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

Appendixes C-K

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CLARK COUNTY MSHCP/EIS

APPENDIXES C-K

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GIS DATA SOURCES AND ANALYSES

Documentation of ARC/INFO geographic information system coverages for Clark County, Nevada, developed by RECON Environmental, Inc., for the Clark County Multiple Species Habitat Conservation Plan and Environmental Impact Statement. RECON GIS contact: **Leslie Smith** 619-308-9333.

All coverages clipped to land or county boundary and projected to coordinate system: Stateplane NAD83 zone 4601 feet. Bracketed names indicate coverages used in final analyses; capitalized names indicate coverages not used.

Base Coverages

CCPLS_S: polygon coverage of township and range datain Virgin River area received 12/30/96

CLKRDS: line coverage of all roads projected from CLARKRD and clipped to OWNBND

[demgrd]: DEM grid received 12/30/96 from SNWD?

GEOLOGY: polygon coverage of geology data received 12/30/96

HYDRO: line coverage of streams, intermittent streams, intermittent washes/ephemeral drains; USGS dlg data received on zipdisk from Rob Bamford at BRRC 2/5/97

HYDROSP: point coverage of springs; USGS data received on 12/30/96

[lakemead] polygon coverage of Lake Mead created by intersecting [clkbnd98] and [lndbnd98] - original data from Utah State management coverage received 9/96

[majorrds] line coverage of most important roads; last modified after agency review 10/98

PLACE: polygon coverage of place names received from Clark County GISMO 3/4/97

[streams] line coverage of most important streams; last modified after agency review 12/98

UTILGPS: polygon coverage of utility corridors that have been located using GPS; received from BLM 11/97

UTILNYE: polygon coverage of utility corridors in Ny; received from BLM 11/97

Land Ownership & Management Coverages

[acecall] Polygon coverage of "Areas of Critical Environmental Concern" including tortoise and non-tortoise ACECs with attributes for acecname and acecvalue. (This management designation in BLM's 1998 RMP replaces desert tortoise critical.) Original coverage from BLM 9/97. Modified to match [lndbnd98].

[clkbnd98] Polygon coverage of Clark County boundary. Created 3/98 from [mgr98].

[conshab] Polygon coverage of desert tortoise conserved habitat with an attribute for conserved habitat name. Original coverage from BLM 9/97. Modified to match [mgr98] and [crithab]; arcs edited to match [lndbnd98] north of Cottonwood Cove on Lake Mead.

[crithab] Polygon coverage of desert tortoise critical habitat with an attribute for critical habitat name. Original coverage from BLM 9/97. Modified to match [lndbnd98]; edited to match [mgr98] in Nellis area; interior private polys removed.

DISPOSAL: polygon coverage of BLM disposal areas received from BLM 9/97

[dnwr] Polygon coverage of Desert National Wildlife Range area with an attribute for DNWR name. Created 7/98 by pulling DNWR boundaries from [nellis] and [mgr98].

[exmgt] Polygon coverage of existing land management with attributes for management and management category. Created 6/98 using mexmgt.sml to union multiple management coverages (listed below)

FIREMGT: polygon coverage of fire management areas received from BLM 11/97; no attribute data

FIRESUP: polygon coverage of fire suppression areas received from BLM 11/97; no attribute data

[grazalot] Polygon coverage of grazing allotment boundaries with attributes for allotment name, grazing titles and grazing status. Original coverage from BLM 9/97. Modified to generalize Las Vegas Valley allotment per BLM's request; matched to [lndbnd98]; Virgin River removed; matched to [mgr98] in certain areas.

[hma_all] Polygon coverage of wild horse and burro herd management areas with an attribute for management area name. Original coverage received from BLM 8/98. Unmodified.

[hotspot] Polygon coverage of biodiversity hotspots in Mt Charleston area with an attribute for hotspot name. Original coverage from USFS 1/97. Modified to fix labelerror.

[isa] Polygon coverage of Instant Study Areas (managed same as WSAs) with an attribute for ISA name. Original coverage from BLM 5/98. Unmodified.

[lakeshor] Polygon coverage of less-intensively managed area along southern portion of Lake Mead shoreline area with an attribute for lake use. Created 5/98 by pulling selected arcs from [conshab]. (This coverage is included because it is part of the composite management coverage [exmgt] but should be replaced by a more complete & accurate coverage from NPS that shows landuse and land management boundaries in Lake Mead.)

[lndbnd98] Polygon coverage of Clark County boundary excluding Lake Mead. Created 3/98 from [mgr98]

[mgr98] Polygon coverage of land managers/owners with attributes for land manager and manager class. Original coverage from Utah State 9/96. Modified to include El Dorado Land Transfer boundaries, some 1997 BLM boundary changes, data in Virgin River area.

[nellis] Polygon coverage of Nellis area including Nellis Air Force Range (NAFR) Nellis Air Force Base (NAFB) Nellis Small arms Range (NSAR) Indian Springs Air Force Auxiliary Field (ISAFAF) with an attribute for area name and use. Created 4/98 by digitizing hardcopy map obtained from the Air Force.

[overtn_c] Polygon coverage of Overton National Wildlife Management Area area with an attribute for WMA name. Original coverage from NDOW 5/98. Modified to exclude Lake Mead by clipping to [lndbnd98].

[prmgt] Polygon coverage of "proposed" land management (requiring the adoption of BLM's 1998 RMP) management with attributes for management and management category. Created 6/98 using mprmgt.sml to union multiple management coverages (listed below).

[redrock] Polygon coverage of Redrock Canyon National Conservation Area (NCA) area with an attribute for NCA name. Original coverage from BLM 9/97. Unmodified.

[rna] Polygon coverage of USFS RNAs with an attribute for RNA name. Original coverage from USFS 1/97 of Mt Charleston RNA only. Modified to include Carpenter Canyon RNA; matched to [wilder].

SRMA: polygon coverage of Special Recreation Management Areas received from BLM 11/9

[stparks] Polygon coverage of State Parks area with an attribute for state parks name. Created 8/98 by pulling Valley of Fire State Park boundaries from [mgr98]. Will be modified 12/98

[unfrag] Polygon coverage of unfragmented habitat in Mt Charleston area with an attribute for unfragmented habitat name. Original coverage from USFS 1/97. Modified to match to [mgr98].

[wilder] Polygon coverage of Mt Charleston Wilderness with an attribute for wilderness area name. Original coverage from USFS 1/97. Modified to remove private inholdings; Carpenter Canyon RNA removed and put to [rna].

[wsa] Polygon coverage of Wilderness Study Areas with an attribute for WSA name. Original coverage from BLM 9/97. Modified to match [lndbnd98]; arcs modified in Mt Stirling WSA per USFS request; matched to [mgr98] in some private land areas; matched to [wilder] in USFS WSA; matched to parts of Nellis boundary.

Biological Resources Coverages

[bats] point coverage of bat locations; unmodified data from Leanne Ball, PhD candidate UNR who compiled this data from published sources including Mary Kay Ramsey's thesis on bats in the Spring Mountains, conducted at UNLV - locations derived from translating 1940's text descriptions; received in mail.zip file spanned onto floppy diskette set from BRRC 10/2/96

BEARPOLY: polygon coverage of Las Vegas bearpoppy received from NPS 11/97; same areas covered by [nhpdata]

BEARPT: point coverage of Las Vegas bearpoppy received from NPS 11/97; same area covered by [nhpdata]

BLMPLNT: polygon coverage of sensitive plant species (groups); projected from BLM data received via email attachment from ? October 1996

BLMPOINT: point locations of sensitive plant species (individuals); projected from BLM data received via email attachment from ? October 1996

[blm_pts] 9114 point locations of sensirtive species in Clark County received from BLM 12/97

[commcoll]: 1894 point locations of commercially collected reptiles in Clark County received from BRRC 9/97

CONIFER: point coverage of conifer species locations; BRRC/David Charlet, PhD published conifer atlas of Nevada - compiled location (TNR) records from herbaria, literature, personal observation (visited 200+ mountain ranges in Navada and made 600+ collections); data received on zipdisk from Rob Bamford, BRRC 2/5/97

LIZARD: point coverage of lizard locations; received from BRRC 10/2/96; coverage replaced by [nvherp]

[mesquitc]: polygon coverage of mesquite habitat; GPS data mostly flown from helicopter, believed to be locationally accurate but underestimated; received from BLM 11/97 and incorporated into [veg98]

MSUFISH: point coverage of sensitive fish species locations. Michigan State University museum records translated into GIS by BRRC; received from Rob Bamford, BRRC 2/5/97

[nhpdata] 1073 point locations of senstive species in Clark County received from Nevada Natural Heritage Program (NNHP) 5/98

[nvherps] point coverage of 1368 herp locations received from BRRC 9/97

[nvmam] point coverage of 416 mammal locations received from BRRC 9/97

OTH_HERP: point coverage of herp locations received from BRRC 10/2/96; replaced by [nvherps]

[spcovpt] composite point coverage of sensitive species created by appending [bats] [blm_pts] [commcoll] [nvherps] [nvmam] [ssp1995] [tespt] [vir_spec] [nhpdata] 6/26/98 and updating attributes including common name, scientific name, data source, HCP status

[spr3epa]: point coverage of springs and aquatic features digitized from 7.5' USGS quads and other sources with attributes for spring type, spring name and data source; received from Dave Bradford, EPA 9/25/97

[ssp1995] point coverage of 472 sensitive species locations received from NPS 11/97

SPRINGS: point coverage of springs for which biological data has been collected by Gary Vinyard (702) 784-6793, gvinyard@scs.unr.edu & Robert Hershler; from BRRC 10/2/96; includes some springs that are not in [spr3epa] with attribute data for sensitive species

TESPOL: polygon coverage delineating areas of threatened, endangered & sensitive species; TNC data received from Rick Connell, USFS 1/28/97; covers same areas as [tespt]

TESPOLY: polygon coverage of

TESPLNT: point coverage of sensitive plant species received from NPS 11/97; same area covered by [nhpdata]

[tespt] point coverage of 121 locations of threatened, endangered & sensitive species locations; TNC data received on floppy diskette from Rick Connell 1/28/97

UNRFISH: point coverage of sensitive fish species locations from museum records; UNR museum records translated into GIS by BRRC; data received from Rob Bamford, BRRC 2/5/97

[veg98] Polygon coverage of vegetation and land cover with attributes for vegetation type, ecosystem. Original coverage from Utah State (GAP data) 9/96. Modified to include additional 1997 BLM mesquite/catclaw polygons; matched to [lndbnd98] and missing data added; interior water polys removed.

[vir_spec] point coverage of 21 sensitive plant species in the Virgin River area; SNWD data received on 12/30/96

VIRLAND: polygon coverage of landuse for Virgin River area; unmodified SNWD data received 12/30/96

VIRPLS: polygon coverage of township and range data for Virgin River area; unmodified SNWD data received 12/30/96

APPENDIX D

DRAFT

Final Draft

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Southern Nevada Mesquite Woodland Habitat Management Plan

Bureau of Land Management

Las Vegas Field Office

April 1999

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ABSTRACT

Southern Nevada Mesquite Woodland
Habitat Management Plan

Prepared by:

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Wildlife Biologist

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Prepared for:

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The purpose of this Habitat Management Plan is to provide for specific management of honey mesquite woodlands in southern Nevada that will ensure the long-time survival of woodlands, which will in turn provide important resources needed by the variety of floral and faunal species that depend on mesquite woodlands for survival in a desert environment.

Until recently, little information was available on the condition and status of mesquite woodlands in southern Nevada. The sharp increase in the population growth rate of Las Vegas Valley over the last several years has stimulated the rapid conversion of many mesquite woodlands (or bosques) into baseball fields, golf courses, and suburban developments. This loss of habitat has raised concern for the many native plant and animal species that are closely associated with mesquite woodlands. This Habitat Management Plan summarizes the current condition of southern Nevada's remaining mesquite woodlands, discusses the importance of mesquite woodlands as wildlife habitat, describes past and current threats to woodlands, and sets goals, objectives, and management actions and recommendations for future mesquite woodland conservation on the public lands.

Historically, mesquite bosques in southern Nevada occupied riparian areas along the Muddy and Virgin Rivers and wash systems found throughout Las Vegas, Moapa, and Pahrump Valleys. Most of the mesquite along the major rivers and washes has now been replaced by saltcedar (*Tamarix ramosissima*), an aggressively invasive exotic species. Saltcedar is generally thought to be suboptimal habitat for many desert faunal species that have evolved specific survival and reproductive strategies that are dependent upon certain elements found only within their historic native habitat.

Southern Nevada's remaining mesquite woodlands are primarily found along drainages and dry lake beds in valley bottomlands where soils are deep and groundwater is relatively high, but perennial surface water is absent. These habitats may not conform to what many consider as the classic riparian system (ie vegetation occupying river- and streamsides); however, they are indeed riparian if we follow the definition of Pinkney (1992):

> "In this definition, hydric soils and perennial flow are not required (DeBano and Schmidt 1989). A terrestrial area, dry arroyo, or stream channel that has a **dependable water supply within the rooting zone** (emphasis added) of riparian vegetation (even with no riparian vegetation present) may be considered a riparian area."

This dependable groundwater supply is a requirement for the continued existence of mesquite woodlands in southern Nevada. However, high water tables also attract human settlements in arid environments. The two communities with the greatest growth rates, Las Vegas and Pahrump, occupy areas that formerly supported some of the largest mesquite bosques found in southern Nevada. These bosques are now either nonexistent, or have been severely degraded due to declining groundwater levels, excessive woodcutting, wildfires, high herbivory pressure, and trampling from livestock and heavy human use.

This Habitat Management Plan will not address the management of remnant patches of mesquite along perennial waters such as the Muddy and Virgin Rivers. These areas will be covered separately under a riparian plan currently under development. This Habitat Management Plan will cover areas outside Las Vegas Valley that support the largest and/or most significant populations of honey mesquite woodlands in Clark and southern Nye Counties. These areas are: Amargosa Flat, Stewart Valley, Pahrump, Stump Spring, and Moapa. Three smaller areas included in the HMP are Sandy Valley, Dry Lake, and Cactus Springs. Objectives have been developed separately for each management area, and depend on specific physical, environmental, and habitat features, amount of use, and ability to support wildlife species, which varies among the eight areas.

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1.0 INTRODUCTION

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1.1 Reasons for Preparation and Justification

Honey mesquite (*Prosopis glandulosa*) is a woody shrub or tree of the Fabaceae (Pea) family. The arid climate of the Mojave Desert has confined the distribution of honey mesquite in southern Nevada to areas with perennial or permanent groundwater. The requirement of a permanent, reliable water source has placed mesquite in direct competition for scarce water supplies with a growing human population. Clark County, within which Las Vegas is located, experienced a ca. 40% population increase between 1990 and 1996, and is projected to more than double by 2015 (Sources: U.S. Bureau of the Census, Washington, DC and Nevada State Demographer's Office, Reno, NV). Nye County, which contains the unincorporated town of Pahrump, as well as one of southern Nevada's largest remaining complexes of mesquite woodlands, sustained a ca. 45% population increase for the same time period (Source: U.S. Bureau of the Census, Washington, DC). Increasing population growth has resulted in greater demand for groundwater, and subsequent declines in water table level may threaten the continued survival of honey mesquite in much of its range in southern Nevada. In addition, urban growth has resulted in the destruction of much of Las Vegas Valley's mesquite woodlands, and increased human use of woodlands has resulted in woodland degradation due to uncontrolled woodcutting, trampling, dumping, herbivory, and increased frequency of wildfires.

In a landscape dominated by desert scrub the patchy occurrence of mesquite woodlands serves as important breeding and resting places for many avian species. Woodlands offer protection from weather and predators and provide places where birds have a more favorable energy budget. Desert woodlands comprise a small percentage of the total vegetation in the Southwest, but support greater densities of birds than the surrounding desert habitat (Germano et al. 1983, Laudenslayer 1981, Szaro 1981). Woodlands add structural complexity to the landscape, providing more nesting sites and food resources for breeding birds. Several species of desert breeding birds such as Lucy's Warbler *(Vermivora luciae*) and Phainopepla (*Phainopepla nitens*) are strongly associated with mesquite woodlands (Anderson and Ohmart 1978, Meents et al. 1983). Woodlands also provide important stopover sites for migratory birds. Several studies have discussed the importance of stopover sites for migrants (Kuenzi and Moore 1991, Moore et al. 1990, Rappole and Warner 1976) and have noted that degradation or loss of stopover habitat can severely reduce the chance of a successful migration (Terborgh 1989). Many neotropical migrants cannot store enough fat to support them throughout their entire migration, and must stop periodically to rest and replenish energy reserves (Winker et al. 1992). Patches of mesquite scattered throughout the desert may play an important role in the successful migration of birds attempting to cross large ecological barriers such as deserts (Berthold and Terrill 1991).

Phainopepla is a frugivorous songbird found only in the southwestern United States and Mexico (American Ornithologists' Union 1983). Its name is derived from the Greek words meaning "shining robe", which describes the glossy black plumage of males (Terres 1995). Phainopepla is the only member of the Ptilogonatidae (Silky Flycatcher) family found in the United States. Its range extends from the Mexican Plateau north into Arizona, California, extreme western Texas, and the southern regions of Nevada and New Mexico (Walsberg 1977). Phainopepla's close association with mesquite is linked to its preferred food, the berries of desert mistletoe (*Phoradendron californicum*), which is a parasitic plant that uses a variety of leguminous species as its host. The specialized digestive tract of Phainopepla is an example of its adaptation to a nearly exclusive diet of mistletoe berries (Walsberg 1975).

Because of Phainopepla's close link to its food source, it can be particularly susceptible to changes in the quantity or quality of its habitat. The Bureau of Land Management (BLM) added Phainopepla to its list of Nevada sensitive species[1] in April 1997. Sensitive species are designated by the BLM State Director, in cooperation with state wildlife agencies, and are afforded the same level of protection as is provided for candidate species[2] under BLM Manual 6840.06 D. This policy states that the BLM will "carry out management consistent with the principles of multiple use for the conservation of candidate species and their habitats, and shall ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered".

The Federal Land Policy and Management Act of 1976 (FLPMA) requires that "... the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that ... will preserve and protect certain public lands in their natural condition; (and) that will provide food and habitat for fish and wildlife ... ". It is the policy of the BLM "to manage habitat with emphasis on ecosystems to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on the public lands" (BLM Manual 6500.06).

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[1] The designation of "sensitive species" includes species that could easily become endangered or extinct in a state.

[2] Candidate species are those species for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threats to support issuance of a proposed rule to list but issuance of the proposed rule is precluded. Identification of candidate species can assist environmental planning efforts by providing advance notice of potential listings and allow land managers to alleviate threats, thereby possibly removing the need to list species as threatened or endangered.

The purpose of this Habitat Management Plan (HMP) is to provide for specific and appropriate management of honey mesquite woodlands in southern Nevada that will ensure the long-term survival of woodlands, which will in turn provide important resources needed by the suite of floral and faunal species associated with mesquite woodlands. If successful, this ecosystem approach to resource management will not only protect and conserve a unique desert plant community, but will help to ensure the continued survival of all associated species.

Conservation measures for mesquite woodlands in Nye County will also protect the Pahrump Valley buckwheat (*Eriogonum bifurcatum*) and Parish's phacelia (*Phacelia parishii*), two BLM sensitive plant species which are closely associated with mesquite. Populations of these annuals in Clark and Nye Counties around the towns of Sandy Valley and Pahrump have been extirpated due to development of private lands.

1.2 Biological Information

1.2.1 Taxonomy

According to Burkart and Simpson (1977), *Prosopis* is an old genus that split into several lineages very early on. Within some of these lineages recent isolation events caused partial speciation, which has produced very similar groups (or sections) of species, as well as similar species within these sections that frequently hybridize. Consequently, the taxonomy of *Prosopis* is complicated and confusing. The taxonomic status used for this HMP is summarized from Burkart and Simpson (1977) and Hickman (1993):

- Family: Fabaceae (Leguminosae) - Pea Family
  Subfamily: Mimosoideae
  Genus: *Prosopis*
  Section: *Algarobia* de Candolle
  Species: *glandulosa*
  Variety: *torreyana*

- Common Name: western honey mesquite

- Habit: Winter deciduous woody shrub or tree generally 1 to 5 m tall, occasionally reaching heights up to 10 m; single or multi-stemmed with spines; dual root system consisting of shallow, widely spreading lateral roots and large tap root.

- Leaves: Bipinnately compound, alternate, oblong, glabrous; primary leaflets generally 1 pair, opposite, 6-17 cm; secondary leaflets 7-17 pairs, opposite, 1-2.5 cm; length 7-9 times the width.

- Flowers: Inflorescence a raceme, 6-10 cm, spike-like; flowers 5-merous, radial, small, yellow, petals generally inconspicuous. Primary mode of pollination is by invertebrate transport, in particular bees.

- Fruit: Indehiscent legume or pod; long, somewhat straight and flattened, somewhat narrowed between seeds; pulpy and green when young, becoming woody and light yellow with maturity.

- Phenology: In southern Nevada, leaf-out begins late April to early May; flowers shortly thereafter; leaf-drop from November to January.

1.2.2 Distribution

Three native species of mesquite occur in the southwestern United States (Fisher 1977): honey mesquite (*P. glandulosa*), velvet mesquite (*P. velutina*), and screwbean mesquite (*P. pubescens*). Honey mesquite occurs in Texas, northern Mexico, and the southern parts of New Mexico, Arizona, Nevada, and California (Simpson and Solbrig 1977) (Fig. 1-1). Velvet mesquite is found in southwestern Arizona and northwestern Mexico (Fig. 1-1), and is distinguished from honey mesquite by its small, velvety leaves. Screwbean is generally found only in locations where surface water is present, such as the edges of springs or streams, and is easily identifiable by the shape of its corkscrew-like pods.

Western populations of honey mesquite (*P. glandulosa* var. *torreyana*) are separated from eastern populations (*P. glandulosa* var. *glandulosa*) by the Pecos River, and can be distinguished by the smaller leaves and longer fruits of the western variety (Hilu et al. 1982). Southern Nevada contains a portion of the northernmost range extent of western honey mesquite. Figure 1-2 shows the distribution of western honey mesquite in southern Nevada.

The root system of mesquite consists of lateral roots used for uptake of nutrients and shallow soil moisture, and large taproots that are able to grow to great depths to reach groundwater. Lateral roots allow mesquite to survive in areas with moderate precipitation where groundwater is less available, while the taproot enables mesquite to exist in arid environments where precipitation and soil moisture are low. In the semi-arid portions of its range such as Texas, New Mexico, and Arizona, precipitation is relatively greater and occurs more frequently than in the arid climates of southern California and Nevada. Mesquite occurring in semi-arid regions can rely on its lateral root system for water uptake, and is thus uncoupled from the requirement of a permanent groundwater source. In contrast, the arid climate of southern Nevada has restricted mesquite to areas with shallow groundwater. Mesquite woodlands in southern Nevada typically occur in areas with deep soils along washes, riparian areas, and the edges of playas (dry lake beds) where their well-developed taproots can easily penetrate into subsurface water.

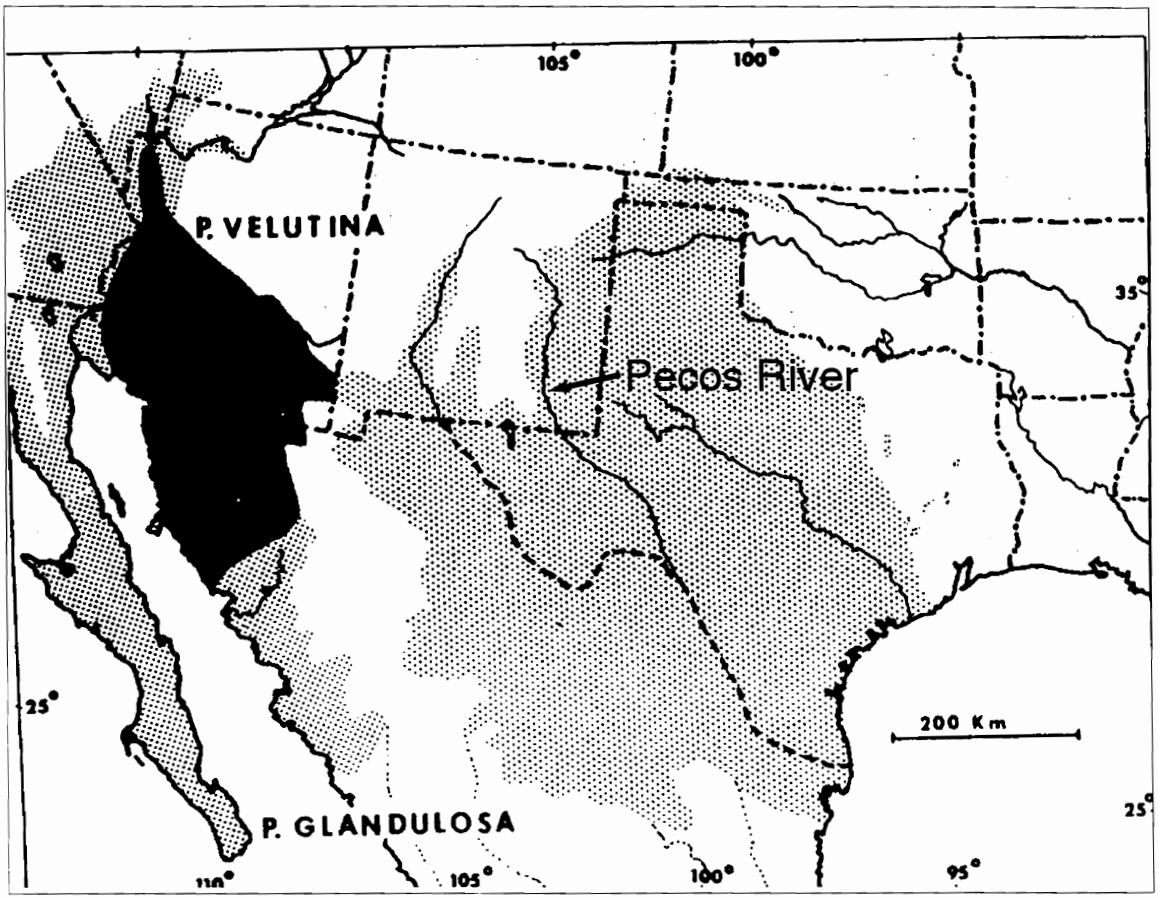

Fig. 1-1. Distribution of honey mesquite (*Prosopis glandulosa*) and velvet mesquite (*P. velutina*) in the southwestern United States. Source: B.B. Simpson. 1977. Mesquite: It's Biology in Two Desert Scrub Ecosystems. US/IBP Synthesis Series 4, Dowden, Hutchinson & Ross, Inc., Stroudsburg, PA.

1.2.3 Relevant Research

In the southern Nevada desert, human settlements tend to occupy areas in and around mesquite woodlands because of easy access to groundwater. Consequently, many mesquite "bosques" have now been replaced by residential subdivisions, baseball parks, and golf courses. Much of the woodland habitat in Las Vegas Valley has been lost to urban development, and southern Nevada's remaining woodlands are threatened with continued loss from urban growth (see Fig. 1-3) and increased stress and disturbance from groundwater depletion and higher levels of human use. Pahrump Valley contains southern Nevada's largest remaining complex of mesquite woodlands. Pahrump Valley is an internal drainage basin, and the aquifer, which is recharged by snowmelt from the Spring Mountains to the east, is the source of virtually all the area's water supply. A study on groundwater depletion in Pahrump Valley between

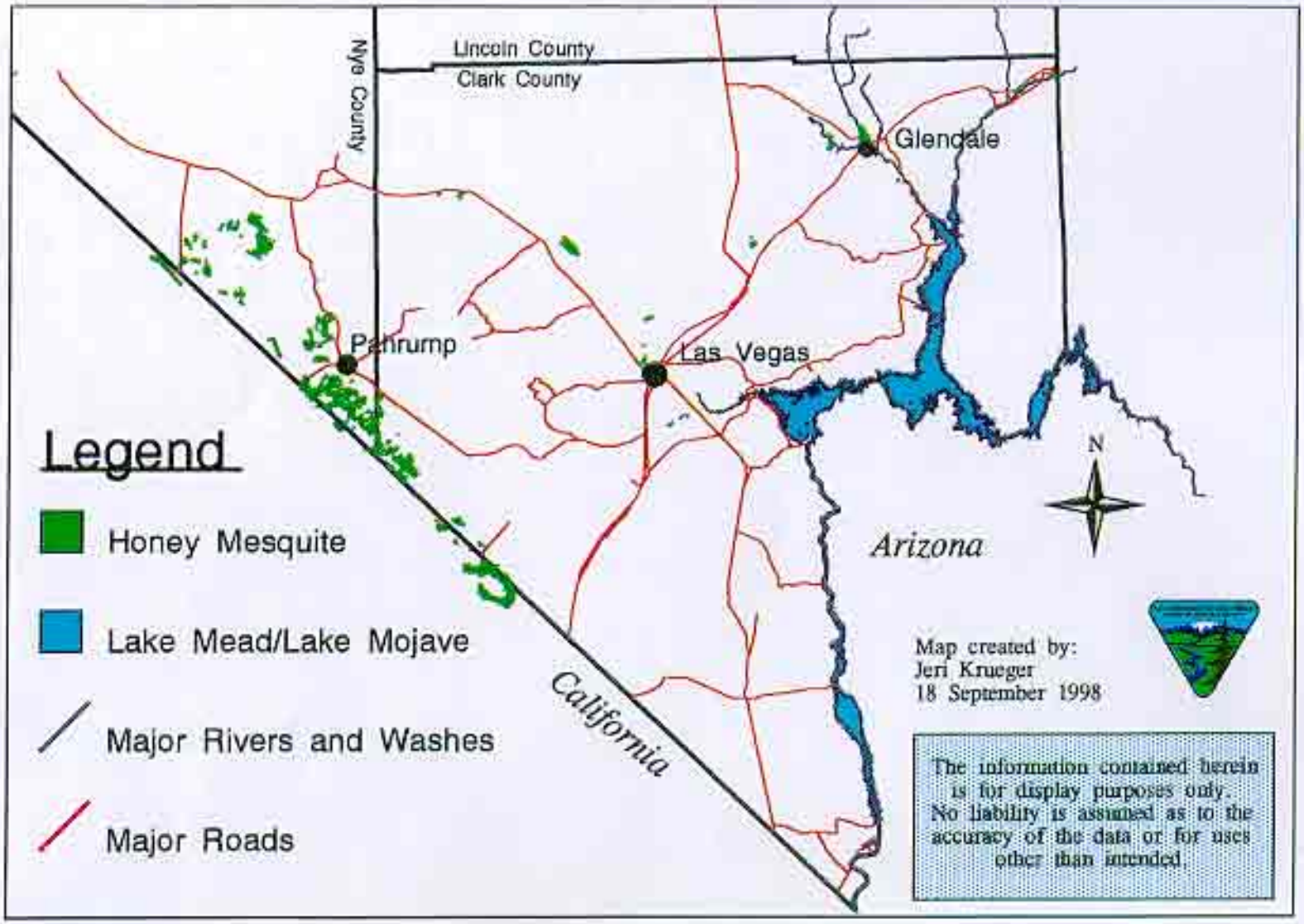

Fig. 1-2. Distribution of western honey mesquite in southern Nevada.

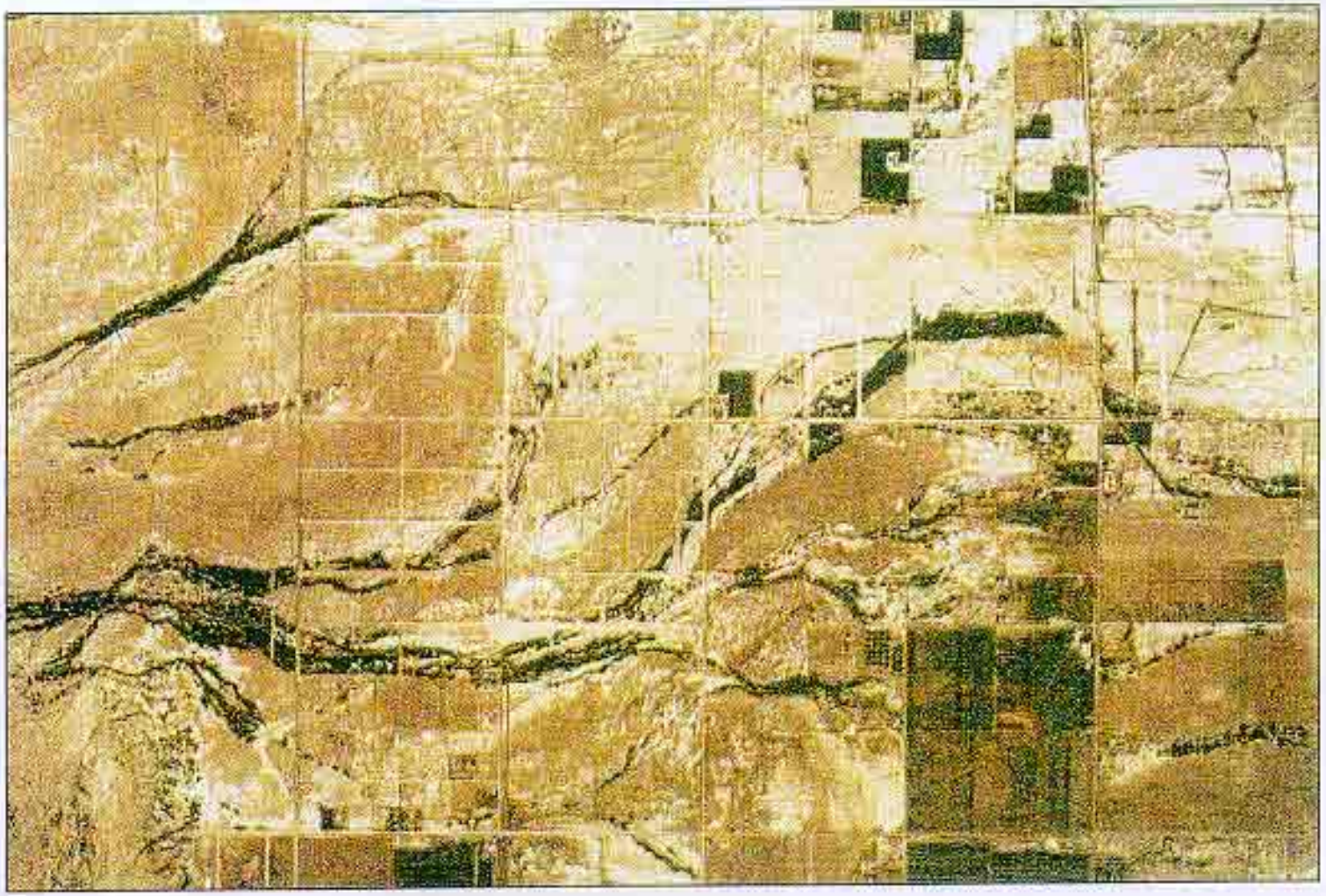

Fig. 1-3 1980 aerial photo of mesquite woodlands along the western edge of Pahrump, Nye County, Nevada.

the years 1962 and 1975 determined that as of 1975 groundwater pumping was causing an overdraft of 11,000 acre-feet per year (Harrill 1982).

In general, western honey mesquite is shorter in stature with more profuse branching than its eastern relative. However, many studies have shown that mesquite tree size and growth form are also strongly influenced by environmental factors such as groundwater level and physical or mechanical disturbance. Studies by Cannon (1913), Haas and Dodd (1972), Holland (1987), Judd et al. (1971), Minckley and Clark (1984), Nilsen et al. (1984), and Stromberg et al. (1992, 1993) have all described the correlation between tree size and groundwater level, and note that mesquite occurs as a tree in areas where groundwater is relatively close to the soil surface, and decreases in size as distance to the water table increases. Stromberg et al. (1992, 1993) also determined that canopy size decreases and mortality increases with increasing distance to the water table. Although mesquite roots have been excavated at depths as great as 60 m (Phillips 1963), this is the exception rather than the rule. In general, it becomes increasingly difficult for mesquite to survive once the water table falls below 15 m (Judd et al. 1971).

In addition to the effects of groundwater level, damage to the stem as a result of woodcutting, chaining, fire, freezing temperatures, herbivory, and trampling promotes resprouting and transforms tall single-stemmed trees into shorter, multi-stemmed thickets (Fisher 1977, Heitschmidt et al. 1988). In southern Nevada, relatively undisturbed woodlands occurring in areas with a shallow, permanent groundwater source contain single-stemmed trees reaching heights as great as 10 m and stems approaching 1 m in diameter (Krueger 1998). See Figs. 1-4 and 1-5 for examples of differences in size and growth form.

Changes in mesquite woodland structure as a result of stress or disturbance may alter its effectiveness as wildlife habitat. A study on phainopepla habitat use in a mesquite woodland north of Glendale, NV determined that phainopepla preferred nesting in taller trees with fewer stems and heavy mistletoe infestation (Krueger 1998). Taller trees with fewer stems are those that have escaped exposure to stress or damage that causes resprouting, and have survived in their original form long enough to develop heavy mistletoe infestation. Phainopepla's preference for these "oldgrowth" trees is related to its breeding success. Krueger (1998) found that breeding success increased when nests were built higher in the tree within the protection of a mistletoe clump, and declined when nests were built lower in the tree in an exposed location. The occurrence of old, undisturbed trees increases the availability of suitable nesting sites, and therefore increases the chance of a successful nesting attempt.

Desert mistletoe is the parasitic plant that ultimately determines whether or not a mesquite woodland will be occupied by Phainopepla. Some mesquite woodlands in southern Nevada are heavily infested with mistletoe, while others are lightly infested. The extent to which parasitic plants are detrimental to the health and longevity of

Fig. 1-4. Examples of mesquite stem size and number. Above - large single stem nearly 3 feet in diameter. Photo taken at Stewart Valley site northwest of Pahrump, NV. Below - small multi-stemmed growth form. Photo taken at Moapa site north of Glendale, NV. See text under "Existing Environment" for site descriptions.

Fig. 1-5. Examples of mesquite growth form. Above - tall, single-stemmed tree form. Photo taken at Moapa site north of Glendale, NV. Below - short, multi-stemmed shrub form, resulting from wood-cutting. Photo taken at Pahrump site southwest of Pahrump, NV. See text under "Existing Environment" for site descriptions

infested hosts has been a source of conflicting debate for many years. There is abundant literature on the physiological and ecological interactions between mistletoes and their hosts, but less on the physiological and ecological effects of mistletoes on their hosts.

The degree to which mistletoes cause harm to their hosts is partially dependent upon the parasites' ability to photosynthesize. For instance, members of the genus *Arceuthobium* (dwarf mistletoe) contain very little chlorophyll and therefore do not photosynthesize at a rate great enough to produce enough food for survival. These parasites are known as holoparasites and depend on the host for nearly all of its sugar, water, and nutrient requirements. Dwarf mistletoe can deform or kill trees of any age (Boyce 1961). However, many members of the genus *Phoradendron*, which includes desert mistletoe, are hemiparasites, and contain enough chlorophyll to photosynthesize and produce their own food. Therefore, hemiparasites depend on their hosts for water and nutrients, but do not drain the host plant of sugars. It has been noted that hemiparasites are seldom the primary cause of death to their hosts, but can cause deformations that render them economically useless. The most common damage is death of the portion of the branch beyond the point of infestation (Boyce 1961).

The aerial shoots of mistletoe usually live no more than 10-20 years, but the haustoria (that part of the mistletoe within the host's wood) can live as long as the host. Mistletoes have relatively high light requirements for optimum growth, which may be why more heavily-infested trees are generally found in open areas (Boyce 1961).

It is generally known that mistletoes have higher transpiration rates, as well as lower leaf water potentials and CO_2 assimilation rates, than their hosts. This translates into a lower water use efficiency, meaning that mistletoes transpire more water per unit of CO_2 assimilated than their hosts. In other words, mistletoe has the ability to place a strong demand on the water reserves of its host. However, several studies have recently determined that mistletoes tend to tightly regulate these physiological processes with the concurrent responses of the host (Ullman et al. 1985, Whittington and Sinclair 1988, Davidson et al. 1989). This tight regulation may help avoid undue load on a host under conditions of high transpirational demand (Whittington and Sinclair 1988) and ensure the long-term survival of both host and parasite.

Orozco et al. (1990) determined that mistletoes in a tropical mangrove system had a greater physiological effect on their hosts under more favorable soil water conditions (lower substrate salinities) because the mistletoe is exploiting a less critical habitat. This leads to excessive water consumption by mistletoe that may deplete host water resources. Under conditions of higher substrate salinities, infestation was either low or absent, most likely due to the critically low leaf water potential the mistletoe would need to develop to maintain xylem sap flow from a host under extreme water stress.

In arid and semi-arid climates mistletoes generally exhibit a relatively more conservative water use efficiency and tend to transpire at a rate closer to that of their hosts if nitrogen is more abundantly available (Schulze and Ehleringer 1984). Under these conditions, mistletoes can reduce the amount of water drawn from the host, which can be important for host survival in arid climates. This is most likely why we see a prevalence of mistletoe infestations on nitrogen-fixing plant species in the lower elevations of the Mojave Desert.

Judd et al. (1971) discussed the possible factors contributing to the widespread death of mesquite trees at Casa Grande National Monument in Arizona. Photographs documented heavy mistletoe infestation in trees as far back as 1878. Tree ring analysis of three mesquite tree cross-sections determined tree ages of 110, 111, and 137 years. All trees in the area died between 1931 and 1949. Death was attributed to the precipitous decline of the water table (from 42'6" in 1931 to 102' in 1949) and aggravated by heavy mistletoe infestation, with tree age and insect infestation listed as secondary factors.

1.3 Existing Environment

Western honey mesquite exhibits a widely spaced and patchy distribution throughout southern Nevada. There are five general locations outside of Las Vegas Valley that support the largest and/or most significant populations of honey mesquite. These five areas are: 1) Moapa, 2) Amargosa Flat, 3) Stewart Valley, 4) Pahrump, and 5) Stump Spring. There are also several areas that contain relatively small patches of mesquite. They are: Sandy Valley, Dry Lake, and Cactus and Indian Springs. All sites are located in areas where no perennial surface water is available. Remnant patches of mesquite are also found scattered along Meadow Valley Wash and the Virgin and Muddy Rivers; however, this plan will not address riparian mesquite as these areas will be covered under a separate riparian plan. Figure 1-6 shows the general location of the Mesquite Woodland Habitat Management Areas (HMAs) that will be addressed in this plan.

1.3.1 Location, Acreage, and General Description

The distribution of mesquite woodlands in Nevada extends through Clark and southern Nye Counties. Clark and southern Nye Counties cover approximately 7.3 million acres, of which less than 20,000 acres (ca. 0.15%) is occupied by mesquite woodlands. Following is a general description of each Habitat Management Area, including location and acreage. A summary of the acreages for all HMAs, as well as a breakdown of acreage for mesquite on private and public land, is found in Table 1-1. Separate location maps for each site are found in Appendix I.

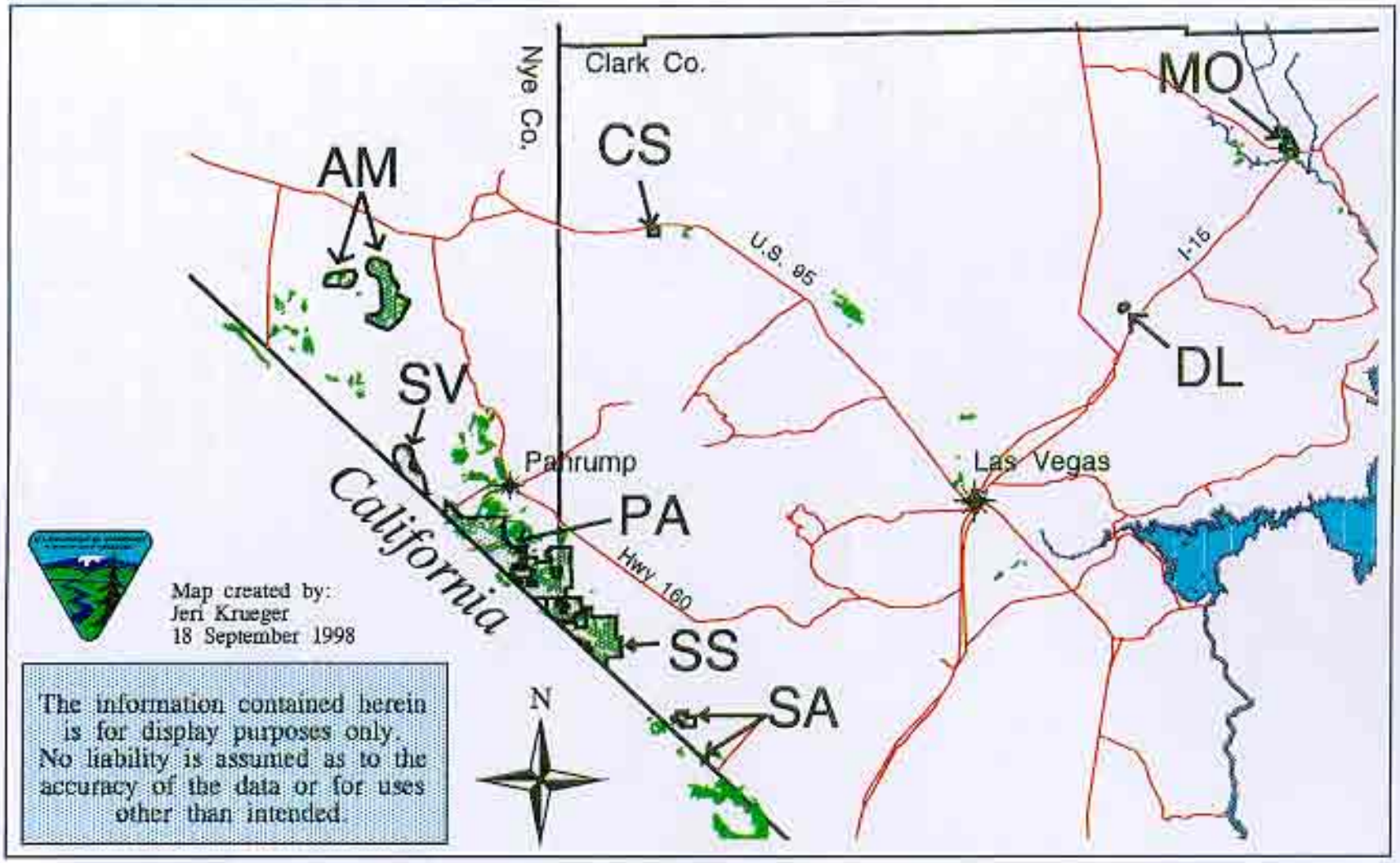

Fig. 1-6. Location of Mesquite Woodland Habitat Management Areas in southern Nevada. MO = Moapa; AM = Amargosa Flat; SV = Stewart Valley; PA = Pahrump; SS = Stump Spring; SA = Sandy Valley; DL = Dry Lake; CS = Cactus Springs.

Table 1-1. Acreage of Mesquite Woodland Habitat Management Areas, including separate estimates of mesquite acreage for both private and public land.

HMA Name	HMA Acreage	Acres Mesquite Private Land	Acres Mesquite Public Lands	Total Acres Mesquite
Moapa	1,120	106	122[a]	228
Amargosa Flat	12,090	0	1,930	1,930
Stewart Valley	4,940	55	215	270
Pahrump	26,000	3,357	3,385	6,742
Stump Spring	14,835	332	1,584	1,916
Sandy Valley	1,625	113	192	305
Dry Lake	355	0	270	270
Cactus Springs	505	21	63	84
Total	61,470	3,984	7,761	11,745

[a] Acreage does not include an additional 234 acres of mesquite that burned in a June 1995 wildfire at the Moapa site.

1.3.1.1 Moapa

The Moapa site is located three km north of the community of Glendale, Nevada in Clark County (Appendix IA). Legal location is T 14 S, R 66 E, Sec. 23, 26, 35, 36. The Moapa woodland lies parallel to and about 300 m east of Meadow Valley Wash. The western edge of the woodland is flanked by two irrigated agricultural fields. The woodland occupies approximately 187 ha (460 ac), most of which occurs on public lands.

The BLM's Las Vegas Resource Management Plan (RMP) dated May 1998 (Record of Decision signed October 5, 1998) has identified approximately 40,950 acres of public lands for disposal in the Moapa/Glendale area. Approximately 35 acres of mesquite woodland occur within the Moapa/Glendale land disposal area (Fig. 1-7). In June 1995 a wildfire burned more than half of the woodland, leaving about 49 ha (120 ac) unburned. Of the remaining unburned woodland, approximately one-half is comprised of short shrubby plants that are in a state of severe stress. The other half supports a relatively open grove of large, mature trees that are 90+ years old. Tree recruitment appears to be low, with no evidence of seedlings and very few saplings. Approximately 45% of trees at Moapa are infested with mistletoe, with less than 10% heavily infested (Krueger 1998). Mistletoe berry production is very high at this site.

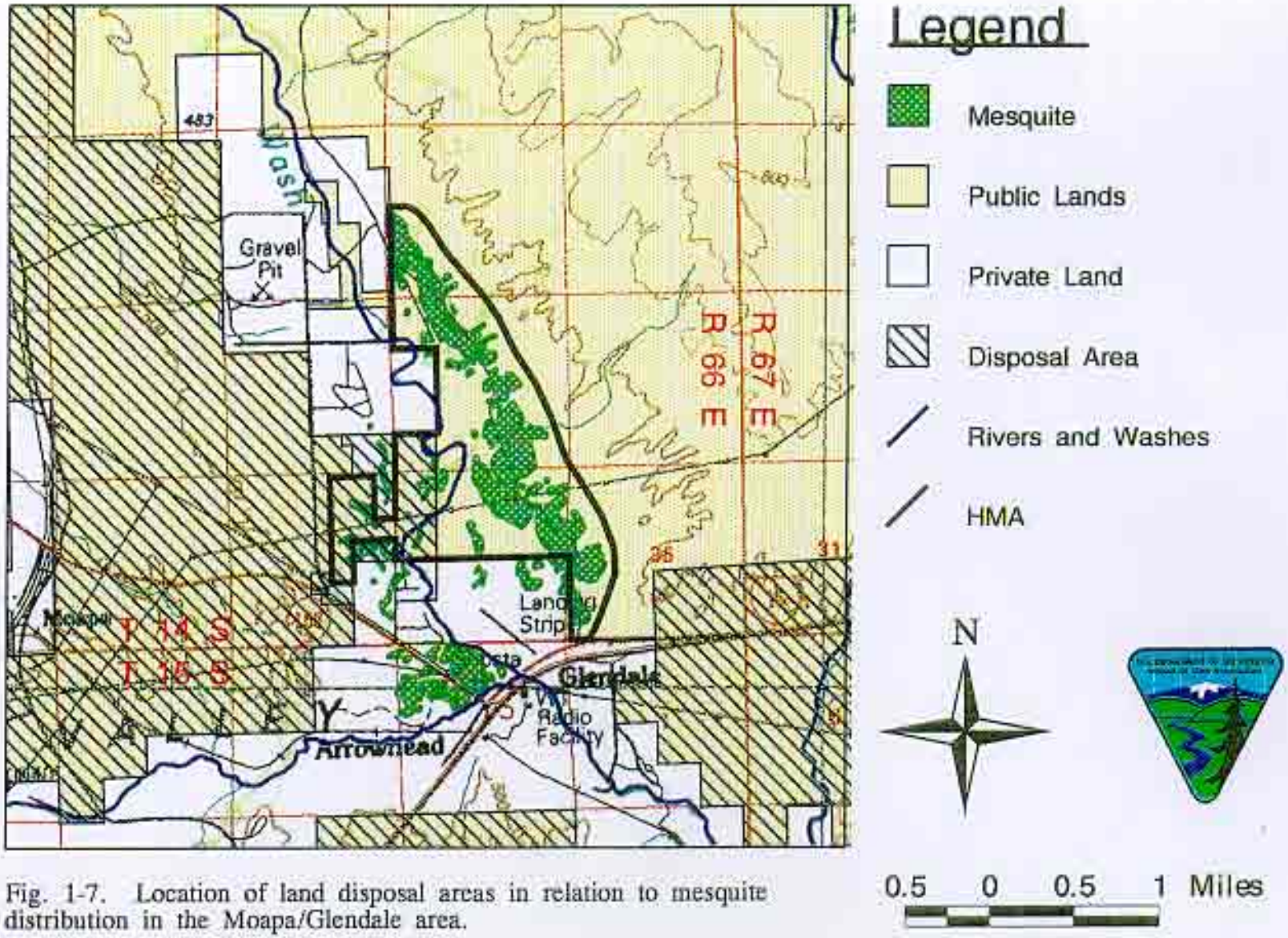

Fig. 1-7. Location of land disposal areas in relation to mesquite distribution in the Moapa/Glendale area.

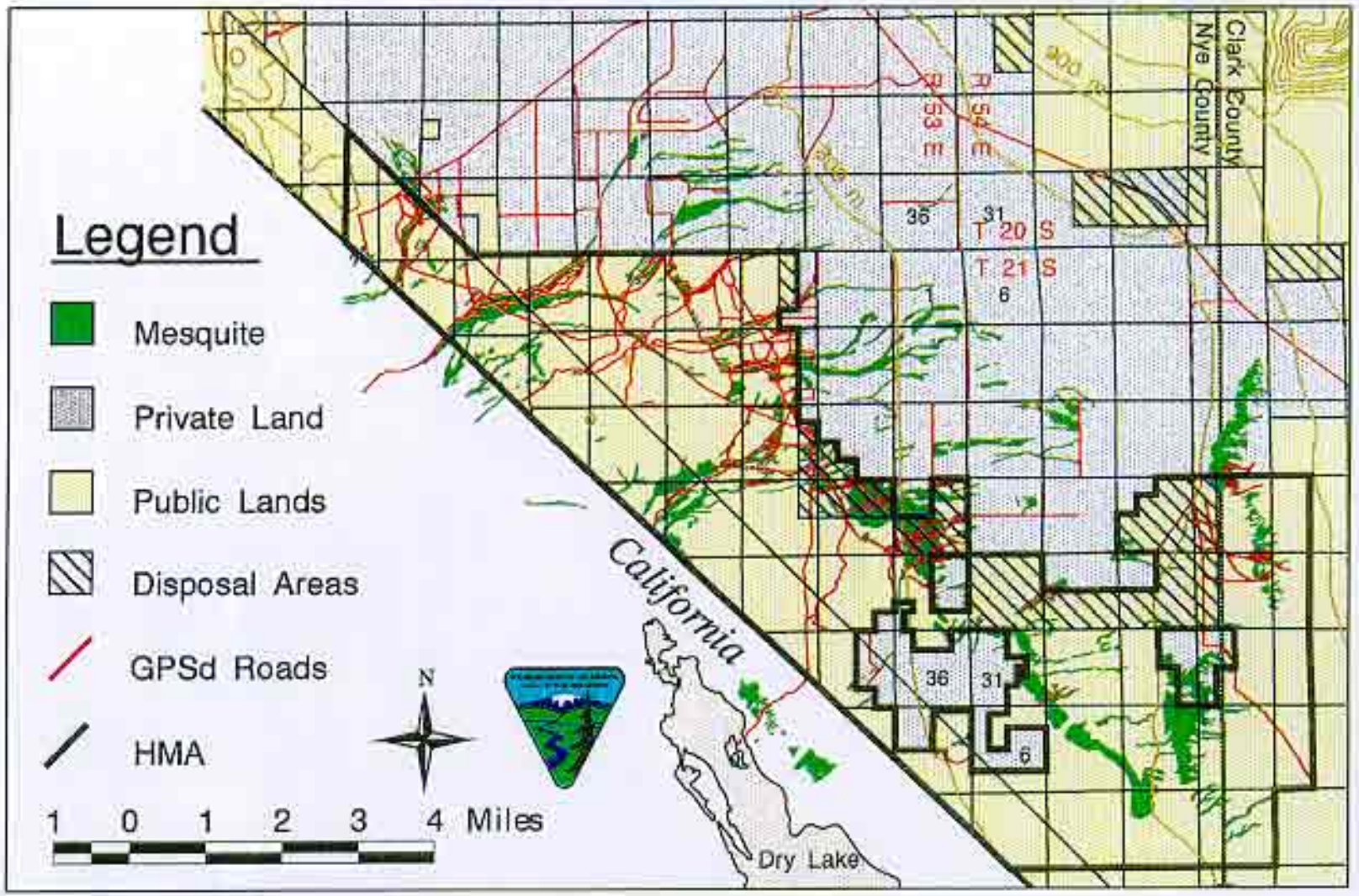

Fig. 1-8. Location of land disposal areas in relation to mesquite distribution in the Pahrump Valley area.

Fig. 1-9. Wildfire in mesquite woodlands southwest of Pahrump, Nye County, Nevada. Above - wildfire on August 4, 1997 burned more than 40 acres of mesquite. Below - same area more than one year later (October 16, 1998). The high-intensity fire burned down into mesquite roots, killing many trees and sterilizing the soil.

Much of the mesquite in the Stump Spring area occurs as shrubby dune mesquite; however, larger shrubs and trees grow along a deeply eroded wash. Recruitment is poor, with about 8% saplings and no evidence of recent seedling establishment. Mistletoe infestation at Stump Spring is low, with about 15% of trees showing light infestation. The Stump Spring site is unique in that it contains several widely spaced, remnant patches of cottonwood (*Populus fremontii* Wats.) and willow (*Salix goodingii* Ball), all of which are dead, dying, or in a state of severe stress. Surface water once occurred at this site, and was documented in the diary of southwestern explorer John C. Fremont (see Fremont 1845) who forged the southern Nevada portion of the Old Spanish Trail. Stump Spring had been a resting place for those traversing the Trail back in the late 1800's, and a portion of the area has been designated as a site of cultural significance (Myrer et al. 1990).

1.3.1.6 Other Sites

Small patches of mesquite are also located in Dry Lake Valley, Cactus and Indian Springs, and in Mesquite Valley close to the community of Sandy Valley. The site at Sandy Valley (Appendix IH) is comprised of sandy mesquite dunes. Legal location is T 24 S, R 56 E, Sec. 14 - 16; T 24 S R 57 E, Sec. 31, 32; T 25 S, R 57 E, Sec. 5. Age class distribution and mistletoe infestation are yet unknown. Most of the mesquite in this area is found around the edge of Mesquite Lake, a dry lake bed located just across the border in California. Of the small amount of mesquite on the Nevada side of the state line, approximately 113 acres are located on private land and 192 acres on public lands. Approximately 4,185 acres of public lands have been identified in the Las Vegas RMP for disposal in the Sandy Valley area. The rare Pahrump Valley Buckwheat occupies about 133 acres within the land disposal area (Fig. 1-10).

The Dry Lake site is located 25 miles northeast of Las Vegas west of Interstate 15 (Appendix IF). Legal location is T 17 S, R 64 E, Sec. 19 and T 17 S, R 63 E, Sec. 24 and 25. This site, which occupies an area about 270 acres in size, lies within a playa and consists of a mixture of mesquite and saltcedar. Mesquite trees are small, shrubby, and relatively young, and mistletoe infestation is very low.

The Cactus and Indian Springs sites are located 45 miles northwest of Las Vegas along Highway 95. All of the mesquite at Indian Springs occurs on private land and is mostly fragmented. Therefore, this Plan will only consider mesquite occurring at the Cactus Springs site. Legal location of the Cactus Springs site is T 16 S, R 55 ½ E, Sec. 11, 12. Mesquite at Cactus Springs occurs on both private and public lands (Appendix IG). This site receives heavy human use from camping and recreational shooting. This site also supports a spring with surface water, but the spring and riparian area are severely degraded from human use. Trees are mostly mature with heavy mistletoe infestation; however, an estimate of age class structure has yet to be determined.

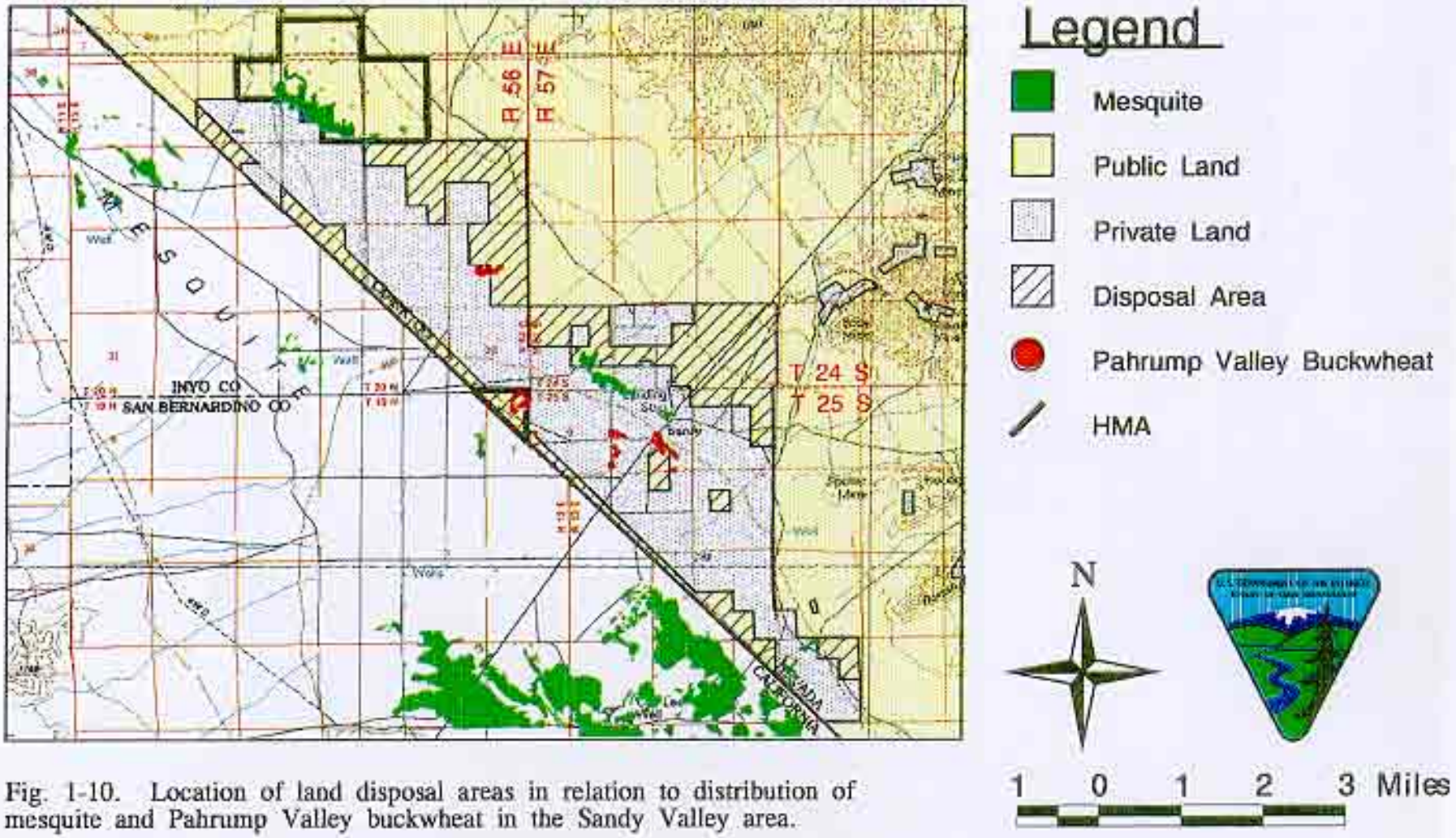

Fig. 1-10. Location of land disposal areas in relation to distribution of mesquite and Pahrump Valley buckwheat in the Sandy Valley area.

1.3.2 Topography

Southern Nye County and much of Clark County have topographic features characteristic of the Basin and Range province, having closed, internal drainage basins separated by steep, rugged mountain ranges that follow a general north-south orientation. The eastern part of Clark County differs in that it has external drainage via the Colorado River, and a few larger valleys such as Muddy and Virgin Valleys do not contain central basins but drain into the Colorado River system. In general, elevation ranges from a high of 11,918 ft on Charleston Peak in the Spring Mountains to 450 feet along the Colorado River. More specifically, elevation of basin floors where mesquite woodlands are found range from: 470 m (1540 ft) at Moapa; 600 m (1970 ft) at Dry Lake; 975 m (3200 ft) at Cactus and Indian Springs; 710 - 720 m (2330 - 2360 ft) at Amargosa Flat; 745 m (2440 ft) at Stewart Valley; 760 - 850 m (2490 - 2790 ft) at Pahrump; 800 - 900 m (2620 - 2950 ft) at Stump Spring; 820 - 830 m (2690 - 2722 ft) at Sandy Valley.

1.3.3 Geology and Minerals

Information for this section is summarized from Longwell et al. (1965) and Cornwell (1972). Mesquite woodlands in southern Nevada are found in the lower elevations of the valley bottoms where deep alluvial and playa lake deposits from Quaternary rock cover the basin floors. The alluvial fans consist of gravel and rubble near the highlands and grade downward into fine sand and silt in the valley bottoms. The playa deposits consist of sand, silt, and clay strata, with a few lenses of fine gravel. Sand dunes are prominent features in some areas, in particular Amargosa Flat, Stump Spring, and Sandy Valley.

No Mining Plans of Operation are on file with the BLM for sites within any of the identified Habitat Management Areas. The Amargosa Flat area has 172 open claims filed, Pahrump contains 2 open claims, and Moapa has 11 open claims filed. One Mining Notice is filed in the Pahrump area.

A large private clay pit in the playa just west of the Amargosa Flat woodland is owned and operated by IMV Division of Floridin Company. IMV Floridin has patent applications south of their current patented lands, and has on file a Mining Plan of Operation (N54-90-001P) for three separate clay pit operations in the area. Each of the three pits mines a specific type of clay, one of which is sepiolite and occurs west of the southernmost part of the mesquite woodland in section 21 of T 17 S, R 51 E. IMV Floridin states that sepiolite is the only known clay mineral that is stable at high temperatures, and only three deposits are known to exist worldwide. IMV Floridin has expressed interest in expanding their exploration of sepiolite clay east of their existing operation in section 21, which may affect mesquite trees that occur in this area.

1.3.4 Groundwater Hydrology

In southern Nevada, mesquite behaves as an obligate phreatophyte; that is, its existence depends upon the availability of a relatively shallow and permanent groundwater source. Groundwater level, drainage patterns, and the soil's water-holding capacity all contribute in determining the distribution of mesquite in the eastern Mojave Desert. Aerial photos of Pahrump Valley taken in 1980 show the close association between mesquite distribution and the east-west drainage pattern in the valley (Fig. 1-11).

Amargosa Flat, Stewart Valley, Pahrump, and Stump Spring HMAs occur within closed basins with internal drainage systems, whereas the Moapa HMA has external drainage into the Colorado River System via the Muddy River. Amargosa Flat occurs in the Amargosa Desert Hydrographic Area (#230) in the Death Valley Basin; the Stewart Valley, Pahrump, and Stump Spring sites occur in the Pahrump Valley Hydrographic Area (#162) in the Central Region; and the Moapa site occurs in the Lower Moapa Valley Hydrographic Area (#220) in the Colorado River Basin. Groundwater flows both through the alluvium and along solution cavities and fractures in Paleozoic carbonate rocks that underlie the basins (Cornwall 1972).

In Amargosa Desert and Pahrump Valley areas, groundwater recharge is derived principally from precipitation in the higher mountains, in particular the Spring Mountains. Groundwater flow in the valley fill in Amargosa Desert generally moves southeastward from north of Big Dune toward Death Valley Junction. In Pahrump Valley, groundwater flows from the Spring Mountains southwestward across the valley toward the Nopah Range. A fault in Pahrump Valley mapped by Malmberg (1967) occurs in the valley fill and extends southeast from Stewart Valley along the state line for about 15 miles. The occurrence of springs and mesquite stands along the northeast side of the fault suggests that it forms a partial barrier to groundwater flow (see Fig. 1-11). Groundwater movement in the Lower Moapa Valley is in the general direction of surface flow, moving from the mountains toward the center of the valley, but is modified somewhat by the general flow of groundwater from the northern part of the area to the southern part where it is discharged into the Muddy River Valley.

Water levels recorded for eight wells in the Amargosa Desert between 1952 and 1957 show a relatively constant level, whereas water levels recorded between 1957 and 1962 show a decline (Walker and Eakin 1963). Declines ranged from 0.1 to 6.1 feet over a 5-year period, with an average yearly decline of 0.7 feet. In the Lower Moapa Valley, the trend has been very slow local decline of groundwater levels (Rush 1964). Water levels of wells drilled in Pahrump Valley generally have been declining since the first wells were constructed in 1913 (Harrill 1982). During the years 1962-1975, water levels declined between 1 and 4½ feet per year, with the greatest declines occurring along the lower edge of the Pahrump and Manse alluvial fans and lesser rates of water level decline occurring lower in the valley bottom.

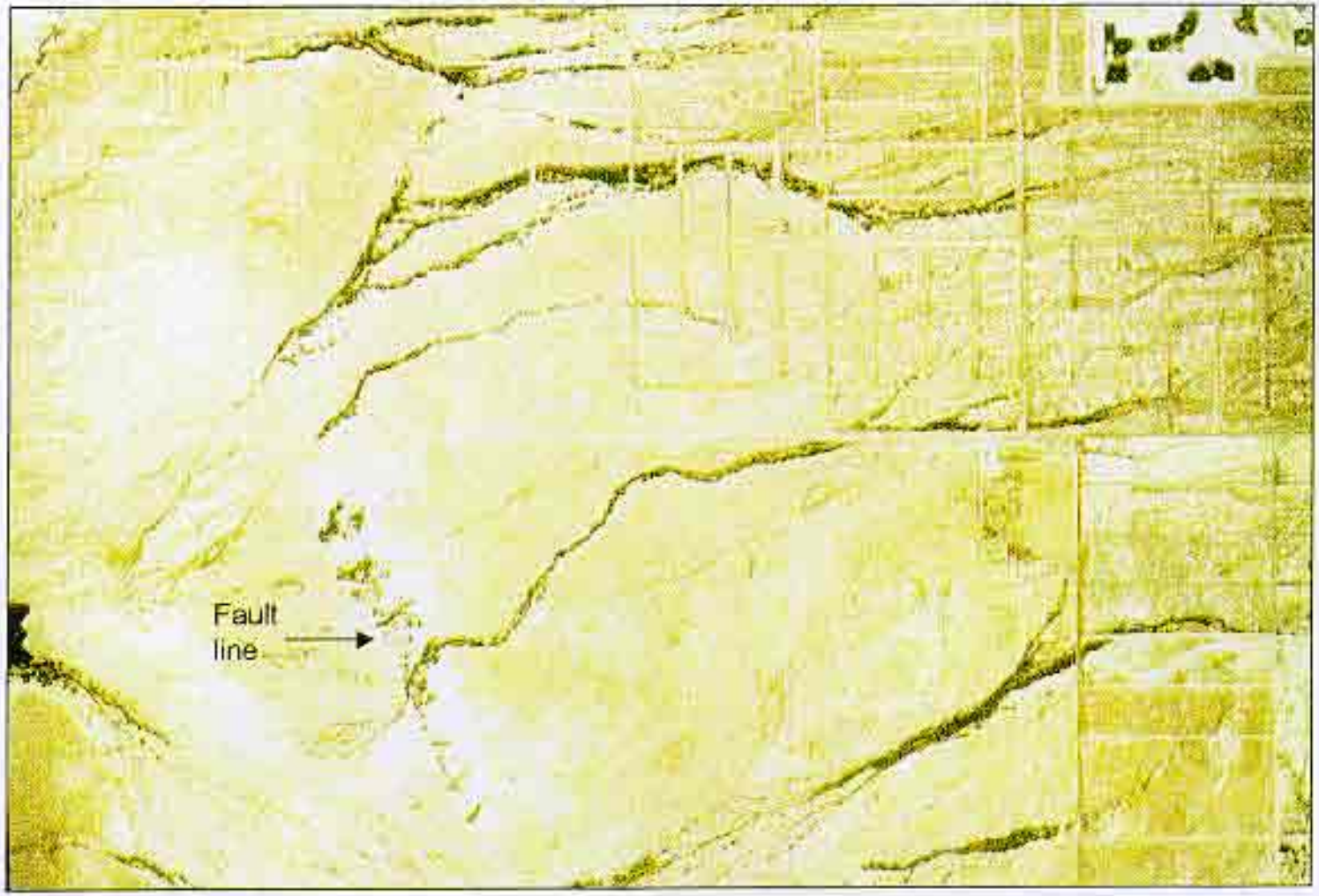

Fig. 1-11. Aerial photo of mesquite woodlands in Pahrump Valley depicting mesquite distribution in relation to drainage pattern.

Most wells drilled in Pahrump Valley from 1913 to 1962 were for irrigation of cotton and alfalfa. Pumpage reached a maximum high in 1968 and then began to decrease after land was taken out of agricultural production and sub-divided for real estate development. However, if this land is fully developed, it is expected that pumpage will return to about the same level as in 1968. Harrill (1982) estimated that, as of 1975, pumping had created an overdraft of approximately 11,000 acre-feet per year on the groundwater supply in Pahrump Valley. An analysis of data on static water levels obtained from the Nevada State Water Engineer's office in Las Vegas for 651 wells drilled within a 1-mile radius of a mesquite woodland in the Pahrump area (Krueger 1998) detected a significant downward trend in static water level for wells drilled between the years 1953 and 1996 (Fig. 1-12). In October 1997 one observation well was drilled at each of four sites (Moapa, Stewart Valley, Pahrump, and Stump Spring) for the purpose of determining current groundwater level at each site, as well as for long-term monitoring of groundwater fluctuations. Figure 1-13 shows a comparison of groundwater levels among the four sites.

1.3.5 Soils

Soils at Amargosa Flat are playa soils of the Corbilt-Bluepoint association. Corbilt soils are coarse-loamy, mixed (calcareous), thermic Typic Torriorthents (gravelly fine sandy loam) and Bluepoint soils are mixed, thermic Typic Torripsamments (loamy fine sand). Mesquite is found growing along drainages and in sand dunes scattered throughout the area. Soils at Stewart Valley and Pahrump are Aquic Xerofluvents, fine-silty, mixed (calcareous), thermic, and are clay loams that are deep and moderately well-drained. Stump Spring soils are fine-silty, gypsic, thermic Typic Gypsiorthids of the Tanazza series, which consists of very deep, well drained, fine sandy loams that formed in alluvium and reworked lacustrine sediments. The Tanazza soils are on remnant shoreline terraces. Soil classification at Moapa is mixed, thermic Typic Torripsamments, which is a Toquop fine sand with 0 to 2 percent slopes. This is deep, excessively drained soil from fine sandy alluvium derived from sandstone. In general, soils at Moapa and Amargosa Flat in which mesquite grow are sandy, whereas soils at Pahrump and Stewart Valley are of a higher clay content. Table 1-2 compares soil texture profiles obtained during drilling of observation wells for four mesquite woodland sites.

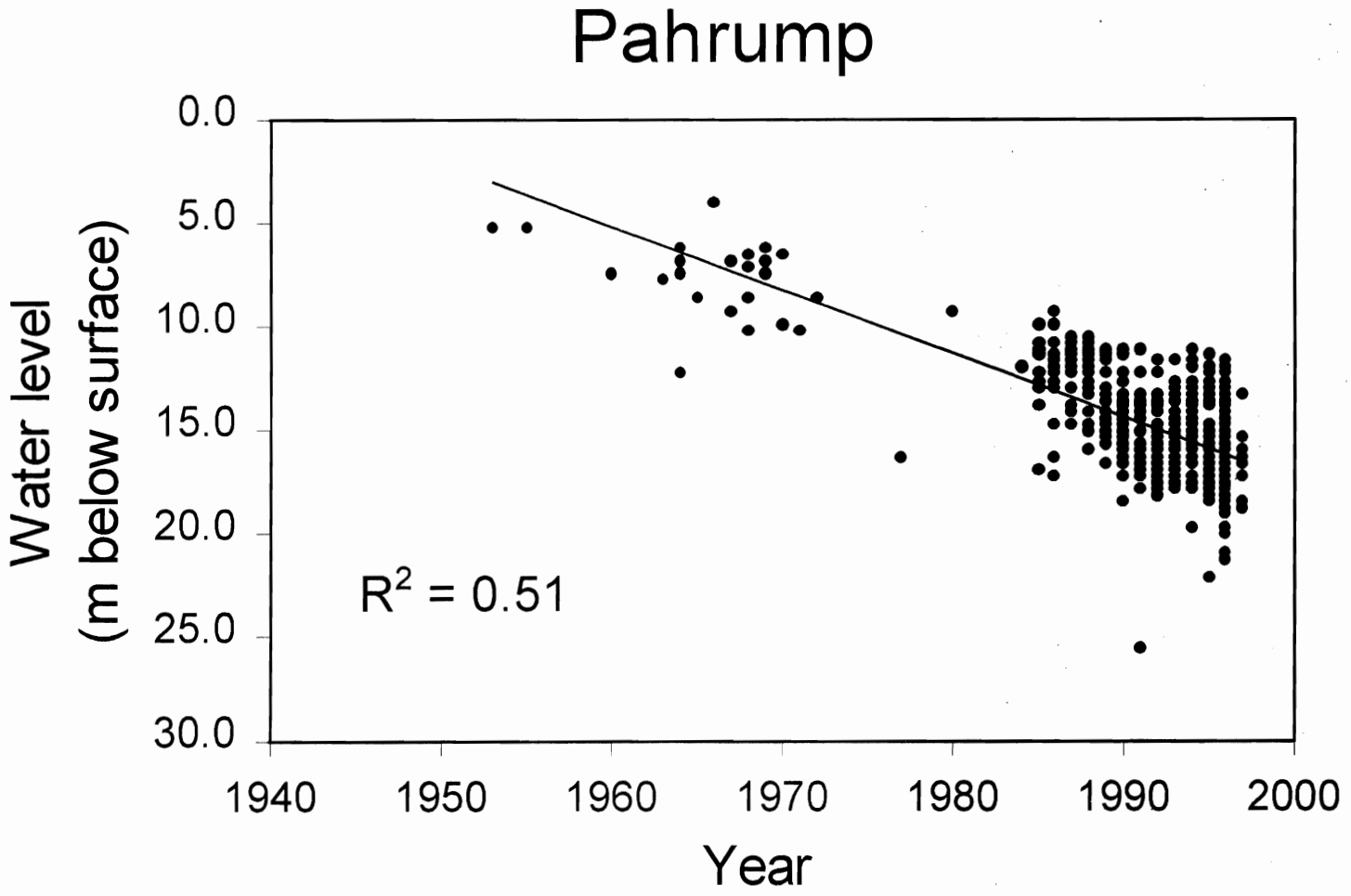

Fig. 1-12. Relationship between static water level and year well was drilled for 651 wells located within a 1-2 mile radius of the Pahrump mesquite site, Nye County, Nevada.

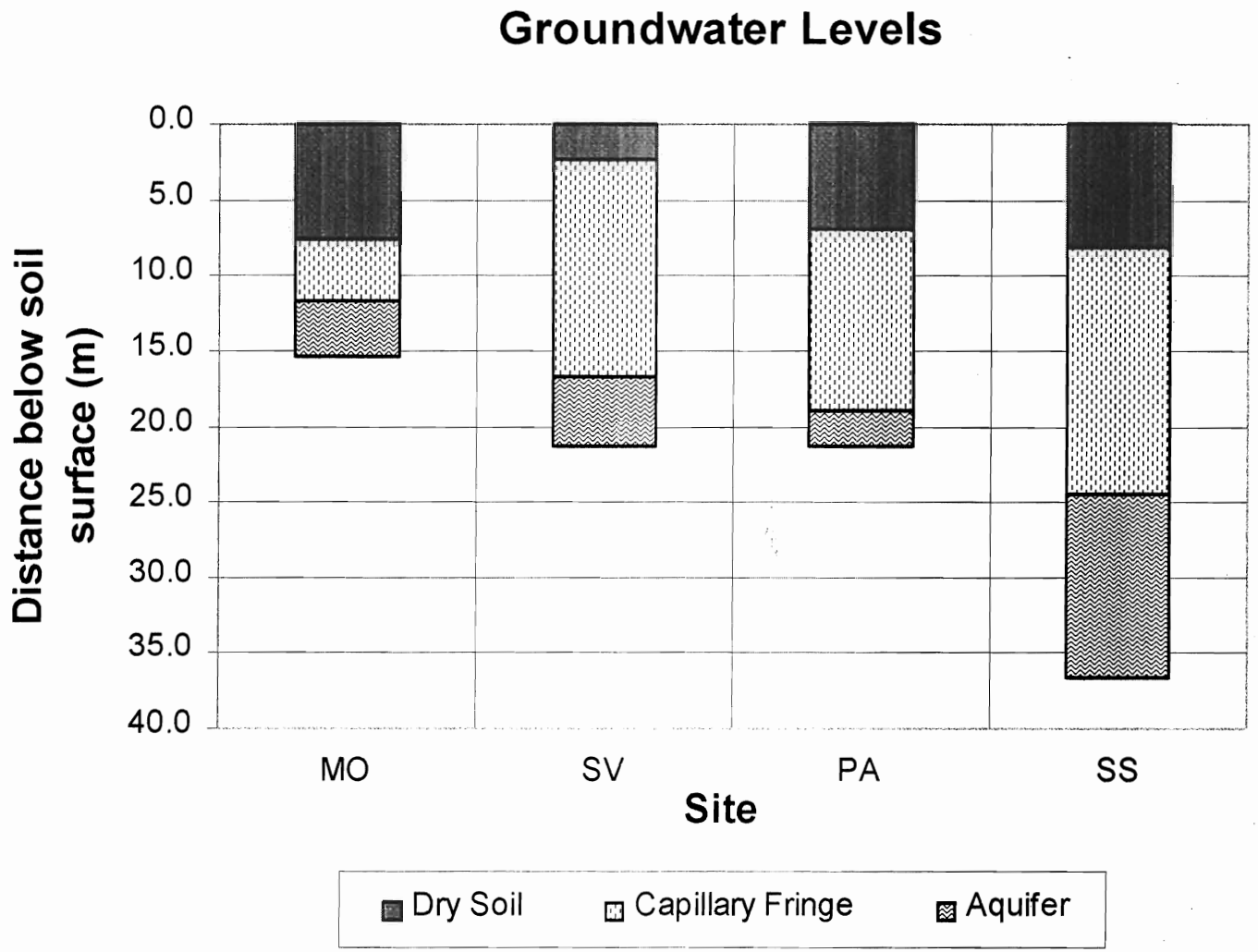

Fig. 1-13. Groundwater levels determined from the drilling of observation wells in October 1997 at four mesquite woodland sites in southern Nevada. MO = Moapa; SV = Stewart Valley; PA = Pahrump; SS = Stump Spring. The bottom of each bar represents the depth of the well at each site.

Table 1-2. Soil texture profiles determined from samples taken at 1.5-m intervals during drilling of observation water wells at four mesquite woodland sites in southern Nevada. MO = Moapa; SV = Stewart Valley; PA = Pahrump; SS = Stump Spring.

	Site			
Depth (m)	MO	SV	PA	SS
0 - 1.5	Sand	SandyLoam	SiltyClay	Loam
1.5 - 3.0	Sand	Clay	Clay	Loam
3.0 - 4.5	SandyClayLoam	Clay	Clay	-----
4.5 - 6.0	Sand	Clay	Clay	ClayLoam
6.0 - 7.5	Sand	Clay	Clay	ClayLoam
7.5 - 9.0	LoamySand	Clay	Clay	ClayLoam
9.0 - 10.5	LoamySand	Clay	-----	ClayLoam
10.5 - 12.0	SandyClay	-----	Clay	-----
12.0 - 13.5	SiltyClay	ClayLoam	Clay	SiltyClayLoam
13.5 - 15.0	Clay	-----	Clay	-----

1.3.6 Climate

Climate at lower elevations in southern Nevada is arid, with characteristically high summer temperatures and low precipitation. Temperatures can range from a maximum of 48^{0}C (118^{0}F) in summer to a minimum of -5^{0}C (23^{0}F) in winter. Average annual precipitation is 10-15 cm (4-6 in), with the majority commonly supplied by infrequent, individual storms. Overall, probability of freezing temperatures is higher, and growing season is shorter, for sites west of the Spring Mountains (Amargosa Flat, Stewart Valley, Pahrump Valley, Stump Spring, and Sandy Valley) than for sites east of the Spring Mountains (Moapa and Dry Lake) because of the large difference in altitude (see Section 1.3.2 - Topography).

1.3.7 Vegetation

In general, vegetation in and around mesquite woodlands is mostly comprised of phreatophytes, plants that obtain their water supply from permanent water sources at or near the soil surface. However, differences in soils, groundwater depth, microclimate, and amount of disturbance will influence plant species composition at a local level. The Amargosa Flat site supports a mixture of several saltbush species (*Atriplex* spp.), including shadscale (*Atriplex confertifolia*) and quailbush (*A. lentiformis*). Prince's plume (*Stanleya pinnata*) is common, especially during years with adequate winter and spring rainfall. Vegetation becomes sparse to the west, and is absent in the playa.

The Moapa woodland is comprised of a sparse understory of goldenweed (*Haplopappus acradenius* var. *erimophilous*), wolfberry (*Lycium cooperi*), wild ryegrass (*Elymus cinereus*), and six-weeks fescue (*Vulpia octiflora*). Seepweed (*Suaeda torreyana*) and Russian thistle (*Salsola paulsenii*) occur along the edge of the woodland. Salt scrub consisting mainly of four-wing saltbush (*A. canescens*) occurs to the west of the woodland, and creosote bush (*Larrea tridentata*) dominates the landscape to the east. Three hundred meters to the west, saltcedar (*Tamarix ramosissima*) has invaded the area, and has spread along the banks of Meadow Valley Wash.

The Stewart Valley site supports an understory of wild ryegrass interspersed with patches of saltgrass (*Distichlis spicata*). Surrounding vegetation is salt scrub consisting mainly of shadscale and quailbush. About 800 m east of the woodland the salt scrub is replaced by creosote bush. Vegetation is absent in the playa west of the woodland.

The understory at Pahrump consists mainly of red brome (*Bromus rubens*) interspersed with patches of wild ryegrass. Seepweed and rabbitbrush (*Chrysothamnus* spp.) occur along the edge of woodland patches, along with shadscale, quailbush, and four-wing saltbush that also comprise the surrounding desert salt scrub vegetation. Alkali sacaton (*Sporobolus airoides*) occurs in patches where soils have better drainage. Several species of buckwheat (*Eriogonum* spp.) occur in small to large patches in open areas between mesquite stands at Pahrump. Saltcedar has begun invading parts of the woodland. A comparison of USGS orthophotoquads from 1976 and GPSd vegetation data from 1998 documents the establishment of saltcedar in this area sometime after 1976.

Vegetation along the main wash at Stump Spring consists of a patchwork of salt scrub species including quailbush, four-wing saltbush, and cattle spinach (*A. polycarpa*) along with rabbitbrush, seepweed, and wolfberry. Pepper grass (*Lepidium fremontii*), snakeweed (*Gutierrezia sarothrae*), prince's plume, and arrowweed (*Pluchea sericea*) grow in and along the edge of the wash, and patches of saltcedar have invaded portions of the wash. The surrounding area is dominated by salt scrub with a secondary component consisting of creosote bush interspersed with Mormon tea (*Ephedra nevadensis*).

1.3.8 Wildlife

Nevada's wildlife is under the managing authority of the Nevada Division of Wildlife.

Mesquite woodlands occupy less than 0.2% of the land area in Clark and southern Nye Counties, yet these woodlands support a disproportionately greater number of wildlife species than the surrounding desert scrub. At least 65 avian species have been observed using mesquite woodlands as migratory stopover sites, breeding sites, and

wintering areas. At least 30 species of birds are known to breed in southern Nevada mesquite stands, and 21 species of migratory passerines have been observed in woodlands during the migration period in May. Eight raptor species have been observed, including three species [great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), and sharp-shinned hawk (*Accipiter striatus*)] known to breed in the mesquite. Mourning dove (*Zenaida asiatica*) and Gambel's quail (*Callipepla gambelii*) are common game species found in mesquite stands. See Appendix II for a list of avian species found in southern Nevada mesquite woodlands.

Small mammals that occur in the eastern Mojave Desert include approximately 10 species of bats and over 20 species of rodents. Common lagomorphs include black-tailed jackrabbit (*Lepus californicus*) and desert cottontail (*Sylvilagus auduboni*). Carnivores include coyote (*Canis latrans*), badger (*Taxidea taxus*), and kit fox (*Vulpes macrotis*). Mountain lion (*Felis concolor*) is rare, but is known to inhabit rugged mountain ranges in the area. Large herbivores include desert bighorn sheep (*Ovis canadensis*) and mule deer (*Odocoileus hemionus*). Many reptiles occur in southern Nevada such as western whiptail lizard (*Cnemidophorus tigris*), side-blotched lizard (*Uta stansburiana*), and zebra-tailed lizard (*Callisaurus draconoides*). Common snakes include gopher snake (*Pituophis melanoleucus*), Mojave rattlesnake (*Crotalus scutulatus*) and red coachwhip (*Masticophis flagellum*). See Appendix III for a more comprehensive list of reptile species known to occur in and around mesquite woodlands in southern Nevada.

1.3.9 Threatened, Endangered, and Sensitive Species

There are currently no known species inhabiting the Mesquite Woodland Habitat Management Areas that are federally listed as threatened or endangered. However, southwestern willow flycatcher (*Empidonax traillii extimus*), an endangered species, may use woodlands as stopover sites during migration. Threatened or endangered species that may occur in habitats adjacent to Mesquite Woodland HMAs include desert tortoise (*Gopherus agassizii*), threatened status; bald eagle (*Haliaeetus leucocephalus*), threatened status; and peregrine falcon (*Falco peregrinus*), endangered status. However, peregrine falcon has been proposed for delisting.

Phainopepla (*Phainopepla nitens*) is a special status species in Nevada and is listed on the BLM Sensitive Species List for Nevada. Of the eight Mesquite HMAs, Moapa supports the only relatively large Phainopepla breeding population. Ten breeding pairs in 1996 and 16 breeding pairs in 1997 were known to occupy a 12-ha area of the woodland. Nesting success for each year was calculated using the Mayfield method (1961, 1975). Nest survival probabilities were 0.413 for 1996 and 0.537 for 1997 (Krueger 1998). Phainopepla breeds at all sites, but densities are much lower than at Moapa. Moapa supports a fairly dense breeding population most likely because mistletoe berry production is much higher at Moapa than at the other sites. The Moapa site is also flanked on the west and south by irrigated agricultural fields. The

additional water available from irrigation may also contribute to higher insect populations, thus increasing the attractiveness of this site to birds.

Other avian species on the BLM Sensitive Species List that are known to use mesquite woodlands for foraging, breeding sites, or migratory stopovers include:

Golden eagle	*Aquila chrysaetos*
Swainson's hawk	*Buteo swainsoni*
Yellow warbler	*Dendroica petechia*
Yellow-breasted chat	*Icteria virens*
MacGillivray's warbler	*Opororis tolmiei*
Bell's vireo	*Vireo bellii*
Gray vireo	*Vireo vicinior*
Orange-crowned warbler	*Vermivora celata*
Wilson's warbler	*Wilsonia pusilla*

Other faunal species on BLM's Sensitive Species List that may occur within or adjacent to mesquite management areas are:

Greater western mastiff bat	*Eumops perotis californicus*
Allen's big-eared bat	*Idionycteris phyllotis (=Plecotus p.)*
California leaf-nosed bat	*Macrotus californicus*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Cave myotis	*Myotis velifer*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
Big free-tailed bat	*Nyctinomops macrotis (=Tadarida m., T. molossa)*
Pale Townsend's big-eared bat	*Plecotus townsendii pallescens*
Pacific Townsend's big-eared bat	*Plecotus townsendii townsendii*
Spotted bat	*Euderma maculatum*
Gila monster	*Heloderma suspectum*
Chuckwalla	*Sauromalus obesus*

Two special status plant species occur in association with the mesquite woodlands in southern Clark and Nye Counties: Pahrump Valley buckwheat (*Eriogonum bifurcatum*) and Parish's phacelia (*Phacelia parishii*).

Pahrump Valley buckwheat is a low, spreading annual with a very narrow endemic range of only three valleys along the Nevada-California border: Stewart Valley (Nye Co., NV), Pahrump Valley (Nye Co., NV and Inyo Co., CA), and Mesquite Valley (Clark Co., NV, Inyo and San Bernardino Cos., CA). This geographical range is within the eastern Mojave Desert. This species occurs in heavy clay soil, saline flats,

and rolling hills around dry lake playas. Major plant associates are mesquite, shadscale, and seepweed. A status report documenting all known information on the taxon was completed in 1988. The episodic nature of flowering events precluded a comprehensive survey until 1998 when intensive surveys were initiated. The results of known locations of Pahrump Valley buckwheat are presented in Appendix IC, ID, and IH. An analysis of occurrences on BLM land vs. private lands shows that significant extirpations are occurring in Sandy Valley where most of the land is private, while most of the populations in Pahrump and Stewart Valleys are on public land.

Parish's phacelia is another annual that occurs adjacent to dry lake beds. A status report for this taxon is in preparation. It is more widely distributed than the Pahrump Valley buckwheat, occurring in 21 known sites on about 5,000 acres in California, Arizona, and Nevada. Like the buckwheat, this plant is highly ephemeral and numbers can range from a few to millions depending upon favorable precipitation. Parish's phacelia was found in Stewart Valley on the edges of playas in fine-textured alkaline soils (see Appendix IC).

1.3.10 Livestock

Commercial livestock ranching has existed in southern Nevada since the 1880s. Currently, seven allotments intersect with Mesquite Woodland Habitat Management Areas. Table 1-3 summarizes the current status of grazing allotments within the eight HMAs.

Table 1-3. Las Vegas District grazing allotments occurring in Mesquite Woodland Habitat Management Areas.

Mesquite Management Area	Allotment Name	Operator	Average Licensed Use 1984-1993 (AUMs)	Period of Use	Acres (BLM)	Status
Moapa	Glendale	C. Hester	0	No Use	23,595	closed
Amargosa Flat	Mt. Stirling	Bow and Arrow Cattle Co.	517	Y/L[a]	126,888	closed
Stewart Valley	Unallotted	----------	----------	----------	----------	----------
Pahrump	County Line	----------	0	----------	6,720	closed
Stump Spring	Stump Spring	R. Wiley	0	No Use	49,557	closed
Sandy	Black Butte	R. Spurlock	0	No Use	40,861	closed
Dry Lake	Dry Lake	J. Hendricks	0	Mar-May	43,873	closed
Cactus Springs	Wheeler Slope	----------	0	----------	72,277	closed

[a] Y/L = Year Long

The Amargosa Flat HMA is the only site that falls within an allotment with a recent grazing history. This area falls within the Mt. Stirling grazing allotment, which had

been classified as perennial range. The portion of the allotment within the Habitat Management Area had been managed under grazing Prescription 2 (BLM 1991), which is season-long grazing use with restrictions on the utilization level of key forage species. The Moapa and Stump Spring HMAs have been grazed in the past, but no record of grazing could be found for the last 10 years. Stewart Valley and the majority of the Pahrump site have no formal grazing histories, and occur in unallotted areas. A small portion of the Pahrump HMA falls within the County Line allotment south of Pahrump, but no grazing history could be found for this allotment. The Sandy Valley, Dry Lake, and Cactus Springs areas have had either low or no use since at least 1984.

All allotments intersecting with Mesquite HMAs have been closed to future grazing according to specific directions identified in the RMP.

1.3.11 Wild Horses and Burros

Two Wild Horse and Burro Herd Management Areas intersect with the Amargosa Flat Mesquite Woodland Habitat Management Area. Table 1-4 lists the current population estimates and Appropriate Management levels for the Herd Management Areas. The eastern portion of the mesquite woodland lies within Johnnie Herd Management Area, while the western edge of the stand is found in the Ash Meadows Herd Management Area. A fence constructed along Highway 160 prevents horses and burros from crossing into the mesquite stand from Johnnie, and most horses and all burros were trapped and removed from the west side of the highway. However, a herd of approximately 8-9 horses remains in the Amargosa Flat mesquite woodland, even though periodic efforts have been made to trap and remove the horses from the area. The Cactus Springs area falls within the Wheeler Pass Herd Management Area, which is managed by the Forest Service. No Herd Management Areas occur within the other mesquite sites.

Table 1-4. Population estimates and Appropriate Management Levels for Herd Management Areas at Amargosa Flat and Cactus Springs Mesquite Woodland Habitat Management Areas.

Herd Management Area	Current Population Estimate		Estimated AMLs[a]	
	Horses	Burros	Horses	Burros
Ash Meadows	0	0	0	0
Johnnie	49	37	50	75
Wheeler Pass (managed by Forest Service)				

[a] As stated in the Las Vegas Resource Management Plan.

1.3.12 Cultural Resources

Portions of two Mesquite HMAs intersect with culturally significant areas. The Stump Spring HMA includes the site of a prehistoric camp and historic trail, and is eligible for nomination to the National Register of Historic Places (see Myhrer et al. 1990). A portion of the southern route of the Old Spanish Trail occurs at this site. Consequently, per the RMP, approximately 640 acres at Stump Spring have been designated as an Area of Critical Environmental Concern (ACEC)(Fig. 1-14). Approximately 193 acres of mesquite habitat is located within the ACEC. Resource constraints for the Stump Spring ACEC as described in the RMP are as follows:

- Retain in federal ownership. Designate as ROW avoidance areas. Close to mineral material ROWs.
- Close to locatable minerals, salables and solid leasables. Open to fluid minerals subject to no surface occupancy stipulations.
- Manage consistent with the surrounding allotment and herd management area, if applicable.
- Require reclamation of temporary roads. Authorize new roads in response to specific authorized actions only, ensure access to private property.
- Limited OHV/ORV designation, consistent with OHV designations of surrounding areas.

The Amargosa Flat HMA has also been determined to hold cultural significance. An Environmental Assessment was conducted for this area in 1991 to determine the potential impacts associated with a proposed action for mesquite woodcutting (EA-NV-054-91-037). Results of a cultural reconnaissance level (Class II) survey detected three dune camp sites that are considered to hold data important in the history of the region (CR5-1076P). These archaeological properties were assigned site number CrNV-53-5686/26Ny7799, and were considered eligible for nomination to the National Register of Historic Places. As a result of the significant archaeological findings, the proposed action was denied and the area closed to further woodcutting. A portion of the mesquite woodland at this site falls within a designated ACEC (Fig. 1-15). The ACEC encompasses approximately 6,800 acres of public land, of which 751 acres is mesquite vegetation. About 1,179 acres of mesquite habitat in the area is not included within the boundary of the ACEC. Resource constraints for the Amargosa ACEC as described in the RMP are as follows:

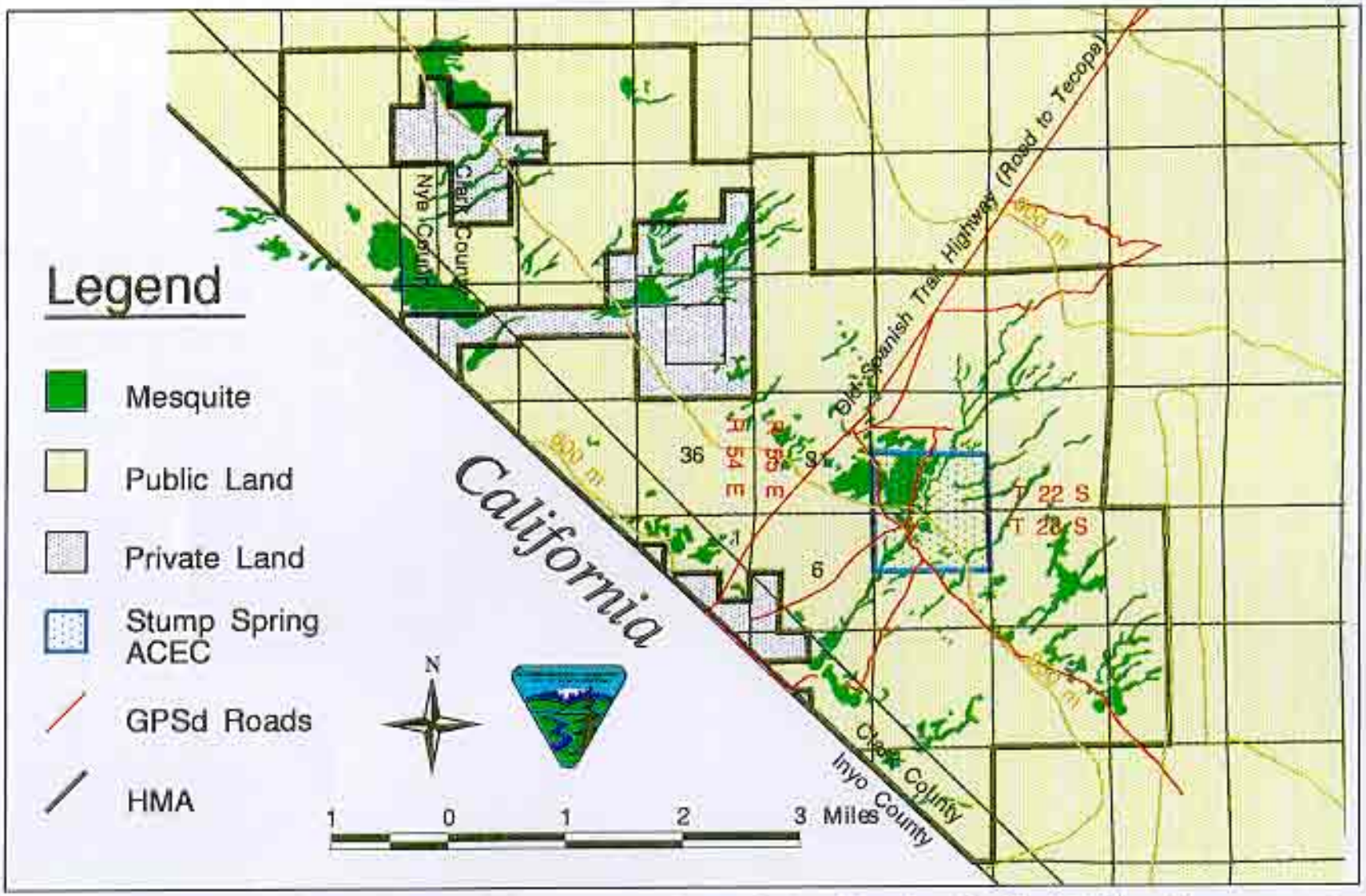

Fig. 1-14. Location of Stump Spring ACEC within the Stump Spring Mesquite Woodland Habitat Management Area.

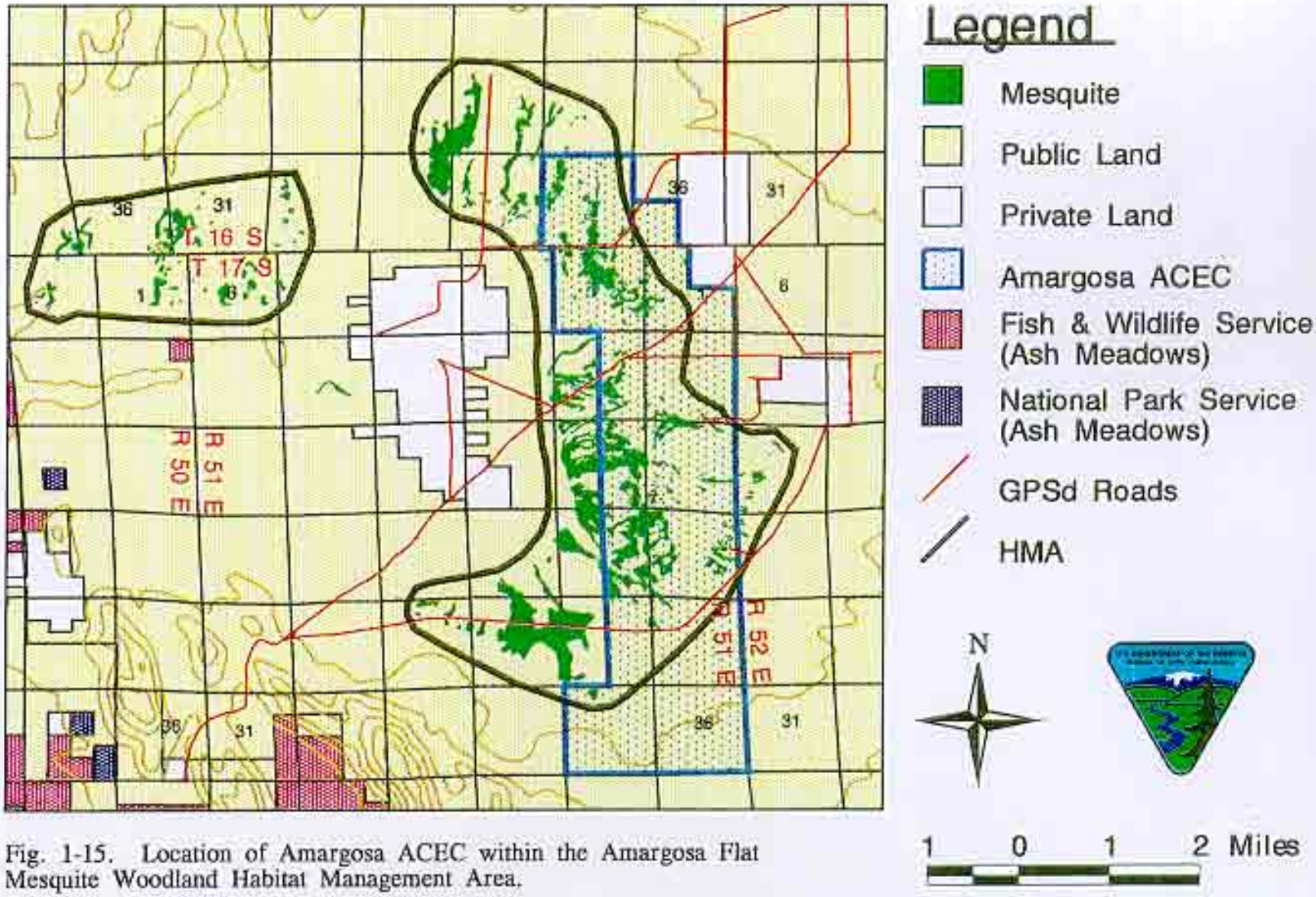

Fig. 1-15. Location of Amargosa ACEC within the Amargosa Flat Mesquite Woodland Habitat Management Area.

- Retain in federal ownership. Designate as an ROW avoidance area except within corridors. Close to mineral material ROWs.
- Close to locatable minerals, salables and solid leasables.
- Allow fluid mineral leasing, subject to Timing and Surface Use Constraint special stipulations.
- Open to livestock grazing. AML for wild horses and burros = zero.
- Require reclamation of temporary roads. Authorize new roads in response to specific authorized actions only, and ensure access to private property.
- OHV/ORV designation is limited to existing roads and trails. No competitive ORV events.

1.3.13 Recreational Resources

Recreational activities within the HMAs include hiking, biking, horseback riding, wildlife viewing, OHV/ORV use, hunting, trapping, and recreational target shooting. Hunting is common in mesquite woodlands because of the abundance of gamebirds such as Gambel's quail and mourning dove. Trapping is a popular activity at Stump Spring. The Cactus Springs site is heavily used year round both by organized shooting clubs and casual users. A blackpowder shoot (Purgatory Plainsmen Rendezvous) is held every President's Day weekend at the Cactus Springs site, and typically draws about 250-400 people. Dry Lake is an intensively used site for target shooting. Mesquite woodlands in Pahrump Valley are particularly popular sites for early morning and late afternoon walks because of its close proximity to a populated area. Several informal dirt bike sites have been constructed throughout the Pahrump Valley area. Activity in the mesquite woodlands adjacent to the community of Pahrump continues to increase as the Pahrump urban area expands.

1.3.14 Wilderness

No wilderness areas or Wilderness Study Areas occur within any of the eight Mesquite HMAs. However, three wilderness areas in California occur adjacent to the Pahrump, Stewart Valley, and Sandy Valley HMAs - the Resting Spring, Nopah, and Pahrump Valley Wilderness Areas (Fig. 1-16). Many of the roads that wind through the mesquite woodlands in Stewart, Pahrump, and Mesquite Valleys lead to the wilderness areas in California. Signs have been posted along the California-Nevada state line indicating the boundary of wilderness area, and roads leading into the wilderness areas have been posted as closed. However, these roads continue to be used, and many signs have been destroyed.

1.3.15 Forestry

Virtually all mesquite woodlands in southern Nevada have been exposed to high levels of woodcutting. Woodcutting has now been suspended because of new information on the status of mesquite woodlands in this area. Mesquite is a renewable resource;

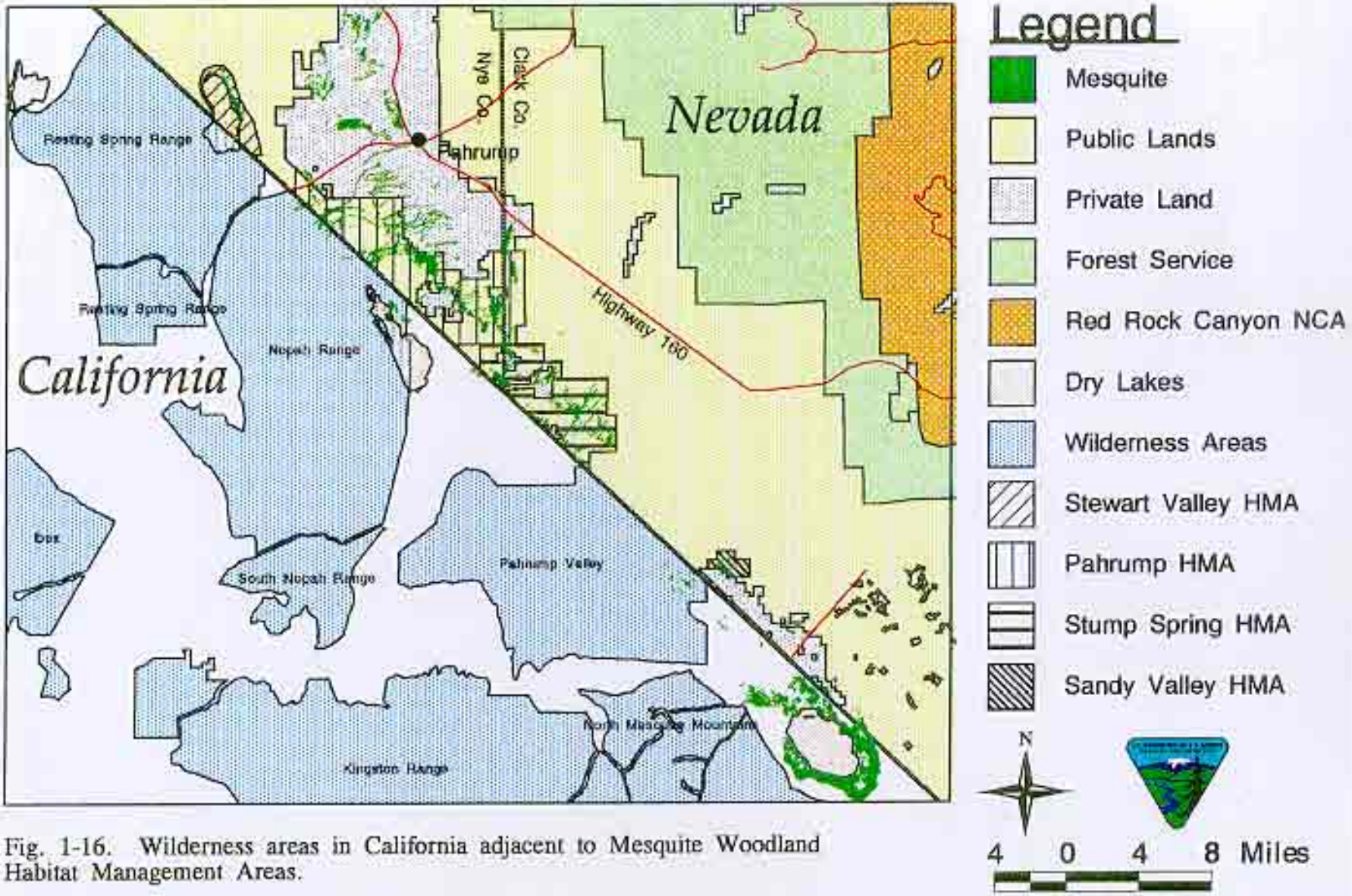

Fig. 1-16. Wilderness areas in California adjacent to Mesquite Woodland Habitat Management Areas.

however, in arid climates mesquite germination and seedling establishment require a specific set of environmental factors, which results in infrequent and episodic recruitment. Once established, mesquite trees are very hardy and difficult to kill, but woodcutting promotes resprouting and changes the original tall tree into a shorter, multi-stemmed shrub. Transformation of large, old mesquite trees into younger, smaller shrubs may have implications towards management of habitat for Phainopepla. A recent study determined that Phainopepla preferred to nest in larger, taller trees with heavy mistletoe infestation, which in turn increased nesting success (Krueger 1998). Loss of old, heavily infested trees may reduce the amount of suitable breeding habitat for Phainopepla in southern Nevada.

All HMAs have been exposed to woodcutting at some point in time, but the extent and severity of woodcutting varies among sites. Although currently prohibited, illegal woodcutting continues to occur. Levels of woodcutting are particularly high in Pahrump Valley because of easy access to the area, largely due to the many roads throughout the woodlands and close proximity to an urban community. Woodcutting is also a problem at Moapa. Although there are signs of past woodcutting at Amargosa Flat, evidence of recent activity is absent. At Stump Spring, signs of woodcutting activity are confined to those few areas of the woodland along the wash with direct road access. Stewart Valley is probably the area least affected by woodcutting. Recent woodcutting has occurred throughout the northern portion of the stand, but signs of past cutting are either absent or obscured by age.

1.3.16 Rights-of-Way

Existing utility rights-of-way pass through the Moapa and Amargosa Flat HMAs. A wildfire at the Moapa site in 1995 damaged powerlines, cutting off power to houses and businesses as far away as northwest Las Vegas. Subsequently, Nevada Power cleared all vegetation from within the right-of-way. The only previous right-of-way corridors were designated in the Esmeralda-Southern Nye Resource Management Plan and occur in southern Nye County. The RMP, which replaced the Southern Nye RMP, modified this corridor and designated additional corridors in Clark County in order to concentrate utility lines within specific areas and avoid widely scattered utility rights-of-way. One corridor runs along the Nevada-California state line and bisects the mesquite woodland in the Pahrump HMA. All future applicants for utility rights-of-way will be encouraged to construct utility lines within one of the designated corridors. The potential threat of damage to utility lines by wildfires in the mesquite may induce right-of-way holders to clear vegetation from the right-of-way, resulting in loss of mesquite habitat. Fig. 1-17 shows designated right-of-way corridors in relation to Mesquite Woodland Habitat Management Areas.

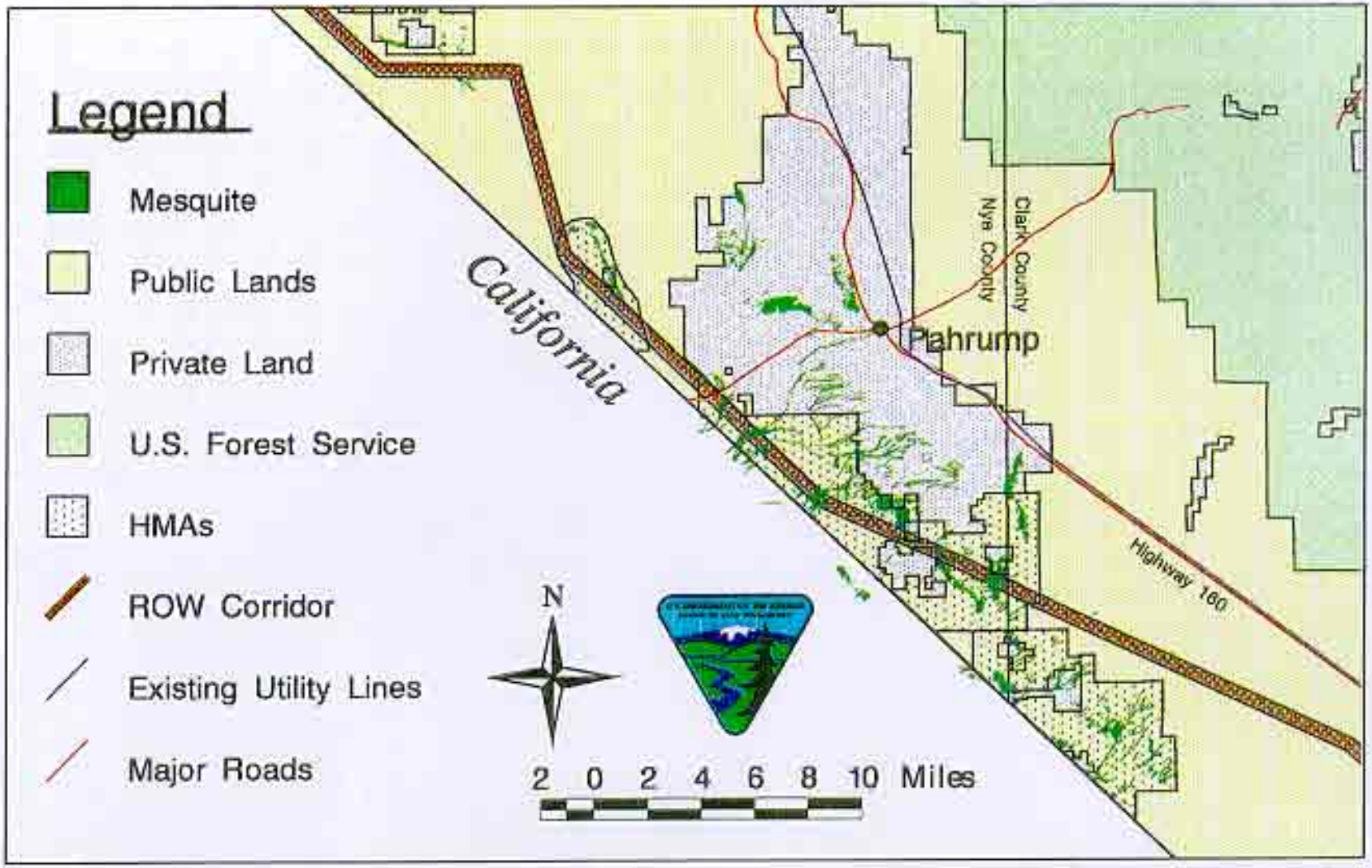

Fig. 1-17. Location of right-of-way corridor in relation to Mesquite Woodland Habitat Management Areas.

2.0 LAND USE PLAN OBJECTIVES AND DECISIONS

Currently, this HMP falls under the direction of the Las Vegas Resource Management Plan. The RMP, approved October 5, 1998, outlines major land use decisions and guides management actions for public lands within Clark and southern Nye Counties. The RMP also provides objectives and specific management direction for Special Status Species and mesquite woodlands in southern Nevada.

Listed below are the objectives and management directions as they appear in the aforementioned Plan that are applicable to this HMP.

Vegetation Management
Objective VG-2: "Restore plant productivity on disturbed areas of the public lands."

Areas of Critical Environmental Concern
Objective AC-2: "Protect areas with significant cultural, natural, or geological values by establishing areas of critical environmental concern ....."

Fish and Wildlife
Objective FW-3: "Support viable and diverse native wildlife populations by providing and maintaining sufficient quality and quantity of food, water, cover, and space to satisfy needs of wildlife species using habitats on public land."

Management Direction
FW-3-a. "Manage mesquite and acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Meadow Valley Wash, Moapa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value."

FW-3-b. "Allow harvesting of green or dead and down mesquite by permit only and in those areas identified in FW-3-a, where consistent with sustaining plant communities in a healthy and vigorous state and also consistent with sustaining viable wildlife populations."

FW-3-g. "Protect important resting/nesting habitat, such as riparian areas and mesquite/acacia woodlands. Do not allow projects that may adversely impact the water table supporting these plant communities."

FW-3-h. "Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity."

Special Status Species

Objective SS-2. "..... Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary."

Management Direction

SS-2-a. "Enter into conservation agreements with the U.S. Fish and Wildlife Service and the State of Nevada that, if implemented, could reduce the necessity of future listings of the species in question. Conservation agreements may include, but not be limited to, the following: Blue Diamond cholla, Las Vegas bearpoppy, white-margined penstemon, and Phainopepla."

Forestry Management

Objective FR-1: "Maintain woodland and conifer forest where possible for all-aged stands, with an understory vegetation forage value rating at moderate or better."

Management Direction

FR-1-a. "Firewood cutting and gathering is limited to approved areas subject to restrictions developed for protection of Threatened, Endangered and Sensitive species and other sensitive resources."

FR-1-b. Allow harvest of dead and/or down wood or BLM-marked green mesquite 'trees' for ..... mistletoe control only in approved areas."

3.0 MANAGEMENT OBJECTIVES, ISSUES, AND ACTIONS

These objectives were developed using various planning documents, policies, environmental legislation, and scientific papers, the most widely used of which include the following: Las Vegas RMP, the Endangered Species Act of 1973, as amended, Federal Lands Policy and Management Act of 1976, Clark County Desert Conservation Plan, and BLM's Fish and Wildlife 2000 (Nevada Fish and Wildlife 2000, Nongame Migratory Bird Habitat Conservation Plan, and Rare Plants and Natural Plant Communities). The following objectives, management actions, and recommendations in no way diminish the authority of the State of Nevada to own, control, and manage the State's wildlife or the BLM's mandate to manage habitat on public lands. Those actions that will require amendments to the existing land use plan will be processed as soon as practicable.

3.1 Goals

Manage southern Nevada mesquite woodlands in a manner that will ensure the long-term survival and vigor of woodlands, which will in turn provide important resources needed by the suite of floral and faunal species associated with mesquite woodlands.

Include appropriate levels of monitoring along with the implementation of management actions to evaluate the success of the Plan. Enhance public awareness of the importance of mesquite woodlands as wildlife habitat in the Mojave Desert, and promote respect for the public lands.

3.2 Objectives

The level of disturbance or human use varies widely among the Habitat Management Areas. Also, the size of Habitat Management Areas is extremely variable. In addition, the ability of sites to support Special Status Plant species or relatively large, persistent, and viable Phainopepla populations varies according to site location. Therefore, objectives for this plan will be site-specific.

3.2.1 Moapa

Objective 1. Protect 355 acres of mesquite woodland habitat within the boundary of the Moapa Habitat Management Area.

Objective 2. Manage for a Phainopepla breeding population density of at least 2 breeding pairs per ha, and a nesting success rate of at least 0.5 per year, for the next 30 years[3].

Objective 3. Improve mesquite age class distribution to include at least 20% seedlings and saplings by the year 2008.

Objective 4. Manage to achieve an average of not more than 3 primary stems per tree over the next 30 years.

Objective 5. Maintain groundwater at a static level not to exceed 35 feet in depth over the next 30 years.

3.2.2 Amargosa Flat

Objective 1. Protect 1,930 acres of mesquite woodland habitat within the boundaries of the Amargosa Flat Habitat Management Area.

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[3] Phainopepla populations in southern Nevada are known to fluctuate from year to year depending on the success of the mistletoe berry crop. It is therefore important to monitor overall trends in breeding density and nesting success over many years, and ensure that climatic events contributing to fluctuations in mistletoe berry production are also considered along with trends in Phainopepla nesting success and population density when evaluating the success of management efforts.

Objective 2. Manage to maintain at least 400 acres of dense mesquite (20% of total mesquite habitat) within HMA boundaries over the next 30 years.

Objective 3. Determine current groundwater depth and maintain at a level not to exceed current depth over the next 30 years.

3.2.3 Stewart Valley

Objective 1. Protect habitat for Special Status Plants and 215 acres of mesquite woodland habitat within the boundary of the Stewart Valley Habitat Management Area.

Objective 2. Maintain mesquite tree age class distribution at current levels over the next 30 years (65% mature, 35% seedlings and saplings).

Objective 3. Maintain current average number of stems at 3 per tree, and average percent canopy cover at 70% over the next 30 years.

Objective 4. Protect adjacent areas to maintain or improve habitat for *Eriogonum bifurcatum* and *Phacelia parishii.*

Objective 5. Maintain groundwater at a static level not to exceed 35 feet in depth over the next 30 years.

3.2.4 Pahrump

Objective 1. Maintain or improve habitat for Special Status Plants and 3,385 acres of mesquite woodland habitat within the boundary of the Pahrump Habitat Management Area.

Objective 2. Manage to achieve an average of no more than 3 stems per tree, and percent canopy cover of at least 50%, over the next 30 years.

Objective 3. Maintain mesquite tree age class distribution at 65% mature and 35% seedlings and saplings over the next 30 years.

Objective 4. Protect adjacent areas to maintain or improve habitat for *Eriogonum bifurcatum.*

Objective 5. Maintain groundwater at a static level not to exceed 50 feet in depth over the next 30 years.

3.2.5 Stump Spring

Objective 1. Maintain or improve 1,585 acres of mesquite dune and woodland habitat within the boundary of the Stump Spring Habitat Management Area.

Objective 2. Improve mesquite tree age class distribution along the main wash to include at least 20% seedlings and saplings over the next 30 years.

Objective 3. Manage to achieve an average of no more than 5 stems per tree over the next 30 years.

Objective 4. Maintain groundwater at the main wash at a static level not to exceed 35 feet in depth over the next 30 years.

3.2.6 Other Sites

Objective 1. Protect 130 acres within the Sandy Valley Habitat Management area to maintain or improve habitat for *Eriogonum bifurcatum.*

Objective 2. Protect 1,000 acres of mesquite dunes within the Sandy Valley Habitat Management Area.

Objective 3. Maintain or improve 65 acres of mesquite habitat within the Cactus Springs Habitat Management Area.

Objective 4. Improve mesquite tree age class distribution at Cactus Springs to include at least 20% seedlings and saplings over the next 30 years.

Objective 5. Manage the spring at Cactus Springs to achieve Proper Functioning Condition.

Objective 6. Maintain 270 acres of mesquite habitat within the Dry Lake Habitat Management Area.

3.3 Issues

Following are land-use issues that relate to the above goals and objectives. Each issue is addressed with recommendations or management actions in order to meet the established goals and objectives.

3.3.1 Issue 1: Land-use Designation

Recommendation:

Through an amendment to the RMP, expand the Amargosa ACEC to include all mesquite habitat in the area.

Recommendation:

Through an amendment to the RMP, nominate the Moapa and Stewart Valley Habitat Management Areas as ACECs.

3.3.2 Issue 2: Undesirable Activities in HMAs

Management Action:

Post and maintain No Dumping signs around perimeters of mesquite woodlands.

Management Action:

Organize periodic clean-ups through volunteer programs. See also Issue 13 (Public Awareness).

Management Action:

Increase presence of law enforcement to discourage illegal dumping and other trespass violations. See also Issue 12 (Law Enforcement).

Management Action:

Expedite resolution of trespass violations and illegal occupancy within Habitat Management Areas.

Recommendation:

Work with Nye County and the community of Pahrump to establish a recreational target shooting area outside of mesquite woodlands through an R&PP lease to Nye County or other qualified applicants in the Pahrump area. See also Issue 11 (Recreation).

Management Action:

Work with Nye County, the community of Pahrump, and Nevada Division of Wildlife to establish No Shooting zones along the public/private land interface.

Management Action:

Establish a toll-free phone number for the public to report violations and other relevant information useful in the management of the public lands.

3.3.3 Issue 3: Groundwater

Management Action:

Monitor groundwater levels every three months using existing observation wells in Mesquite HMAs.

Recommendation:

Drill additional observation wells over time, as needed.

Recommendation:

Investigate the feasibility of obtaining a guaranteed minimum groundwater level sufficient to maintain existing mesquite stands. Work with the State Water Engineer to develop standards for acceptable aquifer drawdown levels.

Management Action:

Through the NEPA process, analyze the impacts to groundwater and mesquite woodlands for all federal actions occurring on the public lands (e.g. golf courses).

Recommendation:

Install gabions or other appropriate flood control structures in the wash at Stump Spring to alleviate and reverse severe erosion occurring at this site.

Management Action:

Develop a public educational program to enhance understanding of the importance of groundwater conservation. See also Issue 13 (Public Awareness).

3.3.4 Issue 4: Woodcutting

Management Action:

Permits will be required for the harvest of any mesquite wood, and will be issued only for those circumstances that are consistent with promoting the health of mesquite woodlands (e.g. fuel load reduction).

Management Action:

Post and maintain No Woodcutting signs around perimeter of mesquite woodlands.

Management Action:

Control vehicular access into mesquite woodlands via fencing and/or road closures.

Management Action:

Increase law enforcement presence in Habitat Management Areas to discourage the illegal harvest of mesquite wood. See also Issue 12 (Law Enforcement).

Management Action:

Coordinate with the Nevada Division of Wildlife and other appropriate agencies or entities to establish a Phainopepla monitoring program at the Moapa Habitat Management Area. Also conduct periodic surveys at other Mesquite HMAs to collect current data on the status of Phainopepla in southern Nevada.

3.3.5 Issue 5: Herbivory

Management Action:

If horse and burro use of the Cactus Springs area becomes a problem, take appropriate action to protect the spring and mesquite seedlings from trampling and herbivory.

Management Action:

Remove remaining horses from the Amargosa Flat Habitat Management Area per current management level for zero animals in the Ash Meadows Herd Management Area.

Management Action:

Periodically monitor the spring in the Amargosa Flat Habitat Management Area and take protective actions if needed.

Recommendation:

With the assistance of research institutions, determine the cause(s) of low mesquite seedling recruitment at Moapa and Stump Spring HMAs.

Recommendation:

Investigate the feasibility of periodic lagomorph and rodent population reduction by Animal Damage Control at the Moapa Habitat Management Area if studies determine that these animals are impacting seedling recruitment.

Management Action:

Monitor the Stump Spring and Moapa Habitat Management Areas for germination events and protect seedlings from herbivory by either construction of exclosure plots or placement of protective cages around seedlings. If necessary, plant seedlings to re-establish desireable age classes, while ensuring genetic integrity of the mesquite community.

Management Action:

Ensure that no livestock grazing remains in effect for all Mesquite Habitat Management Areas.

3.3.6 Issue 6: Wildfire

Management Action:

Implement the Fire Management Plan which designates mesquite woodland areas as a Zone A fire suppression zone.

Management Action:

Reduce fuel loads in mesquite woodlands by removing slash build-up caused by previous woodcutting and illegal dumping of yard cuttings and Christmas trees.

Management Action:

Create fire breaks within the private/public land interface, and work with Nye County public works to reduce vegetation along roadsides that run along private/public land boundaries.

Management Action:

GPS all roads in and around mesquite woodlands. Devise a naming or numbering system for roads to be marked and produce maps to be distributed to local and area fire stations, search and rescue, and sheriff's departments to assist in quick response to fire outbreaks.

Management Action:

Work with local fire officials to establish criteria for allowing open fires in the vicinity of mesquite woodlands. See also under Issue 11 (Recreation).

3.3.7 Issue 7: Invasive Exotic Plants

Management Action:

Eradicate and/or control invading saltcedar at Pahrump and Stump Spring HMAs.

Management Action:

Eradicate patches of Russian knapweed and star thistle that have established in the Pahrump HMA.

3.3.8 Issue 8: Minerals

Recommendation:

Through an amendment to the RMP, withdraw Mesquite Woodland Habitat Management Areas from mineral entry.

Management Action:

In areas where mining is allowed in Habitat Management Areas, work to mitigate impacts to mesquite during the mining plan approval process.

Management Action:

During Notice level activity, work with the proponent to minimize impacts to mesquite.

Management Action:

Do not authorize mineral sales in Mesquite Woodland Habitat Management Areas.

3.3.9 Issue 9: Lands and Realty Actions

Recommendation:

Ensure that all land disposals as described in the Las Vegas RMP are consistent with the objectives of this Habitat Management Plan, and do not result in the net loss of mesquite woodlands or habitat for Special Status Plants within the boundaries of the Habitat Management Areas.

Recommendation:

Retain all public lands that contain mesquite woodlands and Special Status Plants in federal ownership.

Management Action:

Mitigate impacts within right-of-way corridors during construction and maintenance of utility lines to minimize destruction or disturbance to mesquite woodlands and Special Status Plants. This includes off-site mitigation, avoidance, restoration, minimizing clearance of vegetation within rights-of-way, selective pole/tower placement to avoid mesquite, and other measures as appropriate.

Recommendation:

Through an amendment to the RMP, designate an alternative utility corridor route that avoids mesquite woodlands and Special Status Plants.

Management Action:

Discourage the construction of new roads and require restoration of temporary roads to pre-existing conditions.

Management Action:

Do not allow lands actions that would affect groundwater levels in Mesquite Woodland Habitat Management Areas.

3.3.10 Issue 10: Wilderness Areas

Management Action:

Coordinate with the BLM, Ridgecrest District, in California to control vehicular access to existing wilderness areas by roads leading to wilderness areas from the adjoining Mesquite HMAs along the Nevada-California state line.

3.3.11 Issue 11: Recreation

Management Action:

Do not allow OHV speed events within 1/4 mile of mesquite woodlands during the Phainopepla breeding season (February through May).

Management Action:

Ensure that activities permitted by BLM during the Phainopepla breeding season do not have a negative impact on Phainopepla breeding success.

Management Action:

Document, with the use of GPS, existing roads and trails in all Habitat Management Areas by the end of FY99 to establish a baseline for existing roads and trails.

Management Action:

Change OHV designations in Habitat Management Areas to designated roads and trails through any action necessary to do so (e.g. amendment to the RMP or through an interim closure). Roads that are designated closed will be restored.

Management Action:

Work with Nye County and the community of Pahrump to establish alternative areas away from mesquite stands for recreational target shooting. Work with local fire officials to establish criteria for open fires in the vicinity of mesquite woodlands to reduce the threat of wildfire. See also Issue 2 (Undesireable Activities) and Issue 6 (Wildfire).

Management Action:

Consider the feasibility of designating camping areas within mesquite Habitat Management Areas to concentrate activity in previously disturbed sites and away from mesquite trees.

Management Action:

Work with Nevada Division of Wildlife and Nye County to establish No Hunting zones at the urban/public land interface in Mesquite Woodland Habitat Management Areas.

Recommendation:

Implement a study investigating the effect of soil compaction on mesquite tree physiology (including water uptake), germination, and seedling establishment.

3.3.12 Issue 12: Law Enforcement

Management Action:

Include Mesquite Woodland Habitat Management Areas as high priority areas in patrol plans.

Management Action:

Ensure adequate law enforcement presence in Mesquite Woodland Habitat Management Areas, and concentrate efforts in those areas close to urban centers (e.g. Pahrump and Moapa HMAs).

Management Action:

Enter into a Memorandum of Understanding with the BLM Ridgecrest District in California to more efficiently deal with law enforcement issues in areas along the Nevada-California state line.

3.3.13 Issue 13: Public Awareness

Management Action:

Construct interpretive signs where appropriate to educate the public on the importance of mesquite woodlands in southern Nevada.

Management Action:

Develop a brochure or video on avian use of mesquite habitats in the Mojave Desert.

Management Action:

Develop a Bird Check-list for avian species that occur in southern Nevada mesquite woodlands.

Management Action:

Work through the Clark County Multiple Species Habitat Conservation Plan to increase public awareness of the ecological significance of mesquite woodlands in the Mojave Desert.

Management Action:

Work with civic groups to organize periodic clean-ups and patrols in Habitat Management Areas. See also Issue 2 (Undesireable Activities).

Management Actions:

Develop a slide show for presentations to civic groups that will educate the public on the importance of mesquite woodlands in the Mojave Desert and their use by wildlife species.

Management Action:

Develop a Web Page under the Nevada BLM Web site describing mesquite woodland conservation efforts in Nevada, including maps of the areas, lists and images of associated flora and fauna, and links to other interesting sites associated with mesquite research and conservation.

3.4 Recommendations for RMP Amendments

The Mesquite Woodland Habitat Management Plan was developed after finalization of the BLM Las Vegas Resource Management Plan. As a result, many recommendations for management of mesquite woodlands in Habitat Management Areas are not specifically identified in the RMP, although they conform to the objectives described in the RMP. This HMP recommends amending the Las Vegas RMP to include those management actions not addressed in the RMP. Table 3-1 lists recommendations for amendments to the RMP proposed in Section 3.3 (Issues).

Table 3-1. Recommendations for amendments to the Las Vegas Resource Management Plan for mesquite woodland Habitat Management Areas in southern Nevada.

HMP Section No.	Issue	Recommendation
3.3.1	Land-use Designation	Nominate the Moapa and Stewart Valley HMAs as ACECs
3.3.1	Land-use Designation	Expand the Amargosa ACEC to include all mesquite habitat in the area
3.3.8	Minerals	Withdraw Mesquite Woodland HMAs from mineral entry
3.3.9	Lands and Realty Actions	Adjust the RMP land disposal area boundaries to exclude Mesquite Woodland HMAs and habitat for Special Status Plants
3.3.9	Lands and Realty Actions	Designate an alternative utility corridor route that avoids mesquite woodlands and Special Status Plants
3.3.11	Recreation	Change OHV designations in Mesquite Woodland HMAs to designated roads and trails

This Habitat Management Plan recommends the nomination of the Moapa and Stewart Valley HMAs as ACECs because of certain qualities or values that set them apart from the other HMAs. The Moapa HMA is unique in that it currently has the potential to support a relatively dense Phainopepla breeding population. The Stewart Valley HMA is unique because this vegetation community is one of the only remaining mesquite woodlands in southern Nevada that is in relatively pristine condition, and includes two Special Status plant species that are closely associated with the mesquite habitat. Table 3-2 lists resource constraints proposed for these ACECs.

Table 3-2. Proposed ACEC nominations and associated resource constraints. These are only proposals to be considered, and will be required to go through the land use planning process which in turn requires a separate input process and formal public review.

ACEC Name		Moapa	Stewart Valley
Acreage		1,120	4,940
Values		Special Status Species	Special Status Species, Unique Plant Community
Resource Constraints	Lands	Retain in federal ownership. Designate as ROW avoidance area except within currently established corridors.	Retain in federal ownership. Designate as ROW avoidance area.
	Minerals	Close to locatable minerals, salables and solid leasables. Open to fluid minerals subject to no surface occupancy stipulations. Close to mineral material ROWs.	
	Range	N/A	N/A
	Roads	Require reclamation of temporary roads. Authorize new roads in response to specific authorized actions only, ensure access to private property.	
	Wildlife/Forestry	Do not allow commercial collection of flora. Do not allow woodcutting or collecting, except for purposes of improving the resource (e.g. slash reduction).	
	OHV/ORV Designation and Recreation	Designate as "Limited to designated roads and trails" for all motorized and mechanized vehicles. Prohibit ORV speed events. Allow other events on a case-by-case basis. Do not allow campfires. Do not allow recreational target shooting.	

4.0 COORDINATION

4.1 Other BLM Programs

4.1.1 Livestock

All grazing allotments intersecting with Mesquite Woodland Habitat Management Areas have been closed. Therefore, livestock grazing is not an issue for any of the Mesquite Woodland Habitat Management Areas.

4.1.2 Wild Horses and Burros

The Ash Meadows and Johnnie Herd Management Areas intersect with the Amargosa Flat Mesquite HMA. The Appropriate Management Level for this area has been set at zero. Although most horses and burros have been removed from the Ash Meadows Herd Management Area, a small herd of 8-9 horses remains in the mesquite woodland. Cooperation with the Wild Horse and Burro program will be needed to monitor wild horse activity within the mesquite stand, and to remove the remaining horses from the area.

4.1.3 Forest and Woodland Products and Desert Vegetation

Mesquite is a popular resource used for firewood, barbeque grilling, and wood carvings because the wood is hard and dense, and burns long and hot. Unauthorized cutting of mesquite trees continues to be a problem in southern Nevada. To achieve HMP and RMP objectives for permitted wood harvest only, coordination with law enforcement rangers will be needed.

4.1.4 Lands

Approximately 740 acres of mesquite woodlands occupy public lands identified for disposal through the RMP; 35 acres at Moapa and 705 acres at Pahrump. In addition, major existing rights-of-way and ROW corridors bisect several Mesquite HMAs. This plan proposes to recommend only those lands actions in and adjacent to Mesquite HMAs that will not alter groundwater level or cause loss or damage to existing woodlands or habitat for Special Status Plants. Disposal areas identify those lands potentially available for disposal. If unacceptable negative impacts to wildlife, Special Status Species, or vegetation are identified during the NEPA or scoping process, the proposed action should be denied. These actions will require close coordination with the BLM Lands staff.

4.1.5 Soil, Water, and Air Resources

Groundwater hydrology is an important issue in the conservation of mesquite woodlands in southern Nevada. Consultation with soil scientists and hydrologists will be needed to obtain data or information necessary for proper management decisions.

4.1.6 Recreation

Both casual and permitted recreational activities occur in the Mesquite HMAs. This plan recommends management of recreational activities in Mesquite HMAs to reduce or eliminate disturbance or destruction of mesquite woodlands and habitat for Special Status Species. If recreational use becomes a problem, it may be necessary to develop a recreational management plan for these areas. Cooperation with the Recreation Program will be essential to implement management actions that will achieve the objectives of this plan.

4.1.7 Cultural Resources

Section 106 of the National Historic Preservation Act of 1966 requires that Federal agencies take into account the effects of their undertakings on historic properties. Efforts to identify and evaluate cultural resource properties, and consult with the Nevada State Historic Preservation Office will be conducted prior to initiating any project involving surface disturbance within Mesquite HMAs.

4.1.8 Energy and Minerals

Currently, mining activity in or adjacent to Mesquite HMAs is limited, with the most significant activity occurring in the vicinity of the Amargosa Flat HMA. Close coordination with the Minerals Program will be needed to keep current with the status of mining claims, Notices, and Plans of Operation associated with the clay pit that occupies the playa west of the Amargosa Flat mesquite woodland. This plan also recommends prohibition of mineral sales within Mesquite HMAs, and calls for mitigative measures in those areas where mining is allowed. These actions also require cooperation with the Minerals Program to ensure projects minimize or eliminate impacts to mesquite woodlands.

4.1.9 Fire Management

Increased incidence of wildfire, originating from natural, accidental, or intentional sources, threatens to destroy woodlands in southern Nevada faster than they can be replaced. Increased fuel loads from build-up of slash left behind by woodcutters increases the chance of high-intensity fires that kill trees and sterilize soils. Coordination with the Fire Management Program will be ongoing to ensure quick

response to fires, to reduce fuel loads, and to create fire breaks along the private/public land interface.

4.1.10 Support Actions

The support of law enforcement rangers is essential to control illicit activities in mesquite woodlands. The assistance of BLM's Operations division will also be needed to restore roads and habitat, install interpretive signs, and construct fences where appropriate. The Public Affairs Officer will also be consulted for the development of public outreach programs, media news releases, and educational material.

4.2 Other Agencies and Organizations

4.2.1 Federal Agencies

Wild horses and burros in the Wheeler Pass Herd Management Area are managed by the Forest Service. The Cactus Springs Mesquite Woodland HMA lies within the boundaries of the Wheeler Pass Herd Management Area. If horse and burro use of the Cactus Springs area becomes a problem, coordination with the Forest Service will ensure that actions are implemented to protect mesquite habitat in this area.

The BLM, Ridgecrest District in California manages the public lands and wilderness areas adjoining Stewart, Pahrump, and Mesquite Valleys. Coordination with Ridgecrest District law enforcement officers will increase the effectiveness of management efforts for Mesquite HMAs located along the California-Nevada state line.

4.2.2 State, County, and Local Agencies

4.2.2.1 Nevada Division of Wildlife

The BLM Las Vegas Field Office will coordinate with the Nevada Division Of Wildlife for monitoring of Phainopepla populations in Moapa, surveys in other HMAs, road designations, and proposals for hunting restrictions within the private/public land interface.

4.2.2.2 Nevada Division of Forestry

The Nevada Division of Forestry and State Nursery may be consulted for projects that include propagation, restoration, or rehabilitation of mesquite habitat.

4.2.2.3 Nevada State Water Engineer's Office

Consultation with the State Water Engineer and local government entities will be needed to resolve potential future water use conflicts within the mesquite Habitat Management Areas.

4.2.2.4 Nevada Natural Heritage Program

Data aquired from Phainopepla surveys will be shared with the Nevada Natural Heritage Program, and will in turn be consulted for information on other species occurrences within Mesquite Woodland HMAs.

4.2.2.5 University of Nevada

Consultation with UNLV and UNR research scientists may be needed for specific research or information needs related to mesquite habitat conservation and enhancement, which may include more precise soil moisture measurements and studies on the effect of soil compaction on groundwater level and mesquite physiology as related to water uptake. Other in-state or out-of-state academic institutions familiar with mesquite research may also be consulted.

4.2.2.6 Local and County Agencies

Mesquite Woodland HMAs are distributed throughout Clark and southern Nye Counties, and include areas adjacent to the communities of Glendale, Sandy Valley, Crystal, and Pahrump. Private and patented lands also occur in the vicinity of the Amargosa Flat, Stump Spring, and Cactus Springs HMAs. Proposed actions that will conserve and enhance mesquite woodland habitat may be partially funded through Clark County's Multiple Species Habitat Conservation Plan. Nye County is also developing a Habitat Conservation Plan, and close coordination with Nye County representatives will facilitate a more efficient process of plan development and implementation that will complement the proposed actions of this HMP. Specific actions will be coordinated with the Clark County HCP Implementation and Monitoring Committee.

4.2.3 Non-governmental Organizations and Private Groups

The Nature Conservancy is a reviewer of this plan, and will be consulted for input on proposed actions during the development of this HMP. The Audubon Society will be a valuable resource for the development of a bird check-list for mesquite woodlands in southern Nevada. A variety of recreation user groups, including OHV groups, hunters, and recreational shooting groups, will be contacted when road designation and shooting restriction evaluations are conducted.

5.0 IMPLEMENTATION SCHEDULE

The implementation schedule below has been developed through fiscal year 2003 (Table 5-1). The project activities and agency responsibilities are identified, as well as the units of completion by reporting year. The schedule is dependent upon sufficient funding and availability of personnel. Thus, this schedule is subject to change.

Table 5-1. Project activity implementation for fiscal years 1999 through 2003.

Planned Actions	Agency	FY99	FY00	FY01	FY02	FY03
Monitor Phainopepla population density and breeding success at Moapa HMA	BLM/Nevada Division of Wildlife	X		X		X
Finish GPSing roads and produce GIS maps of roads in Pahrump HMA	BLM	X				
GPS roads in remaining HMAs	BLM		X			
Post and maintain "No Wood-cutting" and "No Dumping" signs at all 8 HMAs	BLM	X		X		X
Law Enforcement	BLM	X	X	X	X	X
Designation of roads and trails in Pahrump HMA	BLM		X			
Fencing at Pahrump HMA (materials and labor)	BLM/outside contractors		X	X	X	X
Establish and implement groundwater monitoring plan at Stewart Valley, Pahrump, Stump Spring, and Moapa HMAs	BLM	X	X	X	X	X
Restore 2 acres at Pahrump HMA dump clean-up sites	BLM	X				
Major dumpsite clean-up at Pahrump HMA	BLM/outside contractors	X		X		
Knapweed eradication at Pahrump HMA	BLM	X				
Saltcedar eradication at Stump Spring and Pahrump HMAs	BLM/Southern Nevada Restoration Team			X	X	X
Develop legal descriptions, calculate exact acreage, and create/produce GIS maps of areas within HMAs to be included in the land withdrawal petition/application	BLM	X				
Develop and implement monitoring plan for mesquite seedling establishment, growth, and survival at Moapa HMA	BLM/Nevada Division of Forestry	X	X	X	X	X
Develop Public Information and Education materials	BLM			X	X	
Develop and maintain Web Page	BLM		X	X	X	X
Install gabions at Stump Spring HMA	BLM		X		X	
Fence spring at Amargosa Flat HMA (if needed)	BLM			X		

6.0 COST SCHEDULE AND BENEFIT/COST ANALYSIS

6.1 Cost Schedule

The itemized costs for fulfilling and maintaining this HMP have been estimated through fiscal year 2003 (Table 6-1). The costs are separated by activity for each fiscal year. Project survey and design and National Environmental Policy Act compliance costs are included for all projects.

Table 6-1. Costs ($s in thousands) of implementing the Habitat Management Plan for fiscal years 1999 through 2003.

Planned Actions	FY99	FY00	FY01	FY02	FY03	Total
Monitor Phainopepla population density and breeding success at Moapa HMA	5		5		5	15
Finish GPSing roads and produce GIS maps of roads in Pahrump HMA	4					4
GPS roads in remaining HMAs		5				5
Post and maintain "No Wood-cutting" and "No Dumping" signs at all 8 HMAs	5		2		2	9
Law Enforcement	20	40	40	40	40	180
Designation of roads and trails in Pahrump HMA		10				10
Fencing at Pahrump HMA (materials and labor)		10				10
Establish and implement groundwater monitoring plan at Stewart Valley, Pahrump, Stump Spring, and Moapa HMAs	1	1	1	1	1	5
Restore 2 acres at Pahrump HMA dump cleanup sites	5					5
Major dumpsite cleanup at Pahrump	15		25			40
Knapweed eradication at Pahrump HMA		1			1	2
Saltcedar eradication at Stump Spring and Pahrump		7	7	7	7	28
Determine legal descriptions, calculate exact acreage, and create/produce GIS maps of areas within HMAs to be included in the land withdrawal petition/application	3					3
Develop and implement monitoring plan for mesquite seedling establishment, growth, and survival at Moapa HMA	5	15	2	2	2	26
Develop Public Information and Education materials			10	5	5	20
Develop and maintain Web Page		3	3	1	1	8
Install gabions at Stump Spring		15	10	10	10	45
Fence spring at Amargosa Flat HMA (if needed)			5			5
Total	63	107	110	66	74	420

6.2 Benefit/Cost Analysis

A comparison of benefit versus cost will not be analyzed because it is not possible to assign a monetary value on the benefit of maintaining biological diversity and protecting threatened, endangered, or sensitive species and rare plant communities. However, implementation of conservation measures that would prevent federal listing of a species is less expensive than attempting to manage for a species once it has been listed.

7.0 CONCURRENCE AND APPROVAL

This HMP as written meets with our concurrence and approval.

Prepared by:

Jeri K. Krueger, Wildlife Biologist	Date

Approved by:

Mike Dwyer, District Manager Las Vegas Field Office	Date

APPENDICES

Appendix I.

Location maps of Mesquite Woodland
Habitat Management Areas

1A. Moapa

1B. Amargosa Flat

1C. Stewart Valley

1D. Pahrump

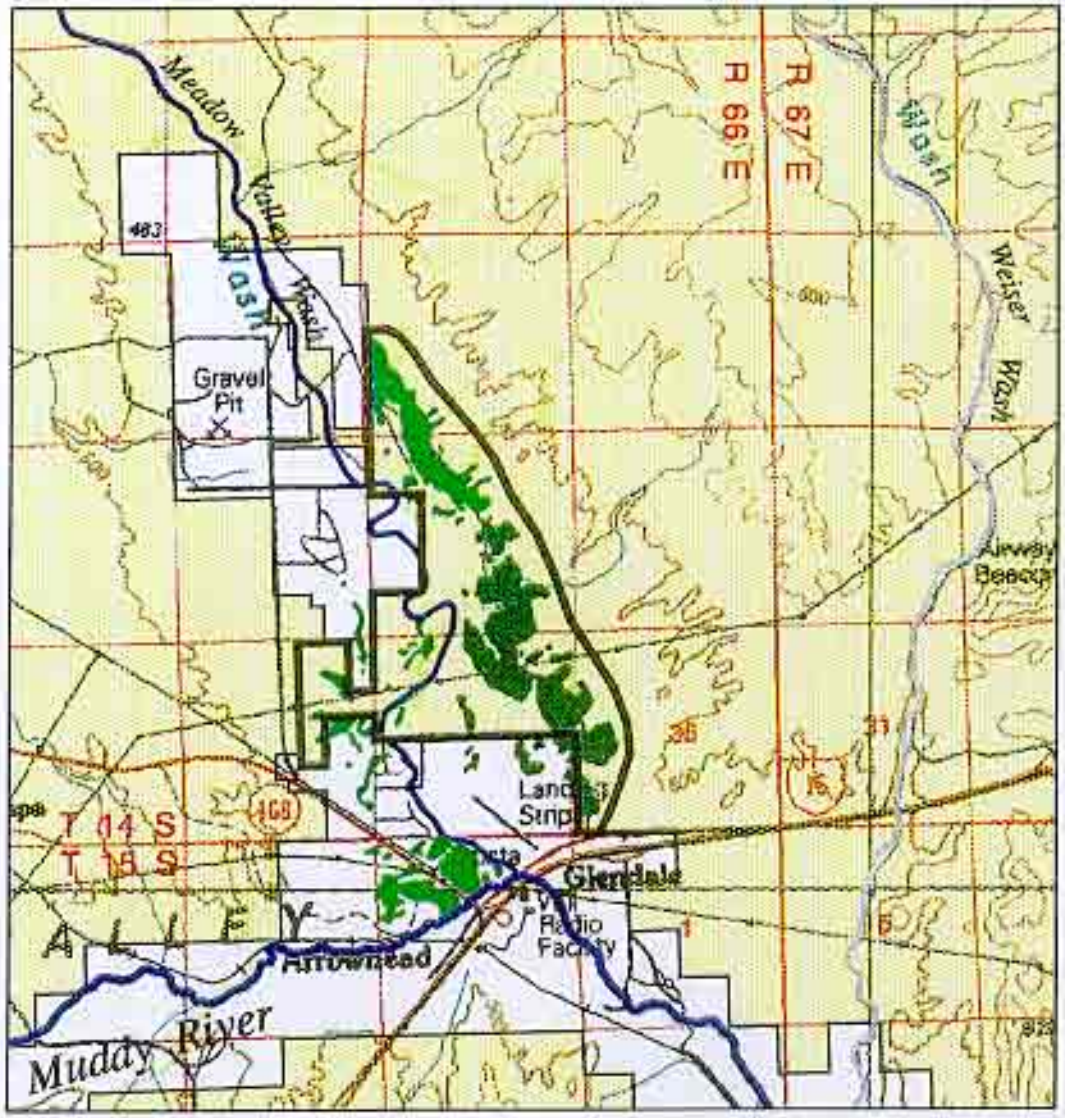
1E. Stump Spring

1F. Dry Lake

1G. Cactus Springs

1H. Sandy Valley

IA. Moapa HMA



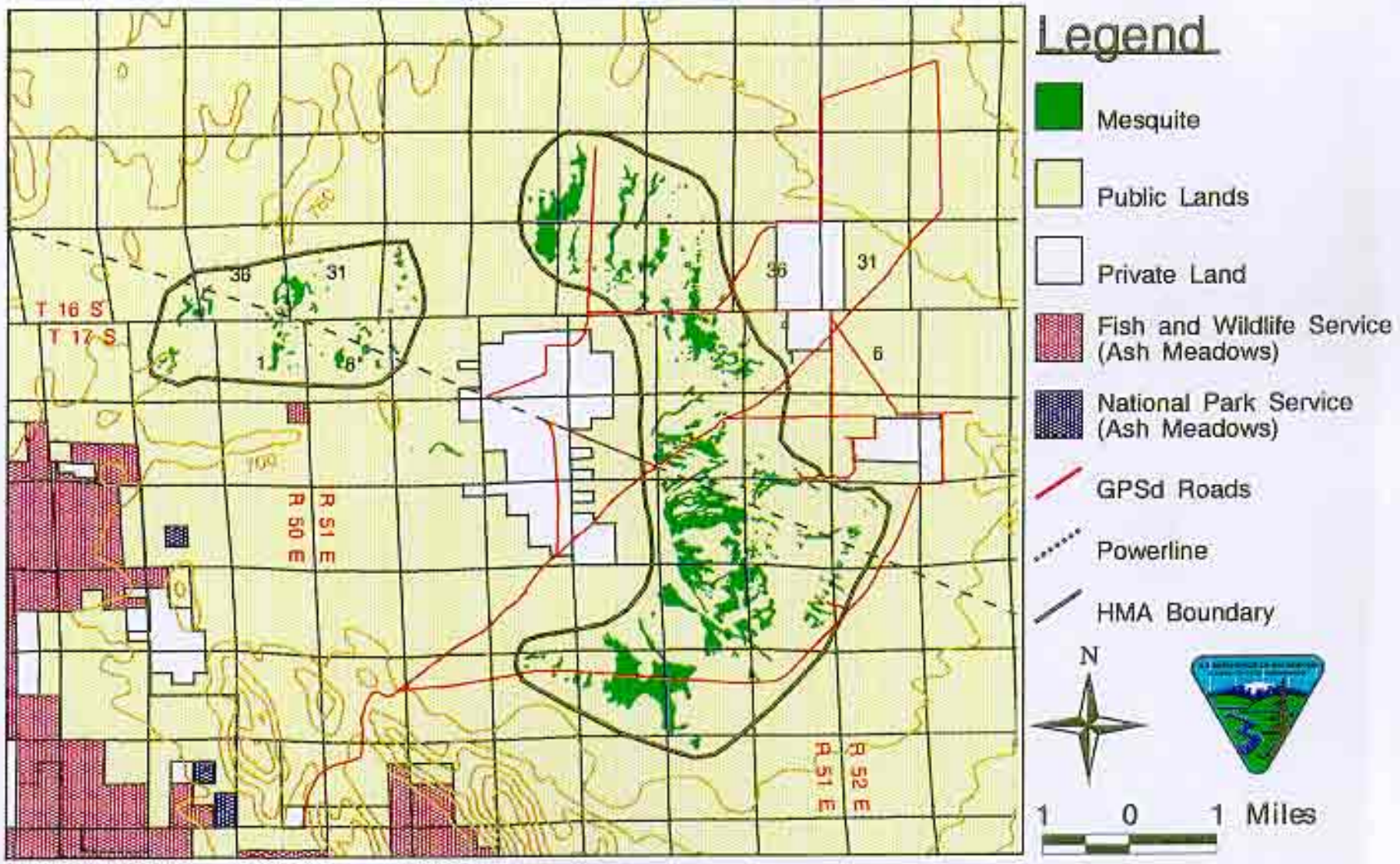
Legend

- Mesquite
- 1995 Mesquite Fire
- Public Lands
- Private Land
- Rivers and Washes
- HMA Boundary

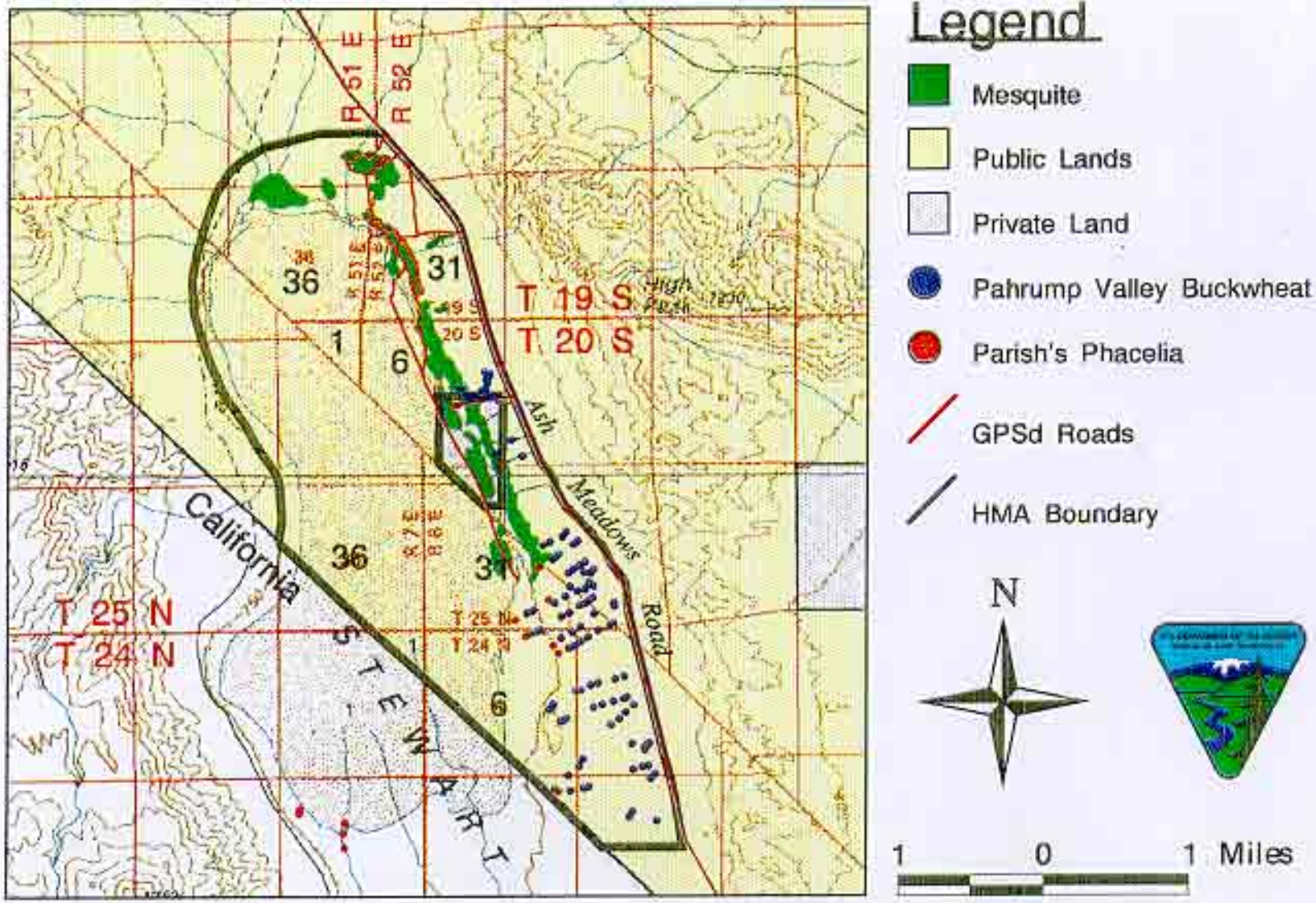
N

1 0 1 Miles

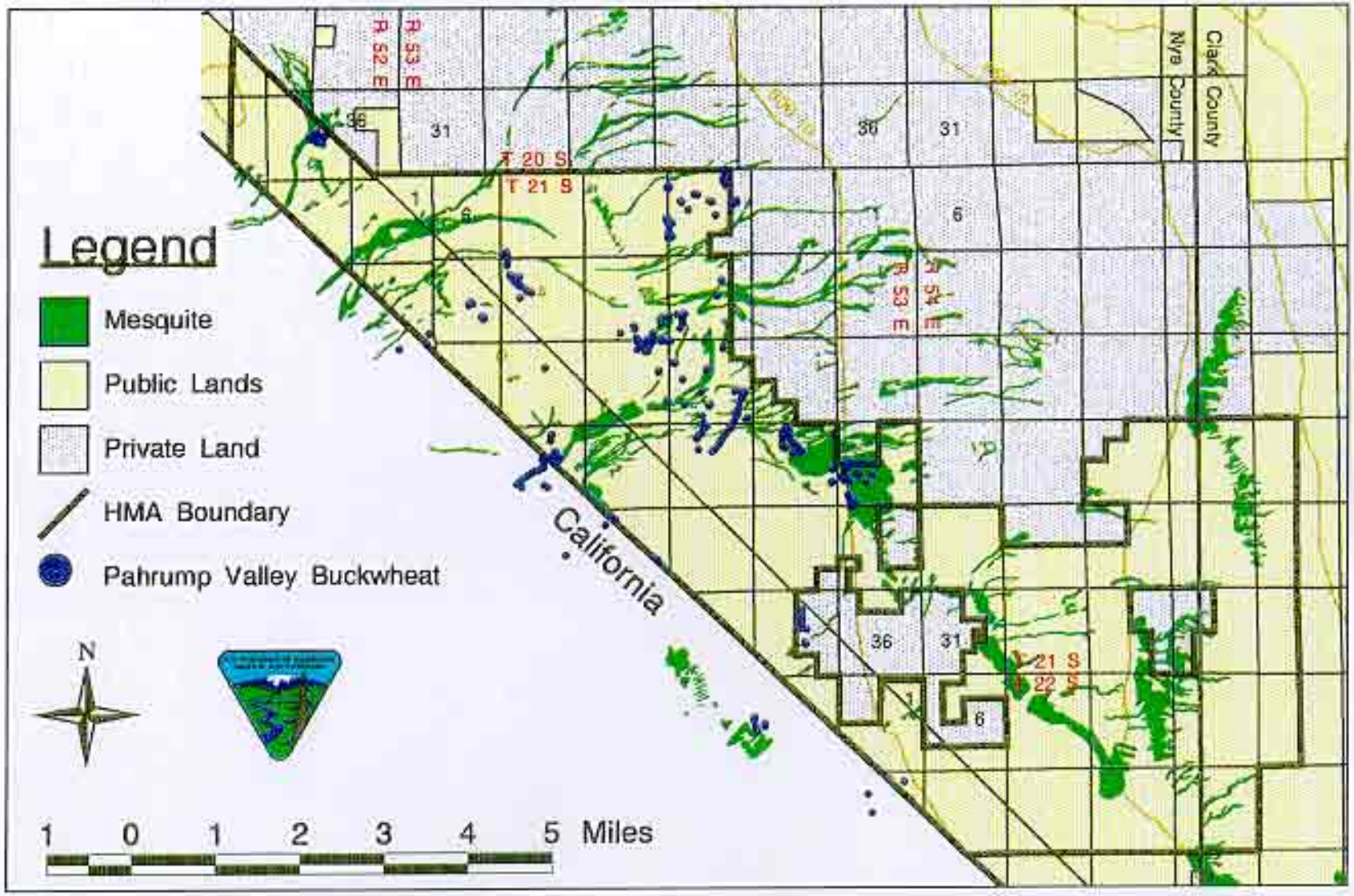
IB. Amargosa Flat HMA



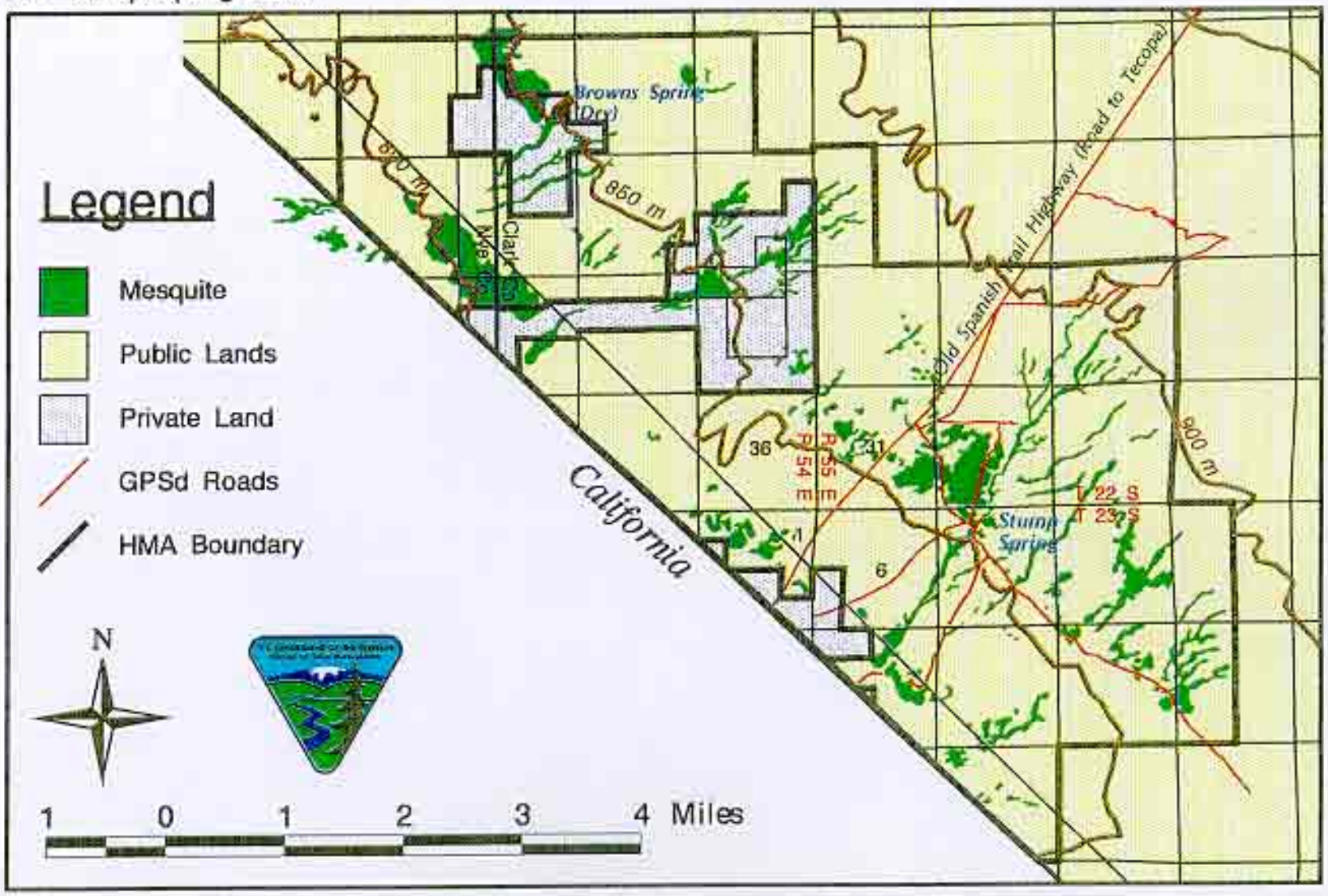
IC. Stewart Valley HMA



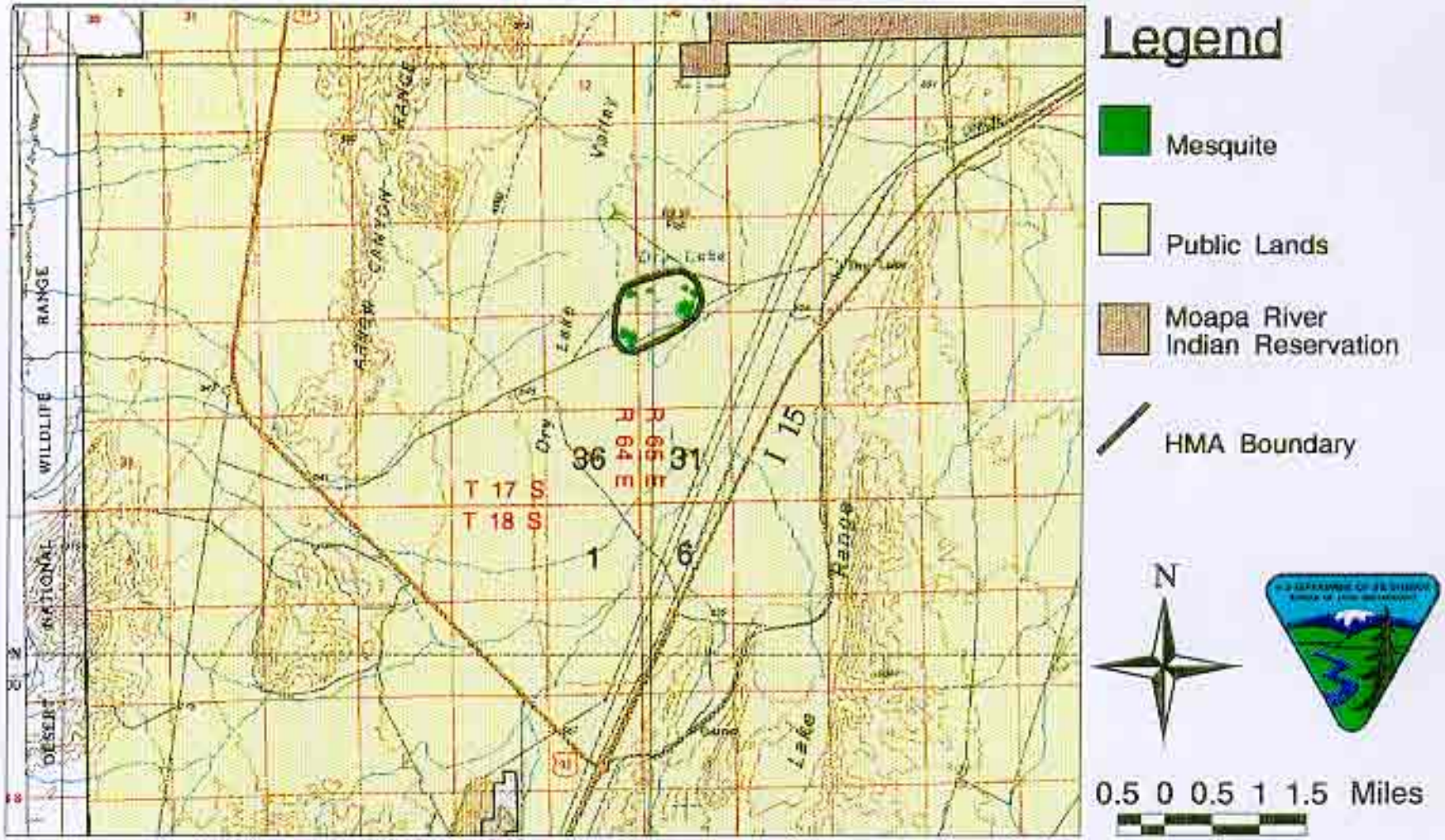
ID. Pahrump HMA



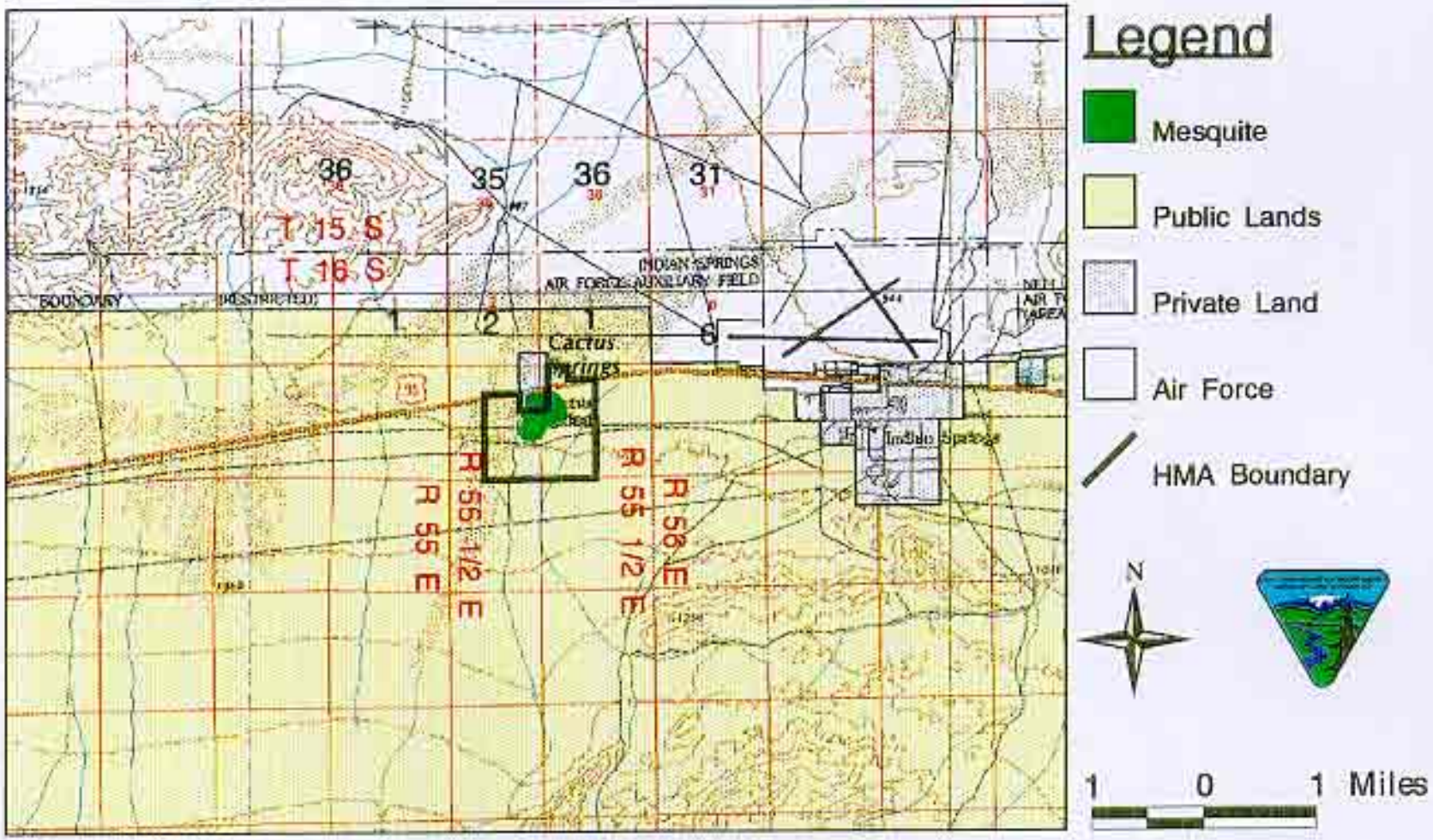
IE. Stump Spring HMA



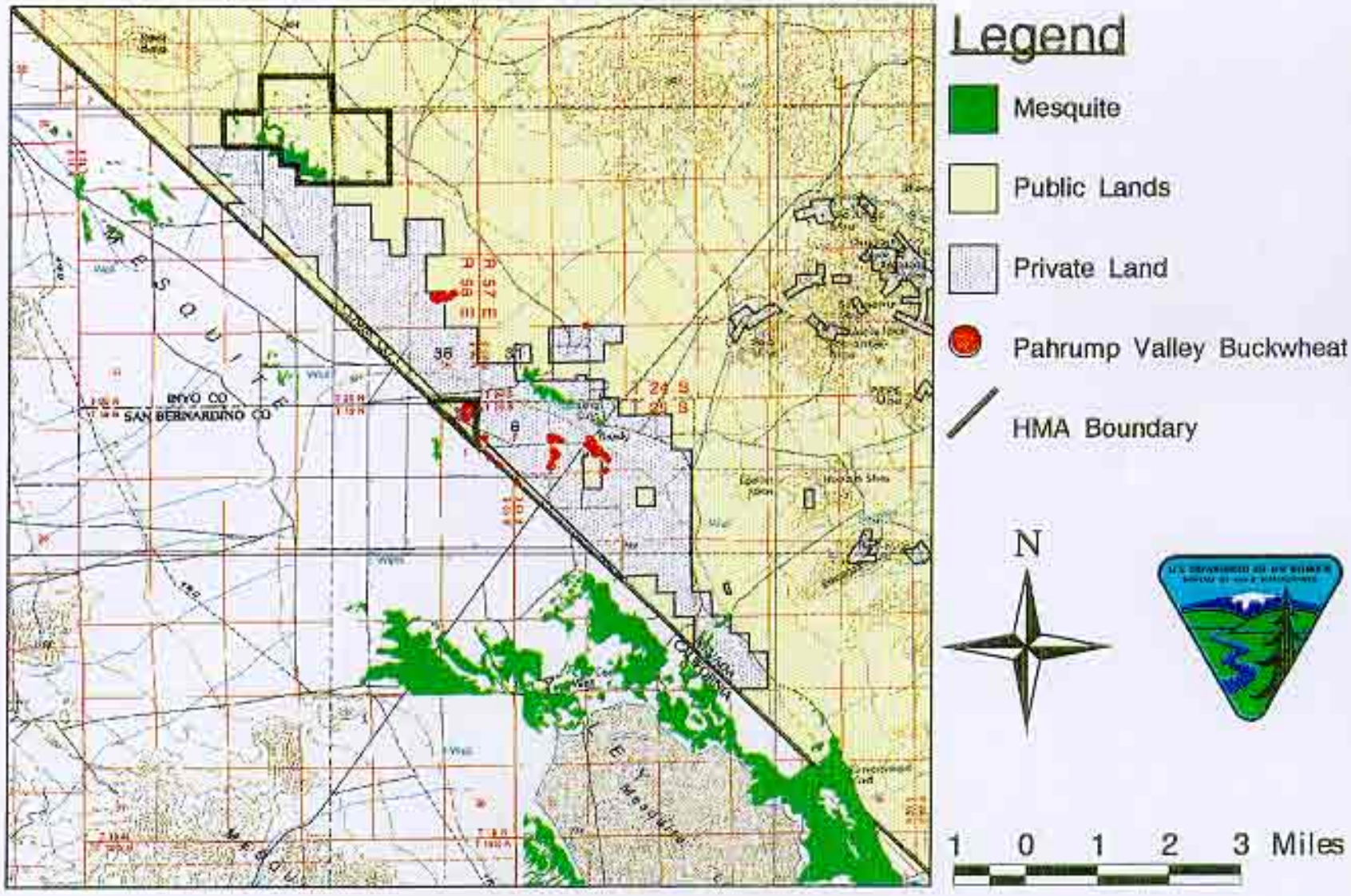
IF. Dry Lake HMA



IG. Cactus Springs HMA



IH. Sandy Valley HMA



Appendix II. List of avian species observed from February through June of 1996 and 1997 in four honey mesquite woodlands in southern Nevada.

Species	Code[a]	Year	MO[b]					PA[c]					SS[d]					SV[e]				
			Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun
Abert's Towhee	B	1996																				
Pipilo aberti		1997		X	X	X	X															
American Kestrel	R	1996												X	X						X	
Falco sparverius		1997																				
American Robin	B	1996																				
Turdus migratorius		1997	X	X	X								X								X	
Ash-throated Flycatcher	B	1996			X	X	X				X	X			X	X	X			X	X	X
Myiarchus cinerascens		1997	X	X	X	X	X			X	X		X			X	X		X		X	X
Bell's Vireo	M	1996																				
Vireo bellii		1997																			X	
Bewick's Wren	B	1996		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Thryomanes bewickii		1997	X	X					X	X	X	X		X	X	X	X	X	X	X	X	X
Black-headed Grosbeak	M	1996														X					X	
Pheucticus melanocephalus		1997																				

Species	Code[a]	Year	MO[b]					PA[c]					SS[d]					SV[e]				
			Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun
Black-tailed Gnatcatcher	B	1996			X	X			X				X	X	X	X	X		X	X		
Polioptila melanura		1997	X	X	X	X	X			X		X	X	X	X	X	X	X		X		
Black-throated Gray Warbler	M	1996			X																X	
Dendroica nigrescens		1997			X											X					X	
Black-throated Sparrow	B	1996				X		X	X	X	X	X	X	X	X	X	X			X	X	X
Amphispiza bilineata		1997						X	X	X	X	X	X	X	X	X	X		X		X	X
Blue Grosbeak	M	1996																				
Guiraca caerulea		1997				X																
Blue-gray Gnatcatcher	B	1996				X	X			X	X	X				X	X				X	X
Polioptila caerulea		1997			X	X					X	X		X	X					X	X	X
Brewer's Sparrow	E	1996			X	X	X			X	X									X		
Spizella breweri		1997			X	X					X				X							
Brown-headed Cowbird	B	1996				X	X				X	X				X	X				X	X
Molothrus ater		1997				X				X	X	X			X	X	X			X	X	X
Bullock's Oriole	M	1996																				
Icterus galbula bullockii		1997			X	X					X										X	
Cactus Wren	B	1996		X	X	X																
Campylorhynchus brunneicapillus		1997		X																		

Species	Code[a]	Year	MO[b]					PA[c]					SS[d]					SV[e]				
			Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun
Chipping Sparrow	M	1996																				
Spizella passerina		1997				X																
Common Nighthawk	B	1996									X											
Chordeiles minor		1997										X										
Common Raven	B	1996		X	X	X			X	X	X	X	X		X							
Corvus corax		1997	X				X	X	X	X	X	X			X	X		X				
Cooper's Hawk	R	1996													X							
Accipiter cooperi		1997																				
Crissal Thrasher	B	1996					X					X	X	X	X	X	X					
Toxostoma crissale		1997	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X
Dark-eyed Junco (Oregon subspecies)	W	1996	X																			
Junco hyemalis oreganus		1997	X		X				X													
Dark-eyed Junco (Gray-headed subspecies)	W	1996																				
Junco hyemalis caniceps		1997		X																		
Empidonax Flycatcher	M	1996				X	X				X										X	X
Empidonax spp.		1997			X	X	X				X		X		X							
Gambel's Quail	B	1996	X			X				X	X	X		X	X	X	X			X	X	X
Callipepla gambelii		1997		X	X	X	X			X	X	X	X	X	X	X	X				X	

Species	Code[a]	Year	MO[b]					PA[c]					SS[d]					SV[e]				
			Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun
Golden Eagle	R	1996							X													
Aquila chrysaetos		1997																				
Gray Vireo	M	1996																				
Vireo vicinior		1997				X																
Great Horned Owl	B	1996											X									
Bubo virginianus		1997								X	X											
Greater Roadrunner	E	1996		X	X	X	X					X							X	X		X
Geococcyx californianus		1997	X								X			X		X					X	
Hermit Warbler	M	1996																			X	
Dendroica occidentalis		1997																				
House Finch	B	1996	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X
Carpodacus mexicanus		1997	X	X	X	X	X		X	X			X	X	X				X	X	X	X
Ladder-backed Woodpecker	B	1996			X	X																
Picoides scalaris		1997					X															
Lark Sparrow	B	1996									X	X										
Chondestes grammacus		1997				X					X	X										
Lesser Nighthawk	B	1996				X	X															
Chordeiles acutipennis		1997				X	X															

Species	Code[a]	Year	MO[b]					PA[c]					SS[d]					SV[e]				
			Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun
Loggerhead Shrike	B	1996																				
Lanius ludovicianus		1997								X							X					
Long-eared Owl	B	1996																	X	X		
Asio otus		1997																				
Lucy's Warbler	B	1996			X	X	X			X		X				X				X	X	X
Vermivora luciae		1997		X	X	X	X		X	X	X								X	X	X	X
MacGillivray's Warbler	M	1996				X					X											
Oporornis tolmiei		1997				X																
Mourning Dove	B	1996			X	X	X			X	X	X			X	X	X			X	X	X
Zenaida macroura		1997	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X
Northern Flicker (Red-shafted race)	B	1996	X	X	X														X			
Colaptes auratus		1997	X			X	X															
Northern Mockingbird	B	1996	X	X	X	X	X		X		X	X							X	X	X	X
Mimus polyglottos		1997				X				X	X				X							X
Olive-sided Flycatcher	M	1996																				
Contopus borealis		1997																			X	
Orange-crowned Warbler	M	1996								X												
Vermivora celata		1997																				

Species	Code[a]	Year	MO[b]					PA[c]					SS[d]					SV[e]				
			Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun
Phainopepla	B	1996	X	X	X	X	X				X	X							X		X	X
Phainopepla nitens		1997	X	X	X	X	X	X	X	X			X	X	X	X	X					
Red-tailed Hawk	R	1996																				
Buteo jamaicensis		1997			X										X							
Ruby-crowned Kinglet	W	1996			X									X	X				X	X		
Regulus calendula		1997		X						X								X				
Sage Sparrow	W	1996													X							X
Amphispiza belli		1997		X						X								X				
Sage Thrasher	W	1996	X	X	X			X			X							X	X			
Oreoscoptes montanus		1997																				
Say's Phoebe	E	1996									X											X
Sayornis saya		1997											X			X						
Sharp-shinned Hawk	B	1996																				
Accipiter striatus		1997			X		X								X					X		
Solitary Vireo	M	1996			X	X					X					X					X	
Vireo solitarius		1997																				
Spotted Towhee	M	1996											X									
Pipilo maculatus		1997																				

Species	Code[a]	Year	MO[b]					PA[c]					SS[d]					SV[e]				
			Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun
Townsend's Warbler	M	1996									X					X					X	
Dendroica townsendi		1997														X					X	
Turkey Vulture	R	1996		X		X	X		X													
Cathartes aura		1997			X					X		X										
Verdin	B	1996		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X
Auriparus flaviceps		1997	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X
Virginia's Warbler	M	1996				X																
Vermivora virginiae		1997																				
Warbling Vireo	M	1996				X										X					X	X
Vireo gilvus		1997				X																
Western Bluebird	W	1996	X					X														
Sialia mexicana		1997	X						X													
Western Kingbird	B	1996			X	X					X					X					X	X
Tyrannus verticalis		1997				X																
Western Tanager	M	1996				X	X				X					X					X	X
Piranga ludoviciana		1997																				
Western Wood-pewee	B	1996									X											X
Contopus sordidulus		1997					X									X					X	

Species	Code[a]	Year	MO[b]					PA[c]					SS[d]					SV[e]				
			Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun	Feb	Mar	Apr	May	Jun
White-crowned Sparrow	W	1996	X	X	X	X			X	X			X	X				X	X	X		
Zonotrichia leucophrys		1997	X	X	X			X	X				X	X	X						X	
Wilson's Warbler	M	1996				X				X	X					X					X	X
Wilsonia pusilla		1997				X										X					X	
Yellow Warbler	M	1996																				
Dendroica petechia		1997				X					X										X	
Yellow-breasted Chat	B	1996				X	X				X					X						X
Icteria virens		1997									X											
Yellow-rumped Warbler (Audubon's race)	M	1996																		X		
Dendroica coronata		1997				X													X		X	

[a] B = Breeding; E = Edge; M = Migrating; R = Raptor; W = Wintering.
[b] Moapa.
[c] Pahrump.
[d] Stump Spring.
[e] Stewart Valley.

Appendix III.

Reptile species known to occur within and adjoining to Mesquite Woodland Habitat Management Areas in Southern Nevada*

Lizards

Banded Gecko	*Coleonyx variegatus*
Chuckwalla	*Sauromalus obesus*
Collared Lizard	*Crotaphytus insularis*
Desert Iguana	*Dipsosaurus dorsalis*
Horned Lizard	*Phrynosoma platyrhinos*
Leopard Lizard	*Gambelia wislezenii*
Night Lizard	*Xantusia vigilis*
Side-blotched Lizard	*Uta stansburiana*
Spiny Lizard	*Sceloporus magister*
Whiptail Lizard	*Cnemidophorus tigris*
Zebra-tailed Lizard	*Callisaurus draconoides*

Snakes

California King Snake	*Lampropeltis getulus*
Coachwhip (Red Racer)	*Masticophis flagellum*
Glossy Snake	*Arizona elegans*
Gopher Snake	*Pituophis melanoleucus*
Leaf-nosed Snake	*Phyllorhynchus decurtatus*
Long-nosed Snake	*Rhinocheilus lecontei*
Mojave Rattlesnake	*Crotalus scutulatus*
Night Snake	*Hypsiglena torquata*
Panamint Rattlesnake	*Crotalus mitchellii*
Shovel-nosed snake	*Chionactus occipitalis*
Sidewinder	*Crotalus cerastes*

* The above information was obtained from records of commercial reptile collectors held at the Nevada Division of Wildlife. The Nevada Division of Wildlife cannot guarantee the accuracy of the above data.

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APPENDIX E

Upper Muddy River Site Conservation Plan
Clark County, Nevada

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INTRODUCTION

In response to a request from Clark County, The Nature Conservancy (TNC) has developed a conservation plan for the upper Muddy River to inform conservation work by landowners, non-governmental entities, and county, state and federal agencies. The aim of this plan is to define the biological systems (i.e. conservation priorities), identify the stresses and sources of stress (=threats) on these systems, and identify possible strategies to address these threats. This plan also identifies priority segments for conservation and makes recommendations regarding possible sites for river restoration. All landowner participation will be predicated upon a voluntary or willing seller basis.

OVERVIEW

This report focuses on the upper watershed of the Muddy River, upstream of the I-15 bridge or approximately 14 miles of the Muddy River. This area is better known as the upper Moapa Valley. The upper section of the Muddy River is one of the most biologically rich areas in Nevada, providing habitat for 4 rare and endemic fish species, 7 species of rare invertebrates, and a unique assemblage of Mojave Desert riparian vegetation. Of particular concern is the endangered Moapa dace, a State and Federally protected fish that lives in the headwaters. This plan's scope was largely determined by the distribution of the rare fishes and their related riparian corridor of the upper watershed. The rare and significant species in the upper Muddy River are given in Table 1. All maps are presented as figures in Appendix A.

Location

The upper Muddy River lies approximately 60 miles northeast of Las Vegas, in Clark County, Nevada (Figure 1). The Muddy River begins as a series of thermal springs in the upper Moapa Valley and flows 32 miles (40 km) before reaching Lake Mead. Prior to the construction of Hoover Dam, the Muddy River flowed into the Virgin River just upstream of the confluence of the Virgin and Colorado Rivers.

Table 1. Upper Muddy River Priority Conservation Species

Common Name	Legal Status*	Scientific Name
Moapa dace	LE	*Moapa coriacea*
Virgin River chub	SOC	*Gila seminuda*
Moapa speckled dace	SOC	*Rhinichthys osculus moapae*
Moapa White River springfish	SOC	*Crenichthys baileyi moapae*
western least bittern	PIF	*Ixobrychus exilis hesperis*
yellow-billed cuckoo	CC	*Coccyzus americanus*
southwestern willow flycatcher	LE	*Empidonax traillii extimus*
Bell's vireo	SOC	*Vireo bellii*
Crissal thrasher	CC	*Toxostoma dorsale*
Phainopepla	SOC	*Phainopepla nitens*
yellow-breasted chat	PIF	*Icteria virens*
Abert's towhee	PIF	*Pipilo abertia*
blue grosbeak	CC	*Guiraca caerulea*
Moapa Warm Springs riffle beetle	SOC	*Stenelmis calida moapa*
naucorid bug	none	*Usingerina moapensis*
Amargosa naucorid	SOC	*Plecoris shoshone shoshone*
Moapa pebblesnail	SOC	*Pyrgulopsis avernalis*
Moapa water strider	none	*Rhagovelia beckii*
grated tryonia	SOC	*Tryonia clathrata*
water bug	none	*Limnocoris moapensis*
elmid beetle	none	*Microcylloepus moapensis*

- LE= Federally listed as Endangered; SOC = Federal Species of Concern; CC = Clark County MSHCP; PIF = Partner's in Flight; none = narrow endemics with no agency status, but of concern to TNC

Geography

The upper Muddy River lies in deeply cut, old alluvial fans and lacustrine sediments that form the surrounding bench lands. Uplands consist of sloping alluvial fans leading to steep, rocky mountains. The river is bounded by the Arrow Canyon Range at the headwaters, and a series of small ridges of Quaternary alluvium along the upper reaches of the project area. The river lies entirely within the Mojave Desert. Elevation ranges from 1520 to 1800 feet.

Climate

Moapa Valley experiences an arid climate typical of the Mojave Desert: long, hot summers, with short, mild winters. Temperatures during summer months are in excess of 100°F. Evaporation rates are high, while humidity is low. Precipitation averages 5 inches per year, falling as rain. Snow is rare.

Hydrology

The Muddy River is a remnant of the great Pluvial White River system that historically spanned nearly 200 miles from east-central Nevada to the Colorado River (La Rivers 1962). The White River was once a flowing stream, but now is discontinuous over most of its length. Starting with its upper reaches at Preston and Lund (in central Nevada), there is restricted surface flow for nearly 40 miles, then a dry channel until the springs in the vicinity of Pahranagat. From Pahranagat, there are 35 miles of dry channel through Coyote Spring Valley, then surface waters resume at Warm Springs in the upper Moapa Valley.

The Muddy River's surface flow originates from the discharge of over 20 springs at Warm Springs. The discharge is thermal and clear. Flow is constant. Average annual discharge is 36,000 ac-ft. Temperatures at the springs range from 86 to 89°F (29 to 32°C). Flash floods are sporadic, highly variable, and contribute only ephemerally to the Muddy River flow. The Muddy River's waters are used for agricultural irrigation, as well as domestic and industrial uses. Waters are removed by surface diversion or wells.

For purposes of river conservation, the riparian corridor has been defined by BLM as the 100-year floodplain, and mapped using geomorphic and wetland indicator species (Figure 1). Down cutting appears to have altered bank morphology dramatically, especially downstream from the Warm Springs bridge (USGS weir) to I-15.

Current Land Use

Most of the project area is under County jurisdiction with 2 local town advisory boards at Moapa and Glendale. Based on the 1994 county land use plan, private land zoning is rural agricultural (over 1300 ac), low density residential (under 100 ac), commercial-tourist (2.5 ac), industrial (40 ac), mineral use (46 ac), and public facilities (20 ac). Zoning emphasis in the upper Moapa Valley is on a rural, agricultural lifestyle. Over 71,000 acres are owned by the Moapa Piute tribe. Public lands surround the project area and are administered by the BLM. The floodplain covers roughly 7,700 acres in the project area, intersecting 219 parcels, with 96 owners. All private parcels that intersect the upper Muddy River floodplain are shown in Figure 2.

CONSERVATION SYSTEMS and TARGETS

Conservation planning requires an understanding of the priority conservation targets for each site, including the natural processes that maintain them. Targets are typically based on occurrences of important rare species, ecological communities or larger groupings of these. On the upper Muddy River, identification of conservation targets focused on 1) viable, vulnerable rare and endangered species of plants or animals, 2) species of special concern due to declining numbers, disjunct distribution, or regional endemism, 3) viable ecological communities, and 4) assemblages of ecological communities or systems. Input on priority targets came from state, federal and non-

governmental entities, and was guided by the Clark County MSHCP (Draft MSHCP 1999) and the US Fish and Wildlife Service (FWS) (1999). Priority conservation targets for the upper Muddy River are given in Table 2.

Table 2. Upper Muddy River Priority Conservation Targets

Warm Spring Aquatic Assemblage

Moapa dace, Moapa White River springfish, Moapa pebblesnail, grated tryonia, Moapa water strider, Moapa turban snail, Moapa Warm Springs riffle beetle, Amargosa & Moapa naucorids

Muddy River Aquatic Assemblage

Virgin River chub, Moapa speckled dace, Moapa water strider,

Riparian Woodland

Riverine birds – yellow-billed cuckoo, vermilion flycatcher, blue grosbeak

Riparian Shrubland

southwestern willow flycatcher, phainopepla, Bell's vireo, Crissal thrasher, loggerhead shrike, yellow-billed cuckoo, blue grosbeak, desert pocket mouse

Riparian Marsh

Marsh birds – green-backed heron, white-faced ibis, ducks, geese, shorebirds, songbirds
Amphibians - relict leopard frog, red-spotted toad, Southwestern toad, Woodhouse toad

Mesquite Bosque

phainopepla, vermilion flycatcher, southwestern willow flycatcher, summer tanager, Bell's vireo, Crissal thrasher, loggerhead shrike

Ecological communities can be defined using a variety of classification schemes. In this plan, individual plant communities are recognized based on conditions of health and restoration potential, along with traditional ecological definitions (Sawyer and Keeler-Wolf 1995). For example, fan palm woodland occurs at the headwaters of the Muddy River and transitions into ash-willow-cottonwood forests more typical of meandering streams. Both of these riparian types function differently and would likely require different restoration strategies.

Assemblages are aggregations of community types and/or species that share a common set of sustaining ecological processes. The priority conservation targets selected as the focus for site planning should represent the entire array of communities and species, and when taken together, identify the patterns and processes necessary to conserve the integrated landscape. Thus, the aquatic fauna were aggregated into 2 assemblages based on the habitat partitioning of the species: thermophiles (warm water loving species) in the warm springs aquatic assemblage and cool water species in the river assemblage.

Six priority conservation targets have been identified for the upper Muddy River: 1) Warm Springs aquatic assemblage, 2) Muddy River aquatic assemblage, 3) riparian woodland, 4) riparian shrubland, 5) mesquite bosque, and 6) riparian marsh and are depicted in Figures 3 and 4.

1. Warm Springs Aquatic Assemblage – includes the aquatic elements from the spring heads and outflow streams to their confluence with the upper Muddy River (Figure 3), approximately 3.5 miles distant. The Warm Springs aquatic assemblage occurs mainly in the headwaters of the river, downstream to approximately river mile 31 or the USGS Wier at the Warm Springs Road bridge. Spring flows are constant in quantity and quality (both physical and chemical). Water at the springs emerges at a temperature of 86-89°F (30 to 32° C) and slowly cools as it flows to the main stem of the river. Water is typically crystal clear, with variable flow rates over a variety of substrates.

   Native fauna include a number of endemics such as Moapa dace, White River springfish, and several geographically limited invertebrates including Moapa pebblesnail, grated tryonia, Warm Springs riffle beetle, Amargosa naucorid and Moapa naucorid. The fishes are thermophilic, using the springs for reproductive periods, with young eventually moving into river segments for protection and foraging (Scoppettone et al. 1992). The invertebrates occupy a variety of habitat niches in the clear, thermal water (Sada & Herbst 1999). This headwater area is critical for the life cycle of Moapa dace.

2. Muddy River Aquatic Assemblage -- includes the main stem of the Muddy River below the confluence of the multiple spring-fed streams (defined in target #1 above) to the I-15 bridge, river miles 32 to 20.7 (Figure 3). Water flow is constant in quantity. Clarity is moderately clear to highly silted following significant precipitation events or livestock-related substrate disturbance, and land-clearing

activities on the floodplain. Substrates vary from fine silty mud to sand, gravel, cobbles, and boulder riffles.

Native aquatic fauna includes Virgin River chub, Moapa speckled dace and Moapa water strider. These species are non-thermophilic, preferring cooler downstream temperatures. Moapa dace occur in the main stem, but are in limited numbers. Aquatic vegetation includes occasional large beds of pondweed (*Potamogeton* sp.).

3. Riparian Woodland – is composed of two woodland types: evergreen fan palms and deciduous ash-willow-cottonwood. Fan palm woodland occurs as monotypic stands at the spring sources and is dominated by *Washingtonia filifera,* a 25 – 30 foot tree. At the springs, there are few native understory species in the fan palm community. Largely confined to the springs, this apparently naturalized population has been extending slowly into the main stem and lower reaches of the Muddy River. There is concern that the palms will become a nuisance species, and like salt-cedar, displace native plants and fauna dependent upon the mixed riparian vegetation. Few species rely on the palm woodland as habitat.

   The deciduous ash-willow-cottonwood woodland is the presumed natural suite of trees and shrubs for the Muddy River. Currently this vegetation occurs along the upper streams surrounding the Warm Springs and Muddy River aquatic assemblages (Figure 4), but downstream of the fan palms. Dominant trees occurring in the floodplain are a mixture of velvet ash (*Fraxinus velutina*), Goodding willow (*Salix gooddingii*), and Fremont cottonwood (*Populus fremontii*). Trees are 10 – 25 m tall, with variability in canopy gaps. Regeneration is evident. The shrub layer is dominated by small willows, grading into more xeric Acacia - Mesquite. Shrubs include quail bush (*Atriplex lentiformis*), wolfberry (*Lycium torreyi*), seep-willow (*Baccharis salicifolia*), arrow weed (*Pluchea sericea*), and mesquite (*Prosopis glandulosa, P. pubescens*).

   The existing deciduous riparian woodland community is small in size and reduced in complexity, or has been removed by agricultural, industrial, and residential activities. Along the entire river, from the headwaters to the I-15 bridge, salt-cedar (an exotic tree) varies from a dominant species to lesser dominance. In some reaches of the river, salt-cedar has significantly (negatively) impacted the riparian corridor by displacing all native vegetation. The deciduous riparian woodland is an important habitat for neotropical migratory and resident birds, e.g. southwestern willow flycatcher, crissal thrasher, Bell's vireo, yellow-breasted chat, blue grosbeak, etc.

   The pre-European riparian vegetation for this site is not well-documented, but is presumed to have been a mosaic of ash-willow-cottonwood, interspersed with mesic shrublands, bosques, and marsh habitats. The fan palm oasis has been reported as a non-native, naturalized grove (Cornett 1988), but conflicting

arguments abound (e.g. Dorris 1999). Archeological papers (Harrington 1929) and early Mormon chronicles (Hafner 1967 and Kimball 1988) state that palms and cottonwoods were planted by the settlers and are not native to the area. Reports by explorers and biologists in the early part of this century describe riparian habitat, e.g. in relation to fish species (Hubbs and Miller 1948a, 1948b), but do not mention fan palms. Clear historic records or photodocuments of the native riparian vegetation are lacking. Native American records of the riparian vegetation are not known. Assumptions about the local "potential climax" vegetation are based on current tree regeneration, analagous models for small spring systems in the Sonoran and Mojave deserts (e.g. Stromberg 1991, 1993; Richter 1992) and historic documents. Unanswered issues related to the target riparian woodland community are addressed in Recommendations: Basic research needs and monitoring section (p. 21).

4. Riparian Shrubland -- occurs as patches along exposed stream banks of the Muddy River (Figure 4). This shrubland is found in seasonally or permanently flooded wetlands along irrigation ditches, streamside, and at margins of springs. Stands of shrubs may form mosaics related to salinity or moisture gradients and/or height above the floodplain. The shrub layer includes quail bush, wolfberry, seep-willow, arrow weed, and young mesquite saplings. This shrubland is often invaded and eventually replaced by salt-cedar.

5. Mesquite bosque -- is a naturally occurring woodland community on a variety of sites from mesic to xeric uplands. Mesic sites include upper floodplain terraces, stream banks, alkali sinks, and ephemeral washes (Figure 4). Mesquites have extensive root systems and can extract ground water to surprising depths. However, they grow best where water tables are shallow. This dense woodland is dominated by small, deciduous trees, up to 5m tall. Typically, honey mesquite (*Prosopis glandulosa*) and screwbean mesquite (*P. pubescens*) are the dominant trees. Some acacia (*Acacia greggii*) is present. The understory is dominated by a layer of shrubs including seep-willow, desert willow (*Chilopsis linearis*), alkali goldenbush (*Haplopappus acradenius*), matchweed (*Gutierrezia* sp.) and succulents (*Opuntia* sp.). The herbaceous layer is sparse, annuals are seasonal. On the upper Muddy River, this woodland occurs on terraces from the I-15 bridge upstream to the spring sources. Mesquite bosque is a key habitat for phainopepla (Anderson & Ohmart 1978, Krueger 1999, Walsberg 1975), Lucy's warbler and verdin, along with neotropical migrants and other native bird species.

6. Riparian Marsh -- occurs on seasonally or perennially flooded soils. Stands form marshes and meadows on lowlands, seeps and saturated swales. The canopy is typically continuous and less than 0.5 m tall. Dominant plants are one or more sedges (*Carex, Eleocharis, Juncus*), along with cattail (*Typha* sp.), yerba mansa (*Anemopsis californica*), paintbrush (*Castilleja* sp.), and graminoids. These marshes require seasonally to permanently saturated soils.

Riparian marsh has been highly disturbed with little of it's former acreage remaining (Figure 4). These marsh sites are currently restricted to remnants along the Apcar and Refuge streams in the headwater vicinity and the lower reaches near Glendale. Although small in area, the marshes are crucial habitats for wetland birds, including western least bittern, rails, marsh wren, white-faced ibis, as well as various other marsh species.

OVERALL ASSESSMENT OF THREATS

Threat analysis is composed of two areas, stresses and sources of stress, that are currently operating or are anticipated in the near future. While every natural system is subjected to various disturbances, for planning purposes we consider only those stresses that result in destruction, degradation, or impairment of a target system. A composite list of stresses occurs in Appendix B. Most stresses are caused by incompatible human uses of land, water and natural resources or indirect human causes that are exacerbated by natural phenomena. Stresses were identified for each target system and ranked as very high, high, medium or low. The relative seriousness of a stress is considered a function of 1) severity of damage – total destruction to slight impairment, 2) scope of damage – pervasive or localized, and 3) duration or irreversibility of damage – permanent or short-term.

For each stress afflicting a natural system there are one or more causes or sources of the stress. To determine sources of stress, one must ask "What is causing the destruction, degradation, or impairment of the priority target?" Most sources of stress are rooted in incompatible uses of land, water, and natural resources at a given site. A list of sources of stress occurs in Appendix C. It is important to precisely identify the current or most recent sources that are responsible for the high ranking stress(es) on a target, as well as those that are most urgent. Each different source of stress often requires a different strategy for abatement. The seriousness of a source of stress was ranked (very high to low) for 1) degree of contribution- is it very large or less, 2) duration or irreversibility – can it be removed or changed, and 3) urgency – will impacts be manifested immediately or is it a future risk?

Characterizing the stress(es) and their source(s) is the basis for identifying critical threats. Sources that rank "very high" represent critical threats. Thus, for taking corrective action, the source becomes the focus of abatement strategies. In cases where it is not feasible to abate a source, then restoration strategies may be considered to maintain, enhance, or restore the priority system. This threats analysis is a methodology designed and utilized by TNC on conservation lands nationwide. The threats analysis for the priority target systems on the upper Muddy River was performed by TNC – NV staff and appears in Appendix D.

The most critical threats (=very high) identified for the upper Muddy River corridor are 1) incompatible land development, 2) reduction in the regional aquifer, and 3) introduction and/or spread of invasive species, particularly tilapia, fan palms, and salt-

cedar. These critical threats are both current (numbers 1 and 3) and a future risk (numbers 2 and 3).

Incompatible land development was ranked high to very high for all 6 priority target systems. It includes disturbances that fragment or destroy habitat, that directly destroy the biota, or alter chemical habitat. Habitat destruction comes from building of structures, roadways, watercourses, and/or utility corridors that alter the physical connections on the land. Typically, incompatible land development in the project area included development of private housing, commercial, and recreational facilities in the aquatic and riparian habitat. Direct loss of biota includes clearing of native vegetation, i.e. the direct removal of trees and shrubs for fire protection, landscaping, planting of orchards or crops, or creation of pasture land. Landscaping species have become problematic after they escape cultivation and invade native habitats, e.g. Russian olive. Newly cleared land becomes introduction points for weedy species, e.g. Russian knapweed and yellow star-thistle, that hitch-hike on tractor tires and earth-moving machinery. Such nuisance species can become costly to manage or eliminate. Altered chemical habitat, e.g. the introduction points for harmful chemicals such as chlorine from swimming pools or biocides (pesticides, herbicides) used in reduction/elimination of pests surrounding homes and in agricultural practices, directly impacts aquatic and riparian species.

Most of these impacts have been historical and were the target of abatement strategies of the past. In the future, development in the floodplain should be considered on a case-by-case basis, with an emphasis on protection of the aquatic and riparian resources. While land development (agriculture, irrigation, or grazing) may be allowable, use of landscaping species and biocides may be limited. For parcels above the floodplain, compatible development would include any legal use that does not lead to an unsustainable local or regional aquifer, accelerate siltation and downcutting of the streambed, or become a point of introduction for pollutants.

Reduction or drawdown in the regional aquifer is a critical threat because the impacts, especially cumulative impacts of upstream withdrawals, would directly affect discharge rates at the springs. Based on USGS models (Prudic et al 1993, Schaefer and Harrill 1995), currently proposed reductions in the regional aquifer would stand to devastate the Muddy River within a 5-year timeframe (US Fish & Wildlife 1998). Regional aquifer reduction was ranked as a very high threat to the two aquatic assemblages and the mesquite bosque. Reduced water level or loss of spring discharge would cause extinction of the 8 endemic species and be linked to extirpation of the riparian communities and their dependent fauna. Loss of the native vegetation would open habitat to invasion by unwanted exotic plants such as salt-cedar, tumbleweed (*Bassia hyssopifolia*) and Russian thistle (*Salsola paulseni*), and others. Reduction of the local aquifer mirrors the regional aquifer, but is likely to show negative impacts on a quicker time line. Lowering of the local water table would impact the riparian vegetation by removing water from the current rooting zone. In particular, a new suite of species, adapted to more xeric soil conditions would begin to compete for deeper ground water, resulting in a shift from riparian to wash or upland vegetation.

Introduction of non-native species represents a critical threat (very high) to both aquatic assemblages, riparian woodland, and shrubland. Based on fish surveys, the introduced piscivorous fish, tilapia, are the current greatest threat to the longevity of Moapa dace. Intestinal studies have shown that tilapia eat Moapa dace (Scoppettone pers. comm. 1999), compete for habitat and resources, and spread parasites to other fish, including Moapa dace.

The dense woodland of fan palms at the headwaters have been identified as a threat to Moapa dace and several of the endemic invertebrates (FWS 1996, Sada & Herbst 1999, Scoppettone 1996, 1998). Habitat alterations caused by the palm roots penetrating the stream substrate along with dense shading from the fan palm canopy have produced habitats that exclude the native Moapa dace and some endemic invertebrates. Fan palms are spreading downstream in the riparian woodland, displacing native trees and shrubs. In addition, fan palms have contributed to a new fire regime, i.e. more frequent and intense fires, that native species are not adapted to. Bird diversity is lowest in the fan palm woodland.

Throughout the river system, a steady encroachment of salt-cedar has been documented. Stands of salt-cedar are impacting and displacing the native riparian woodland and shrub systems. The resulting monoculture of salt-cedar offers little habitat for native birds, small mammals, or herptofauna.

Secondarily, some land-use practices impair (considered "high" threats) the riparian corridor, including incompatible grazing, depletion of the local aquifer, conversion of land to agriculture, and creation and use of irrigation ditches for pasture/orchard maintenance. Grazing has its greatest impacts on the riparian vegetation (woodland to marsh) due to direct herbivory and trampling. In riparian areas, young native seedlings and saplings are lost to foraging and vulnerable to trampling hooves of domestic livestock. Areas recommended for restoration will need grazing modifications to allow successful tree and shrub regeneration. Marshes have been reduced in size by draining to create additional pasture for livestock grazing. The direct impact is loss of habitat and species, followed by a reduction in biodiversity as palatable plants are removed from (eaten) the dwindling marsh areas and the substrates are compacted by trampling.

Loss or reduction of local water resources will impact the endemic aquatic species and its riparian targets directly (FWS 1998). Lowered local water tables will eventually contribute to a shift from riparian to more xeric vegetation. This may lead to invasion by undesirable weedy species.

Conversion of land to agriculture has caused direct loss of riparian woodland and shrubland, and mesquite bosques. Remaining native vegetation is reduced in overall size and species complexity. Diversion of water for irrigation is a major source of loss of marsh habitat (drying of marshes). Diversions have fragmented or reduced the extent

of riparian vegetation, reduced habitat for aquatic species, and created new avenues for invasive species to spread, e.g. tilapia, fan palms, salt-cedar, and others.

STRATEGIES

As part of developing this site conservation plan, Clark County requested that TNC make recommendations as specific as the parcel level, and where possible, to include a range of conservation tools (see Tools, p. 13) that could be utilized to conserve and restore the Muddy River above I-15. While the upper Muddy River is the priority area for conservation, the downstream reach from I-15 to Bowman's Reservoir provides good habitat for native fishes. Parcels in this lower reach would contribute to recovery of native fishes and should be considered as a second tier (lower priority) for conservation efforts. The overall restoration goal for the Muddy River would be to restore natives (both aquatic and terrestrial) from the headwaters all the way to Bowman's Reservoir. Beyond Bowman's Reservoir the natural course of the river is lost to cement ditches.

For the purposes of analysis, this plan divides the upper Muddy River above I-15 into four "ecological" segments (Figure 5) largely based on essential habitats for the endemic fishes:

A. Headwater springs downstream to the Warms Springs Bridge;
B. Warms Springs Bridge downstream to the upstream boundary of the Moapa Paiute Reservation;
C. Moapa Paiute Reservation;
D. Downstream boundary of the Moapa Paiute Reservation to the I-15 Bridge.

Segment A: This segment includes the headwaters springs to the Muddy River (Figure 6), as well as relatively healthy riparian and marsh sections of the upper Muddy River, and the only examples of riparian deciduous forest. Three priority parcels have been identified as most important to any long-term effort to conserve the health of the Muddy River. Those three parcels are the Mormon Farm, Premo, and Apcar.

- The largest property by far is the Latter Day Saints (LDS) Church property (Mormon Farm) at Warm Springs (1,100 acres). This property supports spring marshes and critical segments of streams and the Muddy River. This is a keystone parcel, and if there were a willing seller, we would recommend acquiring a fee interest in a majority of the property (excluding the recreational center and lands outside of the floodplain) or acquiring a conservation easement to protect the springs, marshes, and stream corridor, as well as allow restoration of the present conservation targets. This objective could also be accomplished through a land exchange.

- The Premo property is an important link between the Apcar parcel (below) and the Warm Springs LDS Church property. This seven acre property includes a major stream. The owner has indicated that she is not interested in selling, therefore we would recommend discussing a possible conservation easement.

- The Apcar property (46 acres) includes a spring complex just upstream of the Premo property and would be a high priority for acquisition. The owners have been willing to discuss a sale of the property.

There are a number of other land owners in this segment whose property includes small springs and riparian lands. This plan recommends seeking opportunities to work with these landowners on a voluntary basis to enhance and restore habitat through voluntary agreements or conservation easements.

Segment B: This segment includes the main stem of the Muddy River (see figure 7). The river is severely down cut below the Warm Springs Bridge, thus any long-term restoration strategy needs to focus on efforts to restore the health of the river in this segment. There are several key landowners in the segment, but Nevada Power Company is the most significant owner.

- The most important opportunity in this segment is to work with the largest landowner, Nevada Power, to develop a strategy for the long-term protection of the Perkins Ranch tract (400 acres) through acquisition, land exchange, or a conservation easement. The river channel through this property is fairly degraded and additional research will be needed to define the restoration potential on this parcel. Perkins Ranch contains the largest mesquite bosque along the upper Muddy River. There are a number of important washes that drain into this stretch of the Muddy River.

Segment C is composed of the lands of the Moapa Paiute Tribe (Figure 8). The tribal council will need to be consulted on what role, if any, the tribe would like to take in Muddy River restoration activities on its lands. This plan recommends visiting with the tribal leadership to discuss Muddy River restoration.

Segment D includes the river downstream of the Moapa Paiute Tribe Reservation downstream to I-15 (Figure 9). This segment includes the largest number of landowners, but is again dominated by one major landowner, J & D Coon Indenture Trust. Anderson Dairy is located on this property.

All private landowners in this segment should be approached about potentially entering into an agreement to exchange the floodplain portions of their property for BLM lands identified for disposal. An outright acquisition might be possible if the BLM is interested in acquiring lands along this corridor. A third party facilitator could potentially organize a sale of BLM lands that have been slated for disposal with the simultaneous purchase of private parcels identified for acquisition under this plan. Conservation easements would provide the opportunity to maintain the natural character of the river by preventing development in the floodplain and allow river and riparian restoration. Finally, MRREIAC has been successful in its efforts to undertake restoration activities along the river on the Coon and Nevada Power properties. Voluntary agreements may be more attractive to private landowners not interested in exchange, sale, or easements and equally effective in conserving river habitat.

TOOLS

There are several approaches available to protect significant natural areas (both land and water) and the species that depend upon them. Protection tools are versatile: they can be used singularly, and they can be used together as a system of incentives to build a strong program that preserves the natural values of an area. Conservation of unique habitats, in conjunction with willing sellers (or willing partners), is the foundation of many cooperative efforts between the private sector and government. For example, the Clark County Multiple Species Habitat Conservation plan relies upon the successful implementation of a variety of protection tools by BLM, the U.S. Forest Service, the FWS, MRREIAC, Nevada Division of Wildlife, TNC, and others. The FWS, MRREIAC and TNC are working under an MOU where conservation on the Muddy River is guided by a community-based approach. The key objectives of the MOU are to conserve, enhance and restore the aquatic and terrestrial systems, in conjunction with a variety of partners, and develop a common vision for the natural resources of the upper Muddy River.

The following tools have been used to protect ecological diversity throughout the United States. They offer a range of incentives for land owners and conservation entities.

Land Exchange

The objective of federal land exchanges is to encourage and expedite the exchange of federal lands for non-federal lands, that are found to be in the public interest (43 CFR 2200-2202). Exchanges are important tools for consolidating land ownership, for bringing sensitive resources into public management, and are the preferred method of land disposal (BLM 1998). In a traditional exchange, non-federal owners transfer title to the public entity for land or interest in federal land. The exchange must demonstrate a public interest, and that the relative values of the land involved are equal. There are several dozen steps to process an exchange (see BLM Exchange Handbook (1998) for details).

In general, BLM lands in the Las Vegas District are classified as 1) suitable for disposal and can be transferred to states, counties, municipalities, and private interests and 2) lands to be retained in the public interest for multiple uses such as wildlife development, outdoor recreation, mineral production, wilderness preservation, domestic livestock grazing, and preservation of public values. Approximately 41,000 acres of land have been designated available for disposal in the Moapa area, and an additional 119,000 acres are available in the remainder of Clark County (BLM 1998, see Figures 10 and 11) and are potentially available through sale or exchange. Lands transferred to BLM through the exchange process would be available for continued access for public uses, but may exclude or limit mineral entry, livestock grazing, agriculture, disturbance of target habitat, introduction of exotics, dredging, filling and dumping, and new development. Allowable activities include a broad range of recreational opportunities, subject to demand and ability to protect the natural resources. Motorized vehicle use

would be limited to existing roads and trails, with camping limited to 14 day stays. Management priorities for the BLM would include conservation, i.e. the proper functioning of the aquatic and riparian values and the rare species that depend upon those habitats.

An MOU has been developed between the BLM and Clark County to provide financial resources to ensure the timely processing of land exchange applications for lands and water offered by willing land owners along the upper Muddy River that support the conservation goals of the Clark County Desert Conservation and Multiple Species plans. Additionally, the MOU (in conjunction with FWS, MRREIAC, and TNC) supports development of this Upper Muddy River Conservation Plan, as well as hiring of staff to implement a variety of protection needs and complement the efforts of the BLM staff to complete land exchanges along the upper Muddy River.

Voluntary solutions - non-binding contracts

There are many ways for local property owners to engage in voluntary programs to conserve their land, along with natural resource values that benefit the community. One successful tool is development of local conservation groups that work in conjunction with agencies to protect habitats within their community.

MRREIAC is a voluntary program that is supported by the river communities of Moapa, Logandale, Glendale, and Overton. Their objective is to conserve the Muddy River ecosystem by restoring and enhancing the riparian habitat, largely through salt-cedar suppression. This work is guided by the recovery objectives for the native fishes and aquatic invertebrates. Thus far, MRREIAC has been awarded grants from the U.S. Environmental Protection Agency, FWS, and Clark County.

Deed Restrictions

Binding, long-term arrangements for properties generally involve restrictions on deeds and larger sums of money. Two frequently used tools include conservation easements and fee acquisition.

Conservation easements

Conservation easements are restrictions that owners place on their property that legally bind present and future owners. The owner of fee title surrenders some, but not all, of their rights by transferring certain property rights to an agency or organization. A group that has acquired a conservation easement has acquired a "less-than-fee" interest in a property. By acquiring an easement, an agency or organization, can protect natural resource values (conservation targets) by controlling only those rights that a land owner might use to destroy or degrade them. The owner of the easement does not have to own, manage, or pay for the remaining interests in the land.

The terms of any easement are described in a legal document that varies greatly (Appendix E). Easements are tailored to match the intent of the owner and the conservation entity. They may allow limited development, hunting, agriculture, grazing or mining, while others may have deep restrictions. Easements may allow the owner to reside on the property. Prohibited activities should be clearly defined in the easement document.

On the upper Muddy River, allowable activities would include the ability to sell property, the ability to use the property (as agreed to in the easement), recreation, game hunting, establishment of parks and nature trails, exotic species removal, and riparian restoration activities. Agriculture, irrigation and grazing could be allowable with an acceptable plan. Within the floodplain, flood irrigation, chemical spraying and small fish ponds would not be recommended. Activities that would not be allowed include spring modification, water withdrawal, commercial fish operation, industrial business, development in the aquatic or riparian habitats, or activities that would change the hydrology (water quality, channel morphology, flow rate, temperature, etc.) of the river and springs. Allowable and prohibited activities will vary from site to site. These suggestions are provided as a general guideline.

There are several types of easements:

Negative - meaning the easement restricts, forever, the use of certain rights in a property, e.g. development.

Affirmative - An owner may grant the rights to a use; e.g. prescribed burning of a grassland, which would be characterized as an affirmative easement.

Appurtenant – easements that benefit a contiguous property and are used to grant access to a particular area on a neighboring property. For example, granting unrestricted use of a footpath to reach a river.

In Gross – belongs to its owner regardless of whether or not the owner of the benefited property is adjacent (contiguous, as above). These are more typical of agencies or organizations whose government or corporate offices are not located in the vicinity of the specified property.

Term Easements – last for a specified period of time.

In Perpetuity – last forever, are assigned with the land and affect everyone who will ever own the property.

Conservation easements offer a way for conservation entities to acquire and control development rights without having to acquire fee title. Easements may be purchased or donated. The value of an easement, compared to the fair market value of the entire fee title, depends upon a) the nature of the restrictions placed on development, and b) how developable the property is without the restrictions. Donation

of easements receive the same basic treatment that governs donation of fee-simple interests for charitable or conservation purposes.

Before negotiating the specific terms and restrictions of an easement, the following should be determined:

1. exactly what target(s) are being protected through the easement;
2. what habitats and processes sustain the targets at that site;
3. what actions, knowingly or unknowingly, the owners might take to jeopardize the target(s);
4. what restrictions would be needed to abate the owners ability to jeopardize the target(s) and their ecological systems.

Once established, conservation easements should be monitored and documented to establish the baseline and any changes over time that depart from the terms of the easement.

Fee acquisition

Fee title is full ownership of all the rights over a property that is allowable by law. Each right in property may be separated from the others and sold, bartered, or traded on the open market as an 'interest' in the property. Each interest has as much value as someone will pay for it. Ownership of fee title provides the fullest legal control over any property. Fee acquisition is based on the fair market value of a property, typically defined as the price at which a piece of land might be sold by a willing seller to a willing buyer, who have full knowledge of the facts and are not under pressure to buy or sell. There are a number of ways fee title to a property can be garnered.

Bargain Sale – is part sale and part gift of land: it is a sale of land at less than its fair market value. The seller can deduct, as a charitable contribution for income tax purposes, the difference between the fair market value and the actual sales price. This allows the seller to receive some income and receive a tax deduction on the value of the gift, although the seller usually has to pay taxes on any capital gain. The receiver gets property at a reduced cost.

Donation – An owner can give land to an agency or organization with no strings attached through a standard deed of conveyance. This allows great tax benefits to the "seller."

Donation with Reserved Life Estate – A property owner can donate property, but continue to own and live on it until s/he dies. The donor can then deduct the value of the gift, called a remainder interest, as a charitable contribution at the time of the gift even though s/he controls the property until death. Since the land owner controls the property until death, restrictions or an easement on the deed, would protect conservation features on the property in the interim.

Donation of Undivided Interest in Land – A donor gives a percentage of the total legal interest in the land rather than any physical portion. The donor can deduct the fair market value of the interest contributed. The result is that the land is owned commonly as a unit by all parties who have an interest in the property, with all owners having equal rights to the property. This can lead to management burdens. Leases or agreements over the remaining interest(s) would help to protect conservation targets.

Donation by Will – A land owner can will land to an agency or organization, allowing a deduction from the value of the gross (taxable) estate. Terms of the will may, or may not, contain restrictions on the property.

LONG-RANGE MANAGEMENT OF PARCELS

Management of parcels on the upper river largely falls into categories based on ownership. Lands that are exchanged will be under public ownership, where management practices should emphasize conservation of the target species and natural communities. The two federal agencies best suited to protect the newly acquired land would be the BLM or the FWS, as extensions to the existing Moapa Valley National Wildlife Refuge. Parcels within the floodplain, should be managed to sustain the ecological processes that assure long-term protection of the target species and communities.

Private land uses may harbor the greatest threats on the Muddy River system if not managed for the benefit of the target species and communities. Whether voluntary, or through deed restrictions, private land management will require incentives, positive relationships, and proper funding. For land owners interested in retaining floodplain lands, conservation programs should emphasize incentives to enter into easements or voluntary agreements to protect the natural communities and rare species identified in this plan. Private land owners should have access to planning, habitat restoration funding, and the benefit of long-term management strategies developed by MRREIAC and other partners working on the upper Muddy River. Sound private land stewardship should be a goal pursued by all of the conservation partners.

Funding and management for conservation of key resource values is likely to be a mixture of federal, state, and private partners. Beyond the direct cost of an easement or outright purchase, an endowment should be created to cover the cost of long-term stewardship for each parcel. Restoration and recovery needs should be estimated, along with a budget and an implementation timeline developed for each parcel. A lead agency or organization should be designated to facilitate smooth and consistent stewardship activities on the upper Muddy River.

Land that is restricted by an easement, as well as those purchased as fee title, could be managed in a variety of ways. Easements and/or title could be held by the County, the State (e.g. Nevada Division of Wildlife), or a conservation non-profit. An example to draw on is the Center for Natural Lands Management (CNLM) in California. This non-profit provides long-term protection and management of dedicated

conservation land, from wetland to deserts. They provide consistent, cost-effective, science-based management of priority conservation parcels by accepting lands with an endowment that provides for management in perpetuity. The CNLM could be engaged for long-term stewardship of upper Muddy River parcels. Other existing groups like MRREIAC, should be considered as possible participants, as well as the option of creating a new group designed specifically to provide for the stewardship needs of these private, floodplain parcels.

POTENTIAL PARTNERS and FUNDING SOURCES:

There are numerous public funding programs that could potentially assist in various aspects of a well conceived, community-based conservation effort along the Muddy River. These programs include:

- Army Corps of Engineers (ACoE) In-Lieu Fee Program: The ACoE In-Lieu Fee Program is an alternative to establishing a mitigation bank, and creates a mechanism to fund wetland and riparian habitat conservation and restoration activities. Governmental and non-governmental entities can enter into agreements with the ACoE creating in-lieu fee agreements. This allows Clean Water Act Section 404 Permit applicants to mitigate impacts in a watershed by paying a fee to an entity willing to use those fees to acquire, restore, and/or enhance similar habitat within the watershed.

- Environmental Protection Agency (USEPA): The USEPA has a number of programs and initiatives, including Section 319 Funding that could provide funding to improve water quality through habitat restoration. Another important tool would be for Clark County to apply for low interest (0-3%) loans from the State Revolving Fund established under the Clean Water Act, and administered by the State of Nevada. The loans can be used to purchase lands in order to help improve water quality. In addition, USEPA can provide water quality planning grants to help initiate activities in a priority watershed.

- Natural Resources Conservation Service (NRCS): The NRCS has a number of programs, including the Wetland Reserve Program, Environmental Quality Incentive Program, and Wildlife Habitat Improvement Program that could provide funding for habitat acquisition and restoration.

- Nevada Department of Transportation: The recently re-authorized federal highway bill established the TEA-21 program. This program could be used to acquire and restore habitat, as well as develop "green ways" along the river corridor adjacent to federally-funded highways.

- Southern Nevada Public Lands Management Act: Through the sale of lands in the Las Vegas Valley, this Act will be generating funds that could potentially support the acquisition of habitat, water rights or conservation easements. It is anticipated that

this program will generate funds for at least a decade and help acquire environmentally sensitive lands.

- U.S. Fish and Wildlife Service: The FWS has a number of potential sources of funding for habitat acquisition and restoration. The FWS has sought Land and Water Conservation Fund monies to acquire additional habitat in the Moapa Valley. Although no funds were appropriated by Congress in Fiscal Year 2000, this remains a potential source of habitat acquisition funds. The FWS also administers a number of programs that provide funding incentives to private landowners to help protect rare and endangered species on their lands.

- Clark County Multiple Species Habitat Conservation Plan (MSHCP)
  In 1998, through the Clark County Desert Conservation Program, the Clark County Board of County Commissioners approved a MOU between the BLM, and the County to provide resources needed to ensure the timely processing of land exchange applications for lands offered by willing landowners along the Muddy River corridor to support the goals of the Clark County Desert Conservation Plan and the forthcoming Multiple Species Plan. Funding, awarded on a biennial basis, is potentially available to support planning, research, monitoring and other conservation goals that are covered by the County's permit.

RECOMMENDATIONS

Recommendations are divided into two areas: 1) Species recovery and habitat restoration/enhancement, and 2) basic research needs, project management and monitoring. In addition, the role of the 3) adaptive management process is briefly discussed for the upper Muddy River.

A restoration plan for the entire upper river (from the headwaters to Bowman's Reservoir) is needed. It should be based on an analysis that would better define a restoration vision for the river channel, along with the riparian woodland, marsh, and shrub communities. In addition, a monitoring program should be developed to chart progress, document success and lessons learned, and guide future restoration.

1. Species recovery and habitat restoration/enhancement

Overall recommendations for each priority target include the following:

Warm Springs and main stem river aquatic assemblages

Recovery of fish species in the Muddy River is guided by the U.S. Fish and Wildlife Service recovery plan (USFWS 1996). Objectives of the plan are to improve the status of the Moapa dace, along with seven other species of special concern (fish, springsnails, insects). Steps to achieve recovery include protection of in-stream flows and historical habitat in three springs, increase in the Moapa dace population to 4,500

adults, increase in age-class structure, and successful recruitment and reproduction in the three desired spring systems. Restoration and enhancement of the aquatic system must improve spawning, nursery, cover, and foraging habitats for Moapa dace. Recovery is hindered by the current proliferation of fan palms from the springs into the river system (Scoppettone, pers. comm. 8/23/99).

Deciduous riparian woodland

This habitat should be restored along the river's main stem, on side streams and around springs. The objective would be to establish native trees, e.g. ash and willow, throughout the river corridor. For the majority of the river and springs, removal and continued suppression of salt-cedar is crucial. As salt-cedar is removed, native trees should be planted in the mesic soils of the river bed to assure establishment of clusters of trees.

In the headwaters, fan palms have become naturalized, inhibiting the establishment of native trees and shrubs. The negative impact of the fan palms in the recovery of the endangered fishes has been identified (Scoppettone 1998, 1999). As the fan palms spread downstream they are displacing native species, as well as introducing a new, accelerated fire regime -- an undesirable situation for biota and land owners. Management goals for the native and non-native riparian vegetation should be set. Monitoring will help to determine recovery success for the endemic taxa. Key areas for enhancement or restoration of riparian woodland occur in segments A and D.

Riparian Shrubland

Riparian shrubland should be maintained where it presently exists, and restored along the river main stem, on side streams and at springs. In areas where riparian woodland is re-established, riparian shrubland should occur as the understory. Riparian shrubland should occupy a large portion of the river and stream channels as patches in the overall mosaic of riparian vegetation. The shrub vegetation should be dense, continuous, and species rich, e.g. quailbush, other *Atriplex* species, arrow weed, etc. Riparian shrubland will re-establish itself following removal and suppression of salt-cedar. This has been learned from several years of experience by MRREIAC's work on the Anderson dairy property. Key areas for riparian shrubland enhancement include segments A, B, and D.

Mesquite bosque

Current mesquite bosque should be maintained. On the upper floodplain, mesquite woodland needs restoration or enhancement throughout the river corridor. Salt-cedar should be removed and suppressed until mesquite becomes dominant. Livestock grazing may need to be modified or eliminated from specific areas to allow successful germination and regeneration. Key areas for enhancement of mesquite are segments B and D.

Riparian Marsh

This vegetation should be protected and maintained at existing sites in the headwater area. As the floodplain recovers, allow the natural hydrology to support habitat suitable for marsh vegetation. At sites where drainage activities have dried marsh habitat, restoration of hydrologic systems should occur. Marsh habitats should have modified grazing management, grazing that is limited or eliminated. Key opportunities for marsh restoration occur in segments A and D. Isolated marsh habitat is likely to occur if a healthy meandering stream is re-established.

2. Basic research needs and monitoring

To support a healthy, self-sustaining river system on the upper Muddy River further research needs to be done. In particular, we need a better understanding of: a) the successional model for native vegetation, b) the relationship between the regional and local aquifers and the Moapa Warm Springs discharge, and c) local geomorphology, especially the relationship of the ephemeral drainages to the river channel.

a. Develop a succession model for the Muddy River.

In the current riparian corridor, we recognize two woodland types: evergreen fan palm and deciduous riparian woodland. However, we also acknowledge that the original riparian vegetation is not well documented and that the scant literature available is often conflicting (Dorris 1999). There is some evidence that the fan palm woodland is non-native (Cornett 1988, Kimball 1988, Hubbs and Miller 1948) and that these trees have become naturalized at Warm Springs. The processes maintaining succession in the riparian system are key to designing a responsible restoration program on the Muddy River.

Most published literature on succession of small, arid spring systems (often termed cienegas) are based on sites in the Sonoran Desert of the United States and Mexico. No literature was located describing the vegetation, succession, or hydrology of spring systems in the Mojave Desert. Thus, no local model of river succession appears available to draw upon for the Muddy River. While Sonoran Desert models (see Richter 1992, Stromberg 1991, 1993) appear illustrative, they are based on the assumption that the rivers are meandering. While this is probably analagous for the main stem Muddy River, it does not adequately describe succession in the spring areas or the hydrologic processes dominating at fan palm stands.

Changes in hydrology have been implicated in the loss or reduction of tree recruitment and a decline in native riparian vegetation in rivers of all sizes (Rood and Mahoney 1992). How flow regime and flood pulses influence the dynamics of river vegetation on the Muddy River is undocumented. Are models of succession on meandering streams applicable, i.e., flood-driven succession? What is the role of erosion, especially catastrophic flash flooding? What drives succession at the springs

where the environment appears more stable? Until an appropriate successional model for the Muddy River is determined, restoration should be limited to exotics suppression. We look to the science-based adaptive management program funded by Clark County for insights and future research to resolve these questions.

b. Regional groundwater issues

The White River groundwater flow system is a regional aquifer that terminates at Moapa Warm Springs (Eakin 1966, Thomas et al. 1996). Water is transmitted across topographic divides throughout the regional aquifer. Water in this aquifer is recharged by springs in Pahranagat and Coyote Spring valleys. Moapa Warm Springs and the Muddy River are hydrologically connected to Coyote Spring Valley. Proposed development of Coyote Spring Valley by the largest land owner, Coyote Springs Land Development Corp., will likely affect spring discharge and water levels in the upper Muddy River, and will be detrimental to existing local water rights (US Fish & Wildlife Service 1998). Total combined water rights sought by Coyote Springs Land Development are 117,185 ac.-ft. This volume of water is thought to "far exceed" the highest estimates of available water in Coyote Spring Valley (USFWS 1998). Based on USGS modeling (Prudic et al. 1993, Schaefer & Harrill 1995) of a proposed 117,185 ac.-ft. withdrawal, spring discharge in the Muddy River would be lost in 5 years. Such a withdrawal would have dire effects on the Muddy River and its rare fauna and flora, along with the communities of Moapa, Glendale and the Moapa Valley.

In addition, there are other withdrawal proposals for the White River groundwater system (State Water Engineers office, Carson City). The cumulative effect from these applications would be devastating to existing water resources downstream. While these scenarios are not all current, they have the potential to change the Muddy River permanently. The USGS models of hydrologic recharge need to be tested. Wells should be monitored to demonstrate changes in water level, quality or decrease in discharge. Water rights applications should be monitored and protested by federal agencies if permits will reduce available water in the Muddy River.

c. Determine the role of washes to the health of the river bed

Flash flooding is thought to be a natural and desirable part of the ecology of the river system, where drainage from side washes contributes to a healthy river corridor. However, the importance of the side drainages to this cathartic process is undocumented. Detention basins in a side canyon, or on or above the main stem could disrupt this natural process and have negative impacts on the fishes and the riparian vegetation. Proposed flood control structures should be evaluated for their potential upstream and downstream impacts. The role of flash flooding and it's contribution to down-cutting of the main channel needs to be better understood.

Knowledge of the original floodplain dimensions will help to guide all aspects of restoration. Mapping the floodplain could be done through imagery, along with use of

soil samples. Aerial photos from the early 1900's can be used to delineate the historic river course and is crucial for successful restoration work.

3. Adaptive Management on the upper Muddy River

Adaptive management is a process of evaluating and modifying conservation prescriptions for effectiveness of management actions. The purpose of adaptive management is to ensure attainment of measurable biological goals. The process is an iterative, long-term, continuous evaluation of the status of biological resources and their management. Biological management techniques and objectives are evaluated along with new ecological information, land use changes and a variety of other factors and adapted, if needed, to meet the measurable biological goals for an ecosystem. Adaptive management is a process that is being used to gauge the effectiveness of conservation measures being taken in Clark County under the MSHCP permit. Collecting baseline data on the size, condition, and successional trajectory of the ecological targets identified in this Plan should be among the first steps in the adaptive management process. Subsequently, monitoring techniques, including remote sensing, can provide critical feedback regarding how the health of targets is changing in response to management action(s). Such analyses will strengthen the integrity of the scientific investigations and help direct defensible funding allocations and resource-based decisions .

All of these areas of fundamental research will enrich our understanding of the biodiversity of the upper Muddy River system, guide species and habitat recovery, and help to assure success towards a healthy, self-sustaining river.

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APPENDIX A

Appendix A.

Maps related to the upper Muddy River site conservation plan

Figure 1.

Location of the upper Muddy River, Clark County, NV

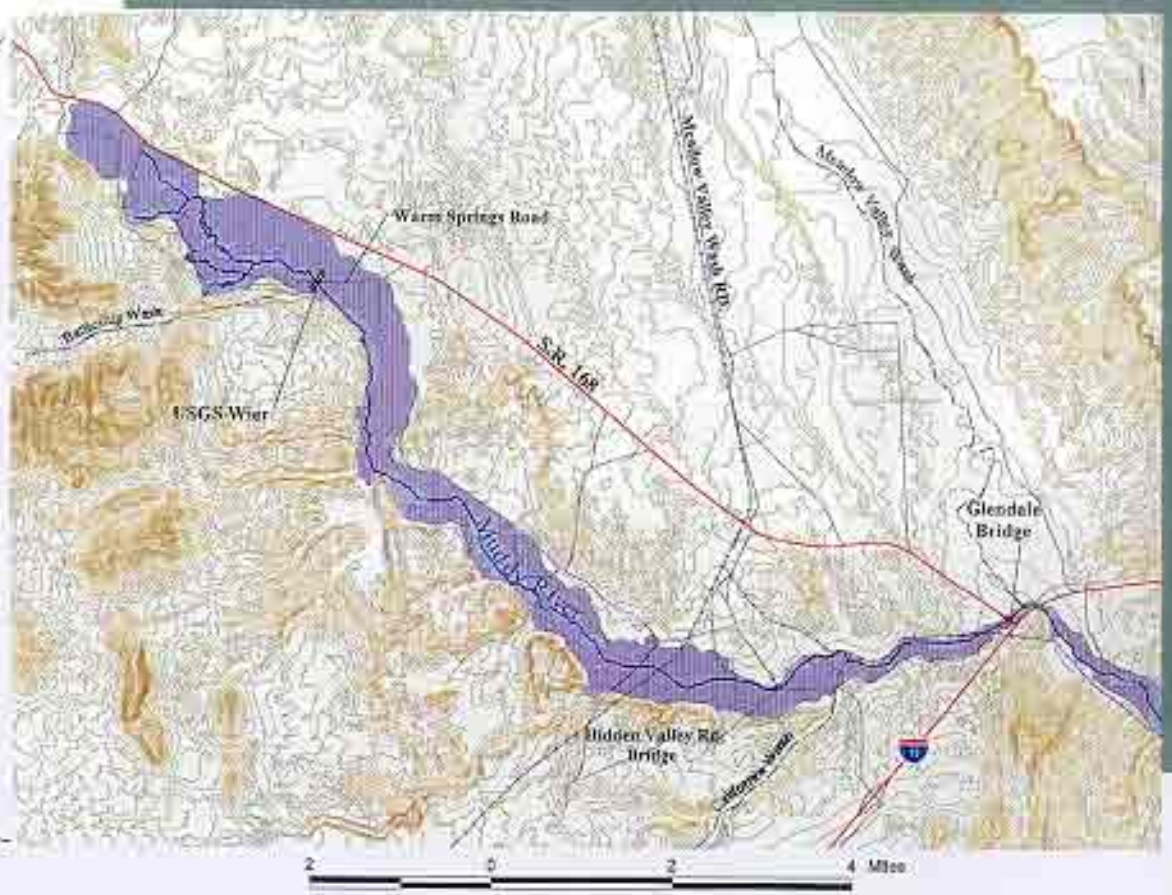


Figure 2. Land parcels intersecting the floodplain of the upper Muddy River, NV

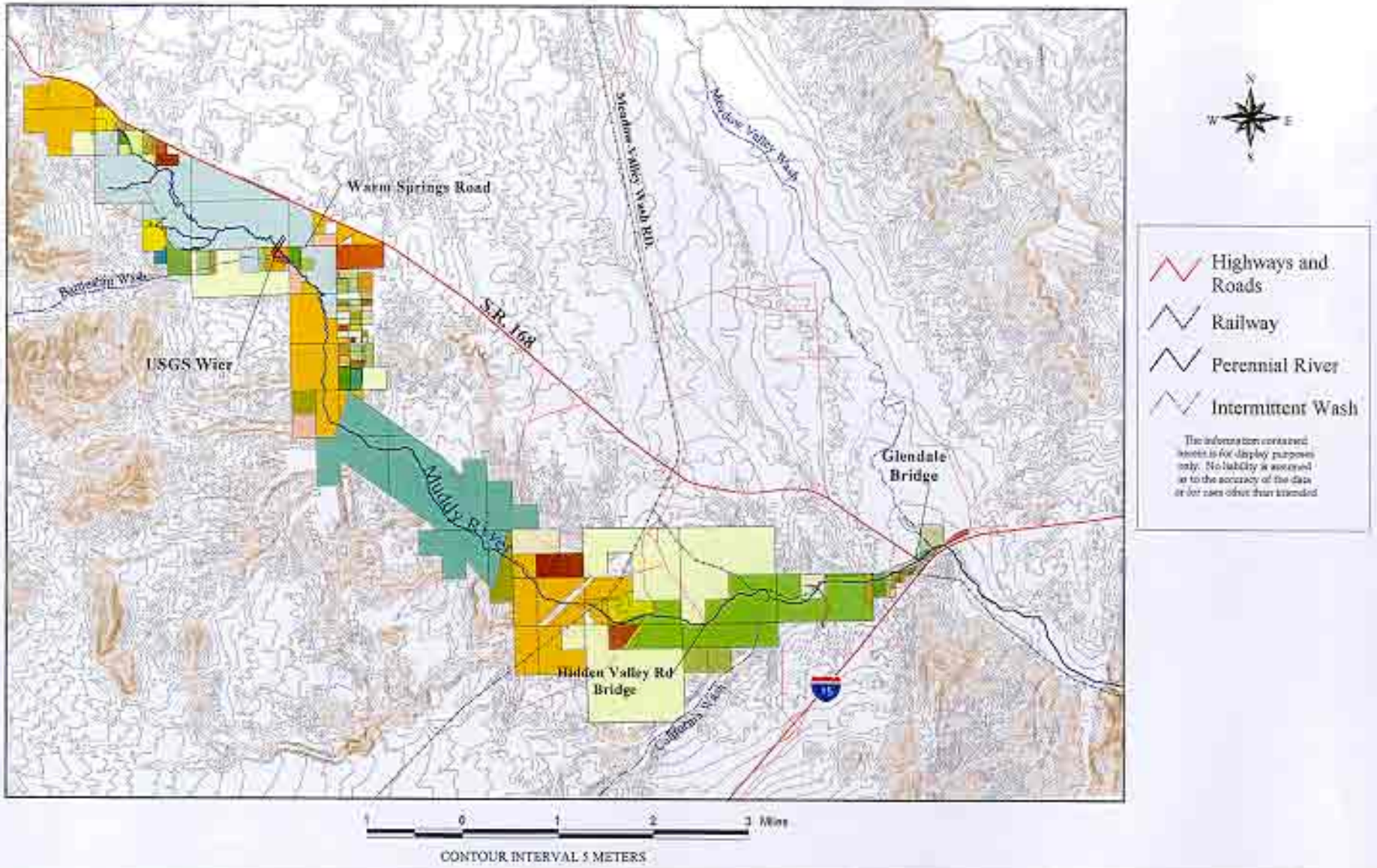


Figure 3. Location of the priority aquatic targets (Warm Springs and Muddy River Aquatic assemblages) on the upper Muddy River, NV

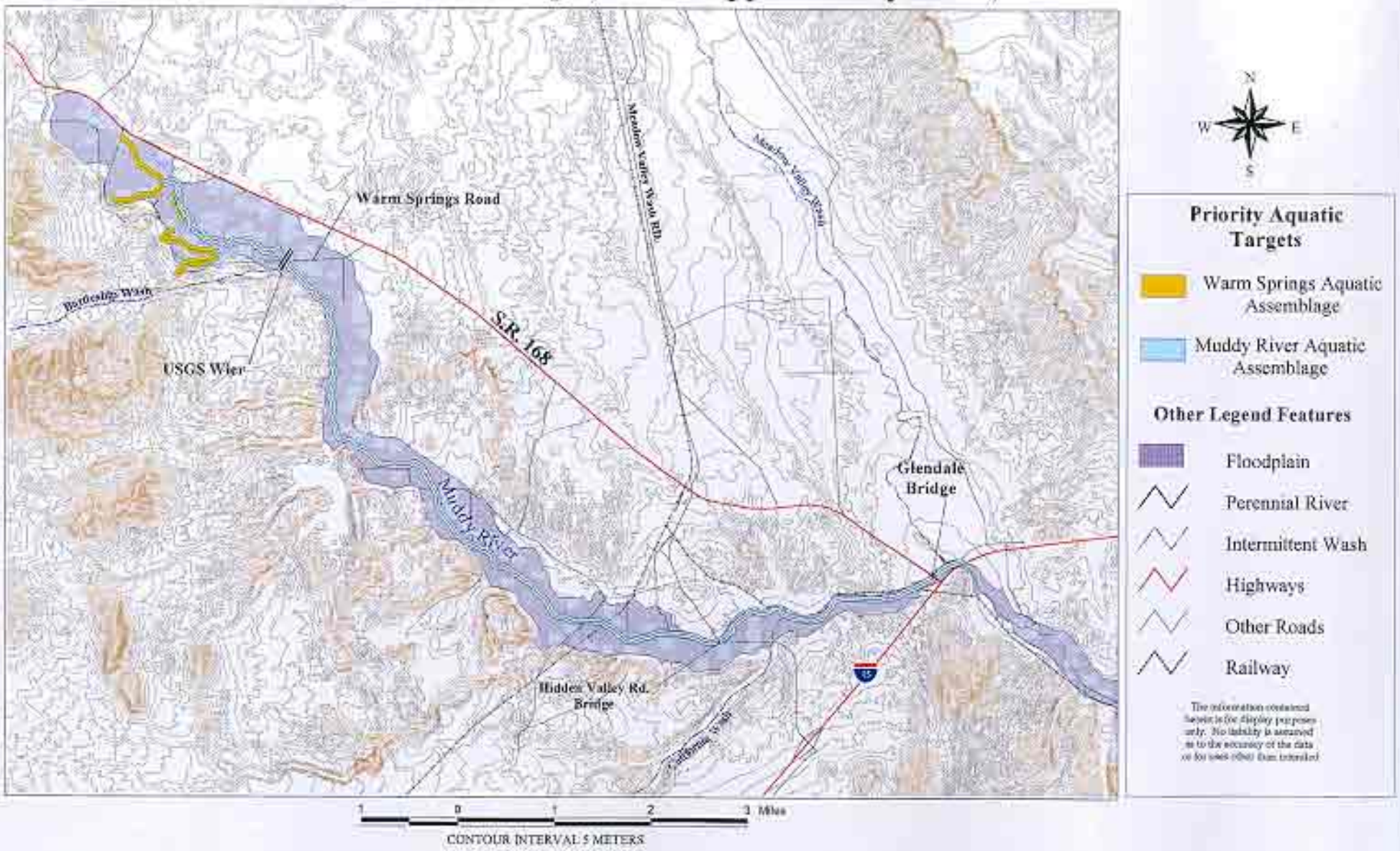


Figure 4. Location of the priority riparian targets (Mesquite Bosque, Riparian Marsh, Riparian Woodland and Riparian Shrubland) on the upper Muddy River, NV

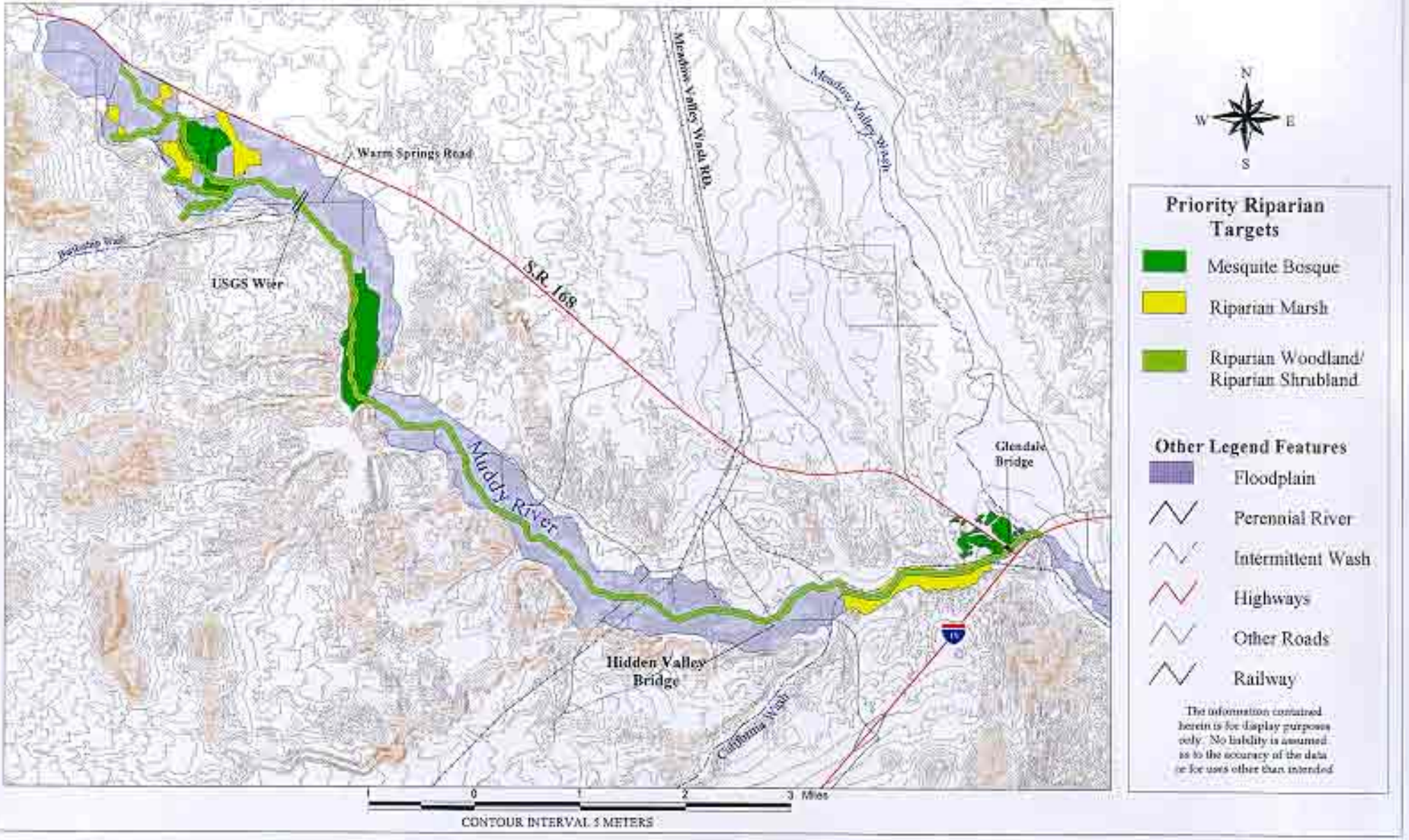


Figure 5. Priority conservation planning segments on the upper Muddy River, NV

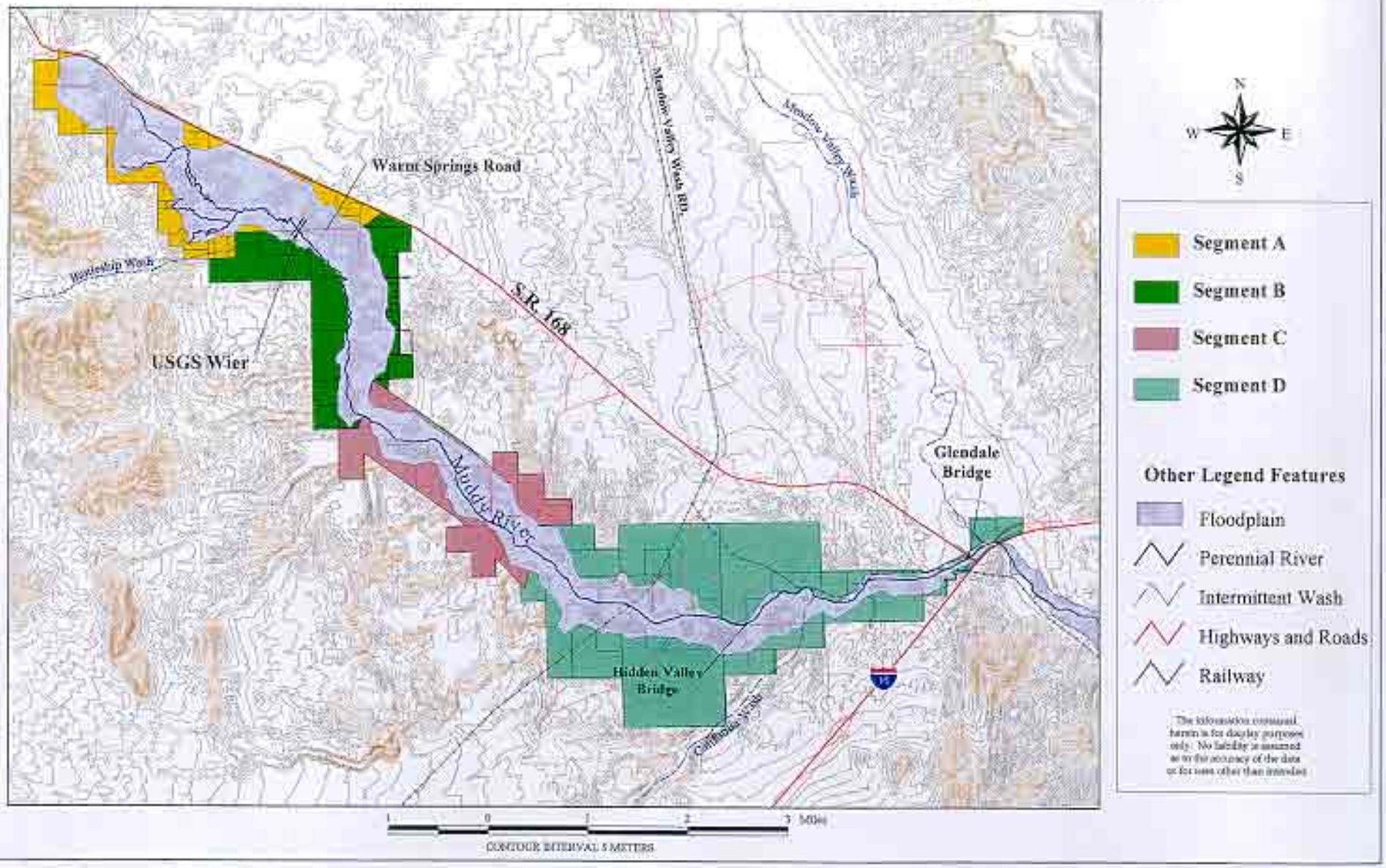


Figure 6. Upper Muddy River priority land owners: Segment A

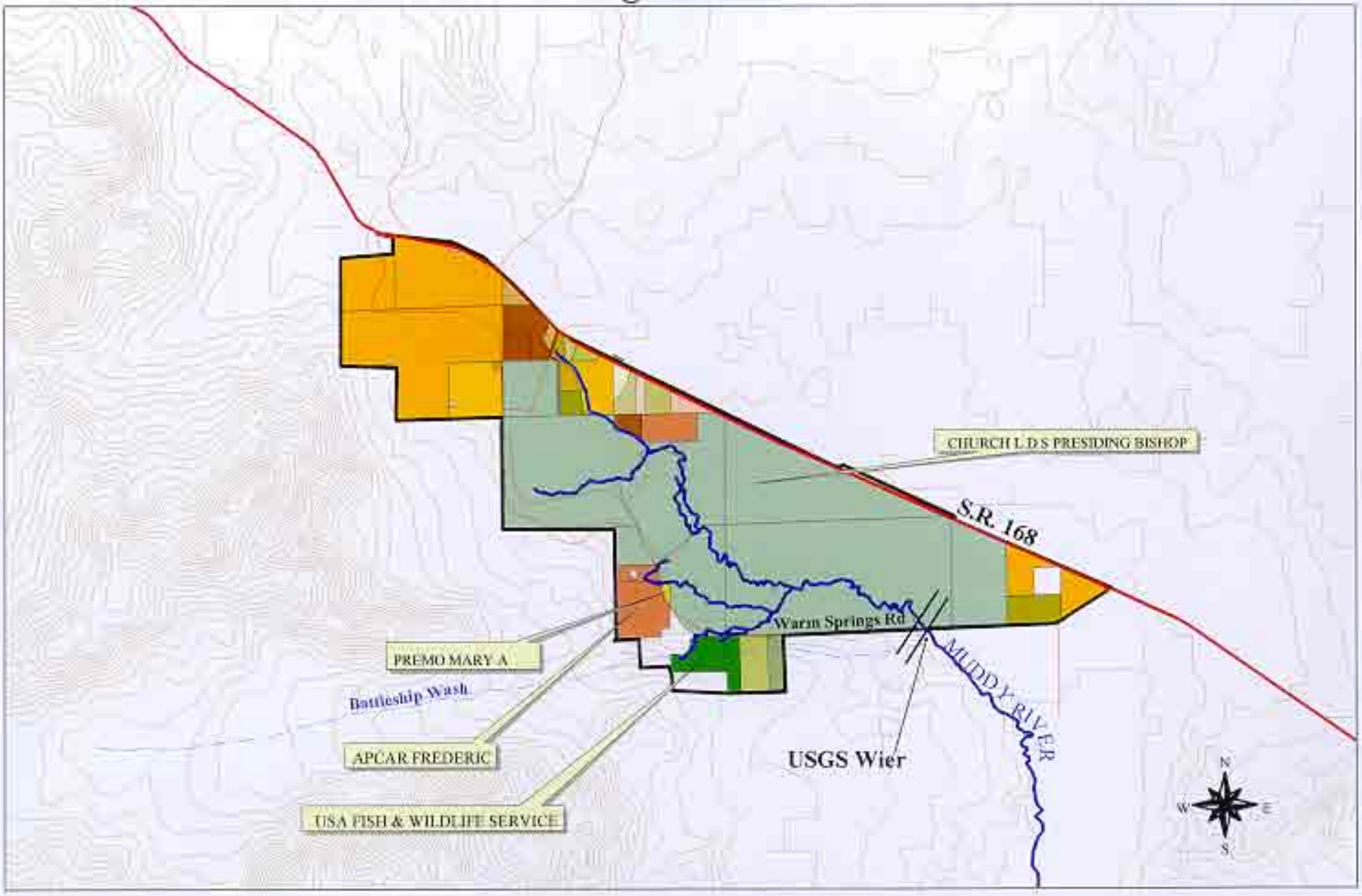


Figure 7. Upper Muddy River priority land owners: Segment B

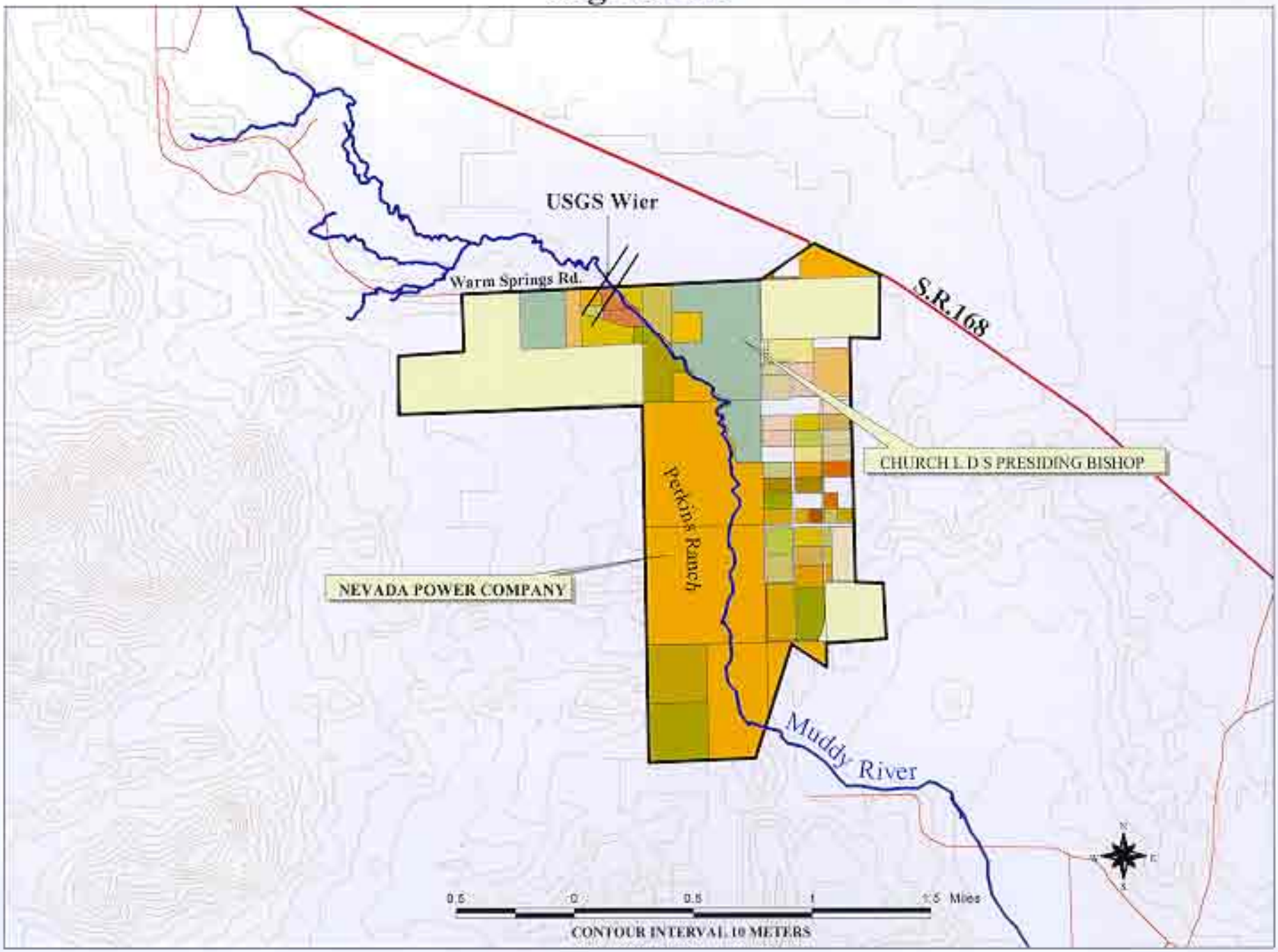


Figure 8. Upper Muddy River priority land owners: Segment C

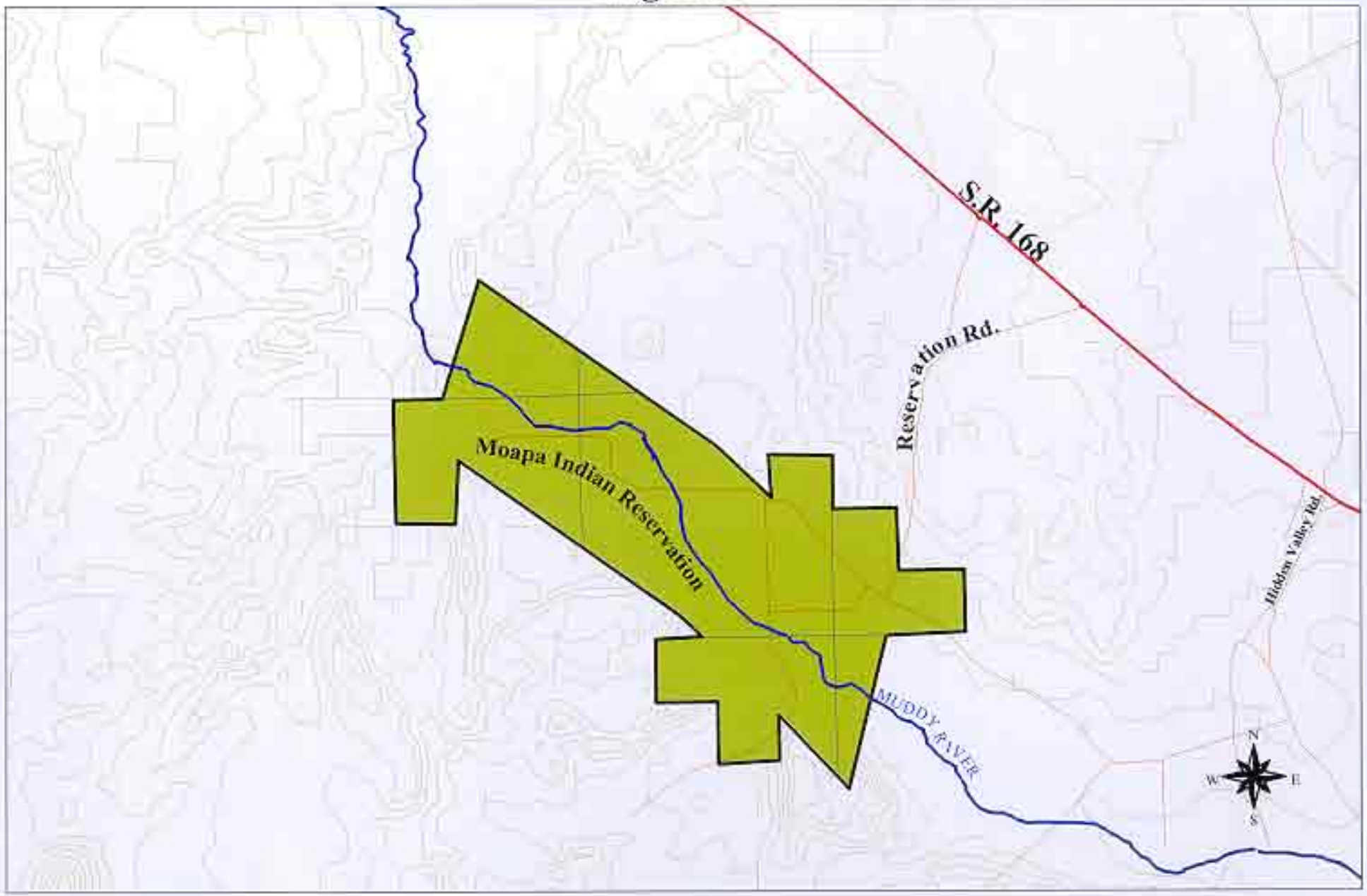
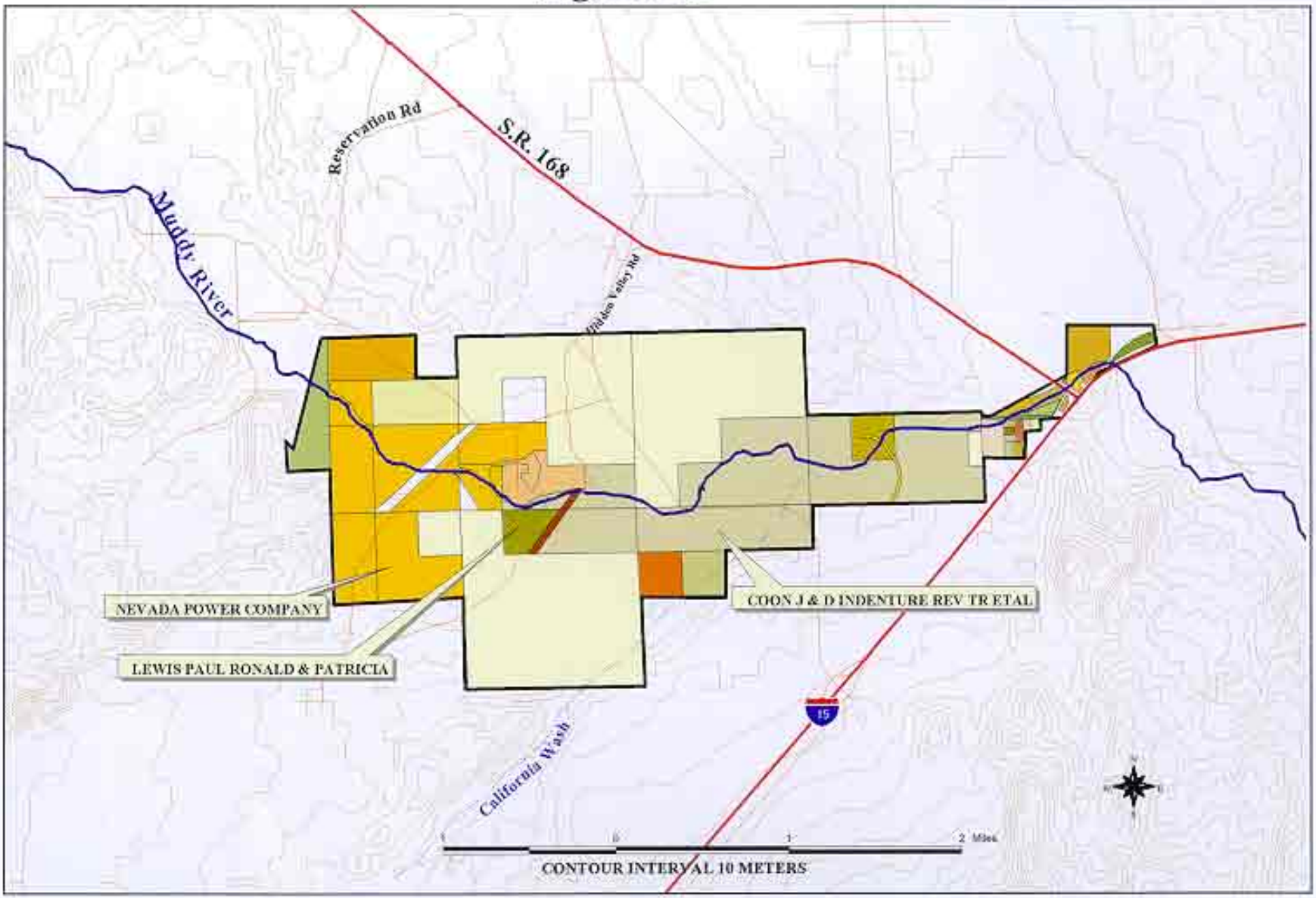


Figure 9. Upper Muddy River priority land owners: Segment D



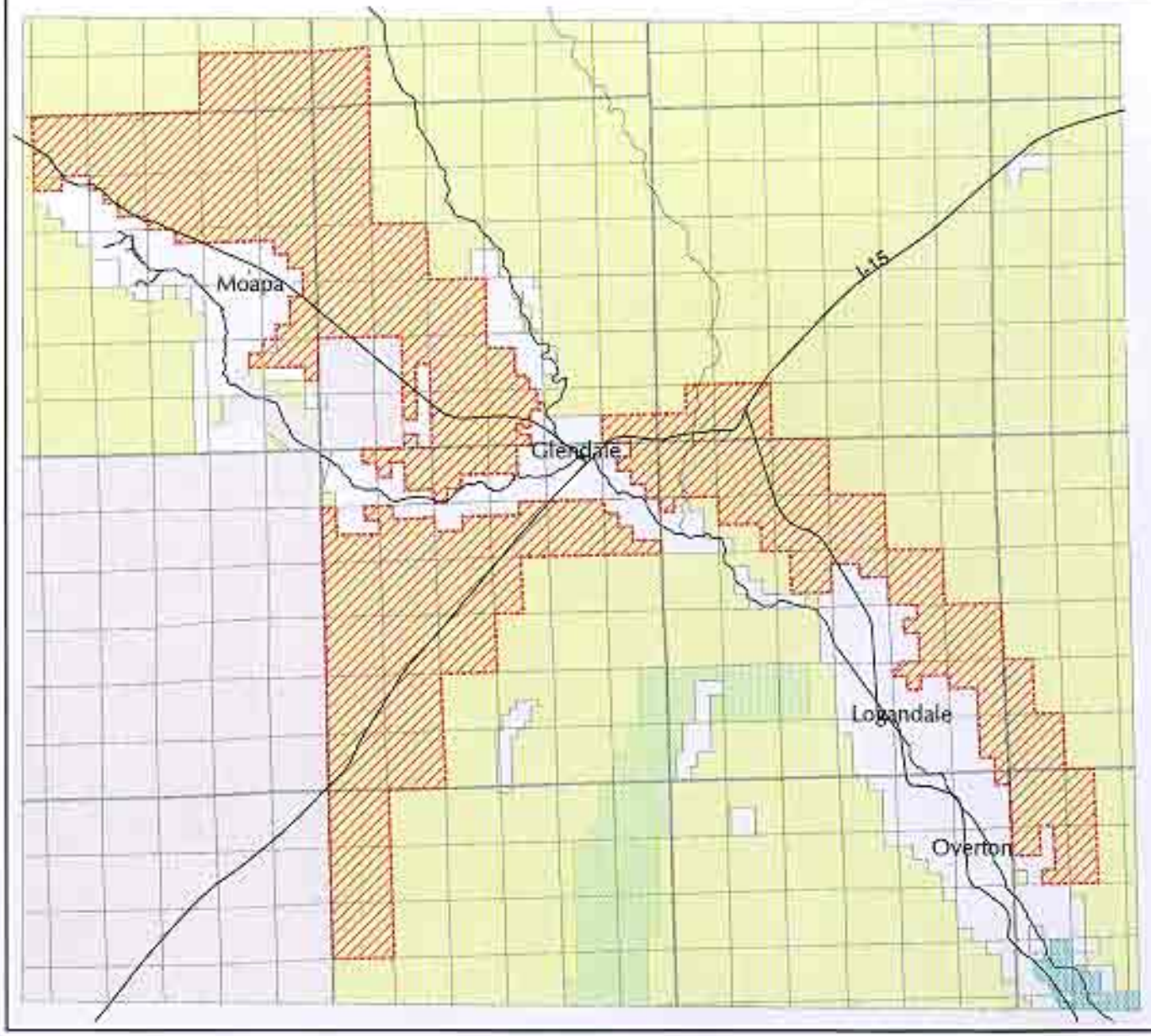


Figure 10. BLM Disposal Areas in Moapa Valley

Land Status

- Indian Reservation
- Lake Mead National Recreation Area
- Private
- Public land
- State Park

Disposal Area

Bureau of Land Management
Las Vegas Field Office
4765 Vegas Drive
Las Vegas, NV 89108

Map Creation by
Renewable Resources
Wildlife Team
September 1999

The information contained herein is for display purposes only. No liability is assumed as to the accuracy of the data or for uses other than intended.

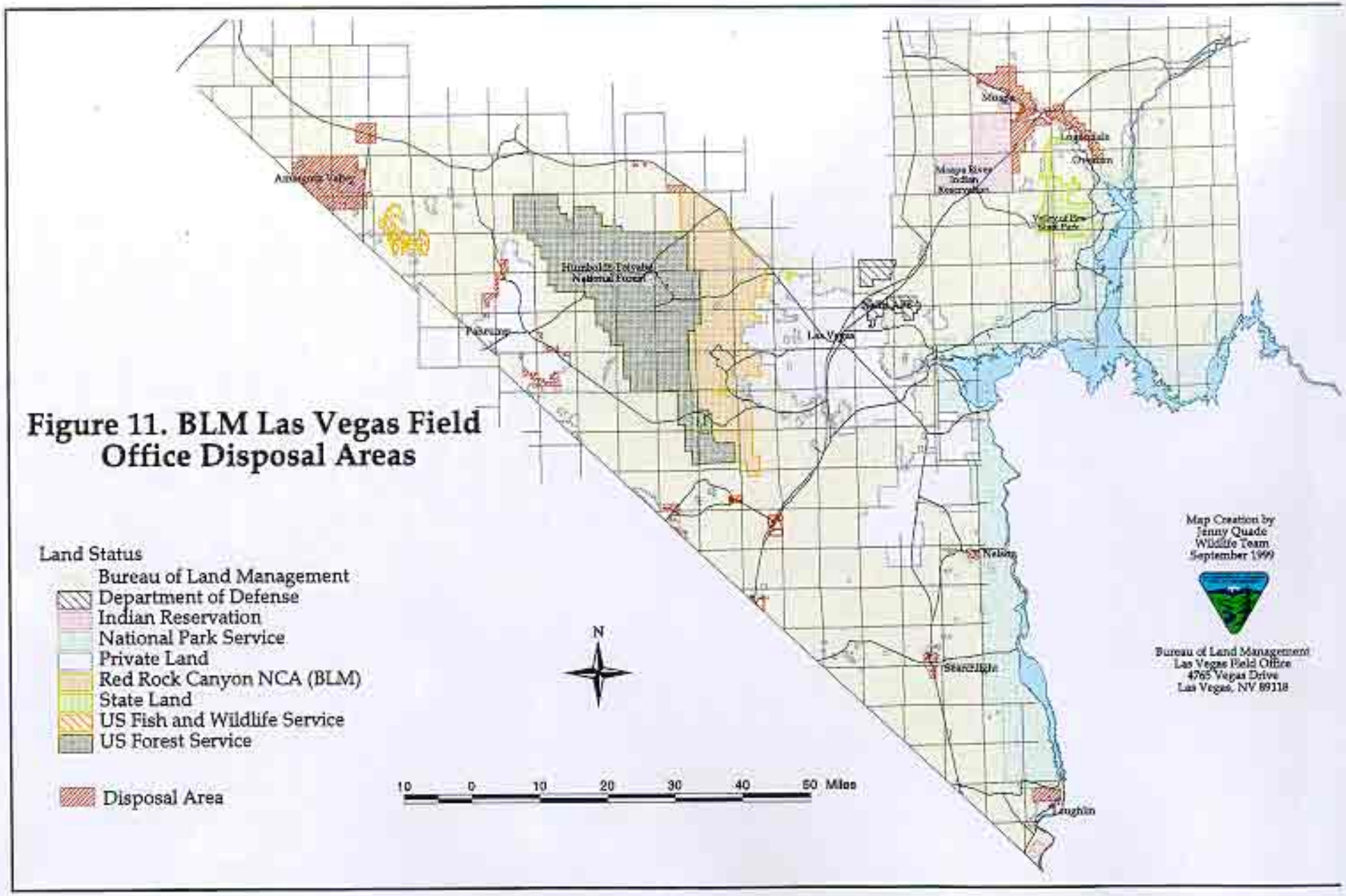


Figure 11. BLM Las Vegas Field Office Disposal Areas
Land Status
Bureau of Land Management
Department of Defense
Indian Reservation
National Park Service
Private Land
Red Rock Canyon NCA (BLM)
State Land
US Fish and Wildlife Service
US Forest Service
Disposal Area
N
10 0 10 20 30 40 50 Miles
Map Creation by
Jenny Quade
Wildlife Team
September 1999
Bureau of Land Management
Las Vegas Field Office
4765 Vegas Drive
Las Vegas, NV 89118

APPENDIX B

Illustrative List of Stresses

1. **Direct Destruction/Degradation of Organisms**
   a) Legal killing or taking
   b) Illegal killing or taking
   c) Harassment/Vandalism
   d) Other direct destruction of organisms (specify)

2. **Destruction/Degradation of Physical Habitat**
   a) Destruction/degradation of aquatic habitat
      i) Altered channel, shoreline, or bed morphology
      ii) Altered bed/bank sediment deposition & erosion
      iii) Altered hydrologic regime
      iv) Disruption of drainage system continuity
      v) Altered suspended solids inputs or turbidity
      vi) Altered woody debris inputs or persistence
      vii) Altered connection to overbank flood zone
      viii) Altered riparian vegetation
      ix) Other specific threat to aquatic habitat (specify)
   b) Destruction/degradation of terrestrial habitat
      i) Damage, destruction, removal of habitat
      ii) Fragmentation of habitat
      iii) Altered fire regime
      iv) Altered air-borne sediment deposition & erosion
      v) Altered water-borne sediment deposition & erosion
      vi) Altered precipitation regime
      vii) Other specific threat to terrestrial habitat
   c) Other specific destruction/degradation of physical habitat (specify)

3. **Destruction/Degradation of Chemical Habitat**
   a) Altered "natural" chemical conditions (air, land, or water)
      i) Altered dissolved oxygen regime
      ii) Altered inorganic nutrient inputs
      iii) Altered particulate organic matter inputs
      iv) Altered pH regime, including from acid rain
      v) Altered salinity regime
      vi) Altered temperature regime
      vii) Other specific alterations of natural chemical conditions (specify)
   b) Anthropogenic biocides (air, land, or water)
      i) Herbicides, algicides, fungicides, bactericides
      ii) Insecticides, rodenticides, molluscicides
      iii) Pesticides
      iv) Other specific intentional biocides (specify)
   c) Anthropogenic toxic wastes (air, land, or water)
      i) Metal wastes
      ii) Chlorine & chloride wastes
      iii) Industrial chlorinated hydrocarbons
      iv) Petroleum hydrocarbons
      v) Solvents (other than above)
      vi) Combustion wastes and PAHs
      vii) Detergents, surfactants, and antioxidants
      viii) Other specific anthropogenic toxic waste (specify)
   d) Alteration of radiation exposure (air, land, or water)
      i) Alteration of UV radiation exposure
      ii) Alteration of atomic radiation exposure
      iii) Other specific radiation exposure (specify)
   e) Other specific threat to the chemical integrity of habitat (specify)

4. **Destruction/Degradation of Ecological/Biological Integrity of Organisms/Habitat**
   a) Altered population dynamics
      i) Altered inter-specific competition
      ii) Altered intra-specific competition
      iii) Altered predation regime
      iv) Parasitism
      v) Pathogens
      vi) Antibiosis
      vii) Altered availability of host biota
      viii) Altered availability of food biota
      ix) Other specific alterations of population dynamics (specify)
   b) Alteration of genetics
      i) Hybridization
      ii) Small or isolated population effects
      iii) Other specific alterations to genetics (specify)
   c) Other specific threats of ecological/biological integrity of organisms/habitat

5. **Other Specific Stresses (Specify)**

Appendix C. Illustrative list of sources of stress

Illustrative List of Sources of Stress

Agricultural and Forestry
- Incompatible crop production practices
- Incompatible livestock production practices
- Incompatible grazing practices
- Incompatible forestry practices

Land Development
- Incompatible primary home development
- Incompatible second home/resort development
- Incompatible commercial/industrial development
- Incompatible development of roads or utilities
- Conversion to agriculture or silviculture

Water Management
- Dam construction
- Construction of ditches, dikes, drainage or diversion systems
- Channelization of rivers or streams
- Incompatible operation of dams or reservoirs
- Incompatible operation of drainage or diversion systems
- Excessive groundwater withdrawal
- Shoreline stabilization

Point Source Pollution
- Industrial discharge
- Livestock feedlot
- Incompatible wastewater treatment
- Marina development
- Landfill construction or operation

Resource Extraction
- Incompatible mining practices
- Incompatible oil or gas drilling
- Overfishing or overhunting
- Poaching or commercial collecting

Recreation
- Incompatible recreational use
- Recreational vehicles

Land/Resource Management
- Fire suppression
- Incompatible management of/for certain species

Biological
- Invasive/alien species

Appendix D. Scorecard of stresses and sources of stress for the priority target systems on the upper Muddy River, NV

Systems/Stresses/Sources Worksheet

Site: ***Upper Muddy River***

System/Conservation Target: **Warm Springs Aquatic Assemblage**

Blue = User Input

List stresses to the system below ***Place cursor over the red cells for help in determining rankings*** *(not available with Excel Version 5.0).*
Rank Severity and Scope for each stress: ***Very High, High, Medium or Low***
Overall stress ranks will be calculated automatically; users can directly enter an alterantive stress rank in the blank "User Override" cells below

Stresses	Severity	Scope	Stress	
	Rank (input)	Rank (input)	Rank (calculated)	User Override
Water withdrawal	Very High	Very High	**Very High**	
Fish predation	Very High	Very High	**Very High**	
Altered bed morpholgy	Very High	High	**High**	
Habitat competition	High	High	**High**	
Direct removal	Medium	Medium	**Medium**	
Chorination	High	Medium	**Medium**	

List the Sources of the stresses below.
Rank Contribution and Irreversibility for each source of each stress: Very High, High, Medium or Low. Users can enter an alternative source rank in the blank cell in the "Override" row.

Sources of Stress		Water withdrawal *Very High*	Fish predation *Very High*	Altered bed morpholg *High*	Habitat competition *High*	Direct removal *Medium*	Chorination *Medium*	Score	Combine Threat Rank
Regional aquifer withdrawal	Contribution	Very High	-	-	-	-	-	**3**	**Very High**
	Irreversibility	Very High							
	Override	**Very High**							
	Source	Very High	-	-	-	-	-		
Local aquifer withdrawal	Contribution	Low	-	-	-	-	-	**0.25**	**Medium**
	Irreversibility	Medium							
	Override	**Medium**							
	Source	Low	-	-	-	-	-		
Invasive species (tilapia)	Contribution	-	Very High	-	Very High	-	-	**3.5**	**Very High**
	Irreversibility		Medium		Medium				
	Override		**Very High**		**High**				
	Source	-	High	-	High	-	-		
	Contribution	-	-	-	-	-	-	**0**	**-**
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
Invasive species (fan palms)	Contribution	-	-	High	-	-	-	**0.25**	**Medium**
	Irreversibility			Medium					
	Override			**Medium**					
	Source	-	-	Medium	-	-	-		
Irrigation ditches for pasture	Contribution	-	-	Medium	-	Very High	-	**0.5**	**Medium**
	Irreversibility			Medium		Low			
	Override			**Medium**		**Medium**			
	Source	-	-	Medium	-	High	-		
Incompatible land development	Contribution	Medium	-	Very High	-	-	-	**3.5**	**Very High**
	Irreversibility	Very High		Very High					
	Override	**Very High**		**High**					
	Source	High	-	Very High	-	-	-		
	Contribution	-	-	-	-	-	-	**0**	**-**
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		

Systems/Stresses/Sources Worksheet

Site: ***Upper Muddy River***

System/Conservation Target: **Muddy River Aquatic Assemblage**

Blue = User Input

List stresses to the system below ***Place cursor over the red cells for help in determining rankings*** *(not available with Excel Version 5.0).*

Rank Severity and Scope for each stress: ***Very High, High, Medium or Low***

Overall stress ranks will be calculated automatically; users can directly enter an alterantive stress rank in the blank "User Override" cells below

Stresses	Severity Rank (input)	Scope Rank (input)	Stress Rank (calculated)	Stress User Override
Predation	Very High	Very High	Very High	
Habitat competition	High	High	High	
Lowered groundwater	Very High	Very High	Very High	
			-	
			-	
			-	

List the Sources of the stresses below.
Rank Contribution and Irreversibility for each source of each stress: Very High, High, Medium or Low. Users can enter an alternative source rank in the blank cell in the "Override" row.

Sources of Stress		Predation *Very High*	Habitat competition *High*	Lowered groundwater *Very High*	- -	- -	- -	Score	Combine Threat Rank
Regional aquifer withdrawal	Contribution			Very High					
	Irreversibility			Very High					
		-	-	Very High	-	-	-	3	Very High
	Override								
	Source	-	-	Very High	-	-	-		
Local aquifer withdrawal	Contribution			Low					
	Irreversibility			Medium					
		-	-	Medium	-	-	-	0.25	Medium
	Override								
	Source	-	-	Low	-	-	-		
Invasive species (tilapia)	Contribution	Very High	Very High						
	Irreversibility	Medium	Medium						
		Very High	High	-	-	-	-	3.5	Very High
	Override								
	Source	High	High	-	-	-	-		
Incompatible land development	Contribution			Medium					
	Irreversibility			Very High					
		-	-	Very High	-	-	-	3	Very High
	Override								
	Source	-	-	High	-	-	-		
	Contribution								
	Irreversibility								
		-	-	-	-	-	-	0	-
	Override								
	Source	-	-	-	-	-	-		
	Contribution								
	Irreversibility								
		-	-	-	-	-	-	0	-
	Override								
	Source	-	-	-	-	-	-		
	Contribution								
	Irreversibility								
		-	-	-	-	-	-	0	-
	Override								
	Source	-	-	-	-	-	-		
	Contribution								
	Irreversibility								
		-	-	-	-	-	-	0	-
	Override								
	Source	-	-	-	-	-	-		

Systems/Stresses/Sources Worksheet

Site: ***Upper Muddy River***

System/Conservation Target: **Deciduous Riparian Woodland**

Blue = User Input

List stresses to the system below ***Place cursor over the red cells for help in determining rankings*** *(not available with Excel Version 5.0).*
Rank Severity and Scope for each stress: ***Very High, High, Medium or Low***
Overall stress ranks will be calculated automatically; users can directly enter an alterantive stress rank in the blank "User Override" cells below

	Severity	Scope	Stress	
Stresses	**Rank (input)**	**Rank (input)**	**Rank (calculated)**	**User Override**
Interspeices competition	Very High	Very High	**Very High**	
Altered fire regime (palms)	Very High	Medium	**Medium**	
Herbivory on young age classes	Very High	Medium	**Medium**	
Trampling	Very High	Medium	**Medium**	
Direct tree removal	Very High	High	**High**	
Altered floodplain morphology			-	

List the Sources of the stresses below.
Rank Contribution and Irreversibility for each source of each stress: Very High, High, Medium or Low. Users can enter an alternative source rank in the blank cell in the "Override" row.

Sources of Stress		Interspeices competition *Very High*	Altered fire regime (palms) *Medium*	Herbivory on young age classes *Medium*	Trampling *Medium*	Direct tree removal *High*	Altered floodplain morphology -	**Score**	**Combine Threat Rank**
Invasive species (fan palms)	Contribution	Very High	Very High	-	-	-	-	**3.15**	**Very High**
	Irreversibility	Medium	Medium						
	Override	**Very High**	**Medium**						
	Source	High	High	-	-	-	-		
Invasive species (tamarix)	Contribution	Low	-	-	-	-	-	**0.25**	**Medium**
	Irreversibility	Medium							
	Override	**Medium**							
	Source	Low	-	-	-	-	-		
Incompatible grazing practices	Contribution	-	-	Very High	Very High	-	-	**0.5**	**Medium**
	Irreversibility			Low	Low				
	Override			**Medium**	**Medium**				
	Source	-	-	High	High	-	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
Incompatible land development	Contribution	-	Medium	-	-	Very High	-	**1.05**	**High**
	Irreversibility		Low			Very High			
	Override		**Low**			**High**			
	Source	-	Low	-	-	Very High	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		

Systems/Stresses/Sources Worksheet

Site: ***Upper Muddy River***

System/Conservation Target: **Riparian Shrubland**

Blue = User Input

List stresses to the system below ***Place cursor over the red cells for help in determining rankings*** *(not available with Excel Version 5.0).*
Rank Severity and Scope for each stress: ***Very High, High, Medium or Low***
Overall stress ranks will be calculated automatically; users can directly enter an alterantive stress rank in the blank "User Override" cells below

	Severity	Scope	Stress	
Stresses	**Rank (input)**	**Rank (input)**	**Rank (calculated)**	**User Override**
Direct tree removal	Very High	High	**High**	
Altered interspecific competition	Very High	Very High	**Very High**	
Altered soil salinity regime	Very High	Very High	**Very High**	
Herbivory	Very High	Medium	**Medium**	
Trampling	Very High	Medium	**Medium**	
			-	

List the Sources of the stresses below.
Rank Contribution and Irreversibility for each source of each stress: Very High, High, Medium or Low. Users can enter an alternative source rank in the blank cell in the "Override" row.

Sources of Stress		Direct tree removal *High*	Altered interspecific competition *Very High*	Altered soil salinity regime *Very High*	Herbivory *Medium*	Trampling *Medium*	- -	**Score**	**Combine Threat Rank**
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
Incompatible grazing practices	Contribution	-	High	-	Very High	Very High	-	**1.5**	**High**
	Irreversibility		Low **High**		Low **Medium**	Low **Medium**			
	Override								
	Source	-	Medium	-	High	High	-		
Invasive species (tamarix)	Contribution	-	Very High	Very High	-	-	-	**4.5**	**Very High**
	Irreversibility		High **Very High**	High **Very High**					
	Override								
	Source	-	Very High	Very High	-	-	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
Incompatible land development	Contribution	Medium	-	-	-	-	-	**1**	**High**
	Irreversibility	Very High **High**							
	Override								
	Source	High	-	-	-	-	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		

Systems/Stresses/Sources Worksheet

Site: ***Upper Muddy River***

System/Conservation Target: **Mesquite Bosque**

Blue = User Input

List stresses to the system below ***Place cursor over the red cells for help in determining rankings*** *(not available with Excel Version 5.0).*
Rank Severity and Scope for each stress: ***Very High, High, Medium or Low***
Overall stress ranks will be calculated automatically; users can directly enter an alterantive stress rank in the blank "User Override" cells below

	Severity	Scope	Stress	
Stresses	**Rank (input)**	**Rank (input)**	**Rank (calculated)**	**User Override**
Direct tree removal	Very High	High	**High**	
Lowered groundwater	Very High	Very High	**Very High**	
Trampling	Medium	Medium	**Medium**	
			-	
			-	
			-	

List the Sources of the stresses below.
Rank Contribution and Irreversibility for each source of each stress: Very High, High, Medium or Low. Users can enter an alternative source rank in the blank cell in the "Override" row.

Sources of Stress		Direct tree removal *High*	Lowered groundwater *Very High*	Trampling *Medium*	- -	- -	- -	**Score**	**Combine Threat Rank**
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
Incompatible land development	Contribution	High	Medium					**3.5**	**Very High**
	Irreversibility	Very High **High**	Very High **Very High**	-	-	-	-		
	Override								
	Source	High	High	-	-	-	-		
Conversion to agriculture	Contribution	Medium	-	-	-	-	-	**0.25**	**Medium**
	Irreversibility	Medium **Medium**							
	Override								
	Source	Medium	-	-	-	-	-		
Incompatible grazing practices	Contribution	-	-	Very High	-	-	-	**0.25**	**Medium**
	Irreversibility			Low **Medium**					
	Override								
	Source	-	-	High	-	-	-		
Regional aquifer withdrawal	Contribution	-	Very High	-	-	-	-	**3**	**Very High**
	Irreversibility		Very High **Very High**						
	Override								
	Source	-	Very High	-	-	-	-		
Local aquifer withdrawal	Contribution	-	Low	-	-	-	-	**0.25**	**Medium**
	Irreversibility		Medium **Medium**						
	Override								
	Source	-	Low	-	-	-	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		
	Contribution	-	-	-	-	-	-	**0**	-
	Irreversibility								
	Override								
	Source	-	-	-	-	-	-		

Systems/Stresses/Sources Worksheet
Site: ***Upper Muddy River***

System/Conservation Target: **Riparian Marsh**
Blue = User Input

List stresses to the system below ***Place cursor over the red cells for help in determining rankings*** *(not available with Excel Version 5.0).*
Rank Severity and Scope for each stress: ***Very High**, **High**, **Medium** or **Low***
Overall stress ranks will be calculated automatically; users can directly enter an alterantive stress rank in the blank "User Override" cells below

Stresses	Severity	Scope	Stress	
	Rank (input)	Rank (input)	Rank (calculated)	User Override
			-	
Herbivory	Very High	High	High	
Trampling	Very High	High	High	
Direct removal	Very High	Very High	Very High	
			-	
			-	

List the Sources of the stresses below.
Rank Contribution and Irreversibility for each source of each stress: Very High, High, Medium or Low. Users can enter an alternative source rank in the blank cell in the "Override" row.

Sources of Stress		- -	Herbivory *High*	Trampling *High*	Direct removal *Very High*	- -	- -	Score	Combine Threat Rank
	Contribution Irreversibility Override Source	- -	- -	- -	- -	- -	- -	0	-
Incompatible grazing practices	Contribution Irreversibility Override Source	- -	Very High Low High High	Very High Low High High	- -	- -	- -	2	High
Incompatible land development	Contribution Irreversibility Override Source	- -	- -	- -	Very High Very High Very High Very High	- -	- -	3	Very High
	Contribution Irreversibility Override Source	- -	- -	- -	- -	- -	- -	0	-
	Contribution Irreversibility Override Source	- -	- -	- -	- -	- -	- -	0	-
	Contribution Irreversibility Override Source	- -	- -	- -	- -	- -	- -	0	-
	Contribution Irreversibility Override Source	- -	- -	- -	- -	- -	- -	0	-
	Contribution Irreversibility Override Source	- -	- -	- -	- -	- -	- -	0	-

Threats Worksheet

Summary from individual target worksheets

Systems and Threats	Warm Springs Aquatic Assemblage	Muddy River Aquatic Assemblage	Deciduous Riparian Woodland	Riparian Shrubland	Mesquite Bosque	Riparian Marsh	Combined Threat Rank
Incompatible land development	[redacted]	[redacted]	High	High	[redacted]	[redacted]	[redacted]
Regional aquifer withdrawal	[redacted]	[redacted]	-	-	[redacted]	-	[redacted]
Invasive species (tilapia)	[redacted]	[redacted]	-	-	-	-	[redacted]
Invasive species (fan palms)	[redacted]	-	[redacted]	-	-	-	[redacted]
Invasive species (tamarix)	-	-	[redacted]	[redacted]	-	-	[redacted]
Incompatible grazing practices	-	-	[redacted]	High	[redacted]	High	**High**
Local aquifer withdrawal	[redacted]	[redacted]	-	-	[redacted]	-	[redacted]
Conversion to agriculture	-	-	-	-	[redacted]	-	[redacted]
Irrigation ditches for pasture	[redacted]	-	-	-	-	-	[redacted]
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-

Site Threat Ranking	
Overall Site Threat Grade	[redacted]

Appendix E. An example of a conservation easement.

RESERVED CONSERVATION EASEMENT IN DEED

THIS CONSERVATION EASEMENT is reserved by _____, a _____ non-profit corporation, ___address_____ in the attached deed from the _____ to ____name and address_____ (the "Grantee"). The following Exhibits are a part of this Easement:

Exhibit A -Map of Property
Exhibit B - Description of Property
Exhibit C - Acknowledgment of Condition

WHEREAS, the [organization] is the owner of certain real property in Clark County, Nevada, described in Exhibit A and Exhibit B ("the Property"); and

WHEREAS, the Property currently remains in a substantially undisturbed, natural state and has significant ecological and open-space values; and

WHEREAS, the Property is a valuable part of the Muddy River, which includes the Property and the aesthetic and ecological values thereof, including flora, fauna, and soils; and

WHEREAS, the Property provides significant relatively natural habitat for native wildlife and plants; and

WHEREAS, all of the natural elements and ecological and open-space values on the Property are of great importance to Grantee and the [organization] and to the people of the State of Nevada and are worthy of preservation; and

WHEREAS, the [organization], as owner in fee of the Property, owns the affirmative rights to identify, to preserve and protect in perpetuity, and to enhance and restore the native species, natural features, and processes of the Property; and

WHEREAS, the [organization] intends to reserve these rights to itself; and

WHEREAS, the [organization] is organized to preserve and protect natural areas and ecologically significant land for aesthetic, scientific, charitable, and educational purposes, and is qualified under Section 170(h)(3) of the Internal Revenue Code of 1986, as amended, to acquire and hold conservation easements;

NOW THEREFORE, in consideration of the mutual covenants contained herein, [organization], a non-profit corporation, its successors and assigns, reserves to itself a Conservation Easement in perpetuity consisting of the rights hereinafter enumerated, over and across the Property and Grantee, their heirs, successors and assigns agree to be bound by the terms and conditions contained herein.

1. Purpose. It is the purpose of this Conservation Easement to preserve and protect in perpetuity and to enhance and restore the significant relatively natural habitat and natural ecosystems of the Property. Specifically, and without limitation of the general purposes, it is the purpose hereof to preserve, protect, and enhance the significant relatively natural habitat for plants and wildlife and plant communities associated with the Muddy River region. In so doing, it is the purpose of this Conservation Easement to permit the continuation on the Property of such passive recreational uses as are consistent with the conservation purposes of this Conservation Easement.

2. Easement Documentation Report. An Easement Documentation Report ("Report") for the Property has been completed by a competent naturalist familiar with the environs. The Report has been reviewed and approved by the [organization] and Grantee as an accurate representation of the biological and physical condition of the Property at the time of this grant, and an Acknowledgment of Condition has been attached hereto as Exhibit C. In the event a controversy arises with respect to the nature of the biological and/or physical condition of the Property, the parties shall not be foreclosed from using any and all other relevant documents, surveys, reports, or other information in the resolution of the controversy.

3. [organization's] Rights. The rights reserved by the [organization] by this Conservation Easement are the following:

a. To identify, to preserve and protect in perpetuity and to enhance, by mutual agreement, the significant relatively natural habitat for plants and wildlife and plant communities on the Property.

b. To enter upon the Property to enforce the rights herein granted, to study and make scientific observations of its ecosystems, to undertake scientific studies designed to monitor the natural communities and species on the Property, and to determine whether Grantee's activities are in compliance with the terms of this easement, all upon reasonable prior notice to Grantee, and in a manner that will not unreasonably interfere with the use being made of the Property, consistent with this Conservation Easement, at the time of such entry. The [organization] shall also have the right of immediate entry to the Property if, in the [organization's] sole judgment, such entry is necessary to prevent damage to or the destruction of the conservation purposes of this easement.

c. To enjoin any activity on, or use of, the Property which is inconsistent with the Conservation Easement and to enforce the restoration of such areas or features of the Property as may be damaged by such activities.

4. Grantee's Rights. The following uses and practices, though not an exhaustive recital of consistent uses and practices, are consistent with this Conservation Easement, and these practices may not be prevented or limited by this Conservation Easement except for the requirement of prior approval from the [organization] where provided herein:

a. To construct residential or other lodging structures, and accessory outbuildings directly related to the permitted activities herein, in the area defined as the "Building Envelope" on the map in Exhibit A.

b. To maintain, repair and, in the event of destruction, reconstruct existing structures on the Property, utility lines, unpaved roads, wells, septic systems, and other similar structures and improvements which are reasonably accessory or incidental to the structures currently existing on the Property, including, but not limited to, the existing diversion of water from a spring on the Property which is used as the water supply for the activities on the Property, provided that:

1) the manner and location of installation does not materially and adversely impact the conservation values of the Property, as determined by the [organization], and is not otherwise inconsistent with the purpose of this Easement; and

2) the location of all roads must be agreed to in advance by the [organization], taking into consideration the conservation values of the Property. Wherever possible, access roads shall be consolidated so as to minimize the number and length of roads and road cuts on the Property.

c. To engage in light recreational activities, including hiking, fishing, horseback riding, birdwatching, and other passive recreational uses, and other commercial activities that can be conducted within the existing or permitted structures in a manner that does not negatively impact the purposes of this Conservation Easement.

d. To construct, maintain, and repair perimeter and other fencing subject to the following restrictions:

1) All fencing should be kept to a minimum so as to not impede the movement of wildlife.

2) Perimeter fencing on the exterior boundaries of the Property may be constructed, maintained, repaired or reconstructed provided they are compatible with the movement of wildlife across the Property as determined by the [organization].

e. To control noxious weeds with biocides as required by state laws provided that:

1) all application of such biocides shall be made only in those amounts and kinds and with that frequency and manner of application which constitute the minimum necessary to control the noxious weeds with minimal impact on the stream system, riparian, and wildlife values of the Property and that the biocide does not leave residuals in the soil or ground water; and

2) aerial application of such biocides is allowed with the prior approval of the [organization].

5. Prohibited Activities. The following uses and practices by Grantee are inconsistent with the purpose of this Conservation Easement, and shall be prohibited:

a. The change, disturbance, alteration, or impairment of the significant relatively natural habitat for plants, wildlife, or plant communities within and upon the Property.

b. The construction or placement of any buildings, or any structures or roads, including camping accommodations and mobile homes, upon the Property, including, but not limited to, the river floodplain, except as expressly provided herein.

c. The removal, destruction, or cutting of native living vegetation, including harvesting of timber and collecting firewood, except for personal, non-commercial use on the Property.

d. The introduction of non-native plant or animal species.

e. The use of agrichemicals, except as provided herein.

f. Hunting of any non-game animals.

g. The exploration for or extraction of minerals, oil, gas, or other hydrocarbons, soils, sands, gravel, rock, or other materials on or below the surface of the Property.

h. The division, subdivision, or de facto subdivision of the Property is prohibited.

i. The use of any motorized vehicles, including motorcycles and off-road vehicles, or mountain bicycles, is prohibited anywhere on the Property, except on established and approved roads. The Property may be used only for non-motorized recreational purposes, which may include such activities

as hiking, and horseback riding, but which shall not include mountain bikes, except on established and approved roads.

j. The dumping, burning, storage or other disposal of toxic materials or of non-compostable refuse. Notwithstanding anything in this Easement to the contrary, this prohibition does not make the [organization] an owner of the Property, nor does it permit the [organization] to control any use of the Property by the Grantee which may result in the storage, dumping or disposal of hazardous or toxic materials; provided, however, that the [organization] may bring an action to protect the conservation values of the Property, as described in this Easement. (This prohibition does not impose liability on the [organization], nor shall the [organization] be construed as having liability as a "responsible party" under CERCLA or similar federal or state statutes.)

k. The manipulation, diversion, or other alteration of natural water courses, wetlands, or other bodies of water or any practice which degrades or destabilizes their natural banks or shorelines, except as expressly provided herein.

l. The degradation, pollution, or drainage of any surface or sub-surface water.

m. Any change in the topography of the Property through the placement therein of soil, land fill, dredging spoils, or other material, except as incidental and necessary to the activities permitted hereunder.

o. Any commercial or industrial use, except as expressly permitted herein.

p. The operation of a commercial feedlot, defined as any permanently constructed, confined area or facility within which the land is not grazed or cropped annually, for purposes of engaging in the business of reception and feeding cattle, sheep, pigs, hogs, or other livestock. Commercial feedlots shall not include corrals which are permitted within the Building Envelope and keeping a small number of horses in those corrals in connection with the activities expressly permitted herein.

q. The construction of new roadways.

6. Prior Notice and Approval. Grantee shall not undertake or permit any activity requiring prior approval by the [organization] without first having notified and received approval from the [organization] as provided herein.

Prior to the commencement of any such activity, Grantee shall send the Conservancy written notice of his/her intention to undertake or permit such activity. The notice shall inform the [organization] of all aspects of the proposed activity, including location, design, materials or equipment to be used, dates and duration, and any other relevant information, and shall be sent by (i) registered or certified mail, return receipt requested, to [organization], or (ii) such other addresses as Grantee may from time to time be informed of in writing by [organization].

The [organization] shall have forty-five (45) days from receipt of the notice, as indicated by the date of the return receipt, to review the proposed activity and to notify Grantee of any objections thereto; provided that the 45-day period shall not begin until such time as the [organization] has received adequate information from Grantee to evaluate the proposed activity. In the event that the [organization] requires additional information to evaluate the proposed activity, the [organization] shall request the information from Grantee as soon as practicable and in any case not later than 30 days after the receipt of the notice of the proposed activity.

The [organization] decision to approve or disapprove the activity proposed by Grantee shall be sent by registered or certified mail, return receipt requested, to Grantee at the address first stated above, or to such other address as the [organization] may from time to time be informed of in writing by Grantee.

A decision by the [organization] to disapprove a proposed activity must be based upon the [organization] determination that the proposed activity is inconsistent with the conservation purposes of the Easement. If in the [organization] judgment it is possible that the proposed activity can be modified to be consistent with the Easement, the [organization's] decision notice shall inform Grantee of such modification(s). Once modification is made to the satisfaction of the [organization] or the [organization] otherwise concurs with the matters set forth in Grantee's notice, the proposed activity may thereafter be conducted in a manner that is acceptable to the [organization].

Should the [organization] fail to post its response to Grantee's notice within forty-five (45) days of its receipt of notice or within forty-five (45) days of the time that the [organization] has received adequate information to evaluate the proposed activity, whichever is later, the proposed activity is automatically deemed consistent with the terms of the Easement, the [organization] having no further right to object to the activity identified by such notice.

7. Remedies, Breach and Restoration. In the event a violation of any restriction contained herein, whether by Grantee or a third party, comes to the attention of the [organization], the [organization] shall notify Grantee in writing of the violation. Grantee shall have thirty (30) days after the receipt of such notice to undertake actions, including restoration of the Property, that are reasonably calculated to swiftly correct the conditions caused by such violation. If Grantee fails to take such corrective action, the [organization] may at its discretion undertake such actions, including appropriate legal proceedings, as are reasonably necessary to effect such corrections, and the cost of the corrections, including the [organization's] expenses, court costs, and legal fees, shall by paid by Grantee, provided either Grantee, Grantee's family, any shareholders in the Property, agents, guests, employees or other persons permitted by Grantee are determined to be responsible for the violation.

In the event that Grantee undertakes any activity requiring approval of the [organization] without or in advance of securing such approval, the [organization] shall have the right to force, by appropriate legal or equitable action, including an action for injunction or specific performance, the restoration of that portion of the Property affected by the activity to the condition that existed prior to the undertaking of the unauthorized activity. In such case, the costs of restoration and the [organization's] costs of suit, including reasonable attorneys' fees, shall be borne by Grantee or those of his/her heirs, personal representatives, or assigns against whom a judgment is entered, or, in the event that the [organization] secures redress without a completed judicial proceeding, by Grantee or those of his/her heirs, personal representatives, or assigns who are otherwise determined to be responsible for the unauthorized activity.

Enforcement of the terms and provisions of this Easement shall be at the discretion of the [organization]. Any forbearance on behalf of the [organization] to exercise its rights hereunder in the event of any breach by Grantee or their respective heirs, personal representatives, or assigns shall not be deemed or construed to be a waiver of the [organization's] rights hereunder in the event of any subsequent breach.

8. Liabilities. Grantee shall hold harmless, indemnify, and defend the [organization] and the [organization's] members, directors, officers employees, agents, and contractors and the heirs, personal representatives, successors, and assigns of each of them from and against all liabilities, penalties, costs, losses, damages, expenses, causes of action, claims, demands, or judgments, including, without limitation, reasonable attorneys' fees, arising from or in any way connected with the presence or release of any hazardous material or substance of any kind placed or released on the Property on or after the date of the deed from the [organization] to the Grantee. This paragraph shall not apply in the case of any hazardous material or substance in any manner placed on the Property by the [organization] or the [organization's] representatives or agents.

9. Taxes and Costs. Grantee agrees to pay any and all real property taxes and assessments levied by competent authority on the Property, including any tax or assessment on the easement herein granted, and to bear all costs of Grantee's operation, upkeep, and maintenance of the Property, and does hereby indemnify the [organization] therefrom.

10. Access. Nothing herein contained shall be construed as affording the public access to any portion of the land subject to this Conservation Easement solely by virtue of the [organization] holding this Conservation Easement.

11. Assignment. [organization] may assign the Easement with Grantee's prior approval which shall not be unreasonably withheld; provided that:

A. [organization] requires, as a condition of such transfer, that the conservation purposes of the Easement continue to be carried out; and

B. An assignment may be made only to an organization qualified at the time of transfer as an eligible donee under the IRS Code (or any successor provisions then applicable).

C. Grantee's approval shall be sought at least 60 days prior to the proposed assignment.

12. Change of Conditions. The fact that any use of the Property that is expressly prohibited by this Easement, or any other use as determined to be inconsistent with the purposed of this Easement, may become greatly more economically valuable than permitted uses, or that neighboring properties may in the future be put entirely to uses that are not permitted thereunder, has been considered by the Grantee in agreeing to the terms and conditions of this Easement. It is Grantee's belief that any such changes will increase the benefit to the public of the continuation of this Easement, and it is the intent of both Grantee and the [organization] that any changes should not be assumed to be circumstances justifying the termination or extinguishment of this Easement pursuant to this paragraph. In addition, the inability to carry on any or all of the permitted uses, or the unprofitability of doing so, shall not impair the validity of this Easement or be considered grounds for its termination or extinguishment pursuant to this paragraph.

13. Extinguishment. If circumstances arise in the future that render the purpose of this Easement impossible to accomplish, this Easement can only be terminated or extinguished, whether with respect to all or part of the Property, by judicial proceeding in a court of competent jurisdiction. Each party shall promptly notify the other when it first learns of such circumstances. The amount of the proceeds to which the [organization] shall be entitled, after the satisfaction of prior claims, from any sale, exchange, or involuntary conversion of all or any portion of the Property subsequent to such termination or extinguishment, shall be determined, unless otherwise provided by Nevada law at the time, with paragraph 14 below.

14. Proceeds. This Easement constitutes a real property interest vested in [organization], which the parties stipulate to have a fair market value determined by multiplying the fair market value of the Property unencumbered by the Easement (minus any increase in value after the date of this grant attributable to improvements) by the ratio of the value of the Easement at the time of this grant to the value of the Property, without deduction for the value of the Easement, at the time of the deed from the [organization] to the Grantee. The values at the time of the deed shall be those values used to calculate the deduction for federal income tax purposes, if applicable, pursuant to Section 170(h) of the Internal Revenue Code of 1954, as amended. For the purposes of this paragraph, the ratio of the value of the Easement to the value of the Property unencumbered by the Easement shall remain constant.

15. Amendment. If circumstances arise under which an amendment to or modification of the Easement would be appropriate, Grantee and the [organization] may jointly amend the Easement; provided

that no amendment shall be allowed that affects the qualification of the Easement under the IRS code. Any such amendment shall be consistent with the purposes of the Easement, shall not affect its perpetual duration, shall not permit additional development or improvements to be undertaken on the Property other than development or improvements currently permitted by the Easement, and shall not impair any of the significant conservation values of the Property. Any such amendment shall be recorded in the official records of Clark County, Nevada.

17. Notices. Any notice, demand, request, consent, approval or communication that either party desires or is required to give to the other shall be in writing and either personally or sent by first class mail, postage prepaid, addressed as follows:

To the [organization]:

THE GRANTEE:

See the address set forth above.

17. Miscellaneous.

A. Definitions. The terms "Grantee" and "[organization]," wherever used herein, and any pronouns used in place of those terms, shall be deemed to include, respectively, Grantee and their heirs, personal representatives, executors, administrators, successors, and assigns, and the [organization], its successors and assigns.

B. Binding Effect. Grantee and the [organization] intend that this Easement shall run with and burden title to the Property in perpetuity, and shall bind Grantee, their heirs, successors, personal representatives, and assigns.

C. Severability. If any provision of this Easement or the application thereof to any person or circumstance is found to be invalid, the remainder of the provisions hereof and the application of such provisions to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

D. Entire Agreement. This instrument sets forth the entire agreement of the parties with respect to the Easement and supersedes all prior discussions, negotiations, understandings, or agreements relating to the Easement, all of which are merged herein. No alteration or variation of this instrument shall be valid or binding unless contained in an amendment that complies with paragraph 13 above.

IN WITNESS WHEREOF, Grantee and the [organization] have hereunto set their hands this _____ day of _____ , 1998.

GRANTEE:

_____

_____

THE [ORGANIZATION]:

[ORGANIZATION]

By:_____

Its:_____

STATE OF)
) ss.
County of)

I,_____, a Notary Public, hereby certify that on the _____ day of _____, 199_, personally appeared before me, [names], being by me first duly sworn, declared that they signed the foregoing document and have executed the same as their free act and deed.

WITNESS my hand and seal.

_____
Notary Public
Residing at_____
My commission expires:_____

STATE OF _____)
) ss.
COUNTY OF _____)

On this ___ day of _____, 19__, before me personally appeared_____, to me known to be the _____ of [organization] a non-profit corporation, and acknowledged the said

instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that he was authorized to execute said instrument.

[SEAL]

Notary Public in and for the State of _____
Residing at _____
My commission expires_____

Exhibit A

Map of the Property

Please see the attached map.

Exhibit B

Property Description

Exhibit C

Acknowledgment of Condition

Grantee and the [organization] acknowledge that each has read the "_____ Easement Documentation Report," dated _____, 199__, and that the report accurately reflects the condition of the Property subject to the Easement as of the date of the deed from the [organization] to the Grantee.

[organization],
a non-profit corporation

By: _____
Its _____
Date: _____

_____
[name]
Date:_____

_____
[name]
Date:_____

APPENDIX F

DRAFT

MEMORANDUM OF AGREEMENT

between

Bureau of Land Management (BLM)
National Park Service (NPS)
Nellis Air Force Base (Nellis)
Nevada Division of Forestry (NDF)
Nevada Natural Heritage Program (Heritage)
Nevada Department of Transportation (NDOT)
Clark County (County)
Las Vegas Valley Water District (District)
The Nature Conservancy (TNC)
and
U.S. Fish and Wildlife Service (FWS)

for the Las Vegas Bearpoppy
(*Arctomecon californica*)

This document is a Cooperative Management Agreement (Agreement) for the coordination and performance of activities required for the conservation of the Las Vegas bearpoppy *(Arctomecon californica*). The primary purpose of this Agreement is to provide management direction that will conserve the species and lead to reduction or removal of the threats. This Agreement is specific to populations and habitat of the Las Vegas bearpoppy on Federal, State, County, and private land in Clark County, Nevada.

I INTRODUCTION

The Las Vegas bearpoppy (formerly known as the California bearpoppy), is a plant species endemic to the eastern Mojave Desert. The majority of populations occur in Clark County, Nevada, with a few populations in northwestern Arizona. Populations of the Las Vegas bearpoppy, which occur primarily on soils with high gypsum content, are observed to be declining across a substantial portion of its range, particularly in the rapidly developing Las Vegas Valley, and on public lands on the urban fringe of the valley.

As of January 1996, the Las Vegas bearpoppy had been reported from 108 current and historic populations. These populations occur on lands under various management status, including BLM, NPS, Nellis, State of Nevada, and private ownership. Of the 108 populations, 12 percent are presumed extirpated, mostly due to urban development in Las Vegas Valley. Many other populations are likely to be extirpated in the foreseeable future. Immediate threats to the species include urbanization, feral animal overgrazing, mineral exploration and development, highway development, off-road vehicles, and other recreation uses.

II PURPOSE

The purpose of this Agreement is to formalize cooperation between agencies and others concerned with or involved in activities related to the conservation of the Las Vegas bearpoppy in Clark County, Nevada. Since 1979, the Las Vegas bearpoppy has been designated as a "critically endangered" species by the State of Nevada under Nevada Revised Statute (NRS) 527.270. The Las Vegas bearpoppy is not federally listed as threatened or endangered, or proposed for listing under the Endangered Species Act of 1973, as amended (ESA). However, the species exhibits a declining status trend, which, if continued, could eventually result in a need to list the species under the ESA. This Agreement provides a mechanism for averting the declining status trend which could lead towards Federal listing.

The Federal land management agencies are responsible for ensuring that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of threatened, endangered, or proposed species. In 1994, the FWS joined the BLM, NPS, and National Marine Fisheries Service, in signing a Memorandum of Understanding (MOU), that established the general framework for cooperation and participation among the cooperators in the conservation of species that are tending towards federal, listing as threatened or endangered under the ESA. The 1994 MOU provides the basis for the aforementioned agencies working jointly towards the conservation of species and their habitats. Its primary objective is to reduce, mitigate, and possibly eliminate the need for their listing under the ESA by developing strategies leading to conservation agreements, where appropriate, for selected species, groups of species, or specific ecosystems. The 1994 MOU was a model for development and implementation of this Agreement, and as appropriate, may be a model for subsequent development of a conservation agreement for the Las Vegas bearpoppy.

III OBJECTIVES OF THIS MEMORANDUM OR AGREEMENT

Attachment A, entitled "Las Vegas bearpoppy – Overview of Species Status and Conservation Actions Needed for its Long-term Protection," was prepared by FWS and is attached for information only. It is not incorporated or made part of this Agreement. Attachment of this document to the Agreement does not indicate that the parties necessarily concur with the overview, nor does it obligate the parties to additional commitments under this Agreement. The overview includes a list of actions believed necessary to avoid the listing of the Las Vegas bearpoppy under the ESA. The objectives of this Agreement are intended to establish the ftamework for accomplishing those actions. The objectives are:

- To determine how to manage and maintain habitats for the Las Vegas bearpoppy.
- To advise the involved agencies and other entities how they can contribute to conservation of the Las Vegas bearpoppy.
- To gain the mutual cooperation and commitment of all agencies and entities involved in the protection and long-term conservation of the Las Vegas bearpoppy.

IV ROLES AND RESPONSIBILITIES OF THE PARTIES TO THIS AGREEEMENT IN CONSERVATION OF THE LAS VEGAS BEARPOPPY

1. The FWS has drafted guidance for species conservation stressing the need to conserve species and ecosystems in which they occur, before significant declines occur. Cooperative Management Agreements and Conservation Agreements with other parties are an important means used by the FWS for accomplishing species conservation. With this Agreement, the FWS seeks to establish the framework for halting the decline and stabilizing the status of the Las Vegas bearpoppy.

2. The BLM, NPS, and Nellis, as Federal entities, seek to ensure that actions authorized on Federal lands do not contribute to the need to list species under the ESA. Each of these entities have management responsibility for populations of Las Vegas bearpoppy on lands under their stewardship.

   The Las Vegas District of the BLM has management authority for approximately 45 percent of all documented sites, comprising approximately 18 percent of the total documented habitat acreage of the Las Vegas bearpoppy.

   The NPS Lake Mead National Recreation Area has management authority for approximately 19 percent of all documented sites, comprising approximately 77 percent of the total documented habitat acreage of the Las Vegas bearpoppy.

   Nellis AFB supports populations of the Las Vegas bearpoppy that are scattered around the base. A population on Area 3 is a main focus of this Agreement. The exact size of the bearpoppy habitat needed for the conservation of the Area 3 population is unknown. A recent analysis of genetic variation in the species (Harper and Van Buren 1996) demonstrated that the Area 3 population contains unusual genetic materials believed essential to the long-term viability of the species.

3. Clark County administers the Desert Conservation Plan (DCP) to mitigate the impacts of take of desert tortoise under the ESA in the Las Vegas Valley. The County is currently developing a multiple species component to the DCP, which should provide long-term protection for species at risk in the Las Vegas Valley while also providing assurance to the County that additional ESA listings will not jeopardize economic opportunity. The Las Vegas bearpoppy is a priority of the multiple species component of the DCP.

4. Clark County Department of Aviation owns and operates the North Las Vegas Airport. More than 100 acres of Las Vegas bearpoppy habitat exists on this property. The property has been planned for use as a golf course which would destroy much of the prime bearpoppy habitat. Alternatives to golf course

development, which would provide for long-term conservation of the bearpoppy, are being investigated.

5. NDF administers NRS 527.270, requiring that no species designated as "critically endangered" be removed or destroyed except under special permit issued by the State Forester Firewarden.

6. Heritage maintains updated information on the distribution and biology of sensitive species throughout the State of Nevada and provides technical advice and information on the conservation management of those species.

7. NDOT, as a perniittee under the Clark County DCP and a participant in the development of the multiple species component of the DCP, is committed to avoiding or minimizing impacts to sensitive species that occur in highway rights-of-way.

8. The District owns and manages the North Well Field, a 180-acre parcel of land that supports populations of Las Vegas bearpoppy. The District has developed a Master Plan for the North Well Field, which will provide long-term protection not only for the Las Vegas bearpoppy, but for all biological and cultural resources on the property.

9. TNC has an interest in preserving unique species and populations of native plants and wildlife and in facilitating the proactive conservation measures required to insure long-term viability of those species. TNC also believes in employing a strong scientific basis for conservation planning and as such, facilitates research and monitoring programs for the Las Vegas bearpoppy, the habitat, and the associated species necessary for its survival.

V OBLIGATIONS OF THE PARTIES

Actions that will be completed:

1. Clark County Department of Aviation, BLM, TNC, and FWS 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.

2. Nellis, FWS, and TNC will investigate opportunities for establishing a conservation area and will attempt to develop a strategy for protection of the Las Vegas bearpoppy population mentioned in Section IV B, on portions of Area 3 of the base. This strategy will include measures to determine the exact acreage needed to conserve the Area 3 population. Then, the signatories to this agreement, as applicable, will work together to assist Nellis in determining opportunities for land acquisitions from other entities to Nellis.

3. The District, FWS, 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.

4. 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.

5. BLM will implement the 1998 Las Vegas Bearpoppy Habitat Management Plan (HMP) to the extent allowable under the existing Land Use Plan. Additional actions proposed in the Bearpoppy HMP that are not consistent with the Resource Management Plan (RMP) will be proposed as amendments to the RMP, or alternative actions will be found that meet the same goal.

6. BLM and FWS 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.

7. NDOT will coordinate with FWS, NDF, TNC, and Heritage in developing mitigation measures to offset the adverse effects of highway development and maintenance on the Las Vegas bearpoppy.

8. NPS and FWS 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.

9. 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.

10. 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.

11. All signatories to this Agreement will periodically discuss progress in accomplishment of actions outlined in A through J.

12. All signatories to this Agreement will, as deemed necessary for long-term species conservation, work towards development of a signed Conservation Agreement detaing specific on-the-ground actions and commitment towards Las Vegas bearpoppy protection.

VI TIME FRAME

The duration of this Agreement is for two years following the date of the last signature. After two years, the signatories will review the status of the Agreement and decide to renew, modify, amend, or rescind the Agreement. If the signatories cannot, within 60 days, reach consensus on which of these actions to take, then the agreement will expire.

VII TERMS AND CONDITIONS

This Agreement shall become effective only, if and when signed by all the parties, and then shall continue under the terms of Section VI above. This Agreement may be modified, amended, or rescinded at any time upon the mutual consent of all parties. The parties to this Agreement recognize that the failure of any party to follow the terms of this Agreement may result in the release of responsibilities and obligations under this Agreement of other parties to this Agreement.

VIII LIMITATIONS

Nothing herein shall be considered as obligating any party, agency, or other entity to commit or obligate funds, or to otherwise impose requirements on these entities involving any payments of money in excess of appropriations authorized by Congress or law. Any specific actions are not required under this Agreement, and are subject to negotiation by the parties to the Agreement.

IX LITERATURE CITED

Harper, K.T. and R. Van Buren. 1996. An analysis of DNA variation among populations of *Arctomecon californica* and *A. merriamii* in southern Nevada. Report to The Nature Conservancy, Las Vegas, Nevada. 19 pp.

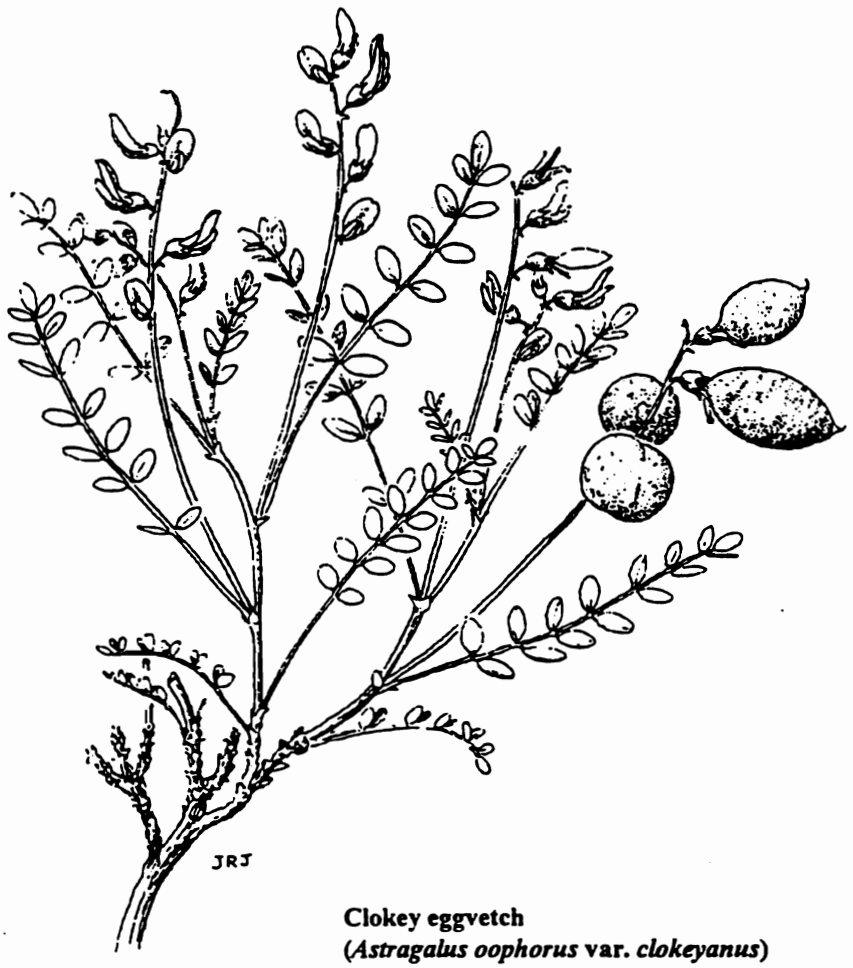
X SIGNATURES

Michael Dwyer, District Manager Bureau of Land Management, Las Vegas Field Office	Date
Alan O'Neill, Park Superintendent Lake Mead National Recreation Area	Date
Russell T. Bolt, Base Commander Nellis Air Force Base	Date
Roy Trenowith, State Forester Firewarden Nevada Division of Forestry	Date
Glenn Clemmer, Program Manager Nevada Natural Heritage Program	Date
Tom Stephens, Director Nevada Department of Transportation	Date
Yvonne Atkinson Gates, Chair Board of County Commissioners	Date
Pat Mulroy, General Manager Las Vegas Valley Water District	Date
Graham Chisholm, State Director The Nature Conservancy	Date
Robert D. Williams, Field Supervisor U.S. Fish and Wildlife Service Nevada Fish and Wildlife Office	Date

APPENDIX G

CONSERVATION AGREEMENT

for the
Spring Mountains National Recreation Area
Clark and Nye Counties, Nevada



Clokey eggvetch
(*Astragalus oophorus* var. *clokeyanus*)

U.S. Forest Service Intermountain Region
State of Nevada, Department of Conservation and Natural Resources
U.S. Fish and Wildlife Service, Pacific Region

April 13, 1998

Declaration of Support
for the
Spring Mountains National Recreation Area
Conservation Agreement

April 13, 1998

We acknowledge and support the cooperative efforts of the U.S. Fish and Wildlife Service, U.S. Forest Service, and Nevada Department of Conservation and Natural Resources that led to development and implementation of the Spring Mountains National Recreation Area Conservation Agreement. This agreement fully meets the intent of the National Interagency Memorandum of Understanding (94-SMU-058) to conserve species within their natural ecosystems.

Senator Harry Reid

Senator Richard Bryan

Bruce Babbitt, Secretary of the Interior

Bill Possiel, The Nature Conservancy

CONSERVATION AGREEMENT

for the
Spring Mountains National Recreation Area
Clark and Nye Counties, Nevada

U.S. Forest Service Intermountain Region
State of Nevada, Department of Conservation and Natural Resources
U.S. Fish and Wildlife Service, Pacific Region

April 13, 1998

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Acknowledgments

The U.S. Forest Service, U.S. Fish and Wildlife Service, and Nevada Department of Conservation and Natural Resources appreciate the assistance provided by the following individuals and entities in preparing this Conservation Agreement: Jan Nachlinger, The Nature Conservancy of Nevada; George Austin, Bruce Boyd, and Bret Boyd, Nevada State Museum; Mary Kay Ramsey, formerly with the University of Nevada, Las Vegas; Stuart Weiss, Stanford University; and private researchers Don Sada and Frank Smith. We also acknowledge the many partners and stakeholders - Bureau of Land Management, Clark County, and Southern Nevada Water Authority; and various conservation and wildlife groups, community associations, town boards, mountain residents and commercial operators, off-highway vehicle enthusiasts, climbers, cavers, special use permitees, and wild horse advocates - all have worked together and with the Forest Service, Fish and Wildlife Service, and Nevada Department of Conservation and Natural Resources, in the spirit of compromise, to manage and conserve resources in the Spring Mountains.

This Conservation Agreement was prepared by Janet Bair, U.S. Fish and Wildlife Service, and Sara Mayben, U.S. Forest Service, Spring Mountains National Recreation Area; in coordination with Butch Padilla and Cris Tomlinson, Nevada Division of Wildlife; John Jones, Nevada Division of Forestry; and Glenn Clemmer, Nevada Natural Heritage Program. Additional review and/or technical support was provided by Teresa Prendusi, Dee Gardner, and Kathy Moskowitz, U.S. Forest Service; and Al Pfister, Dolores Savignano, Donna Withers, and Selena Werdon, U.S. Fish and Wildlife Service.

Conservation Agreement
for the
Spring Mountains National Recreation Area
Clark and Nye Counties, Nevada

I. PURPOSE

This Conservation Agreement (CA) has been developed to facilitate voluntary cooperation between the U.S. Forest Service (FS), U.S. Fish and Wildlife Service (FWS), and State of Nevada Department of Conservation and Natural Resources (DCNR), in providing long-term protection for the rare and sensitive flora and fauna of the Spring Mountains National Recreation Area (NRA). Successful implementation of protection-oriented resource management in the Spring Mountains will involve consideration of conservation values through early project planning, in conjunction with an ongoing program of species, habitat, and ecosystem inventory, monitoring, protection, restoration, research, and education. Specific actions necessary to implement this program are described in section VII.

If successfully implemented, this CA should provide long-term protection for all of the species of concern in the Spring Mountains, and should preclude the future need to list any of these species as threatened or endangered under the Endangered Species Act of 1973, as amended (ESA). Should the terms of this CA not be accomplished, and if declines in species status or habitat quality are documented, the FWS may eventually determine that listing of one or more of these species of concern under the ESA will be necessary to halt and reverse declining status trends.

II. INVOLVED PARTIES

A. U.S. Forest Service
Intermountain Region
324 25th Street
Ogden, Utah 84401
(801) 625-5605

B. U.S. Fish and Wildlife Service
Region 1 Office
911 N.E. 11th Avenue
Portland, Oregon 97232
(503) 231-6118

C. Nevada Department of Conservation and Natural Resources
123 West Nye Lane
Carson City, Nevada 89710
(702) 687-4360

III. AUTHORITY

The authority for the FWS and the FS to enter into this voluntary CA is in the Endangered Species Act of 1973, as amended; the Fish and Wildlife Act of 1956, as amended; the Fish and Wildlife Coordination Act, as amended, and the Economy Act. The authority for the Nevada DCNR to enter into cooperative agreements with Federal agencies is granted in Nevada Revised Statutes (NRS) 232.070. Additional authority is found in a 1994 Memorandum of Understanding (MOU) among the Departments of Agriculture, Interior, and Commerce, which establishes a general framework for cooperation in management of species that are tending towards Federal listing as threatened or endangered. Addendum 1 of the MOU adds State fish and wildlife agency leaders as cooperators under the representation of the International Association of Fish and Wildlife Agencies (Appendix A).

Three divisions of the Nevada DCNR are involved in implementation of this CA. The responsibility of the Nevada Division of Wildlife (NDOW) is for the management, propagation, and protection of species of fish and wildlife found within the borders of the State, and for regulating the public use of these resources for the benefit of the people of the State of Nevada.

Nevada Division of Forestry (NDF) administers a program for the conservation, protection, restoration, and propagation of selected species of flora and for the perpetuation of the habitats of such species. This program permits the State Forester/Firewarden to list native plant taxa as "threatened with extinction", and prohibits removal or destruction without a permit.

Nevada Natural Heritage Program (Heritage) is the State's clearinghouse for sensitive species data. Its ongoing mission is to compile, analyze, and disseminate data from all sources on occurrences of endangered, threatened, and sensitive plants, animals, and unique communities throughout Nevada.

In May 1994, the FWS and FS entered into an Interagency Agreement (IA) for the Spring Mountains Ecosystem Conservation Project (Appendix B). The purpose of the IA was to establish the basis for interagency cooperation in development of ecosystem-level management strategies in the Spring Mountains NRA, with the ultimate goal of development of conservation strategies and a CA that would manage and preserve the threatened, endangered, candidate, and sensitive species within the Spring Mountains NRA. The IA provided guidance and the framework for cooperation between the two agencies, and has resulted in development of this CA. Throughout this process, the FWS and the FS have recognized the role of the State as a partner in development of conservation strategies.

IV. BACKGROUND

Environmental Setting

The Spring Mountains ecosystem, located in Clark and Nye counties, Nevada (Figure 1), has long been recognized as an island of endemism, harboring flora and fauna found nowhere else in the world. Several features of this mountain range, most notably its extreme vertical relief, geographic isolation, and geographic position on the boundary of the warm Mojave Desert and the cooler Great Basin Desert, contribute to the diversity of the range. Charleston Peak, the highest peak in the range, is nearly 12,000 feet. The deserts surrounding the Spring Mountains, which are more than 9,000 feet lower than the summit of Charleston Peak, are barriers to migrations of cooler and more mesic-adapted plant and animal species. As a result, relict species have persisted through time in the Spring Mountains, while new species have evolved and become isolated (Nachlinger and Reese 1996). As presently known, 25 species (15 vascular plants, 1 mammal, 9 invertebrates) are endemic to the Spring Mountains ecosystem.

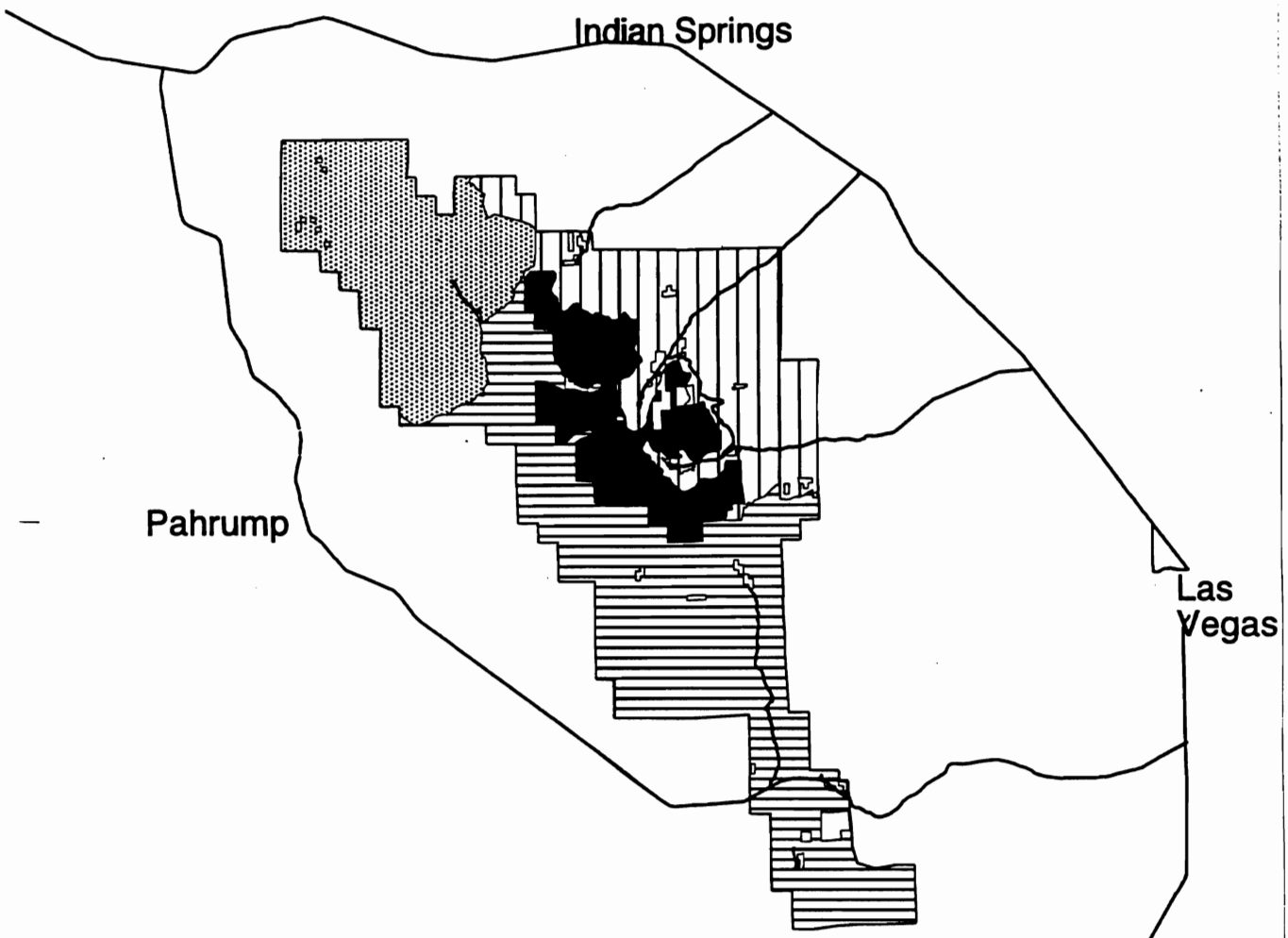
The vegetation of the Spring Mountains has been classified into six broad vegetation zones or types defined by elevational gradient and habitat characteristics: 1) Desert shrublands, 2) low elevation conifer woodlands, montane shrublands, and chaparral, 3) high elevation conifer forests and woodlands, 4) the alpine zone, 5) steep slopes and clifflands, and 6) riparian areas and springs. The vegetation is further hierarchically classified into 17 plant series with 33 associations. A recent focus on these plant communities has contributed to the current understanding of endemic and sensitive species habitats (Nachlinger and Reese 1996).

Various areas within the Spring Mountains are particularly rich in terms of species diversity, numbers of endemic species, and unique plant communities. These "biodiversity hotspots" are defined as areas of any size with any number of ecologically significant elements sharing habitats in the same area (The Nature Conservancy [TNC] 1994, Figure 2). Significant elements may include federally listed species, candidate species, locally and regionally endemic species, locally rare species, and unique communities, such as riparian streams and springs. During the course of management planning and baseline information collection, 39 biodiversity hotspots were identified, including 10 very high, 13 high, and 16 moderate priority hotspots for conservation management (TNC 1994). A list of biodiversity hotspots is provided in Appendix C.

Forest Service Management of the Spring Mountains National Recreation Area

Public Law 103-63, dated August 4, 1993 (the Spring Mountains NRA Act), established the Spring Mountains NRA, including approximately 316,000 acres of Federal lands managed by the Toiyabe National Forest in Clark and Nye counties, Nevada. In establishing the Spring Mountains NRA, three purposes were identified:

Figure 1
Spring Mountains NRA
Management Areas



Management Area 11 - Developed Canyons

Management Area 12 - Mt. Charleston Wilderness Area

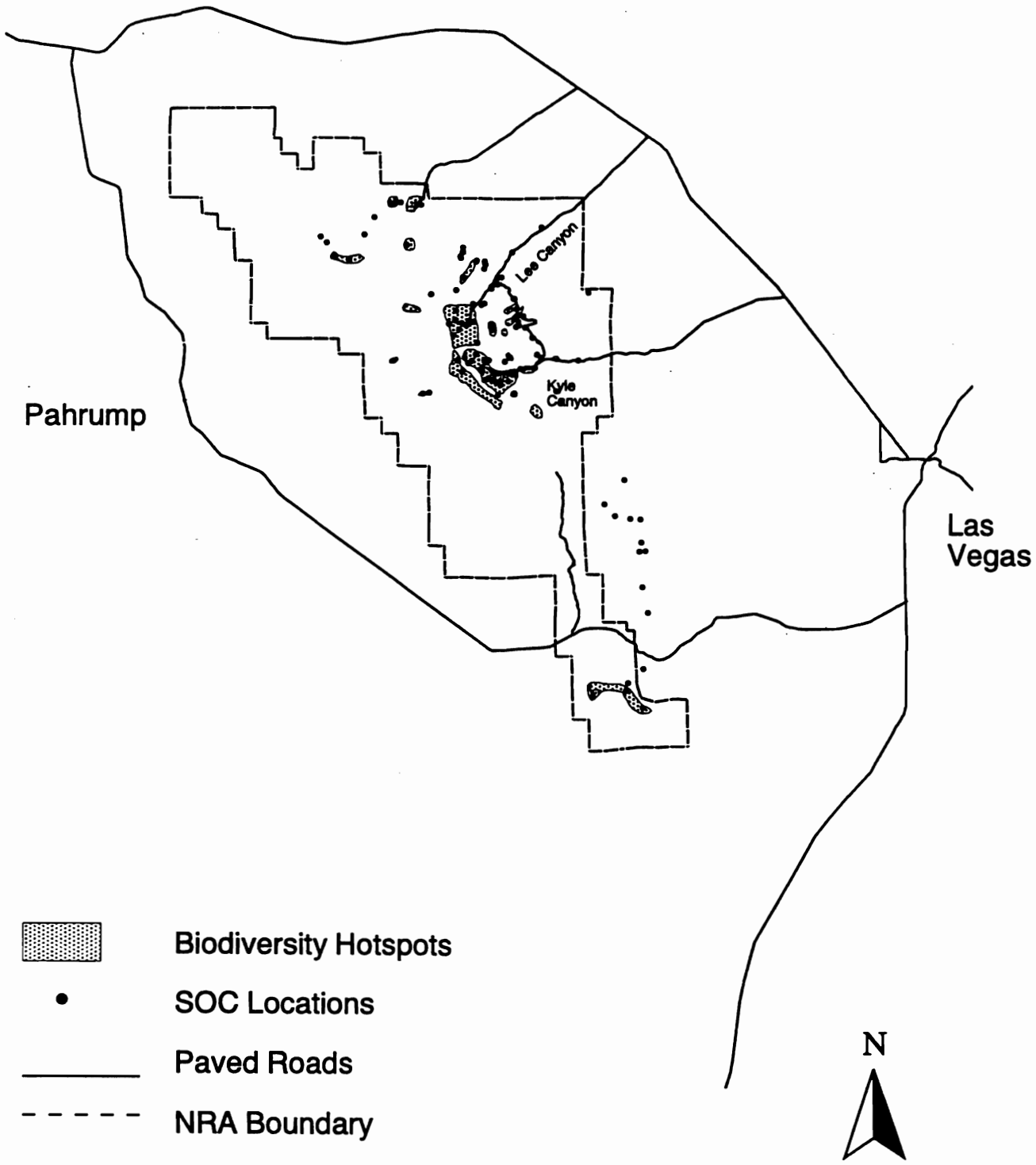
Management Area 13 - West Side

Management Area 14 - Mt. Stirling

Private Lands

Paved Roads

Figure 2
Spring Mountains NRA
Biodiversity Hotspots and
Species of Concern Locations



(1) To preserve the scenic, scientific, historic, cultural, natural, wilderness, watershed, riparian, wildlife, threatened and endangered species, and other values contributing to public enjoyment and biological diversity in the Spring Mountains of Nevada;

(2) to ensure appropriate conservation and management of natural and recreation resources in the Spring Mountains; and,

(3) to provide for the development of public recreation opportunities in the Spring Mountains for the enjoyment of present and future generations.

The Spring Mountains NRA Act also provides for protection of watersheds and the maintenance of free flowing streams and the quality of ground and surface waters in accordance with applicable law, and the use of prescribed fire to improve or maintain habitat. The law specifies the enhancement of public outdoor recreation benefits, including, but not limited to, hunting, fishing, trapping, hiking, horseback riding, backpacking, rock climbing, camping, and nature study, and the management and use of natural resources in a manner compatible with the purposes for which the NRA is established.

The Spring Mountains NRA Act directed development of a general management plan for the NRA as an amendment to the Toiyabe National Forest Land and Resource Management Plan. The Plan Amendment was completed in October 1996. Specific direction is provided in this plan for managing ecosystem health and biological diversity, riparian area protection and restoration, restoration of seral stages for communities of species adapted to disturbance, elimination of term livestock grazing (although grazing may be used to achieve ecosystem health goals), reductions in wild horse and burro populations, and management of ecologically sensitive areas. The NRA Plan Amendment specifically focuses on balancing ecosystem conservation, protection of cultural and heritage resources, continuance of current uses of the Spring Mountains, and additional opportunities for recreation.

The plan provides management emphasis for four primary areas in the Spring Mountains (FS 1996, Figure 1). In all management areas, fire management and vegetation treatments to reduce fire spread are stressed. Prescribed fire and prescribed natural fire will be used in appropriate vegetation types, where lives and property can be protected. Specific management area emphases are as follows:

Management Area 11 - Developed Canyons: The NRA Plan Amendment limits new development in upper Kyle and Lee canyons, while distributing use and facilities to areas of the Spring Mountains NRA outside of the developed canyons. The plan places high emphasis on protection of native species, ecological processes, and heritage resources, incorporating these considerations into the management of recreation areas. Wild horse and elk populations in Cold Creek are to be reduced, while managing recreation use to allow riparian areas to recover.

Management Area 12 - Mt. Charleston Wilderness: The NRA Plan Amendment stresses restoration and protection of the special characteristics of this wilderness, including rare plants, an untrammeled appearance, and opportunities for primitive recreation. Some recreational uses (e.g., campfires, overnight camping, and stock use on some trails) are restricted in order to protect wilderness and ecological values. With the exception of limited construction of hiking trails and climbing routes, no new development will occur, and evidence of past use (e.g., roads, fire rings, water developments) are to be removed. Prescribed natural fires will burn within specific parameters.

Management Area 13 - West Side: The NRA Plan Amendment provides for increased levels of recreation development and service and increased multi-use trails and campsites at appropriate locations, to distribute recreational use throughout this area. The plan will also provide increased protection for heritage resource sites and the unique environment of Carpenter Canyon.

Management Area 14 - Mt. Stirling: The NRA Plan Amendment seeks to retain Mt. Stirling's essentially undeveloped, roadless character, avoiding development of major recreation facilities. Management treatments will be designed to mimic or restore ecological processes such as fire, while maintaining the existing Mt. Stirling Wilderness Study Area suitability for wilderness designation pending Congressional action.

An important emphasis of the NRA Plan Amendment is in providing protection for sensitive species and ecosystems without imposing undue burdens on existing users of the NRA. New opportunities for recreation are to be provided in less sensitive areas, as appropriate. This approach recognizes that increasing demands for recreation and other human uses of the Spring Mountains ecosystem will continue as a result of rapid urban growth in the adjacent Las Vegas Valley. The plan provides the basis for developing recreation sites away from the most sensitive species and habitats, thus diminishing a trend towards unregulated recreation in very sensitive areas (FS 1996).

Ecosystem Management in the Spring Mountains

The FS announced adoption of ecosystem management on June 4, 1992. The Plan Amendment for the Spring Mountains NRA is based on an ecosystem approach to the care and use of national forests. Ecosystem management of National Forest system lands emphasizes an ecological approach in conducting multiple-use management of the National Forests, recognizing that the needs of people and environmental values must be blended in such a way that the National Forests represent diverse, healthy, productive, and sustainable ecosystems (FS 1996).

This CA is intended to reflect an ecosystem management approach to conservation of endemic and sensitive species. Thus, the following guidelines (based on Grumbine 1994) have been adopted as the basis for sustaining viable species, populations, habitats, and ecosystem integrity:

1. Maintain viable populations of all native species in their natural habitats.

2. Represent, within protected areas, all native ecosystem types across their natural range of variation.

3. Maintain evolutionary and ecological processes (i.e., disturbance regimes, hydrological processes, nutrient cycles, etc.).

4. Manage over periods of time long enough to maintain the evolutionary potential of species and the ecosystem.

5. Accommodate human use and occupancy within these constraints.

In achieving this focus, ecosystem management efforts for the Spring Mountains within the context of this CA will emphasize management recognition of the hierarchical context of ecosystems and seek connections among all levels, including species, populations, ecosystems, and landscapes. This emphasis must include working across administrative and political boundaries to establish interagency and public cooperation and support, an ongoing program of research and monitoring, flexible management programs, and acknowledgment that humans are fundamental and unavoidable influences on ecological patterns and processes.

Other Plans and Programs

Three other resource management planning processes that are currently underway consider species of concern and other ecological resources in the Spring Mountains ecosystem:

Bureau of Land Management (BLM), Red Rock Canyon National Conservation Area (NCA): This area formerly consisted of 83,440 acres of public lands on the southeastern flanks of the Spring Mountains ecosystem. Under Public Law 103-450, dated November 2, 1994, the BLM's Red Rock Canyon NCA was expanded in size to 195,610 acres. The expanded NCA includes much of the lower elevation, eastern flanks of the Spring Mountains ecosystem. While a General Management Plan is being prepared for management of this newly expanded area, an Interim General Management Plan provides management guidance (BLM 1995). Interim objectives emphasize protection and conservation of resources in conjunction with management of visitors, facilities, and wild horses.

Bureau of Land Management, Las Vegas District: Lands below 4,500 feet along much of the western and northern flanks of the Spring Mountains ecosystem are under the management authority of BLM's Las Vegas District. Current management direction is provided in several existing plans, primarily, the Clark County Management Framework Plan (BLM 1984), and the Esmeralda-Southern Nye Resource Management Plan/ Environmental Impact Statement - Planning Area B (BLM 1986). The Stateline Resource

Management Plan (RMP), currently in draft stage, will eventually provide management guidance for approximately 3.7 million acres of public lands in southern Nevada (BLM 1992). The draft RMP focuses on six management issues: Land tenure, desert tortoise, mineral development, off-highway vehicle use, special management areas, and utility corridors.

Clark County Habitat Conservation Plan: The Clark County Desert Conservation Plan, signed in 1995, mitigates the impacts of take of desert tortoise under section 10(a)(1)(B) of the ESA, in a permit area comprised of approximately 525,000 acres in Las Vegas Valley (FWS 1995). Mitigation is accomplished through collection of a mitigation fee for development in the permit area. These funds are targeted for conservation of species at risk in Clark County through ecosystem protection. A multi-species plan is being developed to provide assurance to Clark County citizens, developers, businesses, and resource users that additional ESA listings will not jeopardize economic development. Assurances will be given to the County for those species ("covered species") that have been provided conservation measures as if they were listed. These assurances provide the County with the guarantee that they will not be required to provide additional mitigation dollars or land if the species is listed in the future. Implementation of conservation measures for species in the Spring Mountains NRA should provide a basis for declaring that a species is covered.

V. SPECIES AND HABITATS INVOLVED

Species Named in this Agreement and their Conservation Ranking

This section summarizes the species of concern for this CA and highlights those of greatest concern. Appendix D provides a summary of the species of concern, their distribution, habitat requirements, and conservation status. Fifty-seven species are specifically addressed within the context of this CA, including 27 plants, 9 mammals, 5 birds, 1 fish, 3 reptiles, and 12 invertebrates. An additional 11 species are listed at the end of Appendix D. These species are southern Nevada and regional endemic species that are fairly common and/or widespread across their range, and are currently not subject to large scale threats. While these species, are not of specific management concern at this time, they may also benefit from implementation of this CA.

Species included in Appendix D are ranked and categorized by Federal and State entities based on their susceptibility and vulnerability to species disturbance. The major categories are as follows:

Threatened and Endangered Species: These are species listed under the ESA. The listed species known to occur in the NRA are desert tortoise and Lahontan cutthroat trout (a single, introduced population). Listed species with potential to occur in the NRA are peregrine falcon and southwestern willow flycatcher. Section 7(a) of the ESA requires Federal agencies to consult with the FWS when a Federal action may affect a listed species, to insure that any action authorized, funded or carried out by a Federal agency is

not likely to jeopardize the continued existence of those species or result in destruction or adverse modification of critical habitat.

Candidate Species: This category includes species currently being considered by FWS for listing under the ESA. The only remaining candidate species occurring in the Spring Mountains NRA, Clokey eggvetch, was removed from candidate status on March 30, 1998 (63 Federal Register 16217).

Fund For Animals Lawsuit Settlement Agreement Species: In 1991, three endemic plant species of the Spring Mountains NRA were among 401 species included in a nationwide lawsuit settlement agreement between FWS and the Fund For Animals et al., requiring FWS to review the species status and determine whether or not listing under the ESA was necessary to provide for their long-term protection. The Spring Mountains species named in the settlement agreement are Charleston tansy, Charleston kittentails and Clokey eggvetch. In 1996, Charleston tansy and Charleston kittentails were determined not warranted for listing, based on Federal agency efforts to conserve the species, in particular, development and implementation of this CA (61 FR 7595, 61 FR 7457). As previously mentioned, Clokey eggvetch was removed from candidate status in 1998. This decision was based, in part, on conservation actions implemented in the Spring Mountains during and following preparation of this CA.

"Sensitive" is a category used by the FS to designate species for which long-term survival may be of concern due to FS management, because of current or predicted downward trends in population numbers, density, or habitat capability. FS policies require the Spring Mountains NRA to: 1) Ensure that management practices do not cause sensitive species to be federally listed under the ESA, 2) maintain viable populations of native and desired non-native wildlife, fish, and plant species, and 3) develop management objectives for sensitive species.

"Species of concern" is a non-regulatory designation used by the FWS to indicate species that are rare, believed sensitive to human disturbance, or subject to threat. The NRA Plan Amendment also recognizes species of concern that are not designated as sensitive by FS. Most are former candidates for listing under the ESA, for which the FWS lacks sufficient information on vulnerability and threats to base a proposal to list them as threatened or endangered. With the exception of species listed as threatened or endangered under the ESA, all of the species included in the main body of Appendix D are regarded as species of concern.

State Protected Species: The State of Nevada provides protection for selected species of native flora and fauna by placing them on the Critically Endangered Plant Species List or the Protected List of Wildlife Species. Under Nevada State law, it is unlawful to remove or destroy such species of flora, except under special permit issued by the State Forester

Firewarden (NRS 527.270), or capture, remove, or destroy such species of wildlife, except under special permit issued by NDOW (NRS 503.585).

State Heritage Program Rank: The conservation status of native United States species is periodically ranked by the network of affiliated State-agency based Natural Heritage Programs, using standardized methods developed by TNC. Status at State, National, and global (range wide) levels is ranked on a scale of 1 to 5, with 1 being the most vulnerable and 5 the most secure. While Heritage program rankings provide no legal protection, the FWS, FS, and other management agencies use these rankings to prioritize rare species conservation needs.

Habitats for the Species of Concern in the Spring Mountains

The species of concern addressed in this CA occur in one or more of four primary vegetation zones and two azonal habitat types. The Spring Mountains NRA plant community classification (Nachlinger and Reese 1996) defines 17 series with 33 associations within the six zones and types. The zones and types have also been ranked in terms of average biodiversity significance. These rankings are the average value of plant species biodiversity significance within each area, a value based on considerations of global and local distribution and abundances, habitat specificity, and vulnerability to human disturbance (Nachlinger and Reese 1996). The zones and types, characteristic or dominant plant species, average biodiversity significance, and the numbers of species of concern occurring within them are discussed below. Table 1 lists the species of concern by their occurrence within each zone or type.

Alpine Zone (11,335 - 11,900 feet elevation): The alpine zone of the Spring Mountains includes the highest elevations of Charleston Peak, as well as the ridge line south of the peak, and east to Mummy Mountain. The alpine zone is characterized by a single, distinctive plant association (the hidden ivesia series), which ranks highest in terms of biodiversity significance among all series and associations in the mountain range because of the number of endemic species that occur there. Eight plant and one invertebrate species of concern are endemic to the alpine zone of the Spring Mountains.

Springs and Riparian Areas (4,000 - 10,160 feet elevation): There are approximately 200 springs and riparian areas in the Spring Mountains ecosystem, occurring from high to low elevations. In the NRA, springs and riparian areas are classified into 3 series with 11 distinct plant associations, variously characterized by wild rose (*Rosa woodsii* var. *ultramontana*), western water birch (*Betula occidentalis*), salt cedar (*Tamarix ramosissima*), desert baccharis (*Baccharis sergiloides*), narrowleaf willow (*Salix exigua*), and other shrubs, herbaceous perennials, and grasses. These areas vary in terms of biodiversity significance from very low to very high (Nachlinger and Reese 1996). Springs and riparian areas provide habitat for 29 species of concern, including 15 species endemic to the Spring Mountains.

Steep Slopes and Clifflands (4,000 - 8,925 feet elevation): Steep slope and cliff habitats are distributed throughout a 5,000 foot elevational range in the NRA. These areas include five series or associations that are either vegetationally barren or characterized by dwarf mountain mahogany (*Cercocarpus intricatus*) in association with cliff jamesia (*Jamesia americana*), rock spirea (*Petrophyton caespitosum*), and Jaeger ivesia. Steep slopes and cliffs can be a relatively significant source of biodiversity, providing important habitat for various plants, bats, and birds of prey, including 11 species of concern, one of which is endemic to the Spring Mountains.

High Elevation Conifer Forest and Woodland Zone (7,100 to 11,470 feet elevation): The high elevation forests and woodlands, which are vegetationally characterized by various associations of white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa* var. *scopulorum*), curleaf mountain mahogany (*C. ledifolius* var. *intermontanus*), limber pine (*Pinus flexilis*), and bristlecone pine (*Pinus longaeva*), are overall, extremely diverse in terms of species, and rank very high in terms of biological significance. These areas provide habitat for 34 species of concern, including 21 species that are endemic to the Spring Mountains.

Low Elevation Conifer Woodland, Montane Shrubland, and Chaparral Zone (4,970 to 8,900 feet elevation): The low elevation woodlands, shrublands, and chaparral zone is characterized by various associations of single-leaf pinyon (*Pinus monophylla*), Utah juniper (*Juniperus osteosperma*), big sagebrush (*Artemisia tridentata*), and point leaf manzanita (*Arctostaphylos pungens*), in association with singleleaf mountain mahogany (*C. intricatus*), desert ceanothus (*Ceanothus greggii*), and silktassel (*Garrya flavescens*). These associations rank high in terms of biological significance, and provide habitat for 18 of the species of concern, including 7 species that are endemic to the Spring Mountains.

Desert Shrublands Zone (3,800 to 6,510 feet elevation): This zone includes five series and eight associations, variously dominated by creosote bush (*Larrea tridentata*), matchweed (*Gutierrezia microcephala*), blackbrush (*Coleogyne ramosissima*), Utah juniper, cliffrose (*Purshia mexicana* var. *stansburiana*), big sagebrush, and other shrub species. These associations rank relatively low in terms of biodiversity significance, but do provide habitat for 10 of the species of concern, including 1 endemic species.

Of the six primary vegetation or azonal habitat types discussed here, the springs and riparian zones and the high elevation conifer forests and woodlands harbor the greatest numbers of species of concern, followed by the alpine zone. Accordingly, many of the conservation actions outlined in this CA emphasize protection and conservation of ecological resources at the ecosystem level. However, the CA must ensure that individual species are afforded the protection they need so as to avoid declining status trends which could lead towards listing species under the ESA.

TABLE 1. Species named in the Spring Mountains Conservation Agreement and their distribution across six primary vegetation zones and azonal habitat types. (Abbreviations: Al = alpine zone, SR = Springs and riparian areas, Cf = Steep slopes and clifflands, Hi = high elevation conifer forest and woodland zone, Lo = low elevation conifer woodland, montane shrubland, and chaparral zone, DS = desert shrublands zone. [1] indicates species endemic to the Spring Mountains ecosystem, [2] indicates species endemic to southern Nevada and/or neighboring areas, [†] indicates species for which recent status survey information is available.

	VEGETATION/HABITAT TYPES					
SPECIES	**Al**	**SR**	**Cf**	**Hi**	**Lo**	**DS**
PLANTS						
Rough angelica (*Angelica scabrida*)[1†]		X		X		
Charleston pussytoes (*Antennaria soliceps*)[1†]	X	X		X		
Rosy King sandwort (*Arenaria kingii* ssp. *rosea*)[1†]				X		
Clokey milkvetch (*Astragalus aequalis*)[1†]		X		X	X	
Black woolypod (*Astragalus funereus*)				X	X?	X?
Halfring milkvetch (*Astragalus mohavensis* var. *hemigyrus*)[2†]						X
Clokey eggvetch (*Astragalus oophorus* var. *clokeyanus*)[2†]				X	X	
Spring Mountains milkvetch (*Astragalus remotus*)[1]						X
Upswept moonwort (*Botrychium ascendens*)		X				
Dainty moonwort (*Botrychium crenulatum*)		X				
Clokey thistle (*Cirsium clokeyi*)[1]	X	X		X		
Jaeger draba (*Draba jaegeri*)[1†]	X	X		X		
Charleston draba (*Draba paucifructa*)[1†]		X		X		
Nevada willowherb (*Epilobium nevadense*)				X	X	
Clokey greasebush (*Glossopetalon clokeyi*)[1†]			X			
Smooth pungent greasebush (*Glossopetalon pungens* var. *glabra*)[2]			X			
Pungent dwarf greasebush (*Glossopetalon pungens* var. *pungens*)[2]			X			
Hidden ivesia (*Ivesia cryptocaulis*)[1†]	X					
Jaeger ivesia (*Ivesia jaegeri*)[2†]			X			
Death Vly. beardtongue (*Penstemon fruticiformis* var. *amargosae*)[2]			X			X
Charleston beardtongue (*Penstemon leiophyllus* var. *keckii*)[1]		X		X		

	VEGETATION/HABITAT TYPES					
SPECIES	**Al**	**SR**	**Cf**	**Hi**	**Lo**	**DS**
Bean cinquefoil (*Potentilla beanii*)[1]	X	X		X		
Clokey mountain sage (*Salvia dorrii* var. *clokeyi*)[2†]				X	X	
Clokey catchfly (*Silene clokeyi*)[1†]	X			X		
Charleston tansy (*Sphaeromeria compacta*)[1†]	X			X		
Charleston kittentails (*Synthyris ranunculina*)[1†]	X	X		X		
Charleston grounddaisy (*Townsendia jonesii* var. *tumulosa*)[2†]				X	X	
MAMMALS						
Townsend big- eared bat (*Corynorhinus townsendii pallescens*)[†]		X	X	X	X	X
Spotted bat (*Euderma maculatum*)		X?	X?	X?	X?	X?
Allen's lappet-browed bat (*Idionycteris phyllotis*)[†]		X	X	X	X	
Western small-footed myotis (*Myotis ciliolabrum*)[†]		X	X		X	
Long-eared myotis (*Myotis evotis*)[†]		X		X	X	
Fringed myotis (*Myotis thysanodes*)[†]		X	X	X	X	X
Long-legged myotis (*Myotis volans*)[†]		X	X	X	X	X
Yuma myotis (*Myotis yumanensis*)[†]		X	X		X	
Palmer's chipmunk (*Tamias [=Eutamias] palmeri*)[1†]		X		X	X	
BIRDS						
Northern goshawk (*Accipiter gentilis*)				X		
Southwestern willow flycatcher (*Empidonax traillii extimus*)		X?		X?		
American peregrine falcon (*Falco peregrinus anatum*)			X?			
Flammulated owl (*Otus flammeolus*)				X		
Western burrowing owl (*Speotyto cunicularia hypogea*)						X
FISH						
Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)		X				
REPTILES						
Desert tortoise (*Gopherus agassizii*)						X
Banded Gila monster (*Heloderma suspectum cinctum*)		X				X

	VEGETATION/HABITAT TYPES					
SPECIES	**Al**	**SR**	**Cf**	**Hi**	**Lo**	**DS**
Chuckwalla (*Sauromalus obesus*)			X			X
INVERTEBRATES						
Spring Mountains acastus checkerspot (*Chlosyne acastus* ssp.)[1†]		X		X	X	
Bret's blue (*Euphilotes battoides* ssp.)[1]		X			X?	
Dark blue (*Euphilotes enoptes* ssp.)[1†]		X		X	X	
Morand's checkerspot (*Euphydryas anicia morandi*)[1†]	X			X	X	
Spring Mountains comma skipper (*Hesperia comma* ssp.)[1†]		X		X	X	
Spring Mountains icarioides blue (*Icaricia icarioides* ssp.)[1†]		X		X		
Mt. Charleston blue butterfly (*Icaricia shasta charlestonensis*)[1†]				X		
Charleston ant (*Lasius nevadensis*)[1]				X		
Nevada admiral (*Limenitus weidemeyerii nevadae*)[2†]		X		X		
Spring Mountains springsnail (*Pyrgulopsis deaconi*)[2†]		X				
Southeast Nevada springsnail (*Pyrgulopsis turbatrix*)[2†]		X				
Carole's silverspot (*Speyeria zerene carolae*)[1†]				X	X	

Species of Greatest Management Concern in the Spring Mountains

Species of greatest management concern include those with the smallest number of populations, or those most vulnerable to threats. Species of greatest management concern at this time include four species of plants (Clokey eggvetch, rough angelica, upswept and dainty moonwort), Palmer's chipmunk, all bats, five butterflies (Spring Mountains acastus checkerspot, Bret's blue, dark blue, Spring Mountains blue, and Morand's checkerspot), and two species of springsnails. Many of the conservation actions included in this CA are geared specifically towards protection of the species of greatest management concern.

Clokey eggvetch: This rare plant species is known from 13 sites in 2 general areas in the Spring Mountains. Much of the habitat and most of the individual plants occur in Lee Canyon, one of the most intensively visited areas in the Spring Mountains. Clokey eggvetch was recently discovered in the Belted Range, Nye County, Nevada (on Nellis Air Force Range), and on Pahute Mesa, Nye County, Nevada (on the Nevada Test Site).

Rough angelica: This species is endemic to the Spring Mountains, where it grows on moist gravelly soils of washes, ephemeral stream courses, and gullies. Rough angelica

occurs in two general areas: Lower elevations within the BLM Red Rock Canyon NCA, and higher elevations on private land and FS lands within the Spring Mountains NRA.

Dainty and upswept moonwort: While both species occur throughout portions of the western United States, documented records are few. In the Spring Mountains, the known habitat of dainty moonwort occurs at only four springs, while the upswept moonwort has been historically documented but not recently found.

Low elevation plants: Several low elevation plants are of concern because information on their overall distribution within the range is limited. These species include halfring milkvetch, Death Valley beardtongue, black woolypod, and Spring Mountains milkvetch.

Palmer's chipmunk: This endemic chipmunk inhabits the cool mesic canyons of the Spring Mountains, typically near water, in mixed conifer and pinyon-juniper woodlands between 7,000 and 12,000 feet. Palmer's chipmunk appears to adapt to some limited land development. However, chipmunks prefer primitive areas with limited access, abundant cover sites, and few hazards. Well developed areas are not preferred as they offer few cover sites and more hazards, such as vehicles and paved roads (Tomlinson 1995).

Bats: Seven bat species of concern occur in the Spring Mountains (Ramsey 1997). Bat abundance and distribution are influenced by availability of water, roost sites, and foraging habitats. In order to access water in riparian areas, they need small pools with slow-moving water (Ramsey 1994). Bats spend at least half of their lives at roost sites, including nursery and hibernation roosts. Documented bat roosts in the Spring Mountains include snags, rock crevices and outcrops, caves, and talus slopes. The species of greatest concern in the Spring Mountains at this time is the Townsend big-eared bat. This species is highly susceptible to disturbance and known to abandon roost sites after only minor disturbance (Ramsey 1997).

Butterflies: The Spring Mountains support eight local endemic and one regional endemic taxa of butterflies. Butterflies have specific larval hostplant requirements, while nectar sources may include a few to many flower species. Sources of standing water and mud are also important components of butterfly habitat (Weiss et al. 1997). The eight endemic butterflies range from being locally common in appropriate habitats throughout the mountain range, to being fairly restricted in distribution. Butterflies of greatest concern in the Spring Mountains NRA are:

> Spring Mountains acastus checkerspot: This taxon is known from 12 locations around the central core of the mountain range, including a large site below Kyle Canyon campground and along the Deer Creek Highway. Its larval host plant is thought to be rabbitbrush (*Chrysothamnus* spp.).

Bret's blue butterfly: This taxon has not been well surveyed, and thus is currently known from a single location in the vicinity of Big Timber Spring on the North end of the range. This spring is located at 6,560 feet in low elevation conifer woodland. Larval host plants and nectar sources are unknown.

Dark blue butterfly: This taxon is known from 11 locations, primarily in association with mud banks near springs in various canyons. Its larval host plant is sulfur buckwheat (*Eriogonum umbellatum*).

Mt. Charleston blue butterfly: This taxon is known from 17 locations, primarily in Lee Canyon and along the Spring Mountains ridge line. Its larval host plant is a species of milkvetch (*Astragalus calycosus* var. *mancus*), which is fairly common on the slopes of the ski area in Lee Canyon.

Morand's checkerspot butterfly: This taxon is known from nine locations, including various canyons and higher elevations in bristlecone pine woodlands. Its larval host plants are species of paintbrush.

Springsnails: These members of the aquatic snail family (Hydrobiidae) are only 1-2 millimeters in size, complete their life cycle in 1 year, and feed on algae. Springsnails inhabit artesian spring ecosystems with permanent flowing, highly oxygenated waters. The waters must be highly mineralized, but relatively unpolluted (Mehlhop 1996). On FS-managed lands, springsnails occur at Kiup Spring, Willow Creek, and the Cold Creek springs (*Castilleja* spp.).

Baseline Information: While some historical information was previously available on the biology and species of the Spring Mountains, much of the baseline information on species occurrence and habitat condition was obtained through field studies and inventories conducted during the period 1993 to 1996. This section briefly summarizes the status of the information being used to determine species management needs.

Rare Plant Inventory: Field inventory and status reports are largely complete for many of the plant species of concern (Knight 1992; Morefield 1993, Nachlinger 1993, Nachlinger and Sheldon 1995, 1997; Smith, 1995a, 1995b, 1995c). Species status reports provide the most current and comprehensive status assessments, including information on species biology, geographic distribution, habitat description, threats to survival, and management recommendations. Plant species which have been the subject of recent status inventories are identified in Table 1.

Plant Monitoring Protocol: Biological monitoring plans were developed for the two highest priority plant species in the Spring Mountains, Clokey eggvetch and rough angelica (Nachlinger and Combs 1996a, 1996b). These plans detail specific

methodologies for assessing species status and detecting biologically significant changes in population density and age structure over time.

Butterfly Inventory: Recent status inventory for eight of the nine butterfly species of concern (with the exception of Bret's blue) have helped to determine known and potential distributions of the taxa and their key hostplant resources (Weiss et al. 1995, 1997). Predictive models are being developed to further assess the distribution of butterflies and their hostplants.

Butterfly Monitoring Protocol: A monitoring plan was developed for the population of Mt. Charleston blue butterfly and its larval hostplant *Astragalus calycosus* var. *mancus* in Lee Canyon. Monitoring densities of the hostplant in transects will provide useful information for management of vegetation resources in the ski area, particularly erosion control plantings of exotic species including grasses and clover (Weiss et al. 1997).

Bat Inventory: Research on local and regional diversity and habitat use of bats in the Spring Mountains included status evaluation of 14 species of bats through inventory of water sources, mines, caves, and cliffs. Information on distribution, life history, and ecology of the bats of concern are summarized and conservation recommendations are provided (Ramsey 1994, 1997).

Spring Vulnerability Assessment: This assessment 1) characterized spring and seep aquatic and riparian communities, 2) determined habitat conditions at representative springs throughout the range, 3) documented the distribution of rare aquatic and riparian species associated with these representative springs, 4) determined the vulnerability of these habitats to loss of native species from current use, and 5) provided a prioritized list of springs where management is required to improve habitats and reestablish biodiversity to natural conditions. Approximately 25 percent of the known springs in the mountain range were sampled and occurrence records of two species of springsnails were documented during this study (Sada and Nachlinger 1996).

Plant Community Classification: This classification provides a framework for ecosystem management planning by: 1) Describing and classifying NRA plant communities at series and association levels, 2) relating plant communities to important environmental variables at regional and local scales, 3) providing a database of vegetation plot locations representing the various plant communities and their associated rare flora, 4) providing a predictive map of plant communities of the NRA to use as a screen for management actions, and 5) making conservation management recommendations based on plant community classification and analysis of biodiversity (Nachlinger and Reese 1996).

VI. PROBLEMS FACING THE SPECIES

Five factors are evaluated in determining whether or not a species requires listing under the ESA. This section addresses the applicability of these threats to species in the Spring Mountains.

(A) The present or threatened destruction, modification, or curtailment of species habitats or ranges

Recreation: The Las Vegas Valley is one of the fastest growing metropolitan areas in the nation. In July 1996, the population of Clark County was estimated to be 1,119,708 (Clark County Department of Comprehensive Planning, Admatch of Assessor Records). The population of Clark County is expected to reach 1,399,206 by the year 2000, 1,885,717 by the year 2010, and 2,165,949 by the year 2020 (University of Nevada, Las Vegas 1996). Population growth in the Valley has significantly increased recreational usage of the Spring Mountains, and continued growth is certain to increase pressure on the area.

Recreation in the Spring Mountains NRA is basically of two types: Activities that are dispersed across the landscape, and activities carried out in or near developed recreation sites. Recreation of the dispersed type includes day hiking, backpacking, mountain biking, rock climbing, caving, off highway vehicle use, and some winter sports. Recreation at developed sites includes camping, picnicking, winter sports, and organized, permitted group uses.

The east side of the Spring Mountains is the most heavily visited portion of the NRA. The proximity to Las Vegas, easy access on improved and paved roads, and the concentration of developed recreation sites and private land development in Kyle Canyon, Lee Canyon, and Deer Creek all contribute to the large numbers of recreationists and developed recreation opportunities currently present in this area. Other areas in the NRA provide opportunities for different types of recreation, offering greater solitude and less developed conditions. These areas include the large expanses of low elevation lands accessible only by high clearance vehicles, areas with no road access, and designated wilderness and wilderness study areas (FS 1996).

The NRA Plan Amendment provides direction for development of additional recreation sites, particularly in areas outside of Kyle and Lee canyons. However, opportunities for recreation development in sensitive areas such as biodiversity hotspots are allowable under the plan. Any development requires avoiding or mitigating impacts to species. This management direction limits certain types of recreation, particularly in upper Kyle and Lee Canyons, and may also place additional demands for recreation in more dispersed, or undeveloped areas, thereby increasing disturbance in previously undisturbed areas. However, many uses of the NRA are unregulated, and this type of use is apparently having an adverse effect on the species of concern, and their habitats.

The threats of regulated and unregulated recreational use of the NRA, specific to the species of concern and their habitats, include the following:

Alpine Zone: The alpine zone is in the Mt. Charleston Wilderness Area, and is thus subject only to dispersed recreational use of the wilderness by hikers and equestrians. Mountain and motor bike use, while not permitted in the Wilderness Area, does occur on a regular basis. The overall condition of the alpine habitat is currently considered excellent, with the majority of disturbance concentrated at campsites, along the maintained trail, and on the summit of Charleston Peak. The major impacts to alpine plant populations and habitats are trampling, crushing, and soil compaction caused by off-trail hikers, mountain and motor bikes, and equestrians. These activities can also create disturbance pathways promoting weed invasion (Nachlinger and Reese 1996).

Under the Plan Amendment, constraints on use of the Mt. Charleston Wilderness include permits for overnight wilderness visitation and groups of more than 15 individuals and prohibition of campfires. Equestrian and pack stock are currently allowed to use areas above treeline, until monitoring determines if they are having an impact on endemic species. These constraints help to minimize adverse effects on the endemic and sensitive species in the alpine zone. However, the Plan Amendment permits eventual construction of a North Loop Trail to Bristlecone Trail link (see below, Infrastructure), which, if constructed, would occur at high elevation and would fragment populations and habitats of several endemic plant species. In addition, commercial outfitters and guides are allowed to lead trips into the wilderness, which will increase the amount of visitation to the alpine zone. The Plan Amendment sets limits on some commercial use of the wilderness.

Riparian and Spring Areas: The effects of recreation on riparian areas and springs include removal or reduction in vegetation through trail proliferation and trampling, and soil compaction from repeated site use for recreational activities. Roads in some cases lead directly to sites, increasing visitation to these areas by ease of access. The condition of spring and riparian areas in the NRA ranges from poor to excellent (Sada and Nachlinger 1996). Springs and riparian areas of particular concern include the following:

Willow Creek Spring, which provides habitat for springsnails, butterflies, and birds, has been impacted by recreational vehicle use and camping. As a result, large areas of bare ground now border the springbrook. This condition could accelerate erosion and alter the physical condition of the spring, including water quality and temperature.

Cold Creek Spring provides habitat for springsnails, butterflies, and birds. This area is also subject to heavy recreational use. While the condition of the main spring system is currently good, several springs upgradient of Cold Creek are in poor condition.

Deer Creek provides habitat for Palmer's chipmunk, bats, birds, and endemic butterflies. Portions of the area are popular for day use and have been subject to concentrated recreation which has disturbed the habitat.

Carpenter Canyon includes a well developed riparian area providing habitat for bats, birds, butterflies, and an introduced population of Lahontan cutthroat trout. Portions of the riparian zone have been disturbed by unregulated campsite placement and trail proliferation.

Three Springs, located in Lee Canyon above the ski area, supports the only floating bog in the Spring Mountains. This unique spring system provides habitat for several endemic species, including Charleston kittentails, Charleston draba, Charleston pussytoes, Clokey thistle, and one or more of the endemic butterflies. It is accessible by roads leading to the top of the ski area, and then by trails into the bog.

Stanley B Spring provides habitat for rough angelica. It currently supports riparian and aquatic habitat in good condition. The site is actively used by hikers. Increased levels of use will likely cause erosion and degrade habitat quality.

Mummy Spring provides habitat for crenulate moonwort, Clokey thistle, and the Mt. Charleston blue butterfly. It is potentially threatened by increased visitor use, which could accelerate erosion and trail proliferation.

Macks Canyon Spring, which provides habitat for crenulate moonwort, Palmer's chipmunk, and bats, is heavily used for recreational camping. At present, this is a high quality site with high biodiversity rankings. Increased levels of use of the area could degrade habitat of the species of concern.

Peak Spring, which provides habitat for crenulate moonwort and Clokey thistle, is a high altitude, comparatively isolated spring used as a water source for hikers. Increased levels of use of the area could also degrade moonwort habitat.

Kiup Spring provides habitat for springsnails. It is currently fenced and regarded as being in good condition, however ungulates are using the area outside the fence, which could result in erosion of the associated meadow.

Fletcher Spring provides habitat for rough angelica and various species of bats. A trail passes along one edge which has resulted in trampling of riparian vegetation.

Cliff Areas, Steep Slopes, and Caves: The primary threat to species inhabiting cliff areas is recreational climbing. This is a well-established form of recreation activity in the Spring Mountain NRA, and the Mt. Charleston area is internationally known as one of the best limestone climbing areas in the United States (Toula 1995, in FS 1996). While the current condition of the cliff habitats is generally good to excellent, in part, because of their general inaccessibility and remoteness, localized impacts to vegetation on and beneath cliffs has occurred as a result of heavy recreational climbing in some areas (Nachlinger and Reese 1996). The NRA Plan Amendment allows technical and sport climbing throughout most of the Spring Mountains NRA, with varying degrees of constraint or restriction based upon general location or intensity of activity. At locations with known sensitive species, technical/sport climbing are limited to existing routes until resource surveys can establish the appropriate management strategy for these areas.

Vegetation disturbance and removal by climbers probably occurs along some climbing routes. Such removal could potentially include removal or damage of some of the endemic plant species of concern, including Jaeger ivesia and the three taxa of greasebush. Bat roost sites in rock crevices, outcrops, and on talus slopes could be disturbed by climbers or off-trail hikers. Nest and roost sites of peregrine falcons and other birds of prey are also potentially subject to disturbance by climbers.

Caving is also a well-established recreational activity in the Spring Mountains NRA. Many of the caves in the NRA provide important habitat for sensitive bat species. Caves that serve as maternity roosts or hibernacula are especially vulnerable to disturbance caused by human visitation. Under the Plan Amendment, most exploration of caves is seasonally restricted to minimize potential disturbance to bats until roosting inventories are completed. However, not all caving activity is controlled, and some unregulated caving does occur. Such activities are likely having an adverse effect on the bat species of concern.

High Elevation Forest and Woodland Zone: A variety of developed sites, including campgrounds, picnic areas, a skiing and snowboarding facility, and other group use areas are situated in the high elevation forests and woodlands. While overall, the forests and woodlands of the NRA are in excellent condition, many of the most easily accessed areas, such as campgrounds, picnic areas, and other recreational developments, have undergone localized impacts (Nachlinger and Reese 1996). Construction and use of the developed sites have directly destroyed and reduced habitat for numerous species of concern. Many of these sites, which

are frequently filled to capacity, are located in biodiversity hotspots, in particular, upper Kyle and Lee canyons. The rare and sensitive species occurring in these areas are thus subject to the adverse effects of large concentrations of recreationists, including trampling of endemic plants and endemic butterfly larval host plants, collection of endemic flowers for bouquets, and wood gathering. Palmer's chipmunk, in particular, is affected by wood cutting and gathering in and near campgrounds (see below: Woodcutting).

There are many hiking and equestrian trails in this zone, which have adversely affected habitat quality by fragmenting the landscape. In addition, mountain bikes are permitted on some forest trails. A popular route for mountain bikes occurs on the Bristlecone Loop, which passes through the largest known population of Clokey eggvetch. There is evidence of off-trail riding in this vicinity which has caused soil erosion and compaction, and vegetation damage.

Low Elevation Forest, Montane Shrubland, and Chaparral Zone: The prevalent recreational disturbances in this zone are from camping, off highway vehicle use, and subsequent invasion by exotic species. The condition of the plant communities in the low elevation forests and shrublands is considered fair and in need of improvement, in part, because of the effects of campers and off-highway vehicles. Species of concern in this zone are subject to the adverse effects of these activities in some areas, particularly in the main canyons.

Desert Shrublands Zone: Many of the plant communities in this zone exhibit degraded and fragmented habitat conditions, such as damaged and removed vegetation, soil compaction and absence of cryptogamic crusts, trampled plants, and resultant replacement of native plants with exotic species. Off-highway vehicle impacts are more prevalent here than in other zones and often include damage at dispersed camping sites and in dry washes.

Spring Diversions and Developments: New water developments are potentially allowed anywhere in the Spring Mountains NRA to improve native wildlife species habitat or improve distribution of non-native species (FS 1996). Diverting water away from the spring source reduces the amount of water available to the springbrook or riparian habitat, and may result in a reduction in extent of habitat or changes in species dominance, from obligate wetland species to facultative or upland species.

Spring diversion, which may include channelization, impoundment, dredging, and removing water through pipes, may directly affect the distribution and abundance of a number of endemic plants occurring in habitats influenced by springs. In a 1995 survey of 50 springs in the NRA, moderate to high levels of disturbance from diversion were documented at 14 springs. Diversion appears to have the greatest detrimental effect on spring biota than any other activity that occurs in these environments (Sada and

Nachlinger 1996). Diversions may adversely affect the various plant species of concern that occur in spring and riparian areas, and may also affect endemic butterflies and their habitats, including larval host plants, nectar sources, and mud resources. Diversions can also affect springsnail habitats, potentially eliminating entire populations of springsnails. Extirpation of springsnail populations due to diversion has occurred in Red Rock Canyon NCA.

Diversion also influences availability of water supplies for bats. Bats require persistent, good quality, and accessible water sources, typically in proximity to hibernacula and maternity roosts (Ramsey 1997). Maintaining water sources for bats, such as stock tanks, is, in some cases, in conflict with maintaining or enhancing habitats for other species of concern. Riparian areas and springs are important water sources for Palmer's chipmunk, and are also extremely important habitats for breeding and migratory birds, reptiles, amphibians, and mammals (Tomlinson 1995).

Special Use Permits: Private development, profit-making businesses, and public services can be developed on national forest system lands through the issuance of a special use permit. Current categories of use under permit in the Spring Mountains NRA include electronic sites, telephone lines, power lines, water transmission lines, organizational camps, recreation residences, and commercial operations including guided trail rides and rock climbing, the ski resort, and music concerts in Lee Canyon.

The FS authorizes special use permits for activities in the habitats of species of concern with specific measures to minimize adverse effects, including clean-up and consolidation of existing sites, rehabilitation of areas after completion of the permitted activities, and public and worker education programs. However, despite avoidance and minimization requirements, some activities will destroy and fragment species habitats, during both construction and operation phases. In particular, permitted activities in Kyle and Lee canyons, both regarded as biodiversity hotspots, can affect endemic and sensitive species, through trampling, vegetation removal, soil compaction, and habitat destruction and fragmentation.

Infrastructure: Nearly 316,000 acres of FS lands and approximately 7,000 acres of private lands are included within the Spring Mountains NRA boundaries (FS 1996). Private lands include subdivisions and small communities, patented lands around abandoned mines, and undeveloped lands. Activities on private lands that involve vegetation removal, soil compaction, and other habitat disturbances, do have an adverse effect on endemic and sensitive species (in particular, rough angelica), endemic butterfly larval host plants, Palmer's chipmunk, and springsnails. Management of private lands is outside the jurisdiction of the FS, the Plan Amendment, and this CA. However, NDF has, and will continue to provide private landowners with scientifically based natural resource management of private land natural resources through technical assistance, environmental education, and cost-share assistance.

Other aspects of infrastructure include administrative facilities and roads. The Kyle Canyon and Lee Administrative Sites are located within biodiversity hotspots, and various roads in the NRA lead to increased visitor use, and fragment the habitat of various endemic or sensitive species. Under the Plan Amendment, new facilities must be more than 100 yards away from sensitive plant species locations and outside biodiversity hotspots. Buffer zones are defined specifically around Clokey eggvetch and rough angelica sites. Under the Plan Amendment, up to five miles of new roads may be built in the Spring Mountains NRA in the future, including a Kyle to Lee Canyon link which would increase visitation to lower Deer Creek. However, 2.25 miles of roads may be closed in the future, which would limit access to the Carpenter Canyon area. This may benefit the endemic and sensitive species that occur there.

The NRA currently has 52 miles of designated trails, which is fewer trail miles per acre than other National Forest districts in California or Nevada. The increasing population base of Clark County is currently placing demands for new trails to accommodate increased visitation to the NRA. The NRA Plan Amendment provides direction for new trails, an expanded crest trail system, and more trailhead facilities at some locations.

Some trail additions may relieve visitor pressure on the biodiversity hotspots, however, others could adversely impact endemic and sensitive species. Further development of a crest trail would result in greater visitation to the high elevations where many of the endemic species occur. All new trail additions will further fragment the landscape.

Wild Horses and Burros: The Spring Mountains NRA encompasses portions of the Spring Mountains, Johnny, and Red Rock Wild Horse and Burro Territories. In some areas of the NRA, overgrazing has occurred and soil compaction from habitual trampling is evident (FS 1996). In particular, many of the low elevation desert communities exhibit degraded conditions, including, soil compaction, absence of cryptogamic crusts, grazed and pulled or trampled plants, and replacement of native plants with exotic species (Nachlinger and Reese 1996).

Past Appropriate Management Levels (AML) for wild horse and burro populations were based on available water, with 25 percent of water resources allocated to wild horses and burros (FS 1996). Current management limits wild horse and burros numbers based on seven percent of available water and forage resources. This change in management reduces, but does not eliminate, the potential for overgrazing and soil compaction in some areas. In 1995, moderate to high levels of disturbance from wild horses and burros were documented at six surveyed springs in the Spring Mountains NRA.

The FS utilizes gathers and adoption to manage populations throughout the NRA. Wild horses and burros may compete with native wildlife for resources (forage and water), and graze or trample native plant and invertebrate species, including the species of concern. Riparian areas are particularly susceptible, as horses and burros drink and forage in these

areas. Populations of horses and burros have impacted riparian areas by overgrazing the vegetation and compacting soils. In areas where springs have become degraded through overuse by horses and burros, water quality may also have declined. Habitat degradation has permitted exotic species introductions resulting in further habitat degradation.

Woodcutting: While timber resources in the Spring Mountains were once harvested for charcoal production, construction materials, and fuelwood, the only currently permitted use is non-commercial fuelwood for household and family use. Green trees may be harvested only in the Wheeler Wash area, and dead trees may be cut for fuelwood anywhere in the NRA except in wilderness or developed recreational areas. Under the current Plan Amendment, collection is to be managed to meet specific ecosystem health goals, such as reduction in fuel build up or restoration of early seral stages of plant communities.

Some endemic or sensitive species could be adversely affected by dead tree fuelwood cutting, if not managed properly. The Palmer's chipmunk is adversely affected by heavy woodcutting activities, particularly in well-groomed and heavily used campgrounds where a large portion of the downed logs, snags, and trees have been removed (Tomlinson 1995). Snags are important habitat components for the Northern goshawk and other bird species. In addition, certain bat species are known to use snags for roosting. The NRA Plan Amendment attempts to minimize impacts on Palmer's chipmunk, Northern goshawk, and other species during woodcutting activities.

Fire: Management policy in the Spring Mountain NRA has been to suppress all fires to reduce risks to public safety and private property. The exception to the suppression policy is remote areas of the Mt. Charleston Wilderness, where some fires were closely monitored (USFS 1996). While fire frequency in some plant communities is naturally low (e.g., desert shrub communities), for others, fire is important in maintaining plant associations. High elevation forests and woodlands exhibit high fuel loads, and few areas have experienced a burning regime that maintains an open canopy sufficient for healthy levels of conifer regeneration (Nachlinger and Reese 1996).

Ponderosa pine forests have naturally high fire frequencies. Accordingly, fire suppression in Spring Mountains ponderosa-dominated conifer forests, which provide habitat for numerous species of concern, may be a limiting factor in maintaining healthy habitats for these species. Of particular concern is the potential effect of fire suppression on Clokey eggvetch, which is present in common plant associations, but is not common itself. Other plant species occurring in the high elevation forests could also be declining as a result of fire suppression efforts which have influenced forest structure and canopy closure characteristics, in addition to altering fire intensity, frequency, and overall regimes.

Other uses of the NRA: None of the eight livestock grazing allotments are currently active, although livestock occasionally stray onto FS portions of the Mt. Stirling

Allotment. The Mt. Charleston Wilderness was withdrawn from minerals entry by the Nevada Wilderness Act of 1989, and the Spring Mountains NRA Act further closed all new locatable and leasable mining claims with the exception of a single area. Any valid claims prior to August 1993 may be explored and developed.

(B) Overutilization of species for commercial, recreational, scientific, or educational purposes

Species collection for commercial, recreational, scientific, or educational purposes may occur, although no specific incidences resulting in overutilization have been documented. Some species of plants and butterflies may be taken from the wild for private collections, on occasion. Such use is not currently believed to constitute a major threat to any of the species of concern in the Spring Mountains NRA.

(C) Disease or predation

Disease has not been determined to constitute a major threat to the species of concern in the Spring Mountains NRA. Predation may adversely affect the Palmer's chipmunk and other small species. Feral cats and dogs are a threat to wildlife, particularly on the east side of the NRA, which has the most visitation and land development. County animal control officers do not regularly visit residential areas in the Spring Mountains NRA, thus feral animal populations are largely uncontrolled. Feral animal populations threaten Palmer's chipmunk populations in Kyle and Lee Canyons, and on the North Fork of Deer Creek (Tomlinson 1995).

(D) Inadequacy of existing regulatory mechanisms

Existing regulations include both FS policies to protect sensitive species and State of Nevada statutes that protect certain plants, mammals, birds, fish, amphibians, and reptiles. Inadequacy of existing regulatory mechanisms constitutes a threat in areas where enforcement is absent or reduced due to staff or funding shortages.

(E) Other natural or manmade factors affecting species continued existence

Rare and endemic species are subject to random, naturally occurring (stochastic) events. Natural chance events include events such as extended drought or prolonged temperature changes, insect infestations, disease outbreaks, or catastrophic wild fire. Variation in the natural environment may influence naturally or non-naturally occurring predators, parasites, disease, and competitors, any of which may negatively affect the survival of rare species populations. Coupled with other non-natural threats, species with small population sizes or limited distributions may be unable to recover from such events over time.

VII. CONSERVATION ACTIONS THAT WILL BE CARRIED OUT

This section includes the list of conservation actions to be carried out during the 5-year period for Federal fiscal years 1998 through 2002. These conservation actions were developed after careful consideration of information gathered during the primary period of baseline data collection of 1993 through 1996. At this time, numerous species protection recommendations were made in interim and final reports. Only recommendations that meet the goals, objectives, standards, and guidelines of the NRA Plan Amendment (USFS 1996) are included below. The applicable objectives, standards, and guidelines of the Plan Amendment that facilitate conservation management in the NRA are compiled in Appendix E of this CA.

The conservation actions listed below are arranged in seven action type categories, and each category is accompanied by one or more "general commitments", providing the philosophical criteria that guide implementation of the actions. Of the action type categories, the first category, Project Planning, include actions that entail early recognition and consideration of species protection needs during the course of project planning. The remaining six categories involve on-the-ground conservation actions. These categories are inventory, monitoring, research, protection, restoration, and education.

A 5-year conservation action plan for this CA is provided in Appendix F. In the 5-year plan, conservation actions are ranked by priority, and one or more years are specified for accomplishment. The plan also indicates the agency or agencies responsible for completing each action. The conservation actions specified in the table are linked by number to the more detailed descriptions in this section.

The parties to this agreement recognize that priorities may change over time, therefore the conservation action plan is intended to be flexible and adaptive, inasmuch as needed to ensure the most effective conservation for species of concern included in this CA. This flexible and adaptive approach should also provide an effective basis for management of species of concern habitats, other sensitive ecological resources, and overall ecosystem health.

Beginning in 1999, the FS will conduct an Area Analysis planning implementation process by management area (Developed Canyons, Mt. Charleston Wilderness, West Side, and Mt. Stirling). An Area Analysis is a site-specific environmental analysis process that analyzes the individual and cumulative effects of implementing a series of actions over time within an identified area. This analysis process is driven by direction provided in the NRA Plan Amendment. The process takes 2 years to complete, from the beginning of scoping to the signing of the decision document. The projects and actions that are identified for implementation are then submitted through the agency for funding during the year identified in the decision document.

The projects needing National Environmental Policy Act (NEPA) analyses that are identified in this CA will be included in the appropriate area analysis. As such, the actual year that the analysis

step takes place and the implementation steps begin may change from those identified in this CA. As this situation becomes evident, needed dialog and discussion will take place and the appropriate changes will be made.

1.0 Project Planning -- General Commitments

- Maintain a philosophy of adaptive management in implementing this CA which provides the basis for changes and mid-course corrections as determined to ensure species viability and habitat protection. (CA-GC-1.1)

- Develop new trails and encourage trail use outside of biodiversity hotspots to avoid further adverse effects on rare and sensitive species. (CA-GC-1.2)

- Implement the principles of ecosystem management in the Spring Mountains NRA (page 6 of this CA). (CA-GC-1.3)

- Conduct pre-activity surveys for the species of concern prior to any actions that may affect them, and design projects to minimize or avoid adverse effects. Ensure that surveys consider unique habitat components of the species of concern (e.g., mud and puddles for butterflies). (CA-GC-1.4)

- Secure funding for projects involving inventory, monitoring, research, protection, restoration, and education in the Spring Mountains NRA. (CA-GC-1.5)

- Secure funding for additional staff positions including a field ecologist, biologist, botanist, interpreters, visitor center personnel, wilderness manager and rangers, dispersed recreation rangers, and law enforcement officers. (CA-GC-1.6)

1.0 Project Planning -- Conservation Actions

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

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

1.3 Conduct annual briefings with FS, FWS, and State line officers (management) to update them on the status of CA implementation and to provide an assessment of future funding needs.

1.4 Provide NRA staff and key permitees and partners with annual information on biodiversity hotspots, the species that occur in these areas, and the importance of avoiding adverse impacts to the species of concern and their habitats.

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

1.6 Establish a technical advisory group comprised of individuals with knowledge and expertise on conservation of the species of concern, and convene annual meetings to discuss conservation actions.

1.7 Integrate efforts in this CA with the Clark County Multispecies Planning effort to ensure that mutual goals to achieve species conservation are accomplished.

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

1.9 Develop and distribute a field guide for use by Spring Mountains NRA and Red Rock Canyon NCA staff and others in identifying species of concern and their habitats in the Spring Mountains.

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

1.11 (a) Develop and (b) implement a prescribed burn plan for the NRA, with emphasis on ecosystem health and enhancement of habitat for sensitive bats, endemic plants and butterflies, and other ecological resources. This plan will, at a minimum, determine the location, species, and habitats for enhancement, identify studies needed prior to implementation, outline a public information campaign, and identify the time frame in which the plan will be implemented. The prescribed burn plan will address concerns, and where feasible implement recommendations for protection of rare and sensitive flora and plant communities (Nachlinger and Reese 1996), overwintering pollinators, endemic butterflies and their host plants (Weiss et al. 1997), Palmer's chipmunk (Tomlinson 1995),

bats (Ramsey 1994, 1997), and other species of concern. This plan will specifically address the issue of whether or not Clokey eggvetch may benefit from prescribed burns.

1.12 (a) Develop and (b) implement a fuelwood plan for the NRA which addresses and ameliorates potential impacts to the species of concern, in particular, Palmer's chipmunk, bats, and other species that may be affected by fuelwood cutting. The fuelwood plan will address concerns, and where feasible, implement recommendations for protection of Palmer's chipmunk (Tomlinson 1995), bats (Ramsey 1994, 1997), butterflies (Weiss et al. 1997), reptiles, overwintering pollinators, and other species.

1.13 Identify and pursue purchases or exchanges of National Forest inholdings that will benefit the species of concern and other sensitive ecological resources.

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

2.0 Inventory -- General Commitment

- Evaluate inventory priorities on an annual basis and coordinate in development of inventory strategies. (CA-GC-2.1)

2.0 Inventory -- Conservation Actions

2.1 Inventory for populations of rare flora and fauna on an annual basis. A Native Species Site Survey Report (Appendix G) will be used to record new records of species occurrence, and copies of this form will be provided to the Nevada Natural Heritage Program. Species and area priorities identified to date are as follows:

Very High Priority Species

(a) Mojave bajada and wash plants - halfring milkvetch, Death Valley beardtongue, black woolypod, Spring Mountains milkvetch

(b) Spring plants - upswept and dainty moonwort

(c) Bret's blue butterfly - focus inventory at Big Timber Spring

(d) Townsend big-eared bat

Very High Priority Areas

(e) Butterfly habitats - Foxtail Canyon, Mt. Potosi

(f) Bat roosts - Column Cave (summer, winter), Pinnacle Cave (spring, fall, winter)

High Priority Species

(g) Cliff plants - smooth pungent greasebush and pungent dwarf greasebush

(h) Butterflies - Spring Mountains acastus checkerspot, dark blue butterfly, Morand checkerspot, Mt. Charleston blue

(i) Bats - Allen's lappet-browed bat

High Priority Areas

(j) Butterfly habitats - Mummy Mountain, Harris Mountain, Fletcher Peak, West side of Mt. Stirling, Trail Canyon/North Loop intersection, Mud Springs, Wallace Canyon

(k) Bat roosts (cliff climbing areas) - Imagination Wall, Cathedral Rock, Echo Cliff, unnamed wall east of South Loop Trail, The Hood

(l) Bat water sources - unsurveyed springs

(m) Neotropical migratory bird habitat - riparian areas (will also include inventory of brown-headed cowbird nest parasitism)

(n) Raptor inventory

Medium or Low Priority Species

(o) Forest plants - Nevada willowherb and Charleston grounddaisy

(p) Fringed myotis

Medium or Low Priority Areas

(q) Butterfly habitat - Wood Spring

3.0 Monitoring -- General Commitments

- Evaluate monitoring priorities on an annual basis and coordinate in development of additional monitoring protocols for species and habitats, as needed. (CA-GC-3.1)

- Use the results of monitoring activities to, where feasible and necessary, refine management strategies for protection of the species of concern. Where monitoring has indicated status decline or habitat degradation for the species of concern, develop and implement strategies to avert further decline or degradation, and improve species status and habitat quality. (CA-GC-3.2)

3.0 Monitoring -- Conservation Actions

3.1 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 FWS and FS (Nachlinger and Combs 1996a, 1996b).

3.2 (a) Develop a butterfly monitoring plan, emphasizing population, host plant and habitat monitoring. Frequency and intensity of monitoring identified in the plan will be based on population status, abundance, and threats. (b) 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. (c) 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.

3.3 (a) Develop a Palmer's chipmunk monitoring plan, emphasizing population and habitat monitoring. Frequency and intensity of monitoring identified in the plan will be based on population status, abundance, and threats. (b) Conduct periodic monitoring for the Palmer's chipmunk, using methods described in the Palmer's chipmunk monitoring plan.

3.4 (a) Develop a bat monitoring plan, emphasizing roost site and water source monitoring for known occurrences of bats. Frequency and intensity of monitoring identified in the plan will be based on species occurrence, habitat suitability, and threats. (b) Conduct periodic monitoring for bats, using methods described in the bat monitoring plan.

3.5 Develop and implement a plan to monitor springsnail populations and habitats at Kiup Spring, Willow Creek, and Cold Creek.

3.6 (a) Develop a plan to monitor riparian function and habitat condition. The plan will focus primarily on Deer Creek, Cold Creek, Willow Creek, and Carpenter Canyon, but may

include others areas as appropriate. Monitoring protocol will be specific to each area, emphasizing evaluation of habitat requirements of the species particularly dependent on these areas. (b) Conduct periodic monitoring of riparian areas, using methods described in the riparian monitoring plan.

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

3.8 Develop and implement a program to monitor selected biodiversity hotspots and species of concern habitats not covered in 3.1 through 3.7, based on periodic biologist site visits and/or photo points to document habitat conditions. This program will provide information needed to assess management suitability and the need to modify management practices in these areas. Determination of features that should be managed in these areas will be based, in part, on information provided in the report "Spring Mountains National Recreation Area Biodiversity Hotspots and Management Recommendations" (TNC 1996). A form for recording basic monitoring information will be developed with the technical assistance of TNC. Because it will not be logistically feasible to annually visit all known areas for these species, site visits will be most frequent in the most vulnerable or sensitive areas (typically, areas most accessible by people). Where appropriate, photo points will also be established. Priority species and habitats include the following (* indicates photo point will be established):

Frequent (annual) Site Visits

(a) Carpenter Canyon (Palmer's chipmunk, bats, Lahontan cutthroat trout, butterflies, plants, riparian stream corridor)

(b) Deer Creek (Palmer's chipmunk, bats, butterflies, plants, riparian stream corridor); Upper Kyle Canyon, including Mary Jane Falls (Palmer's chipmunk, butterflies, plants, riparian areas and spring sources); Upper Lee Canyon, including Three Springs* (Palmer's chipmunk, butterflies, plants); and Macks Canyon, Macks Canyon Spring*, and Macks Road (Palmers chipmunk, bats, plants)

(c) 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)

(d) Wheeler Well (bats, plants), and Trough Spring* (to monitor habitat following restoration)

(e) Stanley B Spring (plants, riparian area)

Periodic (every 2 to 3 years) Site Visits

(f) Fletcher Canyon and Spring (bats and plants), Mummy Spring*, and lower North Loop Trail (plants)

(g) Lee and Kyle canyons summer home sites (plants, Palmer's chipmunk), Mahogany Grove (plants), Robber's Roost (plants)

(h) Lost Cabin Spring*, CC Spring*, and Cave Spring (to monitor habitat condition following restoration)

(i) Peak Spring (plants)

Occasional Site Visits

(j) Harris Mountain and Saddle (plants)

(k) Mud Springs area (plants)

(l) Big Timber and Rock Spring (to monitor habitat condition following restoration)

(m) Roses Spring (to monitor habitat condition following restoration)

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

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

3.11 (a) Develop and (b) implement a plan to inventory and map problem areas of non-native plants, and monitor encroachment over time.

4.0 <u>Protection -- General Commitments</u>

- Focus new recreation development (campgrounds, picnic areas, and other facilities) in the least sensitive areas at lower elevations, to lessen visitor impacts on the species of concern and other sensitive ecological resources. (CA-GC-4.1)

- Encourage partnerships with volunteers to maintain and enhance natural resources in the NRA. (CA-GC-4.2)

- Adhere to goals, objectives, standards and guidelines detailed in the Plan Amendment which promote protective management of the species of concern and other ecological resources. (CA-GC-4.3)

- Identify specific areas of exceptional sensitivity where conservation management will be emphasized over recreation. (CA-GC-4.4)

- Minimize clearing of undergrowth during construction of new facilities. (CA-GC-4.5)

- Prior to use of pesticides and other chemicals, determine potential impacts to the species of concern (e.g., butterflies, bats), and implement strategies to avoid impacts to those species. (CA-GC-4.6)

- Protect habitat of the species of concern from dispersed recreation (e.g., heavy foot traffic, off-road vehicles, mountain bikes), and the adverse effects of wild horses and burros. (CA-GC-4.7)

4.0 <u>Protection -- Conservation Actions</u>

4.1 (a) Develop and (b) implement an overnight wilderness permitting process that provides visitor education on sensitive resource issues.

4.2 (a) Develop and (b) implement a climbing "self registration" process that encourages development of new routes away from ecologically sensitive areas.

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

4.4 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.

4.5 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.

4.6 Manage wild horses and burros in the NRA to avoid damage to species of concern habitats, particularly in lower Lee Canyon, northwest Mt. Stirling, Wheeler Pass, Wheeler

Wash, Wood Canyon, Carpenter Canyon, and lower Deer Creek, and continue to quickly remove any stray horses at upper elevations, particularly in upper Lee Canyon, Deer Creek, and Kyle Canyon.

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

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

4.9 (a) Develop and (b) implement plan to collect seed for endowment and cultivation of sensitive and rare plants.

4.10 Expand Carpenter Canyon Research Natural Area (RNA) to help protect unique alpine biodiversity.

4.11 Consider, and as appropriate, develop additional protective designations in the NRA to protect the species of concern and other ecological resources.

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

4.13 Ensure consistent law enforcement and ranger presence on the east side of the NRA, west side of the NRA, and in the Wilderness Area, a minimum of 4 days per week per area (including weekends and holidays) during the period April 15 - October 15, and a minimum of 3 days per week (including weekends and holidays) during the period October 15 - April 15. Enforcement will emphasize protection of the species of concern and their habitats (e.g., peregrine falcon eyries, bat roosts, and alpine species). Increased wilderness ranger presence in high elevation forests and alpine areas will provide a means to distribute information on species conservation needs, ecological resource sensitivity, and low impact recreation use practices.

4.14 Remove brown-headed cowbirds where nest parasitism occurs during neotropical migratory bird inventories or other activities.

4.15 Work with utility companies to ensure poles are raptor-safe.

4.16 Coordinate with Nevada Department of Transportation and FS 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).

5.0 Restoration -- General Commitments

- Secure funding for restoration programs beyond those under the scope of Interagency Agreement # 14-48-0001-94605. (CA-GC-5.1)

- Wherever possible, select only locally native species for restoration, and where appropriate, use seed from the plant species of concern and endemic butterfly host plants. (CA-GC-5.2)

- Ensure that restoration projects focus on protection and enhancement of the species of concern and do not inadvertently cause irretrievable damage to the habitats of the species of concern (e.g., open water for bats, mud puddles for butterflies). (CA-GC-5.3)

5.0 Restoration -- Conservation Actions

5.1 (a) Develop native plant material and seed list for restoration projects by plant community. The list will specifically identify larval and nectar host plants for the endemic butterflies. (b) Develop plan to collect local seed for restoration efforts, and (c) establish and maintain a native seed supply.

5.2 Restore habitat in accordance with Interagency Agreement # 14-48-0001- 94605 between the FS and FWS for the Spring Mountains NRA (Appendix H). All restoration activities will be designed and implemented in coordination with the Technical Working Group (1.6) to avoid inadvertent adverse effects on the species of concern. Priorities identified to date are as follows:

Very High Priorities

(a) McFarland Spring - Improve fence, treat headcut, construct drywell
(b) Mummy Spring - Remove informal trails
(c) Carpenter Canyon - Close last 0.25 mile of road, create parking area

High Priorities

(d) Trough Spring - Close road, treat road bed, seed area
(e) Lost Cabin Spring - Close road, eliminate diversion, restore springbrook
(f) Big Timber Spring - Remove stocktank and stockpond
(g) Little Falls Spring - Remove headbox and pipeline
(h) Gold Spring - Remove stocktank, headbox, and pipeline

Medium Priorities

(i) Middle Mud Spring and East Mud Spring - Repair fence, remove headbox and pipeline
(j) Buck Spring - Remove headbox, pipeline, and trough
(k) Macks Canyon Spring - Extend exclosure
(l) Younts Spring - Eliminate salt cedar, remove impoundment
(m) Santa Cruz Spring - eliminate salt cedar, construct exclosure, drywell, and pipeline
(n) Ninetynine Spring - Discontinue dredging, construct exclosure, drywell, and pipeline
(o) Mexican Spring - Discontinue dredging, construct exclosure, drywell, and pipeline
(p) Cougar Spring - Construct exclosure, drywell, and pipeline

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

5.4 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 (*Phainopepla nitens*). The plan will emphasize opportunities for public participation.

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

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

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

5.8 Remove roads causing environmental damage: (a) Road to Cave Spring, (b) road to CC Spring, (c) road to Lost Cabin Spring, and (d) identify additional roads for closure, particularly in biodiversity hotspots, and work with community groups to close them.

5.9 Organize volunteer work parties to manually remove exotic plants and noxious weeds along the ridgeline trail and other high elevation routes.

5.10 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:

(a) Deer Creek Picnic Area - Move picnic tables out of the riparian zone, and revegetate the area to enhance habitat for Palmer's chipmunk, neotropical migratory birds, and bats.

(b) Lee Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat.

(c) Kyle Canyon campgrounds and picnic areas - Create cover sites for Palmer's chipmunk, and revegetate areas to enhance chipmunk and butterfly habitat.

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

5.11 Work with volunteers to provide nest boxes for cavity nesting western bluebirds (*Sialia mexicana*) and mountain bluebirds (*S. currucoides*), and roosting bats, to replace lost habitat.

6.0 Research -- General Commitments

- Secure funding for research based on priorities identified below. (CA-GC-6.1)

- Encourage and support research in the Spring Mountains NRA, particularly in the Carpenter Canyon Research Natural Area, to assist with management concerns as well as to focus on basic research interests. (CA-GC-6.2)

6.0 Research -- Conservation Actions

6.1 Develop an information package identifying and promoting research opportunities in the Spring Mountains NRA and Carpenter Canyon RNA. Update and distribute to local researchers, universities, and other research entities.

6.2 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:

(a) 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.

(b) Autecology, spatial extent of population (particularly Kyle Canyon Wash), and larval host plant relations of the Spring Mountains acastus checkerspot.

(c) 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.

(d) Fire management for ecosystem health within the urban interface.

(e) 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.

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

(g) 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.

(h) Effects of human disturbance, including caving, climbing, and other forms of recreation on bats.

(i) Winter habits of bats: Migration patterns and destinations, habits of bats that overwinter and hibernate in the NRA.

(j) 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.

(k) Survey and study of NRA customer needs to determine who is visiting, what is expected from their visits, and how to communicate with non-English speaking visitors. This survey would assess visitor awareness of, and interest in species and ecological resource conservation issues.

(l) Development of a recreation use monitoring strategy to determine amount, type, and timing of recreation trail use.

(m) Waste management in the Wilderness Area: Effects of waste on resources and methods for control or removal.

7.0 Education -- General Commitments

- Ensure NRA staff are familiar with the basic habitat elements of the species of concern, including requirements of endemic butterflies (larval host plants, nectar sources, puddles and mud), bats (open water, caves, mines, cliffs, crevices, and other roost sites), Palmers chipmunk (shelter requirements), and rare plants (edaphic and other requirements). (CA-GC-7.1)

- Use all opportunities where the public is contacted (e.g., ranger stations, future visitor center and entrance stations, public meetings) to distribute materials emphasizing biodiversity protection and ecosystem management. Ensure that educational materials are focused on critical issues such as staying on trails, controlling pets, and avoidance of vegetation trampling and wildlife harassment. (CA-GC-7.2)

- Secure funding for educational materials, including brochures, displays, driving programs, and school materials. (CA-GC-7.3)

7.0 Education -- Conservation Actions

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

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

7.3 Provide information to summer home residents on Palmer's chipmunk and rough angelica conservation.

7.4 Develop display materials highlighting the unique resources and biological diversity of the Spring Mountains NRA for the NRA office, Kyle Canyon Guard Station, and for community events.

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

7.6 Develop driving tour programs using tapes or low frequency radio transmitters at selected locations to provide NRA information and highlight the unique resources and biological diversity of the Spring Mountains NRA.

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

Fused PVC color signs

(a) Cathedral Rock
(b) Mary Jane Falls Trailhead
(c) Deer Creek Picnic Area
(d) Bristlecone Trailhead
(e) Robbers Roost Trailhead
(f) Fletcher Canyon Trailhead
(g) Trail Canyon Trailhead
(h) North Loop Trailhead
(i) Bonanza Trailhead
(j) Harris Spring Trailhead
(k) Carpenter Canyon

Smaller signs

(l) Mummy Springs
(m) Stanley B Spring
(n) CC Spring
(o) Trough Spring
(p) Cave Spring
(q) Macks Canyon Spring

7.8 Design and install signs specifically addressing Palmer's chipmunk conservation at all developed recreation sites located within its habitat.

VIII. DURATION OF AGREEMENT

The duration of this CA is for 10 years following the date of the final signature. The parties involved will review the CA and its effectiveness at least annually to determine whether it should be revised. Following the fifth year, an accomplishments report will be produced, and the parties will develop a 5-year conservation action plan for the next 5 years of the CA. During the last month in which it is valid, this CA must be reviewed and either modified, renewed, or terminated. If some portion of this CA cannot be carried out or if cancellation is desired, the party requesting such action must notify the other party, within 30 days, of the changed circumstances. When and if it becomes known that there are threats to the survival of the subject species that are not or cannot be resolved through this or any CA, the FWS may choose to assign candidate status and an appropriate listing priority to the species.

Nothing in this agreement shall be construed as obligating any party hereto in the expenditure of funds, or for the future payment of money, in excess of appropriations authorized by law.

IX. LITERATURE CITED

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REVIEWED:

Date: 4/13/98

Mr. Alan S. Pinkerton, Assistant Forest Supervisor
Spring Mountains National Recreation Area
U.S. Forest Service
Las Vegas, Nevada

Date: 4/13/98

Mr. Robert D. Williams, Field Supervisor
Reno Fish and Wildlife Office
U.S. Fish and Wildlife Service
Reno, Nevada

Date: 4/13/98

Mr. William A. Molini, Administrator
Nevada Division of Wildlife
Nevada Department of Conservation and Natural Resources
Reno, Nevada

Date: 4/13/98

Mr. Roy W. Trenoweth, State Forester/Firewarden
Nevada Division of Forestry
Nevada Department of Conservation and Natural Resources
Carson City, Nevada

Date: 13 Apr. 98

Dr. Glenn Clemmer, Administrator
Nevada Natural Heritage Program
Nevada Department of Conservation and Natural Resources
Carson City, Nevada

X. SPRING MOUNTAINS CONSERVATION AGREEMENT SIGNATURES

In Witness Whereof, the parties have caused this Spring Mountains Conservation Agreement to be executed as of the date of last signature below:

Jack A. Blackwell

Date: 4-13-98

Mr. Jack Blackwell, Regional Forester
USDA Forest Service, Intermountain Region
Ogden, Utah

Michael J. Spear

Date: 4/13/98

Mr. Michael J. Spear, Regional Director
USDI Fish and Wildlife Service, Pacific Region
Portland, Oregon

Freeman Holmes Por

Date: 4/13/98

Mr. Peter G. Morros, Director
Nevada Department of Conservation and Natural Resources
Carson City, Nevada

XI. APPENDICES

A. Memorandum of Understanding Establishing a General Framework for Conservation of Species Tending Towards Federal Listing Under The Endangered Species Act

B. Interagency Agreement Between USDI Fish and Wildlife Service and USDA Forest Service for Spring Mountains Ecosystem Conservation Project

C. Biodiversity Hotspots in the Spring Mountains National Recreation Area

D. List of Species Included in the Conservation Agreement for the Spring Mountains National Recreation Area, Clark and Nye Counties, Nevada

E. Toiyabe National Forest Spring Mountains National Recreation Area Amendment to the Land and Resource Management Plan - Applicable Objectives, Standards, and Guidelines for Conservation Management in the Spring Mountains

F. Spring Mountains National Recreation Area Conservation Agreement 5-Five Year Conservation Action Plan

G. Nevada Native Species Site Survey Report Form

H. Interagency Agreement between Fish and Wildlife Service and U.S. Forest Service for Education/Information Signage and a Habitat Restoration Program

APPENDIX A

MEMORANDUM OF UNDERSTANDING
between
UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
and the
UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF LAND MANAGEMENT
NATIONAL PARK SERVICE
and
UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL MARINE FISHERIES SERVICE

94-SMU-058

This Memorandum of Understanding (MOU), is made and entered into by and between the U.S. Department of Agriculture Forest Service, hereinafter referred to as FS; the U.S. Department of the Interior Fish and Wildlife Service, hereinafter referred to as FWS; The U.S. Department of the Interior Bureau of Land Management, hereinafter referred to as BLM; the U.S. Department of the Interior National Park Service, hereinafter referred to as NPS; and the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, hereinafter referred to as NMFS. Collectively, the parties to this MOU will be referred to as the cooperators.

I. PURPOSE

The purpose of this MOU is to establish a general framework for cooperation and participation among the cooperators in the conservation of species that are tending toward federal listing as threatened or endangered under the Endangered Species Act (ESA), 16 U.S.C.

The cooperators propose to work together to achieve a common goal of conservation of selected species, agreed upon by the cooperators, that are tending toward federal listing, ((e.g., sensitive, candidate or proposed species)(see Attachment A for definition of terms)) through protection and management of their habitats and ecosystems upon which they depend. Conservation Agreements (See Attachment A for definition of terms) will be developed for species and/or habitats selected by the cooperators using an agreed upon method of priority setting and in full consideration of budgetary feasibility and respective Agency missions. Attachment A is incorporated by reference into this MOU.

II. STATEMENT OF MUTUAL INTEREST AND MUTUAL BENEFITS

The FS is a land management agency responsible for the management of the national forests and grasslands. The FS manages 191 million acres in 43 states that serve as habitat for many plant and animal species. The FS also has a national policy (Forest Service Manual 2670) to manage habitats for plant and animal species to prevent the need for their federal listing under the Endangered Species Act.

The FWS is a Federal land management and regulatory agency responsible for the implementation of the Endangered Species Act and coordinating with other Federal and State agencies in the national effort to prevent the extinction of species. The FWS is responsible for the publication of the plant and animal candidate lists and has a national candidate conservation program.

The BLM is a land management agency responsible for the management of public lands. The BLM manages 270 million surface acres in 29 states that serve as habitat for many plant and animal species. The BLM also has a national policy (BLM Manual 6840) and strategic plans for implementing BLM's Fish and Wildlife 2000, an initiative to manage habitats for plant and animal species to prevent the need for their federal listing under the Endangered Species Act.

The NPS preserves and manages more than 80 million acres in 367 units of the National Park System for the enjoyment of present and future generations and is responsible for increasing the public knowledge, awareness, and appreciation of natural resources. NPS policies promote the conservation of all federally listed threatened, endangered, or candidate species within park boundaries and their critical habitats.

NMFS is a regulatory agency responsible for stewardship of the Nation's living marine resources. As part of this stewardship role, NMFS implements the Endangered Species Act for most anadromous and marine species.

In 1973, the Endangered Species Act (ESA) was enacted to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved" and made it "the policy of Congress that all Federal departments and agencies shall seek to conserve endangered and threatened species and shall use their authorities in furtherance of the purposes of this Act." Data collected by state Natural Heritage Programs across the United States show that some 9,000 U.S. plant and animal species are rare, seriously declining in numbers and/or are likely to to be at risk of extinction within the foreseeable future. Addressing the threats to these species, thereby reducing or possibly eliminating the need for their listing as endangered or threatened, is of benefit to the cooperators and the nation.

This agreement will be of particular value for those species that require an inter-forest, inter-regional, and/or ecosystem approach to effectively conserve their habitats.

Habitat conservation assessments (see Attachment A for definition of terms) will provide the technical information and interpretation to develop Conservation Agreements outlining the procedural assurance necessary to reduce, eliminate, or mitigate specific threats to some species. These habitat assessments will also represent an important component for development of an ecosystem management approach on national forests, national parks, national wildlife refuges, public rangelands, and other land managed by the cooperators. Such information will also be useful to private landowners and state and other Federal land managers who may choose to coordinate their land management activities with those of the cooperators.

The cooperators seek to improve efficiency by combining their efforts, to foster better working relationships and promote the conservation of species, and thereby encourage conservation of national biological diversity.

In consideration of the above premises, the parties agree as follow:

III. THE COOPERATORS SHALL:

1. Work together and participate in the conservation of selected plant and animal species and their habitats to reduce, mitigate, and possibly eliminate the need for their listing under ESA by developing habitat conservation assessments leading to Conservation Agreements, where appropriate, for selected species, groups of species, or specific ecosystems.

2. Assemble interagency interdisciplinary teams of specialists and land managers to develop habitat conservation assessments for selected species.

a. These assessments will include the best available, comprehensive, state-of-the-art technical information and describe the habitat requirements for a species (or group of species) throughout its occupied range on federal lands.

b. Teams will be established for selected species, agreed upon by all cooperators, in Fiscal Year 1994. Timetables and responsible parties to complete these assignments will be identified. Line officers in each agency will be given responsibility to complete assessments, provide interagency cooperation, and accountability in a timely manner. Assessment teams will be established for subsequent fiscal year activities.

c. As part of the habitat conservation assessment, the respective line officers from the cooperators will identify, where appropriate, shortcomings of existing agency management direction and propose specific options for further consideration.

3. Use appropriate procedures to ensure adherence to all legal requirements in analyzing changes and establishing new management direction for habitat conservation. When appropriate, this will include amendment or revision of land and resource management plans or changes to the cooperators directive systems. These amendments and/or changes, in addition to a signed conservation agreement, will provide a basis for and commitment to the new direction.

4. Develop conservation agreements, as appropriate, to remove, reduce, or mitigate threats to candidate or sensitive species. These agreements will be based on the habitat conservation assessments as described in Section III, 2.

5. Further the purpose of this MOU. Examples may include cooperation in:

a. Preparation and dissemination of public information materials for selected species or species groups and their habitat,

b. Special technical and policy sessions for agency personnel, and

c. Meetings and special sessions to facilitate information exchange regarding the selected species conservation principles.

6. Meet annually at a national level to review the status of the previous years' work, prepare a joint acomplishment report, and establish a program of work for the Fiscal Year.

7. In all agencies, consider successful implementation of the program in evaluating line officer performance. Key leaders who contribute to notable successes will be recognized on a continuing basis.

IV. IT IS MUTALLY AGREED AND UNDERSTOOD BY AND BETWEEN THE PARTIES THAT:

1. Specific work projects or activities that involve the transfer of funds, services, or property among the cooperators to this MOU will require the execution of separate agreements or contracts, contingent upon the availability of funds as appropriated by Congress. Each subsequent agreement or arrangement involving the transfer of funds, services or property among the parties to this MOU must comply with all applicable statutes and regulations, including those statutes and regulations applicable to procurement activities, and must be independently authorized by appropriate statutory authority.

2. This MOU in no way restricts the cooperators from participating in similar activities or arrangements with other public or private agencies, organizations, or individuals.

3. Nothing in this MOU shall obligate the cooperators to expend appropriations or to enter into any contract or other obligations.

4. This MOU may be modified or amended upon written request of any party hereto and the subsequent written concurrence of all the parties. Cooperator participation in this MOU may be terminated with a 60-day written notice of any party to the other cooperators. Unless terminated under the terms of this paragraph, this MOU will remain in full force and in effect until September 30, 1999.

V. PRINCIPAL CONTACTS

The following persons will be the principal contacts for their respective agencies at the time of execution of this MOU. These contacts may be changed at the agencies' discretion upon notice to the other cooperating agencies.

Robert D.Nelson - WLF
USDA Forest Service
14th & Independence, SW
P.O. Box 96090
Washington, DC 20090-6090
(202) 205-1206

Jamie Rappaport Clark
USDI Fish and Wildlife Service
18th & C St. NW
(ARLSQ 452)
Washington, DC 20240
(703) 358-2171

Joe Kraayenbrink
USDI Bureau of Land Management
1849 C Street NW WO-240
Washington, DC 20240
(202) 452-7770

Gary Johnston
USDI National Park Service
Wildife and Vegetation Div.
P.O. Box 37127 MS-490
Washington, DC 20013
(202) 343-8115

Phil Williams
Office of Protected Resources
USDC National Marine Fisheries Service
Silver Spring Metro Center 1
1335 East-West Highway
Silver Spring, MD 20910
(301) 427-2322

IN WITNESS WHEREOF, the parties hereto have executed this MOU as of the last written date below.

JACK WARD THOMAS, Chief
USDA Forest Service

25 Jan 94
Date

MOLLIE H. BEATTIE, Director
USDI Fish and Wildlife Service

25 Jan 94
Date

JIM BACA, Director
USDI Bureau of Land Management

25 Jan 94
Date

ROLLAND SCHMITTEN, Assistant Administrator
USDC National Marine Fisheries Service

11/25/94
Date

for ROGER G. KENNEDY, Director
USDI National Park Service

25 Jan 94
Date

ATTACHMENT A
DEFINITION OF TERMS

Candidate Species: Those plant and animal species that, in the opinion of the Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NFMS), may qualify for listing as endangered or threatened. The FWS recognizes two categories of candidates. Category 1 candidates are taxa for which the FWS has on file sufficient information to support proposals for listing. Category 2 candidates are taxa for which information available to the FWS indicates that proposing to list is possibly appropriate, but for which sufficient data are not currently available to support proposed rules. The NMFS most recent candidate species list is published in 56 FR 28797. Because of the smaller numbers of species on NMFS candidate species list, NMFS does not apply categories to its candidate species list.

Proposed Species: Any plant or animal species that is proposed by the FWS or NMFS in a Federal Register notice to be listed as threatened or endangered.

Sensitive Species: Those plant and animal species identified by a Regional Forester or a BLM State Director for which population viability is a concern, as evidenced by:

a. Significant current or predicted downward trends in population numbers or density.

b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Habitat Conservation Assessment: A comprehensive, state-of-knowledge technical document that describes life history, habitat requirements and management considerations for a species or group of species throughout its/their occupied range on the lands managed by the cooperating agencies.

Conservation Agreement: A formal written document agreed to by FWS and/or NMFS and another Federal agency, Tribe, State agency, local government, or the private sector to achieve the conservation of candidate species through voluntary cooperation. It documents the specific actions and responsibilities for which each party agrees to be accountable. The objective of a Conservation Agreement is to reduce threats to a candidate species and/or its habitat. An effective Conservation Agreement may lower listing priority or eliminate the need to list a species.

International Association of Fish and Wildlife Agencies

(Organized July 20, 1902)

Hall of the States · 444 North Capitol Street, N.W., Suite 544 · Washington, D.C. 20001
Telephone (202) 624-7890 · FAX (202) 624-7891

March 25, 1994

Ms. Mollie H. Beattie, Director
U.S. Fish and Wildlife Service
1849 C Street, NW, Room 3256
Washington DC. 20240

Dear Ms. Beattie:

As we have previously discussed, the Memorandum of Understanding on species tending toward Federal listing under the Endangered Species Act (94-SMU-058) between the USDA - Forest Service; USDI - Fish and Wildlife Service, Bureau of Land Management, and National Park Service; and US Department of Commerce - National Marine Fisheries Service, left out a very vital cooperator - the states. As you are also aware, the states have primary statutory responsibility over the vast majority of species which might be tending toward Federal listing.

In recognition of that, and to remedy the omission of the state fish and wildlife agencies, the USDA - Forest Service prepared Addendum 1 to the MOU, identifying the state fish and wildlife agencies as cooperators in the MOU. Following approval of the Association's Executive Committee, I signed for the Association, representing the states on March 20, 1994.

I enclose a copy of the MOU, including a signed copy of Addendum 1, for your information and use. I would ask that you please provide your appropriate line and field staff with copies of the addendum recognizing the state fish and wildlife agencies as cooperators in this MOU.

Thank you for your attention to this matter.

Sincerely,

R. Max Peterson
Executive Vice President

Enclosure
cc: Executive Committee

RMP\bert\C:\-MAX-\ESADNDUM.LTR

ADDENDUM 1

94-SMU-058

Addendum 1 of this Memorandum of Understanding (MOU) is made and entered into by and between the U.S. Department of Agriculture Forest Service, the U.S Department of Interior Fish and Wildlife Service, the U.S. Department of Interior Bureau of Land Management, the U.S. Department of Commerce National Marine Fisheries Service, the U.S. Department of Interior National Park Service, and the International Association of Fish and Wildlife Agencies (IAFWA) on behalf of the 50 State fish and wildlife organizations. This addendum adds State fish and wildlife agency leaders as cooperators in this MOU as represented by the IAFWA.

The IAFWA, founded in 1902, is a quasi-governmental organization of public agencies charged with the protection and management of North America's fish and wildlife resources. The IAFWA's governmental members include the fish and wildlife agencies of States, provinces, and federal governments of the United States, Canada, and Mexico. All 50 States are members. The IAFWA is a key organization in promoting sound resource management and strengthening Federal, State, and private cooperation in protecting and managing fish, wildlife, and their habitats in the public interest.

IN WITNESS WHEREOF, the party hereto has executed this addendum to the MOU as of the written date below.

R. MAX PETERSON, Executive V.P.
International Association of
Fish and Wildlife Agencies

3/20/94
Date

APPENDIX B

INTERAGENCY AGREEMENT
between
USDI FISH AND WILDLIFE SERVICE
and
USDA FOREST SERVICE

for

SPRING MOUNTAINS ECOSYSTEM
CONSERVATION PROJECT

I. PURPOSE

The purpose of this Interagency Agreement (IA) between the Toiyabe National Forest, USDA Forest Service, hereinafter referred to as the FS, and the Nevada Ecological Services State Office, USDI Fish and Wildlife Service, hereinafter referred to as the FWS, is to work cooperatively to develop ecosystem-level management strategies for the Spring Mountains National Recreation Area (NRA) in southern Nevada. The goal of this effort is to develop conservation strategies and a conservation agreement that will manage and preserve the threatened, endangered, candidate and sensitive species within the Spring Mountains National Recreation Area.

II. AUTHORITY

The authority for the FS to enter into this agreement with the FWS is the Economy Act, 31 U.S.C. 1535, the U.S. Fish and Wildlife Coordination Act (48 Stat/401 as amended; 16 U.S.C. 661 et seq); Section 7 of the U.S. Fish and Wildlife Act of 1956 (16 U.S.C. 742 (a) (4)); and Section 5 of the Endangered Species Act (16 U.S.C. 1531(5)(a)) hereinafter, referred to as the Act. Additional authority is found in the 1994 Memorandum of Understanding (MOU) among the Departments of Agriculture, Interior, and Commerce, which establishes a general framework for cooperation and participation among the cooperators in the conservation of species that are tending towards Federal listing as threatened or endangered under the Act.

III. SCOPE

The goal of the FS is to develop an ecosystem oriented management plan for the newly created Spring Mountains NRA. More information is needed to enhance the general understanding of the Spring Mountains ecosystem. Acquisition of new information, including ecological communities, their spatial distribution and sensitive species occurrences, is required in order to best contribute to the development of effective ecosystem-level management strategies.

The goal of the FWS is to contribute information to the FS to develop an ecosystem-level management plan and conservation agreement for species which are candidates for listing under the Act, and other sensitive species. The intents of the management plan and conservation agreement

are to ensure management actions will contribute towards the conservation of sensitive species and the ecosystem in which they occur.

NOW, THEREFORE, in consideration of the above premises, the parties agree as follows:

IV. FS Shall

1. Cooperate with the FWS to set priorities for collection and analysis of field data.

2. Participate in annual workshops on the Spring Mountains Ecosystem Conservation Project.

3. Provide logistical information and support, when feasible, to field crews working on the Spring Mountains Ecosystem Project.

4. Incorporate strategies for ecosystem conservation and biodiversity protection into the management plan for the Spring Mountains National Recreation Area.

V. FWS Shall

1. Cooperate with the FS to set priorities for collection and analysis of field data and provide coordination among participating entities in the collection and analysis of field data.

2. Organize, coordinate and participate in annual workshops on the Spring Mountains Ecosystem Project.

3. Cooperate with the FS to develop strategies for ecosystem conservation and biodiversity protection in the Spring Mountains NRA.

VI. It is Mutually Agreed and Understood By and Between the FS and FWS That:

1. Both parties will work cooperatively to develop and implement ecosystem management strategies for conservation of plant and animal species which are candidates or already listed under the Endangered Species Act as well as other sensitive species.

2. Both parties will work cooperatively to develop a Conservation Agreement for the Spring Mountains Ecosystem which will provide for conservation of listed and candidate plants and animals and other sensitive species.

VII. Termination

The agreement shall be considered effective upon signatures of both agencies. It may be modified as necessary upon full agreement by both parties.

This agreement may be terminated with the consent of both organizations with a written 60-day advance notice.

VIII. Project Coordinators: Administration of this agreement shall be accomplished by:

Sara Mayben	Janet Bair
U.S. Forest Service	U.S. Fish and Wildlife Service
Toiyabe National Forest	Nevada Ecological Services State Office
2881 S. Valley View, Suite 16	4600 Kietzke Lane, C-125
Las Vegas, Nevada 89102	Reno, Nevada 89502

IX. Deliverables and Milestones

FWS and FS will jointly develop a Conservation Agreement through the planning and environmental analysis process. Development of the Conservation Agreement will include analysis of a wide range of alternatives, and evaluation of environmental effects, as required by NEPA.

The FS will adopt the provisions determined through the above process in an amendment to the Land and Resource Management Plan for the Toiyabe National Forest.

IN WITNESSTH WHEREOF, each party hereto has caused this Interagency Agreement to be executed by the authorized official as of the last date written below.

U.S. Fish and Wildlife Service

By: David 2. Harlow Date: 6/30/94

Title: State Supervisor

U.S Forest Service

By: Gary F Lay Date: 5/26/94

For Supervisor

Title: FOREST ~~SERVICE~~

APPENDIX C

BIODIVERSITY HOTSPOTS IN THE SPRING MOUNTAINS NATIONAL RECREATION AREA

(Source: The Nature Conservancy 1994)

Very High Priority Sites: Areas with the greatest number of elements of concern (5-29), highest degree of vulnerability to impacts, and a high level of existing and potential conflicts with recreation.

- Carpenter Canyon
- Deer Creek
- Middle Kyle Canyon
- Upper Lee Canyon
- Mt. Potosi, Potosi Spring and Mine
- Charleston Ridgeline
- North Fork Deer Creek
- Upper Kyle Canyon
- Mummy Mountain
- Willow Creek

High Priority Sites: Areas with relatively fewer elements of concern (3-9), a high degree of vulnerability to impacts, and a moderate level of existing and potential conflicts with recreation.

- Camp Bonanza and North Divide Trail
- Upper Clark Canyon
- Deer Creek Highway
- Harris Road
- Lower Kyle Canyon
- Macks Canyon
- Wallace Canyon
- Cold Creek
- Fletcher Canyon
- Harris Road end
- Lee Canyon Gaging Station
- Mummy Springs
- Wheeler Well

Moderate Priority Sites: Smaller concentrations of elements of concern (2-5), some vulnerability to impacts, and fewer existing and potential conflicts with recreation.

- Archery Range Road
- Deer Creek Highway Cliffs
- Griffith Trail
- Lee Canyon Ridgeline above Gage
- Lovell Summit
- Mahogany Knoll
- Lower North Loop Trail
- Robber's Roost
- Lower Clark Canyon
- Divide Trail
- Harris Mountain and Saddle
- Lee Canyon Summer Homes
- Macks Road
- Lower Mud Springs Road
- Potosi Pass Road
- Stirling Mine

APPENDIX D

LIST OF SPECIES INCLUDED IN THE
CONSERVATION AGREEMENT FOR THE

SPRING MOUNTAINS NATIONAL RECREATION AREA,
CLARK AND NYE COUNTIES, NEVADA

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
PLANTS							
Angelica scabrida Rough angelica	● Spring Mountains endemic: Kyle Canyon and Red Rock NCA, 4,000 - 9,000 ft, 18 documented occurrences	Washes, riparian areas, and avalanche paths in mixed conifer forests and quaking aspen-white fir associations	FS BLM	SOC	S	--	G2 S2
Antennaria soliceps Charleston pussytoes	● Spring Mountains endemic: Charleston Peak, Mummy Mountain, Kyle and Lee Canyons, 8,700 - 11,700 ft, 22 documented occurrences	Talus and rocky slopes and rock outcrops in alpine zone and bristlecone woodland associations, spring areas	FS Private	SOC	S	--	G1 S1

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Arenaria kingii ssp. *rosea* Rosy King sandwort	● Spring Mountains endemic: Kyle and Lee Canyons, Deer Creek area, 5,900-9,500 ft, 17 documented occurrences	Dry rocky hillsides in bristlecone woodland associations and mixed conifer forests	FS Private	SOC	S	--	G4 T2 S2
Astragalus aequalis Clokey milkvetch.	● Spring Mountains endemic: Scattered around main core of the range, 6,040-8,350 ft, 23 documented occurrences	Dry, gravelly soils of alluvial fans in pinyon-juniper woodland associations, mixed conifer forests, and scrub oak communities	FS Private	SOC	S	--	G2 S2
Astragalus funereus Black woolypod	● Spring Mountains: Lower Kyle Canyon, 7,700 ft, a single occurrence ● Nevada: Clark and Nye Counties (distribution centered around the town of Beatty) ● California: Inyo County	Steep hillsides of ash-flow volcanic tuff in shrub communities (in mixed conifer forest in Kyle Canyon)	FS	SOC	S	--	G2 S2
Astragalus mohavensis var. *hemigyrus* Halfring milkvetch	● Spring Mountains: Eastside foothills, 3,400-5,600 ft, 15 documented occurrences ● Nevada: Clark and Lincoln Counties ● California: Inyo County (presumed extirpated)	Washes, toe slopes and alluvial fans in creosote bush and blackbrush associations	FS BLM Private	SOC	S	CE	G2 T2 S2

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Astragalus oophorus var. *clokeyanus* Clokey eggvetch	● Southern NV endemic ● Spring Mountains: Lee and Clark Canyons, Wheeler Pass, 6,300-9,000 ft, 13 documented occurrences ● Nye County: Belted Range, (Nellis AFR), Pahute Mesa (Nevada Test Site)	Ridges and gravelly slopes in mixed conifer forests and pinyon woodland associations	FS Private	FFA SOC	S	--	G4 S2 S2
Astragalus remotus Spring Mountains milkvetch	● Spring Mountains endemic: Southeast slopes (Red Rock Canyon to Goodsprings), 3,600-5,500 ft, 11 documented occurrences	Gravelly soils, rocky hillsides, and washes in creosote bush and mixed shrub associations	FS BLM	SOC	SOC	--	G1 S1
Botrychium ascendens Upswept moonwort	● Spring Mountains: Single record (exact location unknown) ● Western North America: British Columbia to California, Montana	Meadows and conifer forests - specific habitat requirements unknown	FS	SOC	SOC	--	G3? S1

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Botrychium crenulatum Dainty moonwort	● Spring Mountains: Peak, Mummy, Three, and Macks Canyon Springs, possibly elsewhere, 4 documented occurrences ● California, Arizona, Montana, possibly elsewhere in Nevada	Spring habitats, in association with shooting star, columbine, and Clokey thistle	FS	SOC	SOC	--	G3? S1?
Cirsium clokeyi Clokey thistle	● Spring Mountains endemic: Fairly common in many eastside canyons and slopes, 6700-11900 ft, total # occurrences unknown	Alpine areas, bristlecone woodland associations, mixed conifer forests, high elevation grassland associations, spring and riparian areas	FS Private	SOC	?	--	GX SX
Draba jaegeri Jaeger draba	● Spring Mountains endemic: Charleston Peak, Mummy Mountain, Lee Canyon, 9,600-11,200 ft, 6 documented occurrences	Fellfields and talus rubble in alpine and bristlecone woodland associations, and near moderate to high elevation seeps and springs	FS Private	SOC	S	--	G2 S2
Draba paucifructa Charleston draba	● Spring Mountains endemic: Charleston Peak and ridgeline, Kyle and Lee Canyons, 8,200 - 11,400 ft, 12 documented occurrences	Around seeps and snowdrifts in bristlecone woodland associations	FS Private	SOC	S	--	G1G2 S1S2

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Epilobium nevadense Nevada willowherb	● Spring Mountains: Kyle and Lee Canyons, 6,000 - 9,000 ft, 6 documented occurrences ● Nevada: Clark, Eureka, Lincoln and Lander counties ● Southern Utah	On bedrock, talus, or gravel in mixed conifer forests and pinyon woodland associations	FS	SOC	SOC	--	G2 S2
Glossopetalon clokeyi Clokey greasebush	● Spring Mountains endemic: Primarily Kyle Canyon, also Carpenter Canyon and Robbers Roost, 7,100 - 9;200 ft, 13 documented occurrences	Cracks of vertical and near-vertical limestone and dolomite cliff faces	FS	SOC	SOC	--	G2 S2
Glossopetalon pungens var. *glabra* Smooth pungent greasebush	● Spring Mountains: Mt. Potosi, 6,000 -7,800 ft, 2 documented occurrences ● Nevada: Sheep Range, Clark Co. ● California: Clark Mountains, San Bernardino Co.	Crevices of limestone cliffs	FS	SOC	SOC	--	G2 T1Q S1

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Glossopetalon pungens var. *pungens* Pungent dwarf greasebush	● Southern Nevada endemic ● Spring Mountains: Mt. Stirling, 4,000 - 6,500 ft, 1 documented occurrence ● Sheep Range, Clark Co., NV	Limestone cliffs and rocky slopes	FS	SOC	--	--	
Ivesia cryptocaulis Hidden ivesia	● Spring Mountains endemic: Charleston Peak ridgeline, Mummy Mountain, 11,000 - 11,900 ft, 7 documented occurrences	Talus and scree slopes, rocky ridgelines and slopes in the alpine zone	FS Private	SOC	S	--	G1 S1
Ivesia jaegeri Jaeger ivesia	● Spring Mountains: Kyle, Lee, and Carpenter Canyons, Deer Creek, La Madre Mountain, Mt Potosi, 5,200 - 11,200 ft, 35 documented occurrences ● California: Clark Mountains, San Bernardino Co.	On limestone bedrock and crevices of vertical and near-vertical cliff faces	FS BLM	SOC	S	--	G2 S2

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Penstemon fruticiformis var. *amargosae* Death Valley beardtongue	● Spring Mountains: Mt Stirling, Crystal Spring, 5,000 - 6,700 ft, 2 documented occurrences ● Nevada: Nye Co. - Specter Range, Striped Hills (NTS) ● California: In and near Death Valley, Inyo Co.	Sandy or gravelly washes of desert canyons, montane mass wasted slopes	FS BLM	SOC	S	--	G3 T2T3 S2
Penstemon leiophyllus var. *keckii* Charleston beardtongue	● Spring Mountains endemic: Documented in Deer Creek area, Lee Canyon, N of Mummy Mountain, ~ 7,000 - 11,000 ft, total # occurrences unknown	Bristlecone woodland associations, mixed conifer forests, high elevation forb and grass land associations, spring areas	FS	SOC	--	--	G3 T3 S2
Potentilla beanii Bean cinquefoil	● Spring Mountains endemic: W Harris Mountain and other high elevation locations, 9,600-11,900 ft, total # occurrences unknown	Alpine zone, bristlecone woodlands, high elevation forb and grass land associations, spring areas	FS	SOC	--	--	--

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Salvia dorrii var. *clokeyi* Clokey mountain sage	● Southern NV endemic ● Spring Mountains: Kyle and Lee Canyons, Deer Creek, north of Bonanza Peak, 7,000 - 9,000 ft, 23 documented occurrences ● Sheep Range, Clark Co.	Shallow gravelly soils, ridges and rocky slope drainages in bristlecone woodland associations, mixed conifer forests, and pinyon woodland associations	FS BLM	SOC	S	--	G5 T3 S3
Silene clokeyi Clokey catchfly	● Spring Mountains endemic: Charleston Peak ridgeline and Mummy Mountain, 11,500 ft, 7 documented occurrences	Fellfields, steep eastern dropoffs of high ridgelines, gently sloping plateaus, in alpine zone and bristlecone woodland associations	FS Private	SOC	S	--	G1 S1
Sphaeromeria compacta Charleston tansy	● Spring Mountains endemic: Charleston Peak ridgeline and Mummy Mountain, 10,800 - 11,000 ft, 12 documented occurrences	Talus and scree slopes, rocky ridgelines, and rock outcrops in alpine zone, and bristlecone woodland associations	FS Private	SOC FFA	S	--	G2 S2
Synthyris ranunculina Charleston kittentails	● Spring Mountains endemic: High east side canyons, Charleston Peak ridgeline, Mummy Mountain, 8,900 - 11,800 ft, 33 documented occurrences	High elevation seeps and permanently damp areas in alpine zone, bristlecone woodland associations, and mixed conifer forests	FS Private	SOC FFA	S	--	G1G2 S1S2

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Townsendia jonesii var. *tumulosa* Charleston grounddaisy	Southern NV endemic: ● Spring Mountains - Bonanza Peak area, Lee Canyon, Deer Creek, 6,600 - 9,800 ft, 24 documented occurrences ● Nevada: Sheep Mountains, Clark Co.; Sunnyside, Nye Co. (outlier)	Shallow, gravelly soils along ridges, rocky outcrops, and slopes in bristlecone woodland associations, mixed conifer forests, and pinyon woodland associations	FS BLM Private	SOC	SOC	--	G3 T2T3 S2S3
MAMMALS							
Corynorhinus (=Plecotus) townsendii pallescens Pale Townsend big-eared bat	● Spring Mountains: Mt. Potosi, Kyle Canyon, Deer Creek, Red Rock Canyon NCA ● Nevada: 2 subspecies, occurring throughout state ● Western North America, British Columbia to northeastern Mexico, isolated populations in eastern U.S. (4 subspecies)	Desert shrubland associations, pinyon woodland associations, mixed conifer forest, around water sources Roosts: Mines and caves	FS BLM Private	SOC	SOC	--	G4 T4 S?

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Euderma maculatum Spotted bat	● Spring Mountains: Not documented, but believed to occur. ● Nevada: Scattered records throughout state ● Western North America: British Columbia to Mexico	Associated with high cliffs, canyons, and riparian areas in desert shrubland associations and mixed conifer forests Roosts: Cracks and crevices in cliff faces, buildings, bridges	FS? BLM?	SOC	SOC	T	G4 S1?
Idionycteris phyllotis Allen's lappet-browed bat	● Spring Mountains: Potosi Spring, Red Rock Canyon NCA, Kyle Canyon ● Nevada: Southern counties ● Southwestern U.S. and Mexico	Near water and high cliffs in blackbrush associations, pinyon-juniper woodlands, and mixed conifer forests Roosts: Cliff crevices, caves or mine tunnels, at low elevations	FS BLM	SOC	SOC	--	G5 S1
Myotis ciliolabrum Western small-footed myotis	● Spring Mountains: White Rock Spring, Mt. Potosi, Deer Creek, Wheeler Well, other canyons ● Nevada: Occurring throughout state ● Western N. America: Canada to Mexico	Pinyon woodland associations, around water sources Roosts: Cliff crevices, rock outcrops, mines, caves, buildings, behind loose bark	FS BLM	SOC	SOC	--	G5 S3

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Myotis evotis Long-eared myotis	● Spring Mountains: Various east and west slope canyons, particularly abundant at Wheeler Well, often the only species in Macks Canyon ● Nevada: Occurring throughout state ● Western N. America: Canada to Mexico	Associated with springs in mixed conifer forests and pinyon-juniper woodlands Roosts: Buildings, beneath bark, in snags, mines, caves, crevices	FS BLM	SOC	SOC	--	G5 S3?
Myotis thysanodes Fringed myotis	● Spring Mountains: Various east and west slope canyons, particularly, Potosi Spring and Red Rock Canyon NCA ● Nevada: Occurring throughout state ● Western N. America: British Columbia to Mexico	Desert shrublands, oak and pinyon-juniper woodlands, mixed conifer forests, near water sources Roosts: Caves, mines, rock crevices, old buildings	FS BLM	SOC	SOC	--	G5 S3?

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Myotis volans Long-legged myotis	● Spring Mountains: Various east and west slope canyons, particularly abundant at Wheeler Well, Potosi Spring, and Deer Creek ● Nevada: Occurring throughout state ● Western N. America: Alaska to Mexico	Conifer forests, pinyon-juniper and oak woodlands, desert flats, around water Roosts: Buildings, cliff crevices, hollow trees	FS BLM Private	SOC	SOC	--	G5 S3?
Myotis yumanensis Yuma myotis	● Spring Mountains: A single record of occurrence at Potosi Spring ● Nevada: Clark County, along western edge of state to Washoe County ● Western North America: British Columbia to Mexico	Desert shrublands, particularly in association with permanent open water Roosts: Crevices, mines, caves, buildings	FS Private	SOC	SOC	--	G5 S1?
Tamias [=Eutamias] palmeri Palmer's chipmunk	● Spring Mountains endemic: Deer Creek, Kyle and Lee Canyons, other canyons around the central core of the mountain range, 7,000 -11,900 ft	Cool mesic canyons, typically near water, in bristlecone woodlands, mixed conifer forests, pinyon woodland associations	FS Private	SOC	SOC	--	G2 S2

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
BIRDS							
Accipiter gentilis Northern goshawk	● Spring Mountains: A single nesting record on North Fork of Deer Creek, scattered records of occurrence, primarily in Eastside canyons ● Nevada: High elevation mountain ranges throughout state ● Western N. America	Mixed conifer forest in warmer months, may occur in lower foothills and valleys during winter	FS BLM ? Private ?	SOC	SOC	P	G4 S3
Empidonax traillii extimus Southwestern willow flycatcher	● Spring Mountains: Willow flycatchers have been documented in Eastside canyons, subspecies unknown (potentially, Great Basin subspecies *acastus*) ● Nevada: Virgin River, possibly other Colorado River drainages ● Southwestern U.S. and Central America	Riparian habitats, typically associated with willow and salt cedar	FS?	E	--	P	G5 T2 S1

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Falco peregrinus anatum American peregrine falcon	● Spring Mountains: Observations recorded near La Madre Mountain (Red Rock Canyon NCA), probable sightings near McFarland Peak ● Nevada: Scattered records throughout state ● North America: Alaska to Baja California and northern Mexico, eastern U.S.	Rock ledges, small caves on high cliffs, often near water	FS ? BLM	E	--	P E	G3 S1
Otus flammeolus Flammulated owl	● Spring Mountains: Known from Upper Kyle, Lee, and Macks Canyons ● Nevada: In mountain ranges with mixed conifer forest ● Western North America: British Columbia to Central America	Among snags and dying trees with woodpecker cavities in mixed conifer forests	FS	--	SOC	P	--

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Speotyto cunicularia hypogea Western burrowing owl	● Spring Mountains: Presumed scattered at low elevations ● Nevada: Occurring throughout state ● Western and mid-western U.S., Central and South America	Desert shrublands, intermontane valleys	FS BLM private	SOC	SOC	P	--
FISH							
Oncorhynchus clarki henshawi Lahontan cutthroat trout	● Spring Mountains: Introduced in Carpenter Canyon ● Lahontan and associated basins of Nevada, California, and Oregon	Small streams with cool water, in rocky areas, riffles, deep pools, and habitats near overhanging logs, shrubs, or banks	FS	T	--	--	G4 T2 S2
REPTILES							
Gopherus agassizii Desert tortoise (Mojave population)	● Spring Mountains: Presumed scattered at elevations below 5,000 ft ● Mojave Desert, in southern Nevada, southern California, southern Utah, and northern Arizona	Flats, bajadas, with sand, and sandy gravels in desert shrubland associations	FS BLM	T	--	T	G3 S3

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Heloderma suspectum cinctum Banded Gila monster	● Spring Mountains: Presumed scattered at elevations below 5,000 ft ● Nevada: Clark and Lincoln counties ● Southwestern U.S.: Southwest Utah, Western Arizona, northeastern San Bernardino Co., California	In Washes, around boulders and rocky terrain, near water sources	FS ? BLM	SOC	SOC	P	G4 T3 S2
Sauromalus obesus Chuckwalla	● Spring Mountains: Presumed scattered at lower elevations ● Nevada: Southern portions ● Southwestern U.S.: Southern California, southwest Utah, western Arizona (also northern Baja California)	Rocky hillsides and outcrops, talus slopes, washes, and gravelly alluvial flats in desert shrubland associations	FS BLM	SOC	SOC		G5 SU

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
INVERTEBRATES							
Chlosyne acastus ssp. Spring Mountains acastus checkerspot	● Spring Mountains endemic: 5,600 - 8,500 ft, 12 documented occurrences	Riparian areas, mixed conifer forests, pinyon woodland associations Larval host plant: Rabbitbrush (*Chrysothamnus nauseosus* and *C. viscidiflorus* spp.)	FS	SOC	SOC	--	G1 S1
Euphilotes battoides ssp. Bret's blue butterfly	● Spring Mountains endemic: 6,600 ft, 1 documented occurrence at Big Timber Spring	Habitat requirements unknown	FS	SOC	--	--	--
Euphilotes enoptes ssp. Dark blue butterfly	● Spring Mountains endemic: 5,900 - 8,200 ft, 11 documented occurrences	Associated with mud banks in mixed conifer forests, pinyon woodland associations, and riparian areas Larval host plant: Sulfur buckwheat (*Eriogonum umbellatum*)	FS	SOC	SOC	--	G5 T3 S3

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Euphydryas anicia morandi Morand's checkerspot	● Spring Mountains endemic: 6,900 -10,500 ft, 9 documented occurrences	Ridgelines and avalanche shoots in the alpine zone, bristlecone woodland associations, mixed conifer forests, pinyon woodland associations Larval host plants: Paintbrush (*Castilleja linariifolia, C. martinii*)	FS	SOC	SOC	--	G5 T1 S1
Hesperia comma ssp. Spring Mountains comma skipper	● Spring Mountains endemic: Widely distributed, 4,900 - 9,900 ft, 45 documented occurrences	Bristlecone woodland associations, mixed conifer forests, pinyon woodland associations Larval host plants: Perennial grasses	FS BLM	SOC	SOC	--	G5 T2 S2
Icaricia (=Plebejus) icarioides ssp. Spring Mountains (Boisduval's) blue butterfly	● Spring Mountains endemic: Around the central masiff of the range, particularly common in Kyle Canyon, 5,900 - 9,900 ft, 23 documented occurrences	Bristlecone woodland associations, mixed conifer forests, meadows, quaking aspen associations Larval host plant: Silvery lupine (*Lupinus argenteus*)	FS	SOC	SOC	--	G5 T2 S2

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Icaricia (=Plebejus) shasta charlestonensis Mt. Charleston blue butterfly	● Spring Mountains endemic: Lee Canyon and Spring Mountains ridgeline, 6,600 feet and above, 17 documented occurrences	Open habitats (e.g., ridgelines, ski runs, avalanche paths), in bristlecone woodland associations and mixed conifer forests Larval host plant: Torrey milkvetch (*Astragalus calycosus* var. *mancus*)	FS	SOC	SOC	--	G5 T1 S1
Lasius nevadensis Charleston ant	● Spring Mountains endemic: 1 report of 6 populous colonies at 7700 ft in Kyle Canyon	Open conifer forest, nests beneath large stones	FS	SOC	SOC	--	???
Limenitus weidemeyerii nevadae Nevada admiral	Southern NV endemic: ● Spring Mountains: Widely distributed, 4,900 - 9,200 ft, 46 documented occurrences ● Sheep Range	Bristlecone woodland associations, mixed conifer forests, quaking aspen-white fir associations, riparian areas Larval host plants: Aspen (*Populus tremuloides)*, Utah serviceberry (*Amelanchier utahensis*), willow (*Salix* sp.)	FS BLM	SOC	SOC	--	G5 T2 S2
Pyrgulopsis deaconi (= sp. nov. 1a) Spring Mountains springsnail	● Southern NV endemic: Extant at 2 sites: Kiup Spring (FS) and Red Spring (BLM), extirpated from Willow Spring (BLM) and Pahrump Spring (private)	Spring brooks	FS BLM	SOC	SOC	--	--

SPECIES	DISTRIBUTION	HABITAT	MGT. IN SPRING MTNS	CONSERVATION STATUS*			
				FWS	USFS	NV	HERIT-AGE RANK
Pyrgulopsis turbatrix (= sp. nov. 58) Southeast Nevada springsnail	● Southern NV endemic: Extant at 7 sites: Willow Creek and Cold Creek Springs (FS), La Madre, Lost Creek, and Grapevine Springs (BLM), Horseshutem Spring (private), extirpated from Willow Spring (BLM)	Spring brooks	FS BLM Private	SOC	SOC		--
Speyeria zerene carolae Carole's silverspot	● Spring Mountains endemic: Distributed around the central core of the range, 6,600 - 8,900 ft, 37 documented occurrences	Open bristlecone woodland associations, mixed conifer forests, quaking aspen-white fir association, pinyon woodland associations Larval host plant: Charleston violet (*Viola purpurea* var. *charlestonensis)*	FS	SOC	SOC		G5 T2 S2

***KEY**:

FEDERAL CATEGORIES

T	Listed Threatened under the Endangered Species Act of 1973, as amended
E	Listed Endangered under the Endangered Species Act of 1973, as amended
C	Candidate for listing under the Endangered Species Act of 1973, as amended
FFA	Species named in the 1992 Nationwide settlement agreement between Fund For Animals, et al., and U.S. Fish and Wildlife Service
S	Category used by U.S. Forest Service to designate species for which long-term survival may be of concern due to Forest Service management, because of current or predicted downward trends in population numbers, density, or habitat capability.
SOC	Species of Concern: Non-regulatory designation used by U.S. Fish and Wildlife Service and U.S. Forest Service, Spring Mountains National Recreation Area to indicate species that are rare, believed sensitive to human disturbance, or subject to threat

NEVADA ADMINISTRATIVE CODE (NAC) CLASSIFICATION

T	Listed Threatened by the State of Nevada (NAC 503.030)
E	Listed Endangered by the State of Nevada (NAC 503.050, 503.065)
P	Protected by the State of Nevada (NAC 503.030, NRS 503.080)
CE	Listed Critically Endangered by the State of Nevada (NRS 527.270)

HERITAGE PROGRAM RANKS

G	Global rank indicator, based on worldwide distribution at the species level
S	State rank indicator, based on distribution within Nevada at the lowest taxonomic level
T	Trinomial rank indicator, based on worldwide distribution at the infra specific level
1	Critically imperiled due to extreme rarity, imminent threats, or biological factors
2	Imperiled due to rarity or other demonstrable factors
3	Rare and local throughout its range, or with very restricted range, or otherwise vulnerable to extinction
4	Apparently secure, though frequently quite rare in parts of its range, especially at its periphery
5	Demonstrably secure, though frequently quite rare in parts of its range, especially at its periphery
U	Unknown
?	Assigned rank uncertain
--	Not ranked

Southern Nevada Endemic and Regional Endemic Species that may Benefit from this Conservation Agreement

Southern Nevada endemics:

Inch high fleabane	*Erigeron uncialis* ssp. *conjugans*
Clokey buckwheat	*Eriogonum heermannii* var. *clokeyi*
Spring Mountain goldenweed	*Haplopappus compactus*
Hitchcock bladderpod	*Lesquerella hitchcockii*[1]
Charleston pinewood lousewort	*Pedicularis semibarbata* var. *charlestonensis*
Jaeger beardtongue	*Penstemon thompsoniae* ssp. *jaegeri*
Charleston phacelia	*Phacelia hastata* var. *charlestonensis*

Mojave Desert or Colorado Plateau Endemics:

New York Mountains catseye	*Cryptantha tumulosa*
Utah spikemoss	*Selaginella utahensis*
Charleston violet	*Viola purpurea* var. *charlestonensis*
Clokey paintbrush	*Castilleja martinii* var. *clokeyi*

[1] Extends north to central-eastern Nevada in White Pine County

APPENDIX E

TOIYABE NATIONAL FOREST
SPRING MOUNTAINS NATIONAL RECREATION AREA
AMENDMENT TO THE
LAND AND RESOURCE MANAGEMENT PLAN

APPLICABLE OBJECTIVES, STANDARDS, AND GUIDELINES FOR CONSERVATION MANAGEMENT IN THE SPRING MOUNTAINS

OBJECTIVES APPLICABLE TO THE ENTIRE NRA

(0.1) Maintain or enhance ecosystem health, function, sustainability, and diversity (plant, animal, and community).

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

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

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

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

(0.6) Maintain historic/natural operation of floodplains, where possible.

(0.7) Maintain historic conditions of water chemistry, temperature, clarity, and surface flow.

(0.8) Manage for endemic levels of native insects and diseases within the ecosystem.

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

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

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

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

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

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

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

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

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

(0.19) Limit impacts of new administrative facilities on natural and heritage resources, and visual quality.

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

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

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

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

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

(0.45) Continue to provide rock climbing opportunities while protecting resource values.

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

STANDARDS AND GUIDELINES APPLICABLE TO THE ENTIRE NRA

(0.1) Use native species when restoring riparian areas. (Standard)

(0.3) Prohibit parking and camping within riparian areas. (Standard)

(0.5) Where possible, maintain historic floodplain and channel width, slope, and gradient. (Guideline)

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

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

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

(0.9) Assert claims to water that benefit recreation development, instream flow, wildlife, threatened, endangered, and sensitive species, species of concern, and wild horse and burro populations. (Standard)

(0.11) Divert 25% or *less* of the surface flow from new developments at springs, seeps, and streams. (Standard)

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

(0.17) Develop a seed bank of native species produced from seed sources on the SMNRA. (Guideline)

(0.18) Chaining will not be allowed. (Standard)

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

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

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

(0.23) Use prescribed fire within known and potential habitat of Clokeys eggvetch to improve habitat suitability when fuel, weather, and local/national fire season allows. (Guideline)

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

(0.28) Collection of threatened, endangered, and sensitive species requires a permit from the Regional Forester, except for traditional use by American Indians. (Standard)

(0.29) Limit negative impacts to all species of concern due to management activities. Enclosed species list is the current (9/96) list of species of concern. (Guideline)

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

(0.31) 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) (see Map 4 and Map 5). (Standard)

(0.32) Design new roads and motorized trails to maintain a minimum 0.5 mile distance from active or recently active desert tortoise burrows. (Guideline)

(0.33) For organized, motorized events on unpaved roads or trails within 0.5 mile of active desert tortoise burrows, require special permit provisions for desert tortoise protection. (Guideline)

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

(0.35) New facilities and roads will be sited so as to avoid vital populations or habitats of species of concern. (Standard)

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

(0.37) Retain a minimum of 50 linear feet/acre of downed trees with a minimum 12 inch diameter on sites being managed for late seral stage of the Pinyon/Juniper and Mixed conifer Land Type Associations, to provide ground cover for small mammals, amphibians, reptiles, and invertebrates. Trim branches and limbs as necessary. Place downed trees in such as way as to not affect drainage patterns; impede traffic or use of recreation facilities; create a public safety problem; and where consistent with "defensible space. " (Standard)

(0.38) Provide a minimum of 5 wildlife cover sites per acre within developed or primitive recreation sites by maintaining or adding dead and down wood material or rocks at appropriate locations. (Standard)

(0.39) Permit application of herbicides and insecticides only to avoid or control epidemic outbreaks of insect and plant diseases where there is a threat to public safety, private property, or extreme fire danger. When applied, use only formulations registered by the EPA for the intended use, at minimum effective rates, and using selective methods. Avoid use in habitat for threatened, endangered, or sensitive species, or species of concern whenever possible. Single tree treatment will be used. (Standard)

(0.40) Do not permit introduction of new non-native species of fish or wildlife. (Standard)

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

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

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

(0.46) Develop and maintain cooperative partnerships with hunters and trappers to benefit ecosystem health. (Guideline)

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

(0.49) Remove all structures related to grazing activities that are not necessary for current management, or of historic value. (Standard)

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

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

(0.52) Construction above or in the vicinity of a cave will be designed in a way to insure protection of the cave resources. Diversion of surface drainage into caves is prohibited. (Standard)

(0.53) Where possible, maintain native vegetation around cave openings for a minimum distance of 100 yards. (Guideline)

(0.54) Gate cave or mine openings where needed for public safety and resource protection. (Guideline)

(0.55) All gates on caves and mines will be designed to provide for unrestricted access for bats. Temporary (test) gates of PVC or other light, impermanent material will be constructed first to determine bats' reaction to gate design, prior to final design and construction of permanent gates. (Standard)

(0.56) Prohibit alteration of cave and mine entrance (except for gating to protect cave resources) or their use as disposal sites for slash, spoils, or other refuse. (Standard)

(0.57) 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. (Standard)

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

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

(0.61) Allow collection of snags only between the months of October and the end of February. (Standard)

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

(0.63) Close all undesignated spur roads in riparian areas; close other spur roads on a case by case basis, after Bite specific analysis. (Guideline)

(0.64) Relocate existing roads outside of washes, riparian areas, and 50-year floodplains if relocation will result in better resource conditions. Priority should be given to relocating roads when major maintenance is required and to roads that: (Guideline)

1. Are located in vital habitat for plant or animal species of concern.
2. Receive higher levels of use.

(0.65) Allow motorized vehicle use only on designated roads and trails, except for snowmobile use in approved areas. Close washes to motorized use. (Standard)

(0.66) Allow bicycle use only on established and/or designated roads and trails. (Standard)

(0.67) No sale of National Forest System land within the SMNRA. (Standard)

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

(0.89) Use bulldozers in fire suppression only as a last resort (lives or private property threatened). (Guideline)

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

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

(0.93) Do not use bulldozers to create control lines for prescribed burns. (Standard)

(0.103) Work cooperatively with interested groups to establish seasonal use periods for caves and to educate cave users. (Guideline)

(0.106) Allow development of new bolted climbing routes under a voluntary route registration system. After development of more than 5 routes, new climbing areas in Wilderness and WSA's will require site survey before additional routes are developed. (Standard)

(0.108) Develop or realign trails into climbing areas as appropriate to provide for public safety and resource protection. (Guideline)

(0.114) Abandoned mine entrances may be closed for public safety after surveys to determine the locations of biological and heritage resources have been conducted. (Guideline)

(0.123) Manage designated and informal use (unnumbered) trails that are causing resource damage to reduce damage and restrict use to a single trail. (Guideline)

(0.125) As existing appropriate permits expire, require permittee to provide for education and interpretation of natural resources. (Guideline)

(0.126) Require site/area rehabilitation upon completion/termination as part of all new permits. (Standard)

(0.130) Require permits for publicized and/or organized events with 25 or more participants. (Standard)

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

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

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

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

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

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

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

(0.144) New commercial developments will be approved only if they meet all the following requirements: (Standard)

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

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

(0.146) All new administrative facilities will use drought tolerant landscaping with an emphasis on native species. (Guideline)

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

(0.148) Land purchase and exchange will be carried out only with willing sellers, on an equal value basis. (Standard)

(0.150) Consider disposal through exchange of land occupied by Special use permits or summer homes if it would result in ecosystem administrative, and recreational benefits and where exchange will further the purposes of the Spring Mountains National Recreation Area Act. (Guideline)

MANAGEMENT AREA 11 - DEVELOPED CANYONS

OBJECTIVES

(11.1) Achieve the following mixture of plant communities (seral stages) within each Land Type Association:

Seral Stage (Vegetation Mosaic) **Land Type Association**	**Early**	**Kid**	**Late**
Creosote	0%	0%	90-100%
Blackbrush	0%	0%	90-100%
Pinyon/juniper	3-10%	50-67%	30-40%
Mixed Conifer	1-3%	25-50%	50-70%
Bristlecone Pine	0%	0%	90-100%
Lower Wash	0%	0%	90-100%
Upper Wash	0%	0%	90-100%

(11.4) Allow surface flows to return to ecosystem use.

(11.5) Enhance developed sites where feasible to restore resource or wildlife values where recreation use has adversely affected resources.

(11.11) Keep wild horses from Kyle and Lee Canyon.

(11.12) Lower Deer Creek is removed from the Spring Mountains Wild Horse and Burro Territory due to danger posed by this herd to traffic on Kyle and Lee Canyon highways.

Appropriate Management Level for wild horses and burros in Cold Creek is: horses, 26; burros, 0 (based upon 1992 range analysis and estimated population).

The analysis showed a downward trend in the vegetation community composition, and soil condition (erosion and compaction) within a one mile radius of the ponds. Utilization on willow exceeded 40%. This is excessive utilization for a community in a downward trend. This Appropriate Management Level is therefore based upon 30% of 1993 population which was 92 wild horses. No burros use this area, therefore, Appropriate Management Level for burros is 0.

(11.15) Develop cooperative management relationships with recreational residence associations.

(11.17) Future trail alignments will emphasize public safety, resource protection, and customer satisfaction.

STANDARDS AND GUIDELINES

(11.1) Provide protection of the riparian areas (in accordance with NV Revised Statute 503.660) at Cold and Willow Creeks through the use of new road alignments, vehicle barriers, and/or signage. Redirect

parking and camping away from riparian corridors. Allow only day-use, walk-in activities to occur within the riparian corridor. (Standard)

(11.2) Relocate the road through Cold Creek and Willow Creek out of riparian areas, in cooperation with Clark County, to provide an alignment that improves road safety, maintenance, and management. (Guideline)

(11.3) When practical, use current technologies (such as vault mini-flush, on-site treatment) to minimize the amount of organic waste entering the ground water supply from recreation developments in Kyle and Lee canyons, and along Deer Creek Highway. (Guideline)

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

(11.5) 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. (Guideline)

(11.6) Allow collection of butterflies in Lee Canyon, Cold Creek, Willow Creek, and upper Kyle Canyon only through permits. (Standard)

(11.7) Where possible, control access to, and revegetate areas that are adjacent to recreation developments and have slopes greater than 25 percent. (Guideline)

(11.8) Close and rehabilitate trail to and "Gary Abbot Campground" site. Close area to overnight use. (Standard)

(11.9) Revegetate and restore understory at appropriate locations within developed recreation areas and new administrative sites consistent with defensible space (i.e., fire safety) guidelines. Where possible, control access using temporary barriers at locations where revegetation efforts are occurring. (Guideline)

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

(11.11) Provide water sources for wildlife adjacent to or within developed facilities. Maintain public restrooms to prevent access by wildlife (Palmers chipmunk). (Guideline)

(11.20) Construct fences in strategic locations to keep wild horses out of Kyle and Lee Canyons. (Guideline)

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

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

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

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

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

(11.52) Provide entrance stations on State Highways 157 and 158 at the entrances to upper Kyle and Lee canyons, in cooperation with federal, state, and local agencies, and local residents and business interests. The stations will include gates or other methods to manage traffic flow. (Guideline)

(11.53) Provide additional multi-use recreation facilities in lower Kyle or Lee canyons. (Guideline)

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

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

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

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

MANAGEMENT AREA 12 - MT. CHARLESTON WILDERNESS

OBJECTIVES

(12.1) Restore and maintain the natural, ecological, and visual character of the Wilderness.

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

(12.3) Manage the Research Natural Area to retain its natural and scientific values.

(12.4) Reduce impacts of non-native plants.

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

(12.6) Protect wilderness resources, including live and dead bristlecone pines, from removal/cutting for fuel.

(12.7) Restore water sources to historic flows.

(12.8) Keep wild horses and burros out of the Wilderness.

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

STANDARDS AND GUIDELINES

(12.1) Allow natural disturbances (fire, flood, avalanche) to achieve desired condition of vegetation mosaic. Use management tools to achieve desired condition only if other alternatives are not available. (Guideline)

(12.2) Where possible, remove obvious exotic plants (dandelions, cheatgrass) manually. (Guideline)

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

(12.4) Remove fire rings from the Wilderness. Emphasis should be placed on removing features which encourage use on degraded or sensitive sites. (Guideline)

(12.5) Allow fences and other barriers to be constructed in the Wilderness to prohibit wild horses and burros access into the Wilderness and Kyle and Lee canyons. (Guideline)

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

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

(12.9) Relocate South Loop Trail away from meadow if practical, and if other resources will not be affected. (Guideline)

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

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

(12.13) Wilderness permits are required for all overnight use within the Wilderness. Prohibit camping in sensitive areas, as determined through monitoring. (Standard)

(12.14) Campstoves are not restricted within the Wilderness. Campfires of any kind are prohibited. (Standard)

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

(12.17) Discontinue equestrian use in the alpine if monitoring determines that equestrian use is having a negative impact on vegetation within the biodiversity hotspots. (Standard)

(12.18) Pack and saddle stock are limited to day use on all of South Loop Trail and on North Loop Trail from Trail Canyon trail junction to Charleston Peak (see Map 6). (Standard)

(12.19) Encourage the use of weed-free feed. (Guideline)

(12.24) A maximum of 15 pack or saddle stock will be permitted to use the trails in the Wilderness for organized trail rides. (Standard)

MANAGEMENT AREA 13 - WEST SIDE

OBJECTIVES

(13.1) Achieve the following mixture of plant communities (seral stages within each Land Type Association):

Stage (Vegetation Mosaic)			
Land Type Association	**Early**	**Mid**	**Late**
Creosote	0%	0%	90-100%
Blackbrush	0%	0%	90-100%
Pinyon/juniper	5-10%	60-75% 20-30%	
Mixed Conifer	2-5%	25-50% 50-70%	
Bristlecone Pine	0%	0%	90-100%
Lower Washes	0%	0%	90-100%
Upper Washes	0%	0%	90-100%

(13.2) Maintain unfragmented blocks of land.

(13.8) Habitat Capability for elk: Wheeler Pass, 87; Lovell Summit, 65.

(13.10) Appropriate Management Level for wild horses and burros in WheelerPass:horses, 11; burros, 0 (based upon 7% of available water). Lowest recorded water flow rate is used; assuming wild horses require 10 gallons of water per day. Those gpm rates (gallons per minute): Wheeler Well, 0.0 gpm; Buck Spring, 0.75 gpm; Rosebud Spring, 0.34 gpm.

Appropriate Management Level for wild horses and burros in Wheeler/Wallace: horses, 10; burros, 21 (based upon 7% of available water).

Lowest recorded water flow rate is used; assuming wild horses require 10 gallons of water per day; burros require 5 gallons of water per day. Those gpm rates (gallons per minute): Kiup Spring, 1.7 gpm; Ford Spring, 0.25 gpm; Carpenter Tank, 0.0 gpm; Lee Spring, unknown; Trout Spring, 0.0*; Horse Spring, 0.0* Dedicated to community/private use).

Appropriate Management Level for wild horses and burros in Red Rock Territory: horses, 50; burros, 50 (based upon Bureau of Land Management recommendations and the best available information).

STANDARDS AND GUIDELINES

(13.2) Maintain large undisturbed blocks of vegetation in an unfragmented condition without new roads or motorized trails including: Lovell Wash/Yount/Rose Springs area (T. 21S, R. 57E, Sections 4, 5, 6, 7, 8, 17, 1B, 19, 30; T. 21S, R. 56E, Sections 1, 2, 10-17, 20-27) (see Map 7). (Standard)

MANAGEMENT AREA 14 - MT. STIRLING

OBJECTIVES

(14.1) Achieve the following mixture of plant communities (seral stages within each Land Type Association):

Seral Stage (Vegetation Mosaic)

Land Type Association	**Early**	**Mid**	**Late**
Creosote	0%	0%	90-100%
Blackbrush	0%	0%	90-100%
Pinyon/juniper	5-15%	45-75%	20-40%
Mixed Conifer	2-5%	25-50%	50-70%
Lower Wash	5-15%	45-75%	20-40%
Upper Wash	5-15%	45-75%	20-40%

(14.2) Take advantage of the remote setting of this management area to actively restore historic disturbance regimes and improve wildlife habitat.

(14.6) Maintain existing roadless character of the Wilderness Study Area.

(14.7) Habitat capability for elk for Mt. Stirling is 97.

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

STANDARDS AND GUIDELINES

(14.2) Prohibit construction of developed recreation sites or additional roads in the Mt. Stirling WSA until such time as Congress makes the decision regarding inclusion in the National Wilderness Preservation System. (Standard)

APPENDIX F
Spring Mountains National Recreation Area Conservation Agreement
5-Year Conservation Action Plan

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
1.0 PROJECT PLANNING AND IMPLEMENTATION								
1	1.1 Annual CA review by NRA staff	FS	5pd	X	X	X	X	X
1	1.2 Annual review of species protection recommendations by NRA staff	FS	5pd	X	X	X	X	X
1	1.3 Annual manager briefing on progress and future funding needs	FS, FWS, NDOW, NDF	5pd	X	X	X	X	X
1	1.4 Annual review of biodiversity hotspots by NRA staff and partners	FS, FWS, NDOW, NDF, Heritage	5pd	X	X	X	X	X
1	1.5 (a) Provide CA to partners	FS, FWS	5pd	X	X	X	X	X
1	1.5 (b) Hold annual meetings with partners	FS, FWS, NDOW, NDF, Heritage	5pd	X	X	X	X	X
1	1.6 Establish technical advisory committee and convene annual meetings	FS, FWS, NDOW, NDF, Heritage	5pd	X	X	X	X	X
1	1.7 Integrate CA with Clark County MSHCP	FS, FWS	10pd	X	X	X	X	X
1	1.8 (a) Coordinate with BLM on species issues	FS, FWS, NDOW	25pd	X	X	X	X	X
1	1.8 (b) Work towards inclusion of BLM in CA	FS, FWS	50pd	X	X			

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
1	1.9 Develop and distribute species of concern field guide for Spring Mountains NRA and Red Rock Canyon NCA	FS	10pd, 10K	X	X	X	X	X
1	1.10 Maintain GIS of species of concern occurrence	FS, Heritage	25pd	X	X	X	X	X
2	1.11 (a) Develop prescribed burn plan	FS, NDF	50pd, 20K			X		
2	1.11 (b) Implement prescribed burn plan	FS, NDF	20pd, 50K				X	X
1	1.12 (a) Develop fuelwood plan	FS, NDF	25pd, 10K	X	X			
2	1.12 (b) Implement fuelwood plan	FS, NDF	20pd, 50K			X	X	X
1	1.13 Identify and pursue land purchase and exchange	FS	50pd+ tbd	X	X	X	X	X
1	1.14 (a) Develop MOUs and hold annual meetings w/ climbing and caving groups	FS	10pd	X	X	X	X	X
2	1.14 (b) Identify additional special interest groups and develop MOUs	FS	10pd		X	X	X	

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
2.0 INVENTORY								
----------	2.1 Inventory species of concern and habitats	----------	---------	----- --	----- --	----- --	----- --	----- --
1	2.1 (a) Mojave bajada and wash plants (halfring and Spring Mountains milkvetch, black woolypod, Death Valley beardtongue)	FS, FWS	20pd		X			
1	2.1 (b) Spring plants (Upswept and dainty moonwort)	FS, FWS	20pd	X				
1	2.1 (c) Bret's blue butterfly (Big Timber Spring and elsewhere)	FS, FWS	3K	X				
1	2.1 (d) Townsend big-eared bat	FS, FWS, NDOW	20pd or 8K	X				
1	2.1 (e) Butterfly habitats (Foxtail Canyon, Potosi Mountain)	FS, FWS	7K	X				
1	2.1 (f) Bat roosts (Column and Pinnacle Cave)	FS, FWS, NDOW	10K		X			
2	2.1 (g) Cliff plants (smooth pungent and pungent dwarf greasebush)	FS, FWS	20pd, 5K		X			
2	2.1 (h) Butterflies (checkerspots and blues)	FS, FWS	7K		X			
2	2.1 (i) Allen's lappet-browed bat	FS, FWS, NDOW	20pd or 8K		X			
2	2.1 (j) Butterfly habitats (Mummy, Harris, Fletcher, Sterling, Trail and Wallace canyons, Mud Spring)	FS, FWS	7K		X	X		

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
2	2.1 (k) Bat roosts (cliff climbing areas)	FS, FWS, NDOW	20pd or 10K			X		
2	2.1 (l) Bat water sources (unsurveyed springs)	FS, FWS, NDOW	20pd or 10K			X		
2	2.1 (m) Neotropical migratory bird habitat (riparian areas)	FS, FWS, NDOW	40pd 20K			X		
2	2.1 (n) Raptor inventory	FS, FWS, NDOW	20pd 10K		X	X		
3	2.1 (o) Forest plants (Nevada willowherb, Charleston grounddaisy)	FS, FWS	20pd		X	X		
3	2.1 (p) Fringed myotis	FS, FWS, NDOW	20pd or 8K		X		X	
3	2.1 (q) Butterfly habitat (Wood Spring)	FS, FWS	7K	X			X	
3.0 MONITORING								
1	3.1 (a) Conduct Clokey eggvetch monitoring	FS, FWS	50pd	X	X	X	X	X
1	3.1 (b) Conduct rough angelica monitoring	FS, FWS	50pd	X	X	X	X	X
1	3.2 (a) Develop butterfly monitoring plan	FS, FWS	20pd	X				
1	3.2 (b) Conduct periodic butterfly monitoring for high priority species	FS, FWS	tbd		X	X	X	X
2	3.2 (c) Conduct periodic butterfly monitoring for medium priority species	FS, FWS	tbd			X		X

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
1	3.3 (a) Develop Palmer's chipmunk monitoring plan	FS, FWS, NDOW	20K	X				
1	3.3 (b) Conduct periodic Palmer's chipmunk monitoring	FS, FWS, NDOW	tbd		X		X	
1	3.4 (a) Develop bat monitoring plan	FS, FWS, NDOW	20pd		X			
1	3.4 (b) Conduct periodic bat monitoring	FS, FWS, NDOW	tbd			X		X
1	3.5 Develop and implement a plan to monitor springsnail populations and habitats (Willow and Cold Creek, Kiup Spring)	FS, FWS	10pd, 10K	X	X	X	X	X
2	3.6 (a) Develop riparian habitat monitoring plan	FS, FWS, NDOW	10pd, 50K		X			
2	3.6 (b) Conduct periodic riparian habitat monitoring	FS, FWS, NDOW	tbd		X	X		X
1	3.7 (a) Develop high elevation community monitoring program	FS, FWS	10pd, 30K	X				
1	3.7 (b) Implement high elevation community monitoring program	FS, FWS	tbd		X		X	
----------	3.8 Periodic biologist site visits to monitor species status and site condition (* indicates photo point)	----------	---------	----- --	----- --	----- --	----- --	----- --
1	3.8 (a) Carpenter Canyon	FS, FWS	2pd		X		X	
1	3.8 (b) Deer Creek Upper Kyle Canyon, including Mary Jane Falls Upper Lee Canyon, including Three Springs Macks Canyon, Macks Canyon Spring*, Macks Road	FS, FWS	10pd	X	X	X	X	X

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
1	3.8 (c) Willow Creek Camp Bonanza and North Divide Trail (including McFarland and Whiskey Spring) Cold Creek Spring	FS, FWS	10pd	X	X	X	X	X
1	3.8 (d) Wheeler Well, Trough Spring*	FS, FWS	3pd	X		X		X
1	3.8 (e) Stanley B Spring	FS, FWS	3pd	X	X	X	X	X
1	3.8 (f) Fletcher Canyon and Spring Mummy Spring*, lower North Loop Trail	FS, FWS	6pd	X		X		X
2	3.8 (g) Lee and Kyle canyons summer home sites Mahogany Grove, Robbers Roost	FS, FWS	3pd		X		X	
2	3.8 (h) Lost Cabin Spring*, CC Spring*, Cave Spring	FS, FWS	6pd		X		X	
1	3.8 (i) Peak Spring	FS, FWS	4pd		X			X
3	3.8 (j) Harris Mountain and Saddle	FS, FWS	2pd		X			X
3	3.8 (k) Mud Springs area	FS, FWS	4pd	X			X	
3	3.8 (l) Big Timber and Rock Spring	FS, FWS	4pd		X			X
3	3.8 (m) Roses Spring	FS, FWS	2pd			X		
2	3.9 (a) Develop recreation monitoring strategy	FS	10pd		X			
2	3.9 (b) Implement recreation monitoring strategy	FS	40pd		X	X	X	X
2	3.10 (a) Develop cumulative impact tally program	FS, FWS	10pd			X		
2	3.10 (b) Conduct cumulative impact tally program	FS, FWS	6pd			X	X	X

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
2	3.11 (a) Develop plan to inventory and map non-native plants	FS, FWS, Heritage	20pd 25K?		X			
2	3.11 (b) Implement plan to inventory and map non-native plants	FS, FWS	20pd, 50K			X	X	X
4.0 PROTECTION								
1	4.1 (a) Develop overnight wilderness permitting system	FS	10pd	X				
1	4.1 (b) Implement overnight wilderness permitting system	FS	80pd		X	X	X	X
1	4.2 (a) Develop climbing self registration process	FS	10pd	X				
1	4.2 (b) Implement climbing self registration process	FS	40pd		X	X	X	X
1	4.3 (a) Develop plan to protect bat roosts in mines and caves	FS, FWS, NDOW	5pd	X				
1	4.3 (b) Implement plan to protect bat roosts in mines and caves	FS, FWS, NDOW	tbd		X	X	X	X
1	4.4 Facilitate enforcement of leash laws and feral animal control	FS, NDOW	5pd	X	X	X	X	X
1	4.5 Coordinate with county health department in management of diseases (hanta virus, plague)	FS, NDOW	5pd	X	X	X	X	X
1	4.6 Manage wild horses and burros	FS	50pd	X	X	X	X	X
1	4.7 (a) Develop and distribute pelletized feed information to equestrians	FS	4pd		X	X	X	X

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
2	4.7 (b) Develop and distribute weed free policy for equestrians	FS, NDOW	6pd			X	X	X
1	4.8 (a) Sign closure order allowing FS to prohibiting camping within specified distances of water sources	FS, NDOW	2pd	X	X			
1	4.8 (b) Control dispersed primitive camping in the NRA by enforcing closure orders	FS, NDOW	100pd	X	X	X	X	X
1	4.9 (a) Develop native seed collection plan for endowment and cultivation of sensitive and rare plants	FS, NDF, Heritage	8pd	X				
2	4.9 (b) Collect seed for endowment and cultivation of sensitive and rare plants	FS, NDF	25pd 16K		X	X	X	X
1	4.10 Expand Carpenter Canyon RNA	FS	5pd	X				
2	4.11 Consider and develop additional protective designations	FS	4pd		X	X	X	X
1	4.12 Coordinate with golf course on pesticide and fertilizer use procedures	FS, FWS, NDOW	10pd	X	X	X	X	X
1	4.13 Ensure law enforcement and ranger presence throughout the NRA on a consistent basis	FS	1200 pd		X	X	X	X
1	4.14 Remove brown-headed cowbirds when found	FS, NDOW	tbd	X	X	X	X	X
2	4.15 Work with utility companies to ensure poles are raptor safe	FS, FWS, NDOW	2pd		X	X		
1	4.16 Coordinate with NDOT and FS road crews on road maintenance activities and species of concern	FS, FWS	10pd	X	X	X	X	X

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
5.0 RESTORATION								
1	5.1 (a) Develop native seed list for restoration and rehabilitation	FS, FWS, NDF, Heritage	5pd	X				
1	5.1 (b) Develop plan to collect seed for restoration efforts	FS, FWS, NDF, Heritage	5pd		X			
1	5.1 (c) Establish and maintain seed supply	FS, NDF	20pd 24K			X	X	X
----------	5.2 Restore habitats:	----------	---------	-----	-----	-----	-----	-----
1	5.2 (a) McFarland Spring	FS, FWS	20pd 15K	X				
1	5.2 (b) Mummy Springs	FS, FWS	20pd	X				
1	5.2 (c) Carpenter Canyon	FS, FWS	40pd 100K					X
2	5.2 (d) Trough Spring	FS, FWS	10pd		X			
2	5.2 (e) Lost Cabin Spring	FS, FWS	15pd 10K			X		
2	5.2 (f) Big Timber Spring	FS, FWS	15pd 10K			X		
2	5.2 (g) Little Falls Spring	FS, FWS	15pd			X		
2	5.2 (h) Gold Spring	FS, FWS	tbd				X	

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
3	5.2 (i) Middle Mud / East Mud Spring	FS, FWS	5pd	X				
3	5.2 (j) Buck Spring	FS, FWS	5pd			X		
1	5.2 (k) Macks Canyon Spring	FS, FWS	15pd 5K		X			
3	5.2 (l) Younts Spring	FS, FWS	15pd 5K			X		
3	5.2 (m) Santa Cruz Spring	FS, FWS	15pd 10K			X		
3	5.2 (n) Ninetynine Spring	FS, FWS	15pd				X	
3	5.2 (o) Mexican Spring	FS, FWS	10pd				X	
3	5.2 (p) Cougar Spring	FS, FWS	10pd				X	
2	5.3 Work with property owners to restore and enhance Cold Creek area	FS, FWS	50pd		X	X	X	X
1	5.4 (a) Willow Creek: Develop comprehensive restoration plan	FS, FWS, NDOW	200pd		X	X		
1	5.4 (b) Willow Creek: Implement comprehensive restoration plan	FS, FWS, NDOW	tbd				X	X
3	5.5 Work with summer home residents to restore and enhance habitats	FS, FWS, NDOW	8pd				X	X
1	5.6 Work with ski resort to incorporate habitat enhancement measures into new permit	FS, FWS	10pd	X	X			

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
1	5.7 Remove selected high-elevation campsites and fire rings	FS	25pd	X	X			
----------	5.8 Remove roads causing environmental damage:	----------	---------	----- --	----- --	----- --	----- --	----- --
2	5.8 (a) Remove road to Cave Spring	FS	15pd 5K		X			
2	5.8 (b) Remove road to CC Spring	FS	15pd 5K		X			
3	5.8 (c) Remove road to Lost Cabin Spring	FS	15pd 5K		X			
3	5.8 (d) Identify additional roads causing environmental damage and work with community groups to close them	FS	5pd + tbd			X	X	X
2	5.9 Organize volunteer work parties to remove weeds in high elevation communities	FS	5pd		X		X	
----------	5.10 Develop and implement vegetation management and restoration plans for campgrounds and day use areas:	----------	---------	----- --	----- --	----- --	----- --	----- --
2	5.10 (a) Deer Creek Picnic Area	FS, FWS	10pd 25K			X		
2	5.10 (b) Lee Canyon campgrounds and picnic areas	FS, FWS	30pd tbd			X		
2	5.10 (c) Kyle Canyon campgrounds and picnic areas	FS, FWS	30pd tbd			X		

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
2	5.10 (d) Gary Abbot Campground	FS, FWS	10pd		X			
3	5.11 Work with volunteers to provide nest boxes for cavity nesters	FS, NDOW	5pd		X		X	
6.0 RESEARCH								
1	6.1 Develop information package identifying research opportunities in the Spring Mountains NRA	FS, FWS, NDOW, Heritage	10pd		X			X
----------	6.2 Conduct research on species and communities:	----------	--------	-----	-----	-----	-----	-----
1	6.2 (a) Clokey eggvetch seed biology and habitat requirements	FS, FWS	tbd					
2	6.2 (b) Spring Mountains acastus checkerspot autecology	FS, FWS	tbd					
1	6.2 (c) Fire ecology and disturbance regimes of plant communities	FS, FWS	tbd					
1	6.2 (d) Fire management for ecosystem health within the urban interface	FS	tbd					
1	6.2 (e) Checkerspot and blue butterfly metapopulation dynamics and genetics	FS, FWS	tbd					
2	6.2 (f) Blue butterfly / ant relationships	FS, FWS	tbd					
1	6.2 (g) Checkerspot and blue butterfly habitat requirements	FS, FWS	tbd					
1	6.2 (h) Effects of human disturbance on bats	FS, FWS	tbd					

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
3	6.2 (i) Winter habits of bats	FS, FWS	tbd					
1	6.2 (j) Palmer's chipmunk movement and dispersal	FS, FWS	tbd					
1	6.2 (k) Study of NRA customer needs/visitor communications	FS	tbd					
1	6.2 (l) Development of a recreation use monitoring strategy	FS	tbd					
3	6.2 (m) Waste management in the Wilderness Area	FS	tbd					
7.0 EDUCATION								
2	7.2 Develop environmental education programs for schools and community groups	FS	30pd 25K		X	X		
2	7.3 Distribute educational materials directed at specific user groups	FS	5pd 5K			X		
3	7.4 Provide information to summer home residents on species of concern conservation	FS	5pd				X	
3	7.5 Develop display materials for NRA office and guard station	FS	20pd 20K				X	
2	7.6 Develop brochures for trailheads	FS	20pd 20K		X	X		
3	7.7 Develop driving tour programs	FS	20pd 50K					X
----------	7.8 Design and install information and education signs	----------	--------	----- --	----- --	----- --	----- --	----- --

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
1	7.8 (a) Cathedral Rock sign	FS, FWS	5K	X				
1	7.8 (b) Mary Jane Falls Trailhead sign	FS, FWS	5K	X				
1	7.8 (c) Deer Creek Picnic Area sign	FS, FWS	5K	X				
1	7.8 (d) Bristlecone Trailhead sign	FS, FWS	5K	X				
1	7.8 (e) Robber's Roost Trailhead sign	FS, FWS	10pd 8K		X			
2	7.8 (f) Fletcher Canyon Trailhead sign	FS, FWS	10pd 8K		X			
1	7.8 (g) Trail Canyon Trailhead sign	FS, FWS	10pd 8K	X				
2	7.8 (h) North Loop Trailhead sign	FS, FWS	10pd 8K		X			
2	7.8 (i) Bonanza Trailhead sign	FS, FWS	10pd 8K		X			
2	7.8 (j) Harris Springs Trailhead sign	FS, FWS	10pd 8K		X			
2	7.8 (k) Carpenter Canyon sign	FS, FWS	10pd 8K					X
1	7.8 (l) Mummy Springs sign	FS, FWS	1pd 0.5K	X				

PRIORITY[1]	CONSERVATION ACTION	ACTION AGENCY	Est. staff time and cost [2]	ACCOMPLISHMENT YEARS				
				FY98	FY99	FY00	FY01	FY02
1	7.8 (m) Stanley B Spring sign	FS, FWS	1pd 0.5K	X				
2	7.8 (n) CC Spring sign	FS, FWS	1pd 0.5K		X			
2	7.8 (o) Trough Spring sign	FS, FWS	1pd 0.5K			X		
2	7.8 (p) Cave Spring sign	FS, FWS	1pd 0.5K		X			
2	7.8 (q) Macks Canyon Spring sign	FS, FWS	1pd, 0.5K			X		
2	7.9 Design and install Palmer's chipmunk signs at developed recreation sites	FS, NDOW	5pd 5K			X	X	

[1] Priority:

1 High priority - Conservation actions necessary to avoid large magnitude and/or imminent threats that may cause species declines or habitat degradation

2 Medium priority - Conservation actions necessary to avoid moderate magnitude and/or non-imminent threats that may cause species declines or habitat degradation.

3 Low priority - Other conservation actions that would enhance conservation management in the NRA.

[2] Estimated cost and staff time:

$K Actual cost outlays are indicated in thousands of dollars for conservation actions requiring supplies, equipment, or outside assistance.

pd Staff time indicated as person days

tbd To be determined

APPENDIX G

>>> NEVADA NATIVE SPECIES SITE SURVEY REPORT <<<

rev. 5.0-12/1994

MAIL TO: NEVADA NATURAL HERITAGE PROGRAM, 1550 East College Parkway, Carson City, NV 89710 (702) 687-4245

PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU. USE THE BACK FOR COMMENTS IF NECESSARY. PLEASE ATTACH OR DRAW A MAP ON BACK.

OFFICE USE ONLY

Source Code_____ Map Code_____
Element Code_____ Occurrence #_____
Copy Sent to_____

Scientific name (no codes): _____

Surveyor/Reporter: _____ Phone: ( ) _____

Address: _____

Date of Survey: ____ ____ ____ (day month year) County: _____ Collection #_____ Museum/Herb. _____

LOCATION (please attach map showing population boundaries and routes/areas searched):

Map Name: _____ Field # _____ | T _____ R _____ ____¼ of ____¼ Sec ____

scale=1:_____ Elevation: _____ to _____ ft/m | T _____ R _____ ____¼ of ____¼ Sec ____

Landowner/Manager: _____

# of individuals/ramets: _____ if zero, reason: _____

# of colonies/genets: _____ if different, explain: _____

Is this a new location record (Yes/No/?)_____ a subsequent visit?_____ Compared to last visit:__more __same __fewer

Phenology (plants): ____% dormant ____% vegetative ____% budding ____% flowering ____% fruiting ____% seeding

Age Structure: ____% senescent ____% adult/mature ____% juvenile ____% 1st-year ____% newborn/seedling

Site Function (animals): ____breeding ____foraging ____wintering ____roosting ____denning _____other

INTERACTIONS (disease, predation, competition, parasitism, symbiosis, pollination, hybridization, dispersal, etc.):

HABITAT DESCRIPTION (community dominants, associates, other rare spp., moisture, substrate/soils, aspect/slope, light, air/H_2O temp., time, weather, etc.):

CURRENT SITE USE/Visible Disturbances and Impacts/Possible Threats:

Overall Relative Site Quality: _____Excellent _____Good _____Fair _____Poor COMMENTS:

SHOULD/COULD THIS SITE BE PROTECTED? How?

OTHER COMMENTS:

IDENTIFICATION OF SPECIES (Check one or more, fill in blanks):

____ Keyed in reference: _____
____ Compared w/specimen at: _____
____ Compared w/photo/drawing in: _____
____ By another person (name): _____
____ Other: _____

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone):

PHOTOGRAPHS (Check one or more):

Subject	Type
____Plant/Animal	____Slide
____Habitat	____Print
____Diagnostic Feature	
____Other	

May we obtain duplicates at our cost?

_____yes _____no

APPENDIX H

SCOPE OF WORK
for the
INTERAGENCY AGREEMENT
between
FISH AND WILDLIFE SERVICE
and
U.S. FOREST SERVICE
for
SPRING MOUNTAINS NATIONAL CONSERVATION AREA

The Spring Mountains ecosystem is a physiographically isolated mountain range in southern Nevada ranking high among western United States mountain ranges in terms of biological diversity and endemism. The Spring Mountains provides habitat for more than 60 rare and sensitive plants and animal taxa, including 18 plants, 8 butterflies, and 1 mammal found nowhere else in the world. The Las Vegas metropolitan area, located adjacent to Spring Mountains, is one of the fastest growing cities in the western U.S., with a population of more than 1 million people and influx of new residents at a rate of several thousand per month. Increasing demand for recreational opportunities in the Spring Mountains by residents of the Las Vegas Valley is steadily increasing pressure on ecological resources.

The U.S. Forest Service Humboldt-Toiyabe National Forests (FS) have been cooperating with the U.S. Fish and Wildlife Service (FWS) in development of an ecosystem-level conservation agreement addressing conservation and management of rare, endemic, and other sensitive taxa in the Spring Mountains National Recreation Area (NRA). If successfully implemented, this agreement should provide long-term protection for all rare and sensitive species in the Spring Mountains, such that future listings under the Endangered Species Act of 1973, as amended (ESA) are unnecessary.

Central to the goal of long-term protection for sensitive species is a coordinated program of inventory, monitoring, research, protection, restoration, and education. To this end, recent inventories of the plant and animal fauna of the Spring Mountains have resulted in identification of sensitive habitats and biodiversity hotspots (i.e., those areas harboring the greatest number of species and highest rates of endemism). In addition, monitoring protocol have been developed for several species, and various field-based research efforts have been completed. Information derived from these efforts is being incorporated into the Spring Mountains NRA management plan which is expected to be finalized by September 1996

The purpose of this interagency agreement is to enhance current management efforts focused on biodiversity and species protection through a program of public education and habitat restoration This agreement will facilitate the following programs:

1 Education/Information signage:

Eight signs (two per location, four locations) will be designed, constructed, and installed in the following areas: Deer Creek Picnic Area, Cathedral Falls trail head, Mary Jane Falls, and one other area, to be determined. One sign per location would discuss rare and sensitive species The other sign would provide a map and information on permissible/non-permissible activities.

Sign designs, narratives, and construction details will be developed by the FS. Design and text will be submitted to FWS for comments and final approval.

II Habitat Restoration Program

This program will provide a funding source for restoration projects in the Spring Mountains NRA. The FS and FWS will jointly develop and finalize a list of project priorities by no later than February 1, 1997. Actual on-the-ground work will be conducted during 1997. Additional projects will be conducted in 1998, if funding has not been exhausted. Priorities for funding of restoration projects will be based on the following criteria:

+ Projects should benefit one or more of the rare, endemic, sensitive, candidate, and listed species, or other critical components of biodiversity occurring in the Spring Mountains NRA.

+ Highest priorities will be assigned to projects 1) most likely to avert declining status trends that could result in a need to list new species under the ESA, or hinder recovery of currently listed species; and 2) improving ecosystem health, lands in poor condition, and areas where threats to biodiversity are greatest.

+ Consideration will be given to management recommendations provided by Nevada Division of Wildlife, The Nature Conservancy, University of Nevada, Las Vegas, Stanford University, and others, within the framework of various inventory, monitoring, and research studies accomplished in the Spring Mountains NRA during the period 1993 to 1996.

+ Projects should facilitate future implementation of the Spring Mountains Conservation Agreement between the FS and FWS.

+ Projects should increase public awareness and education on protection needs of sensitive ecological resources.

+ Projects should provide ample opportunities for involvement, participation and/or cost sharing by partners. Partners could potentially include (but would not be limited to) Federal, State, local and governments, universities, non-profit and public service organizations, schools, interested citizens, and other interest groups.

+ Projects might include, but will not be limited to, the following types of restoration activities:

Relocation of facilities away from biodiversity hotspots and other sensitive areas
Riparian and spring rehabilitation
Revegetation in and near campgrounds
Rehabilitation of unneeded trails and roads
Erosion control
Cave protection and restoration

APPENDIX H

CONSERVATION AGREEMENT

Blue Diamond cholla
(*Opuntia whipplei* Engelmann & Bigelow var. *multigeniculata* (Clokey) L. Benson)

I. Purpose

This Conservation Agreement (CA) has been developed to facilitate voluntary cooperation between the U.S. Bureau of Land Management (BLM), the Nevada Division of Forestry (NDF), the U.S. Fish and Wildlife Service (FWS), and James Hardie Gypsum Company (J.H. Gypsum), in providing long-term protection for Blue Diamond cholla (*Opuntia whipplei* var. *multigeniculata*). Such protection will entail: 1) Removal of threats, 2) studies to determine species biology and habitat requirements, 3) periodic species monitoring and 4) review of the effectiveness of this CA and changes to the CA, as determined necessary. Conservation measures funded or carried out through this CA are intended to provide long-term conservation benefits that can achieve long-term survival of the Blue Diamond cholla.

II. Involved Parties

A. U.S. Bureau of Land Management
Las Vegas Field Office
4765 W. Vegas Drive
Las Vegas, Nevada 89108 (702) 647-5000

U.S. Bureau of Land Management
Nevada State Office
1340 Financial Boulevard
Reno, Nevada 89502 (702) 861-6400

B. Nevada Division of Forestry
Southern Regional Office
State Mail Room
Las Vegas, Nevada 89158 (702) 486-5123

Nevada Division of Forestry
State Office
1201 Johnson Street, Suite D
Carson City, Nevada 89706 (702) 684-2500

C. U.S. Fish and Wildlife Service
Nevada Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502 (775) 861-6300

U.S. Fish and Wildlife Service
Southern Nevada Field Office
1510 North Decatur Boulevard
Las Vegas, Nevada 89108 (702) 647-5230

U.S. Fish and Wildlife Service
California Nevada Operations Office
2800 Cottage Way, Room W-2606
Sacramento, California 95825 (916) 414-6464

D. James Hardie Gypsum Company
HCR 89033, Box 2900
Las Vegas, Nevada 89124 (702) 875-4111

III. Authority

The authorities for the agencies to enter into this voluntary CA derives from the following: the Endangered Species Act of 1973, as amended (ESA); the Fish and Wildlife Act of 1956, as amended; the Fish and Wildlife Coordination Act of 1958, as amended; and the National Interagency Memorandum of Understanding for the conservation of species tending towards listing, issued on January 25, 1994 (94-SMU-058). BLM additionally provides for management of sensitive species through conservation management of the lands and ecosystems supporting them (BLM Manual 6840). Nevada Revised Statutes (NRS) 527.260, *et. seq*, directs the NDF State Forester/Firewarden to provide a program for the conservation, protection, restoration, and propagation of selected species of flora and for the perpetuation of the habitats of such species.

IV. Status and Distribution of the Species

Blue Diamond cholla is endemic to Blue Diamond Hills, Clark County, Nevada (Figure 1). This area lies at the southeastern margin of the Spring Mountains complex, west of Las Vegas in the northern Mojave Desert. The cholla occurs from 3450-4350 feet elevation where annual precipitation averages about 7-9 inches. It is restricted to dry limestone hills, underlain by gypsum, occurring mostly on west- to southwest facing slopes and exposed ridges. This species forms part of a distinctive, unusual, and rare Nevada plant community, succulent scrub, which is characterized and dominated by a wide diversity of cactus, yucca, and agave species. Despite their formidable armor, many cacti serve as sources of forage and/or pollen to native wildlife. Because of their high drought and temperature tolerances, many cacti and other succulents function as primary

sources of productivity, biomass, and soil stabilization where most other plants are unable to survive.

The Blue Diamond cholla population occurs on 312 acres of land, 83 percent (259 acres) of which is managed by BLM and the remainder (53 acres) by J.H. Gypsum. In 1994, 880 acres of BLM land between the BLM managed Red Rock Canyon National Conservation Area (RRCNCA) and private land were added to expand the RRCNCA. This is the single most important conservation action for this species, as most of the habitat of Blue Diamond cholla (approximately 83 percent) now falls under RRCNCA management.

The Blue Diamond cholla is a candidate for listing under the ESA. This species was initially added to the candidate list in 1987 because of low numbers, very limited distribution, and multiple threats and disturbances to the habitat, including potential mine expansion and development in the Blue Diamond Hills. At the time of inclusion on the candidate list, the area supporting the Blue Diamond cholla was subject to very little on-the-ground management, leaving the species highly susceptible to disturbance.

The Blue Diamond cholla was listed as critically endangered in 1992 by the State of Nevada under NRS 527.260, *et. seq*. The NRS states that a species or subspecies of native flora shall be regarded as threatened with extinction when the state forester firewarden, after consultation with competent authorities, determines that its existence is endangered and its survival requires assistance because of overexploitation, disease, or other factors or because its habitat is threatened with destruction, drastic modification, or severe curtailment. According to the NRS, a permit issued by the state forester firewarden is required for activities on any lands, public or private, that would disturb or destroy any species that is listed by the State.

Since 1968, lands in the Red Rock Canyon area have been managed by BLM for recreation. Rapid population growth in the Las Vegas Valley resulted in increased use in this area, and the need to protect sensitive natural resources became evident. The RRCNCA was established in 1990 to provide for better control of recreational users and reduce potential impacts to resources. Certain management provisions are required for lands under the NCA designation, including the preparation of a General Management Plan to identify interpretation and public education strategies, administration and visitor facilities, cultural and wildlife resource management plans, and a recreation management plan. Inclusion of Blue Diamond cholla habitat within the 196,000 acre RRCNCA affords the species protection by prohibiting future mineral entry (mining claims filed prior to the expansion of the RRCNCA would still be valid), providing planning and management for public use, and preventing habitat destruction through the increased presence of BLM rangers.

Since its listing as a candidate species, increased awareness on the part of land management and regulatory agencies and the private mining company has resulted in a

commitment to take proactive measures to conserve the species. For instance, since 1989, The Nature Conservancy (TNC) and J.H. Gypsum have had an informal agreement to protect this species on their private lands. Also, the BLM has provided increased law enforcement in an effort to reduce illegal activities that may negatively affect the cholla, and the establishment of expanded boundaries of the RRCNCA provided important restrictions on land use in the Blue Diamond area which directly benefit the species. The development and implementation of this CA should provide long-term conservation benefits that can achieve long-term survival of the Blue Diamond cholla.

V. Problems Facing the Species and Management Actions Taken to Date

A. Past destruction, modification, or curtailment of habitat or range. The partnership and protection effort between TNC and J.H. Gypsum continues to date; however, in 1991, site visits revealed that a small area of the population was being buried by overburden. Various other mining activities, including scraping, clearing, and road construction for mine access have destroyed Blue Diamond cholla individuals as well as portions of habitat. An estimated 13 acres of habitat (4 percent) were lost to such activities in the past.

The threat of the mining has been significantly reduced in recent years. Dumping of overburden from the adjacent mine into canyons containing Blue Diamond cholla has ceased. There are no existing mining claims in the RRCNCA that will affect the Blue Diamond cholla. In addition, no new mining is allowed on its habitat within the boundaries of the RRCNCA. The access road to the mine is an Exclusive Use right-of-way of J.H. Gypsum and as such provides controlled access onto Blue Diamond Hill. Potential changes to the right-of-way alignment and construction of a new access road may be proposed in the future; however, no impacts to Blue Diamond cholla or its habitat are expected.

Over 1 million people visit the RRCNCA annually, and visitation continues to steadily increase from year to year. Activities within the RRCNCA include, but are not limited to, tour and mountain biking, equestrian use, rock climbing, and commercial filming and bus tours. To date, these recreational activities have not resulted in negative impacts to the Blue Diamond cholla, mostly because of the remote nature and controlled access of the sites it occupies.

B. Overutilization for commercial, recreational, scientific, or educational purposes. All members of the cactus family are subject to illegal collection. Blue Diamond cholla is located in an area particularly rich in cactus diversity. The rarity of this taxon may make it particularly susceptible to overutilization through collection; however, overutilization has not, so far, been known to occur due to limited access into the remote canyons where this species is most abundant. This situation could change in the future with an increase in RRCNCA visitation.

C. Disease or predation. None known. Though very unlikely, wild burros that inhabit the area could utilize the Blue Diamond cholla for food. Herbivory from a beetle has been observed on buds and flowers. The effect of this insect on the population is unknown but probably not significant.

D. Inadequacy of enforced regulatory mechanisms. Blue Diamond Hills have not been a focus of law enforcement activities. Because of the inconspicuous nature of the species and the remoteness of the habitat, no management problems such as illegal collection are known. Habitat that is most accessible appears to be intact. Prior to the expansion of the RRCNCA boundaries, however, there was very little land management in the area, and there were imminent threats to the species including mine expansion and potential residential development.

Inclusion within the RRCNCA affords the species protection by prohibiting future mineral entry (mining claims filed prior to the expansion of the RRCNCA would still be valid), providing planning and management for public use, and preventing habitat destruction through the increased presence of BLM rangers.

The Blue Diamond cholla was listed as critically endangered by the State of Nevada on December 18, 1992. The purpose of NRS 527.260, *et. seq*, is to provide a program for the conservation, protection, restoration, and propagation of selected species of flora and for the perpetuation of the habitats of such species. Any plant species declared endangered is fully protected and cannot be removed or destroyed at any time by any means except under special permit issued by the state forester firewarden. This species is also protected under the State's cactus, yucca, and Christmas tree law (NRS 527.060, *et. seq*), which states NDF must be notified of the removal or possession for commercial purposes of any of these species, and registration and a permit are required. The adequacy of State laws depend on informed and cooperative landowners, or on some form of deterrent enforcement (Morefield 1992), which has been difficult to achieve due to a lack of resources within the land management and regulatory agencies.

This species achieved candidate status in 1987. Candidate species receive no statutory protection under the ESA. However, the FWS encourages the formation of partnerships to conserve these species since they are, by definition, species that may warrant future protection under the ESA. Conservation agreements such as this are developed in an effort to preclude the listing of species by implementing protective measures which prevent further decline of populations and habitats.

BLM Manual 6840 provides policy and guidance for conservation of candidates and other special status species. This manual states that BLM shall ensure that actions authorized, funded, or carried out by the agency do not contribute to the need to list any candidate species. The adequacy of BLM policy is dependent upon sufficient staffing and funding levels.

Increased awareness on the part of the participating entities has resulted in the commitments identified in this CA. Successful implementation of the conservation measures (Section VI) would provide for additional law enforcement patrols in the area and ensure restricted access to Blue Diamond Hills is maintained, thereby increasing the effectiveness of the existing regulatory mechanisms.

E. Other natural or man-made factors. Because the Blue Diamond cholla is restricted to such a small geographic area, it its inherently more susceptible to catastrophic events such as fire and perhaps climatic changes, such as prolonged warming trends. The invasion of non-native annual grasses has promoted fire in the Mojave Desert where it was not known to occur at the present frequency and severity. Fires burned the northern end of Blue Diamond Hill in the early 1980s, including the deep canyons, and could present a danger to this species.

Blue Diamond cholla is generally not found in areas of runoff accumulations, thus, water quality would typically not be an issue. Cessation of overburden dumping near the cholla habitat has alleviated this concern. The BLM and J.H. Gypsum will develop remedial actions to correct the problem, if necessary.

Burros are known to occur in the Blue Diamond Hills, however, they have not been directly associated with any adverse impacts to the cholla. The BLM has proposed to remove burros from this area in the Proposed General Management Plan for the RRCNCA, which would relieve the area of grazing pressures and future habitat degradation. A final decision on whether or not burros will remain in this area has not been made at this time.

F. Future activities. Future activities on the remaining Blue Diamond cholla habitat found on private land could impact the species. J.H. Gypsum, BLM, NDF, and the FWS are working to resolve any impacts from such activities. The short-term effects of future projects for hydroelectric power generation and other developments on private land could directly and indirectly impact Blue Diamond cholla habitat. At the present time, there are no identified projects that could result in such impacts.

VI. Conservation measures That Will be Carried Out

The following list of conservation measures to be carried out during the first 5 years of the 10-year agreement for Federal fiscal years 2000 through 2004, after which the program will be assessed to determine whether the conservation measures have been accomplished and to establish the list of conservation measures needed during the fiscal years 2005 through 2009. The objective of the conservation measures are to address the current threats and provide long-term protection to the species. The cost and schedule for completing these actions is provided in Table 1.

As noted in Table 1, several conservation measures have been implemented and/or completed to date. These cooperative efforts by the participating entities is indicative of their dedication to the conservation of the Blue Diamond cholla. This species is threatened mostly by past and potential habitat degradation destruction, modification, or curtailment of habitat or range. The following conservation measures have been developed to address these threats:

1. The BLM will complete a land exchange with J.H. Gypsum of Blue Diamond cholla habitats on private patented lands for adjacent BLM inholdings within the patented lands by the end of the federal fiscal year 2001. BLM will incorporate the exchanged lands into the RRCNCA, at which time these lands will be withdrawn from mining. The land exchange may incorporate all remaining Blue Diamond cholla habitat into the RRCNCA. At most, 5 percent (15 acres) of Blue Diamond cholla habitat will remain on private patented lands.

2. The BLM will map both potential habitat and existing disturbance along the main access road. Together with J.H. Gypsum, the current condition of the access road and adjacent areas will be maintained. The BLM will also rehabilitate, as determined necessary by BLM and FWS botanists and NDF resource staff, any disturbed Blue Diamond cholla habitat. Mapping the habitat and existing disturbance will allow the BLM to identify future impacts resulting from harmful activities, such as overburden dumping, and enable them to accurately determine areas to be rehabilitated.

3. The BLM will also limit casual use to the extent possible by maintaining the "Restricted Access" sign at the entrance to the main access road. This road provides access to the mine through the largest population of Blue Diamond cholla. The gate will be kept locked to restrict public access, as determined necessary by J.H. Gypsum, BLM and FWS botanists, and NDF resource staff, based upon monitoring as called for in Conservation Action L, and evaluation of the information collected in Conservation Action F.

4. The BLM and J.H. Gypsum will maintain the current condition of the main access road and adjacent areas. This will ensure that no further degradation of populations along the road occur as a result of use.

Table 1. Blue Diamond cholla 5-year conservation action plan

Objectives	Conservation Measures	Entity	Cost	FY 00	FY 01	FY 02	FY 03	FY 04	C/O
A	Land exchange				x				O
		BLM	16K						
		J.H. Gypsum	TBD						
A	Map habitat and disturbance	BLM	**	x					C
A	Maintain restricted access	BLM	TBD	x					
B, D	Increase law enforcement	BLM	TBD	x					
E	Fire prevention pretreatment								
	Feasibility study			x					
		BLM	5K						
		NDF	TBD						
	Implementation				x				
		BLM, NDF	TBD						
R	Harvest and stockpile seed			x	x	x	x	x	
		BLM	1K						
		NDF	TBD						
A	Maintain current condition of access road and adjacent areas			x	x	x	x	x	
		BLM	TBD						
		J.H. Gypsum	TBD						
A	Notify NDF and FWS of land disturbance			x	x	x	x	x	
		BLM	**						
		J.H. Gypsum	**						
R	Conduct studies	FWS, BLM		x	x	x	x	x	
	Propagation		TBD						
	Pollination		TBD						
	Germination		TBD						
	Taxonomy	FWS	12K	x					O
F	Review management plans and status reports, provide technical assistance	FWS, NDF	**	x	x	x	x	x	
F	Develop monitoring protocol	FWS, BLM, NDF	**	x					
F	Implement monitoring protocol				x	x	x	x	
		BLM	5K						
		FWS, NDF	**						
F	Work to resolve impacts to cholla and habitat on private lands	All	**	x	x	x	x	x	O
F	Annual meetings	All	**	x	x	x	x	x	O

Key to Table 1.

Objectives (Removal of identified threat or research)
A = Remove threat of past destruction, modification, or curtailment of habitat or range
B = Remove threat of overutilization for commercial, recreational, scientific, or educational purposes
D = Remove threat of inadequacy of enforced regulatory mechanisms
E = Remove threat of other natural or man-made factors
F = Remove threat of future activities
R = Research to expand knowledge of species and habitat requirements

FY = Fiscal year

C/O = Completed/Ongoing

K = Estimated cost in thousands of dollars

** = Indicates actions that will not involve expenditures beyond cost of maintaining existing staff

TBD = Costs to be determined

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5. The BLM and J.H. Gypsum will notify NDF 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. FWS will also be notified of anticipated land disturbance. This coordination should help to minimize habitat disturbance to the extent possible.

To minimize the threat of overutilization for commercial, recreational, scientific, or education purposes and to increase the adequacy of enforced regulatory mechanisms, the BLM will implement the following:

1. The BLM will increase law enforcement patrols along the access road. Levels of patrol activity will be documented, and findings summarized annually in a report to the RRCNCA manager, BLM botanist, and NDF. BLM will determine appropriate actions to be taken if plant removal or off-highway vehicle activities become problematic. Any incidents on Blue Diamond Hill will be reported to the RRCNCA manager so that corrective action may be taken.

Effects from other natural or man-made factors, such as fire, grazing and potential development of private lands, must be considered in the conservation of the cholla. The following conservation measures will assist in ensuring that these factors do not result in a decline in population numbers or habitat area:

1. The BLM will investigate the development, feasibility, and benefits of pre-treating the area for fire prevention (e.g., fuel breaks on exposed slopes) and implement a pre-treatment program if determined by the parties to this agreement to be necessary to protect the Blue Diamond cholla and its habitat.

2. The parties to this CA will work together to avoid or resolve any impacts to Blue Diamond cholla or its habitat resulting from activities on private land.

Conservation measures included in this CA which are indirectly associated with threats from future activities are designed to advance the conservation efforts for this species, ensure the long-term survival and protection of the cholla and its habitat, fill informational gaps regarding the biology of the species, and should enable the FWS to remove the Blue Diamond cholla from the candidate list. These conservation measures include the following:

1. Harvest and stockpile mature seeds from a variety of sites to conserve the seed bank and for use in propagation studies. NDF will develop and document the methods for secure, long term seed storage and seeds will be stored by NDF using appropriate storage methods and protocols.

2. Fund propagation (seed and cuttings), pollination, germination, monitoring, and taxonomic studies to elucidate the ecology, life history, and taxonomy of Blue Diamond cholla.

3. 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 J.H. Gypsum.

4. Coordinate with other species experts to develop and implement monitoring protocol for the species to document status trends. The monitoring protocol will identify quantifiable parameters and establish standards for these parameters by which progress towards achieving objectives will be measured.

   The parties to this CA, together with Clark County, and a working group comprised of species experts and agency resource managers are working to implement long-term conservation strategies for this and other special status species through the Clark County Multiple Species Habitat Conservation Plan (MSHCP). Implementation of the MSHCP will provide benefits to the species through funding of conservation measures or negotiating solutions to problems that may arise that present barriers to the implementation of this CA. Such efforts, if successfully implemented, should alleviate the need to list the species under the ESA. The principles of adaptive management will be applied to this CA, based on the results of monitoring, to ensure the long term effectiveness of the CA under changing circumstances.

5. The parties to this CA will meet annually, or more frequently when mutually determined necessary, to evaluate progress made on conservation of the Blue Diamond cholla, and to determine the need to modify, expand, or reduce the scope of this CA. At this time, the parties will evaluate the effectiveness of the conservation measures in this CA. Species experts and other knowledgeable entities will be invited to participate as determined necessary by the parties to this CA. BLM, the FWS, or NDF will coordinate with the other parties in establishing meeting dates and locations. Modifications to this CA will be implemented only

upon written agreement by all parties, as described under IX, below.

VII. Expected Results from the Implementation of this Agreement

Successful implementation of this CA should remove the threats to the species, and ensure the long-term survival of Blue Diamond cholla, by consolidating, maintaining, or improving existing habitat in the Blue Diamond Hills. As a result, the need to list the species under the ESA should be avoided. If reviews of the information indicate that the species has a larger range, is part of a more common taxon, or if conservation measures have reduced threats and have resulted in long-term protection of the species, then FWS may remove the Blue Diamond cholla from its status as a candidate for listing under the ESA. When and if it becomes known that there are threats to the survival of the Blue Diamond cholla that are not or can not be resolved through this CA, the FWS may choose to reassign candidate status and an appropriate listing priority to the species.

The conservation measures set forth in this CA were developed specifically to address the threats facing the Blue Diamond cholla, as well as provide a mechanism to ensure its long-term survival. Some of the key actions include a land exchange, maintaining restricted access to the Blue Diamond cholla habitat, increasing law enforcement in the area, conducting various studies on the biology of species, developing and implementing a monitoring protocol, and holding annual meetings to review the progress made toward conservation of the species. All of the conservation measures, as discussed above in Section VI., are expected to enhance management awareness and effectiveness. Annual meetings will allow involved parties to evaluate the effectiveness of these conservation efforts. If it is determined that an action is not succeeding in conserving the species and its habitat, adaptive management will be employed and modifications will be made to that action to ensure its objective can be achieved.

By becoming signatory to this CA, the FWS, BLM, NDF, and J.H. Gypsum acknowledge their commitment to the conservation of the Blue Diamond cholla and its habitat through implementation of the measures described herein. All parties have assigned responsibilities and have committed to fulfilling them utilizing existing and available funding and staff resources. Parties will also seek additional funding and staff resources as needed to fulfill their obligations under this CA. While the participating entities have demonstrated their commitment to this effort by beginning work on several of the conservation measures, execution of this CA is essential to ensure the long term survival of the Blue Diamond cholla.

VIII. Duration of CA

The duration of this CA is for ten years following the date of the last signature. After ten years, parties to the agreement will determine if the CA should be extended. As discussed under Conservation Action K, the parties will meet annually, or when mutually determined necessary, to determine whether or not these actions are ensuring the survival of Blue Diamond cholla and whether new measures should be adopted or existing

measures intensified. The list of conservation measures in Table 1 will be reviewed and updated after five years. Modifications to this CA will be implemented by agreement of all parties to this plan.

IX. Modifications to the CA

Modifications to this CA may be proposed by any of the parties, and shall become effective with a signed amendment to this CA. Modifications will only be implemented with concurrence of all parties to the CA.

X. Termination Clause

This CA is intended to provide the framework for achieving long-term protection and survival of the Blue Diamond cholla. At the end of ten years, this CA will terminate, unless the parties agree that the need for conservation measures still exists. If conservation measures are still required to ensure the survival of the species after ten years, a new CA will be developed at that time. If any party decides that some portion of this CA cannot be carried out or desires to cancel the agreement, then that party must notify the other signatories in writing 30 days prior to such action. Within that time frame, the parties to the CA will meet to discuss alternatives to implementation of the CA.

XI. Funding

Nothing in this agreement shall be construed as obligating any party hereto in the expenditure of funds, or for the future payment of money in excess of appropriation authorized by law. Parties to this CA are committed to the successful implementation of the conservation measures identified herein and anticipate that necessary funding and staff resources will be available to meet the objectives of the CA. The BLM, FWS, and NDF have resident botanical staff that will assume the lead on ensuring that measures identified in this CA are sufficiently funded and that adequate staff time is available to meet the schedule identified in Table 1.

XII. National Environmental Policy Act (NEPA) Compliance

Signing of this CA is covered under authorities outlined in Section III above. NEPA compliance for surveys and monitoring in accordance with this CA should be satisfied under existing approved BLM land use and management plans. However, all conservation measures included within this CA will be reviewed prior to implementation for compliance with NEPA regulations, and all required NEPA compliance will be achieved, as determined necessary, prior to implementation of individual actions.

XIII. Signatures

U.S. DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT

BY _____

TITLE **Nevada State Director**

DATE _____

NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
NEVADA DIVISION OF FORESTRY

BY _____

TITLE **State Forester/Firewarden**

DATE _____

U.S. DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE

BY _____

TITLE **California-Nevada Operations Manager**

DATE _____

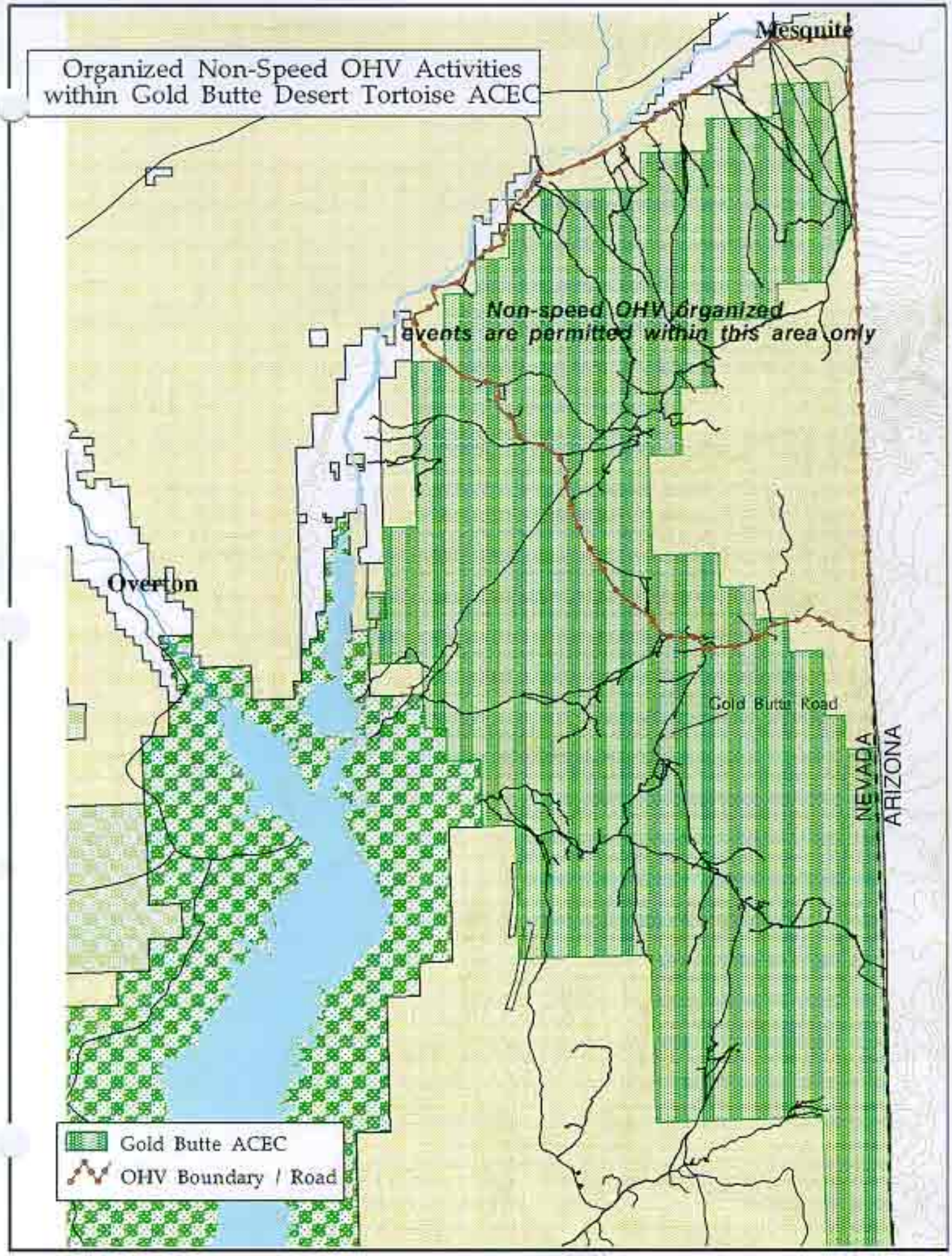
JAMES HARDIE GYPSUM COMPANY

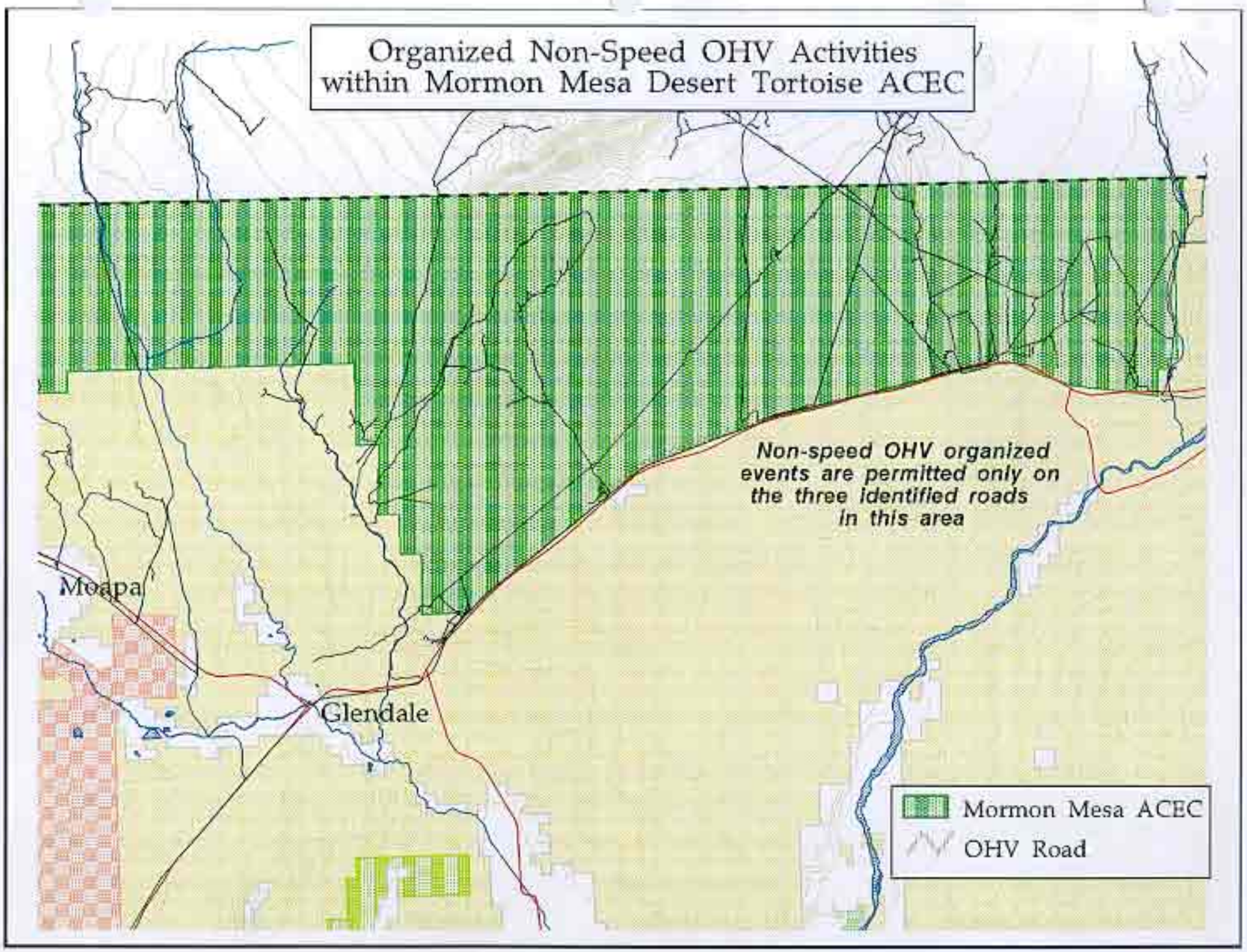
BY _____

TITLE **Senior Vice President of Manufacturing**

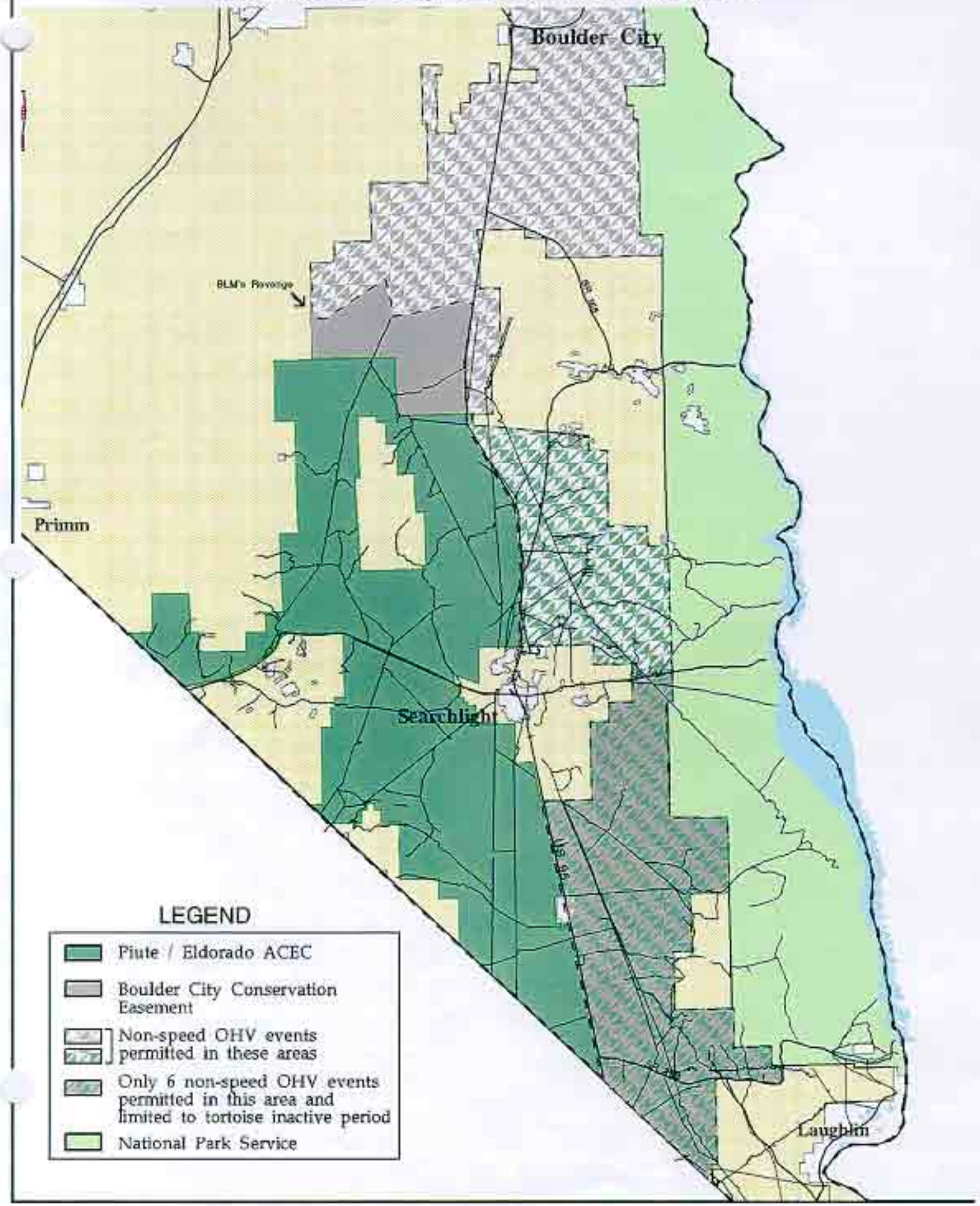
DATE _____

APPENDIX I


Organized Non-Speed OHV Activities within Gold Butte Desert Tortoise ACEC
Mesquite
Non-speed OHV organized events are permitted within this area only
Overton
Gold Butte Road
NEVADA
ARIZONA
Gold Butte ACEC
OHV Boundary / Road


Organized Non-Speed OHV Activities
within Mormon Mesa Desert Tortoise ACEC
Non-speed OHV organized events are permitted only on the three identified roads in this area
Moapa
Glendale
Mormon Mesa ACEC
OHV Road

Organized Non-Speed OHV Activities within Piute / Eldorado Desert Tortoise ACEC and Boulder City Conservation Easement



APPENDIX J

IMPLEMENTATION AGREEMENT

CLARK COUNTY

MULTIPLE SPECIES HABITAT CONSERVATION PLAN

CLARK COUNTY MULTIPLE SPECIES HABITAT CONSERVATION IMPLEMENTATION AGREEMENT

This Clark County Multiple Species Habitat Conservation Plan Implementation Agreement (Agreement) is made and entered into this ___ day of _____, 1999 by and between the United States Fish and Wildlife Service (Service), the United States Bureau of Land Management (BLM), the United States Forest Service (USFS), the United States National Park Service (NPS), Nellis Air Force Base (NAFB), the Nevada Division of Wildlife (NDOW), the Nevada Division of Forestry (NDF), the Nevada Division of State Parks (NDSP), the Nevada Division of Transportation (NDOT), Clark County, Nevada (County), and the cities of Las Vegas, North Las Vegas, Boulder City, Henderson and Mesquite (collectively, Cities). The County, the Cities and NDOT may hereinafter be referred to collectively as Applicants or Permittees.

1. RECITALS

1.01 HISTORICAL BACKGROUND:

A. In March of 1990, the Desert Tortoise was listed as a threatened species pursuant to the provisions of the Endangered Species Act (ESA). Pursuant to the provisions of Section 10(a)(1)(B) of the ESA, the County and the Cities, through a community based Steering Committee, later designated the Implementation and Monitoring Committee (IMC), prepared a Short Term Habitat Conservation Plan ("STHCP") and, on January 15, 1991, submitted it to the Service with a request that the Service issue a permit to allow Tortoises to be incidentally taken within certain locations within the County.

B. On July 24, 1991, the Service issued its permit ("PRT-756260") which allowed the incidental take of Tortoises pursuant to the terms of the STHCP. PRT-756260 terminated on or about August 1, 1995.

C. Immediately upon receipt of PRT-756260, the County and the Cities, through the IMC, began work to prepare a long term habitat conservation plan which would be the basis for a long term incidental take Permit for the Desert Tortoise. The plan was designated the Clark County Desert Conservation Plan (DCP).

D. On or about August 1, 1995, the DCP was approved and a new Section 10(a) permit was issued by the Service (PRT 801045) to allow the incidental take of Desert tortoises for a term of 30 years.

E. On or about May 1, 1996, the IMC began discussing the possibility of preparing another Habitat Conservation Plan which would cover the Desert tortoise as well as a broad range of species and all habitats located within Clark County. In August of 1996, after additional study, the County and the Cities authorized the preparation of the Clark County Multiple Species Habitat Conservation Plan, (MSHCP).

1.02 THE PROCESS. The IMC, the Applicants and each of the other Parties hereto have reviewed and approved the terms of the MSHCP. The MSHCP proposes a cooperative federal, state and local program of conservation for all ecosystems located within Clark County to benefit a broad range of species as set forth in the MSHCP. The MSHCP is the product of lengthy study, debate and negotiations among private development interests, mining, ranching and recreation interests, environmental and conservation groups as well as Federal, State and local governmental entities.

1.03 COMPREHENSIVE PLAN. The MSHCP is a comprehensive, long-term habitat conservation plan for the Covered Species which addresses multiple species needs and the preservation of the natural communities upon which the Covered Species rely. The MSHCP addresses the potential impacts of urban growth, natural habitat loss and endangerment to species and creates a plan to minimize and mitigate for the loss of Covered Species and their habitats due to the direct and indirect impacts of future development of both federal and nonfederal lands within the Plan Area to the maximum extent practicable.

1.04 CONDITIONS FOR PERMITS. The MSHCP establishes the conditions under which the Permittees, for the benefit of themselves and of public and private landowners within their jurisdictional boundaries will received from the Service certain long term permits and authorizations to allow the incidental taking of the Covered Species incidental to otherwise lawful activities and land uses.

1.05 UNLISTED SPECIES. In addition to dealing with Covered Species which are listed as Threatened or Endangered or Proposed for such listing, the Permits and authorizations sought by the

Applicants will address those Covered Species which are not presently listed or proposed for listing, even though the take of unlisted species is not prohibited. The purposes of treating such unlisted Covered Species the same as listed Covered Species include protecting such unlisted species and their habitat to prevent such species from ever being in danger of becoming extinct and providing certainty regarding how the subsequent listing of such species may affect future permitting and mitigation requirements. In addition, the preservation of natural habitats and wildlife will significantly enhance the quality of life in southern Nevada and preserve and set aside lands for the future use and enjoyment of its residents and visitors.

1.06 SUBMITTAL OF APPLICATION. On or about _____, the County, the Cities and NDOT submitted their application for an incidental take permit pursuant to the provisions of Section 10(a)(1)(B) of the ESA ("MSHCP Permit) to permit the incidental take of over ___ species as more particularly identified in the MSHCP (Covered Species). The MSHCP was included as a part of the application.

1.07 LEGAL REQUIREMENTS. In order to fulfill the requirements which will allow the Service to issue the MSHCP Permit, the MSHCP sets forth measures that are intended to assure that any take occurring will be incidental; that the impacts of the take will, to the maximum extent practicable be minimized and mitigated; that adequate funding for the provisions of the MSHCP will be provided; and that the take will not appreciably reduce the likelihood of the survival and recovery of the Covered Species in the wild. It also includes measures which have been suggested by the Service as being necessary or appropriate for purposes of the MSHCP.

1.08 FEDERAL LEGAL AUTHORITY. The Service inters into this Agreement pursuant to the ESA, the Fish and Wildlife Coordination Act (16 U.S.C. 661-666c), and the Fish and Wildlife Act of 1956 (16 U.S.C.742(f), et.seq.). Section 10(a)(1)(B) of the ESA (16 U.S.C.1539(a)(1)(B)), expressly authorizes the Service to issue a Section 10(a) Permit to allow the Incidental Take of species listed as threatened or endangered under the terms of the ESA. The legislative history of Section 10(a)(1)(B) clearly indicates that Congress also contemplated that the Service may, should and would approve Habitat Conservation Plans that protect unlisted species as if they were listed under the ESA, and that in doing so the Service would provide Incidental Take assurances for such unlisted species. Relevant excerpts from such legislative history includes the following:

> The Committee intends that the Secretary may utilize this provision [regarding habitat conservation plans] to approve conservation plans which provide long-term commitments regarding the conservation of listed as well as unlisted species and long-term assurances to the proponent of the conservation plan that the terms of the plan will be adhered to and that further mitigation requirements will only be imposed in accordance with the terms of the plan. In the event that an unlisted species addressed in an approved conservation plan is subsequently listed pursuant to the Act, no further mitigation requirements should be imposed if the conservation plan addressed the conservation of the species and its habitat as if the species were listed pursuant to the Act.
>
> It is also recognized that circumstances and information may change over time and that the original plan might need to be revised. To address this situation, the Committee expects that any plan approved for a long-term permit will contain a procedure by which the parties will deal with unforeseen circumstances. (H.R. Rep. No. 97-835, 97th Cong., 2d Session 30-31 (1982) (Conference Report on 1982 Amendments to the ESA)).

The Service routinely approves habitat conservation plans that address and provide coverage for both listed and unlisted species.

Regulations adopted by the Service to implement Section 10 (50 CFR 17.22 et.seq.) and the recently adopted "Assurances Rule" (50 CFR 17.2 and 17.22 et.seq; 63 FR 8859) are further expressions of the intent of the Service to implement the intent of Congress regarding both listed and unlisted species. Under the Assurances Rule, if HCPs protect identified unlisted species as if they were listed, the Service will not seek additional mitigation that requires the expenditure of money or land set asides from the plan proponents. The Assurances Policy also assures plan proponents that if an approved HCP is implemented as proposed, the Service will not seek additional land or financial compensation if "unforeseen" or "extraordinary" circumstances should later arise with respect o either listed or unlisted species.

The Solicitor's Office of the US Department of Interior has reviewed the Assurances Rule as described above and integrated into this Agreement and has determined that the Rule and its application to this Agreement and the MSHCP is authorized under the ESA, including the provisions and legislative history set forth hereinabove.

1.09 INCORPORATION OF DCP AND MSHCP. Relevant terms of the DCP have been incorporated into the terms of the MSHCP, and except as hereinafter provided, the MSHCP is intended to supersede and replace the terms of the DCP. The MSHCP and each of its terms are intended to be, and by this reference are, incorporated herein. In the event of any direct contradiction between the terms of the DCP and the MSHCP, the MSHCP shall control. In the event of any direct contradiction between the terms of the MSHCP and this Agreement, the terms of this Agreement shall control. In all other cases, the terms of this Agreement and the terms of the MSHCP shall be interpreted to be supplementary to each other. References to specific sections of the MSHCP herein indicate the sections of the MSHCP wherein a specific topic is discussed. However, the references are not intended to be exclusive, and a specific topic may be discussed in other sections of the MSHCP which have not been specifically referenced. All sections and provisions of the MSHCP shall be utilized to interpret the terms of this Agreement, whether or not specifically referenced herein.

1.10 COOPERATIVE EFFORT. In order that each of the legal requirements of the ESA are fulfilled, each of the Parties to this Agreement must perform certain specific tasks as more particularly set forth in the MSHCP. The MSHCP thus describes a cooperative Federal, State and local program of conservation for the habitats and species located within Clark County.

NOW THEREFORE, for and in consideration of the mutual covenants and conditions contained herein, the parties do hereby agree as follows:

2. PURPOSES

The general purpose of this Agreement and the MSHCP is to provide for the long-term reconciliation of development within the MSHCP Plan Area, as hereinafter set forth, with the conservation and protection of the Covered Species. In order to provide this reconciliation the specific purposes of this Agreement are:

2.01 ASSURE IMPLEMENTATION: To assure the implementation of each of the terms of the MSHCP; and,

2.02 CONTRACTUALLY BIND: To contractually bind each of the Parties to completely fulfill and faithfully perform the obligations, responsibilities and tasks assigned to it pursuant to the terms of the MSHCP, including without limitation, the financial commitments and undertakings committed to by the Applicants; and,

2.03 DESCRIBE REMEDIES AND RECOURSE: To describe remedies and recourse should any party fail to perform its obligations, responsibilities and tasks as set forth in this Agreement; and,

2.04 PROVIDE ASSURANCES TO THE APPLICANTS: To provide assurances to the Applicants and non-federal landowners participating in the MSHCP that:

A. Compliance with the terms of this Agreement and the MSHCP constitutes compliance with the provisions of the ESA and applicable and relevant laws of the State of Nevada; and,

B. Implementation of this Agreement and the MSHCP will adequately provide for the conservation and protection of the Covered Species and their habitat in the Plan Area; and,

C. As long as the terms of the MSHCP and the MSHCP Permit issued pursuant to it are fully

and faithfully performed, no additional land restrictions or financial compensation for the Covered Species will be required, without their written consent, in the event of unforeseen or extraordinary circumstances, as more particularly set forth hereinafter.

3. TERMS, DEFINITIONS AND ACRONYMS USED

3.01 Terms, definitions and acronyms utilized in the MSHCP and/or the ESA shall have the same meaning when utilized in this Agreement, except as specifically noted.

3.02 **Insert as 3.02, 3.03, etc... and following, any definitions which may be required. My view is that most definition sections of IA's are unnecessary, but we can certainly add as many as signatories want.**

4. TERM

4.01. STATED TERM. As further described in Section 2.4.1 of the MSHCP, this Agreement shall become effective on the date that the Service issues the MSHCP Permit requested in the MSHCP and shall remain in full force and effect for a period of thirty (30) years.

4.02. PERMANENCE OF CONSERVED HABITAT. Notwithstanding the stated term of this Agreement, the Parties agree and recognize that once species have been taken and habitats disturbed pursuant to the MSHCP, the take of species and habitat modification will be permanent. It is therefore the intention of the Parties that the provisions of the MSHCP and of this Agreement regarding the establishment and maintenance of habitat by the BLM, USFS, NPS, NDF, NAFB, NDOW, NDSP and the Service shall likewise, to the extent permitted by law, be permanent and extend beyond the term of this Agreement. Likewise, any funds remaining in the MSHCP Endowment Fund at the end of the Stated Term of the MSHCP shall continue to be expended solely and exclusively for the conservation of species and habitats.

5. MSHCP PLAN AREA

5.01. CLARK COUNTY: As further described in Section 2.3 and Section 2.4 of the MSHCP, the Plan Area includes all of Clark County and its cities, and the MSHCP Permit will allow the incidental take of Covered Species resulting from all otherwise lawful activities upon all nonfederally owned property located within that County and its cities.

5.02 NDOT: As further described in Section 2.3 and Section 2.4 of the MSHCP, the Plan Area also includes NDOT rights of way (including material sites) below 5,000 feet in elevation, south of the 38th parallel in Nye, Lincoln, Mineral and Esmeralda Counties, all of which are located within the State of Nevada. The MSHCP Permit allows NDOT to incidentally take Desert tortoises upon its rights of way within the Plan Area located outside of Clark County, but no other Covered Species except within Clark County.

6. SUSPENSION OF THE DCP AND PERMIT 801045

6.01. SUSPENSION: As specifically provided in Section 2.2.4.3 of the MSHCP, immediately upon the approval of the MSHCP and the issuance of the MSHCP permit, the terms of the DCP and Permit 801045 will be suspended; provided, however, that if for any reason the MSHCP permit is suspended, revoked or terminated, the terms of the DCP and Permit 801045 will immediately be reinstated and the parties shall thereafter again be bound by the terms of both the DCP and Permit 801045.

7. SPECIES

7.01 SPECIES REVIEWED AND ANALYZED: As further described in Section 2.4.2.4, Section 2.5, Section 2.6, Table 2-5 and Volumes II and III of the MSHCP, species reviewed and analyzed in the MSHCP are categorized as:

A. Covered Species, as set forth in Table 2-5 of the MSHCP, for which the MSHCP Permit will allow incidental take resulting from all otherwise lawful activities conducted within Clark County. Covered Species include species which are currently listed as well as species which are not currently listed. Covered Species which are not currently listed have been treated by the MSHCP as if they have been listed.

B. Evaluation Species, as set forth in Table 2-6 of the MSHCP, for which additional information is required or for which sufficient management prescriptions have been defined sufficiently to support an application for a MSHCP Permit pursuant to Section 10(a) of the ESA at the present time. The MSHCP provides a process to move species designated as Evaluation Species to the Covered Species list by acquiring additional data and information regarding those species and the identification of conservation measures which will allow coverage pursuant to Section 10(a).

C. Watch List Species, as set forth in Table 2-7 of the MSHCP, which are those species for which adequate information is not available to assess their current status or that are not considered to be at risk during the planning horizon the MSHCP. The MSHCP contemplates that as more information is gathered, Watch List species may be moved to the Evaluation Species List or the Covered Species List.

7.02. COVERED BUT CURRENTLY UNLISTED SPECIES: As further described in Section 2.11.2 of the MSHCP, in the event a Covered but currently unlisted species is listed in the future, the Service shall immediately, and without any further action on the part of the Applicants, provide the Applicants with a document reflecting coverage of such species pursuant to the terms of Section 10(a) of the ESA.

7.03 ADDITIONS TO COVERED SPECIES LIST: As further described in Section 2.11.3, in the event the Applicants wish to move a species from the Evaluation Species List to the Covered Species List and include it in the MSHCP Permit, it shall amend the MSHCP and request an amendment to the MSHCP Permit from the Service, which such amendment shall be supported by sufficient data and evidence to meet the requirements of a Section 10(a) Permit.

8. THREATS, STRESSORS AND CONSERVATION MEASURES

8.01 THREATS AND STRESSORS: As further described in Section 2.4.2.6, Section 2.5 and Volumes II and III of the MSHCP, the Parties agree and the Service finds that the MSHCP has adequately described known, reasonably foreseen or alleged threats and stressors which affect both species and their habitats within Clark County.

8.02 CONSERVATION MEASURES: As further described in Section 2.4.2.6, Section 2.8, and Volumes II and III of the MSHCP, the Parties agree and the Service finds that the MSHCP has adequately described known conservation measures which currently appear to adequately address the known, reasonably foreseen or alleged threats and stressors.

8.03 MODIFICATIONS AND CHANGED CIRCUMSTANCES: As further described in Section 2.8.2 and 2.10, the MSHCP contemplates that the list of threats and stressors as well as conservation measures adequate to deal with those threats and stressors may be modified from time to time as a result of the Adaptive Management Plan (AMP) process and Changed and Unforeseen Circumstances.

8.04 IMPLEMENTATION PLAN AND BUDGET PROCESS. As further described in Section 2.11.2, in the event, as a result of the AMP or additional information gathered by the IMC, it desires to modify the list of threats and stressors or modify the list of conservation measures, such proposed modifications shall be submitted to the Service and be processed as part of the Implementation Plan and Budget (IPB) process.

8.05 AGREEMENT AND FINDING; The parties agree and the Service, NDOW and NDF find that the threats and stressors (known or reasonably foreseeable) set forth in the MSHCP are those factors which adversely affect or likely could adversely affect the Covered Species and that the conservation measures set forth in Section 2.8 hereof fully meets and fulfills the requirements of the ESA and relevant laws of the state of Nevada with respect to the Covered Species and their respective habitats. **(I may want to add more here)**

9. MANAGEMENT AREAS

9.01. CATEGORIES: As further described in Section 2.4.2.7, Section 2.5 and Volumes II and III of the MSHCP, all lands within Clark County have been categorized as one of the following:

A. Intensively Managed Areas (IMA's) which are areas within the County in which management is oriented primarily toward actions that reduce or eliminate potential threats and stressors to species and habitats.

B. Less Intensively Managed Areas (LIMA's) which are areas within the County upon which management generally limits the range of uses allow to primarily recreational uses, and which augment the habitats located within IMA's, provide buffers between IMA's and areas of more intensive use, and provide corridors between IMA's.

C. Multiple Use Managed Areas (MUMA's) which are areas within the County upon human utilization may be intense, but which nevertheless continue to support significant areas of undisturbed habitat. MUMA's provide connectivity between populations of species in IMA's and LIMA's, provide additional habitat for species, provide buffer areas between IMA's and LIMA's and areas of more intensive use and provide connectivity between IMA's and LIMA's.

D. Unmanaged Areas (UMA's) which are areas on which human activities predominate and which incidentally may support populations of some species. All privately owned lands have been designated as UMA's.

9.02. AGREEMENT AND FINDING: The Parties agree and the Service finds that current management, as augmented by the minimization, mitigation and monitoring provisions of Section 2.8 of the MSHCP and this Agreement, within IMA's, LIMA's and MUMA's are sufficient to assure that the incidental take of the Covered Species will not appreciably reduce the likelihood of the survival and recovery of the Covered Species in the wild.

9.03 SIGNIFICANT MODIFICATIONS: Notwithstanding the provisions of Section 9.02 hereof, the Parties agree that in the event of any significant change in size or location of IMA's, LIMA's or MUMA's or a significant modification of management actions or activities permitted within those areas which are significantly different from those set forth in the MSHCP, significant adverse impacts upon habitats and Covered Species could occur which might significantly reduce the likelihood of the survival and recovery of one or more Covered Species in the wild. Any such change which has a significant adverse impact upon the likelihood of the survival and recovery of the species in the wild may be grounds for the suspension, termination or revocation of all or a portion of the MSHCP Permit pursuant to the provisions of Section 16.07 of this Agreement.

9.04 ACTIONS PRIOR TO MODIFICATION: State and Federal land managers agree that, prior to any significant change of size or location of IMA's, LIMA's or MUMA's or a significant modification of management actions or activities permitted within those areas, different from those set forth in the MSHCP and existing management plans adopted by the land managers, they shall consider the likely effects on the habitats and Covered Species and the MSHCP Permit, shall report to the IMC and the Service the exact nature and extent of such proposed modification and receive and consider input from the IMC and the Service.

9.05 SECTIONS 7 CONSIDERATIONS: The Service agrees that it shall consider the effects of any proposed modification upon the terms of the MSHCP Permit in any Section 7 consultation which may be instituted to consider such modification, and shall require such reasonable and prudent alternatives and measures as it shall consider necessary to avoid the suspension, termination or revocation of the MSHCP Permit.

9.06 REASONABLE AND PRUDENT ALTERNATIVES AND MEASURES: Costs associated with the implementation of any reasonable and prudent alternative or measure required as a result of any such modification shall be borne by the Federal action agency which instituted the Section 7 consultation and shall not be passed through or imposed upon any private person, firm or entity without the written consent of such private person, firm or entity.

10. EFFECTS OF INCIDENTAL TAKE ON COVERED SPECIES

10.01 EFFECTS: As more particularly set forth in Sections 2.3.2, 2.6,2.7, (add relevant EIS Sections) Table 2-5 and Volumes II and III, issuance of a Section 10(a) Permit and relevant permits from NDF and NDOW will allow the incidental take of Covered Species primarily as the result of the disturbance of up to 145,000 acres of nonfederal land within the Permit Area. However, measures to minimize mitigate and monitor as set forth in Section 2.8 will contribute to the recovery of listed species, reduce the likelihood of the necessity to list Covered Species which are currently unlisted and provide protection and conservation benefits to Evaluation and Watch List Species which share habitat with Covered Species.

10.02 AGREEMENT AND FINDING: The Parties agree and the Service finds that the incidental take of Covered Species associated with the disturbance of no more than 145,000 acres of nonfederally owned land within the Permit Area during the Stated Term of the MSHCP Permit will not appreciably reduce the likelihood of the survival and recovery of the Covered Species in the wild.

11. RESPONSIBILITIES OF THE PARTIES

11.01 GENERAL STATEMENT: In order to minimize, mitigate and monitor the impacts of incidental take, the Parties each agree that they shall undertake the tasks, responsibilities and obligations set forth hereinafter. The parties agree that while the specific obligations set forth hereinafter may remain in effect throughout the Stated Term of the MSHCP, funding for each specific measure is not guaranteed and may increase or decrease during each biennial period with the approval of the IMC, the Service and the BCC pursuant to the IPB process as more particularly set forth in Section 2.12 of the MSHCP and that additional and different obligations and conservation measures may be undertaken by the Parties and funded by Clark County as a result of the Adaptive Management Program (AMP) and IPB process.

11.02 THE COUNTY AND THE CITIES: The County and the Cities shall:

A. As more particularly provided in Section 2.8.2 and 2.8.3.10 of the MSHCP, establish an science based Adaptive Management Program (AMP).

B. As further described in Section 2.8.3.1 of the MSHCP, adopt and keep in effect ordinances which impose a $550 per acre development fee on all nonfederal lands within Clark County which are disturbed and which disturbance requires a permit issued by the County or the Cities. Such ordinances shall be in substantially the same form as adopted by Clark County in Chapter 28.46 of the Clark County Code.

C. As further described in Section 2.8.3.2 and Section 2.10 of the MSHCP, expend $2.05 million dollars annually ($4.1 million dollars biennially) on conservation measures for the Desert tortoise and other Covered Species and Evaluation Species approved by the IMC, the Service and the Clark County Board of County Commissioners (BCC) through and including June 30, 2005 and $1.750 million dollars annually ($3.5 million dollars biennially) during the remainder of the Stated Term, adjusted biennially to reflect cost of living adjustments, not to exceed 4% per annum, and credits for expenditures in excess of those required during earlier biennium periods.

D. As further described in Section 2.8.3.3 of the MSHCP, administer the MSHCP utilizing the IMC, a Program Administrator and staff at levels approved by the IMC, the Service and BCC.

E. As further described in Section 2.8.3.4 of the MSHCP, establish an active Public Information and Education program through its Public Information and Education Committee (PIE).

F. As further described in Section 2.8.3.5 of the MSHCP, make funds available to purchase and exchange grazing allotments and other interests in real property and water with the advice and consent of the IMC, the Service and the BCC.

G. As further described in Section 2.8.3.6 of the MSHCP, make funds available to maintain and manage grazing allotments, land and water rights which it has acquired.

H. As further described in Section 2.8.3.7 of the MSHCP, continue their program of installing linear barriers along selected and prioritized highways and roads within Clark County to protect Desert tortoises and other species from the effects of roads and highways.

I. As further described in Section 2.8.3.8 of the MSHCP, continue their program of translocating Desert tortoises.

J. Continue their program of participating in the Las Vegas Bearpoppy Memorandum of Understanding, and in particular, assist in setting aside Bearpoppy habitat located at the North Las Vegas Airport, the North Well Field owned by the Southern Nevada Water Authority and approximately ____ acres of habitat located at Nellis Air Force Base.

K. As further described in Section 2.8.3.9 of the MSHCP, participate in and provide funding assistance to local habitat restoration and enhancement projects, with the advice and consent of the IMC, the Service and the BCC.

L. As further described in Section 2.8.3.2 of the MSHCP, augment but not replace federal land manager budgets to allow those federal managers to more fully or quickly implement conservation measures set forth in Sections 2.8.4 through 2.8.9 of the MSHCP.

11.03 UNITED STATES FOREST SERVICE: The USFS shall:

A. As further described in Section 2.8.4.1 of the MSHCP, institute and/or continue a Public Information and Education program in cooperation with the PIE.

B. As further described in Section 2.8.4.2 of the MSHCP, institute and/ or continue a research program dealing with the habitats and species of Clark County.

C. As further described in Section 2.8.4.3 of the MSHCP, institute and/or continue a program to inventory habitats and species within its jurisdiction within Clark County.

D. As further described in Section 2.8.4.4 of the MSHCP, institute and/or continue a program to monitor habitats and species within its jurisdiction within Clark County.

E. As further described in Section 2.8.4.5 of the MSHCP, institute and/or continue a program to protect habitats and species within its jurisdiction within Clark County.

F. As further described in Section 2.8.4.6 of the MSHCP, institute and/or continue a program to restore and enhance habitats within its jurisdiction within Clark County.

G. As further described in Section 2.8.4.7 of the MSHCP, institute and/or continue a land use policies and actions to protect habitats and species within its jurisdiction within Clark County.

11.04 UNITED STATES FISH AND WILDLIFE SERVICE: The Service shall:

A. As further described in Section 2.8.5.1 of the MSHCP, institute and/or continue a Public Information and Education program in cooperation with the PIE.

B. As further described in Section 2.8.5.2 of the MSHCP, institute and/ or continue a research program dealing with the habitats and species of Clark County.

C. As further described in Section 2.8.5.3 of the MSHCP, institute and/or continue a program to inventory habitats and species within its jurisdiction within Clark County.

D. As further described in Section 2.8.5.4 of the MSHCP, institute and/or continue a program to monitor habitats and species within its jurisdiction within Clark County.

E. As further described in Section 2.8.5.5 of the MSHCP, institute and/or continue a program to protect habitats and species within its jurisdiction within Clark County.

F. As further described in Section 2.10.9.2 of the MSHCP, utilize and take into consideration the terms of the MSHCP, the AMP and IPB in any biological opinion or incidental take statement issued by it as required by Section 7 of the ESA.

G. As further described in Section 2.10.6.3(???), inform the IMC, in writing, of any listing package, listing proposal affecting any Covered (but currently unlisted), Evaluation or Watch List Species which it considers may be in need of specific conservations measures in order to prevent listing in the future. In addition, to the extent permitted by law, the Service will consider the MSHCP, the AMP and the IPB process and conservation actions undertaken pursuant thereto prior to listing or proposing to list any species within the County. In the event of the listing of any Evaluation or Watch List Species, shall provide a written explanation of why conservation measures undertaken within the County have been insufficient to avoid the listing, and what specific measure it believes must be undertaken before such species may be included as a Covered Species.

H. At anytime it considers the designation of Critical Habitat or the preparation of a Recovery Plan for any species located within Clark County, it shall immediately notify the IMC of its intention, and shall enter into a dialogue with the County and the IMC regarding the proposed designation or preparation. To the extent permitted by law, it shall include a representative or representatives of the IMC on any Recovery Team appointed to prepare a Recovery Plan and shall present any proposed designation of Critical Habitat to the IMC prior to publication thereof.

11.05. THE UNITED STATES BUREAU OF LAND MANAGEMENT: The BLM shall:

A. As further described in Section 2.8.6.1 of the MSHCP, institute and/or continue a Public Information and Education program in cooperation with the PIE.

B. As further described in Section 2.8.6.2 of the MSHCP, institute and/ or continue a research program dealing with the habitats and species of Clark County.

C. As further described in Section 2.8.6.3 of the MSHCP, institute and/or continue a program to inventory habitats and species within its jurisdiction within Clark County.

D. As further described in Section 2.8.6.4 of the MSHCP, institute and/or continue a program to monitor habitats and species within its jurisdiction within Clark County.

E. As further described in Section 2.8.6.5 of the MSHCP, institute and/or continue a program to protect habitats and species within its jurisdiction within Clark County.

F. As further described in Section 2.8.6.6 of the MSHCP, institute and/or continue a program to restore and enhance habitats within its jurisdiction within Clark County.

G. As further described in Section 2.8.6.7 of the MSHCP, institute and/or continue a land use policies and actions to protect habitats and species within its jurisdiction within Clark County.

H. As further described in Section 2.8.6.6 of the MSHCP, institute and/or continue a program to restore and enhance habitats within its jurisdiction within Clark County.

I. As further described in Section 2.8.6.7 of the MSHCP, institute and/or continue a land use policies and actions to protect habitats and species within its jurisdiction within Clark County.

J. As further described in Section 2.8.6.????, consider the adoption of a rural roads and OHV policy consistent with the proposal set forth in that section.

11.06 THE UNITED STATES NATIONAL PARK SERVICE: The NPS shall:

A. As further described in Section 2.8.7.1 of the MSHCP, institute and/or continue a Public Information and Education program in cooperation with the PIE.

B. As further described in Section 2.8.7.2 of the MSHCP, institute and/ or continue a research program dealing with the habitats and species of Clark County.

C. As further described in Section 2.8.7.3 of the MSHCP, institute and/or continue a program to inventory habitats and species within its jurisdiction within Clark County.

D. As further described in Section 2.8.7.4 of the MSHCP, institute and/or continue a program to monitor habitats and species within its jurisdiction within Clark County.

E. As further described in Section 2.8.7.5 of the MSHCP, institute and/or continue a program to protect habitats and species within its jurisdiction within Clark County.

F. As further described in Section 2.8.7.6 of the MSHCP, institute and/or continue a program to restore and enhance habitats within its jurisdiction within Clark County.

G. As further described in Section 2.8.7.7 of the MSHCP, institute and/or continue a land use policies and actions to protect habitats and species within its jurisdiction within Clark County.

11.07 THE UNITED STATES AIR FORCE: NAFB shall:

A. As further described in Section 2.8.8.1 of the MSHCP, institute and/or continue a Public Information and Education program in cooperation with the PIE.

B. As further described in Section 2.8.8.2 of the MSHCP, institute and/ or continue a research program dealing with the habitats and species of Clark County.

C. As further described in Section 2.8.8.3 of the MSHCP, institute and/or continue a program to inventory habitats and species within its jurisdiction within Clark County.

D. As further described in Section 2.8.8.4 of the MSHCP, institute and/or continue a program to monitor habitats and species within its jurisdiction within Clark County.

E. As further described in Section 2.8.8.5 of the MSHCP, institute and/or continue a program to protect habitats and species within its jurisdiction within Clark County.

F. As further described in Section 2.8.8.6 of the MSHCP, institute and/or continue a program to

restore and enhance habitats within its jurisdiction within Clark County.

G. As further described in Section 2.8.8.7 of the MSHCP, institute and/or continue a land use policies and actions to protect habitats and species within its jurisdiction within Clark County.

11.08 THE STATE OF NEVADA: THE NEVADA DIVISION OF WILDLIFE: NDOW shall:

A. As further described in Section 2.8.9.1(a) of the MSHCP, institute and/or continue a Public Information and Education program in cooperation with the PIE.

B. As further described in Section 2.8.9.1(b) of the MSHCP, institute and/ or continue a research program dealing with the habitats and species of Clark County.

C. As further described in Section 2.8.9.1(d) of the MSHCP, institute and/or continue a program to inventory habitats and species within its jurisdiction within Clark County.

D. As further described in Section 2.8.9.1© of the MSHCP, institute and/or continue a program to monitor habitats and species within its jurisdiction within Clark County.

E. As further described in Section 2.8.9.1(e) of the MSHCP, institute and/or continue a program to protect habitats and species within its jurisdiction within Clark County.

F. As further described in Section 2.8.9.1(f) of the MSHCP, institute and/or continue a program to restore and enhance habitats within its jurisdiction within Clark County.

G. As further described in Section 2.8.9.1(g) of the MSHCP, institute and/or continue a land use policies and actions to protect habitats and species within its jurisdiction within Clark County.

11.09. THE STATE OF NEVADA: THE NEVADA DIVISION OF TRANSPORTATION: NDOT shall:

A. As further described in Section 2.8.9.2(a) of the MSHCP, institute and/or continue a Public Information and Education program in cooperation with the PIE.

B. As further described in Section 2.8.9.2(b) of the MSHCP, institute and/ or continue a research program dealing with the habitats and species of Clark County.

C. As further described in Section 2.8.9.2(c) of the MSHCP, institute and/or continue a program to inventory habitats and species within its jurisdiction within Clark County.

D. As further described in Section 2.8.9.2(d) of the MSHCP, institute and/or continue a program to monitor habitats and species within its jurisdiction within Clark County.

E. As further described in Section 2.8.9.2(e) of the MSHCP, institute and/or continue a program to protect habitats and species within its jurisdiction within Clark County.

F. As further described in Section 2.8.9.2(f) of the MSHCP, institute and/or continue a program to restore and enhance habitats within its jurisdiction within Clark County.

G. As further described in Section 2.8.9.2(g) of the MSHCP, institute and/or continue a land use policies and actions to protect habitats and species within its jurisdiction within Clark County.

H. As further described in Section 2.8.3.1, pay a fee in the amount of $550 per acre of land it disturbs outside of IMA's and LIMA's.

11.10. THE STATE OF NEVADA: THE NEVADA DIVISION OF STATE PARKS: NDSP shall:

A. As further described in Section 2.8.9.3(a) of the MSHCP, institute and/or continue a Public Information and Education program in cooperation with the PIE.

B. As further described in Section 2.8.9.3(b) of the MSHCP, institute and/or continue a program to protect habitats and species within its jurisdiction within Clark County.

C. As further described in Section 2.8.9.1(c) of the MSHCP, institute and/or continue a program to restore and enhance habitats within its jurisdiction within Clark County.

D. As further described in Section 2.8.9.1(d) of the MSHCP, institute and/or continue a land use policies and actions to protect habitats and species within its jurisdiction within Clark County.

11.11 THE STATE OF NEVADA: THE NEVADA DIVISION OF FORESTRY: NDF shall:

A. As further described in Section 2.8.9.4(a) of the MSHCP, institute and/or continue a program to protect habitats and species within its jurisdiction within Clark County.

B. Issue its Master Permit to Clark County to allow individual owners of private property the right to incidentally take (List all protected species which are on our Covered Species List) upon compliance with the terms of the MSHCP.

11.12 ADDITIONAL STATE AND FEDERAL AGENCY COMMITMENTS: As further described in Section 2.10.6.1 of the MSHCP, each State and Federal Agency which is a party to this Agreement shall:

A. Include in its annual budget request adequate dedicated and earmarked funding to allow the agency to fully operate, manage, maintain and monitor its lands pursuant to the terms of this Agreement and the MSHCP, and it allow it to fulfill its obligations to protect ecosystems, habitats and species consistent with statutory obligations imposed by Congress and the Legislature and to actively cooperate with and provide technical assistance to the IMC.

B. Not allow or use funds received from the MSHCP to be substituted for funds which it would otherwise receive from the State or Federal budget process and shall use MSHCP funds solely to augment, and not replace, its appropriated funds.

C. Not move or redirect its own funds from budget categories established to implement conservation measures, plans or policies to other budget categories.

D. Not take into account any MSHCP funds paid or expected to be paid in allocating available funds among its various offices and departments.

E. Provide annual reports to the IMC and the Service of its allocation of appropriated funds to conservation measures and personnel within Clark County and the State of Nevada, in order that it may be determined whether each such Agency is in compliance with the provisions of subparagraphs A through D hereof.

F. Fully cooperate with and participate in the AMP process undertaken by Clark County pursuant to the provisions of the MSHCP. Cooperation and participation shall include, without limitation, meeting with AMP contractors, providing access to lands managed by the agency, providing data and information which it has accumulated, providing future data in a format mutually agreed upon by Clark County and the agency to allow a database to be established through the AMP process which will be available to the agency, all parties to this Agreement and the public and seriously considering evidence and suggestions for modifications to management policies and actions made by the AMP.

11.13 AGREEMENT AND FINDING: The Parties agree and the Service finds that the measures set forth in Sections 11.1 through 11.12 hereof minimize and mitigate the effects of incidental take of Covered Species to the maximum extent practicable.

12. FINANCIAL ASSURANCES

12.01 THE COUNTY AND THE CITIES.

A. Mitigation Fee Ordinance. As further described in Sections _____ and _____, shall keep in full force and effect, during the term of this Agreement, a Multiple Species Mitigation Fee Ordinance in substantially the same form as set forth in the Clark County Code, Title 28, Chapter 46, ("Mitigation Fee Ordinance") which shall impose a fee of five hundred fifty ($550) dollars per acre for each acre of land proposed to be disturbed within its jurisdiction, and for which it otherwise issues permits. Funds derived from the imposition of this mitigation fee shall be utilized to fund each of the provisions of the MSHCP.

B. Delivery to County. As further described in Section ____ of the MSHCP, shall cause all mitigation fees collected by each City and the County to be delivered to the County on a monthly basis pursuant to the terms of an Interlocal Agreement, which fees and interest thereon shall be expended by the County to fulfill the terms of the MSHCP.

C. Application to All Land Disturbances. As further described in Section 2.9.2 of the MSHCP and the Mitigation Fee Ordinance, shall cause the Mitigation Fee Ordinance to apply to all instances of land disturbance occurring upon land located within Clark County and for which the Cities and the County otherwise issue permits. However, land disturbance by any local government, agency or department, the State of Nevada or its departments, which are not signatory to this Agreement and which do not require local grading or building permits or who for any other reason are not subject to regulation by the County or the Cities shall not be covered by the MSHCP, the MSHCP Permit, or this Agreement unless the entity or agency proposing to thus disturb the land has entered into an interlocal agreement or cooperative agreement permitted by Nevada law with the County, wherein such local government, agency or department agrees to be bound by the provisions of this Agreement, the MSHCP and the MSHCP Permit.

D. Credit For Section 7 Payments. Shall cause its Mitigation Fee Ordinance to provide that in the event a landowner has previously paid mitigation fees to a Federal Land Manager or to any other entity in Clark County as designated by the Service as mitigation for effects upon covered species Tortoises pursuant to Section 7, such landowner shall receive a credit in the amount of the fees actually paid, but in no event shall the credit exceed the amount of the mitigation fee imposed by the Mitigation Fee Ordinance. No

credit shall be given for non-monetary mitigation which may be required pursuant any Biological Opinion issued by the Service.

E. Additional Funding: As further described in Section 2.9.3 of the MSHCP, shall seek additional funding from private, local, state and federal sources, including but not limited to funds generated from the Southern Nevada Public Lands Management Act (PLMA). The County shall, in its IPB report and budget request, report to the Service and the IMC, the amount all funds generated from additional funding sources, including but not limited to PLMA fund received and the utilization of those funds during the previous two year period.

F. Endowment Fund. Shall continue to maintain the Clark County Multiple Species Habitat Conservation Plan Endowment Fund ("Endowment Fund") which Clark County shall administer and invest in accordance with the laws of the State of Nevada and make disbursements consistent with approved Biennial Implementation Plan and Budget (IPB), as more particularly set forth in Section 2.12.1 of the MSHCP. The following funds shall be retained or deposited into the Endowment Fund:

1. All mitigation fees collected pursuant to the DCP, less the amount of expenditures paid to date.
2. All mitigation fees collected pursuant to the terms of the MSHCP, including payments from NDOT.
3. All interest and earnings which accrue as a result of the investment of the Endowment Fund.
4. All additional funds received from local, state or federal sources.

12.02 ALL STATE AGENCIES:

A. Section 6 Funds. Shall actively apply for and seek funds from the United States of America available pursuant to the provisions of Section 6 of the ESA, to be utilized to foster, promote and facilitate implementation of the terms and goals of the MSHCP.

B. Budget Requests. Shall include in their annual budget request adequate dedicated and earmarked funding to allow each of them to fully operate, manage, maintain and monitor the lands administered by them within Clark County pursuant to the terms of the MSHCP, to fulfill their obligations to protect habitats and species consistent with statutory obligations imposed by law and to actively participate on the IMC. The Parties specifically agree that funds collected by Clark County pursuant to the terms of the MSHCP and paid to a state agency are not intended to be substituted for monies which would otherwise be allocated to the state agencies to fulfill statutory obligations to protect the Covered Species, but are intended to supplement those funds.

12.03 ALL FEDERAL AGENCIES:

A. Budget Requests: Shall include in their annual federal budget request adequate dedicated and earmarked funding to allow each of them to fully operate, manage, maintain and monitor the lands administered by them within Clark county pursuant to the terms of the MSHCP, to fulfill their obligations to protect habitats and species consistent with statutory obligations imposed by law and to actively participate on the IMC. The Parties specifically agree that funds collected by Clark County pursuant to the terms of the MSHCP and paid to a state agency are not intended to be substituted for monies which would otherwise be allocated to the state agencies to fulfill statutory obligations to protect the Covered Species, but are intended to supplement those funds.

B. Southern Nevada Public Lands Management Act (PLMA) Funds: Shall involve the County and the IMC in discussions regarding the expenditure of funds generated by the PLMA. Federal Agencies receiving funds generated as a result of the PLMA shall, in their IPB report and budget request, report to the Service and the IMC, the amount of PLMA funds received and the utilization of those funds during the previous two year period. To the extent such agency participates in or is the beneficiary of funds generated by PLMA, it shall, to the maximum extent practicable and without violating the spirit or intent of the PLMA, utilize such funds in a manner which assists in the goals and objectives of the MSHCP and shall coordinate the utilization of such funds with the Service and the IMC to achieve those goals and objectives.

12.04 THE SERVICE:

A. Section 7 Expenditures. Shall coordinate and cooperate with the IMC with respect to the expenditure of mitigation fees paid as a result of authorization of incidental take of Covered Species pursuant to Section 7 of the ESA in order to avoid duplication of effort and to ensure the efficient utilization of those funds to achieve the goals and objectives of the MSHCP.

12.05 AGREEMENT AND FINDING: The Parties agree and the Service finds that the provisions set forth in Sections 7.01 through Section 7.04 ensure that adequate funding for the MSHCP will be provided.

13. CHANGED CIRCUMSTANCES AND UNFORESEEN CIRCUMSTANCES

13.01 DEFINITIONS:

A. The terms “Changed Circumstances” and “Unforeseen Circumstances” means Changed or Unforeseen Circumstances as defined in the Habitat Conservation Plan Assurances ("No Surprises") Rule promulgated by the Service. (Federal Register 63 (35), February 23, 1998). Any modification of circumstances not reviewed and analyzed in the MSHCP as a Changed Circumstance (including reasonably foreseen Threats and Stressors as set forth in Volumes II and III of the MSHCP) shall be considered to be an Unforeseen Circumstance.

B. As more particularly set forth in Section 2.8.2 of the MSHCP, the term "Adaptive Management Plan" (AMP) shall mean the scientifically based flexible and iterative approach to long-term management of biotic resources that is directed over time by the results of ongoing monitoring activities and other information. Biological management techniques and specific objects will be regularly evaluated in light of monitoring results and other new information. These periodic evaluations will be used over time to adapt both the management objectives and techniques to better achieve overall management goals resulting in the conservation of both habitats and species.

13.02. CHANGED CIRCUMSTANCES: As further described in Section 2.10.5 of the MSHCP, upon the occurrence of any Changed Circumstance, including the occurrence of any reasonably foreseeable Threat or Stressor set forth in Volumes II and III of the MSHCP, Clark County and the appropriate state and federal agencies will conduct an expedited analysis of the potential effects of the Changed Circumstances for the purpose of development of appropriate management responses for the species, habitats or key areas impacted by any such Changed Circumstances. If additional conservation and mitigation measures are deemed necessary to respond to Changed Circumstances, the appropriate local, state or federal party to this Agreement will be expected to implement the measures specified in the MSHCP, but only those measures and no others, and in any event, within the financial constraints and financial assurances set forth in the MSHCP.

13.03 UNFORESEEN CIRCUMSTANCES:

A. As further described in Section 2.10.3 of the MSHCP, upon any preliminary determination by the Service that an Unforeseen Circumstance has occurred, it shall immediately provide written notice to the Applicants and the IMC of its preliminary determination; shall give each Applicant and the IMC the opportunity to submit information to the Service and the IMC regarding the determination; shall participate in any public hearing or hearings established and conducted by the IMC regarding the alleged Unforeseen Circumstance; shall have the burden of establishing that an Unforeseen Circumstance has occurred; and, shall make written findings which are clearly documented and based upon reliable peer reviewed technical information regarding the status and habitat requirements of the species involved in the Unforeseen Circumstance, which findings shall be in writing and immediately transmitted to the IMC.

B. As further described in Section 2.10.7 of the MSHCP, if, at the conclusion of the process described in subparagraph A hereof, the Service determines that an Unforeseen Circumstance has occurred, and that additional conservation measures are required to address such circumstances which are not contemplated or capable of implementation by the AMP and other provisions of the MSHCP, and provided that the Applicants have fully complied with the terms of the MSHCP, any proposed additional conservation measures shall fit, to the maximum extent possible, within the terms of the MSHCP and its AMP. Additional conservation measures shall not involve the payment of additional compensation by the Applicants or private landowners or apply to parcels of land where incidental take is permitted pursuant to the provisions of the MSHCP and this Agreement.

C. Prior to undertaking or attempting to impose any action or conservation measure, it shall consider all practical alternative to the proposed conservation measures, including but not limited to those set forth **in Section 3.e** (spell these out) of the DCP and adapt only that action or conservation measure which would have the lease effect upon the economy and lifestyle of the residents of Clark County while at the same time addressing the Unforeseen Circumstance and the survival and recovery of the affected species and its habitat. The purpose of this provision is to recognize that Congress intended, even in the event of unforeseen and extraordinary circumstances that additional mitigation requirement, even if undertaken by federal agencies should not adversely impact a Section 10 Permittee or private landowner which has fully

implemented the requirements undertaken by it pursuant to an approved plan, such as the MSHCP.

D. Clark County agrees that in the event of Unforeseen Circumstances, it shall cooperate with and assist the federal government, within the budget and scope of the MSHCP, to deal with such circumstances.

13.04 The Parties agree and the Service finds that the provisions of this Section 13, adequately define and provide for Changed and Unforeseen Circumstances.

14. CLARIFICATIONS, MINOR ADMINISTRATIVE AMENDMENTS AND AMENDMENTS

14.01 Clarifications. As more particularly set forth in Section 2.11.1 of the MSHCP, Clarifications are written understandings between the Service and Clark County regarding administration of the MSHCP process and to add specificity to the meaning and intent of language contained in the MSHCP, this Agreement and the MSHCP Permit (together, Plan Documents). Clarifications may not change the provisions of any of those documents but merely clarify and make more precise the mutual understanding of the Service and Clark County regarding those provisions.

14.02 Minor Administrative Amendments. As more particularly set forth in Section 2.11.1 of the MSHCP, Minor Administrative Amendments (MAA) to the MSHCP and this Agreement are amendments which make no substantive changes to any of the provisions of the Plan Documents, and do not require an amendment to the MSHCP Permit, but whch may be necessary or convenient, over time, to more fully represent the overall intent of Clark County and the Service and facilitate the implementation of the MSHCP.

14.03 Procedure for Clarifications and Minor Administrative Amendments. A request for a Clarification shall be in writing and may be instituted by either the Service or the IMC. Upon receipt, a response shall be provided within 30 days by the recipient. Upon agreement, the Clarification shall become

effective immediately. MMA's to the MSHCP may only be initiated by the IMC and an application therefor shall be in writing and describe the proposed amendment, an explanation of why the amendment is necessary or desireable and an explanation of why the IMC believes the effects of the proposal are not significantly different from those described in the original MSHCP. The Service shall respond to the request within 30 days after receipt and if they concur shall authorize the MMA. Upon approval by the Service, the MMA shall become effective immediately.

14.04 Amendments. As more particularly set forth in Section 2.11.3 of the MSHCP, and except as provided in Sections 14.01 through 14.04 of this Agreement, none of the Plan Documents may be amended or modified in any way without the written approval of all signatories to this Agreement, including without limitation, the Service and the BCC. All amendments shall be processed in accordance with the provisoins of the ESA and regulations at 50 CFR Parts 13 & 17 and shall be subject to appropriate environmental review pursuant to the provisions of NEPA.

15. IMPLEMENTATION OF THE MSHCP

15.01 MINIMIZATION, MITIGATION AND MONITORING. Each of the Parties to this Agreement has committed to undertake and shall be responsible for the specific minimization, mitigation, monitoring and funding responsibilities pursuant to the provisions hereof and Sections 2.8 and 2.9 of the MSHCP.

15.02 OVERALL ADMINISTRATION, PLANNING, BUDGETS AND REPORTING. Clark County shall be responsible of the overall administration, planning budgeting and reporting process, with the cooperation of the Parties to this Agreement as more particularly set forth in Section 2.12 of the MSHCP.

16. REMEDIES AND ENFORCEMENT

16.01 REMEDIES IN GENERAL. Except as set forth hereinafter, each of the Parties hereto shall have all of the remedies otherwise available in equity (including specific performance and injunctive relief) and at law to enforce the terms of this Agreement and the MSHCP Permit and to seek remedies and compensation for any breach hereof, consistent with and subject to the provions of the following sections.

16.02 NO MONETARY DAMAGES: No party shall be liable in monetary to any party or other person for any breach of this Agreement, any performance or failure to perform a mandatory or discretionary obligation imposed by this Agreement or any other cause of action arising from this Agreement. Notwithstanding the foregoing:

A. Retain Liability. All parties shall retain whatever liability they would possess for their present and future acts or failure to act without the existence of this Agreement.

B. Land Owner Liability. All parties shall retain whatever liability they possess as owners of interests in land.

16.03 RESPONSIBILITY OF THE UNITED STATES; Nothing herein contained is intended to limit the authority or responsibility of the United States government to invoke the penalties or otherwise fulfill its responsibilities under the ESA.

16.04 INJUNCTIVE AND TEMPORARY RELIEF. The Parties acknowledge that the Covered Species are unique and that the loss thereof would result in irreparable damage to the environment and that therefore injunctive and temporary relief may be appropriate in certain instances involving a breach of this Agreement.

16.05 AUTHORITY OF COUNTY AND CITIES: The Cities and County shall have the right to revoke, terminate or suspend the right of any landowner to enjoy or have the benefit, right or privileges under the

MSHCP Permit by terminating or suspending subpermits or building, grading or surface mining permits or development approvals which allow the disturbance of land in the event the mitigation fee has not been paid or in the event any other term and condition of this agreement, the MSHCP or the MSHCP Permit have not been fulfilled. In the event any City or County shall terminate or suspend any subpermit, it shall promptly notify the Service, NDOW and NDF, in writing, of such termination or suspension and shall set forth in writing the basis for such termination or suspension.

16.06 SEVERABILITY. The violation of the MSHCP Permit by a landowner or by any Permittee with respect to any one or more particular parcels of land or portions thereof within the jurisdiction of any such Permittee shall not adversely affect or be attributed to nor shall it result in a loss or diminution of any right, privilege or benefit hereunder of any other Permittee or landowner.

16.07 LONG TERM PERMIT SUSPENSION, REVOCATION OR TERMINATION: The Section 10 (a) Permit shall not be suspended or revoked except in conformance with the provisions of 50 CFR 13.27 through 13.29, 1994, as the same exists as of the date hereof.

16.08 LIMITATIONS AND EXTENT OF ENFORCEABILITY:

A. It is acknowledged that the purpose of this Agreement is to set forth the obligations and rights of the Parties hereto with respect to the MSHCP and to provide for the conservation of the Covered Species and the minimization, mitigation and compensatory measures required in connection with incidental taking of the Covered Species in the course of otherwise lawful activities within Clark County. Accordingly, except as otherwise required by law, no further minimization, mitigation or compensation for the conservation of the Covered Species will be required by any party hereto or the owner of any non-Federally owned land within Clark County.

B. In the event of unforeseen or extraordinary circumstances with regard to any Covered Species, no additional land restrictions or financial compensation shall be required from the County, the Cities, or any non-Federal land owner, without their written consent.

16.09 LAND USE REGULATIONS. Except as otherwise specifically provided herein, nothing herein contained shall be deemed to limit the power of the Cities and the County to regulate the use of lands within their respective jurisdictions subject to such other limitations as may apply to such power under the Constitution and laws of the United States and the State of Nevada.

16.10 SECTION 7: Except as specifically provided herein, nothing in this Agreement is intended to apply to any activity that is governed by the provisions of Section 7 of the ESA. Notwithstanding the foregoing, the Service shall cause minimization and mitigation measures that result from authorization of incidental take pursuant to Section 7 of the ESA ("Section 7") to be consistent with the minimization and mitigation measures required herein; provided, however that nothing herein contained is intended to prohibit or proscribe the Service from requiring minimization and mitigation in excess of that provided for herein should the circumstances so warrant. For example only, in the event NDOT proposes new or expanded roads within DWMAs, it is anticipated that Section 7 requirements may substantially differ from the minimization and mitigation requirements set forth herein.

17. FINDINGS AND ISSUANCE OF PERMITS

17.01 FINDINGS. The Service has found and determined that the MSHCP, as implemented by the provisions of this Agreement meets the requirements for a habitat conservation plan for purposes of Section 10(a) of the ESA and specifically has found and determined:

A. The taking of Covered Species as a result of the activities described in the MSHCP will be incidental to an otherwise lawful activity.

B. The minimization and mitigation measures of the MSHCP, to the maximum extent practicable, minimize and mitigate the impacts of the taking of the Covered Species.

C. This Agreement assures the funding required to implement the minimization and mitigation measures specified in Section 2.8 of the MSHCP.

D. This Agreement and the MSHCP provide adequate procedures for addressing Changed and Unforeseen Circumstances.

E. The incidental take of Covered Species, as contemplated in the MSHCP and as provided in this Agreement will not appreciably reduce the likelihood of the survival and recovery of those species in the wild.

F. All measures required by the Service as necessary or appropriate for purposes of the MSHCP and the Section 10(a) Permit have been provided for in the MSHCP as implemented by this Agreement.

G. The Service has determined that no assurances other than those set forth in the MSHCP and this Agreement are necessary to ensure that the MSHCP and this Agreement will be implemented.

H. If additional mitigation is required in order to meet ESA standards in the event of Unforeseen Circumstances, the Service has the authority under federal law and regulations, including Sections 5, 6 and 10 of the ESA, but subject to appropriated funds, to provide such mitigation so that no further land or funds beyond that required by the MSHCP and this Agreement will be required on the part of the Permittees or private landowners.

17.02 ISSUANCE OF PERMIT. Based upon the findings set forth in Section 17.01 hereof, the Secretary, through the Service, is fully authorized to and, concurrent with the execution of this Agreement, shall issue a Section 10(a) Permit as requested by the application and the MSHCP filed by the Applicants to allow the incidental take of Covered Species as a result of any otherwise lawful activity occurring within Clark County during the term of this Agreement and the Permit.

17.03 MIGRATORY BIRD TREATY ACT.

A. The Section 10(a) Permit issued pursuant to the MSHCP and this Agreement which allows the incidental take of any listed species or any unlisted Covered Species shall, when such permit is effective as to such species also constitute a Special Purpose Permit pursuant to 50 CFR 21.27 to allow the take of

species covered by such permit. Any such take shall not be in violation of the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-12). Such Special Purpose Permit shall be valid for a period of three years from its effective date, provided the Section 10(a) Permit remains in effect for such period and for such species, subject to renewal as provided in paragraph (B).

B. Any Special Purpose Permit as described in this section shall be renewed, provided that the Permittees remain in compliance with the terms of this Agreement. Each such renewal shall be valid for a period of three years, provided the Section 10(a) Permit remains in effect for such period and for such species.

18. MISCELLANEOUS PROVISIONS

18.01 NO PARTNERSHIP. Except as otherwise expressly set forth herein, neither this Agreement nor the MSHCP shall make or be deemed to make any party to this Agreement the agent for or the partner of any other party.

18.02 SUCCESSORS AND ASSIGNS; ANNEXATIONS, ACQUISITIONS AND INCORPORATION

.

A. This Agreement, and each of its covenants and conditions shall be binding upon and shall inure to the benefit of the Parties hereto and their respective successors and assigns.

B In the event the County, the City or any person, firm or entity acquires property from the Federal government, the land so acquired, with the exception of lands acquired within any LIMA or IMA, shall thereafter be subject to and the beneficiary of the terms of the Permit. Lands acquired within any LIMA or IMA may be subject to and the beneficiary of the terms of the Permit, but only on such terms and conditions as may be determined by the Service as necessary to offset the adverse impacts, if any, of such acquisition and development.

C. In the event any city incorporates subsequent to the date hereof, such city shall succeed to the rights and obligations of the County pursuant to the MSHCP Permit, the MSHCP and this Agreement with respect to the land thus incorporated, provided that such city has adopted a Mitigation Fee Ordinance,

executed an Interlocal Agreement in substantially the same form that has been adopted by the County and the Cities, and has executed a written Contract, approved by the Service, wherein it agrees to be bound by the terms and conditions of this Agreement.

18.03 NOTICE. Any notice permitted or required by this Agreement shall be delivered personally to the persons set forth below or shall be deemed given five (5) days after deposit in the United States mail, certified and postage prepaid, return receipt requested and addressed as follows or at such other address which any Party may from time notify each of the other Parties, in writing:

Clark County
Attn: County Manager
225 Bridger Avenue
Las Vegas, NV 89155

City of Las Vegas
Attn: City Manager
400 East Stewart
Las Vegas, NV 89101

City of North Las Vegas
Attn: City Manager
2200 Civic Center Drive
North Las Vegas, NV 89030

City of Henderson
Attn: City Manager
240 Water Street
Henderson, NV 89015

City of Boulder City
Attn: City Manager
900 Arizona Street
Boulder City, NV 89005

City of Mesquite
Attn: City Manager
P.O. Box 69
Mesquite, NV 89024

United States Fish and Wildlife Service
Attn: Regional Director
500 NE Multnomah, Suite 607
Portland, OR 97232

United States Fish and Wildlife Service
Attn: State Supervisor
4600 Kietzke Lane, Building C, Room 125
Reno, NV 89502

United States National Park Service
Attn: District Manager
601 Nevada Highway
Boulder City, NV 89005

United States Bureau of Land Management
Attn: District Manager
4765 Vegas Drive
Las Vegas, NV 89108

United States Bureau of Land Management
Attn: State Director
P.O. Box 12000
Reno, NV 89520-0006

Nevada Division of Wildlife
Attn: Area Manager
4747 West Vegas Drive
State Mailroom Complex
Las Vegas, NV 89158

Nevada Division of Wildlife
Attn: Director
P. O. Box 10678
Reno, NV 89510

Nevada Department of Transportation
Chief, Environmental Services Division
1263 South Stewart Street
Carson City, NV 89712

United States Forest Service
Attn: Office Supervisor
1500 N. Decatur Avenue
01
Las Vegas, NV 89108

Nellis Air Force Base
Attn: Base Commander
99th ABW/EM
Building 625
Nellis Air Force Base, NV 89191-7007

Nevada Division of Forestry
4747 W. Vegas Drive
Las Vegas, NV 89158

Nevada Division of State Parks
4747 W. Vegas Drive
Las Vegas, NV 89108-2315

18.04 ENTIRE AGREEMENT. This Agreement supersedes any and all other Agreements, either oral or in writing between the Parties hereto with respect to the subject matter hereof and contains all of the covenants and agreements among them with respect to said matters, and each Party acknowledges that no representation, inducement, promise or agreement, oral or otherwise, has been made by any other party or anyone acting on behalf of any party which are not embodied herein.

18.05 ATTORNEYS' FEES. If any action at law or equity, including any action for declaratory relief, is brought to enforce or interpret the provisions of this Agreement, all parties to the litigation shall bear their own attorney's fees and costs. Notwithstanding the foregoing, attorneys' fees and costs recoverable against

the United States, however, shall be governed by applicable Federal law.

18.06 ELECTED OFFICIALS NOT TO BENEFIT. No member of or delegate to Congress or Federal Resident Commissioner, shall be entitled to any share or part of this Agreement, or to any benefit that may arise from it.

18.07 AVAILABILITY OF FUNDS. Implementation of this Agreement by any of the Parties is subject to the availability of appropriated funds; The financial obligations of the County and the Cities are not general obligations of those entities and shall be paid solely from the Endowment Fund and the sources of the Endowment Fund as identified in the MSHCP.

18.08 DUPLICATE ORIGINALS. This Agreement may be executed in any number of duplicate originals. A complete original of this Agreement shall be maintained in the official records of each of the Parties hereto.

THIS AGREEMENT HAS BEEN EXECUTED ON THE DAY SET BY EACH SIGNATURE ATTACHED HERETO AND SHALL BECOME EFFECTIVE ON THE DAY AND YEAR FIRST ABOVE WRITTEN.

DATE: _____ **CLARK COUNTY**

BY:_____

DATE: _____ **CITY OF LAS VEGAS**

BY:_____

DATE: _____ **CITY OF NORTH LAS VEGAS**

BY:_____

DATE: _____ **CITY OF HENDERSON**

BY:_____

DATE: _____ **CITY OF BOULDER CITY**

BY:_____

DATE: _____ **CITY OF MESQUITE**

BY:_____

DATE: _____ **U.S. FISH & WILDLIFE SERVICE**

BY:_____

DATE: _____ **U.S. NATIONAL PARK SERVICE**

BY:_____

DATE: _____ **U.S. BUREAU OF LAND MANAGEMENT**

BY:_____

DATE: _____ **U.S. FOREST SERVICE**

BY: _____

DATE: _____ **NEVADA DIVISION OF WILDLIFE**

BY:_____

DATE: _____ **NEVADA DEPARTMENT OF TRANSPORTATION**

BY:_____

DATE:_____ **NEVADA DIVISION OF FORESTRY**

BY: _____

DATE: _____ **NEVADA DIVISION OF STATE PARKS**

BY: _____

DATE: _____ **NELLIS AIR FORCE BASE**

BY: _____

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APPENDIX K

MEMORANDUM OF UNDERSTANDING

AMONG

UNITED STATES BUREAU OF LAND MANAGEMENT
UNITED STATES FOREST SERVICE
NATIONAL PARK SERVICE
UNITED STATES FISH AND WILDLIFE SERVICE

AND

BIOLOGICAL RESOURCES RESEARCH CENTER
at the University of Nevada, Reno

AND

CLARK COUNTY, NEVADA

Signature Draft

This Memorandum of Understanding (MOU) is made and entered into as of _____, 2000 by and among the United States Bureau of Land Management (Bureau), the United States Forest Service (Forest Service), the United States Park Service (Park Service), the United States Fish and Wildlife Service in its capacity of administrator of the Endangered Species Act (Fish and Wildlife Service), the United States Fish and Wildlife Service in its capacity of manager of refuges within Clark County (FWS–Refuges), the Biological Resources Research Center at the University of Nevada, Reno (BRRC) and Clark County, Nevada (County). Collectively, the Bureau, the Forest Service the Park Service and the FWS–Refuges shall be referred to as the Federal Agencies.

I.
PURPOSES OF THE MOU

1. To set forth background information regarding the Clark County Multiple Species Habitat Conservation Plan (MSHCP), the Adaptive Management Plan (AMP) of the MSHCP, the Southern Nevada Public Lands Management Act (PLMA), the relationship between the MSHCP and the PLMA and the importance of the participation of the Federal Agencies in the MSHCP process.

2. To agree upon the types of MSHCP Development Activities which may be forwarded to the PLMA Executive Committee and the Secretary of Interior to be considered for funding pursuant to the PLMA

3. To agree upon a process to determine which future MSHCP Projects which qualify as MSHCP Development Activities pursuant to PLMA should be submitted to the Secretary of Interior by the Federal Agencies and the County for consideration for funding.

4. To develop a schedule for the process of determining which MSHCP Development Activities and which MSHCP Implementation Projects should be funded by the MSHCP.

5. To agree upon a specific course of action to assure meaningful participation of the Federal Agencies in the AMP process.

II.
BACKGROUND INFORMATION REGARDING THE CLARK COUNTY MSHCP

1. Clark County consists of approximately 5,500,000 acres of land and water located in the southernmost part of the State of Nevada.

2. Approximately 90% of Clark County is owned by the United States of America and is managed by the Federal Agencies, in addition to the Department of Defense. Fewer than 500,000 acres within the County are privately owned.

3. The County and cities located within the County are in the process of developing a multiple species habitat conservation plan (MSHCP or Plan) pursuant to the provisions of Section 10(a) of the Endangered Species Act (ESA).

4. The County has been designated as the administrator of the Plan on behalf of itself, the cities located within the County, and the Nevada Department of Transportation which are the developers of the MSHCP and the applicants for the Section 10(a) incidental take permit .

5. The goals of the MSHCP are to secure an Incidental Take Permit (Permit) from the Fish and Wildlife Service which will allow the incidental take, on nonfederal land, of various species of flora and fauna covered by the terms of the Plan (Covered Species) and to participate in a countywide program whose goal is to balance economic growth with the conservation of the natural resources of the County including its wildlife and natural habitats.

6. In order to secure the Permit from the Fish and Wildlife Service, the County must demonstrate that the effects of the incidental take of the Covered Species have been minimized and mitigated to the maximum extent practicable, that the incidental take will not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and that implementation of the terms of the Plan have been assured to the satisfaction of the Secretary of Interior (Secretary).

7. In view of the fact that approximately 250,000 of the approximately 500,000 acres of nonfederally owned property located within the County has already been developed and the remainder is highly fragmented, the County and the Fish and Wildlife Service, in consultation with the Federal Agencies, have determined that, with some exceptions, it is neither practical, efficient nor in the best interests of the Covered Species and their habitat to focus mitigation efforts primarily upon the highly urbanized, developed and fragmented nonfederal property within the County.

8. The parties to this MOU have also determined that the most effective and efficient method of protecting and preserving the flora and fauna of the County is to implement existing laws, policies and regulations already adopted by the Federal Agencies, to monitor the status of various flora and fauna upon the lands administered by the Federal

Agencies, to gauge the effectiveness of the existing policies, local rules and regulations, local management practices and conservation measures and in the event it is determined that existing policies, local rules and regulations, local management practices and conservation measures are not effective or are not the most efficient methods of protecting and preserving the flora and fauna within the County, to modify or develop additional policies, local rules and regulations, local management practices and conservation measures using the best basic and applied scientific methods and techniques available.

9. In view of the foregoing, the parties have also determined that without the active cooperation of the Federal Agencies, it would be extremely difficult for the County to obtain and retain its Permit. Without the monitoring, research, data collection, experimentation and other conservation measures which have been funded by the MSHCP and implemented on Federal land, the issuance of the Section 10(a) Permit could be in doubt. Similarly, continued development of the Plan and its AMP can not occur without the active cooperation and participation of the Federal Agencies in the process. One of the primary mitigation measures proposed by the MSHCP and its predecessor plan, the Desert Conservation Plan for the Desert Tortoise is to provide funds to the Federal Agencies to allow each of them to accelerate the implementation of conservation measures which have been previously adopted by them, but for which there is inadequate funding.

III
BACKGROUND INFORMATION REGARDING ADAPTIVE MANAGEMENT

1. Regulations adopted by the Fish and Wildlife Service require that one of the provisions which must be included in any habitat conservation plan approved by it in support of a Section 10(a) Permit is a plan for the adaptive management of the remaining species and their habitats within the area covered by the habitat conservation plan.

2. The MSHCP includes an Adaptive Management Program (AMP). The County has entered into a contract with BRRC to develop and implement the AMP which must be based upon the best scientific methods available and be developed and implemented in coordination with the Federal Agencies.

3. The goal of the County AMP is to determine the effectiveness of current management policies, rules and regulations and to assist in the development of addition means and methods of effectively managing species and habitats within the County on both federal and nonfederal lands.

4. Given the importance of the federal lands and management thereof to the success of the MSHCP, the County has entered into an agreement with BRRC which requires that BRRC shall closely coordinate its AMP activities with the Federal Agencies and that it shall, among other things, 1) determine what management questions and issues the Federal Agencies desire to be addressed; 2) upon approval of the Fish and Wildlife Service, incorporate those issues and questions into the AMP; 3) discuss and coordinate the scientific methodology and design proposed to be utilized by it with the Federal Agencies; 4) determine whether there are similar plans and procedures for adaptive management being utilized by the Federal Agencies (i.e. the Park Service's "Vital Signs" program); and, 5) to the greatest extent possible, incorporate relevant portions of the federal adaptive management process into the County AMP; and, 6) after scientific inquiry, suggest to the IMC and the Federal Agencies which are members of the IMC such modified or additional management measures as it can demonstrate will more efficiently and effectively conserve species and habitats within Clark County

IV.
RELATIONSHIP BETWEEN THE MSHCP AND THE SOUTHERN NEVADA PUBLIC LANDS MANAGEMENT ACT (PLMA or the ACT)

1. The PLMA contemplates the disposition or sale of approximately 27,000 acres of land administered by the Bureau, located within the Las Vegas Valley of Clark County. The disposal of PLMA lands selected will occur over an extended period of time and is anticipated to generate a significant fund of money.

2. Funds generated by the PLMA and deposited into the Special Account created by the Act, may be expended solely for five specific purposes mandated by the Act. Included among those purposes is the development of the MSHCP.

3. The MSHCP is intended to be a process and not a static plan. Suggested conservation measures and proposed management actions will, in light of the federally mandated Adaptive Management Plan, be in the process of development for the entire thirty (30) years of its term.

4. The Federal Agencies have played an active and important role in the development of the MSHCP, to date. As members of the Implementation and Monitoring Committee which was established by the Board of County Commissioners of the County (BCC) to develop the terms of the MSHCP, the input, participation and cooperation of the Federal Agencies will be a significant factor in determining whether or not to issue the Section 10(a) Permit, as more particularly described in Section II..I, hereof.

5. The Parties anticipate that actions which result in the continued development of the MSHCP will be carried out and implemented by both the County and the Federal Agencies upon approval of the Fish and Wildlife Service.

V.
BACKGROUND CONCERNING THE MSHCP BUDGET PROCESS

1. The MSHCP and its predecessor, the Desert Conservation Plan for the Desert Tortoise (DCP) is and has been funded exclusively by the imposition of a Mitigation Fee upon land disturbance activities on private lands which are regulated by the County and the cities.

2. To date the DCP and the MSHCP have funded both measures to continue the development of the Plan (MSHCP Development Activities), such as data collection and monitoring, as well as measures to implement the Plan (MSHCP Implementation Projects), such as law enforcement, habitat protection and enhancement and construction of fences along roadways.

3. Decisions regarding which MSHCP Development Activities and which MSHCP Implementation Projects to fund are currently recommended by the Clark County Implementation and Monitoring Committee (IMC) in the fall of each even numbered year. Decisions regarding funding are made pursuant to a competitive process wherein all interested persons, firms and entities are invited to submit development and implementation proposals and the IMC, in conference with and with the approval of the Fish and Wildlife Service determines which of those proposals to fund during the ensuing two year period.

4. Because there have been no federal funds involved in the MSHCP process to date, no decision making process for the application for and expenditure of federal funds which may become available through PLMA has been developed.

VI.
AGREEMENT

Types of MSHCP Projects which may be funded by PLMA–definition of MSHCP Development.

1. Because of the iterative and scientific basis of the MSHCP and its AMP, the term "MSHCP Development Project" includes projects and proposals specifically designed to

improve and conserve habitats and the status of species on both federal and nonfederal lands within Clark County, and shall include, but not be limited to, programs and proposals approved by the Fish and Wildlife Service which involve data collection, monitoring, research, experimentation, the adaptive management program, development and redevelopment of management plans for all species, habitats and ecosystems, conservation initiatives, mapping, interagency GIS capacity coordination and enhancement, development of ecosystem conservation strategies, proposals to enhance land management efficiency, and public education and outreach strategies designed to improve public awareness of the importance of habitat and species conservation within Clark County.

2. "MSHCP Implementation Project" includes projects and proposals which provide for the construction or implementation of on-the-ground conservation measures.

3. The Federal Agencies anticipate that they shall apply for funds through the MSHCP process for MSHCP Development Activities, approved by the Fish and Wildlife Service, which meet the definition set forth in Section 1 above which will aid in the development of the MSHCP as well as assist them to comply with Section 7(a)(1) of the ESA.

4. The County agrees that all funds paid to it by the Secretary on account of MSHCP Development Activities submitted through it, as proposed by the Federal Agencies for PLMA funding, will be paid to the Federal Agency (or to a third party cooperator, as directed by the Federal Agency) whose project is submitted for funding.

5. The Federal Agencies agree that they shall, pursuant to the terms of the MSHCP, continue to make periodic reports and accountings to the IMC describing the utilization of MSHCP funds and the results of all such development projects thus funded.

6. The parties agree that some portion of the expense required to administer the MSHCP will be involved in MSHCP Development activities and thus may qualify for PLMA funding, as the parties may agree, as hereinafter described.

Principles to be used in determining which MSHCP Development Activities and which MSHCP Implementation Projects should be funded by the MSHCP.

1. The parties agree that to the extent possible, PLMA funds should be utilized to fund MSHCP Development Activities and Mitigation Fees should be utilized to fund MSHCP Implementation projects.

2. The parties agree that to the extent that federal PLMA funds are made available to assist in the development of the MSHCP, the federal government, through the Federal Agencies should have a significant role in determining how those federal funds are expended.

3. Subject to the process described hereinafter, the County and the Fish and Wildlife Service agree that, as land managers, the Bureau, the Park Service and the Forest Service and FWS–Refuges are suited and qualified to determine what MSHCP Development Activities should be undertaken by them or third party contractors to assist in land management decisions to aid in the conservation of species and habitats.

4. Subject to the process described hereinafter, the Federal Agencies agree that the Adaptive Management Plan of the MSHCP is an integral, important and imperative part of the development of the MSHCP and as such, is the type of project which should be considered by the PLMA executive committee and the Secretary of Interior for PLMA funding.

5. In order to allow and facilitate long term planning by the Federal Agencies and the MSHCP process, the Federal Agencies and the IMC shall submit a joint application to the Secretary for a long term Authorization for PLMA funding for MSHCP Development in such amounts and for such term as they may agree.

Process to be used to determine which MSHCP Development Activities and which MSHCP Implementation projects should be funded by the MSHCP.

Attached hereto, marked Exhibit A and by this reference made a part hereof, is a schematic representation of the following calendar of events applicable to the approval of MSHCP Development Activities and MSHCP Implementation Projects.

1. **Prior to May 1 (even numbered years):** The Federal Agencies propose

   MSHCP Development Activities to the Fish and Wildlife Service and BRRC, including tentative work schedules, costs and management objectives. BRRC proposes AMP projects to the Fish and Wildlife Service and the Federal Agencies, including tentative work schedules, costs and management objectives proposed to be served.

2. **May 1 through August 1:** Staff members of each of the Federal Agencies, the Fish and Wildlife Service and BRRC shall, as a group, analyze and review the proposed MSHCP Development Activities, management objectives and tentative costs and the

AMP and its work schedule, costs and management objectives proposed to be served. Prior to August 1, the Fish and Wildlife Service shall approve, modify or disapprove the proposed MSHCP Development Activities. BRRC, in consultation and with the cooperation of the Federal Agencies and the Fish and Wildlife Service shall draft a proposed AMP plan for the ensuing two years for submittal to the IMC.

3. **August 1:** MSHCP Development Activities, as approved by the Fish and Wildlife Service, and the proposed AMP, are delivered to the IMC. In addition, the IMC accepts proposals for MSHCP Implementation Projects from the Federal Agencies and others.

4. **August 1 through September 1:** Clark County distributes the approved MSHCP Development Project descriptions, the proposed MSHCP Implementation Project descriptions and the proposed Adaptive Management Plan descriptions to IMC.

5. **September 1 through December 1 (or sooner):** The IMC considers and approves by consensus, MSHCP Implementation Projects and the Adaptive Management Plan for funding on a project by project basis and approves or rejects the MSHCP Development Activities submitted by the Federal Agencies, and previously approved by the Fish and Wildlife Service, as a whole. At the conclusion of the IMC budget process, the IMC shall approve and present a combined MSHCP budget comprised of:

   MSHCP Implementation Projects–funded by Mitigation Fees

   +MSHCP Adaptive Management Projects–PLMA funding proposal

   +MSHCP Development Activities–PLMA funding proposal_____

   equals: TOTAL RECOMMENDED MSHCP BUDGET

6. **December 1 through January 31:** The Fish and Wildlife Service reviews and

   approves, modifies or rejects the Total Recommended MSHCP Budget and determines, in writing, whether the Total Recommended MSHCP Budget and the conservation plan adopted and funded for the ensuing two years complies with the provisions of the MSHCP and the Section 10(a) Permit.

7. **January 31 (odd numbered years):** The proposed PLMA budget for MSHCP Development Activities is jointly submitted by the Federal Agencies and the IMC to the PLMA Executive Committee and Secretary for approval. After action by the Secretary, the entire proposed MSHCP Recommended Budget is submitted by the IMC to the BCC for its consideration and approval.

8. **July 1 (or sooner):** All MSHCP contracts, including contracts with Federal Agencies have been signed and approved by the BCC, and work commences on all MSHCP Development Activities and MSHCP Implementation Projects.

9. **October 1:** Final reports regarding and an evaluation of the work accomplished during any two year contract period will be required by all agencies and contractors following the end of the biennial contract period.

VIII
PARTICIPATION OF THE FEDERAL AGENCIES IN THE MSHCP ADAPTIVE MANAGEMENT PLAN

1. BRRC agrees that it shall, no less frequently than once each calendar quarter, meet with each Federal Agency pursuant to a calendar developed by mutual agreement of BRRC and the Federal Agencies. The purpose of such meetings will be to discuss and coordinate activities of the AMP, to determine the issues and questions the Federal Agencies desire the AMP to address, to integrate the MSHCP AMP program with similar programs already adopted by the Federal Agencies and to discuss and agree upon what scientific methods and procedures will be utilized by BRRC, together with such other and further matters as they may agree upon.

2. Each Federal Agency and BRRC agree that in the event it is dissatisfied with the schedule for or the content of the meetings described in Section A hereof, or in the event it is dissatisfied with the actions or activities of another party in connection with AMP matters, it shall immediately report its dissatisfaction, in writing, to the County, the Fish and Wildlife Service and the party with whom it is dissatisfied specifying, in detail, the reasons for its dissatisfaction (Notice of Dissatisfaction).

3. Upon receipt of any Notice of Dissatisfaction, the County shall, at the earliest possible date, schedule and conduct a meeting among itself, the Fish and Wildlife Service, BRRC and the Federal Agency. The purpose of the meeting will be to attempt to resolve the issue which has caused the dissatisfaction. Each of the parties agrees that it shall, in good faith, attempt to resolve any such item of dissatisfaction, and absent violation of any law, rule, regulation or official policy will participate in reaching a solution which will meet the needs of the AMP and

resolves the issue of dissatisfaction.

In witness whereof, the Parties have executed this Memorandum of Understanding as of the day and year first above written.

_____	_____
Mark Morse Bureau of Land Management	Alan O'Neill National Park Service
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Bob Williams United States Fish and Wildlife Service	Robert L. Vaught USDA Forest Service
_____	_____
Richard Tracy Biological Resource Research Center	Dick Birger USFWS–Refuges
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Cindy Truelove Clark County MSHCP	