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**ENVIRONMENTAL ASSESSMENT**  
for the  
MEADOW VALLEY-ARROW CANYON-DELAMAR  
HABITAT MANAGEMENT PLAN  
FOR BIGHORN SHEEP  
(EA No. NV054-91-92)

PREPARED BY  
BUREAU OF LAND MANAGEMENT  
LAS VEGAS DISTRICT

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## X. ENVIRONMENTAL ASSESSMENT NO. NV054-91-92

### Purpose and Need

The objective of the proposed action is to establish and maintain viable populations of desert bighorn sheep in four mountain ranges in the Las Vegas District: Arrow Canyon, Elbow, Meadow Valley and Delamar ranges. The desert bighorn sheep is a State and Bureau listed sensitive species that was thought to have occupied most of the mountain ranges in the Las Vegas District before the arrival of the European settlers. The Nevada Department of Wildlife (NDOW) has a successful trapping and transplant program that has already reestablished desert bighorn into several mountain ranges throughout Nevada. Implementation of the proposed action would help to realize projected population numbers for these four mountain ranges.

### Conformance with the Land Use Plan

The proposed action is consistent with Decisions RM-1.1 and RM-1.10 of the Clark County MFP; decision WL-2.1, WL-4.8 and WL-4.13 of the Caliente MFP; and the Bureau's Rangewide Plan for Managing Desert Bighorn Sheep on Public Land.

The goal of the Rangewide Plan is to facilitate recovery of desert bighorn sheep by managing the habitat to support viable populations. The objectives are to maintain or improve category I habitat areas and to improve category II habitat areas. The Arrow Canyon and Meadow Valley ranges are classified as category I habitat and the Delamar Range is classified as category II habitat.

### Proposed Action and Alternatives

#### 1. Proposed Action

The proposed action is to manage the habitat to support viable populations of desert bighorn sheep in the Delamar, Meadow Valley, Elbow and Arrow Canyon ranges by developing water sources. The Arrow Canyon and Elbow ranges are administered by the Stateline Resource Area (RA), Las Vegas District, Bureau of Land Management (BLM). The Meadow Valley and Delamar ranges are administered by Caliente Resource Area (RA), Las Vegas District, BLM.

##### a. Arrow HMA/Stateline RA

#### Objectives

1. Improve or maintain approximately 68,700 acres of habitat to support a viable population of approximately 391-431 animals in the Arrow Canyon and Elbow Ranges by the year 2015. Population estimates will be revised as necessary through monitoring.
2. Improve approximately 3,300 acres of habitat in the Elbow Range from a weighted average of 170.6 points to a weighted average of 180+ points by the construction of one slickrock catchment (Elbow #1). Maintain approximately 4,500 acres of winter habitat at a weighted average of 170 points.

Improve approximately 8,800 acres of habitat in the Arrow Canyon Range from a weighted average of 172.5 to a weighted average of 180+ points by the construction of two slickrock catchments (Arrow #3 and #4). Maintain approximately 7,100 acres of current crucial habitat at a weighted average of 180+ points. Maintain 32,600 acres of winter habitat at a weighted average of 144 points.

#### Planned Actions/Management Direction

- A1-1 Nevada Department of Wildlife (NDOW) will conduct appropriate population monitoring studies to determine population size, structure and distribution.
- A2-1 BLM and NDOW will cooperatively develop 3 water sources in the Arrow HMA (2 in the Arrow Range and 1 in the Elbow Range). If necessary, BLM will work with livestock operators to locate gap fences to keep livestock from using wildlife waters. A natural slickrock will be utilized for the water collection surface. A small rock dam would be built at the base of the slickrock to temporarily hold runoff water. The dam would be constructed from concrete, and rocks found on site and anchored to the bedrock with steel reinforcement. Water that accumulates behind the dam would be collected by two stainless steel Johnson screens and flow into a galvanized pipe. From the galvanized pipe, the water would flow through polyethylene pipe to the storage tanks. Water would be stored in three to four polyethylene storage tanks, that may vary in size from 1,600 to 2,300 gallons. A level pad would be constructed of soil and rocks for the tanks to set on. A prefabricated drinker-float box would be connected to the tank manifold. Tanks and exposed pipe would be painted to blend into the natural environment. Materials and equipment would be sling loaded into the project sites by helicopter. No new roads would be constructed.
- A2-2 BLM will conduct appropriate habitat monitoring studies to ensure that use levels are consistent with maintaining existing habitat conditions. The extent and frequency of habitat monitoring studies will be based upon bighorn sheep concentration areas and use patterns as determined by NDOW population monitoring studies.
- A2-3 BLM will not allow competitive OHV events in bighorn sheep habitat. Other appropriate commercial permitted activities will be allowed on a case-by-case basis, if consistent with the goals and objectives of the HMP and the Rangewide Plan for Managing Bighorn Sheep Habitat on Public Lands.
- A2-4 Through the environmental process, BLM will include appropriate stipulations to ensure that oil and gas, and mineral leases are compatible with the objectives of this plan. Prevent undue and unnecessary degradation of bighorn sheep habitat due to mineral related exploration and development by implementation of the following stipulations.
- a. Where feasible, allow no new road construction or siting of ancillary facilities in lambing habitat. If roads or ancillary facilities cannot be avoided in lambing habitat, mitigate such facilities to the extent possible.
  - b. If mineral activities result in denying access of bighorn sheep to water, or discourage the use of water sources, the lessee will be required to mitigate impacts to bighorn sheep.

- A2-5 BLM will ensure that mineral material sales are issued with appropriate stipulations to mitigate impacts to bighorn and their crucial habitat. If appropriate mitigation can not be developed, the BLM authorized officer will not approve the sale.
- A2-6 Through mining plans of operations and the environmental process, BLM will work with mining companies to reduce impacts to bighorn sheep and their crucial habitat.
- A2-7 BLM will not increase livestock distribution from current use areas within bighorn sheep habitat.
- A2-8 BLM will not dispose of bighorn sheep habitat, within the constraints of the current land use plan.
- A2-9 Fences will be constructed only when necessary and then to Bureau's standards for bighorn sheep, as specified in the BLM fencing handbook.
- A2-10 BLM will maintain or improve forage condition by ensuring that utilization of key forage species does not exceed an average of 50 percent use of the current years growth on key forage species throughout the HMA.
- A2-11 NDOW will take the appropriate actions necessary to manage bighorn sheep populations to ensure that habitat use is consistent with habitat objectives and appropriate utilization levels.
- A2-12 BLM will not allow the conversion of the following allotments from cattle use to domestic sheep use. 1) Acton-Farrier, 2) Arrow Canyon, 3) Dry Lake, 4) Pittman Well and 5) Ute.
- A2-13 BLM will remove any wild horses and burros found outside of herd management areas as expediently as possible.

#### Monitoring Studies

- A1-M1 NDOW will conduct census surveys to determine population size, recruitment, structure and distribution every 2-4 years. Crucial lambing grounds will be identified to help identify conflicts between bighorn sheep management and other land uses such as mining and competitive OHV use.
- A2-M1 Within one year of construction of additional water catchments, the BLM will determine key forage species and conduct utilization studies (as defined in the Nevada Rangeland Monitoring Handbook, 1984). Key areas will be located in bighorn sheep concentration areas, such as near water catchments. Install and read a utilization study in the Elbow Range within one year of construction of the slickrock water catchment Elbow #1. Continue to read utilization studies in the Arrow Canyon Range. If any habitat overlap occurs, at least one key area will be located in areas that receive use by both livestock and bighorn sheep. Utilization will be read on a one to three year cycle depending upon use levels. If average utilization of key forage species exceeds 40 percent or light use, utilization will be read annually and frequency trend studies will be established and read on a five year cycle. Utilization will be read in the fall.

b. Delamar HMA/Caliente RA

Objectives

1. Improve or maintain 76,250 acres to support a viable population of 319-352 bighorn sheep in the Meadow Valley Range by the year 2020. Population estimates will be revised as necessary through monitoring.

Improve or maintain 104,170 acres of habitat to support a viable population of 302-334 bighorn sheep in the Delamar Range by the year 2015. Population estimates will be revised as necessary through monitoring.

2. Improve approximately 27,500 acres of habitat in the Meadow Valley Range from a weighted average of 146.3 points to a weighted average of 162 points by the construction of 2-6 slickrock catchments in the southern part of the range, including improvement or replacement of Tri-canyon catchment. Maintain approximately 36,050 acres of crucial habitat at a weighted average of 146.3 points. Maintain or improve approximately 5,900 acres of current watered habitat around the Sunflower Mountain area at a weighted average of at least 156 points.

Improve approximately 33,600 acres in the Delamar Range from a weighted average of 163 points to a weighted average of 180+ points by the construction of seven slickrock catchments in the identified bighorn sheep habitat in the southern end of the range. Maintain 27,700 acres at a weighted average of 163 points.

3. With the cooperation of the water rights holder, improve approximately 6,800 acres around Grapevine and Hackberry springs through spring improvement, from a weighted average of 129 points to 160 points. With the cooperation of the water rights holder, improve 4,700 acres around Willow Spring from a weighted average of 162 to 180 points.

**Planned Actions**

- D1-1 If necessary, NDOW will augment the present desert bighorn sheep population in the Delamar Range by 1995. Further augmentation releases will be made as necessary to reach the desired population size. Population increases in the Meadow Valley range will be by natural migration and expansion.
- D1-2 NDOW will conduct appropriate population monitoring studies to determine population size, structure and distribution.
- D2-1 BLM and NDOW will cooperatively develop up to 13 water sources in the Delamar HMA (seven in the Delamar Range and six in the Meadow Valley Range). Exact locations of water development sites will be determined after appropriate feasibility studies and project survey and design work has been completed. Of seven catchments in the Delamar Range, a maximum of six will be located within the Delamar WSA. At least two catchments will be developed in the Delamar Range before release of bighorn sheep. A maximum of two new catchments and improvement of the existing catchment will be allowed in the Meadow Valley WSA until Congress either designates it as wilderness or releases it from consideration for wilderness. Up to four additional water developments may be built either outside the WSA or if it is released from consideration for wilderness. If necessary, BLM will work

with livestock operators to locate gap fences to keep livestock from using wildlife waters. Whenever possible, a natural slickrock will be utilized for the water collection surface. A small rock dam would be built at the base of the slickrock to temporarily hold runoff water. The dam (2-3 feet high and 10-15 feet wide) would be constructed from concrete, and rocks found on site and anchored to the bedrock with steel reinforcement. Water that accumulates behind the dam would be collected by two stainless steel Johnson screens and flow into a galvanized pipe. From the galvanized pipe, the water would flow through a polyethylene pipe to the storage tanks. Water would be stored in two or three polyethylene storage tanks, that may vary in size from 1,600 to 2,300 gallons. A level pad would be constructed of soil and rocks for the tanks to set on. A prefabricated drinker-float box would be connected to the tank manifold. Tanks and exposed pipe would be painted to blend into the natural environment. If conditions do not permit the use of a natural slickrock, an artificial apron would be constructed. No apron catchments would be permitted in WSAs until Congress releases the areas from consideration for wilderness. Materials and equipment will be sling loaded into the project sites by helicopter and no roads new roads will be constructed.

- D2-2 BLM will conduct appropriate habitat monitoring studies to insure that use levels are consistent with maintaining existing habitat conditions. The extent and frequency of habitat monitoring studies will be based upon bighorn sheep concentration areas and use patterns as determined by NDOW population monitoring studies.
- D2-3 BLM will not allow competitive OHV events in bighorn sheep habitat. Other appropriate commercial permitted activities will be allowed on a case-by-case basis, if consistent with the goals and objectives of the HMP and the Rangeland Plan for Managing Bighorn Sheep Habitat on Public Lands.
- D2-4 Through the environmental process, BLM will include appropriate stipulations to ensure that oil and gas, and mineral leases are compatible with the objectives of this plan. Prevent undue and unnecessary degradation of bighorn sheep habitat due to mineral related exploration and development by implementation of the following stipulations.
  - a. Where feasible, allow no new road construction or siting of ancillary facilities in lambing habitat. If roads or ancillary facilities cannot be avoided in lambing habitat, mitigate such facilities to the extent possible.
  - b. If mineral activities result in denying access of bighorn sheep to water, or discourage the use of water sources, the lessee will be required to mitigate impacts to bighorn sheep.
- D2-5 BLM will ensure that mineral material sales are issued with appropriate stipulations to mitigate impacts to bighorn and their crucial habitat. If appropriate mitigation can not be developed, the BLM authorized officer should not approve the sale.
- D2-6 Through mining plans of operations and the environmental process, BLM will work with mining companies to reduce impacts to bighorn sheep and their habitat.
- D2-7 BLM will not increase livestock distribution from current use areas within bighorn sheep habitat.

- D2-8 BLM will retain bighorn sheep habitat in public ownership within the constraints of the Land Use Plan.
- D2-9 Fences should be constructed only when necessary and then to Bureau's standards for bighorn sheep, as specified in the BLM fencing handbook.
- D2-10 BLM will maintain or improve forage condition by ensuring that utilization of key forage species does not exceed an average of 50 percent use of the current years growth on key forage species throughout the HMA.
- D2-11 NDOW will take the appropriate actions necessary to limit population size to ensure that habitat use is consistent with habitat objectives and appropriate utilization levels.
- D2-12 BLM will not allow the conversion of the following allotments from cattle use to domestic sheep use. 1) Delamar, 2) Grapevine, 3) Rox-Tule, 4) Breedlove, 5) Henrie, 6) Morrison-Wengert, 7) Buckhorn and 8) Lower Lake East.
- D2-13 BLM will remove any wild horses and burros found outside of herd management areas as expediently as possible. Wild horses and burros within the Breedlove Allotment will be removed.
- D3-1 BLM will complete survey and design on Hackberry, Grapevine and Willow springs to determine the feasibility of improving these water sources for wildlife. If the potential for improvement is good, the BLM will develop these spring sources to provide reliable water at the source for wildlife and to protect any riparian habitat around the source. The BLM will cooperate with water rights holder to ensure that water is safely available for livestock away from the spring source and any associated riparian habitat.

#### Monitoring Studies

- D1-M1 NDOW will conduct census surveys to determine population size, recruitment, structure and distribution every 2-4 years. Once bighorn sheep are established in the HMA, crucial lambing grounds will be identified to facilitate the implementation of planned actions that refer to OHV use and mineral development.
- D2-M1 Within one year of the initial augmentation of the existing bighorn sheep population or construction of the first water catchment, the BLM will determine key forage species and conduct utilization studies (as defined in the Nevada Rangeland Monitoring Handbook, 1984). One or two key areas within bighorn concentration areas in each mountain range will be selected to determine forage use levels. If any habitat overlap occurs, one key area will be located in an area that receives use by bighorn sheep and livestock and/or wild horses and burros. A second key area will be located in an area used exclusively by bighorn sheep. Utilization will be read on a one to three year cycle dependant upon use levels. If average utilization of key forage species exceeds 40 percent or light use, utilization will be read annually and frequency trend studies will be established and read on a five year cycle. Utilization will be read in the fall.

## 2. No Action Alternative

Under the no action alternative, no additional water catchments would be built in the habitat management areas. The two existing catchments in the Arrow Canyon Range would be maintained. The existing water catchment in the Meadow Valley Range may or may not be maintained.

### Existing Environment

The existing environment is described in the Meadow Valley-Arrow Canyon-Delamar Habitat Management Plan.

### Environmental Impacts

#### 1. Unaffected Resources

The following resources will not be affected by implementation of the proposed action alternative or the no action alternative.

- Air quality
- Farm lands
- Flood plains
- Wastes, hazardous or solid
- Water quality, drinking or ground
- Wetlands and wild and scenic rivers
- Threatened and Endangered species
- Areas of Critical Environmental Concern (ACEC) - Under the Draft Stateline Resource Management Plan, part of the habitat management area is proposed as an ACEC. The planned actions in the HMP are consistent with anticipated management of the area should it be designated.

#### 2. Proposed Action - Affected Resources

##### a. Wildlife

Water developments of this type in Nevada, Arizona and California have improved habitat conditions for desert bighorn sheep and resulted in improved populations in terms of both status and trend. For example, the first water development in the Muddy Mountains was built in 1985. During helicopter surveys in 1984 and 1985, 178 bighorn sheep were observed. In 1991, 263 bighorn sheep were observed during helicopter surveys. This is the highest number of sheep ever observed during a survey of the Muddy Mountains. The River Mountains was not considered yearlong habitat until a sewage lagoon was built. After construction of the sewage lagoon, yearlong use by bighorn sheep was observed. The Boulder City Lateral was built in the 1970s. Water was provided for wildlife along the project. Another source of water was provided by the construction of a pumping station. Now there is a highly visible yearlong population of bighorn sheep in the River Mountains. Hundreds of bighorn have been trapped out of the River Mountains and transplanted to other mountain ranges both in Nevada and other states.

The two existing water catchments in the Arrow HMA have resulted in bighorn staying in the HMA yearlong. Before construction of these catchments, bighorn sheep in the Arrow Canyon Range probably moved to the Desert National Wildlife Range (DNWR) during the summer months. Total population size was limited by the amount of watered habitat. An increase in



watered habitat would be expected to lead to an increase in bighorn sheep numbers in the HMAs.

Historically, bighorn sheep may have used the HMAs on a yearlong basis. Several historical water sources in the HMA were altered or are no longer available to bighorn sheep. These include water pockets in Arrow Canyon that were affected by the construction of a dam in the 1930s, the headwaters of the Muddy River that has been channelized and developed for domestic use and a seep in the Elbow Range that has dried up. Several springs in the Delamar and Meadow Valley ranges are developed with water piped away from the source. Meadow Valley Wash was historically a source of water for wildlife. However, development of the area, including a road, a railroad, and fences discourages bighorn from using Meadow Valley Wash. The development of several water sources would replace these historical sources.

After the development of three additional, water catchments, approximately 19,200 acres (28%) of habitat in the Arrow Canyon and Elbow ranges would become yearlong habitat for bighorn sheep. This additional watered habitat would allow the bighorn sheep population to increase and would help in reaching the population numbers goal of 411 bighorn sheep in the Arrow HMA. In addition, a portion of the Elbow Range would be inhabited by bighorn sheep yearlong instead of only during the winter.

After the development of 2-6 water catchments in the Meadow Valley Range, approximately 40,100 acres or 36% of the habitat would be crucial habitat. The increase in watered habitat would help achieve the population numbers goal for the range of 335 bighorn sheep.

The development of seven water catchments in the Delamar Range, approximately 38,300 acres (32%) of the range would be watered habitat. This additional watered habitat would allow bighorn to stay in the area yearlong, would allow the population to increase and would help in achieving the population numbers goal for the range.

Water at these developments would be available to other species of wildlife. These developments could increase the distribution of upland game species such as chukar and Gambel's quail.

#### b. Visual Resources

Wilderness Study Areas (WSAs) are managed under an interim visual resource management (VRM) Class II designation until such time as Congress designates the area as wilderness or releases the area from further study. Should Congress designate the area as wilderness, it would immediately be designated as VRM Class I.

The objective of VRM Class I is to preserve the existing character of the landscape. This class provides for natural ecological changes, but does not preclude limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention. The objective of VRM Class II is to retain the existing character of the landscape. The level of change due to management activity should be low. Management activities may be seen but, should not attract attention. Changes must repeat the basic elements of form, line, color and texture found in the characteristic landscape.

The scale of the proposed projects will be minimal in relationship to the landform features of the HMAs. No two project sites will be visible to one another. All three projects in the Arrow HMA will utilize a natural slickrock surface for the collection surface. Wherever possible, the

projects in the Delamar HMA will also use natural slickrocks rather than aprons. Projects will be designed and sited to blend into the natural environment. Tanks and exposed pipe will be painted to blend into the natural environment. Coordination with the Stateline wilderness specialist will ensure that catchments are properly designed and sited to reduce visual impacts. All these elements combined will reduce the contrast of the proposed projects to meet VRM Class I objectives.

c. Wilderness

The proposed actions meet the non-impairment criteria and will not impair the overall natural character of the WSAs.

The impacts to wilderness by the construction of two water catchments in the Arrow Canyon Range were analyzed in the Clark County Wilderness EIS and were found to be non-impairing if properly designed and located. One slickrock catchment is proposed for the Elbow Range, within Fish and Wildlife #2 WSA. The impacts to wilderness from the construction of two catchments in Fish and Wildlife #2 were analyzed in the Contiguous Lands Wilderness Final EIS and were found to be non-impairing if properly designed and located. Some restrictions may be placed on the way waters are developed and subsequent maintenance activities in order to meet IMP guidelines or in the case of wilderness designation.

The impacts on wilderness from the maintenance of one existing catchment and the construction of two new catchments in the Meadow Valley WSA were analyzed in the Caliente Wilderness Recommendations, Final EIS and were found to be non-impairing if properly designed and sited. Although no wildlife water catchments were analyzed for the Delamar WSA, this type of catchment was constructed in other WSAs in the Las Vegas District and has been found to be non-impairing if properly designed and located. Wilderness Management Policy allows for the construction and maintenance of water developments, management of current wildlife populations and reestablishment of native species. Some restrictions may be placed on the way waters are developed and subsequent maintenance activities in order to meet IMP guidelines or in the case of wilderness designation.

Impacts due to maintenance of these projects would be minimal. Access for maintenance and the type of maintenance allowed would be consistent with IMP and any future wilderness legislation. Projects within designated wilderness areas would not be filled with water artificially unless provided for in the wilderness legislation.

d. Recreation

Implementation of the proposed action would have no impact on Off Highway Vehicle (OHV) recreation in the Elbow Range. The Elbow Range is designated as "limited" (L6) to non-speed competitive and non-competitive events only.

Implementation of the proposed action would have limited impacts on OHV recreation in the Arrow Canyon Range. All of the Arrow Canyon Range, except Arrow Canyon, is designated as open. Past demand for OHV events in the Arrow HMA has been fairly low with most events being located in Dry Lake Valley to the east of the HMA. Topography and lack of roads or trails prohibit OHV events within much of the HMA. The HMA is surrounded by desert tortoise habitat which would be expected to further limit future demand for races in the HMA and surrounding area.

Implementation of the proposed action would have limited impacts on OHV recreation in the Delamar HMA. Approximately 64% of the habitat in the Meadow Valley Range and 41% of the habitat in the Delamar Range was designated as limited with no competitive OHV events allowed. Due to the precipitous terrain and lack of roads the likelihood of receiving proposals for competitive events within the open portions of the HMA is low. Also, the southern end of the HMA is surrounded by desert tortoise habitat which would be expected to limit the future demand for OHV races in the area.

Any proposed OHV events would be handled on a case-by-case basis and protective stipulations would be required to mitigate impacts to bighorn sheep habitat.

Implementation of the proposed action would have beneficial impacts on primitive and semi-primitive recreation. Increased bighorn sheep populations would lead to an increase in the number of bighorn sheep tags and increased wildlife viewing opportunities for recreationists. An estimated maximum of 34 bighorn sheep tags would result if population objectives are realized. This would result in a projected maximum of 1020 hunting related visitor days in the HMAs. Water catchments would safely provide water for all forms of wildlife leading to increased wildlife viewing opportunities and possibly increase opportunities for upland game hunting.

#### e. Minerals

Fluid minerals and geothermal exploration and development would be subject to standard stipulations and minor constraints in the open portion of the Delamar HMA and in the Arrow HMA. Much of the Meadow Valley Range is closed to fluid and geothermal mineral leasing (MFP Step Three decision M 2.1, Caliente MFP). There is low to moderate potential for oil and gas development in the Arrow HMA. The U.S.G.S. has classified the Delamar HMA as having potential for speculative oil and gas resources but there is a lack of data supporting this. The area has not been classified as prospectively valuable for geothermal or other leasable minerals due to lack of data. Potential for oil and gas is based upon the sedimentary basin concept and location within the overthrust belt. Several wells drilled to the south of the Arrow Canyon Range were dry. One exploratory well was drilled in the Meadow Valley Range but no hydrocarbon resources were found. There has been no hydrocarbon production or exploratory drilling in the Delamar Range. The demand for exploration or development of oil and gas in the HMA is expected to be low because of better potential for reserves in other areas. Protective stipulations may be necessary on a case-by-case basis on future oil and gas leases within the HMA to ensure that multiple use objectives are met. Impacts to oil and gas leasing from the implementation of the proposed action are expected to be low.

Sand and gravel can be found in the HMAs but distance from market centers makes development of these resources non-profitable. Also, bighorn sheep habitat is generally too steep and rugged to be suitable for mineral sales. Implementation of the HMP is expected to create few conflicts with salable and leasable mineral development. Sales and leases would be handled on a case by case basis and protective stipulations would be required to mitigate impacts to bighorn sheep and their habitat.

There are numerous mining claims in the Meadow Valley Range but only four active claims can be found in the bighorn sheep habitat. Past mineral production has been minor. For these reasons, implementation of the HMP is expected to generate few conflicts with mineral development in the Meadow Valley Range. Mineral potential in the Elbow and Arrow canyon ranges is low. Currently, there is one active mining claims in the Arrow Canyon Range. Due to low potential for mineral resources, the existence of better reserves elsewhere and failure of past exploratory work, no significant mineral development is anticipated in either range in the future.

Each plan of operation will be reviewed for possible impacts on bighorn sheep and their habitat and recommendations will be made to mitigate those impacts. The process will be part of the normal review process which now occurs on receipt of plans of operations. Mining operators will be encouraged to avoid crucial bighorn sheep habitat during lambing and the stressful summer months through mining plans of operation and mining notices. Code of Federal Regulations (CFR) 3809 will be used as the vehicle to mitigate or reduce impacts to bighorn sheep habitat on a case by case basis.

f. Livestock

Implementation of the proposed action is expected to have no impacts on livestock grazing in the Arrow HMA. Only five livestock grazing allotments are involved and only two of these allotments have been grazed in the past five years. Livestock use in Arrow Canyon and Acton-Farrier allotments only overlaps slightly with bighorn sheep habitat. Areas of habitat overlap are winter bighorn habitat and no wildlife waters are proposed for these areas. Currently, no livestock developments are proposed in the Arrow HMA and livestock use on these allotments is not expected to increase greatly in the future.

Implementation of the proposed action is expected to have little impact on livestock grazing in the Delamar HMA. A total of nine allotments are involved. According to use pattern mapping for these allotments, little habitat overlap occurs between livestock and bighorn sheep. The area with the most overlap is Hackberry Canyon. This area receives light use by livestock. Some conflicts may occur around springs in the Delamar and Meadow Valley Mountains. However, both Willow and Grapevine springs are developed for livestock with water being piped away from the source to a trough. Developing the source for wildlife and fencing riparian habitat would not affect water availability for livestock as the troughs would continue to function. Spring improvements at Hackberry spring could also be designed to reserve water at the source for wildlife while providing water for livestock some distance away. Some restrictions could be placed on the location of new livestock waters proposed in the future. However, much of the bighorn sheep habitat is unsuitable for or inaccessible to livestock due to slope and percent rock.

Due to the federal listing of the desert tortoise as a threatened species and the presence of desert tortoise in all the grazing allotments within the HMA, BLM and the permittee may desire to construct additional livestock waters at higher elevations to draw livestock out of desert tortoise habitat. Any livestock developments proposed in WSAs would have to meet IMP guidelines.

g. Vegetation

An increase in the number of bighorn sheep from current population levels and a change in the habitat from winter range to summer range would result in increased utilization of preferred bighorn forage species. However, current bighorn sheep numbers are well below

the carrying capacity of the habitat (with water developments) and utilization would not be expected to exceed proper use levels. Utilization studies were done in the Arrow Canyon Range since construction of the two existing water developments. Key areas were located at the two existing water catchments. Utilization levels ranged from slight to light in 1988. Utilization in 1990 was slight on all key species.

Bighorn sheep require approximately 4 pounds of good quality forage per day (air dried weight). Estimated forage demand for the HMAs ranged from a high of 12 pounds/acre/year on summer range in the Arrow Canyon Range to 4 pounds/acre/year in winter range in the Elbow, Meadow Valley and Delamar ranges. Although no ecological site inventory has been completed in the HMAs, projected forage demands are expected to be well within the capacity of the habitat.

#### h. Wild Horses and Burros

No impacts to wild horses and burros will occur in the Arrow Canyon HMA as no wild horses and burros or herd management areas are located in the area.

No impacts are expected to occur to wild horse and burro management in the Delamar Herd Management Area as only about 800 acres of overlap occurs between the herd management area and the bighorn sheep habitat. The horses are generally found in the northern end of the herd management area. The area of overlap is at the very southern tip of the herd management area and is not heavily used by either horses or bighorn sheep.

Impacts to wild horse and burro management in the Meadow Valley Herd Management Area are expected to be light. The herd management area overlaps with bighorn sheep habitat in Hackberry Canyon on the northeast edge of the HMA. A population of about 26 horses are distributed throughout the herd management area in groups of 2-3 animals. The primary water source for the horses is Meadow Valley Wash and livestock waters. Some potential for conflicts exists around Hackberry spring. Spring improvements would be designed to prevent competition for water by providing a separate drinker for wildlife which is inaccessible to wild horses.

#### i. Cultural Resources

Monitoring wildlife populations and reintroducing endemic or native species into their historical habitats in ways that do not involve surface disturbance are excluded from further Section 106 consultation under the 1990 Programmatic Agreement signed by the Nevada State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation and Nevada BLM (Appendix 3:F.1.).

Actions that involve surface disturbance, such as construction of water sources, are subject to Section 106 consultation procedures. When specific locations of surface-disturbing actions are available, the area archeologist should conduct an existing data review and determine whether field survey is necessary in order to fulfill the requirements in Section 106 of the National Historic Preservation Act of 1966. This law and Federal regulations 36 CFR Parts 60 and 800 require Federal agencies to take into account the effects of a Federal action on historic (cultural resources) properties. Consultation with the Nevada SHPO should be initiated concerning the determination and the results of the field inventory, if necessary.

j. Socio-Economics

There would be beneficial economic impacts to the local economy due to the increased number of hunting and wildlife associated recreation days. A projected maximum of 1020 hunting and wildlife associated recreation days would result from the successful implementation of the proposed action.

k. Soils

There would be a slight impact to soil resources due to construction of the proposed water developments. Up to 3.5 acres of disturbed through construction of all 13 proposed projects. Soils would be compacted in the immediate vicinity of water developments and on game trails. However, these impacts would be minor.

3. No Action Alternative

Under the no action alternative, there would be no additional impacts to visual resources, wilderness, OHV recreation, minerals, livestock grazing, vegetation and wild horses and burros. The population numbers goal for bighorn sheep in the Arrow Canyon, Delamar and Meadow Valley ranges would not be met. Bighorn sheep populations would not be augmented in the Delamar range. The goals and objectives of the Bureau's Rangewide Plan for Managing Bighorn Sheep on Public Land would not be met. An estimated 660 hunting and wildlife associated recreation days would be foregone. Bighorn sheep habitat which has been lost or degraded due to urban development, ROWs, livestock grazing, wild burros and other impacts would not be mitigated.

Cumulative Impacts

1. Wildlife

The three catchments proposed in the Arrow HMA would increase the amount of crucial bighorn sheep habitat by 12,100 acres. The 13 catchments proposed in the Delamar HMA would increase the amount of crucial bighorn sheep habitat by 61,100 acres. If population numbers are realized, bighorn sheep numbers would increase by 294 animals in the Arrow HMA and 252 animals in the Delamar HMA.

2. Visual Resources

Visual resource would be affected on a projected maximum of 125 acres in Fish and Wildlife #2 WSA, 250 acres in Arrow Canyon WSA, 375 acres in Meadow Valley WSA and 750 acres in Delamar WSA. This equates to less than one percent of each WSA.

3. Wilderness

The three slickrock catchments proposed in the Arrow HMA would affect the natural character of 12,100 acres in the Arrow Canyon and Fish and Wildlife #2 WSAs by changing it to yearlong bighorn sheep habitat.

The two to six water catchments proposed in the Meadow Valley range would affect the natural character of up to 27,500 acres by changing it to yearlong bighorn sheep habitat. The six water catchments proposed in the Delamar range would affect the natural character of up to 31,000 acres in the Delamar WSA by changing it to yearlong bighorn sheep habitat.

#### 4. Recreation

Due to lack of roads and trails, and rough topography, the cumulative impacts to OHV recreation would be minimal. Topography, screening, distance of proposed catchments from roads and trails, and the "limited" designation that applies to most of the area other than the Arrow Canyon Range limits potential conflicts between OHV events and bighorn sheep. Construction of the two catchments in the Arrow Canyon Range would remove approximately 0.4 square miles from competitive OHV use. This is less than one percent of the Arrow Canyon Range. Construction of water catchments in the Delamar Range would remove approximately 0.6 square miles from competitive OHV use. This is less than one percent of the HMA. Additional protective stipulations would be required to mitigate impacts to bighorn sheep and their habitat on any OHV event allowed in the HMAs. The Arrow Canyon Range is designated as open to OHV use. However, under IMP, OHV use in the WSA is limited to existing roads and trails. Since there are few roads and trails in the HMA, the potential demand for OHV events is expected to be low.

A projected maximum of 34 bighorn sheep tags are projected, if population numbers are realized. These tags would result in a projected 1,020 hunting related visitor days.

#### 5. Vegetation

The expected increase in bighorn sheep numbers would increase utilization on preferred bighorn sheep forage species. Forage demand is projected to range from 4 pounds/acre/year on winter habitat to a high of 12 pounds/acre/year in summer habitat. This would equal utilization of 1% to 24% of the current years growth or slight to light use levels. These use levels are well within the forage production capacity of the range.

#### 6. Soils

Up to 3.5 acres of soil would be disturbed through the construction of the proposed water developments and compaction of soil around the development. This is less than one-hundredth of a percent of the acreage involved. An undefined amount of soil would be compacted due to increased trailing of big game species. However, an estimated 1% of the total acreage would be affected.

#### 7. Wild Horses and Burros

Up to 800 acres of the Delamar Herd Management Area and 13,700 acres of the Meadow Valley Herd Management Area would be included in the bighorn sheep habitat management area. Use of these areas by bighorn sheep is expected to be at a level that is compatible with appropriate horse and burro use levels. Bighorn sheep would tend to avoid areas that are heavily used by wild horses or burros. Differences in habitat preferences between these species would further limit habitat overlap and reduce the potential for conflicts.

#### Mitigating and Enhancing Measures

1. If any cultural resources are encountered during construction, construction will stop immediately and the Stateline Resource Area Manager for the Arrow HMA or Caliente Resource Area Manager for the Delamar HMA will be notified. Construction may not resume until the site has been evaluated and the Area Manager has authorized the continuance of construction, in writing, to the project inspector.
2. Access routes, staging sites and project locations will be subject to cultural resource and threatened and endangered species clearance.

3. All construction debris and excess construction materials will be immediately removed from the project sites upon completion of the project.
4. On projects located in WSAs project design will be reviewed and approved by a wilderness specialist to ensure that the design proposal meets IMP guidelines. A BLM wilderness specialist will be on site during construction and will make final determination as to the acceptability of the finished product in meeting the standards of IMP.
5. The drinkers will include a small animal escape device.
6. No roads will be constructed to the project sites.
7. Removal of vegetation will be done only when necessary and then to the minimum necessary to complete the project.
8. If cultural resources that are determined eligible for nomination to the National Register of Historic Places are found within the Area of Potential Effect for a surface-disturbing action, a mitigation plan should be implemented in consultation with the Nevada SHPO. This plan should include avoidance, data recovery efforts or other measures deemed adequate through Section 106 consultation.
9. Water developments will be designed to blend into the natural environment, using rocks, natural topography and paint.

Irretrievable and Irreversible Commitments of Resources

Five grazing allotments in Stateline RA and nine allotments in Caliente RA could not be reclassified from cattle to domestic sheep.

Consultation and Coordination

List of Preparers

Jeanie Cole	Wildlife Management Biologist, Stateline RA, BLM
Kyle Teel	Wildlife Management Biologist, Caliente RA, BLM
Craig Stevenson	Wildlife Biologist, Region III, NDOW

The following individuals and organizations reviewed or commented on the HMP/EA.

BLM Las Vegas District Office

Sid Slone	Wildlife Biologist
Robert Taylor	Recreation/Wilderness Program Lead
Mark Chatterton	Geologist
Robert Stager	Range Conservationist



BLM Stateline Resource Area

Pat Hall	Reality Specialist
Jeff Steinmetz	Supervisory Natural Resource Specialist
Bruce Sillitoe	Wild Horse and Burro Specialist
Rich Berry	Range Conservationist
Ed Seum	Geologist
Eddie Garner	Soil Scientist
Keith Myhrer	Archeologist
Tim Smith	Recreation Planner
Rick Waldurp	Wilderness Coordinator
Runore Wycoff	Area Manager

BLM Caliente Resource Area

Kyle Teel	Wildlife Biologist
Dawna Ferris	Archeologist
Julie Wadsworth	Wild Horse and Burro Specialist
Marc Pierce	Recreation Planner
Terry Smith	Range Conservationist
Mike Jewell	Operations
Curtis Tucker	Area Manager

Other agencies and organizations

Nevada Department of Wildlife, Region III  
U.S. Fish and Wildlife Service, Reno Field Office  
Sierra Club, Toiyabe Chapter  
Nevada Outdoor Recreation Association, Inc. (NORA)  
Red Rock Audubon Society  
Howard Booth  
Commission for the Preservation of Wild Horses  
Wild Horse Organized Assistance (WFOA)

The draft HMP and EA were sent to 61 individuals and organizations for comment and review. A total of nine letters were received. Three letters addressed potential impacts on wild horses and burros, four letters addressed potential impacts on wilderness values and two letters addressed potential impacts on wildlife. The wilderness groups were concerned that implementation of the HMP would affect the naturalness of the area, both through construction of manmade structures and an "artificial" increase in bighorn sheep numbers. The wild horse and burro groups were concerned that an increase in bighorn sheep numbers would decrease the amount of forage available for wild horses and burros. The U.S. Fish and Wildlife Service was concerned about riparian habitat and invertebrates in the springs being affected by spring development, disruption of gene flow and bighorn sheep migration routes and the cumulative impacts of the Statewide bighorn sheep program. Cumulative impacts were questioned by the wilderness and wild horse and burro groups as well. Nevada Department of Wildlife felt that the acreage of the HMP should be increased and that additional water developments may be desirable in the Meadow Valley Range (outside the WSA). They felt that the number of catchments proposed in the HMP was driven by wilderness concerns and not by the biological needs of the species. The following discussion addresses appropriate comments that were not fully addressed in the EA or Draft HMP.

The Sierra Club and other groups expressed concern that the long-term and large area goals for management of bighorn sheep in Nevada should be addressed in the EA. This is beyond the scope of this Habitat Management Plan and EA. The following comments were received during the public comment period.

1. Increasing bighorn sheep numbers seems to be more for human purposes such as hunting than for the ultimate welfare of the bighorn sheep or the wilderness character of the land in question.

Due to impacts from grazing, urbanization, mining, increased recreation pressure and other land uses, much of the historical bighorn sheep habitat in the southwest is either no longer available to bighorn or is degraded to where it can no longer support viable populations. For example, thousands of acres of bighorn sheep habitat was lost with the construction of Hoover, Davis and Glen Canyon dams.

Sunrise/Frenchman mountain is historical bighorn sheep habitat. However due to increased urbanization of Las Vegas and intensive recreational pressures in this area, it will probably never be feasible to manage for bighorn sheep in the area. Traditional migration routes have been compromised by the construction of interstate highways and other development. Bighorn sheep habitat in Nevada, Arizona and California is used for military purposes. Traditional water sources have been developed for livestock and domestic purposes. The long term impacts of these uses on bighorn sheep is not known. In general, wilderness study areas represent the most intact and least disturbed habitat areas and are thus the best areas to manage for bighorn sheep over the long term.

2. Areas with no natural waters have lower levels of forage. Implementation of the proposed action may result in changes in the vegetative community in terms of plant species composition and frequency.

Forage availability is dependant upon a variety of factors including precipitation, elevation, topography and soils. While it is true that springs and streams support riparian vegetation, the lack of springs does not mean there is insufficient forage to support bighorn sheep or other large animals. In bighorn sheep habitat in southern Nevada riparian habitat around springs is generally limited to less than one acre and in some cases, there is no riparian habitat associated with springs. The amount of riparian vegetation available would not be a significant component of the overall availability of forage. For example, there are a total of three springs in the habitat management areas. If each of these springs supported one acre of riparian habitat, there would be three acres of riparian forage available for use. This would be less than 1/100,000 of a percent of the total area available for bighorn sheep use. Use of riparian habitat for forage by bighorn sheep would be expected to be minimal. Unless the water source is located in good escape cover with good visibility, bighorn sheep would approach only to drink and would return to better escape cover to forage. None of these springs is located within good escape cover. However, they are close enough to escape cover that bighorn sheep would approach to drink.

Desert bighorn sheep are adapted to living in arid environments with low forage production. The majority of the desert bighorn populations in the U.S. occur where precipitation averages only 6 to 10 inches annually (Desert Bighorn Council, 1980). A bighorn sheep requires only about 4 pounds of forage a day (air dried weight) compared to 27 pounds/day for cattle and 33 pounds/day for horses (U.S.D.I. Instruction Memorandum No. Ut 80-349).

Soils in the habitat management area are capable of producing approximately 50 to 350 pounds of annual growth per acre per year during a normal precipitation year. Increasing bighorn sheep numbers to the levels proposed in the habitat management plan would result in a forage demand of approximately 4 to 12 pounds/acre/year.

This would equal utilization of 1% to 24% of the current years growth or slight to light use. Forage utilization at these levels would not result in degradation of the habitat. Most of the habitat management area is not grazed by livestock, horses or burros. Therefore, most of the forage produced would be available for wildlife use.

Forage utilization by bighorn sheep in the Arrow Canyon Range has been monitored since the construction of the two existing wildlife water developments. Utilization was read in 1988 and 1990. Average use levels on key areas ranged from 3% to 18.6%. This equates to slight use and has not resulted in any apparent degradation of the habitat or changes in species composition and frequency.

If monitoring data in other bighorn sheep ranges in Clark County is examined, similar use levels are found. In the North McCullough Range, where four artificial waters have been built and where there is only one natural seep, utilization on key areas ranged from 4% to 15% or slight use. Average utilization on key areas in the Muddy Mountains, where there are four artificial water developments and few natural springs, ranged from 1.2% to 14.5% or slight use. The first water development in the Muddy Mountains was built in 1985. Average utilization on key areas before 1985 ranged from 5% to 13% or slight use. This data indicates that forage utilization has remained well within acceptable use levels since the construction of these water developments.

Trend studies have been established in the Arrow Canyon Range. These studies will be reread in 1992. Based upon professional judgement, use pattern mapping and utilization data, the Arrow Canyon Range is probably in late seral stage to potential natural community and apparent trend is static. The same is true of the south end of the Delamar and Meadow Valley ranges. The northern end of the Delamar HMA and the Hackberry spring area have been used by livestock and wild horses/burros for decades. It is likely that these areas are in a lower seral stage and utilization is higher due to use from livestock, horses and burros. However, areas receiving regular use by livestock, horses and burros would not be used much by bighorn sheep.

BLM will continue to monitor forage utilization at existing studies as well as establishing new studies in all four mountain ranges. If utilization exceeds 40%, trend plots will be established. If the data shows that bighorn sheep are degrading their own habitat, NDOW will reduce bighorn sheep numbers through the appropriate means. BLM will also continue to monitor utilization by livestock and wild horses and burros. If utilization exceeds the proper use levels, livestock and wild horse and burro numbers will be adjusted as appropriate.

3. A major purpose of the wilderness act is to set aside areas in their natural state. If these areas are modified by human activity, there will no longer be any "baseline" areas to which we may refer to determine what a natural state is.

Due to man's influence, it is doubtful that there are any areas left in a truly "natural" state. Another factor to keep in mind is that all these areas are current bighorn sheep habitat. There is no way of knowing population densities of bighorn sheep 100 to 200 years ago. However, it appears that several natural water sources were available to bighorn sheep before the arrival of European's. There are historical accounts of a spring in the Elbow Range near Gunsight Pass. There were water pockets in Arrow Canyon that silted in after construction of a dam in the 1930s. The headwaters of the Muddy River are close enough to escape cover to have been used by bighorn before they were altered for man's use. Meadow Valley wash provided water adjacent to

good escape cover before livestock, horses and burros were brought into the area and a railroad, road, fence and several towns were built. Grapevine, Willow and Hackberry springs were natural riparian systems and the sources of these springs are close enough to escape cover that bighorn sheep could have used them. There are hunting blinds in the Elbow and Arrow Canyon ranges and petroglyphs of bighorn sheep in the Arrow and Delamar ranges. Given the apparent historical availability of water, it is almost certain that portions of these mountain ranges were once used by bighorn sheep on a yearlong basis.

In addition, bighorn sheep are highly social animals who exhibit a high fidelity to the same range year after year. Home ranges are passed on from generation to generation through learned behavior (Desert Bighorn Council, 1980). Desert bighorn have shown little extension of their former ranges beyond that of their ancestry. The fact that there are currently bighorn sheep in the Arrow Canyon, Elbow, Meadow Valley and Delamar ranges is another indication that these areas historically supported bighorn sheep. No augmentation or reintroduction releases of bighorn sheep have occurred in any of these mountain ranges.

An actual baseline of what is natural for these areas (before man's influence) would include bighorn sheep as a natural component of the ecosystem. Artificial waters would be replacing traditional water sources that are no longer available or would serve as mitigation for other habitat areas that are too degraded to support viable populations of bighorn sheep.

4. How will this affect seasonal migration patterns and what impact would there be on the Las Vegas Range population if its traditional winter habitat becomes fully occupied by a year round population?

Generally, winter habitat is not a limiting factor of bighorn sheep populations. Approximately 72% of the Arrow HMA and 59% of the Delamar HMA would remain as winter habitat (more than 2 miles from water) after construction of proposed waters. Even if estimated population numbers are realized in all four mountain ranges, it would only result in a density of 3.3 bighorn sheep per square mile. There would be ample winter range for anticipated population levels. In addition, there is winter habitat in the Las Vegas range. Bighorn sheep from the Las Vegas Range not only move to the Arrow Canyon range but also to the Sheep Range, Delamar Range, Meadow Valley Range, Pahrangat Range, Pintwater Range and Desert Range. Movement between mountain ranges is a natural part of bighorn sheep biology. Subadult rams often leave their traditional ranges and wander into new areas. The shortest distance between the Arrow Canyon Range and Las Vegas Range is only about one mile and it is unlikely that this route would be abandoned unless it becomes impassable due the presence Highway 93.

The U.S. Fish and Wildlife Service was solicited for comments on the draft HMP. The Reno Field Office of FWS commented on the HMP. Management direction under the HMP is consistent with management actions occurring on the Desert Game Range.

5. What would happen if these water developments go dry? Would nature be allowed to take it's course?

BLM's and NDOW's goal is to have one water development in each area that has an existing access road and could be accessed with a water truck. There are currently two water developments in the Arrow Canyon Range with existing access roads. Water has been hauled to one of these developments by truck in the past. Both of these water developments are outside the WSA. A similar situation may be appropriate in the Meadow Valley and Delamar ranges. Due to the lack of roads in these areas, such developments would most likely be located outside the WSAs. Water developments within designated wilderness areas would not be filled artificially unless provided for in the Wilderness legislation. In addition, water storage capacity on proposed projects has been increased based on use of existing projects during the current long-term drought.

6. Can artificial collecting aprons such as those that may be constructed in the south Delamars under this plan avoid wilderness impairment?

No. Our experience with artificial collecting aprons is that they are a tremendous eyesore and attract attention from a long distance. Under the "Planned Actions," paragraph D2-1, it states that, "No apron catchments would be permitted in WSA's until Congress releases the areas from consideration for wilderness." In the interim, efforts will be made to identify a suitable slickrock site.

7. Does this constitute a major man-made intrusion scenario that would affect Interim Management and protection of the WSA's?

The Interim Management Policy for Lands Under Wilderness Review (H-8550-1, "IMP") provides for the installation of wildlife guzzlers as long as they "...are substantially unnoticeable in the area as a whole and would not require maintenance involving motor vehicles if the area were designated as wilderness."(p. 41) It also states that construction activities must satisfy nonimpairment criteria. Their installation must also be determined to enhance the wilderness values by seeking to create "...a natural distribution, number, and interaction of indigenous species..." The policies set forth in the IMP are intended to minimize, and mitigate if necessary, the intrusions of man-made activities which were permitted under the Wilderness Act of 1964.

8. Will these projects jeopardize the potential for these areas to be permanently classified as wilderness?

The Nevada Department of Wildlife and the Fraternity of the Desert Bighorn, as well as many other organizations dedicated to big game hunting have already expressed a blanket opposition to any wilderness designations for the very same issues that are involved in this Habitat Management Plan. The manipulation of wildlife habitat for the benefit of particular species, access for maintenance of existing wildlife projects, and the ability of hunters to gain vehicular access to remote areas for big game hunting are issues that have previously defined the positions of these groups. Installation of the proposed projects will neither gain nor diminish support for designation of these areas as wilderness.

Any argument that the presence of the projects would represent evidence of man's impact on the areas, rendering them ineligible for inclusion in the wilderness system

would be invalid since their installation would take place under the Interim Management Policy, and therefore have been determined to be non-impairing and substantially unnoticeable in the area as a whole.

9. What assurances will there be that the water projects will be unobtrusive?

Both the District and Resource Area Wilderness Specialists have been involved in reviewing proposed project sites to provide input for selection of the least obtrusive location of the projects. Should the projects be approved, at least one wilderness specialist will be on site to monitor and ensure that construction of the projects is accomplished in the least obtrusive possible manner.

XII. COMBINED FONSI/DECISION RECORD

Decision: It is my decision to authorize the proposed action identified in the Meadow Valley-Arrow Canyon-Delamar Habitat Management Plan and EA No. NV054-91-92. Construction of similar water developments for bighorn sheep in other WSAs have not affected the suitability of those WSAs for consideration for wilderness designation. Based upon this and the impacts identified in this EA, I have determined that the implementation of this HMP, with the inclusion of mitigation measures 1-8, will not affect the suitability of these WSAs for wilderness consideration. Mitigation measures identified for the proposed action in the environmental consequences section of the Environmental assessment will be implemented. This decision incorporates mitigation measures 1-8 below.

1. If any cultural resources are encountered during construction, construction will stop immediately and the Stateline Resource Area Manager for the Arrow HMA or Caliente Resource Area Manager for the Delamar HMA will be notified. Construction may not resume until the site has been evaluated and the Area Manager has authorized the continuance of construction, in writing, to the project inspector.
2. Access routes, staging sites and project locations will be subject to cultural resource and threatened and endangered species clearance.
3. All construction debris and excess construction materials will be immediately removed from the project sites upon completion of the project.
4. On projects located in WSAs project design will be reviewed and approved by a wilderness specialist to ensure that the design proposal meets IMP guidelines. A BLM wilderness specialist will be on site during construction and will make final determination as to the acceptability of the finished product in meeting the standards of IMP.
5. The drinkers will include a small animal escape device.
6. No roads will be constructed to the project sites.
7. Removal of vegetation will be done only when necessary and then to the minimum necessary to complete the project.
8. If cultural resources that are determined eligible for nomination to the National Register of Historic Places are found within the Area of Potential Effect for a surface-disturbing action, a mitigation plan should be implemented in consultation with the Nevada SHPO. This plan should include avoidance, data recovery efforts or other measures deemed adequate through Section 106 consultation.
9. Water developments will be designed to blend into the natural environment, using rocks, natural topography and paint.

Finding of No Significant Impacts: Based on the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined that impacts are not expected to be significant and an environmental impact statement is not required.

Rationale for Decision: The decision to allow the proposed action does not result in any undue or unnecessary environmental degradation and is in conformance with the Clark County MFP, approved in 1983 and the Caliente MFP, approved in 1982.

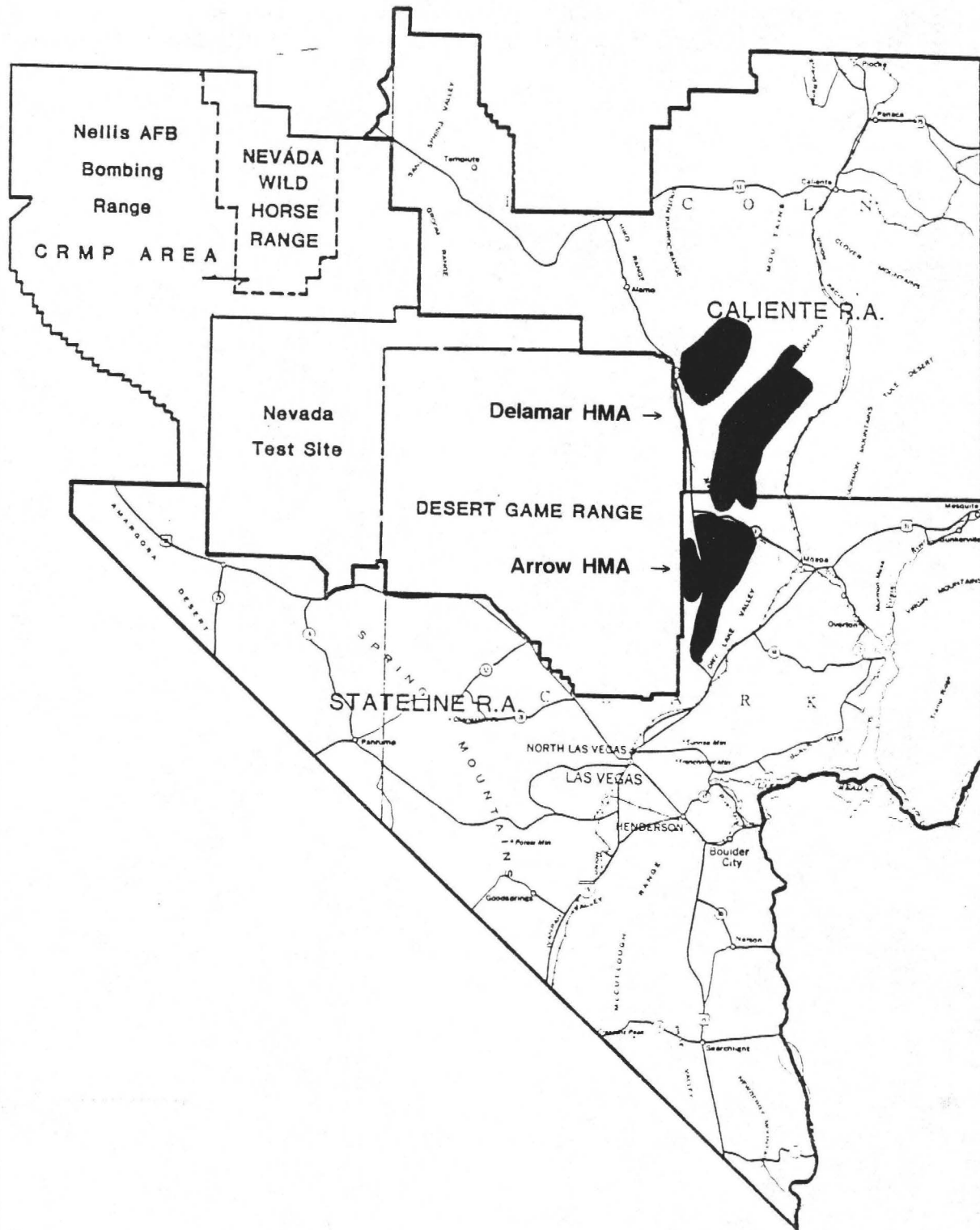
Compliance and Monitoring: The Meadow Valley-Arrow Canyon-Delamar Habitat Management Plan will serve as the compliance and monitoring plan for this project and is incorporated by reference into this decision.

Ben F. Collins  
District Manager

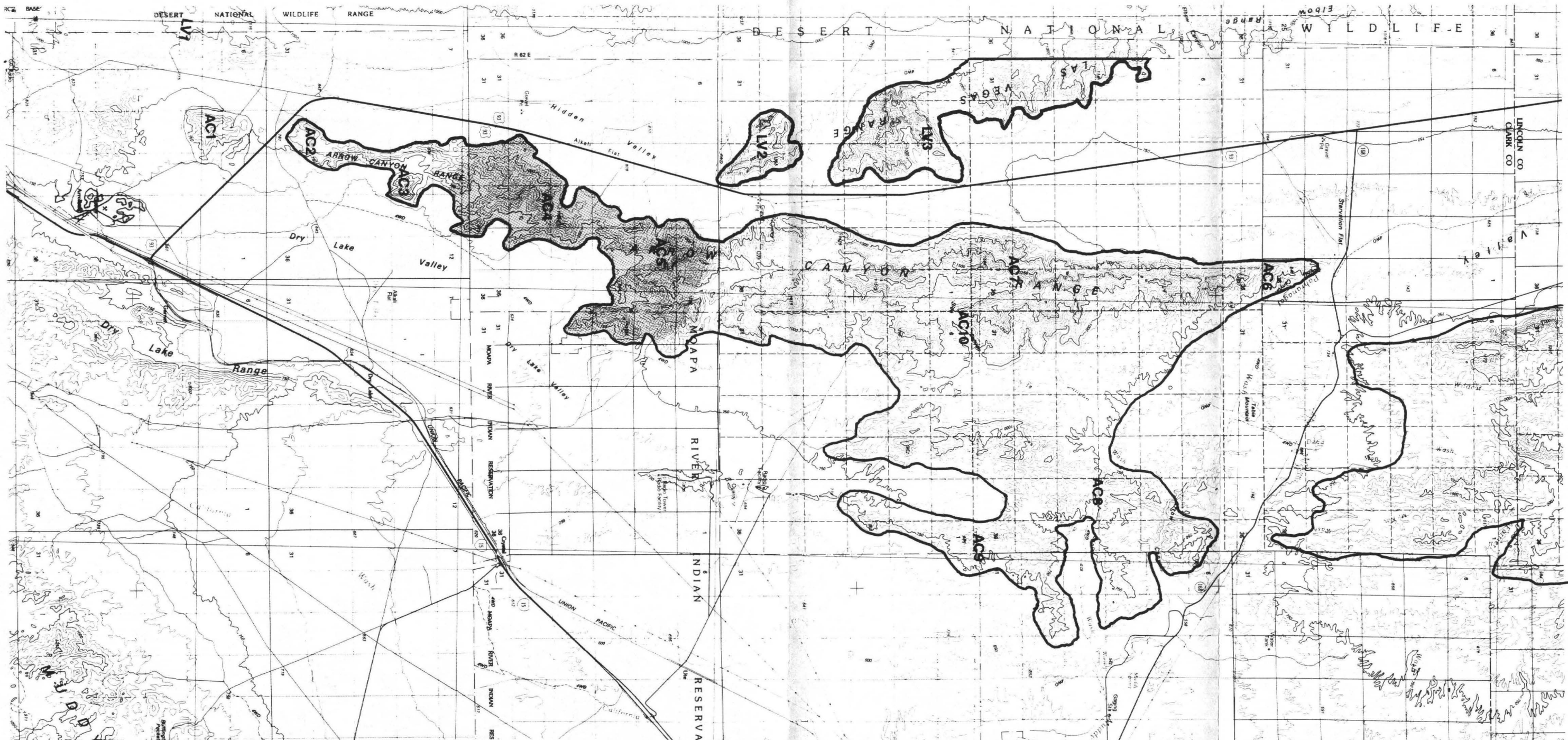
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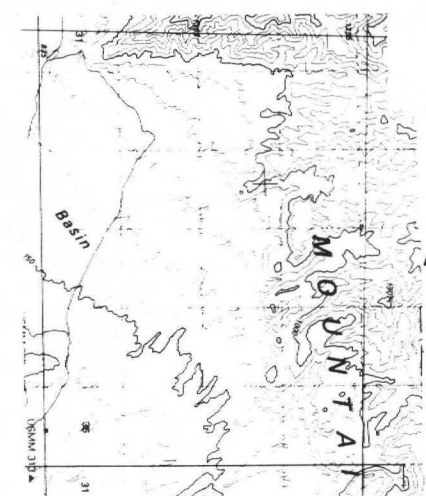
# MAP 1: GENERAL LOCATION MAP



## LAS VEGAS DISTRICT

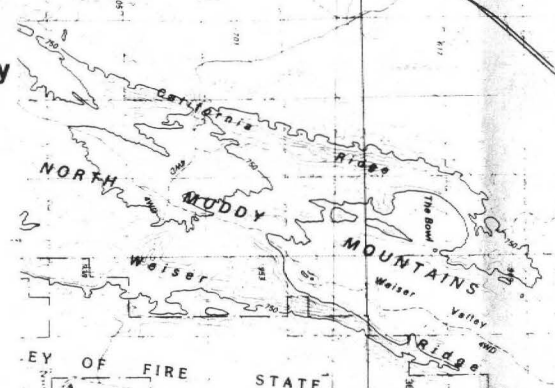


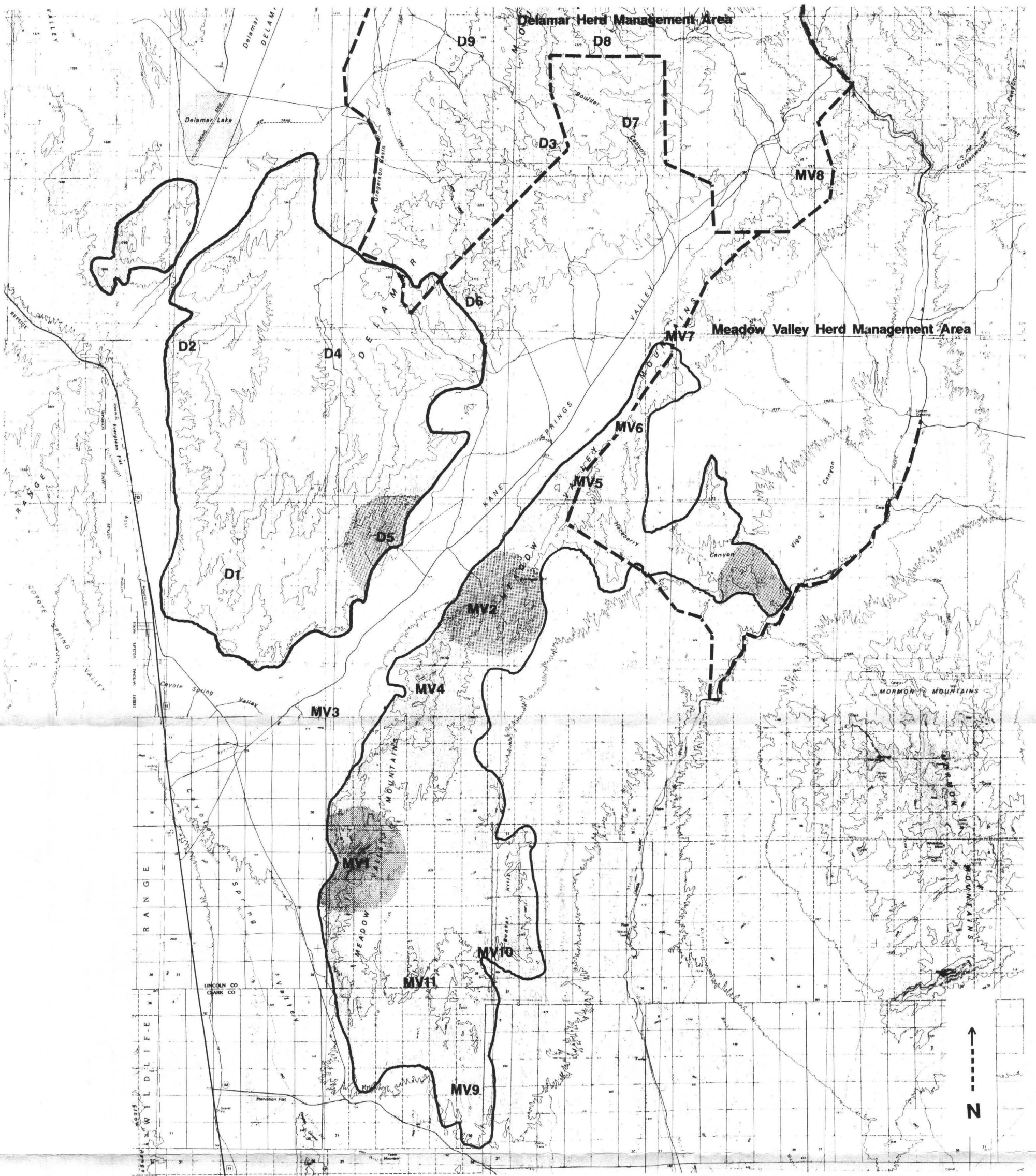
**MAP 2: ARROW HABITAT MANAGEMENT AREA**







- Bighorn sheep habitat**
- Habitat Management Area Boundary**
- AC1, LV1 Location of Survey Sites**
- Current Crucial Habitat**

**SCALE 1 Inch = 3.7 Miles**

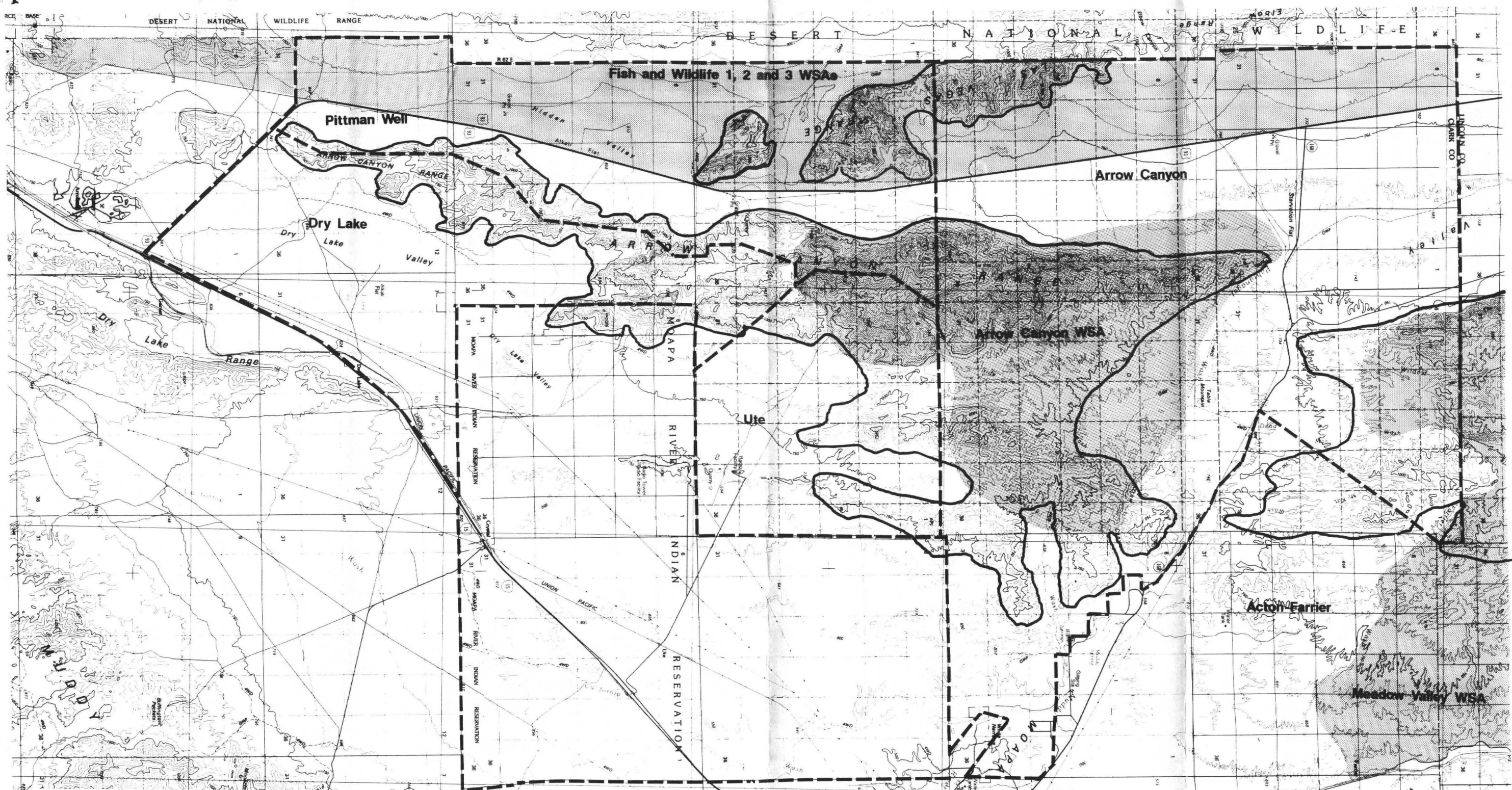







**MAP 3: DELAMAR HABITAT MANAGEMENT AREA**  
**Bighorn sheep habitat and Herd Management Areas**

-  Habitat Management Area Boundary
-  MV1 Location Survey Sites
-  Current Crucial Habitat
-  Herd Management Area Boundary

SCALE 1 Inch = 2.43 miles

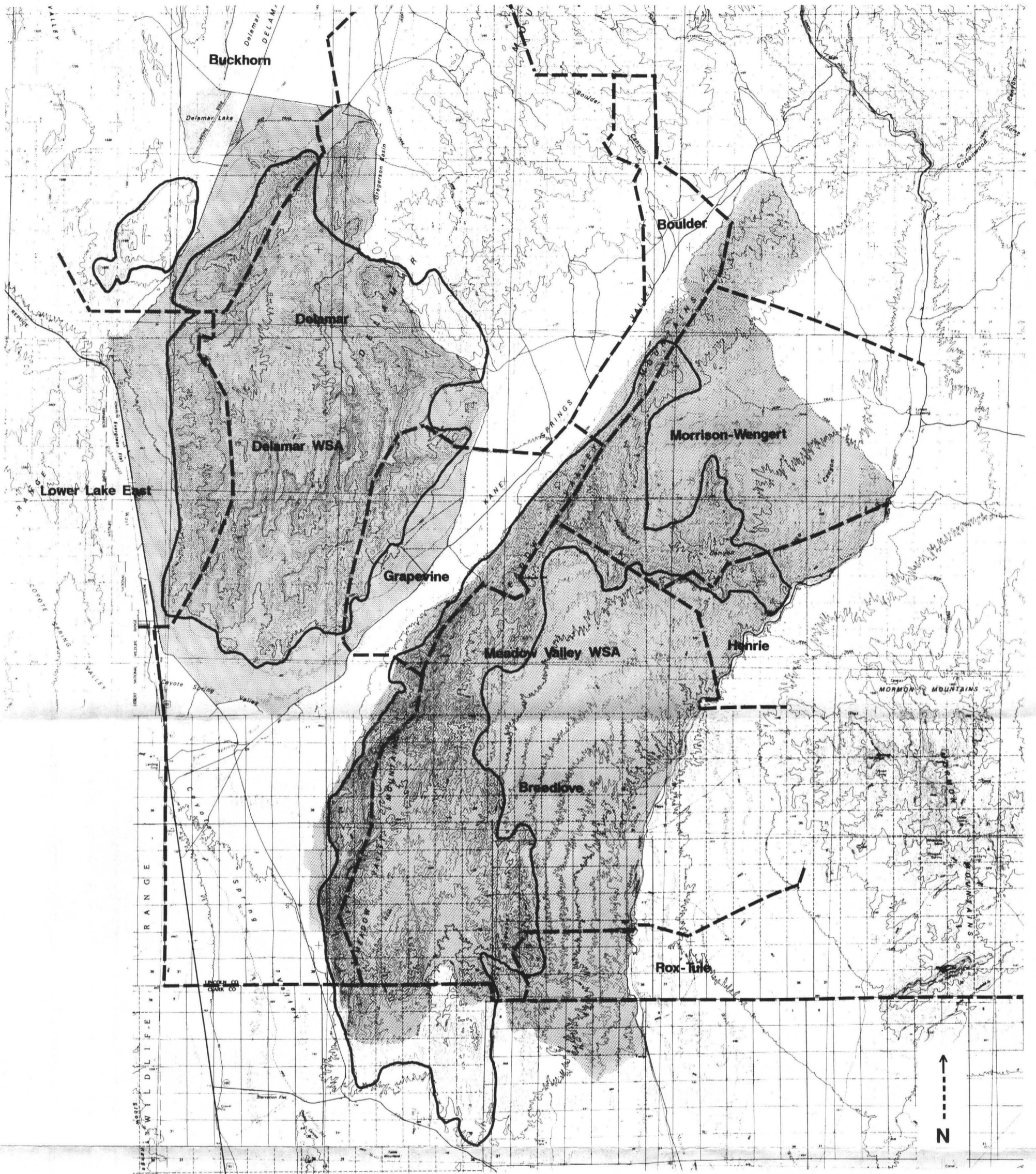


**MAP 4: ARROW HABITAT MANAGEMENT AREA**  
**Grazing allotments, wilderness study areas**

-  Habitat Management Area Boundary
-  Grazing Allotment Boundaries
-  Wilderness Study Areas



**SCALE 1 Inch = 3.7 Miles**



**MAP 5: DELAMAR HABITAT MANAGEMENT AREA**  
**Grazing Allotments and Wilderness Study Areas**

- Habitat Management Area Boundary
- - - Grazing Allotment Boundaries
- Wilderness Study Areas

SCALE 1 Inch = 2.43 miles