and Wildlife Service and other willing parties, that if implemented, could negate or reduce the necessity of future listings of Covered and Evaluation Species or recover Federally listed species. Conservation agreements may include, but not be limited to, the following: Las Vegas bearpoppy, white-margined penstemon, and phainopepla.

BLM(220)² 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).

NPS(15) Monitor Las Vegas bearpoppy populations.

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.

USAF(10) Create a Special Botanical Area for Las Vegas bearpoppy on NAFB.

USAF(22) Avoid future development on the NAFB in Las Vegas bearpoppy areas identified for protection in the memorandum of agreement.

Adequacy of Existing Management: The majority of the potential habitat for Las Vegas bearpoppy is on lands managed by the BLM (70 percent) and NPS (16 percent) and will be managed as IMA or LIMA. The remainder is on private, State, and USAF lands. Implementation of the MOA, BLM HMP, and agreements and plans developed for the species, with NDF permit regulations will provide adequate management for this species.

References: BLM 1998; Mistretta et al. 1996; Las Vegas Bearpoppy MOA 1998.

6.1.7 White bearpoppy, *Arctomecon merriamii*

Status: BLM Sensitive, Nevada Natural Heritage Program Global Rank G3, State Rank S3.

Clark County MSHCP Status: Covered.

Range: Mojave Desert endemic; Clark County, extreme southwest corner of Lincoln County, southern tip Nye County, Death Valley area, Inyo County, California.

Clark County Distribution: Western half of Clark County (Figure 6-6). Widely, but sparsely, distributed throughout a 9,650-square-mile area between 2,000 and 6,200 feet elevation. Populations near Las Vegas possibly extirpated by development. Approximately one third of the distribution is in Clark County.

Habitat: **Salt desert scrub** and **Mojave desert scrub** habitats. Populations are scattered within various habitats including limestone and dolomite ridges, rocky slopes, gravelly canyon washes, and less often on valley bottoms, disturbed sites such as roadsides and bladed areas, and old lakebeds derived from carbonate rock sources. Often found in association with *Atriplex*.

Population Trends: Stable, except in the Las Vegas Valley.

Ecosystem Level Threats:

- Loss of habitat due to urbanization. **Threat 1101**
- Habitat fragmentation due to urbanization. **Threats 503, 1102**
- Soil and cryptogamic crust loss. **Threat 1101**
- Cattle, wild horse, and burro trampling. **Threats 701, 703**
- Mining activities. **Threat 902**
- Off-highway vehicle activities. **Threats 403, 404**
- Dispersed recreation activities, including collection of wildflowers. **Threat 401**
- Highway development and road proliferation in backcountry areas. **Threats 503, 504**
- Habitat degradation at target sites, on roads, or other military access locations. **Threat 801**
- Habitat modification from military facilities construction and maintenance activities. **Threat 802**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on salt desert scrub and Mojave desert scrub. The Air Force is working with The Nature Conservancy to provide

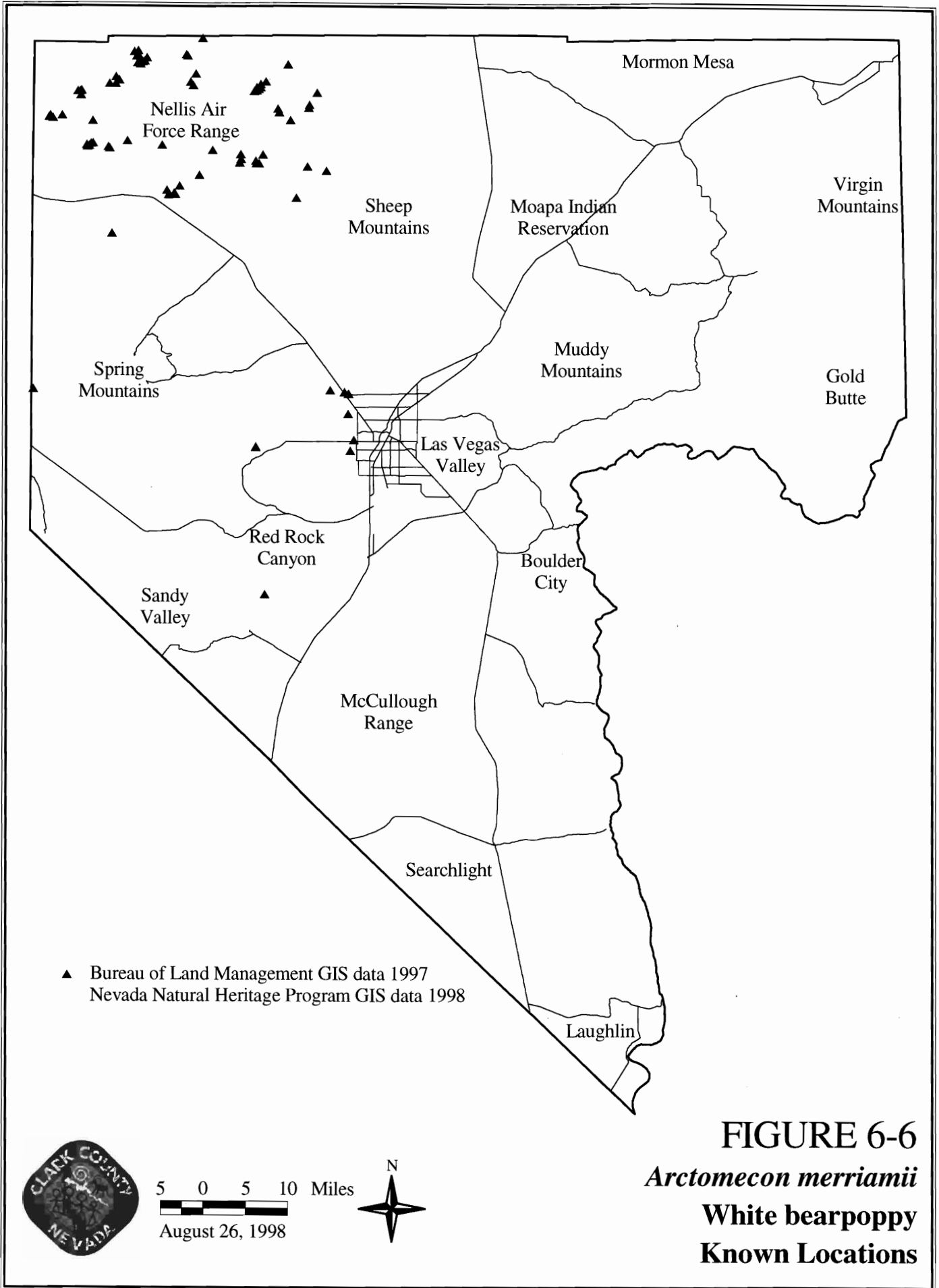


FIGURE 6-6
Arctomecon merriamii
White bearpoppy
Known Locations

long-term protection of this species and other rare taxa occurring on NAFR. The USAF has provided the USFWS with a letter stating that they will continue to provide protective management for populations on the NAFR. The USAF is currently monitoring this species and have proposed to manage populations consistent with the terms of the “Keystone Dialogue”

Adequacy of Existing Management: In Clark County, 60 percent of the habitat is on DNWR. Additional habitat is on land managed by the BLM, NPS, USAF, and under private ownership. The majority of populations occur on lands categorized as IMA or LIMA within the SMNRA, and DNWR/NAFR. Implementation of existing management should provide adequate conservation for this species.

References: The Nature Conservancy 1994.

6.1.8 Rosy king sandwort, *Arenaria kingii* ssp. *rosea*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G4T2, State Rank S2.

Clark County MSHCP Status: Covered

Range: Spring Mountains endemic.

Clark County Distribution: East side of the Spring Mountains, from Lee Canyon, Kyle Canyon, and Deer Creek (Figure 6-7). Seventeen sites documented, with an estimated 113,900 total plants on approximately 120 acres.

Habitat: **Bristlecone pine** and **mixed conifer forest**. It is found on dry rocky hillsides, on limestone and carbonate-derived substrates, between 5,900 and 9,500 feet elevation.

Population Trends: Unknown, presumed stable.

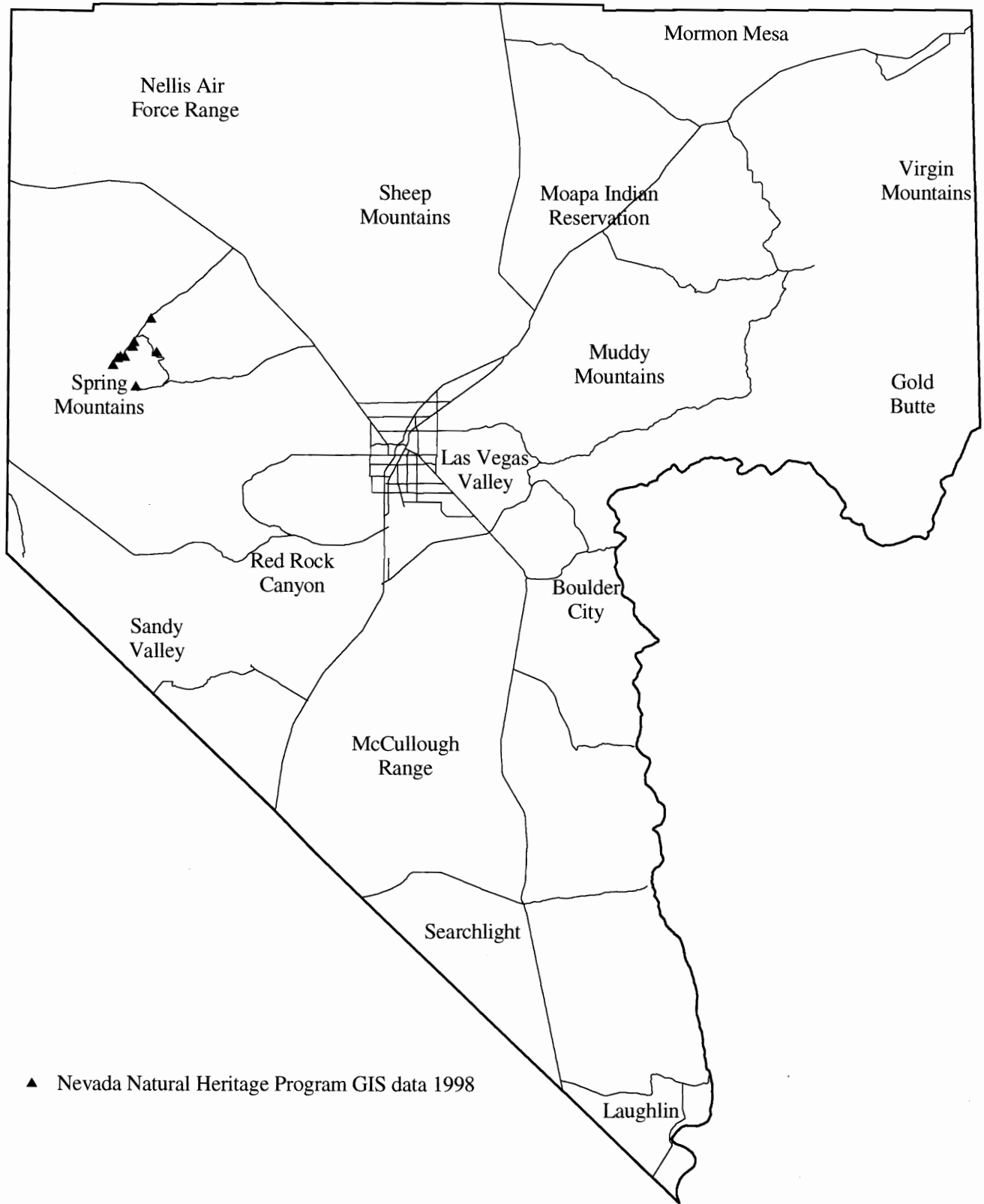
Ecosystem Level Threats:

- Adverse habitat modification due to fire suppression and fuels management in the Spring Mountains. **Threat 301**
- Adverse habitat modification and indirect effects from dispersed recreational activities, trail construction, and maintenance in the Spring Mountains NRA, in particular, Lee Canyon, Kyle Canyon, and Deer Creek. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation, in particular, near Dolomite and McWilliams campgrounds in Lee Canyon. **Threat 402**
- Habitat degradation from highway and road construction or maintenance on National Forest lands. **Threat 501**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on bristlecone pine and mixed conifer forest. The CA for the Spring Mountains NRA identifies general management actions for mid-elevation plants, such as this species, 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.



▲ Nevada Natural Heritage Program GIS data 1998



5 0 5 10 Miles
August 26, 1998



FIGURE 6-7
Arenaria kingii ssp. rosea
Rosy king sandwort
Known Locations

Adequacy of Existing Management: The majority of the species' habitat (15 of 17 sites) is on USFS lands included in the Spring Mountains NRA and is therefore managed as IMA. The remaining sites are located on private lands on the north fork of Deer Creek and Griffith Mine (Kyle Canyon). Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Knight 1992; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.9 Clokey milkvetch, *Astragalus aequalis*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range Spring Mountains endemic.

Clark County Distribution: Clokey milkvetch is endemic to the Spring Mountains, Clark County, Nevada, where it is known from 23 sites (Figure 6-8).

Habitat: Typically in **pinyon-juniper**; also **mixed conifer** and **sagebrush** habitat. The species occurs on flat to gently sloping sites with dry, gravelly soils of alluvial fans, at elevations of 6,000 to 8,400 feet.

Population Trends: Unknown, presumed stable

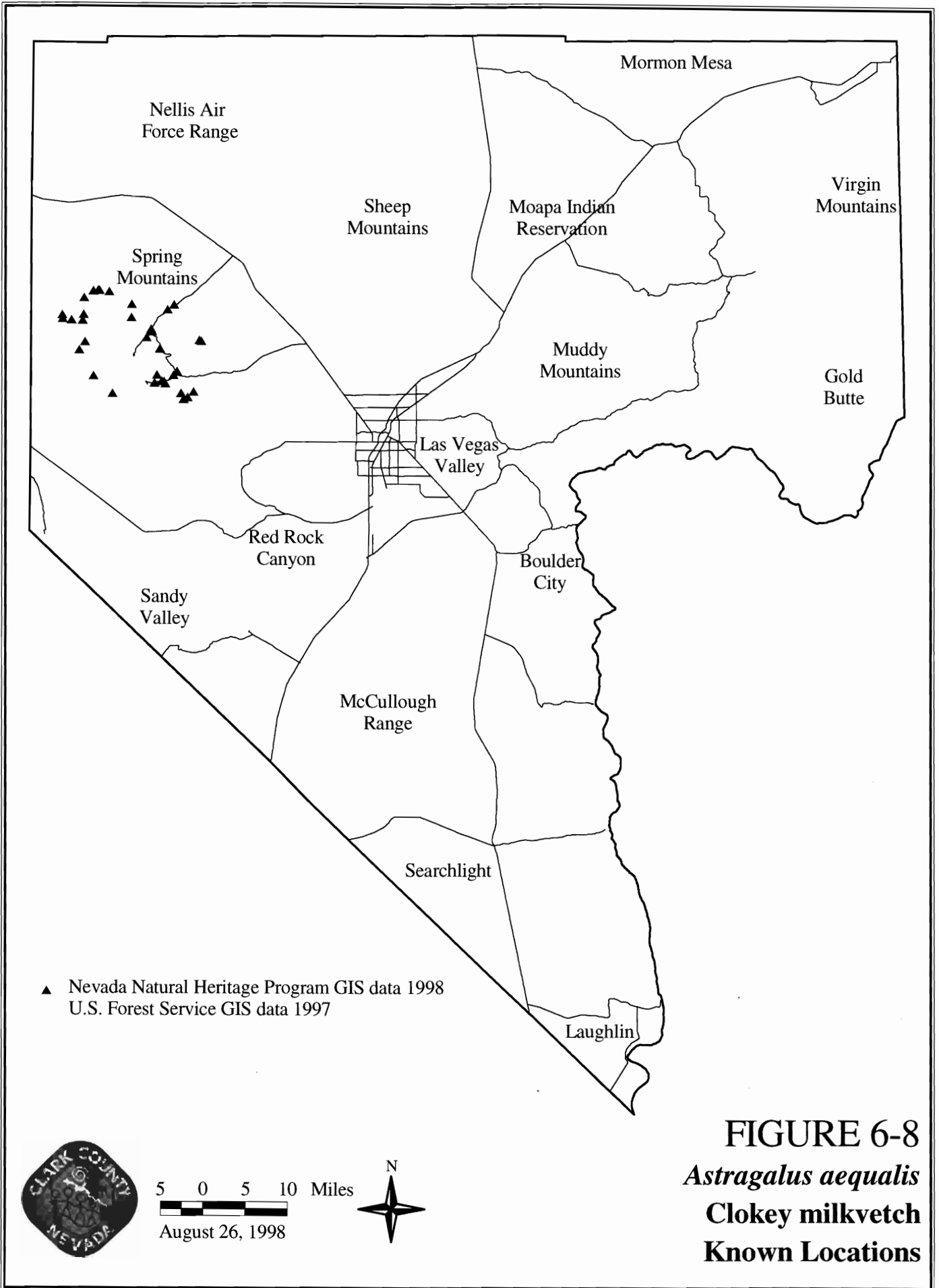
Ecosystem Level Threats:

- Adverse habitat modification from human-caused fires and fire management practices, including brush clearing and limb removal, on the north, east, and west sides of Spring Mountains NRA. **Threat 301**
- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, trail construction, and maintenance, particularly in the east side canyons of the Spring Mountains NRA. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation, particularly in the east side canyons of the Spring Mountains NRA. **Threat 402**
- Habitat degradation from highway and road construction or maintenance in the Deer Creek, Willow Spring, Harris Springs, and Cold Creek areas. **Threat 501**
- Habitat degradation from wild horse and burro trampling. **Threat 701**
- Residential development activities in the Deer Creek, Willow Spring, Harris Springs, and Cold Creek areas. **Threats 1101, 1102**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on pinyon-juniper; mixed conifer, and sagebrush. The CA for the Spring Mountains NRA identifies general



management actions for mid-elevation plants, such as this species, 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.

Adequacy of Existing Management: The majority of potential habitat occurs on USFS land and, to a lesser extent, on BLM-managed land, and private lands. Twenty sites occur on lands managed by USFS in the Spring Mountains NRA within IMAs or LIMAs, while the remaining sites occur on private inholdings. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Nachlinger 1994; USFS, NDCNR, USFWS 1998,

6.1.10 Threecorner milkvetch, *Astragalus geyeri* var. *triquetrus*

Status: State of Nevada Critically Endangered (NRS 527.270), Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Southeastern Mojave Desert endemic, Lincoln and Clark Counties in Nevada and Mojave County, Arizona. About 43,000 acres of habitat.

Clark County Distribution: Limited to eastern portion of Clark County in the vicinity of Dry Lake Valley, Glendale, Riverside, Overton Arm, and Sandy Cove. Approximately 20 occurrences are known rangewide (Figure 6-9). Plants occur in low numbers (10 to 40 individuals per location) at most locations and may not appear every year. Range overlaps with *Eriogonum viscidulum*. Potential habitat is larger than the habitat in which plants are found in any one year. Appearance may be dependent upon rainfall.

Habitat: Mojave desert scrub communities; sandy soils formed from sedimentary formations adjacent to Lake Mead and its tributary valleys in Clark County. Associated with Aztec sandstone outcrops. This plant seems to prefer average to above-average rainfall years to germinate in quantity.

Population Trends: Unknown; annual species with extreme between year variability.

Ecosystem Level Threats:

- Dispersed shoreline recreation on Lake Mead. **Threat 401**
- Concentrated off-road vehicle travel in sandy areas (especially adjacent to Mesquite, Bunkerville, and along the Muddy River). **Threats 403, 404**
- Burro trampling **Threat 701**
- Sand/gravel mining, **Threat 902**
- Expansion of rural communities including associated activities **Threat 1101**
- Utility development **Threat 1202**

Species Specific Threats: None identified.

- Unknown population trends **Threat 102**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on Mojave desert scrub. BLM management that specifically benefits this species includes consideration of

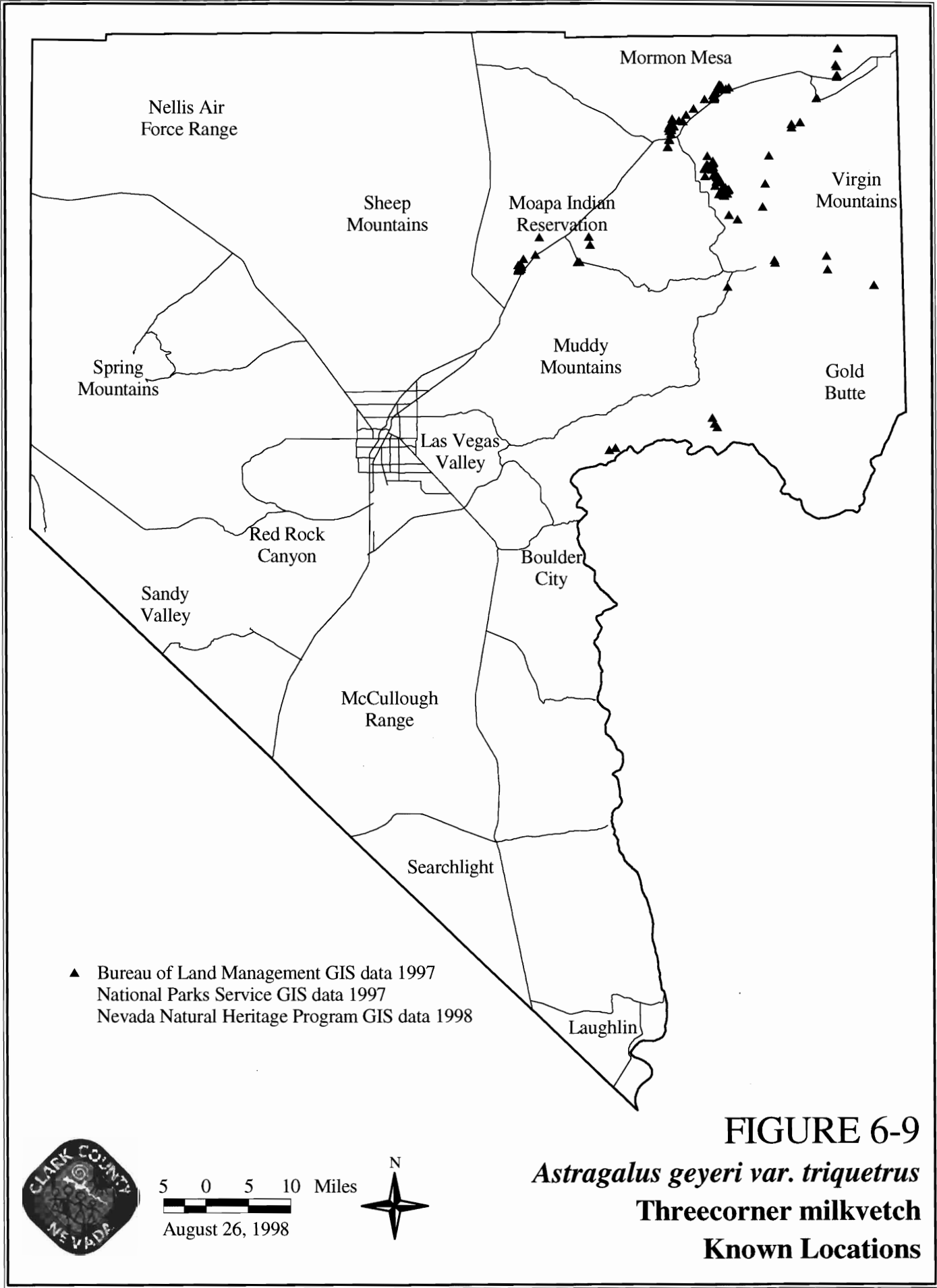


FIGURE 6-9

Astragalus geyeri var. triquetrus
Threecorner milkvetch
Known Locations

conservation needs in management actions for land disposals, saleable minerals, livestock and feral animals, OHV, and utility corridors. Species specific protective management actions implemented by NPS are also beneficial to the species:

NPS(6) Coordinate inventory of three-cornered milkvetch and sticky buckwheat with other survey efforts on Federal lands (existing).

Adequacy of Existing Management: Most habitat for this species occurs on BLM and NPS lands; other management includes State of Nevada, Bureau of Reclamation, and limited areas of private land. Implementation of existing management, including NDF permit requirements, should provide adequate conservation for this species

The AMP should investigate the development of an appropriate monitoring program recognizing the between year variability of populations of this annual species. This might include the monitoring of general habitat conditions or other appropriate indicators.

References: Knight 1990; Niles, et al. 1995.

6.1.11 Spring Mountains milkvetch, *Astragalus remotus*

Status: BLM Sensitive, Spring Mountains NRA Species of Concern, Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: The species is a locally abundant endemic known only from the southeastern slopes of the Spring Mountains, from Rocky Gap in Red Rock Canyon to Goodsprings (Figure 6-10).

Habitat: Pinyon-juniper, sagebrush, grassland, blackbrush, and Mojave desert scrub. This species occurs in gravelly soils, rocky hillsides, and desert washes.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Vegetation community conversion to fire regime due to introduction of exotic annuals (cheatgrass). **Threat 302**
- Recreational use (hiking, mountain biking), particularly with respect to mountain bike trails in Cottonwood valley area. **Threat 401**
- Wild horses and burros. **Threat 701**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on pinyon-juniper, sagebrush, grassland, blackbrush, and Mojave desert scrub. BLM and USFS management that particularly benefit this species include management of wild horses and burros, and activities related to fire management.

Additional species specific management actions proposed for this species include:

USFS(20) Inventory for populations of rare flora and fauna on an annual basis. A Native Species Site Survey Report will be used to record new records of species occurrence, and

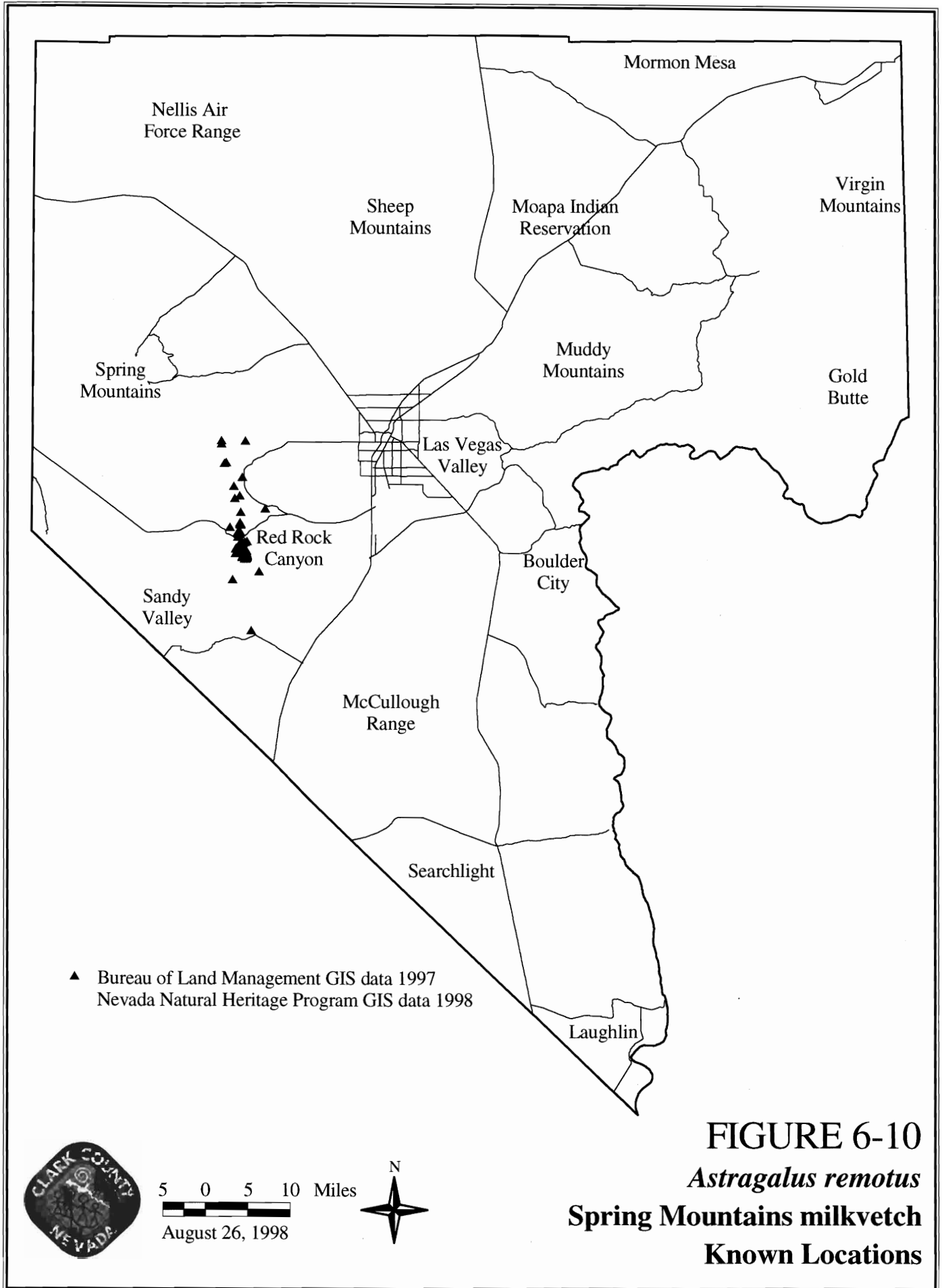


FIGURE 6-10
Astragalus remotus
Spring Mountains milkvetch
Known Locations

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)

- Mojave bajada and wash plants - halfring milkvetch, Death Valley beardtongue, black wooly-pod, **Spring Mountains milkvetch** - very high priority (CA2.1a)

BLM(97) Restrict mountain bikes and other mechanized non-motorized vehicles to designated trails within the Red Rock Canyon NCA and only allow new trails consistent with the conservation of BLM sensitive species, including the **Spring Mountains milkvetch**.

Adequacy of Existing Management: The majority of populations of this species are within IMAs and LIMAs. Of the 11 recorded sites, one is within the Spring Mountain Ranch State Park, five are within BLM's Red Rock Canyon NCA, three are on a combination of BLM and USFS Spring Mountains NRA lands, and two are within a combination of BLM and private land parcels. Implementation of existing BLM management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: WESTEC 1980; USFS, NDCNR, USFWS 1998.

6.1.12 Alkali mariposa lily, *Calochortus striatus*

Status: BLM Sensitive, Nevada Natural Heritage Program Global Rank G2, State Rank S1.

Clark County MSHCP Status: Covered.

Range: Endemic to western Mojave Desert in California and Nevada.

Clark County Distribution: There are eight populations in Clark County (6 in Red Rock Canyon NCA and 1 in the Las Vegas Valley), and one in Nye County (Figure 6-11).

Population Trends: Unknown, possibly declining.

Habitat: **Mojave desert scrub**; restricted to alkaline meadows and mesic areas between 2100 and 3700 feet in elevation.

Ecosystem Level Threats:

- Dispersed recreation in the Red Rock Canyon NCA. **Threat 401**
- Wild horse and burro grazing and trampling. **Threat 701**
- Habitat modification and degradation and wildlife mortality from competitive OHV races **Threat 403**
- Habitat modification and degradation and wildlife mortality from casual use (non-competitive non-commercial) OHV activities **Threat 404**
- Habitat degradation resulting from spring diversion and modification **Threat 1401**
- Habitat degradation resulting from spring outflow diversion **Threat 1402**
- Decreased spring flows resulting from groundwater pumping **Threat 1403**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on Mojave desert scrub. BLM management that particularly benefits this species includes activities to ensure that springs and seeps are in proper functioning conditions and recreation designations which reflect level and intensity of use.

Species specific conservation measures within the Red Rock Canyon NCA include:

BLM(25) Monitor populations of **alkali mariposa lily** within Red Rock Canyon NCA

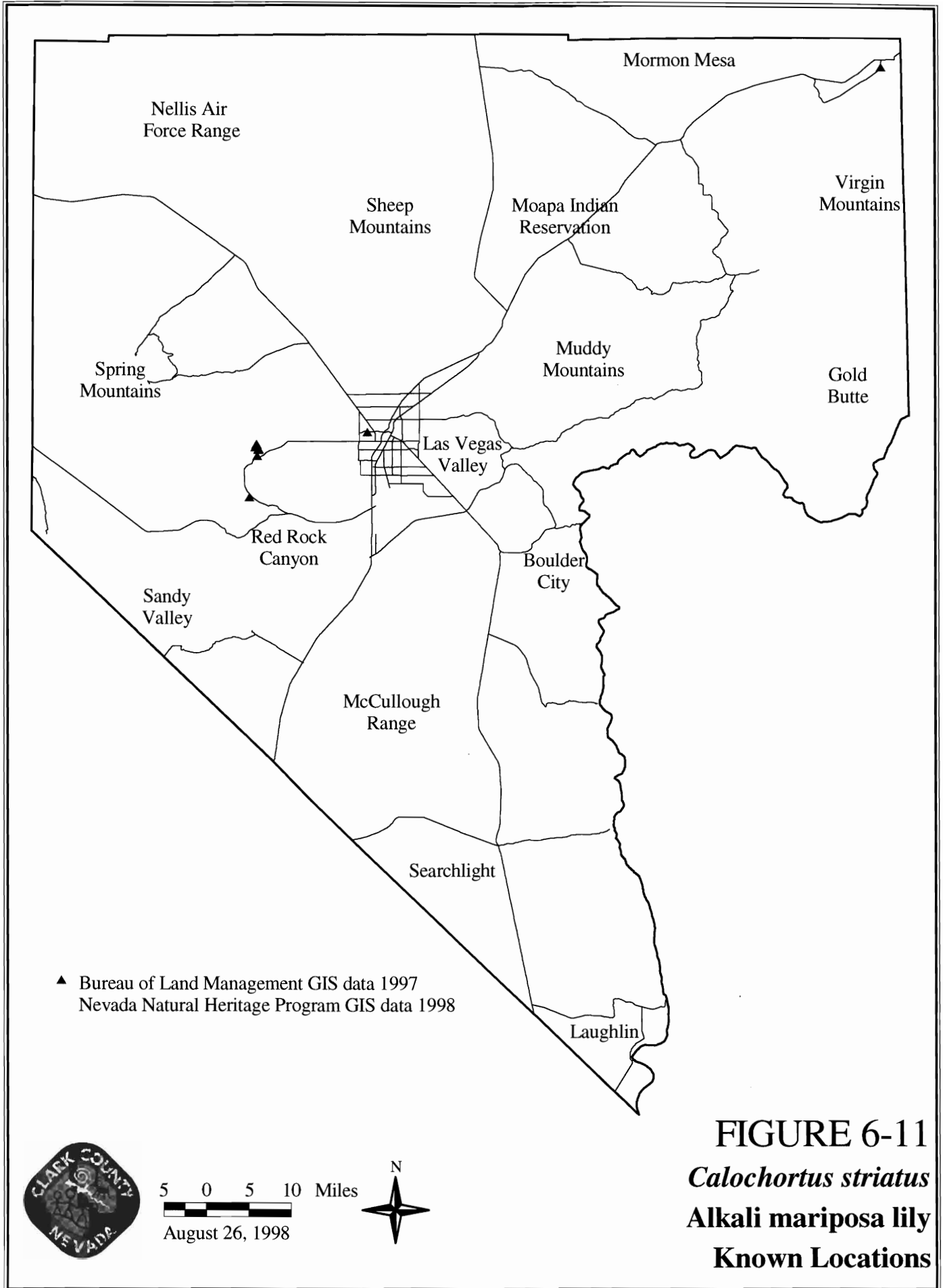


FIGURE 6-11
Calochortus striatus
 Alkali mariposa lily
 Known Locations

BLM(33) Develop and implement a monitoring program for the **alkali mariposa lily**, Blue Diamond cholla in Red Rock Canyon NCA, the white-margined penstemon, and other Covered and Evaluation Species as needed.

BLM(new) Develop and implement an activities plan for Red Spring, with emphasis on the conservation of springsnails and alkali mariposa lily.

Adequacy of Existing Management: The majority of populations of this species are in IMAs and LIMAs in Red Rock Canyon NCA. Implementation of existing and proposed BLM management, including the BLM activities plan for Red Spring, should provide adequate conservation for this species.

References: Mozingo and Williams 1980; Kartesz 1987; Hickman 1993; Southern Nevada Water Authority 1995.

6.1.13 Clokey paintbrush, *Castilleja martinii* var. *clokeyi*

Status: Nevada Natural Heritage Program Global Rank G3T2.

Clark County MSHCP Status: Covered.

Range: Mountain ranges of southern Nevada, Sheep Range, Spring Mountains, and Quinn Canyon Range in Nye County and Inyo County, California.

Clark County Distribution: Locally common at higher elevations in the Spring Mountains. Occurrence records include Macks, Kyle, Lee, and Clark Canyons, Deer Creek, and the major high elevation trails (Figure 6-12).

Habitat: **Bristlecone pine** and **mixed conifer**; on dry gravelly slopes between 6,500 and 10,250 ft.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification due to fire suppression and fuels management. **Threat 301**
- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, particularly in the Spring Mountains developed canyons. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation, particularly in Spring Mountains developed canyons. **Threat 402**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on bristlecone pine and mixed conifer. The CA for the Spring Mountains NRA identifies general management actions for mid-elevation plants, such as this species, 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.

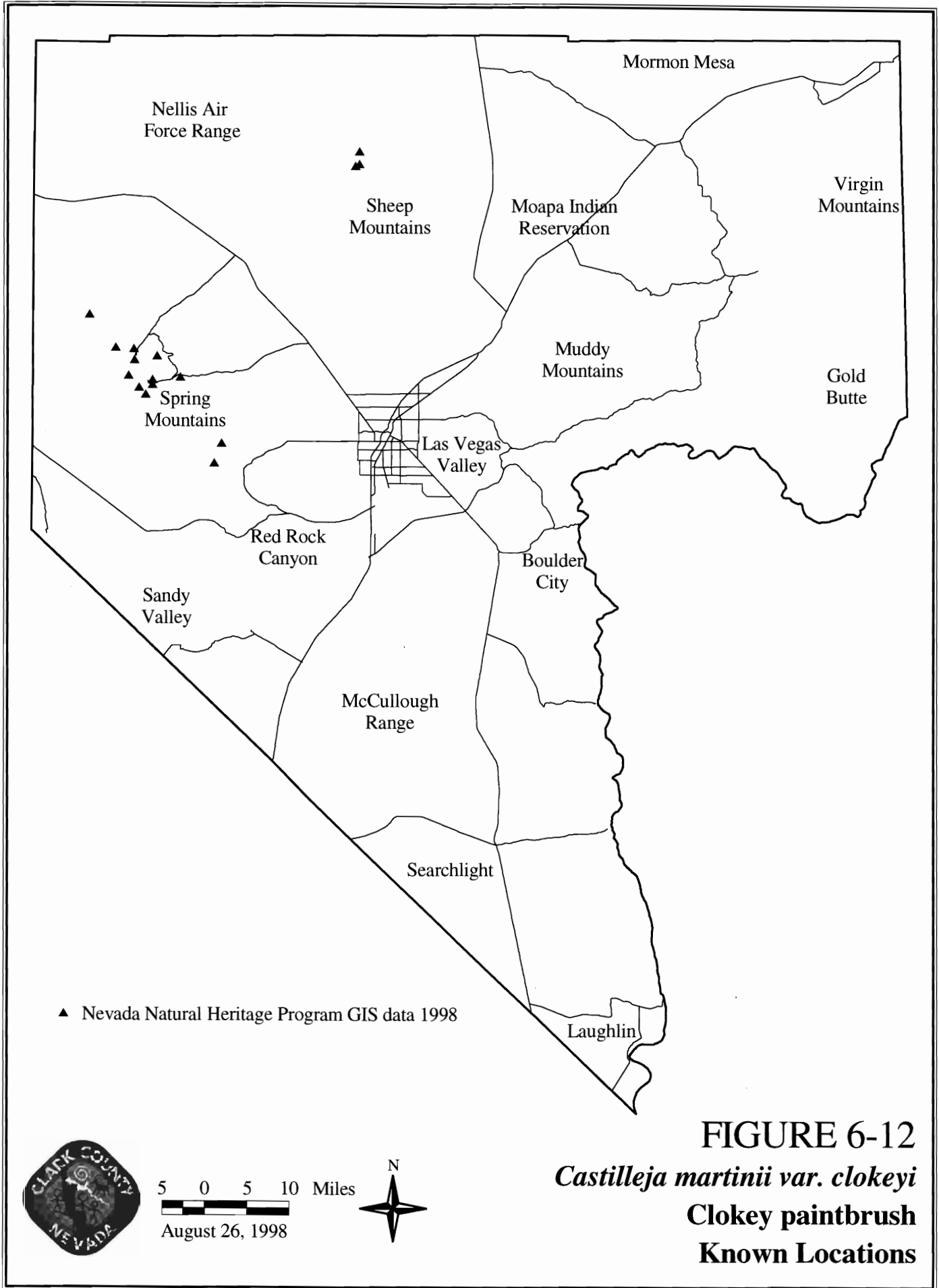


FIGURE 6-12
Castilleja martinii var. clokeyi
Clokey paintbrush
Known Locations

Adequacy of Existing Management: Most of the potential habitat for this species occurs on lands managed by the USFS, and the USFWS, as IMAs and LIMAs. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA and DNWR management should provide adequate conservation for this species.

References: Knight 1992; Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.14 Clokey thistle, *Cirsium clokeyi*

Status: Nevada Natural Heritage Program Global Rank G2, G3, State Rank S2, S3.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic, all of range within Clark County.

Clark County Distribution: Fairly widespread in the Spring mountains, including occurrences at Charleston Peak, Deer Creek, the head of Lee Canyon, and Kyle Canyon (Figure 6-13).

Habitat: **Alpine, bristlecone pine, and mixed conifer.** Gravelly slopes and dry ridges and around springs, at elevations of 9,100 to 11,000 ft in elevation.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, trail construction, and maintenance, in particular, Macks Canyon, Lee Canyon, Kyle Canyon, and along high elevation trails. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation, in particular, Macks Canyon, Lee Canyon, and Kyle Canyon. **Threat 402**
- Physical alteration of spring and spring outflow habitats, resulting in alterations to the natural flow, temperature, and sediment regimes. **Threats 1401, 1402**
- Habitat degradation and population decreases resulting from introductions, competition, and encroachment of exotic species. **Threat 1501**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on Alpine, bristlecone pine, and mixed conifer. The CA for the Spring Mountains NRA identifies general management actions for high-elevation plants, such as this 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,

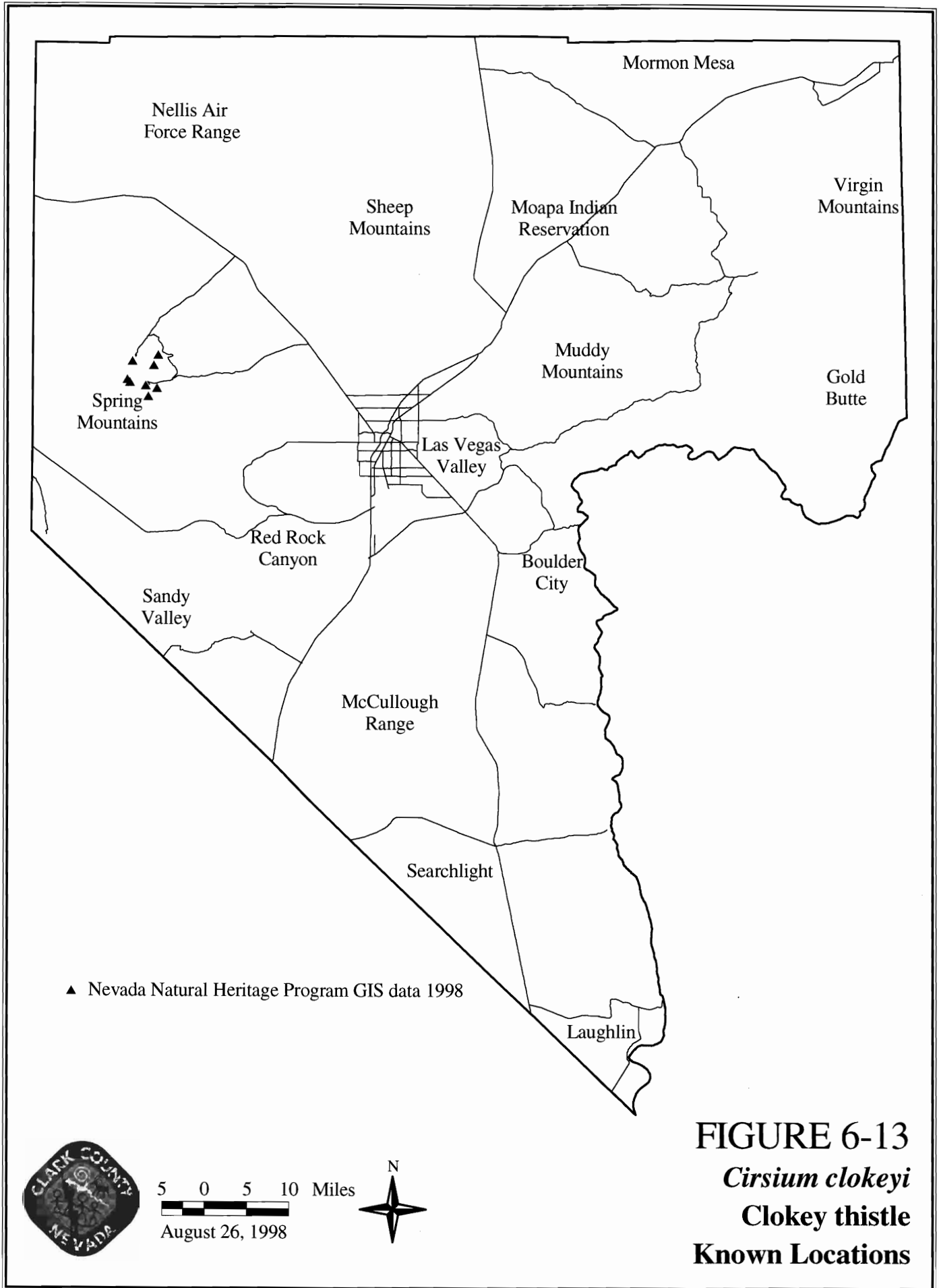


FIGURE 6-13
Cirsium clokeyi
 Clokey thistle
Known Locations

as determined through monitoring, removal of selected informal high-elevation and alpine campsites, and implementation of a weed management strategy.

Adequacy of Existing Management: Almost all of the medium to high potential habitat occurs on lands managed by the USFS as IMAs and LIMAs. The small amount of remaining occurs on private lands. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species

References: Knight 1992; Nachlinger 1994; USFS, NDCNR, USFWS 1998.

6.1.15 Jaeger whitlowgrass, *Draba jaegeri*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic, all of range within Clark County.

Clark County Distribution: Jaeger whitlowgrass is endemic to the Spring Mountains, Clark County, where it is known from Charleston Peak, Mummy Mountain, and Lee Canyon (Figure 6-14).

Habitat: Alpine and bristlecone pine communities between 9,650 and 11,200 feet elevation, in alpine fell fields and talus rubble, near or at timberline.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities in the alpine zone. **Threat 401**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on alpine and bristlecone pine. The CA for the Spring Mountains NRA identifies general management actions for high-elevation plants, such as this 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.

Adequacy of Existing Management: Most of the high potential habitat occurs on lands managed by the USFS and all known populations occur on lands under management by the USFS in the Spring Mountains NRA as IMAs and LIMAs. Implementation of

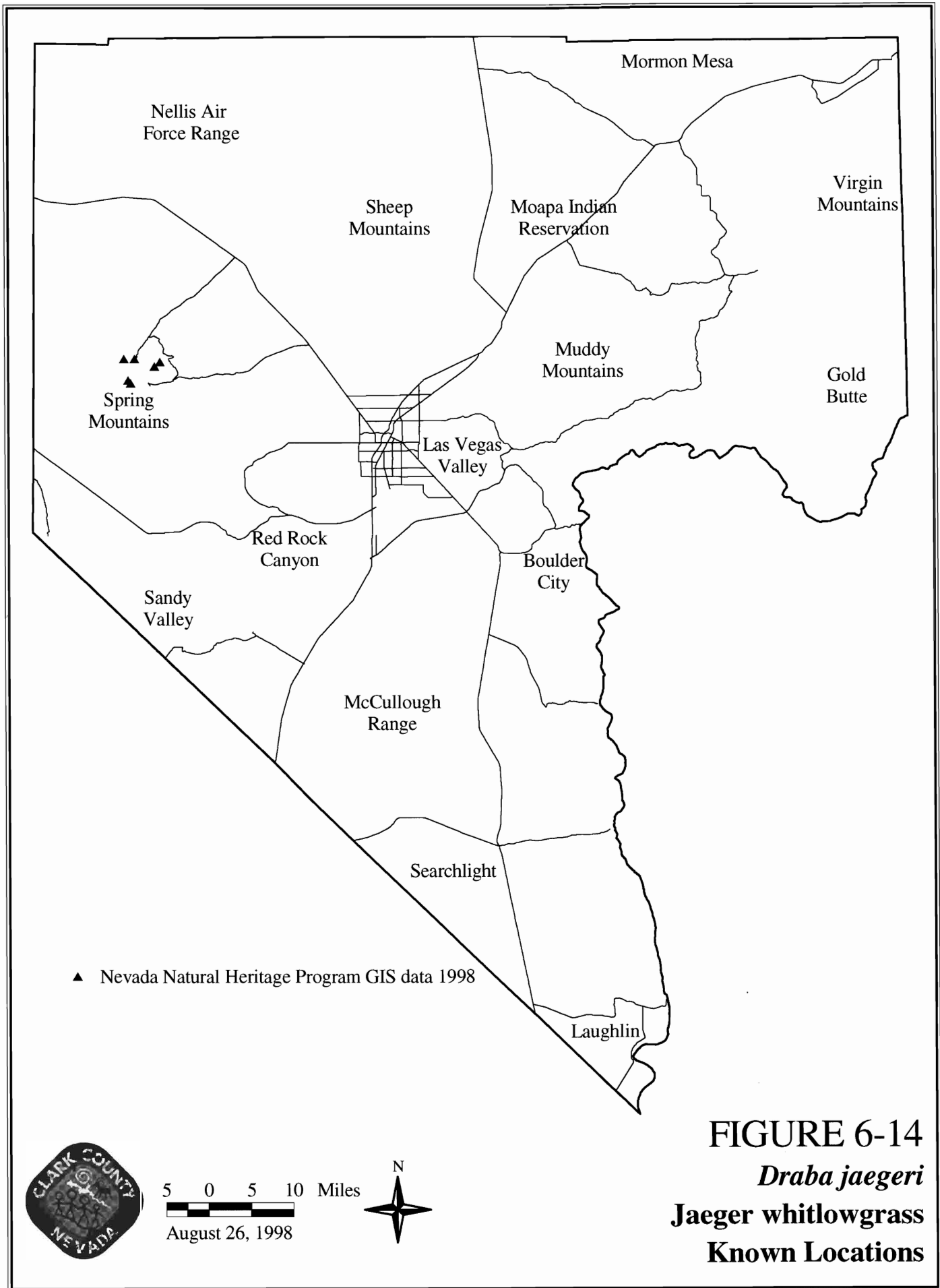


FIGURE 6-14
Draba jaegeri
Jaeger whitlowgrass
Known Locations

existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Knight 1992; Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.16 Charleston draba, *Draba paucifruca*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G1, G2, State Rank S1, S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic, all of range is within Clark County.

Clark County Distribution: The species is endemic to the Spring Mountains, where it occurs between 8,250 and 11,400 feet elevation (Figure 6-15). Known from 19 sites at three primary locations at Charleston Peak and ridgeline, Kyle Canyon, and Lee Canyon.

Habitat: Alpine and bristlecone pine communities, at and above timberline, in moist areas such as seeps and late-lying snow drifts. It is found in association with bristlecone and limber pine, shooting star, and alumroot.

Population Trends: Unknown, presumed stable.

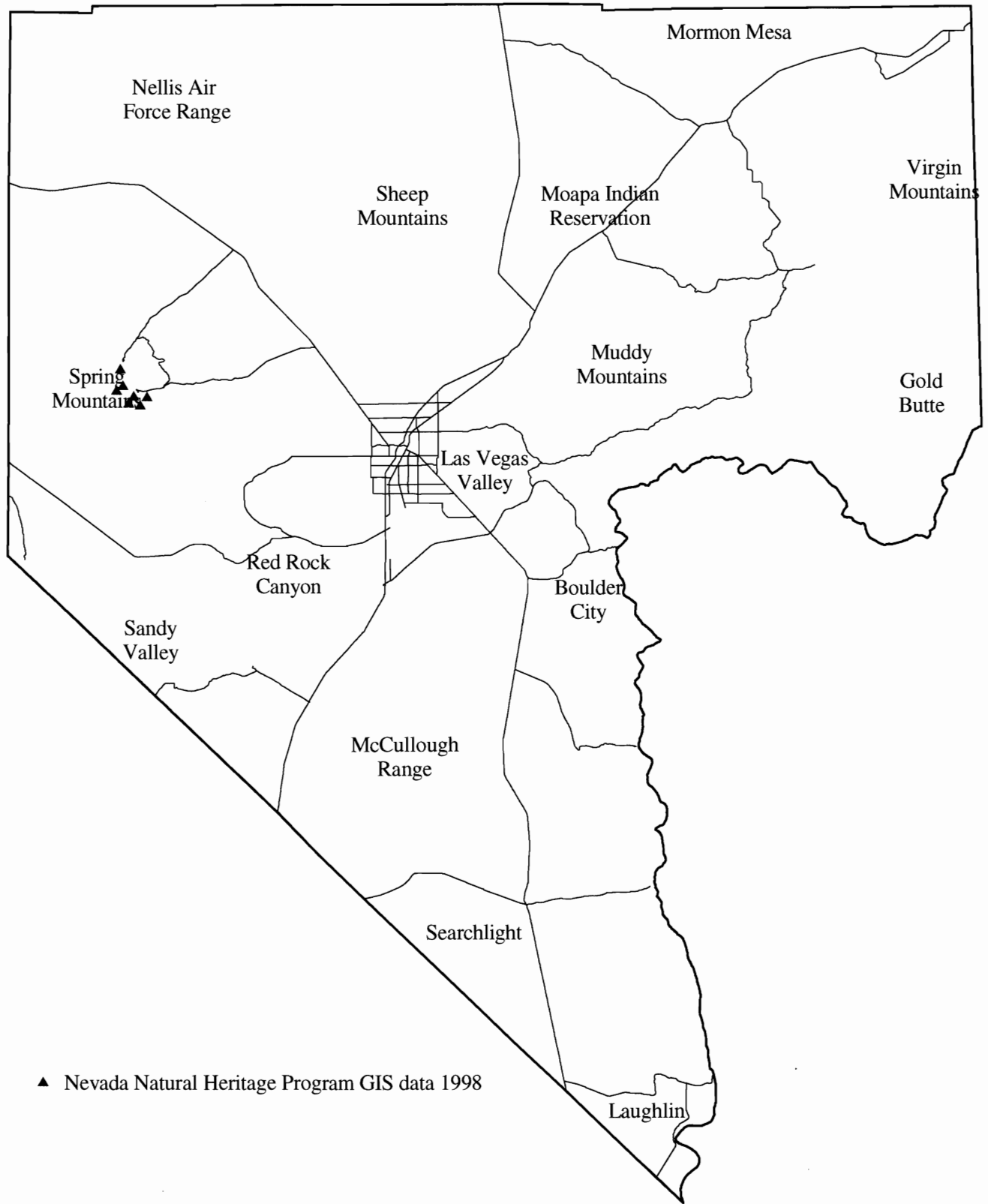
Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, trail construction, and maintenance. **Threat 401**
- Physical alteration of spring and spring outflow habitats (e.g., piping, diversion), resulting in alterations to the natural flow, temperature, and sediment regimes. **Threats 1401, 1402**
- Habitat degradation and population decreases resulting from introductions, competition, and encroachment of exotic species. **Threat 1501**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on alpine and bristlecone pine. The CA for the Spring Mountains NRA identifies general management actions for high-elevation plants, such as this 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



▲ Nevada Natural Heritage Program GIS data 1998



5 0 5 10 Miles
August 26, 1998



FIGURE 6-15
Draba paucifructa
Charleston draba
Known Locations

monitoring, removal of selected informal high-elevation and alpine campsites, and implementation of a weed management strategy. In addition, the CA identifies general management actions for mid-elevation plants, such as this species, 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.

Adequacy of Existing Management: The majority of the high potential habitat for this species occurs on lands managed by USFS as IMAs and LIMAs. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Knight 1992; Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.17 Inch high fleabane, *Erigeron uncialis* ssp. *conjugans*

Status: Nevada Natural Heritage Program Global Rank G3T3, State Rank S3.

Clark County MSHCP Status: Covered.

Range: Southern Nevada endemic, Clark and Nye Counties.

Clark County Distribution: Inch high fleabane occurs in the Spring Mountains and Sheep Range (Figure 6-16). Occurrences in the Spring Mountains include Kyle and Lee Canyons, Carpenter Canyon, and Deer Creek.

Habitat: **Bristlecone pine, mixed conifer, pinyon-juniper, and sagebrush** communities: restricted to limestone cliffs and around boulders. It prefers the cracks in vertical faces of limestone cliffs and large boulders from 7,200 to 11,500 ft in elevation.

Population Trends: Unknown, presumed stable.

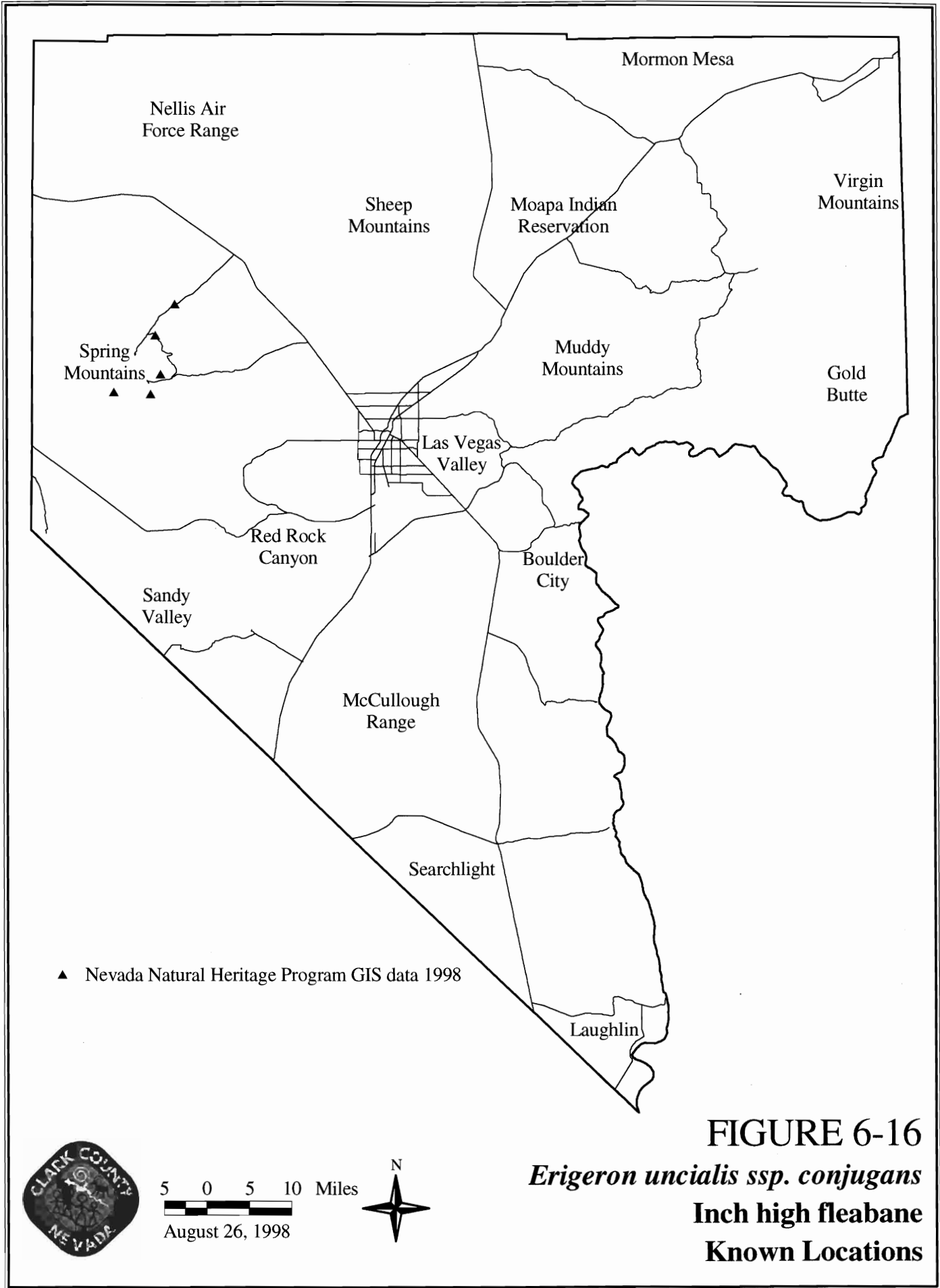
Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, trail construction, and maintenance, in particular, Lee Canyon, Kyle Canyon, and Deer Creek area. **Threat 401**
- Habitat modification, individual displacement by rock climbing. **Threat 405**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on bristlecone pine, mixed conifer, pinyon-juniper, and sagebrush. The CA for the Spring Mountains NRA identifies general management actions for mid-elevation plants, such as this species, 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. The CA also identifies management actions for plants found on and around cliffs and in rocky areas, including distribution of educational materials to climbers, and sensitive plants surveys prior to development of new climbing routes.



Adequacy of Existing Management: Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.18 Forked (Pahrump Valley) buckwheat, *Eriogonum bifurcatum*

Status: BLM Sensitive, Nevada Natural Heritage Program Global Rank G2, State Rank S1.

Clark County MSHCP Status: Covered.

Range: Mojave Desert endemic, along the border of Nevada and California.

Clark County Distribution: Occurs in Sandy Valley and Pahrump Valley (Figure 6-17). The greatest extent of occurrence is in Pahrump Valley; with additional populations in Stewart Valley and in California along the California/Nevada border.

Population Trends: Unknown; losses of habitat have been documented in Sandy and Pahrump Valley from urban and agricultural development.

Habitat: **Salt desert scrub** within a limited area of in Sandy Valley and Pahrump. Occurs in saline flats with sandy soils and stabilized dune topography around dry lake beds and associated **mesquite** woodlands at approximately 2,500 ft. Ephemeral species; responds to precipitation events.

Ecosystem Level Threats:

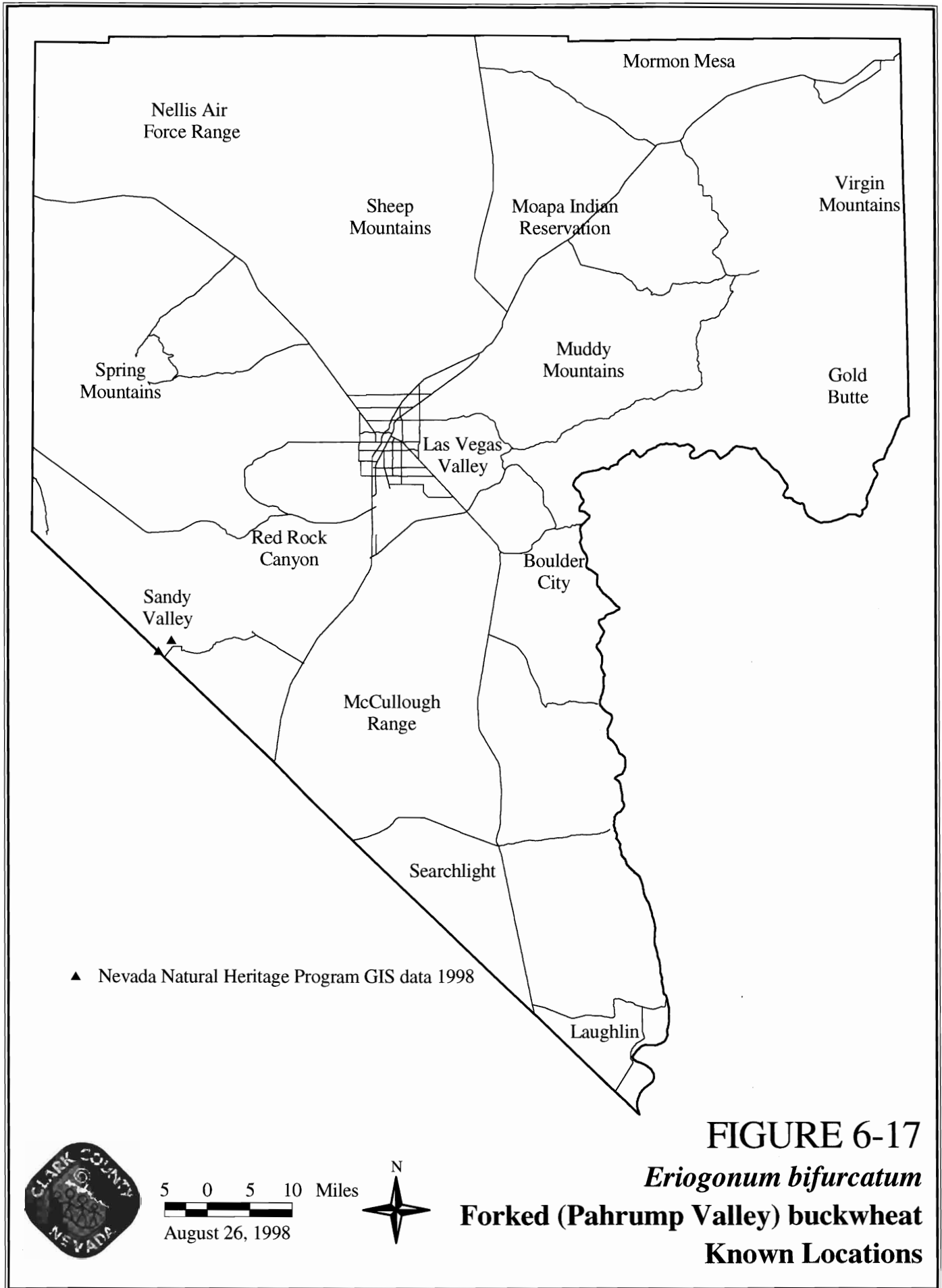
- Urbanization and associated activities (off-highway vehicles and dumping). **Threat 1702**
- Conversion and expansion of agricultural activities. **Threat 1101**
- Habitat modification and degradation from competitive OHV races. **Threat 403**
- Habitat modification and degradation from casual use (non-competitive non-commercial) OHV activities. **Threat 404**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on salt desert scrub and mesquite/catclaw. BLM management that particularly benefits this species includes consideration of conservation needs in activities involving land disposal and OHV management. A Mesquite Management Plan currently under development by BLM includes provisions for road closures and rehabilitation, signs and fences, and will address dumping and woodcutting problems which affect this species.

Adequacy of Existing Management: The species occurs on both private and BLM lands. Implementation of existing BLM management will provide adequate conservation for this species.

References: Beatley 1977; Mozingo and Williams 1980; Knight 1988.



6.1.19 Sticky buckwheat, *Eriogonum viscidulum*

Status: State of Nevada Critically Endangered (NRS 527.270), BLM Sensitive Species, Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Eastern Mojave endemic; Clark County, southeast portion of Lincoln County and Mojave County, Arizona).

Clark County Distribution: Muddy River from Weiser Wash to the confluence with the Virgin River, Virgin River drainage from Sand Hollow Wash to the confluence of the Colorado River at Middle Point (Figure 6-18). Overlaps with *Astragalus geyeri* var. *triquetrus* over much of its range. About 20 populations have been identified in Nevada, two in Mojave County, Arizona.

Habitat: Occurs in low dunes, washes, beaches, and areas of aeolian accumulation, in loose sandy soils, 1,500 and 2,500 feet elevations within the **Mojave desert scrub** community.

Population Trends: Unknown.

Ecosystem Level Threats:

- Shoreline recreation; OHV recreation. **Threats 410, 403, 404**
- Burro trampling and grazing. **Threat 701**
- Livestock trampling and grazing. **Threat 703**
- Sand/gravel mining activity between Mesquite and the Muddy River. **Threat 902**
- Utility corridor construction and maintenance. **Threat 1202.**
- Flooding, washouts, rising level of Lake Mead. **Threat 1302**
- Habitat displacement by tamarisk in shoreline habitat and arrowweed. **Threat 1501**

Species Specific Threats: None identified.

- Unknown population trends. **Threat 102**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on Mojave desert scrub. BLM management that specifically benefits this species includes consideration of conservation needs in management actions for land disposals, saleable minerals, livestock and feral animals, OHV, and utility corridors. Species specific protective management actions implemented by NPS are also beneficial to the species:

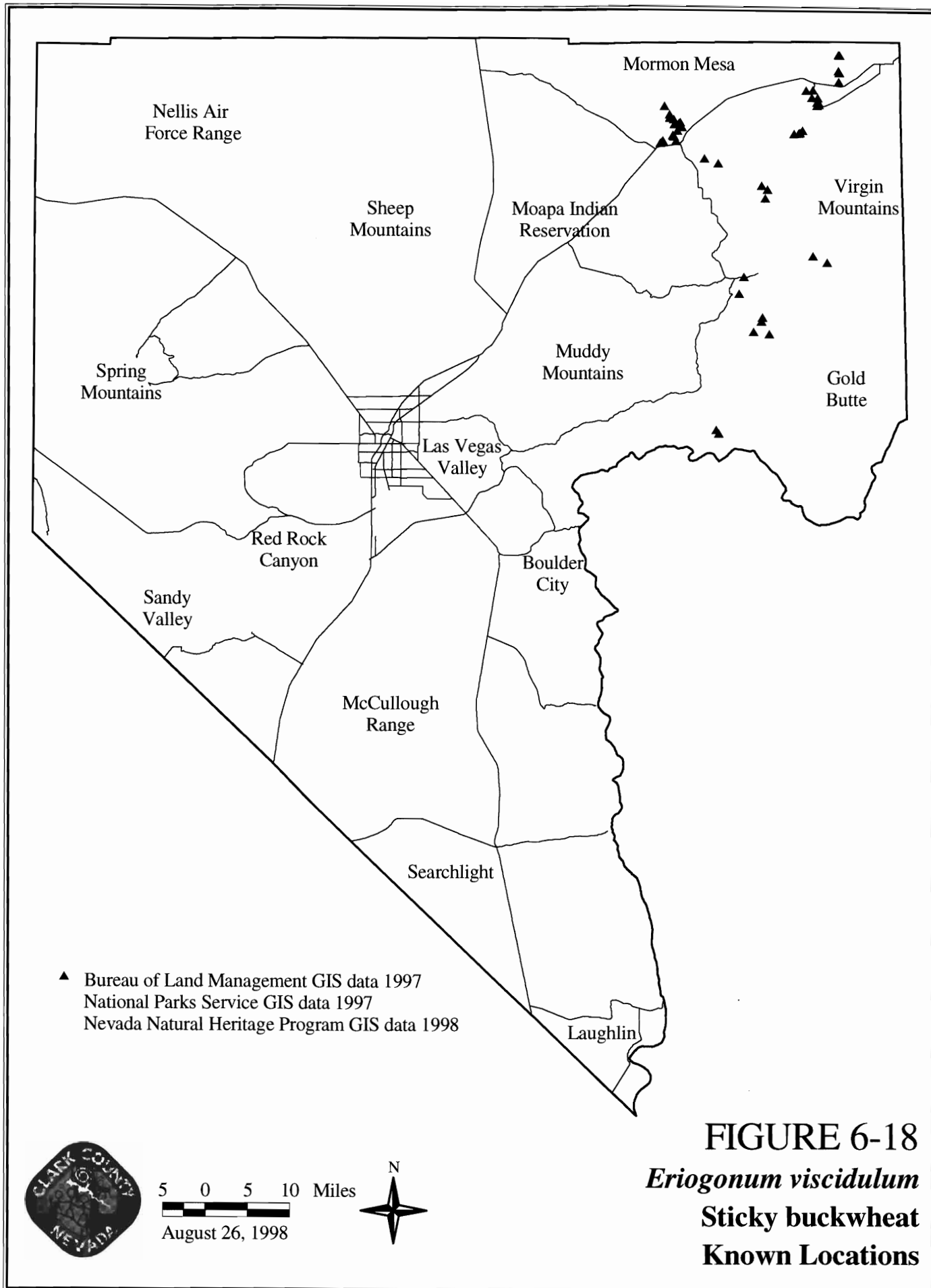


FIGURE 6-18
Eriogonum viscidulum
 Sticky buckwheat
 Known Locations

NPS(6) Coordinate inventory of three-cornered milkvetch and sticky buckwheat with other survey efforts on Federal lands (existing).

Adequacy of Existing Management: The majority of habitat for this species occurs on BLM and NPS (Lake Mead National Recreation Area) land and some private land (Riverside, Nevada). Implementation of existing NPS and BLM management and proposed conservation measures above, including NDF permit regulations, should provide adequate conservation for this species.

The AMP should investigate the development of an appropriate monitoring program recognizing the between year variability of populations of this annual species. This might include the monitoring of general habitat conditions or indicators.

References: Niles et al. 1995.

6.1.20 Clokey greasebush, *Glossopetalon clokeyi*

Status: Spring Mountains NRA Species of Concern, Nevada Natural Heritage Program
Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic, all of range within Clark County.

Clark County Distribution: Known from 13 sites in the Spring Mountains, on approximately 36 acres at elevations between 7,000 and 9,200 ft. Known occurrences are Kyle and Carpenter Canyons (Figure 6-19).

Habitat: **Mixed conifer** community in cracks and crevices on northern side of vertical and near vertical limestone cliffs.

Population Trends: Appears to be stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, including hiking, picnicking, and rock scrambling, in particular, at Mary Jane Falls, Echo Cliff, and Robbers Roost. **Threat 401**
- Habitat modification, individual displacement by rock climbing. **Threat 405**

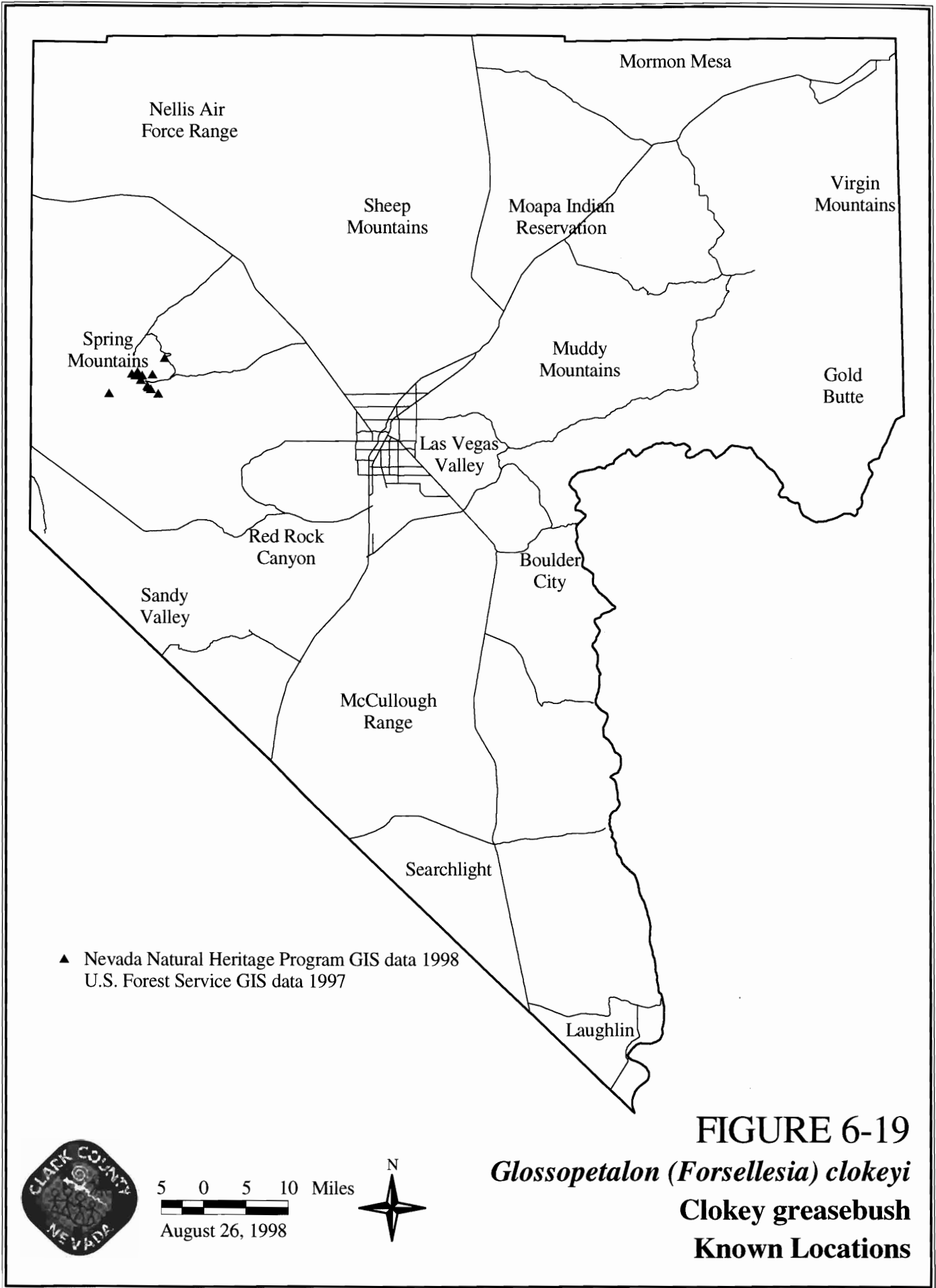
Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on mixed conifer. The CA for the Spring Mountains NRA identifies management actions for plants found on and around cliffs and in rocky areas, including distribution of educational materials to climbers, and sensitive plants surveys prior to development of new climbing routes.

Species specific management actions that benefit this species include:

USFS(20) Inventory for populations of rare flora and fauna on an annual basis. A Native Species Site Survey Report 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)



▲ Nevada Natural Heritage Program GIS data 1998
 U.S. Forest Service GIS data 1997

FIGURE 6-19

Glossopetalon (Forsellesia) clokeyi
Clokey greasebush
Known Locations



5 0 5 10 Miles
 August 26, 1998



- Cliff plants - smooth pungent greasebush and pungent dwarf greasebush - high priority (CA2.1g)*

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)*

Adequacy of Existing Management: Almost all of the potential habitat for this species occurs on lands managed by the USFS in IMAs and LIMAs, with the remainder on private lands. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species

References: Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.21 Smooth pungent greasebush, *Glossopetalon pungens* var. *glabra*

Status: Spring Mountains NRA Species of Concern, Nevada Natural Heritage Program Global Rank G2T1Q, State Rank S2S1.

Clark County MSHCP Status: Covered.

Range: Mojave desert mountains endemic; Southern Nevada and Clark Mountains, San Bernardino, CA.

Clark County Distribution: Sheep Range and Spring Mountains (near Potosi Mountain). 6,000-7,000 feet (Figure 6-20).

Habitat: Pinyon-juniper and sagebrush communities; limestone cliffs and rocky slopes between 4,000 and 6,500 feet.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities. **Threat 401**
- Habitat modification, individual displacement by rock climbing. **Threat 405**

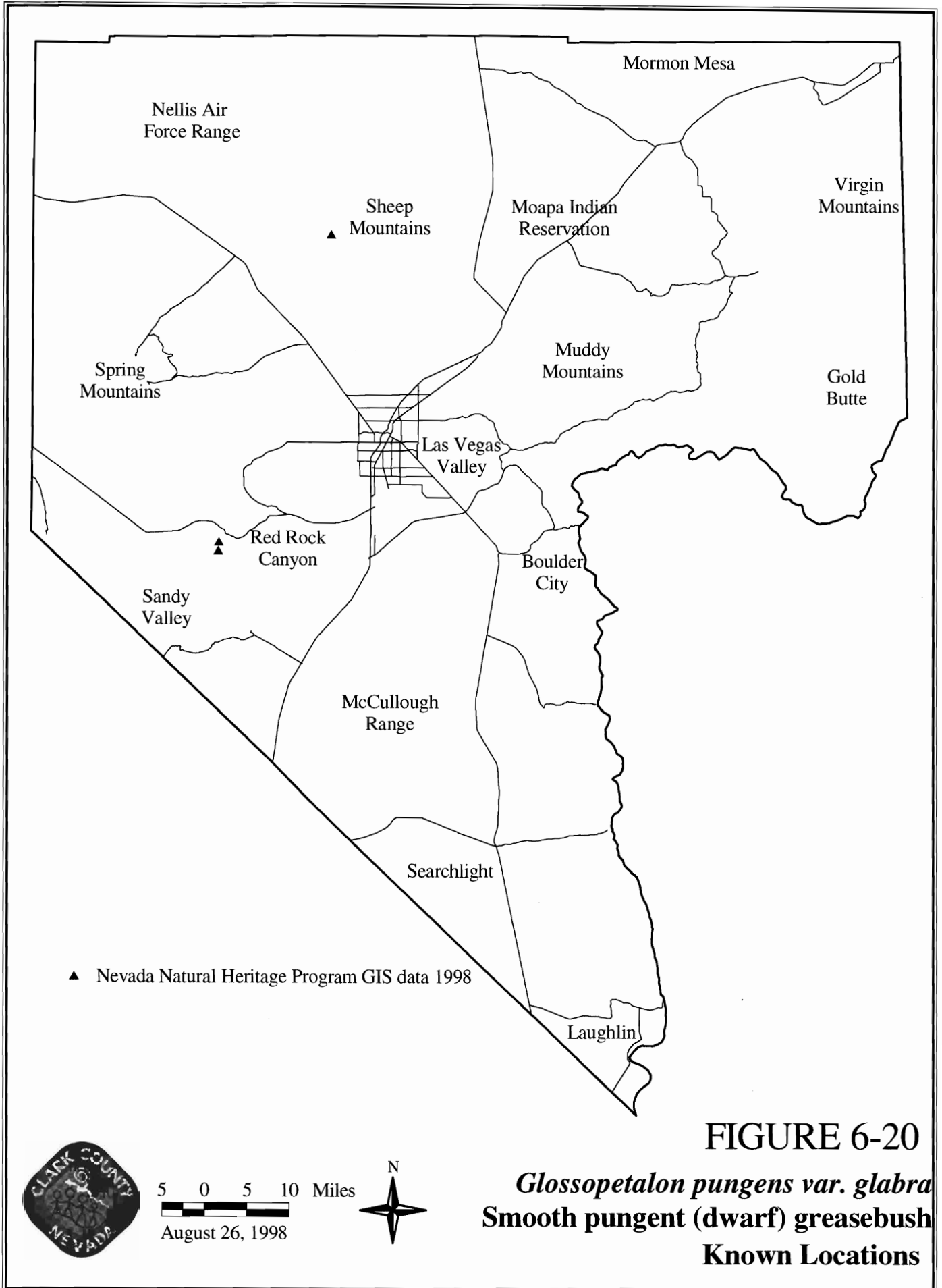
Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on pinyon-juniper and sagebrush. In addition, this species is included in the Bridge Mountain Monitoring Plan. The CA for the Spring Mountains NRA identifies management actions for plants found on and around cliffs and in rocky areas, including distribution of educational materials to climbers, and sensitive plants surveys prior to development of new climbing routes.

Species specific management actions that benefit this species include:

USFS(20) Inventory for populations of rare flora and fauna on an annual basis. A Native Species Site Survey Report 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)

- Cliff plants - **smooth pungent greasebush** and pungent dwarf greasebush - high priority (CA2.1g)

Adequacy of Existing Management: The majority of the potential habitat for this species occurs on lands managed by the USFS and BLM in IMAs and LIMAs. Implementation of existing management, including the Bridge Mountain Monitoring Plan and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.22 Pungent dwarf greasebush, *Glossopetalon pungens* var. *pungens*

Status: Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Southern Nevada endemic.

Clark County Distribution: Spring Mountains and Sheep Range.

Habitat: Pinyon-juniper and sagebrush communities; limestone cliffs and rocky slopes.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities. **Threat 401**
- Habitat modification, individual displacement by rock climbing. **Threat 405**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: Occurs within USFS, USFWS, and BLM managed lands. The USFS policies for candidate and sensitive species provide protection for this species for new project construction and implementation. The CA for the Spring Mountains NRA identifies management actions for plants found on and around cliffs and in rocky areas, including distribution of educational materials to climbers, and sensitive plants surveys prior to development of new climbing routes.

Species specific management actions that benefit this species include:

USFS(20) Inventory for populations of rare flora and fauna on an annual basis. A Native Species Site Survey Report 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)

- Cliff plants - smooth pungent greasebush and **pungent dwarf greasebush** - high priority (CA2.1g)

Adequacy of Existing Management: The majority of potential habitat for this species occurs on lands managed by the USFS, USFWS, and BLM in IMAs and LIMAs. Implementation of existing BLM and USFWS management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.23 Red Rock Canyon aster, *Ionactis caelestis*

Status: BLM Sensitive, Nevada Natural Heritage Program Global Rank G1, State Rank S1.

MSHCP Status: Covered.

Range: Red Rock Canyon endemic, all of range within Clark County.

Clark County Distribution: Known from a single population in Red Rock Canyon (Figure 6-21).

Habitat: Very open **mixed conifer** forest; potential habitat includes approximately 6,400 acres of Red Rock escarpment in Aztec sandstone crevices. Occurs on rocky, sandstone outcrops within ponderosa pine.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Dispersed recreation, hiking, and rock climbing. **Threats 401, 405**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on mixed conifer. This species is included in the Red Rock Canyon NCA Bridge Mountain Monitoring Plan.

Adequacy of Existing Management: Virtually all of the habitat for this species occurs in a very remote area of the NCA on top of the escarpment in the Red Rock Canyon NCA. Implementation of proposed management in the Red Rock Canyon NCA GMP should provide adequate conservation for this species.

References: Neeson and Leary 1992.

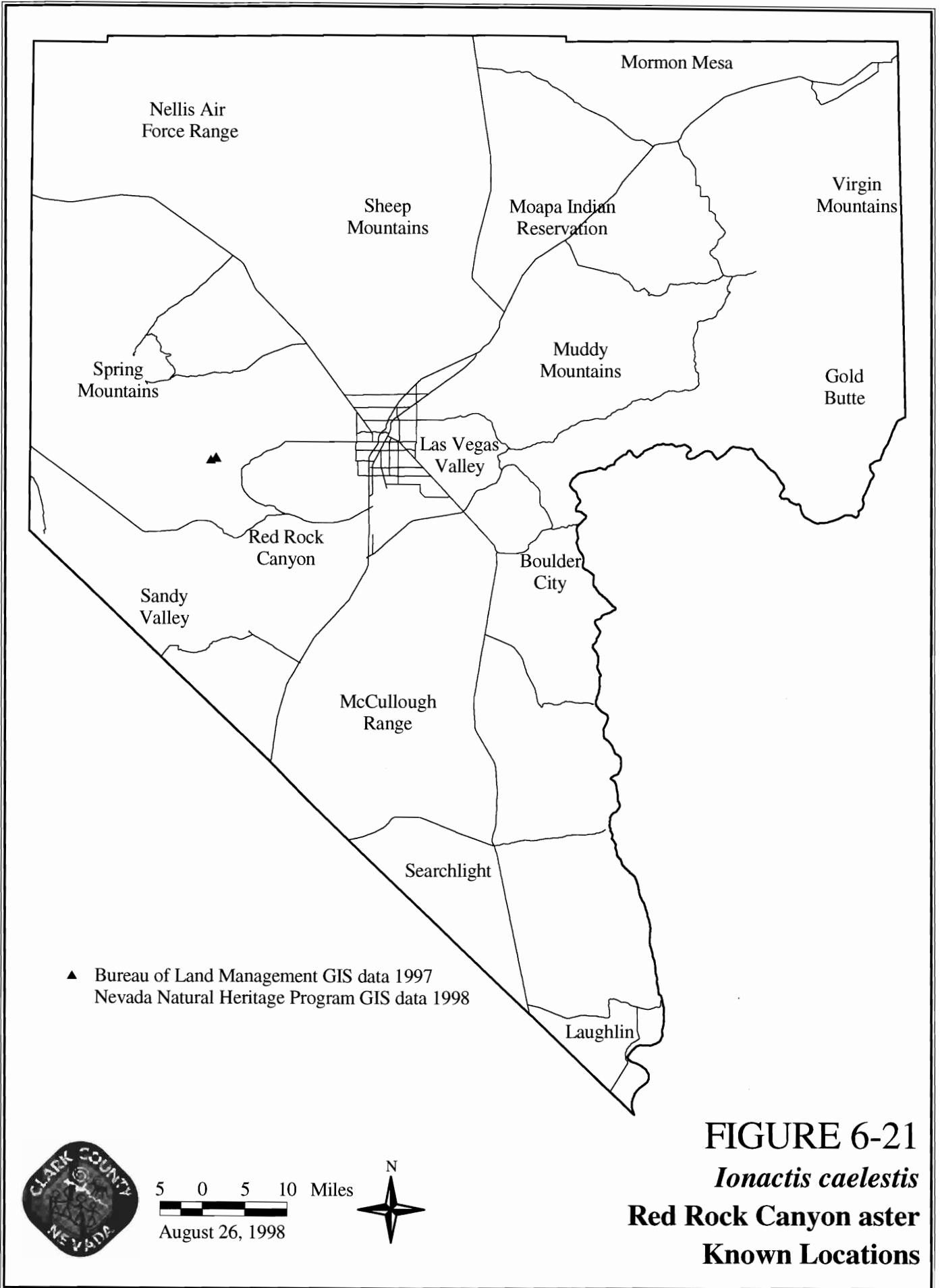


FIGURE 6-21
Ionactis caelestis
Red Rock Canyon aster
Known Locations

6.1.24 Hidden ivesia, *Ivesia cryptocaulis*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Confined to a ½-square-mile area on Charleston Peak ridgeline, Mummy Mountain, 10,800-11,900 feet (Figure 6-22).

Habitat: **Alpine** at or just above tree line. Talus and scree slopes, rocky ridgelines.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities. **Threat 401**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on alpine. USFS will develop and implement a monitoring program for assessing effects of recreational use on high elevation communities and the species that occur in these communities, 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 weed management strategies

Adequacy of Existing Management: All of the habitat for this species occurs on land managed by USFS in IMAs or LIMAs. Implementation of the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Knight 1992; Nachlinger 1994; The Nature Conservancy 1994; Smith 1995a; USFS, NDCNR, USFWS 1998.

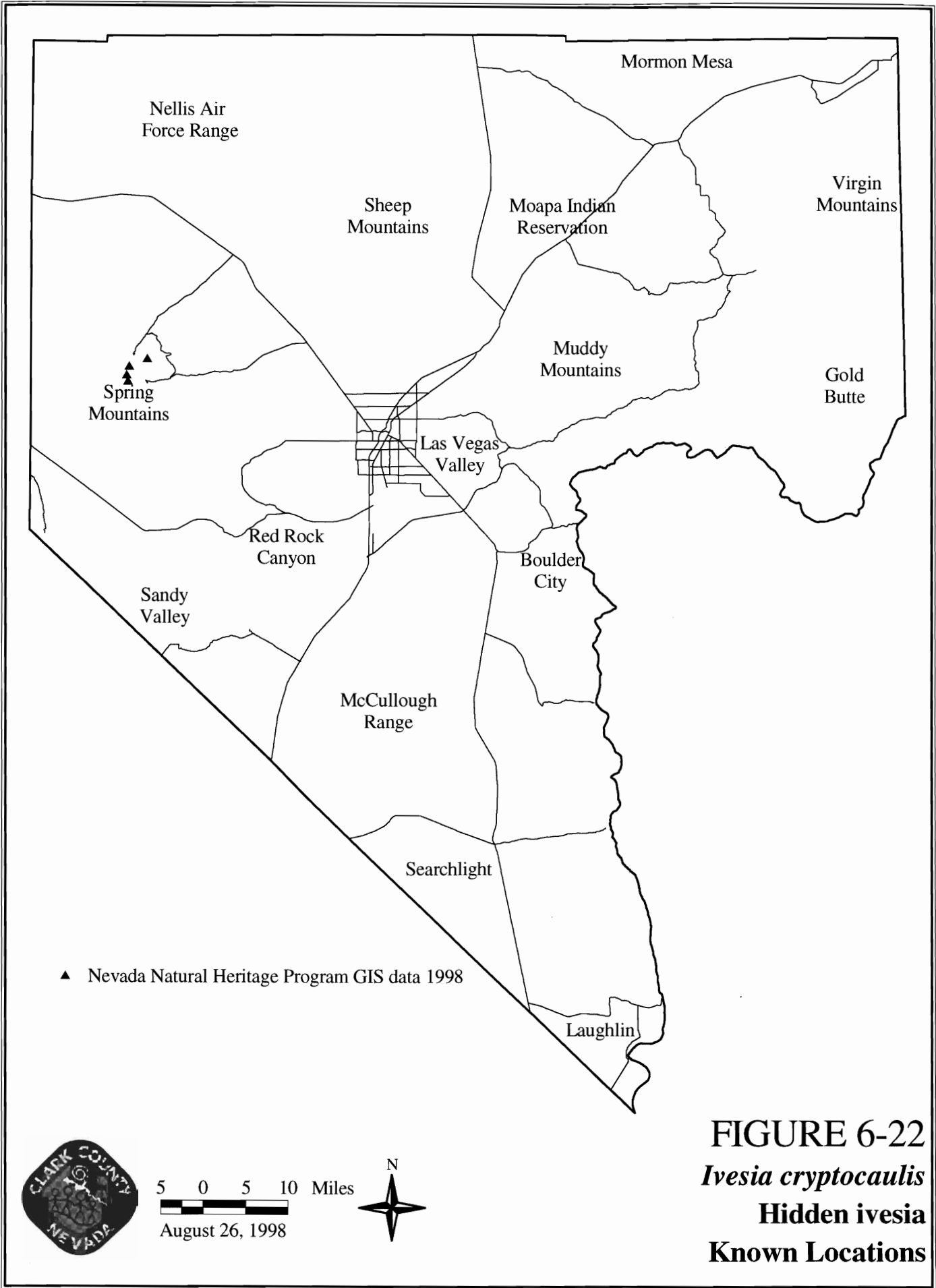


FIGURE 6-22
Ivesia cryptocaulis
Hidden ivesia
Known Locations

6.1.25 Jaeger ivesia, *Ivesia jaegeri*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G3, State Rank S2, S3.

Clark County MSHCP Status: Covered.

Range: Endemic to Spring Mountains and Clark Mountains in San Bernardino, California.

Clark County Distribution: Populations including about 10,000 individuals occur at 35 sites on approximately 80 acres in Lee, Deer, Kyle, and Carpenter Canyons in the Spring Mountains and La Madre Mountain to Mt. Potosi (Figure 6-23).

Habitat: **Bristlecone pine, mixed conifer** communities; bedrock, and crevices of vertical and near-vertical cliff faces of limestone and dolomite outcrops in elevations from 5,200 to 11,200 ft.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities (trail construction, and maintenance), particularly in the Mary Jane Falls, Echo Cliff, Deer Creek and Robbers Roost areas. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation, particularly in the Mary Jane Falls, Echo Cliff, Deer Creek and Robbers Roost areas. **Threat 402**
- Habitat modification, individual displacement by rock climbing in popular climbing areas on the east side of the Spring Mountains. **Threat 405**
- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on Bristlecone pine, mixed conifer. The CA for the Spring Mountains NRA identifies general management actions for high-elevation plants, such as this 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

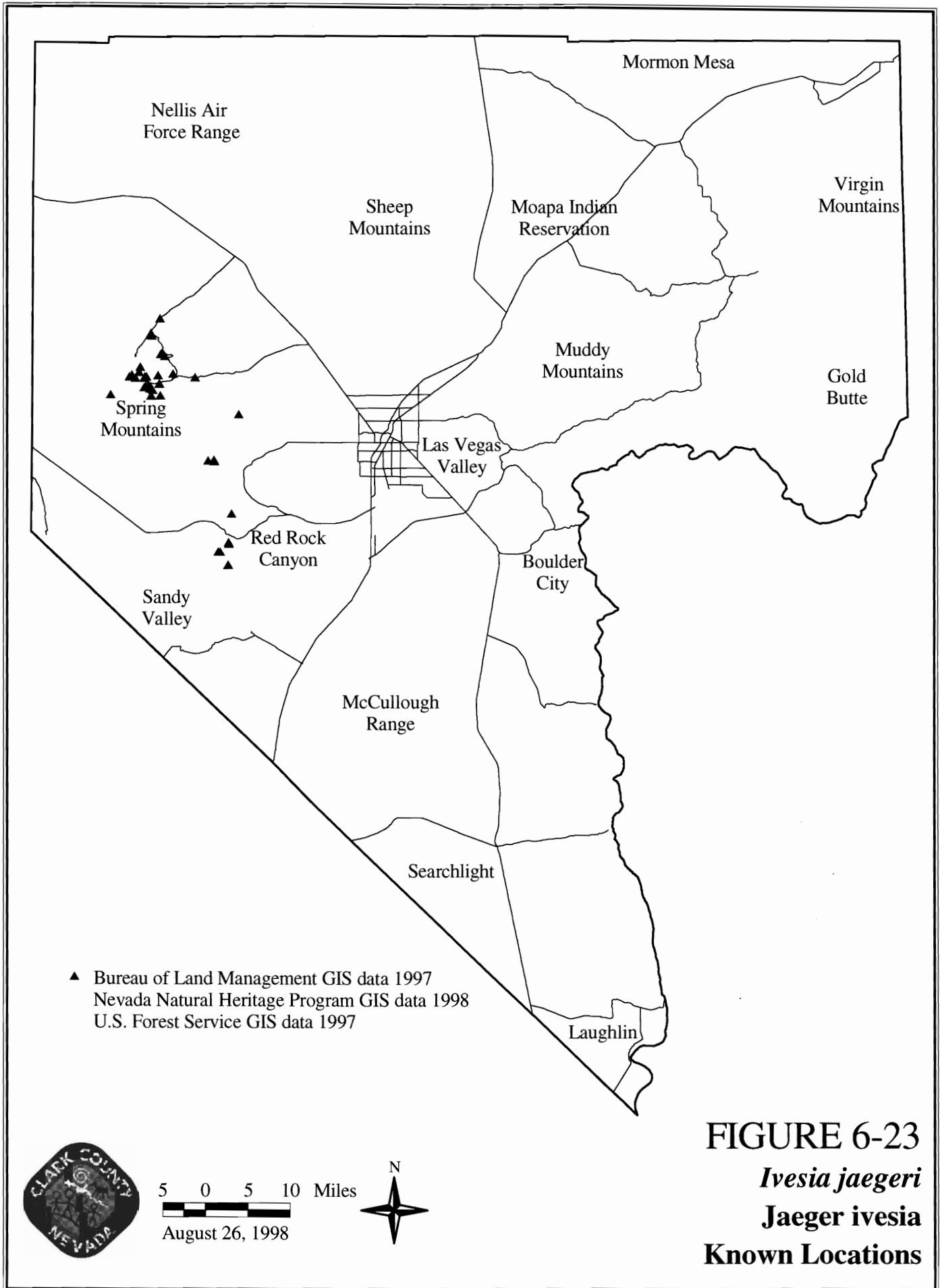


FIGURE 6-23
Ivesia jaegeri
Jaeger ivesia
Known Locations

monitoring, removal of selected informal high-elevation and alpine campsites, and implementation of a weed management strategy. The CA also identifies management actions for plants found on and around cliffs and in rocky areas, including distribution of educational materials to climbers, and sensitive plants surveys prior to development of new climbing routes. This species is included in the Red Rock Canyon NCA Bridge Mountain Monitoring Plan.

Species specific management actions that benefit this species include:

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)

Adequacy of Existing Management: Almost all of the potential habitat for this species occurs on USFS and BLM managed lands in IMAs and LIMAs, and only a small amount occurs on private lands. Implementation of existing management, including the GMP for Red Rock Canyon NCA and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Nachlinger 1994; The Nature Conservancy 1994; Smith 1995a; USFS, NDCNR, USFWS 1998.

6.1.26 Hitchcock bladderpod, *Lesquerella hitchcockii*

Status: Nevada Natural Heritage Program Global Rank ND, State Rank ND.

Clark County MSHCP Status: Covered.

Range: Extends from Clark County north to central eastern Nevada in White Pine County.

Clark County Distribution: Charleston Peak area; Kyle and Lee Canyons (Figure 6-24).

Habitat: **Alpine, bristlecone pine, and mixed conifer** communities; on flat or sloping ground, talus slopes, dry ridges, and rocky hillsides, 8,200 and 11,400 ft.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification due to fire suppression and fuels management. **Threat 301**
- Adverse habitat modification and indirect effects on species due to dispersed recreational activities. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation. **Threat 402**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on Alpine, bristlecone pine, and mixed conifer. USFS will develop and implement a monitoring program for assessing effects of recreational use on high elevation communities and the species that occur in these communities, 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.

Adequacy of Existing Management: The majority of the potential habitat for this species occurs on land managed by the USFS, USFWS, and BLM in IMAs and LIMAs, with less than 5 percent on private lands. Implementation of existing BLM and USFWS management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

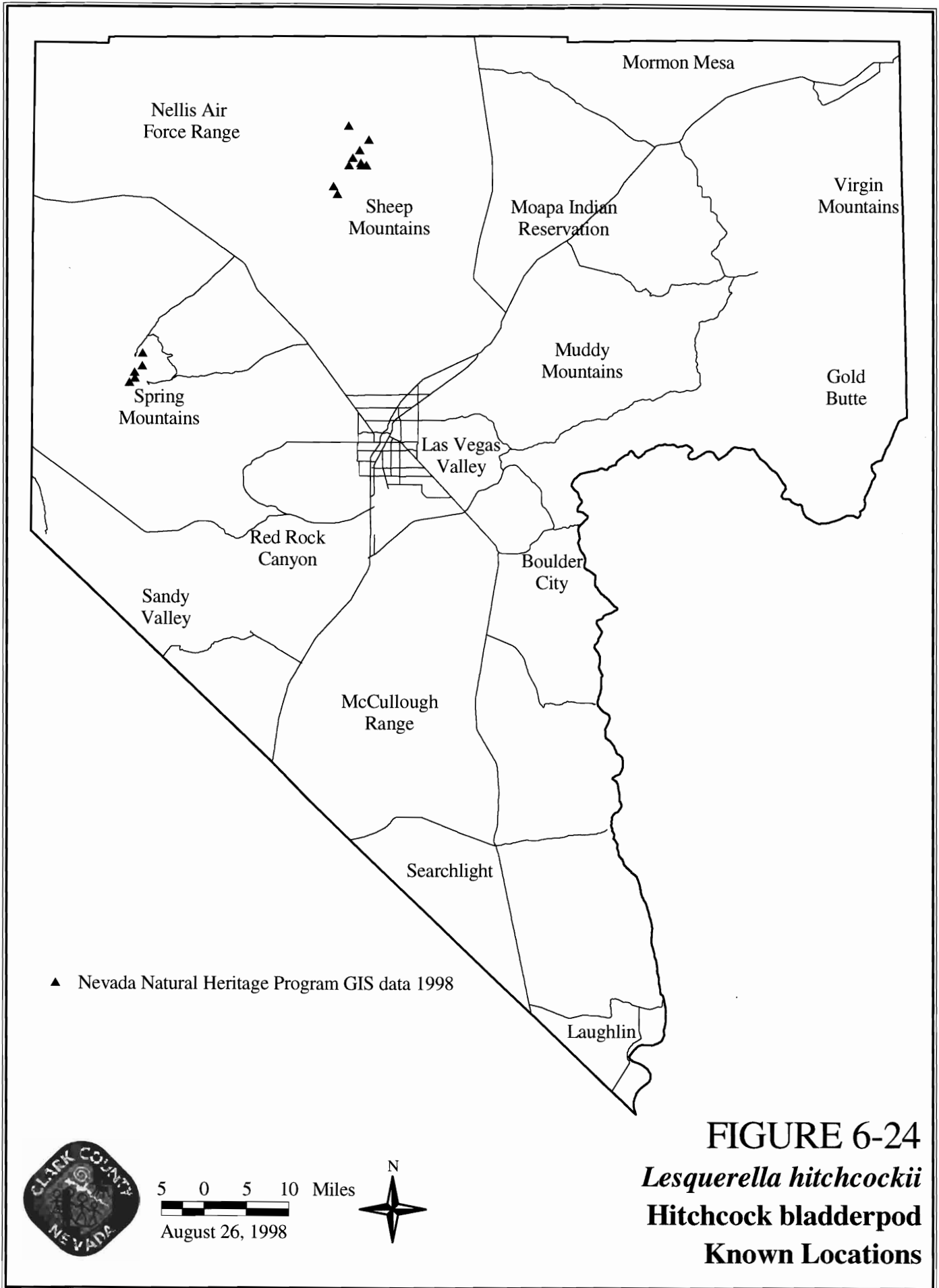


FIGURE 6-24
Lesquerella hitchcockii
Hitchcock bladderpod
Known Locations

6.1.27 Charleston pinewood lousewort, *Pedicularis semibarbata* var. *charlestonensis*

Status: Nevada Natural Heritage Program Global Rank G4T3Q, State Rank S3.

Clark County MSHCP Status: Covered.

Range: Southern Nevada endemic, all of range within Clark County.

Clark County Distribution: Spring Mountains and the Sheep Range. In the Spring Mountains, common in above Lee Canyon, Deer Creek, and other forested locations.

Habitat: Mixed conifer forest and bristlecone pine communities. All known populations occur between elevations of 8,400 and 9,800 feet.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification due to fire suppression and fuels management. **Threat 301**
- Adverse habitat modification and indirect effects on species due to dispersed recreational activities. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation. **Threat 402**
- Habitat degradation from highway and road construction or maintenance. **Threat 501**
- Habitat degradation by wild horse and burro trampling. **Threat 701**
- Habitat degradation or fragmentation resulting from mountain home development, improvement, and upkeep in the Spring Mountains developed canyons. **Threats 1101, 1102**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on mixed conifer forest and pinyon-juniper . The CA for the Spring Mountains NRA identifies general management actions for mid-elevation plants, such as this species, 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.

Adequacy of Existing Management: The majority of the habitat occurs on lands managed by USFS and USFWS in IMAs and LIMAs. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA and similar measures for the DNWR should provide adequate conservation for this species.

References: Nachlinger 1994; USFS, NDCNR, USFWS 1998.

6.1.28 White-margined beardtongue, *Penstemon albomarginatus*

Status: BLM Sensitive, Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Eastern Mojave Desert endemic in Nevada, with disjunct populations in California and Arizona.

Clark County Distribution: Within Clark County, a total of 15 populations; identified centers of distribution in Hidden Valley, Jean Lake, and Roach Lake (Figure 6-25).

Habitat: Mojave desert scrub, and to a lesser extent blackbrush. Occurs on sand deposits on leeward side of dry lake beds between 1,500 and 3,600 feet elevation in flat wash bottoms of outwash canyons and occasionally on slopes above them. This species is dependent upon the maintenance of the sand transport system from dry lakebeds toward lower slopes.

Population Trends: Unknown, possibly declining in areas of intensive grazing.

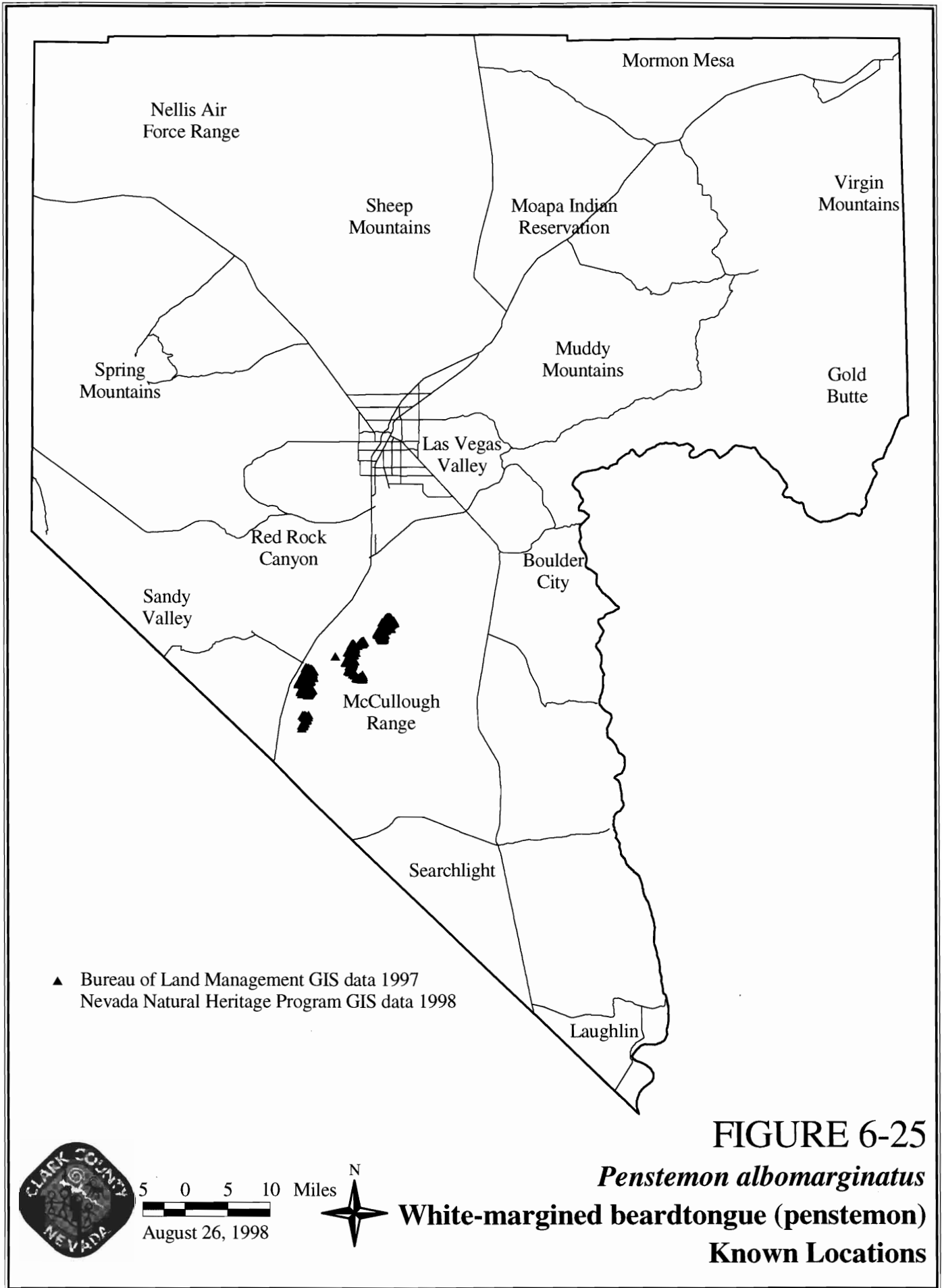
Ecosystem Level Threats:

- Recreational development in Hidden Valley. **Threat 402**
- Off-highway vehicle use (casual and organized). **Threats 403, 404**
- Road maintenance along U.S. Highway 95. **Threat 504**
- Habitat degradation by livestock grazing and trampling in Hidden Valley and Jean Lake. **Threat 703**
- Sand/gravel operations proposals on BLM lands. **Threat 901**
- Development of airport and other facilities in Jean. **Threat 1101**
- Interruption of sand transport from airport development. **Threat 1102**
- Utility corridor maintenance and construction. **Threat 1202**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on Mojave desert scrub.

BLM management that would specifically benefit this species includes the consideration of conservation needs in management actions for saleable minerals, OHV use, road and



utility corridor maintenance, livestock grazing, wild horse and burro management, and land disposals. In addition, grazing exclosures will be constructed in Jean Lake and Hidden Valley to monitor grazing. The results of plot monitoring in Hidden Valley and Jean Lake will be reviewed by the USFWS and NDOW and used in the AMP process to inform future management decisions with respect to grazing and OHV activities. If monitoring shows that the grazing system at Jean Lake has an adverse effect on this species, BLM will propose modifications intended to reduce these adverse effects.

Species specific measures for this species include:

CC() Ensure that prior to construction of the proposed cargo airport in Ivanpah Valley, an EIS will be prepared and, as appropriate, adequate mitigation for impacts to this and other species will be developed.

USFWS(29) Develop a conservation strategy for **white-margined beardtongue** (Ecological Services).

BLM(23) Monitor **white-margined beardtongue** to assess impacts from recreational activities.

BLM(24) Monitor populations of Las Vegas bearpoppy and **white-margined beardtongue** under the Special Status Plants strategy plan.

BLM(33) Develop and implement a monitoring program for the alkali mariposa lily, Blue Diamond cholla in Red Rock Canyon NCA, the **white-margined beardtongue**, and other Covered and Evaluation Species as needed.

BLM(99) Enter into conservation agreements or easements with the U.S. Fish and Wildlife Service and other willing parties, that if implemented, could negate or reduce the necessity of future listings of Covered and Evaluation Species or recover Federally listed species. Conservation agreements may include, but not be limited to, the following: Blue Diamond cholla, Las Vegas bearpoppy, **white-margined beardtongue**, and phainopepla.

BLM(300) Fifty acres in Jean Lake Valley and thirty acres in Hidden Valley are being fenced to conserve **white-margined beardtongue** habitat.

Adequacy of Existing Management: The majority of the potential distribution is on BLM undesignated lands in MUMAs. Given the widespread distribution of the species, implementation of the BLM measures identified above would provide adequate protection for this species.

References: Sheldon 1994; Blomquist et al. 1995.

6.1.29 Charleston beardtongue, *Penstemon leiophyllus* var. *keckii*

Status: Nevada Natural Heritage Program Global Rank G3T2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Spring Mountains at high elevations, above and in upper Kyle and Lee Canyons (Figure 6-26).

Habitat: **Bristlecone pine** and **mixed conifer** forest communities; or with aspen; gravelly or rocky slopes, or open meadows; on ledges and talus slopes between 7,000 and 11,200 feet.

Population Trends: Unknown, presumed stable.

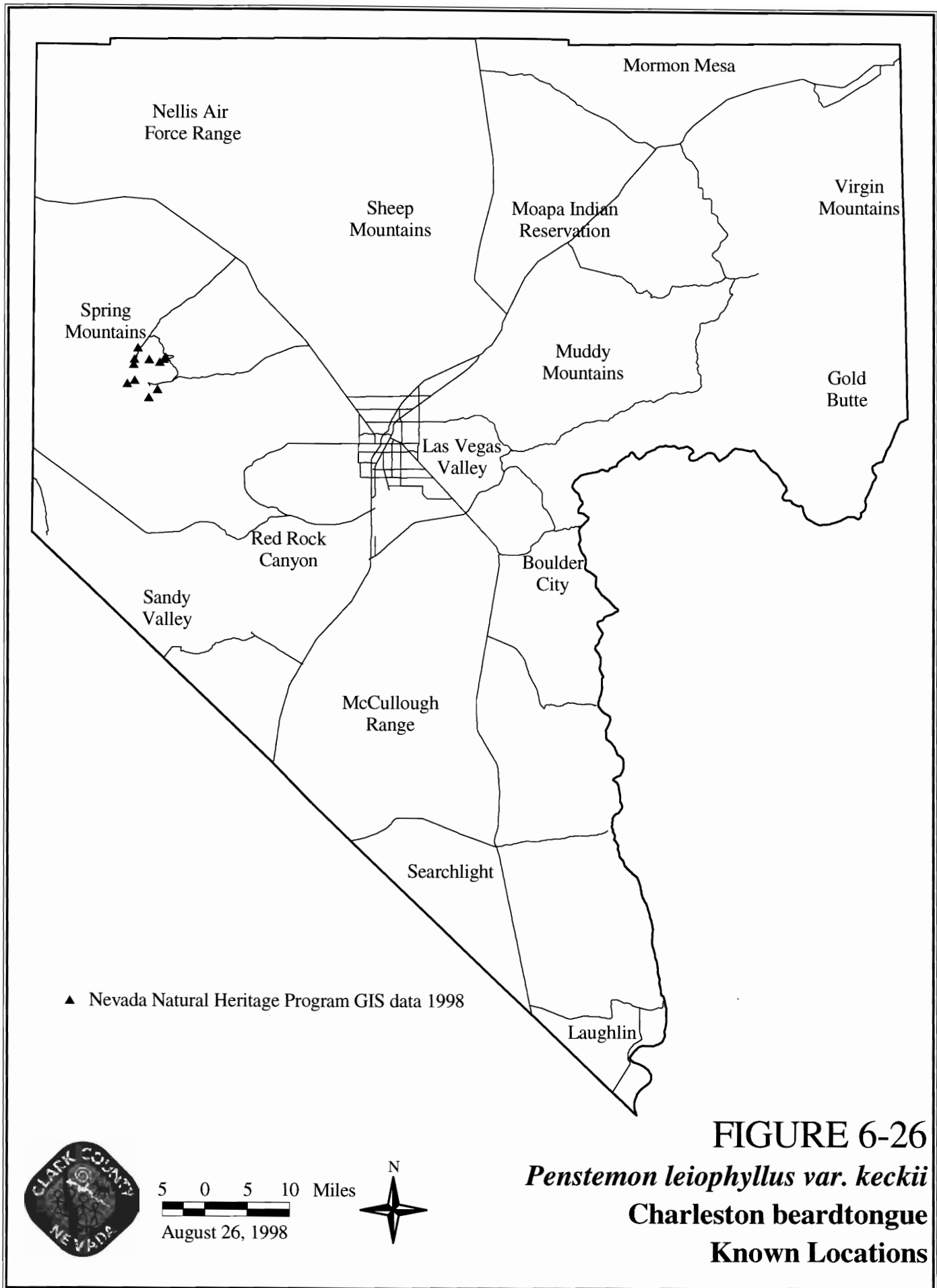
Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities at high elevations. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation in Kyle and Lee Canyons. **Threat 402**
- Habitat degradation and population decreases resulting from introductions, competition, and encroachment of exotic species. **Threat 1501**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on bristlecone pine and mixed conifer. The CA for the Spring Mountains NRA identifies general management actions for high-elevation plants, such as this 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. The CA also identifies general



management actions for mid-elevation plants, such as this species, 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.

Adequacy of Existing Management: The majority of the potential distribution of this species occurs on lands managed by USFS in IMAs and LIMAs. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.30 Jaeger beardtongue, *Penstemon thompsonae* var. *jaegeri*

Status: Nevada Natural Heritage Program Global Rank G4T2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Southern Nevada endemic, all of range in Clark county.

Clark County Distribution: Jaeger beardtongue is endemic to Clark County, where it occurs from Mt. Potosi to Deer and Kyle Canyons, and Trout Creek in the Spring Mountains. Also known from the Sheep Range in Deadman Canyon (Figure 6-27).

Habitat: Mixed conifer forest and pinyon-juniper woodlands; gravelly limestone banks and hillsides at elevations ranging between 6,300 and 9,300 feet.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification due to fire suppression and fuels management. **Threat 301**
- Adverse habitat modification and indirect effects on species due to dispersed recreational activities. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation. **Threat 402**
- Habitat degradation by wild horse and burro trampling. **Threat 701**
- Habitat degradation or fragmentation resulting from recreational facility and mountain home development, improvement, and upkeep. **Threats 1101, 1102**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

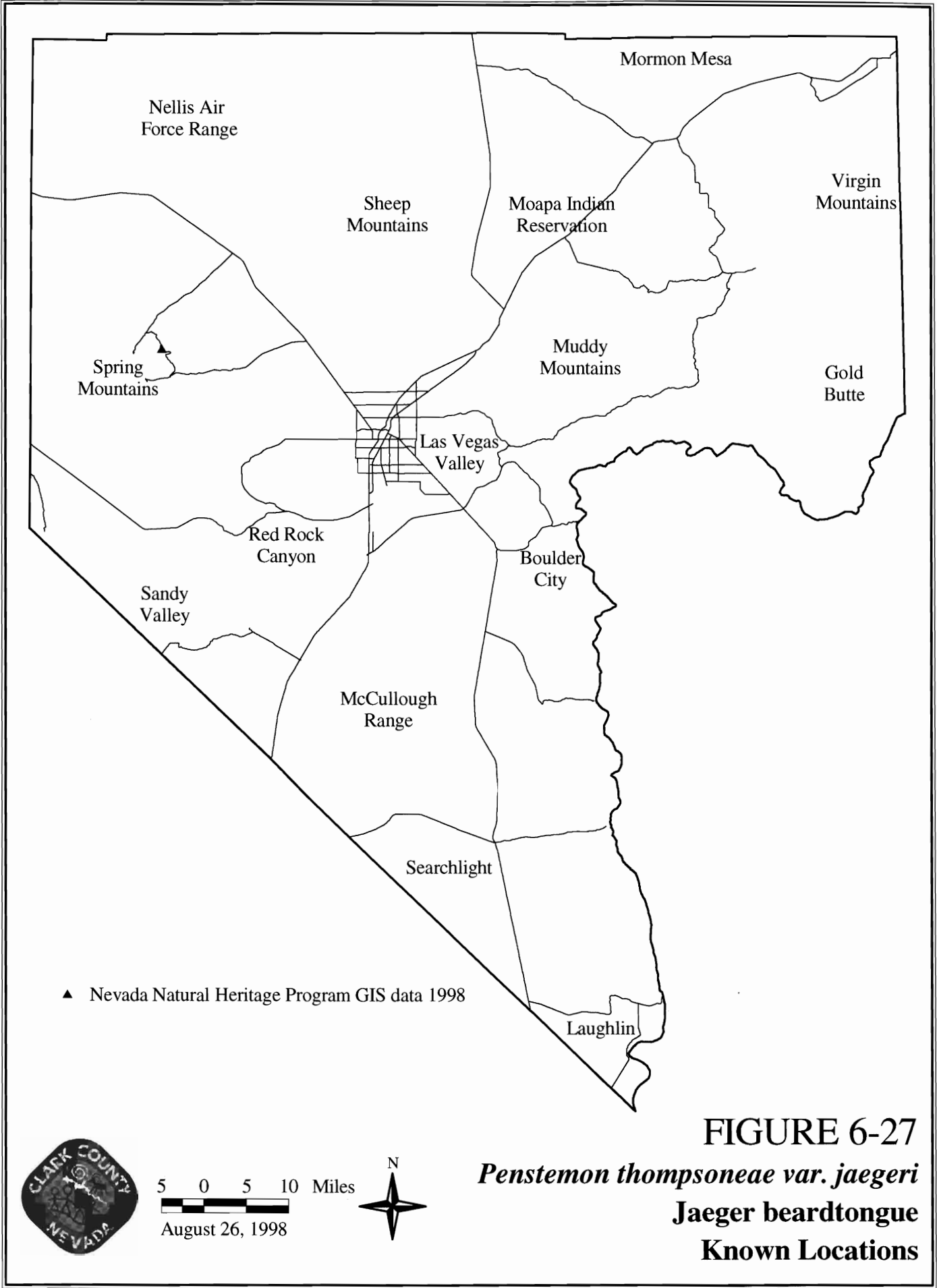


FIGURE 6-27

Penstemon thompsonae var. *jaegeri*
Jaeger beardtongue
Known Locations

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on mixed conifer and pinyon-juniper. The CA for the Spring Mountains NRA identifies general management actions for mid-elevation plants, such as this species, 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.

Adequacy of Existing Management: Most of the potential habitat for this species is located on lands managed by USFS and USFWS in IMAs and LIMAs. Implementation of existing USFWS management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.31 Parish's phacelia, *Phacelia parishii*

Status: BLM Sensitive, Nevada Natural Heritage Program Global Rank G2, G3, State Rank S2, S3.

Clark County MSHCP Status: Covered.

Range: Widely distributed annual occurring from San Bernardino County, California, to Clark, Nye, and White Pine Counties, Nevada, and Mojave and Yuvapai Counties, Arizona. The Nevada Natural Heritage Program database identifies 12 populations in Nevada.

Clark County Distribution: Two locations in Clark County: Indian Springs Valley and Three Lakes Valley (Figure 6-28). An historic population in Las Vegas Valley is apparently extirpated.

Habitat: **Salt desert scrub** on alkaline playas and valley floors on lake beds characterized by wet, heavy clay soil with excessive concentrations of soluble salts; found in association with *Atriplex*. Found between 2500 and 5600 feet elevation.

Population Trends: Unknown.

Ecosystem Level Threats:

- Habitat modification and degradation and wildlife mortality from casual use (non-competitive non-commercial) OHV activities. **Threat 404**
- Habitat degradation at military target sites, on roads, or other military access locations. **Threat 801**
- Habitat modification from military facilities construction and maintenance activities. **Threat 802**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions:: General and ecosystem level conservation actions are identified in Appendix A. See chapter on salt desert scrub.

Species specific management actions for this species include:

USAF(7) Continue annual monitoring of *Phacelia parishii*, *Arctomecon merriamii*, undescribed phacelia, and remote rabbitbrush.

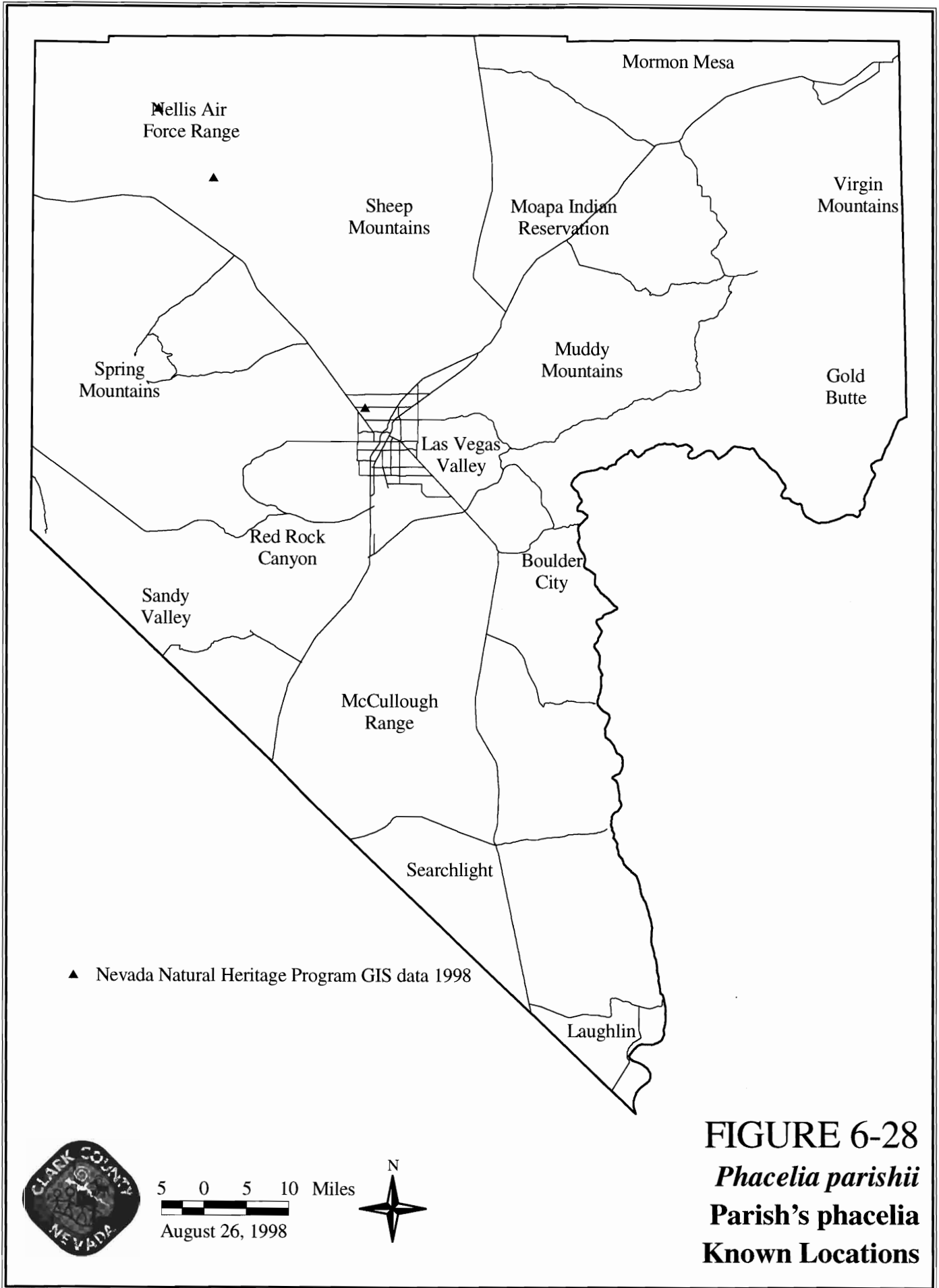


FIGURE 6-28
Phacelia parishii
 Parish's phacelia
 Known Locations

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.

Adequacy of Existing Management: The majority of habitat for this species occurs on lands managed by USFWS and USAF in IMAs and LIMAs. Implementation of existing and proposed management on the NAFR and DNWR should provide adequate conservation for this species.

References: Blomquist et al. 1995; Smith 1998.

6.1.32 Clokey mountain sage, *Salvia dorrii* var. *clokeyi*

Status: USFS Sensitive, BLM Sensitive, Nevada Natural Heritage Program Global Rank G5T3, State Rank S3.

Clark County MSHCP Status: Covered.

Range: Southern Nevada endemic.

Clark County Distribution: Spring Mountains and Sheep Range in Clark County (Figure 6-29). In the Spring Mountains, known from Macks, Lee and Kyle Canyon, Deer Creek area, Harris Saddle, and summit of Mt. Wilson.

Habitat: **Bristlecone pine, mixed conifer, and pinyon-juniper** communities. This species is found typically on shallow gravelly soils derived from limestones, dolomites, and sandstones; along ridges and where bedrock outcrops occur; and in rocky slope drainages, between 7,000 and 10,000 feet elevation.

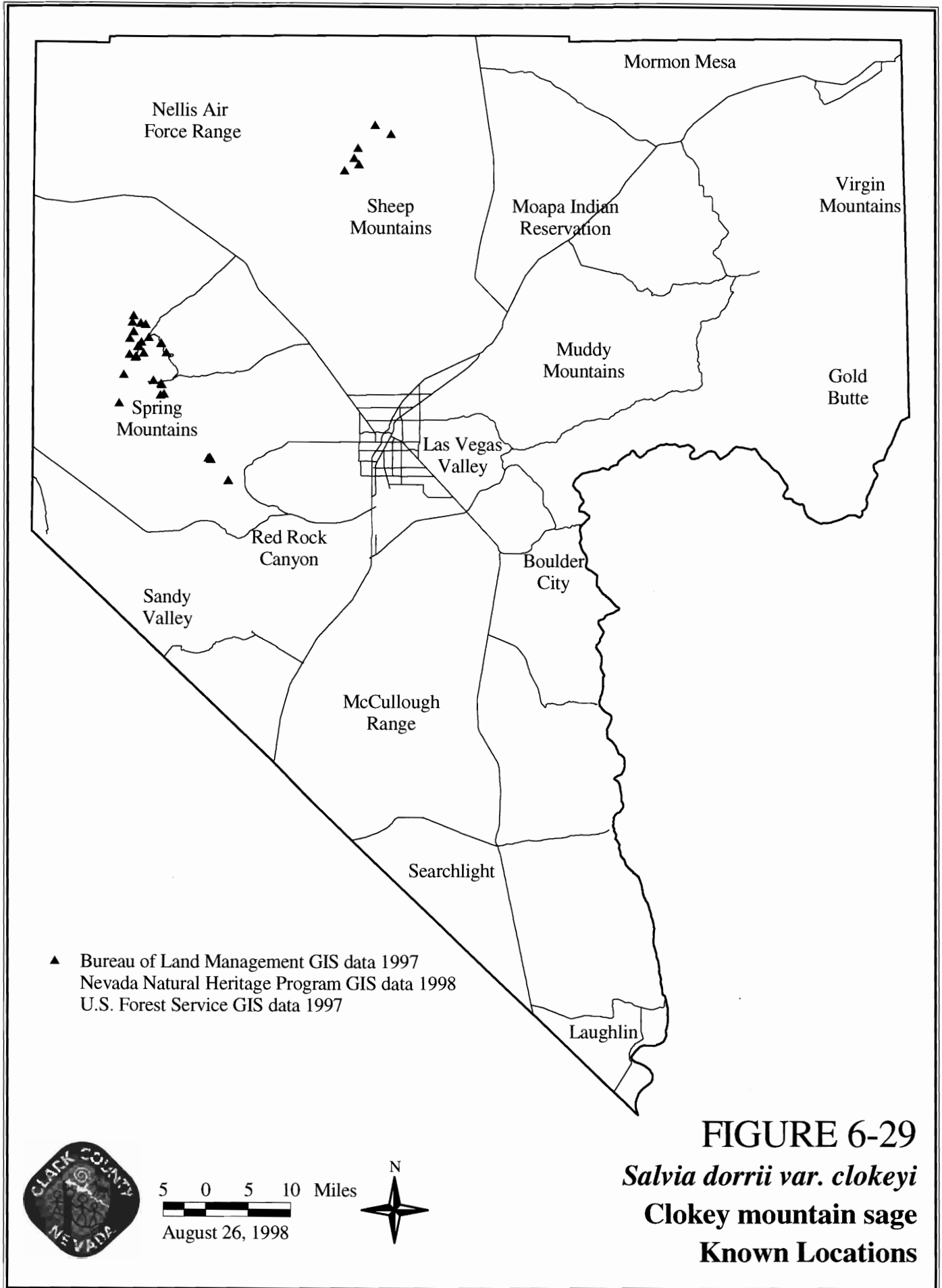
Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, including hiking, equestrian use, off-highway vehicle use, and dispersed camping. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation. **Threat 402**
- Adverse habitat modification due to fuels management (cutting lower limbs from woodland dominants and clearing understory), particularly along Macks Road. **Threat 301**
- Habitat degradation from highway and road construction or maintenance, in and around Lee Canyon, along Deer Creek Highway, and Macks Road. **Threat 501**
- Habitat degradation by wild horse trampling, particularly in the northeast quadrant of Spring Mountains. **Threat 701**
- Habitat degradation or fragmentation resulting from recreational facility and mountain home development, improvement, and upkeep in and around Lee Canyon and off of Deer Creek Highway and Macks Road. **Threats 1101, 1102**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on bristlecone pine, mixed conifer, and pinyon-juniper ecosystems. This species is included in the Bridge



Mountain Monitoring Plan in the Red Rock Canyon NCA GMP. The CA for the Spring Mountains NRA identifies general management actions for mid-elevation plants, such as this species, 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. BLM policies for sensitive species and other species of concern provide protection for this species from new project construction and implementation.

Adequacy of Existing Management: Over half of the high potential habitat occurs on land managed by the USFS, with most of the remainder on lands managed by USFWS and BLM. The majority of the potential distribution of the species is in IMAs and LIMAs. Implementation of existing management by USFS, BLM, DNWR, and the provisions of the CA for the Spring Mountains NRA and the Bridge Mountain Monitoring Plan (Red Rock Canyon NCA GMP) should provide adequate conservation for this species.

References: Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.33 Clokey catchfly, *Silene clokeyi*

Status: USFS, Sensitive, Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Endemic to the Spring Mountains (Figure 6-30). Known from seven sites on Mummy Mountain and along the Charleston Peak ridge line.

Habitat: **Alpine** and **bristlecone pine** communities. Populations of this species are found between 11,400 and 11,500 ft on fell-fields, steep eastern drop-offs of high ridgelines, and gently sloping plateaus.

Population Trends: Unknown, presumed stable.

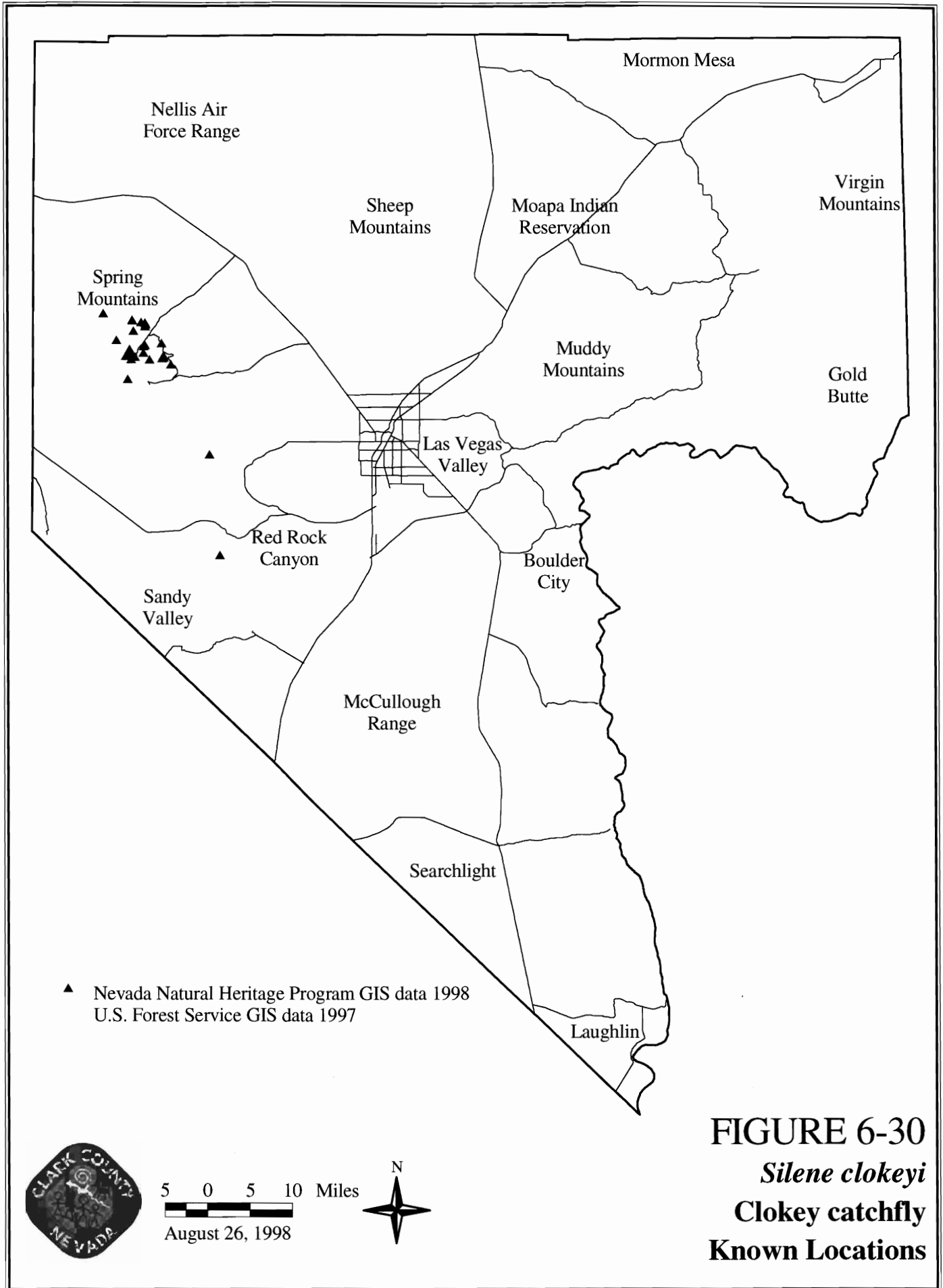
Ecosystem Level Threats:

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

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on alpine and bristlecone pine. The CA for the Spring Mountains NRA identifies general management actions for high-elevation plants, such as this 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.



▲ Nevada Natural Heritage Program GIS data 1998
 U.S. Forest Service GIS data 1997



5 0 5 10 Miles
 August 26, 1998



FIGURE 6-30
Silene clokeyi
Clokey catchfly
Known Locations

Species specific management actions proposed for this species includes:

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. 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)

Adequacy of Existing Management: The majority of the potential habitat for this species occurs on lands managed by USFS in IMAs and LIMAs, and approximately 8 percent occurs on private lands. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Knight 1992; Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998

6.1.34 Charleston tansy, *Sphaeromeria compacta*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G2, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: Charleston tansy is known only from the Spring Mountains, Clark County; apparently confined to Mummy Mountain and the Charleston Peak ridgeline (Figure 6-31).

Habitat: **Alpine** and **bristlecone pine**. The species' habitat includes talus and scree slopes, rocky ridgelines and slopes, and rock outcrops, at elevations between 10,800 and 11,900 feet.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, including hiking, mountain biking, camping, and equestrian use. **Threat 401**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing Management: General and ecosystem level conservation actions are identified in Appendix A. See chapters on alpine and bristlecone pine. The CA for the Spring Mountains NRA identifies general management actions for high-elevation plants, such as this 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.

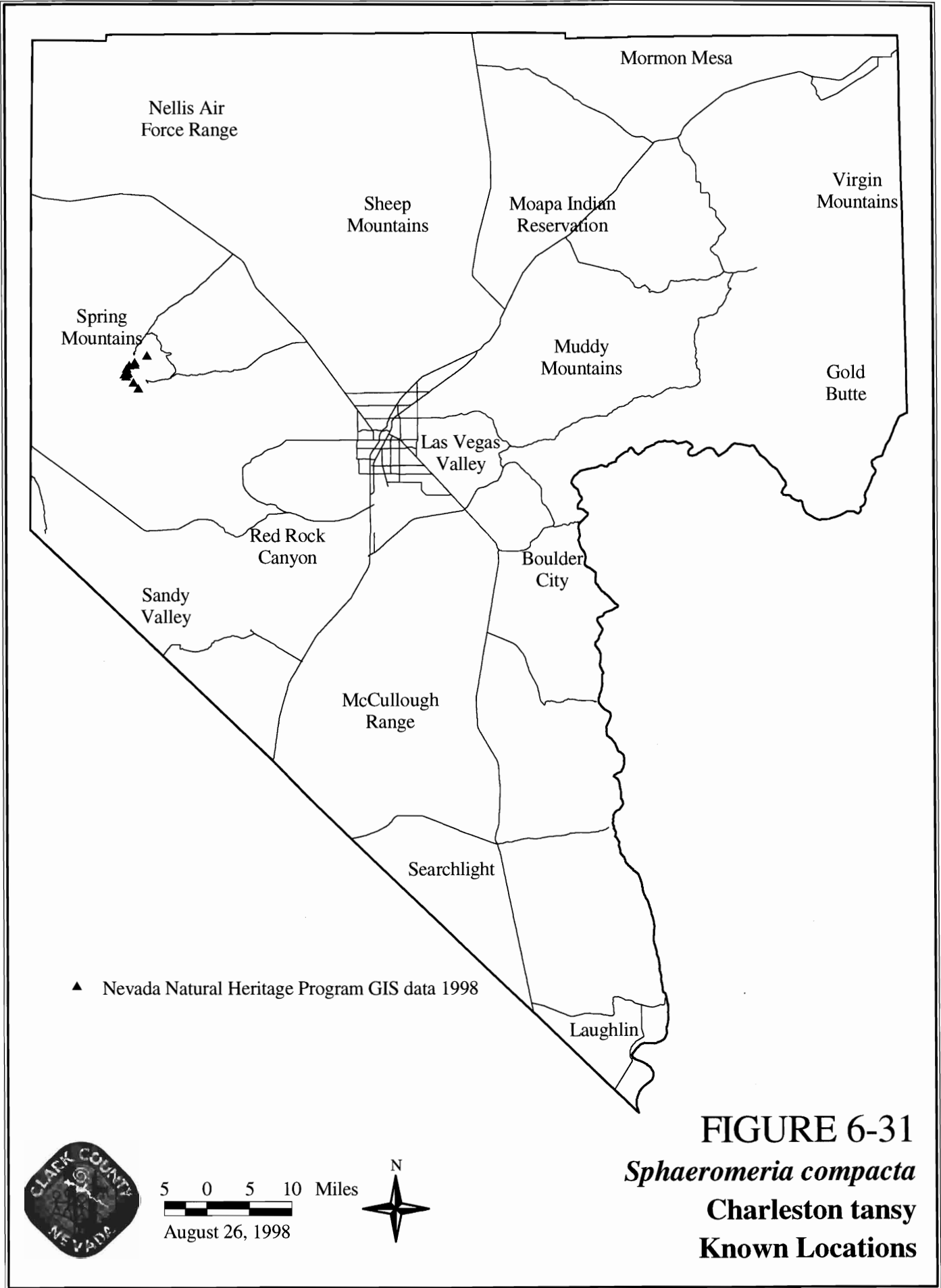


FIGURE 6-31

Sphaeromeria compacta
 Charleston tansy
Known Locations

Species specific management actions proposed for this species includes:

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. 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)

Adequacy of Existing Management: The majority of the potential habitat for this species occurs on lands managed by USFS in IMAs and LIMAs. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Knight 1992; Nachlinger 1994; Smith 1995b; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.35 Charleston kittentails, *Synthyris ranunculina*

Status: USFS Sensitive, Nevada Natural Heritage Program Global Rank G2, G3, State Rank S2, S3.

Clark County MSHCP Status: Covered.

Range: Spring Mountains endemic.

Clark County Distribution: The Charleston kittentails is known 33 sites, primarily in upper Kyle and Lee Canyons, from the vicinity of Mummy Mountain, and on the ridgeline in the vicinity of Griffith Peak (Figure 6-32).

Habitat: **Alpine, bristlecone pine, and mixed conifer** forest between 8,500 and 11,800 ft. Occurs in high elevation **springs** and seeps and permanently damp areas.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, primarily hiking and backcountry camping at springs. **Threat 401**
- Physical alteration of spring and spring outflow habitats, resulting in alterations to the natural flow, temperature, and sediment regimes. **Threats 1401, 1402**
- Habitat degradation and population decreases resulting from introductions, competition, and encroachment of exotic species, in particular, dandelion. **Threat 1501**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on alpine, bristlecone pine, and mixed conifer. The CA for the Spring Mountains NRA identifies general management actions for high-elevation plants, such as this 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,

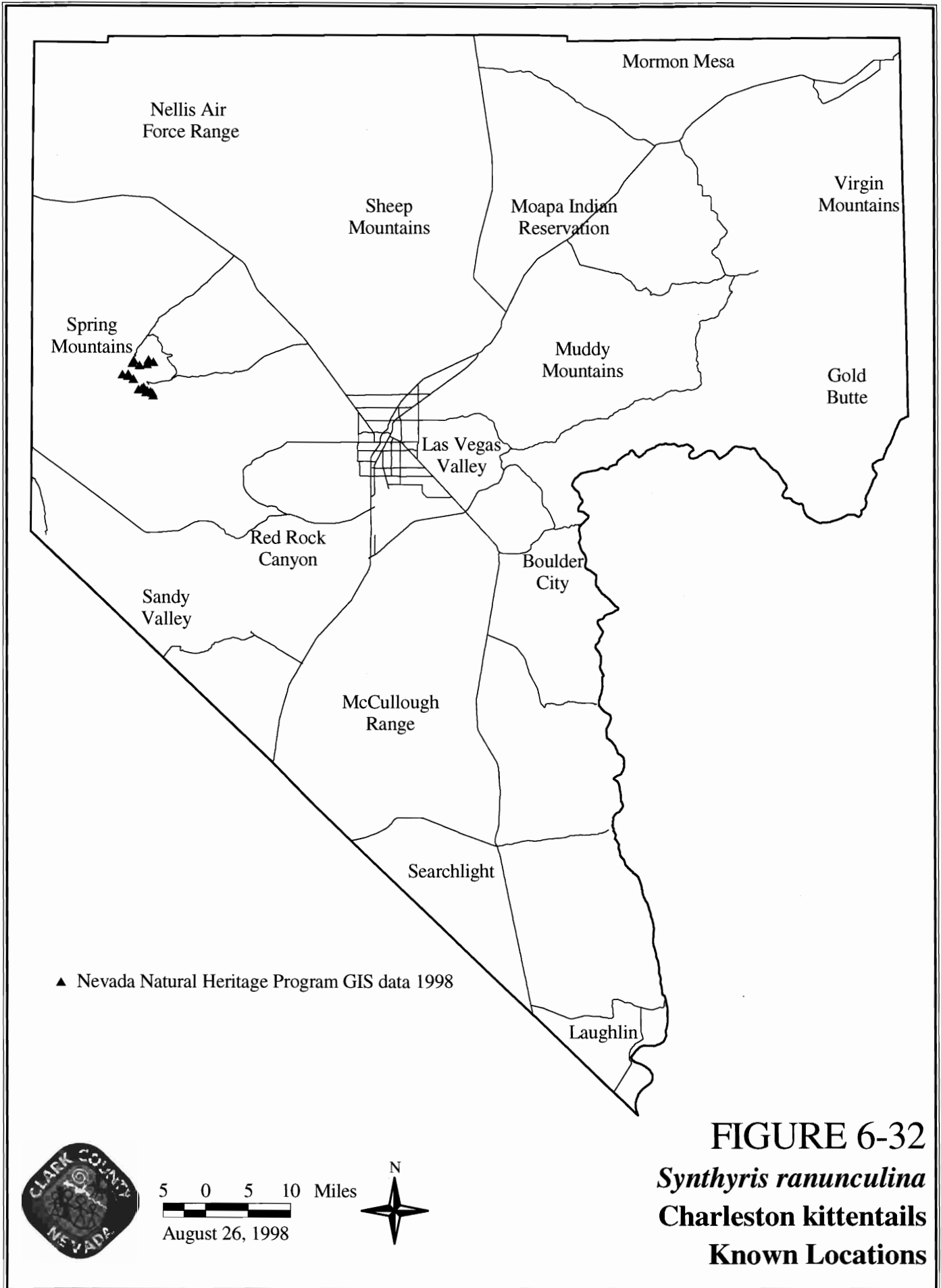


FIGURE 6-32
Synthyris ranunculina
 Charleston kittentails
Known Locations

as determined through monitoring, removal of selected informal high-elevation and alpine campsites, and implementation of a weed management strategy. The CA also identifies general management actions for mid-elevation plants, such as this species, 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.

Adequacy of Existing Management: Almost all the potential habitat occurs on land managed by the USFS in IMAs and LIMAs. Implementation of existing management and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Knight 1992; Nachlinger 1994; Nachlinger and Sheldon 1997; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.36 Charleston grounddaisy, *Townsendia jonesii* var. *tumulosa*

Status: Nevada BLM Sensitive, Nevada Natural Heritage Program Global Rank G3T2T3, State Rank S2.

Clark County MSHCP Status: Covered.

Range: Southern Nevada endemic in the Spring Mountains, Sheep Mountains, and Sunnyside, Nye County.

Clark County Distribution: In the Spring Mountains, known from the vicinity of Bonanza Peak, Mack Canyon, Lee Canyon, Deer Creek, Kyle Canyon, Bridge Mountain, Mt. Wilson, and Potosi Mountain (Figure 6-33).

Habitat: **Bristlecone pine, mixed conifer, and pinyon-juniper** habitats between 6,600 and 9,700 ft; shallow gravelly soils along ridges, rocky outcrops, and slopes.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Adverse habitat modification due to fuels management (cutting lower limbs from woodland dominants and clearing understory), particularly along Macks Road. **Threat 301**
- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, including hiking, equestrian use, off-highway vehicle use, and dispersed camping. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation. **Threat 402**
- Habitat degradation from highway and road construction or maintenance, in and around Lee Canyon, along Deer Creek Highway, and Macks Road. **Threat 501**
- Habitat degradation by wild horse trampling, particularly in the northeast quadrant of Spring Mountains. **Threat 701**
- Habitat degradation or fragmentation resulting from recreational facility and mountain home development, improvement, and upkeep in and around Lee Canyon and off of Deer Creek Highway and Macks Road. **Threats 1101, 1102**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species. **Threat 101**

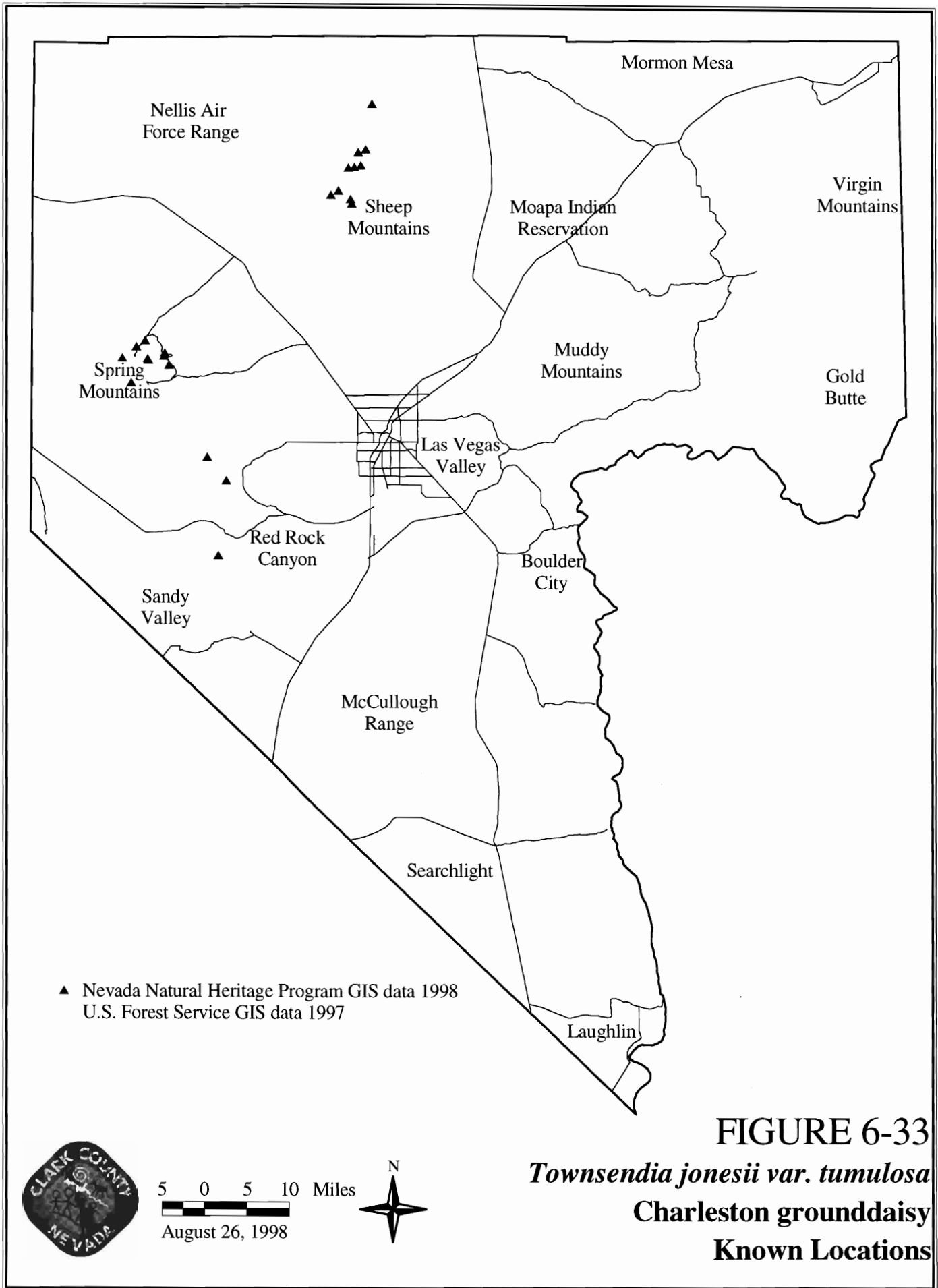


FIGURE 6-33
Townsendia jonesii var. *tumulosa*
 Charleston grounddaisy
Known Locations

Existing Management: General and ecosystem level conservation actions are identified in Appendix A. See chapters on bristlecone pine, mixed conifer, and pinyon-juniper. This species is included in the Bridge Mountain Monitoring Plan in the Red Rock Canyon NCA GMP. The CA for the Spring Mountains NRA identifies general management actions for mid-elevation plants, such as this species, 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.

Adequacy of Existing Management: Over half of the potential habitat for this species occurs on land managed by the USFS, and the remainder occurs on lands managed by USFWS and the BLM in IMAs and LIMAs. Implementation of existing BLM and USFWS management, the Bridge Mountain Monitoring Plan, and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species

References: Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

6.1.37 Limestone (Charleston) violet, *Viola purpurea* var. *charlestonensis*

Status: Nevada Natural Heritage Program Global Rank G3Q, State Rank S2, S3.

Clark County MSHCP Status: Covered.

Range: Southwestern desert endemic.

Clark County Distribution: In the Spring Mountains at Mud Spring, Lee Canyon, and Deer Creek; Virgin Mountains and Sheep Range (Figure 6-34). It is presumed that the majority of the habitat occurs in Clark County.

Habitat: Mixed conifer forest and pinyon-juniper communities at elevations ranging from 6,500 to 9,500 feet.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats: The major threats to the species are:

- Adverse habitat modification and indirect effects on species due to dispersed recreational activities, including hiking, equestrian use, off-highway vehicle use, and dispersed camping. **Threat 401**
- Adverse habitat modification resulting from concentrated recreation. **Threat 402**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on mixed conifer and pinyon-juniper. This species is included in the Bridge Mountain Monitoring Plan in the Red Rock Canyon NCA GMP. The CA for the Spring Mountains NRA identifies general management actions for mid-elevation plants, such as this species, 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.

Adequacy of Existing Management: The majority of the potential habitat for this species is on USFS lands, and the remainder on lands managed by BLM in IMAs and LIMAs. Implementation of existing BLM management, the Bridge Mountain Monitoring Plan, and the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Nachlinger 1994; The Nature Conservancy 1994; USFS, NDCNR, USFWS 1998.

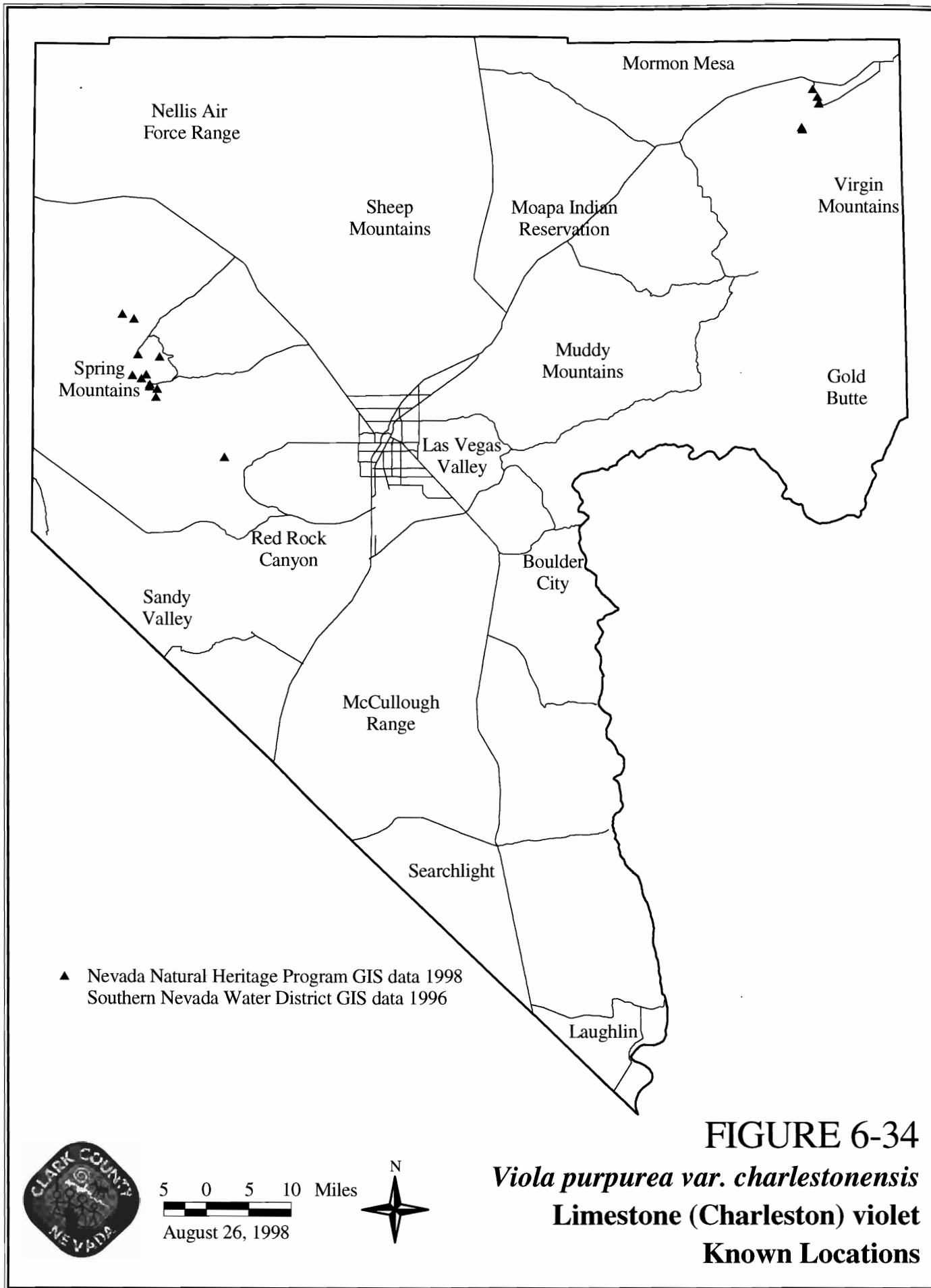


FIGURE 6-34

Viola purpurea var. *charlestonensis*
Limestone (Charleston) violet
Known Locations



5 0 5 10 Miles
 August 26, 1998



6.2 Evaluation Plant Species

High Priority

- Black wooly-pod, *Astragalus funereus*
- Triangle lobe moonwort, *Botrychium ascendens*
- Dainty moonwort, *Botrychium crenulatum*
- Silverleaf sunray, *Enceliopsis argophylla*
- Nevada willowherb, *Epilobium nevadense*
- Las Vegas Valley buckwheat, *Eriogonum corymbosum* var. *aureum*
- Yellow twotone beardtongue, *Penstemon bicolor* ssp. *bicolor*
- Curve-podded Mojave (halfring) milkvetch, *Astragalus mohavensis* var. *hemigyris*

Medium Priority

- Meadow Valley sandwort, *Arenaria stenomeres*
- Ackerman milkvetch, *Astragalus ackermanii*
- Sheep Mountain milkvetch, *Astragalus amphioxys* var. *musimonum*
- Mokiak milkvetch, *Astragalus mokiacensis*
- Remote rabbitbrush, *Chrysothamnus eremobius*
- Unusual catseye, *Cryptantha insolita*
- Ripley's biscuitroot, *Cymopterus ripleyi* var. *saniculoides*
- Sheep fleabane, *Erigeron ovinus*
- Desert (Clark) parsley, *Lomatium graveolens* var. *clarkii*
- Pygmy poreleaf, *Porophyllum pygmaeum*

Low Priority

- Virgin River thistle, *Cirsium virginense*
- Clokey buckwheat, *Eriogonum heermannii* var. *clokeyi*
- Amargosa beardtongue, *Penstemon fruticiformis* ssp. *amargosae*

6.3 Watch List Plant Species

- One-leaflet Torrey milkvetch, *Astragalus calycosus* var. *monophyllidius*
- Clokey pincushion, *Coryphantha vivipara* ssp. *rosea*
- Hoffman's cryptantha, *Cryptantha hoffmannii* (= *C. virginensis*)
- New York Mountains catseye, *Cryptantha tumulosa*
- Chalk liveforever, *Dudleya pulverulenta*
- Clokey fleabane, *Erigeron clokeyi*
- Barrel cactus, *Ferocactus acanthoides* var. *lecontei*
- Nevada greasebush, *Glossopetalon nevadensis*
- Beaver Dam scurfpea (breadroot), *Pediomelum castoreum*
- Rosy twotone beardtongue, *Penstemon bicolor* ssp. *roseus*
- Utah spikemoss, *Selaginella utahensis*

7.0 Non-Vascular Plants

The MSHCP includes a total of 14 species of non-vascular plants:

Covered	4
High Priority Evaluation	0
Medium Priority Evaluation	6
Low Priority Evaluation	2
Watch List	2

7.1 Covered Non-Vascular Plants

- *Anacolia menziesii*
- *Claopodium whippleanum*
- *Dicranoweisia crispula*
- *Syntrichia princeps*

The potential impacts, management, rationale for coverage, and measurable biological goals for each of the non-vascular plant species proposed for coverage in the MSHCP are summarized in Table 7-1.

TABLE 7-1
COVERED SPECIES CONSERVATION EVALUATIONS

Species	Conserved (IMAs, LIMAs)	Potential Indirect Impacts (MUMAs)	Potential Direct Impacts (UMAs) ¹	Management	Rationale for Coverage	Measurable Biological Goals
<i>Anacolia menziesii</i>	Only cited locations	none	none	BLM Red Rock Cyn NCA	West Coast species with single location in Nevada at Red Rock Cyn.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
<i>Claopodium whippleanum</i>	Only cited locations	none	none	BLM Red Rock Cyn NCA	West Coast species with single location in Nevada at Red Rock Cyn.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
<i>Dicranoweisia crispula</i>	Only cited locations	none	none	USFS SMNRA	Western North American species with single population in Lee Cyn.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers
<i>Syntrichia princeps</i>	Both cited locations	none	none	USFS SMNRA BLM GMP	West Coast species with two Nevada locations in Spring Mtns and Virgin Mtns.	<ul style="list-style-type: none"> No net unmitigated loss or fragmentation of habitat in IMAs & LIMAs Maintain stable or increasing population numbers

¹In all cases, projected potential impacts represent the “worst case” analysis.

7.1.1 *Anacolia menziesii*

Status: None.

Clark County MSHCP Status: Covered.

Range: A common West Coast species, with the only Nevada collection of this species found in Red Rock (see map this page).

Clark County Distribution: A single location in **pinyon-juniper** and **blackbrush** habitat in the Spring Mountains at approximately 4,800 feet.

Habitat: Occurs in **pinyon-juniper** and **blackbrush**.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Habitat degradation by wild horse and burro grazing and trampling. **Threat 701**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on pinyon-juniper and blackbrush. Existing USFS management from the GMP includes measures to prevent trampling and/or browsing of plants by horses, off-road-vehicle use, mountain bikes, heavy foot traffic, or other mechanisms to prevent dramatic declines of this species.

Species specific measures for the conservation of this species include:

*BLM(33) Develop and implement a monitoring program for BLM Special Status Plants such as the alkali mariposa lily, Blue Diamond cholla and covered and evaluation moss species in the Red Rock Canyon NCA.**

Adequacy of Existing Management: The majority of the potential habitat occurs on lands managed by BLM and USFS in IMAs and LIMAs, with approximately 2 percent on private lands. Implementation of existing BLM management, the provisions of the CA for the Spring Mountains NRA, and the measures outlined above should provide adequate conservation for this species.

References: Stark, pers. com. 1996.

7.1.2 *Claopodium whippleanum*

Status: None.

Clark County MSHCP Status: Covered.

Range: A common West Coast species, abundant in California, with the only Nevada collection of this species found in Red Rock (see map this page).

Clark County Distribution: Pinyon-juniper habitat in the Spring Mountains at approximately 4,900 feet.

Habitat: Occurs in the **pinyon-juniper** zone, generally in recessed, sheltered locations. The single known location is near Willow Springs in Red Rock Canyon.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**
- Habitat modification and degradation, individual displacement by rock climbing. **Threat 405**

Species Specific Threats: None identified.

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapter on pinyon juniper.

Species specific measures for the conservation of this species include:

*BLM(33) Develop and implement a monitoring program for BLM Special Status Plants such as the alkali mariposa lily, Blue Diamond cholla and covered and evaluation moss species in the Red Rock Canyon NCA.**

Adequacy of Existing Management: All of the potential habitat occurs on BLM land within IMA and MUMA category lands. The known population occurs entirely within an IMA. Implementation of existing BLM management should provide adequate conservation for this species.

References: Stark, pers. com. 1996.

7.1.3 *Dicranoweisia crispula*

Status: None.

Clark County MSHCP Status: Covered.

Range: Southernmost population of a widespread western North American species (see map this page).

Clark County Distribution: Population recorded in Lee Canyon in the Spring Mountains, probably more widespread.

Habitat: Generally occurs on downed logs associated with **mixed conifer**, and **pinyon juniper**.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- Habitat degradation and modification due to fire suppression and fuels management, post fire suppression and fuels management, historical fire management, fire. **Threat 301**
- Habitat degradation from wood removal. **Threat 1001**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**

Existing and Proposed Conservation Actions: General and ecosystem level conservation actions are identified in Appendix A. See chapters on mixed conifer and pinyon juniper .

Species specific measures for the conservation of this species include:

*BLM(33) Develop and implement a monitoring program for BLM Special Status Plants such as the alkali mariposa lily, Blue Diamond cholla and covered and evaluation moss species in the Red Rock Canyon NCA.**

Adequacy of Existing Management: Most of the potential habitat occurs on USFS land and on lands managed by the BLM in IMAs and LIMAs. Implementation of existing BLM management, the provisions of the CA for the Spring Mountains NRA should provide adequate conservation for this species.

References: Stark, pers. com. 1996.

7.1.4 *Syntrichia princeps*

Status: None.

Clark County MSHCP Status: Covered.

Range: A common West Coast species with the only two Nevada collections from the Spring and Virgin Mountains (see map this page).

Clark County Distribution: Occurs in the pinyon-juniper zone in the Virgin Mountains, in a single, recessed, sheltered location near the *Claopodium* population at Willow Springs at 4,900 feet.

Habitat: Occurs in the **pinyon-juniper** zone, generally in recessed, sheltered locations.

Population Trends: Unknown, presumed stable.

Ecosystem Level Threats:

- 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 401**
- Habitat degradation by wild horse and burro grazing and trampling. **Threat 701**

Species Specific Threats:

- Susceptibility to stochastic events of narrow endemics and limited distribution species (those with limited habitat or low relative densities). **Threat 101**

Existing Management: General and ecosystem level conservation actions are identified in Appendix A. See chapter on pinyon-juniper.

Species specific measures for the conservation of this species include:

*BLM(33) Develop and implement a monitoring program for BLM Special Status Plants such as the alkali mariposa lily, Blue Diamond cholla and covered and evaluation moss species in the Red Rock Canyon NCA.**

Adequacy of Existing Management: Implementation of existing management should provide adequate conservation for this species. Occurs in the Red Rock Canyon NRA under BLM jurisdiction. All of the low potential habitat occurs on BLM managed lands.

References: Stark, pers. com. 1996.

7.2 Evaluation Non-Vascular Plants

Medium Priority

- Pseudocrossidium moss, *Pseudocrossidium crinitum*
- Undescribed targionia liverwort, *Targionia* sp. nov.
- Nevada didymodon, *Didymodon nevadensis*
- Crossidium moss, *Crossidium seriatum*
- American grimmia, *Grimmia americana*
- Trichostomum moss, *Trichostomum sweetii*

Low Priority

- *Distichium inclinatum*
- Undescribed syntrichia moss, *Syntrichia* spp.

7.3 Watch List Non-Vascular Plants

- *Fissidens sublimbatus*
- *Splachnobryum obtusum*