

Area 6 Mule Deer Working Group Habitat Management Practices



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This document provides guidelines to aid all land managers within the project area, regardless of ownership, to improve deer herd and habitat health. These guidelines can be used by entities both public and private.

It is understood that requirements within existing land use plans, grazing management plans, mining plans of operation, ranch management plans or other such documents will often have a necessary precedence over use of habitat management practices (HMPs) agreed upon by the Mule Deer Coalition. When creating, updating, or revising such documents, the HMPs as displayed in this document should be referenced and considered for inclusion and implementation. The HMPs displayed should be used as a companion document with NDOW's Area Six Deer Herd Management Plan.

By virtue of being a participant, members in the Area Six Mule Deer Coalition agree to use the HMPs created by the group whenever possible.

Area 6 Mule Deer Working Coalition

Signature	Lettered Name	Representing	Date
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Scope and Intent of Habitat Management Practices and Area 6 Mule Deer Working Group Coalition

The *Habitat Management Practices* is a document developed by the Area 6 Mule Deer Working Coalition (Coalition). The document presents technical and administrative guidance to aid all land managers within the project area (Mule Deer Management Units 064, 067, and 068) in managing mule deer populations and habitat. This guidance may be used by private and/or public land managers to improve deer herd and habitat health.

Requirements associated within existing land use plans, grazing management plans, mine plans of operation, ranch management plans and other such documents will often take precedence over the Habitat Management Practices (HMP's) developed by the Coalition. When creating, updating, or revising such plan documents, it is recommended that the HMP's presented here be considered and, as applicable, be incorporated into such plans. The *Habitat Management Practices* should be used as a companion document to Nevada Department of Wildlife's Area 6 Deer Herd Management Plan.

By joining the Coalition, members commit to consider and utilize as practicable and applicable the *Habitat Management Practices*. It must be emphasized that partners participate on a voluntary and willing basis to focus on opportunities to work together to address mule deer population and habitat health where possible and when practical and subject to economic and technical factors associated with each partner entity.

Mule Deer Habitat Management Practices

Drafted by the Mule Deer Working Group Technical Group

December 16, 2009

Finalized by the Coalition Leadership Group

January 19, 2012

Background

The pace and amount of activity, natural and human initiated, in Northeastern Nevada is not expected to slow or decline in the coming years. The actions, planned and unplanned, that occur will tax all organizational entities, government and private, significantly.

Deer herd and deer habitat health is one of the many issues that we face in much of our area. It is one that we address as we consider most actions, whether in response to fire, granting of a road right of way or expansion of a permitted mining activity.

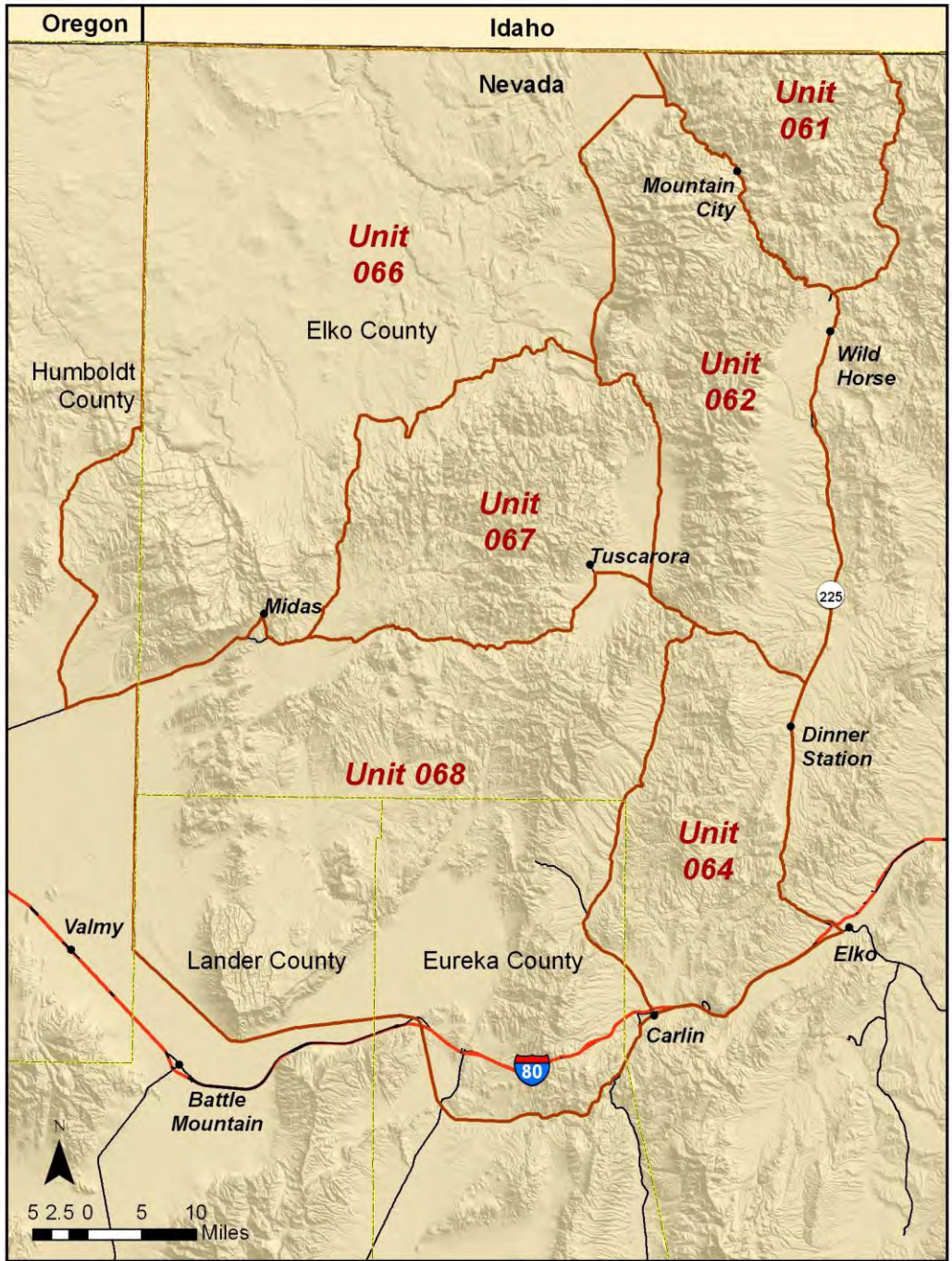
Realizing this to be so, representatives from Newmont Mining Corporation (Newmont), Nevada Department of Wildlife (NDOW), Barrick Goldstrike (Barrick) and the Bureau of Land Management (BLM) propose formation of a coalition to address the issue in a manner that looks from a landscape scale over the longer term and avoids working the issue project by project or action by action.

Mission and Goals

The Mission: Using a coalition of stakeholders, develop habitat management practices (HMP) to ensure maintenance or improvement of mule deer health, including herd migration capability and vegetation composition, in portions of NDOW Wildlife Management Units 064, 067 and 068. These practices will be utilized in land management activities, when possible, over the next 5-7 year planning horizon and will lead to long term planning targets.

The Goals:

- Develop habitat management practices that are understood by all stakeholders and are applied towards actions and activities considered for permit, authorization, or development on public or private lands.
- Promote maintenance of historic / adequate north-south movement corridors associated with wildlife management units 064, 067 & 068 (Map 1 in Appendix and below).
- Reduce fragmented and degraded sagebrush habitat and move towards a healthier condition
- Link existing and restored sagebrush / mule deer habitat
- Encourage cooperation between private, State and Federal landowners
- Inform and educate landowners and the general public regarding the mule deer issue as it relates to various uses on lands in the area



Map: Area 6 Deer Management Units

Framework

The Technical Group that developed the following objectives, strategies, and action items was comprised of resource specialist representatives from the Bureau of Land Management and the Nevada Department of Wildlife and mining and environmental engineers from Barrick and Newmont. Given the dynamics of the mining industry and mule deer, and in order to make this document functional for all stakeholders, this Habitat Management Plan has been designed as guidelines that will be implemented as extensively as practicable.

Through the development of these Habitat Management Practices, the Technical Group recognized the need to take a hierarchical approach to the formation of the objectives. There exists the need for actions and projects to facilitate deer movement and the need to develop landscape designs that will enhance Area 6 deer habitat for the future. This document is organized into Objectives, Strategies and Action Items. Each Action Item is a specific project or task that can be assigned to an individual or group of individuals. These Action Items provide deliverables to the Leadership Team and stakeholders at large and are a method to achieve our goals and facilitate the mission of the coalition. In order to track the success of these guidelines, an Objective that requires documenting projects, monitoring deer movement and population sizes, and monitoring vegetation projects was also incorporated.

In addition to the development of habitat management practices, an appendix has been developed and included in this document. These appendices provides explicit information for future users of this plan as well as sources for additional information.

1. To the degree practicable, maintain currently undisturbed migration corridors.

Strategy 1. Conduct annual information sharing between agencies and the industry to identify resource areas, such as migration corridors, recent fires and reasonably foreseeable actions.

Action Item 1. Establish an annual meeting in September between NDOW, BLM, Newmont, Barrick and other potential stakeholders, with representatives from the industry's management, engineering and environmental divisions, to discuss current habitat conditions and likely potential mining actions in the coming years.

Action Item 2. Establish channels of communication for projects in the pre-permitting stages with the creation of a current contact list for all stakeholders.

Strategy 2. Utilize a mine design philosophy that attempts to reduce disturbance within existing migration corridors. See HMP 3.

Action Item 1. Locate non-pit disturbances such as waste rock dumps, stockpiles, and tailings dams, outside of existing corridors when possible, unless those disturbances can enhance or improve the migration corridors.

Action Item 2. Minimize the amount of new fences in mine development. See HMP 1.

Action Item 3. Locate haul roads outside of corridors and when possible orient haul roads in a manner that minimizes migration/habitat disturbance. Encouragement of a general North-South direction for deer movement is desirable.

Action Item 4. Work to sequence mine development to minimize disturbed ground and/or activity levels within the migration corridors.

Strategy 3. Protect and enhance existing habitat within undisturbed migration corridors.

Action Item 1. Establish fire breaks around undisturbed sagebrush habitat and cooperate to quickly rehabilitate burned areas while maintaining integrity of existing permits and bonding stipulations at permitted facilities.

Action Item 2. Develop a cooperative weed management plan for monitoring, control and eradication of noxious weeds within migration corridors. A weed control subcommittee is recommended to address specific issues within the project area.

Action Item 3. Grazing interacts with fire and noxious weed impacts. A grazing subcommittee is recommended to address specific issues within the Carlin Trend.

2. To the degree practicable, modify existing migration impediments to facilitate deer movement.

Strategy 1. Identify existing impediments and develop modification goals for improving migration. See HMP 4.

Action Item 1. Utilize historic and current biological data to identify migration corridors. This data is to be presented and communicated at the annual meetings with BLM, NDOW, Barrick, Newmont and other potential stakeholders.

Action Item 2. Utilize aerial photography, GIS layers, and other data to define existing migration impediments. This data is to be presented and communicated at the annual meetings with BLM, NDOW, Barrick, Newmont and other potential stakeholders.

Action Item 3. Coordinate and participate in interdisciplinary field trips, with representation from the BLM, NDOW, Barrick, Newmont and other stakeholders, to identify existing impediments.

Action Item 4. Use the interdisciplinary field trips to determine a specific improvement goal.

Strategy 2. Modify existing impediments to mule deer movement. Take advantage of opportunities that do not require permits. See HMP 3.

Action Item 1. Identify the potential for sloping, re-grading, stripping, backfill, and modification of mining features within the corridors.

Action Item 2. Minimize, modify, or remove berms, roads, fences and ponds, whenever and wherever possible. See HMP 1.

Action Item 3. Provide workforce training to inform employees of deer migration areas and actions that can be taken to minimize impacts to these areas.

Action Item 4. When possible, limit surface disturbing activity within corridors during migration (November 30th – January 5th, and March 15th – April 30th).

Action Item 5. Minimize the use of temporary facilities, such as trailers, light plants, and parked equipment, within corridors during migration.

Strategy 3. Identify opportunities to consolidate the existing plans and disturbances with future concurrent actions and reclamation.

Action Item 1. Emphasize concurrent reclamation with mine development to facilitate mule deer movement capability.

Action Item 2. Consider the duration of disturbance activities so that disturbance does not further impede mule deer migration.

Action Item 3. Evaluate reclamation timeframes to maintain primary and potential alternative migration routes.

Action Item 4. Minimize the total amount of land disturbance at any given time by utilizing existing facilities to their design extent and for multiple phases of development.

3. To the degree practicable, current mining activity will incorporate reclamation measures that reduce or eliminate impacts to migration corridors and habitat.

Strategy 1. During the project design phase, incorporate concurrent reclamation into the timing of project development to minimize the amount of disturbance at any given time.

Action Item 1. Discuss the timing and focus of reclamation projects at the annual information sharing meeting, between agencies and industry.

Action Item 2. For each project, develop a preferred schedule of actions along with alternate plans of action for concurrent reclamation.

Action Item 3. Whenever possible, complete reclamation (see Glossary of Terms) on existing disturbance before adjacent disturbance is initiated.

Action Item 4. Ensure that environmental, reclamation and/or mining engineers are involved with the design phase and during project development.

Strategy 2. Make mining reclamation projects within migration corridors and adjacent habitats, a priority.

Action Item 1. Identify and prioritize projects within and adjacent to migration corridors.

4. Develop stable landform designs that complement surrounding topography and support mule deer habitat requirements.

Strategy 1. Use established engineering and hydrologic principles, and new, improved or existing technologies to design stable landforms. See HMP 3.

Action Item 1. Pursue new ideas in mining practices and/or improved technologies as they develop.

Action Item 2. Utilize a diverse design team, including but not limited to mine engineers, environmental engineers, biologists, ecologists, and others as needed.

Action Item 3. Gather hydrogeomorphic information in the Carlin Trend for input into landform designs.

Strategy 2. Design the surface features of mine facilities, such as waste rock dumps and heap leach pads, to create a heterogeneous environment that facilitates deer movement and promotes biodiversity. See HMP 3.

Action Item 1. Prioritize design opportunities for Barrick and Newmont to create contiguous landforms conducive to future deer movement from undisturbed habitat to undisturbed habitat.

Action Item 2. Incorporate undulations into top and side slopes and distribute growth media at variable depths to create a more heterogeneous environment.

Action Item 3. Design facilities, as practicable, to use existing topography, for stability and to facilitate deer movement by designing variable slopes shallower than 2.5:1.

Strategy 3. During mine development and reclamation, include water harvest methods to enhance mule deer habitat.

Action Item 1. In areas where snowfall is deep or where water is available, plan drainages, plant hydrophilic flora, and create landforms, such as ridges and hills, that will harvest snowfall.

Action Item 2. Use snow fence as a temporary measure to harvest snowfall and promote successful revegetation.

Action Item 3. When a pit lake has suitable water quality and appropriate topographic features, create access routes to the water for deer.

Action Item 4. When a drainage must be reconstructed and/or relocated, incorporate pools into its design to provide water sources for deer.

5. Enact fire management strategies to protect deer habitat, with an emphasis on crucial mule deer winter range.

Strategy 1. Improve, maintain, or manipulate vegetation in order to reduce the frequency and size of fires.

Action Item 1. Plant fire resistant vegetation, such as perennial grass, forage kochia, and succulent forbs. See HMP 2. Plant these in strategic locations to protect intact habitat.

Action Item 2. Enhance riparian areas by improving grazing systems through existing regulatory processes, introducing beavers, plant willows

and trees, eradicating weeds, and /or other projects that raise the water table.

Action Item 3. Reduce fuels in strategic locations by employing prescriptive grazing, mowing, disking, herbicide application or other vegetation manipulation methods.

Strategy 2. Make protection of crucial deer winter range a priority when fires occur.

Action Item 1. Provide information on crucial deer winter range to land management agencies, Nevada Department of Forestry, and other fire fighting entities and create detailed maps and descriptions of crucial deer winter range to resource advisors and field managers to be used during fire fighting activities

Action Item 2. Use existing communication systems and a media tools within local BLM management to convey to fire managers and fire fighters the importance of protecting crucial deer winter range.

Strategy 3. Use fire suppression tools and techniques to keep fires as small as possible.

Action Item 1. Within dictates of safety, minimize the size of back burns in crucial deer winter range.

Action Item 2. Working with the Nevada Department of Forestry, develop a system through agreements, training, and/or certification that allows miners and ranchers in close proximity to crucial deer winter ranges to act as first responders to fire.

Strategy 4. Identify and reduce impediments that slow firefighting efforts in crucial deer winter range.

Action Item 1. Compile existing archeological data and complete surveys in strategic areas to allow for quick deployment of dozers involved in firefighting within crucial deer winter range.

6. After each new fire, rehabilitate burned areas as quickly as possible with seed mixes and ground preparations that will re-establish deer habitats, with an emphasis on crucial deer winter range.

Strategy 1. Promote the importance of rehabilitating impacted crucial deer winter range to range resource managers

Action Item 1. For each new fire, identify priority crucial deer winter range that have been impacted and provide that information to range resource managers on public and private lands.

Action Item 2. Range resource managers on public and private lands should ensure that there is adequate shrub and forb components in each seed mix list as grasses alone do not provide sufficient deer forage and cover. See HMP 2.

Action Item 3. Range resource managers on public and private lands

should create a seed mix list for the emergency stabilization of sites that also meets mule deer forage requirements. See HMP 2.

Action Item 4. Range resource managers on public and private lands should create seed mix lists that can be purchased using non-emergency stabilization funds and that provide optimal deer forage and cover. See HMP 2.

Action Item 5. Create a matrix of ground preparation and seeding techniques that will work with the various seed mixes and site characteristics. See HMP 2 and Appendix 7.

7. Rehabilitate historic burns that do not currently provide adequate deer habitat.

Strategy 1. Identify historic burns that do not currently provide adequate deer habitat and prioritize these areas in rehabilitation and restoration programs.

Action Item 1. Develop a map that identifies areas that have been impacted by historic fires and do not currently provide adequate deer habitat.

Strategy 2. Use existing protocols, or develop new ones when needed, that outline restoration techniques including weed control, soil preparation, and seeding practices. See HMP 2 and Appendix 7.

Action Item 1. For each category of undesirable vegetation, develop best management control practices.

Action Item 2. Create a matrix of ground preparation and seeding techniques that will work with the various seed mixes and site characteristics.

Strategy 3. Identify specific modification goals to improve winter range, prioritized for restoration efforts. These goals may include weed eradication, an increase in forbs and/or shrubs, a decrease in less desirable plant species, or the application of a specific planting technique.

Action Item 1. Conduct field trips to evaluate existing winter habitat and identify modification goals.

Action Item 2. Enter into coalitions with Newmont, Barrick and other private landowners that will allow for private land enhancement.

Action Item 3. Implement seedings using proven restoration protocols. See Appendix 7.

Strategy 4. Monitor the success of habitat modifications.

Action Item 1. Develop a monitoring plan that evaluates the success and utilization of the seed mix.

Action Item 2. Utilize deer survey data to help determine deer use of the seedings and to determine long-term herd health of deer utilizing reseeded winter ranges.

Action Item 3. Share knowledge with entities interested in habitat restoration and rehabilitation.

8. Ensure that there is sufficient forage and cover for mule deer.

Strategy 1. Implement grazing practices through existing administrative processes and landowner cooperation to provide alternative forage for cattle to maintain or enhance seedings for wintering deer.

Action Item 1. Work with landowners and permittees to leave adequate amounts of forage kochia for use by mule deer annually

Action Item 2. Plant additional seedings adjacent to winter ranges to alleviate cattle foraging on crucial deer winter range.

Action Item 3. Plant grasses and forbs within existing seedings to increase forage for livestock.

Strategy 2. Implement grazing practices, through existing administrative processes, that maintain or improve deer habitat on all seasonal ranges.

Action Item 1. Utilize the WAFWA (Western Association of Fish and Wildlife Agencies) intermountain west mule deer guidelines and establish specific allotment range objectives when issuing permit renewals. See HMP 5.

Action Item 2. Establish a review committee that focuses on grazing modifications that includes permittees in the process.

Strategy 3. Attempt to eliminate noxious weeds on crucial winter habitat.

Action Item 1. Coordinate weed control efforts with other local public and private entities.

Action Item 2. Identify areas that require weed eradicating measures.

Action Item 3. Refer to Objective 1, Strategy 3 and Objective 5, Strategy 1 on weed management.

Strategy 4. In reclamation, design the most appropriate vegetative communities to ensure optimal forage for deer.

Action Item 1. Reclamation seed mixes should be designed to take advantage of slope, aspect, and deer use. See HMP 2 and 3.

9. Document the success of all objectives.

Strategy 1. Document completed remediation, reclamation, and restoration actions.

Action Item 1. Create a list of completed actions for presentation at the annual review meeting.

Action Item 2. Create a list of upcoming actions for presentation at the annual review meeting.

Action Item 3. Conduct field trips to sites where successful action has been completed.

Strategy 2. Monitor and quantify the movement of deer between summer and winter range.

Action Item 1. Continue to collect data on deer migration patterns. Include a variety of data collection methods, such as radio telemetry, satellite telemetry, aerial observations, and ground observations. Share the results of these studies at the annual review meeting.

Action Item 2. Continue to collect data to estimate Area 6 deer herd size. Use proven population estimation methods. Share these data at the annual review meeting.

Strategy 3. Monitor and quantify vegetation reclamation and restoration projects.

Action Item 1. Collect and compile data from existing monitoring projects (grazing, fire restoration, reclamation activities) and present these at the annual meeting.

Habitat Management Practice 1:

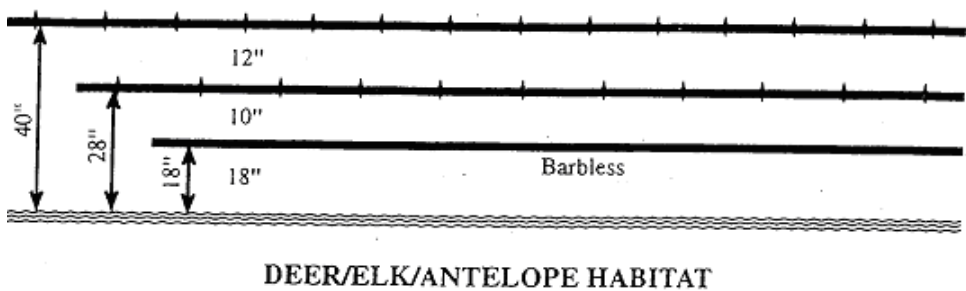
Wildlife-Friendly Fencing Specifications

**Fencing Specifications for Fences Constructed or Modified
Within Deer Habitat in Area Six**

A *healthy* adult deer can usually negotiate a standard four strand barbed wire fence that is 42 inches high. A *healthy* fawn can usually go underneath a smooth wire 16 inches from the ground.

However, on winter range or within migration areas, a standard four strand fence can be devastating for deer. Deer are often in a weakened state on winter range or along migration corridors, especially on the poor quality ranges that exist in The project area. Deer in poor condition have trouble jumping a fence. Therefore, they try to go under it or through it. Unfortunately, snow accumulation of even eight inches makes the lower strand eight inches from snow level which does not allow any deer to go under. The next space between the bottom wire and the second wire is six inches wide which also does not allow deer passage. This results in deer 1) expending energy as it tries to get through the fence, 2) injury as a deer forces its way through the narrow wires or 3) the animal becomes trapped and unable to make it to or from winter range. Unfortunately, mortality and injury as a result of fences is impossible to document, as deer often die away from the fences.

The schematic below describes a wildlife-friendly fence. A three strand fence is easier for a deer to pass through. This fence is shorter, the bottom wire is higher off the ground and there is more spacing between wires. Deer in weaker condition appear to be able to negotiate a three strand fence more easily than a four strand fence. Some land managers and land owners have even replaced the top barbed wire with barbless wire.



Habitat Management Practice 2:

Reclamation Seed Matrix

Reclamation Seed Matrix

Common Name	Scientific Name	Seed/lb	Cool or Warm Season	Life Form	Native ¹	Minimum Moisture Requirements (Inches)	Soil Texture ^{1,3}					Soil pH ^{1,4}			Mycorrhizal Dependent ⁵
							C	MC	M	MF	F	Acidic	Neutral	Basic	
Grasses							C	MC	M	MF	F	Acidic	Neutral	Basic	
Indian ricegrass, var. Nezpar	<i>Achnatherum hymenoides</i>	141,000	Cool	Perennial bunchgrass	Yes	8	3	3	3	1	0	0	3	1	Yes
Columbia needlegrass	<i>Achnatherum neslonii ssp. dorei</i>	150,000	Cool	Perennial bunchgrass	Yes	6	0	2	3	2	0	1	3	1	Yes
Standard crested wheatgrass, var. Hycrest	<i>Agropyron desertorum</i>	175,000	Cool	Perennial bunchgrass	No	6	1	3	3	3	1	0	3	2	Yes
Siberian wheatgrass, var. P-27	<i>Agropyron fragile</i>	170,000	Cool	Perennial bunchgrass	No	6 - 10	2	3	3	2	0	1	3	3	Yes
Mountain brome, var. Garnet	<i>Bromus marginatus</i>	64,000	Cool	Perennial bunchgrass	Yes	10	0	1	3	3	1	0	3	1	Yes
Inland saltgrass	<i>Distichlis spicata</i>	520,000	Warm	Perennial, rhizomatus	Yes	5	0	1	2	3	3	0	1	3	Yes
Bottlebursh squirreltail, var. Toe Jam Creek	<i>Elymus elymoides</i>	192,000	Cool	Perennial bunchgrass	Yes	8	2	3	3	3	1	1	3	2	Yes
Thickspike wheatgrass, var. Schwendimar	<i>Elymus lanceolatus ssp. lanceolatus</i>	154,000	Cool	Perennial, rhizomatus	Yes	6 - 8	2	3	3	2	0	0	3	2	Yes
Streambank wheatgrass, var. Sodar	<i>Elymus lanceolatus ssp. psammophilus</i>	156,000	Cool	Perennial, rhizomatus	Yes	6 - 8	0	1	3	3	2	0	3	2	Yes
Slender wheatgrass, var. Pryor	<i>Elymus trachycaulus ssp. trachycaulus</i>	159,000	Cool	Perennial bunchgrass	Yes	10	0	2	3	2	3	2	3	2	Yes
Snake River wheatgrass, var. Secar	<i>Elymus wawawaiensis</i>	120,000	Cool	Perennial bunchgrass	Yes	8	2	3	3	2	1	0	3	1	Yes
Idaho fescue, var. Joseph	<i>Festuca idahoensis</i>	450,000	Cool	Perennial bunchgrass	Yes	12	0	2	3	3	1	1	3	1	Yes
Sheep fescue, var. Covar	<i>Festuca ovina</i>	680,000	Cool	Perennial bunchgrass	Yes	10 - 12	2	3	3	3	1	2	3	0	Yes
Needle and thread	<i>Hesperostipa comata ssp. comata</i>	115,000	Cool	Perennial bunchgrass	Yes	5	2	3	3	2	0	0	3	2	Yes
Great Basin wildrye, var. Trailhead	<i>Leymus cinereus</i>	130,000	Cool	Perennial bunchgrass	Yes	8	1	2	3	3	2	0	3	2	Yes
Saline wildrye	<i>Leymus salinus</i>	170,000	Cool	Perennial bunchgrass	Yes	10	1	2	3	2	1	1	3	1	Yes

Western wheatgrass, var. Walsh	<i>Pascopyrum smithii</i>	110,000	Cool	Perennial, rhizomatus	Yes	10	0	1	2	3	3	1	3	3	Yes
Sandberg bluegrass, var. High Plains	<i>Poa secunda ssp. sandbergii</i>	1,047,000	Cool	Perennial bunchgrass	Yes	8	1	3	3	3	1	0	3	2	Yes
Canby bluegrass, var. Canbar	<i>Poa secunda ssp. canbyi</i>	926,000	Cool	Perennial bunchgrass	Yes	10	1	2	3	1	1	0	3	1	Yes
Bluebunch wheatgrass, var. P-27	<i>Pseudoroegneria spicata ssp. spicata</i>	140,000	Cool	Perennial bunchgrass	Yes	8 - 10	0	2	3	3	1	0	3	1	Yes
Pubescent wheatgrass, var. Luna	<i>Tinopyrum intermedium ssp. barbulatum</i>	100,000	Cool	Perennial, rhizomatus	No	12 - 14	1	2	3	3	0	1	3	2	Yes
Forbs															
Western yarrow	<i>Achillea millefolium var. occidentalis</i>	2,770,000		Perennial	Yes	Low - Wetland	2	3	2	1	0	1	3	1	Yes
Pacific aster	<i>Aster chilensis</i>	2,668,000		Perennial	Yes	Low - Moderate	2	3	3	3	3	1	3	2	Yes
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>	55,000		Perennial	Yes	Low - Moderate	0	2	3	2	0	1	3	1	Yes
Wild geranium	<i>Geranium viscosissimum</i>	52,000		Perennial	Yes	Low - Wetland	0	2	3	2	0	1	3	0	Yes
Northern sweetvetch, var. Timp	<i>Hedysarum boreale</i>	46,000		Perennial	Yes	Low - Moderate	2	2	3	2	1	2	3	1	Yes
Lewis flax, var. Maple Grove	<i>Linum lewisii</i>	170,000		Perennial	Yes	Low	1	3	3	2	1	1	3	2	Yes
Fernleaf biscuitroot	<i>Lomatium dissectum</i>	45,000		Perennial	Yes	Low - Moderate	1	3	3	3	1	1	2	3	Yes
Firecracker penstemon	<i>Penstemon eatonii</i>	400,000		Perennial	Yes	Low	2	3	2	0	0	0	3	1	Yes
Palmer penstemon	<i>Penstemon palmeri</i>	610,000		Perennial	Yes	Low	1	3	3	2	0	0	3	1	Yes
Small burnet	<i>Sanguisorba minor</i>	49,000		Perennial	No	Low	1	2	3	2	0	1	3	1	Yes
Gooseberry-leaf globemallow	<i>Sphaeralcea grossulariifolia</i>	500,000		Perennial	Yes	Low	3	3	2	1	0	1	3	1	Yes
Trees and Shrubs															
Utah serviceberry	<i>Amelanchier utahensis</i>	25,800		Perennial	Yes	10	2	2	3	1	0	0	3	1	Yes
Black sagebrush	<i>Artemisia nova</i>	907,200		Perennial	Yes	7	2	2	3	2	1	0	3	2	Yes
Low sagebrush	<i>Artemisia arbuscula</i>	972,000		Perennial	Yes	7	0	1	3	3	2	0	2	3	Yes
Mountain big sagebrush	<i>Artemisia tridentata ssp. vaseyana</i>	2,500,000		Perennial	Yes	11	0	2	3	2	0	1	3	1	Yes
Wyoming big sagebrush	<i>Artemisia tridentata ssp. wyomingensis</i>	2,500,000		Perennial	Yes	8	1	3	3	1	0	1	3	1	Yes
Fourwing saltbush	<i>Atriplex canescens</i>	52,000		Perennial	Yes	5	3	3	3	3	1	0	2	3	No
Shadscale	<i>Atriplex confertifolia</i>	64,900		Perennial	Yes	4	2	2	3	3	2	0	1	3	No
Forage kochia	<i>Bassia prostrata</i>	407,700		Perennial	No	5	1	3	3	3	2	0	3	3	Yes
Winterfat	<i>Krascheninnikovia lanata</i>	123,000		Perennial	Yes	5	2	3	3	2	1	0	3	3	Yes
Antelope bitterbrush	<i>Purshia tridentata</i>	15,000		Perennial	Yes	10	1	3	3	2	0	1	3	2	Yes
Mountain snowberry	<i>Symphoricarpos oreophilis</i>	54,700		Perennial	Yes	12	0	2	3	2	0	2	3	1	Yes

¹ Native indicates it is native to U.S., not necessarily indigenous to this area.

² Soil Adaption Codes - 0 = Not adapted; 1 = Marginal; 2 = Average; 3 = Best

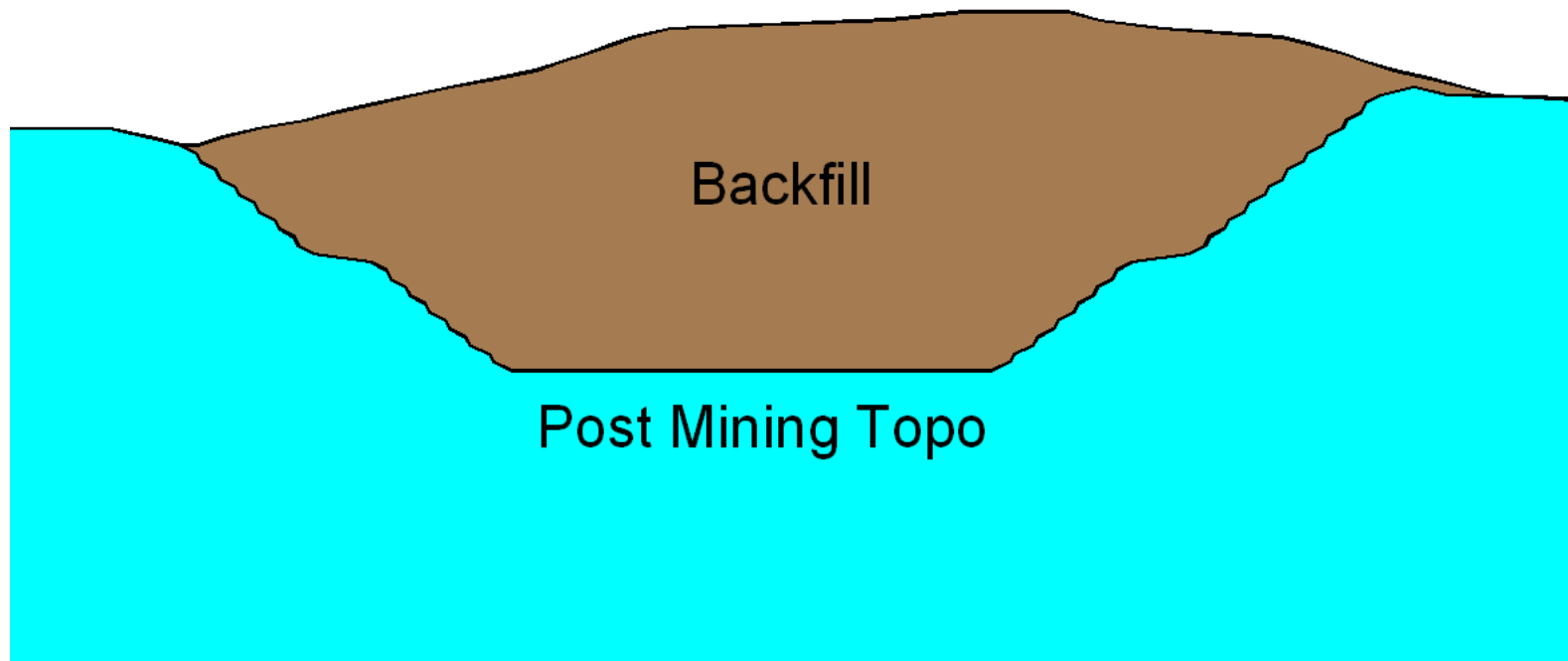
³ Soil texture C = Coarse; MC = Moderately coarse; M = Medium; MF = Moderately Fine; and F = Fine

⁴ Soil pH - A = acidic; N = Neutral; B = Basic

⁵ Mycorrhizal dependent - Yes = this species are dependent on mycorrhizal fungi for sustainability. This may be important where alluvium or Carlin type material is being used as growth media, but may not be as important where stockpiled salvaged soil or direct haul soil is being used for reclamation.

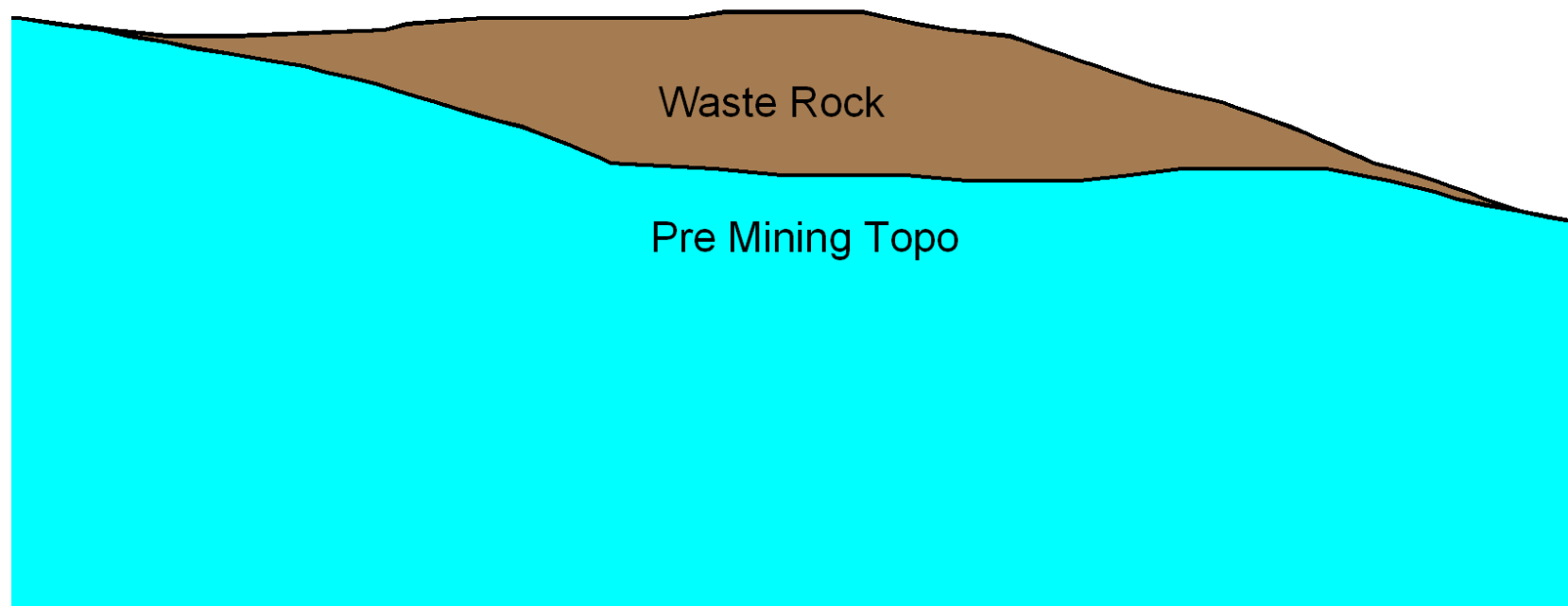
Habitat Management Practice 3:
Technique Diagrams for Reclamation

Post Mining Reclamation and Design Techniques



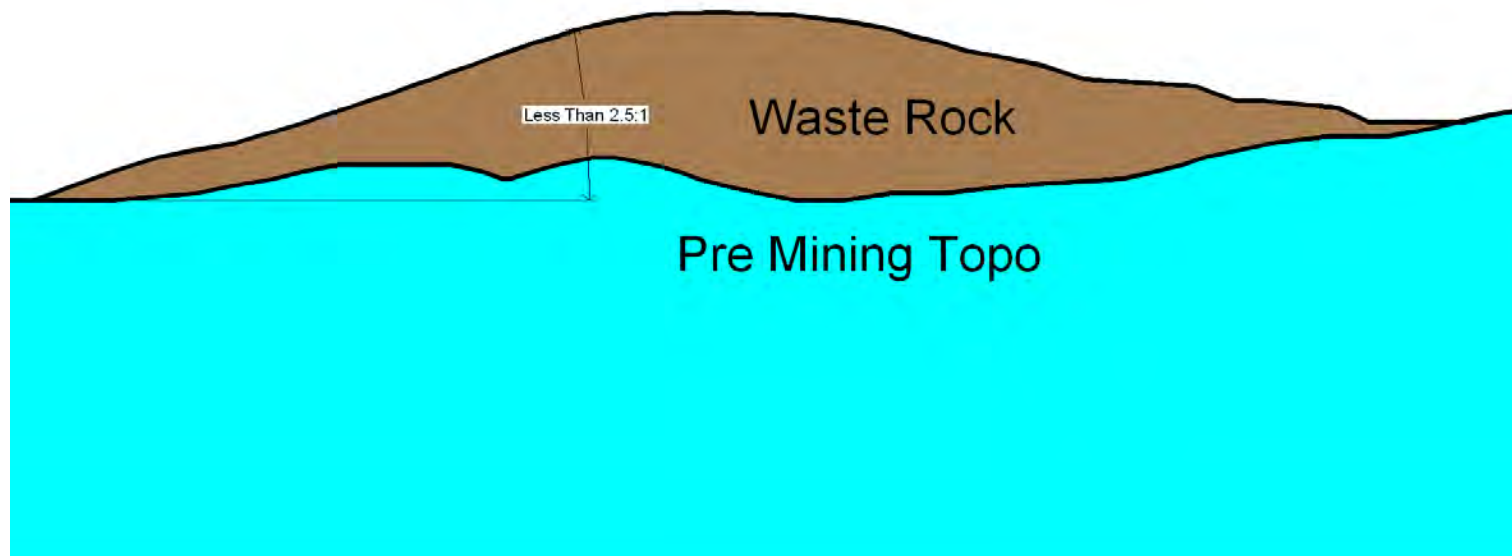
- When possible, backfill pits to eliminate barriers to deer movement.
-

Post Mining Reclamation and Design Techniques



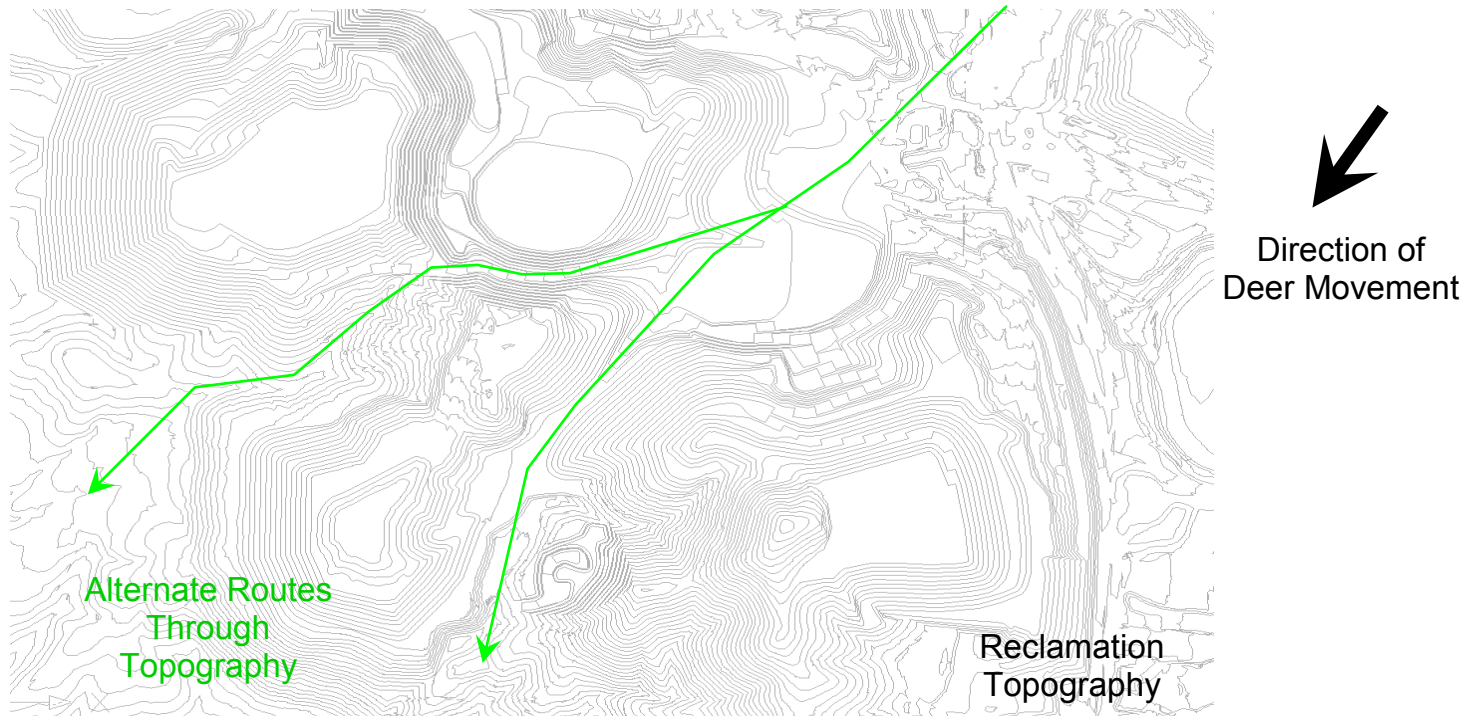
- When building WRDFs, extend natural landforms and utilize existing topography for stability.

Post Mining Reclamation and Design Techniques



- Slope and re-grade WRDFs to less than 2.5:1
- Incorporate undulations and non-linear features into slopes

Post Mining Reclamation and Design Techniques



- Utilize topography to facilitate deer movement.
- Attempt to orient facilities in the direction of deer migration rather than across deer migration routes

Clydesdale WRF: Example of utilizing natural landforms to enhance reclamation design.

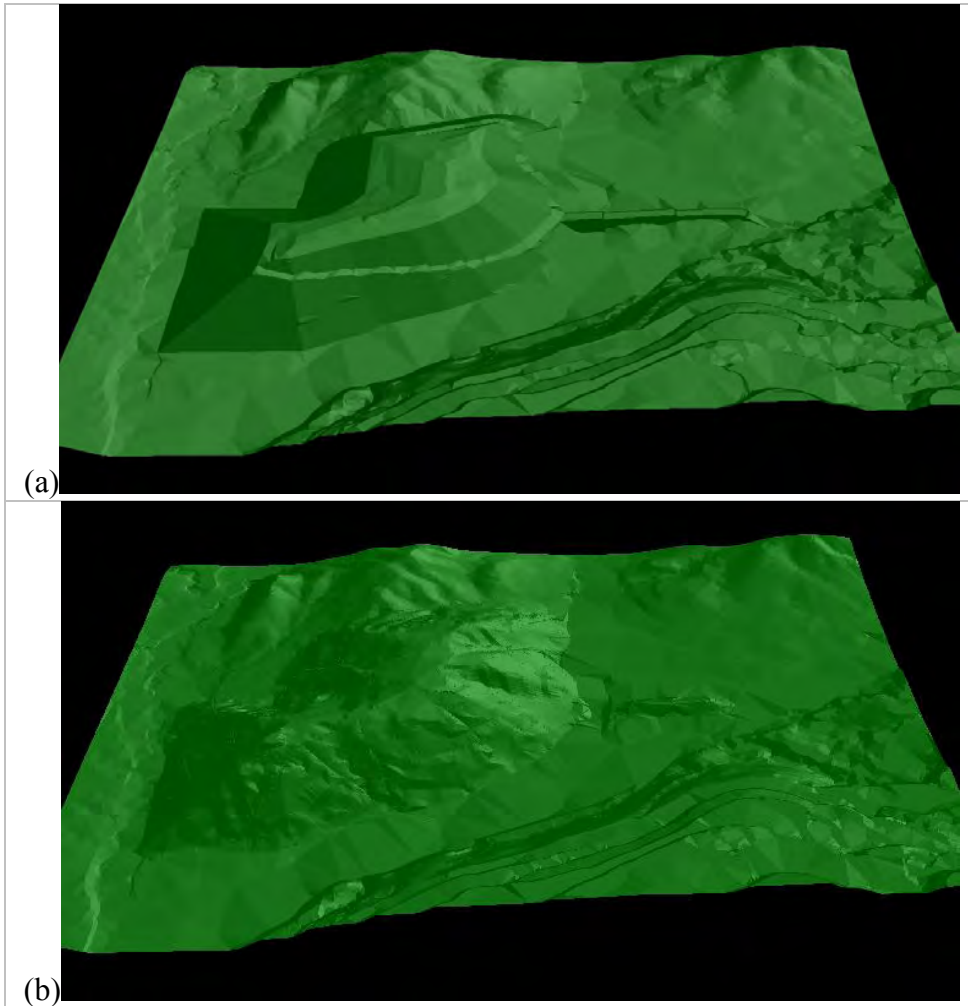


Figure (a): Clydesdale design, “post placement” reclamation approach, (b): Proposed Clydesdale design; visible drainage network and integration with original ground to the north.

Habitat Management Practice 4:
Identification of Migration Impediments

A Method to Identify Migration Impediments

A migration impediment has been defined by this group as, “any obstacle that slows, deters, or prevents a deer from passing or crossing during its migration.” Several such impediments currently exist within Area Six, both within and beyond the boundaries of mine operations areas.

The modification of existing impediments will facilitate deer movement. However, such impediments must first be identified before remedial action can be undertaken. This HMP provides a methodology for the identification of mule deer migration impediments.

1. Gather the necessary physical information and data.
 - Obtain existing aerial photography from both public and private entities.
 - Obtain the pertinent GIS layers on habitat types, facility locations, migration corridors, and any other layers that may be relevant to develop an ArcView project for migration impediments

2. Share and discuss the above listed information with all stakeholders, public and private, at the annual stakeholders meeting.
 - Create a series of maps using both aerial photos and GIS data
 - Consult agency biologists to determine which obstacles are impediments to deer migration
 - As a group, identify which of these impediments may or may not be modified to facilitate deer movement.

3. Conduct interdisciplinary field trips with representatives from all stakeholders.
 - If some obstacles cannot be determined as impediments to migration from maps alone, use these field trips to visit those sites
 - Use these field trips to visit identified impediments and determine a specific improvement goal for the obstacle.

Habitat Management Practice 5:

Habitat Guidelines for Mule Deer
Western Association of Fish and Wildlife
Agencies 2009

[http://www.muledeerworkinggroup.com/Docs/IMW Mule Deer Habitat Guidelines.pdf](http://www.muledeerworkinggroup.com/Docs/IMW_Mule_Deer_Habitat_Guidelines.pdf)

Appendix 1

Historic Overview of Area Six Deer Herd

Historic Overview of the Area Six Deer Herd

Population Trend:

The long-term trend of the Area 6 Deer Herd has been in a steady decline for the past 37 years (Figure 1 below). Historic buck harvest provides the most consistent database to evaluate long-term trend. From 1956 through 1973, the buck harvest never dipped below 2,000 bucks. From 1974 through 2006, the buck harvest was above the 2,000-harvest mark only twice. In 1988, when most of the state was experiencing all time record buck harvest, Area 6 was 25% lower than the record harvest experienced in 1961. The trend of the buck harvest has decreased by 76% when comparing the first ten years (1956-1965) with the last ten years (1999-2008).

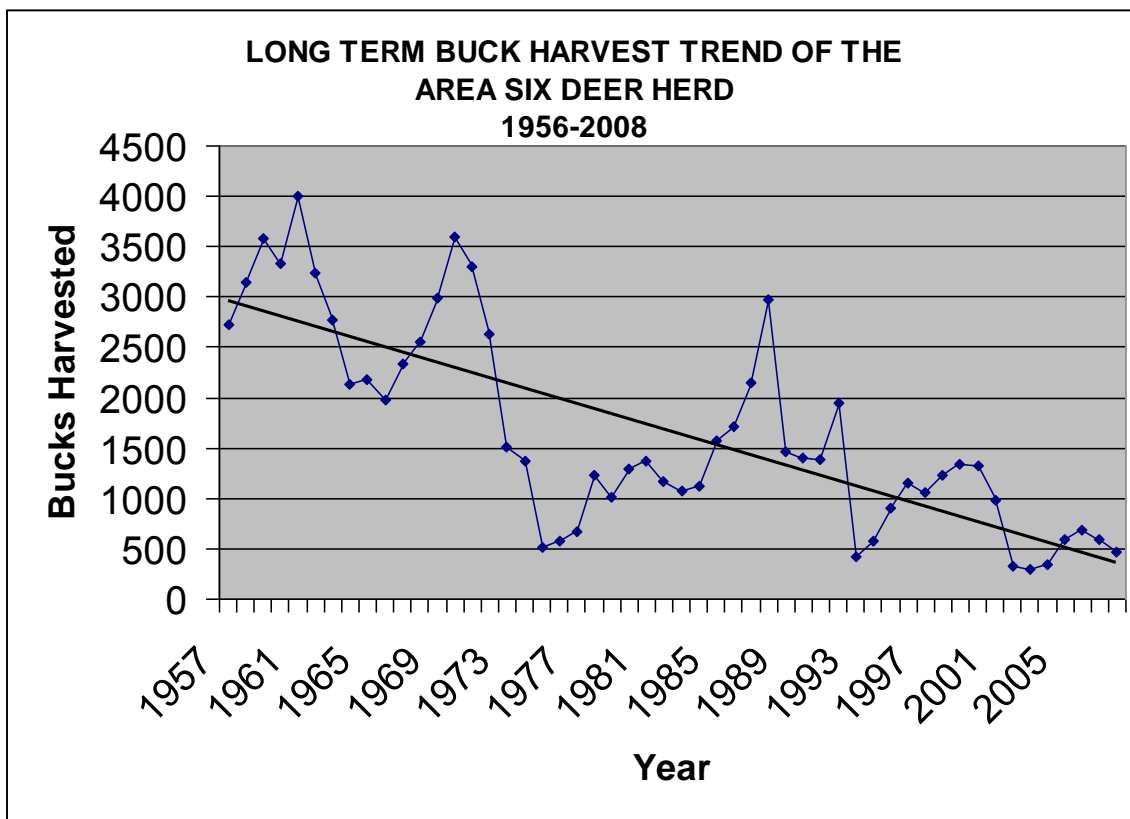


Figure 1. The long-term buck harvest trend of the Area 6 Deer Herd.

Radio Collar Data:

From December of 2006 through June of 2009 eight deer have been captured and fitted with GPS satellite radio collars within the South Tuscarora Range. The following is a summary of the movements of each of these deer:

COLLAR 159.449 (72082)

This doe was captured in the Dunphy Hills on December 14, 2006. Within a week, she moved 25 miles to the north, crossing through the mines using the east side corridor and

resided in Little Jack Creek drainage until January 14, 2007 when she returned to the Dunphy Hills via the same route. She remained in the Dunphy Hills until March 21, 2007. She then proceeded to move north through the heavy mining area on the east side of the Tuscarora Range along the Pete Pit migration area and again spent some time in the Little Jacks Creek area. On April 14th she proceeded north along the west side of the South Tuscarora Range then crossed the upper end of Independence Valley. She moved through the southeast end of the north Tuscarora Range in the area of Mount Blitzen and then proceeded to the Bull Run Mountains. From the south end of the Bull Run Mountains she traveled through Columbia Basin and through the McCall Creek area. She then crossed Highway 225 on May 31, 2007 and ended up in a small canyon along the East Fork of the Owyhee River on the Owyhee Indian Reservation. She has remained in this same area through June 30, 2007. This deer traveled over 117 miles from the time she left the Dunphy Hills in March until she reached her fawning area in June. This deer also traveled through excellent summer habitat throughout her journey. The winter range this deer was captured at was not the closest range available to her.

Deer # 79912 This doe was trapped and collared on the west side of Richmond Mountain in Unit 068 on December 14, 2007. On December 15th this deer migrated along the west side of the South Tuscarora Range and arrived in the Dunphy Hills on December 16th. She then crossed Interstate 80 just south of Dunphy on December 17th and ended up in Whirlwind Valley on the southeast side of the Argenta Rim. By January 1, 2008 this doe had crossed Interstate 80 and moved to the Dunphy Hills. It should be noted that the entire southeastern portion of the Argenta Rim had burned in the summer of 2007 and no forage remained in this area. She remained in the Dunphy Hills until February 17th when she again crossed the Interstate and moved into Whirlwind Valley. She remained on the southeast side of the Argenta Rim until April 27th. She then crossed Interstate 80, moved through the Dunphy Hills and to the west side of Richmond Mountain. On April 30th, she moved through the mining activity moving traveling through the Carlin Mine migration area. She continued along the west side of the Tuscarora Range and then moved up and over the top to the east side of the range and ended up in the Middle portion on the south side of Little Jack Creek. She remained in this area though June 30, 2008.

Deer # 79916 This doe was captured within the north fork of Brush Creek on the west side of the South Tuscarora Range (Unit 068) on December 14, 2007. From December 14th through December 20th she moved approximately 11 miles to the south following the lower portion of the South Tuscarora Range. During the week of December 21st she moved through the mining activity from north to south through the Carlin Min migration area and then turned to the west of the mines. On December 31st she moved north and then west in the lower Rodeo Creek area and ended up on the northern portion of the Sheep Creek Range about a mile south of Bootstrap Mine. She remained in this are until the first week of February when heavy snow loads forced her south to the Rock Creek Fields on the west side of Boulder Valley. She remained in this area until March 23rd and then moved just to the west of Dee Gold Mine where she stayed until May 5th. She then moved to the east between Dee Gold and the Rossi Mine and then up the west side of the

South Tuscarora Range and settled into the head waters of Indian Creek where she has remained through June 30, 2008.

Deer # 79917 This doe was captured in upper Little Jack Creek in Unit 068 on December 14, 2007. She remained in Little Jack Creek until December 29th when she quickly moved through the mining activity through Carlin Mine migration area. She was moved on the west side of Richmond Mountain and was in the Dunphy Hills by January 2, 2008. This deer wintered in the northwest Dunphy Hills until April 2, 2008. From April 2nd to April 4th she migrated to the mining area in Little Boulder Valley. Between April 4th and April 5th she moved through the mining area using the gap just to the west of the Carlin Mine. By April 8th she was in upper Brush Creek. She then moved into the upper Little Jack drainage during the first of May and has remained in this area through June 30, 2008.

Deer # 89579 This doe was trapped in the middle of the Dunphy Hills in Unit 068 on December 14, 2007. She remained in the Dunphy Hills until March 1st. She then moved to the north side of Mary's Mountain which she occupied until March 12th when she moved to Richmond Mountain. On April 7th she crossed the Carlin Trend mining activity via the Pete Pit migration area and continued a few miles north into the Cottonwood drainage where she lived until April 23rd. She then moved quickly along the eastern base of the South Tuscarora Range crossed Highway 226 in Taylor Canyon and then dropped onto the western side of the Independence Range. She crossed over the Independence Range in the vicinity of Jerritt Canyon and ended up in the lower portion of California Creek on April 30th. From April 23rd to April 30th this deer moved 41 miles in seven days. From May 1st through June 30th, which includes the fawning period, this deer has remained in the lower portion of California Creek.

Deer #79918 This doe was captured and collared about two miles northwest of the Barth Pit in Unit 068 on January 6, 2009. She remained in this area using Emigrant Pass Ridge and Stonewall Canyon area until April 18th. She then moved due east and crossed Highway 278 and spent approximately 10 days around Cole Canyon in Unit 065. On April 30th she crossed Highway 278 back to the west and spent four days just south of Palisade. She then crossed back to the east of Highway 278 on May 5th and then proceeded north crossing Interstate 80 somewhere west of Carlin. The collar did not send a signal for four days, so the exact location of the crossing cannot be determined. On May 10th this doe was on the west side of Swales Mountain. She then continued north along the western flank of the South Independence Range. On May 15th she arrived in Taylor Canyon and has remained there through June 30th. She appeared to be fawning in the willows along Taylor creek. She traveled about 55 miles from her winter range to her summer range.

Deer # 89577 This doe was trapped on the west side of Mary's Mountain (Unit 068) on January 6, 2009. The following day she moved south and crossed Interstate 80 in the upper portions of Bobs Flat. She moved to the Humboldt River below Beowawe and stayed along the river for three days. She then moved east and crossed Highway 306. She again moved to the Humboldt River approximately five miles below Barth Pit where

she spent most of her time until the first of March. She then spent the month of March and the first 23 days of April between the Humboldt River and Interstate 80 in the area of Emigrant Canyon. On April 23rd she crossed Interstate 80 on the west side of Emigrant Summit and proceeded along the western flank of the South Tuscarora. On April 25th she was at the southwest edge of the Pete Pit. She then headed in a westerly direction skirting the mining activity until she came to the Carlin Mine migration area where she crossed the Carlin Trend on April 26th. Once she cleared the mining activity she moved back to the eastern side of the mountain, just north of the mine access road. She remained in these hills until May 6th when she moved north along the eastern flank of the South Tuscarora Range. On May 9th she crossed Highway 226 in the Taylor Canyon area and ended up in the upper reaches of Pie Creek where she has remained through June 30th.

Deer # 79911 This doe was trapped on the eastern ridge of the Dunphy Hills (Unit 068) on January 6, 2009. On January 9th she crossed Interstate 80 just east of the Beowawe rest area and then crossed Highway 306 where she utilized the hills just east of Highway 306. On January 22, she moved west of Highway 306 and lived in the hills just south of the interstate through January 31st. On February 1st she moved back to the hills on the east side of Highway 306 and remained there through April 12th. She crossed Interstate 80 just east of the Beowawe interchange and moved rapidly north along the western flank of the South Tuscarora Range. On April 22nd she moved through the Carlin Trend using the Pete Pit migration area. She continued north along the east side of the South Tuscarora Range to the southern fork of Coyote Creek where she has remained through June 30th.

Issues:

The Mule Deer Habitat Management Plan focuses on deer units 064, 067, and 068 (See Map 1.) Crucial deer habitat, especially winter range, has particularly been impacted in Unit 068. The following are the most significant issues impacting this segment of the Area Six deer herd and have driven the development of this plan:

- Range fires have eliminated over 90% of the low elevation sagebrush habitat in Unit 068, where deer depend to survive the winters. It is estimated that the southern winter ranges once supported up to 60 to 70 percent (an estimated 18,000 deer) of the Area 6 Deer Herd during moderate to severe winters. Once these low elevation areas burned, cheatgrass and other non-native weeds dominate the site and preclude the reestablishment of the native vegetation that deer are dependent on for winter survival. There are areas that burned over 40 years ago that are still dominated by cheatgrass and other weeds. Not only is cheatgrass a poor forage for deer it also provides no thermal protection for deer.
- The deer migration corridors within the southern portion of the Tuscarora Range have been constricted. The majority of deer now move through two areas, the Pete Mine area and the existing sagebrush below the Carlin Mine tailings dam (See Map 2).

- Hundreds of miles of fence have been constructed within units 067 and 068 during the past seven years. Most of these fences have been associated with fencing of the burns but fencing has also occurred with mining construction and urbanization. In addition, many fences were built decades ago when fence specifications to address deer movement were nonexistent. A healthy deer appears to have no problem negotiating most fences. However, when deer are in a weakened condition, (i.e., returning from poor quality winter ranges) fences can kill deer as they entangle themselves in them or break legs as they hit them. However, it is believed that the indirect mortality associated with fences is much higher. Deer, already in poor condition, expend significant energy trying to go through the numerous fences they are required to negotiate as they migrate.
- The expansion of several weed species into important deer habitat is of great concern. Weeds such as white top, Russian Knap weed, camel-thorn, and scotch thistle are a few weeds that are spreading into both the riparian and upland communities. These weeds are a real threat to the displacement of native vegetation vital to deer survival.
- Inappropriate use can have a negative impact on winter habitat and transitional range, particularly on the forage kochia and the bitterbrush components. In some cases, the usable forage kochia is being completely utilized by cattle, leaving little forage for deer during the winter.

Appendix 2

**Map 1 – Game Management Units 064, 067,
068**

**Map 2 – Carlin Trend Mining Area and
Migration Routes**

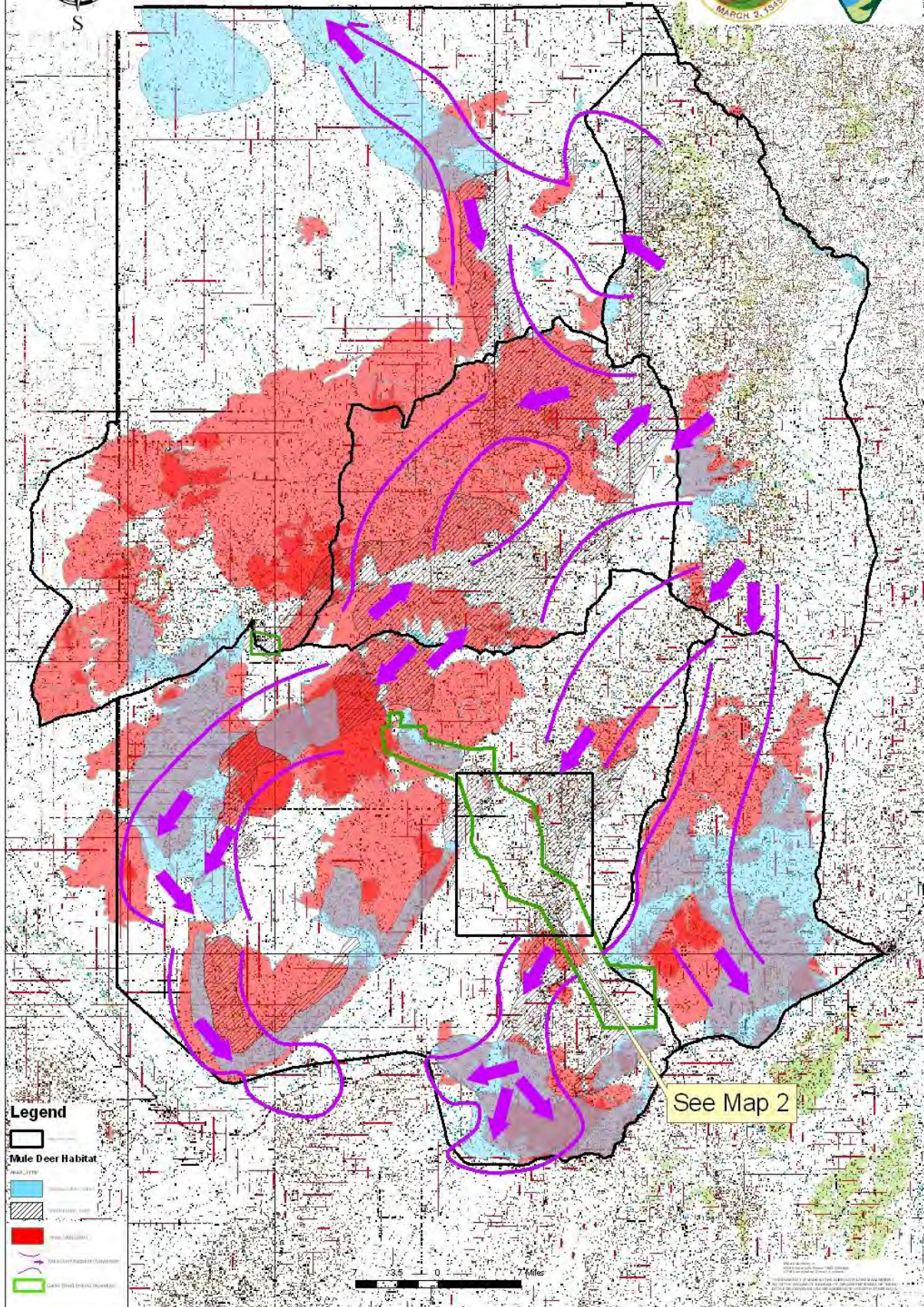
**Map 3 – Pete Pit and Carlin Mine Area
General Deer Movement Routes**

**Map 4 – Mule Deer Migration Based on
Satellite Telemetry**



Area 06 Mule Deer Herd Management Area

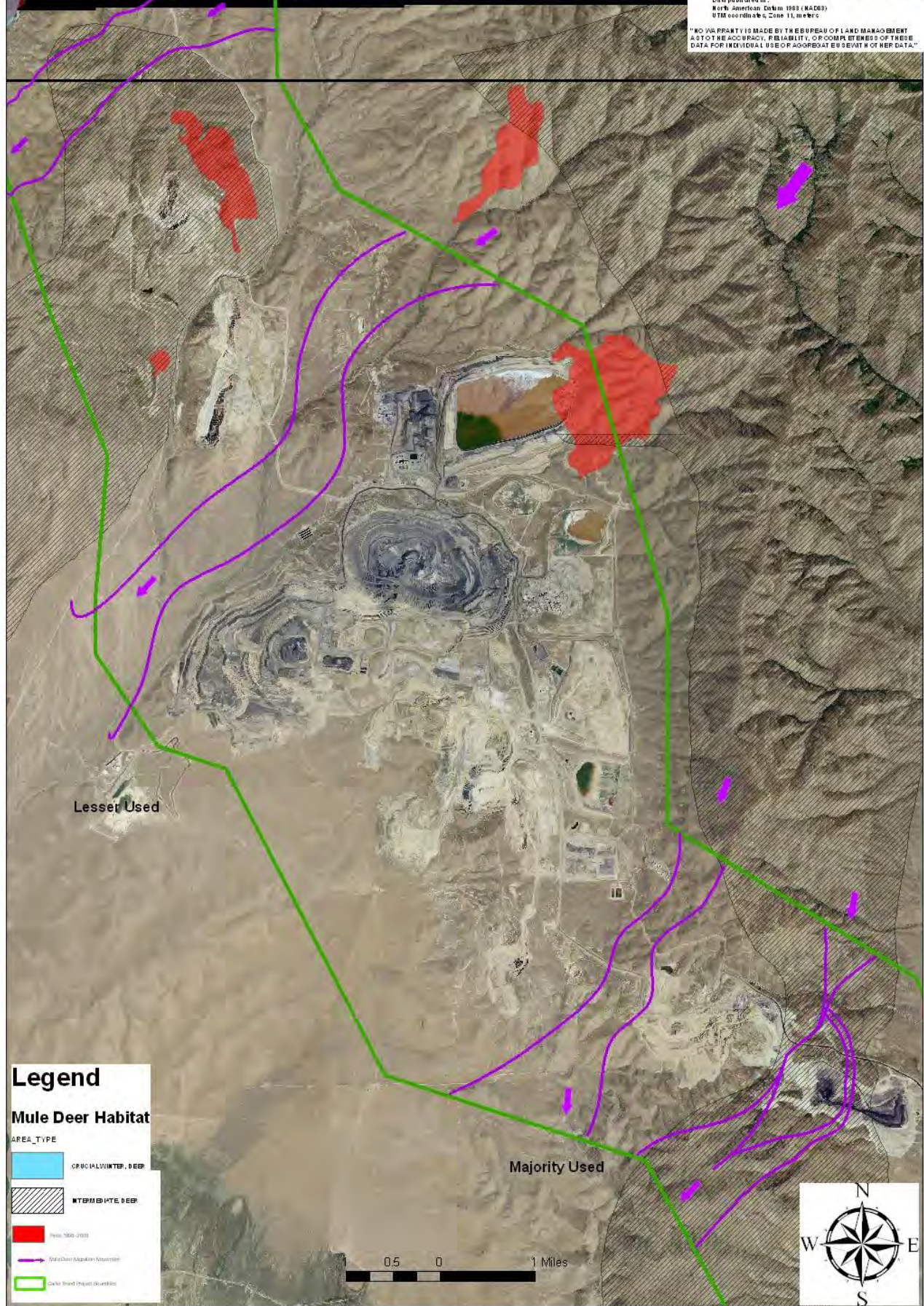
Map 1



**Area 06 Mule Deer Herd Management Area
Trend Existing Corridors
Map 2**



Date published in:
North American Datum 1983 (NAD83)
UTM coordinate, Zone 11, meters
"NO WARRANTY IS MADE BY THE BUREAU OF LAND MANAGEMENT
AS TO THE ACCURACY, RELIABILITY, OR COMPLETENESS OF THESE
DATA FOR INDIVIDUAL USE OR AGGREGATE USE OF THESE DATA."

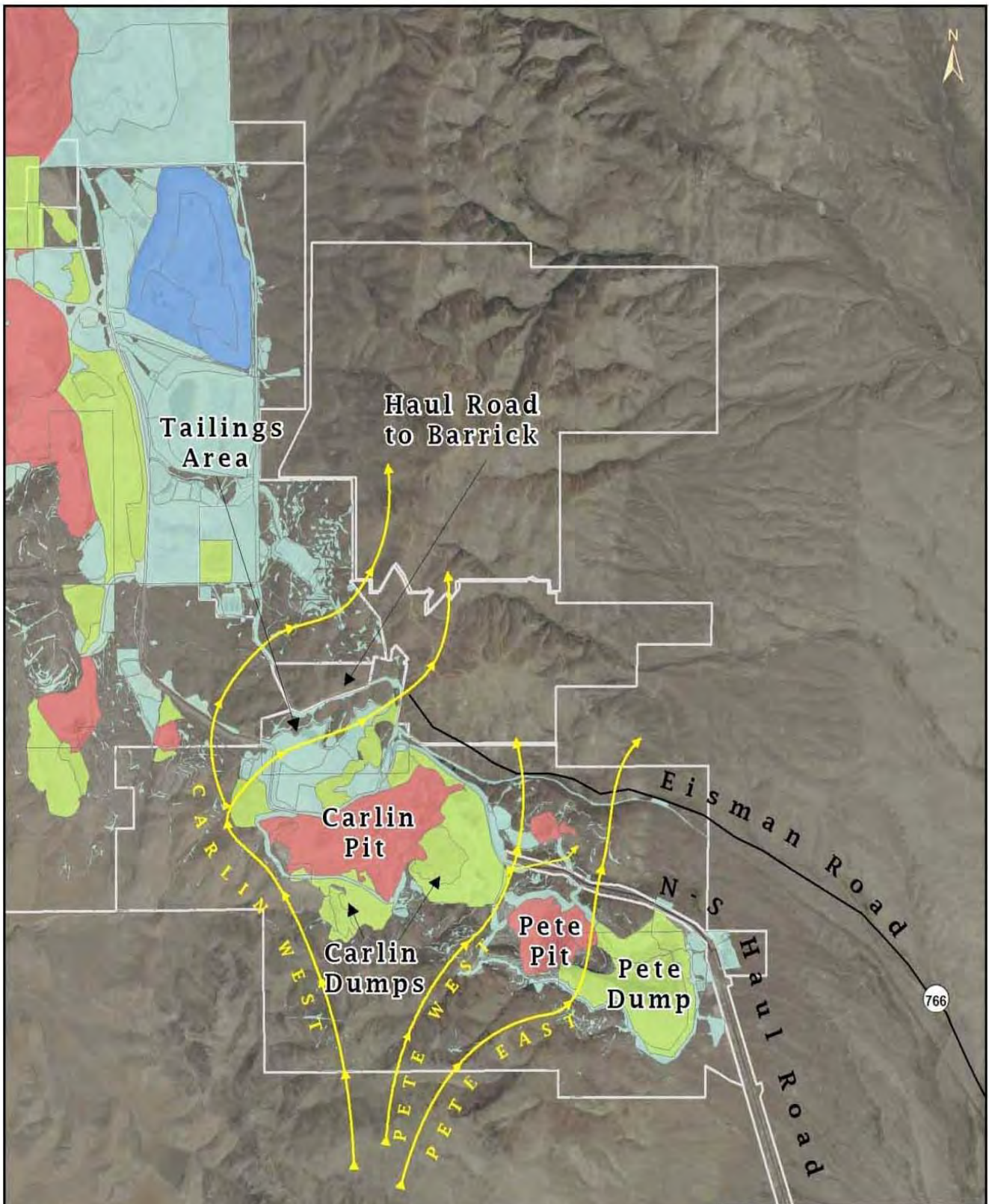


Legend

Mule Deer Habitat

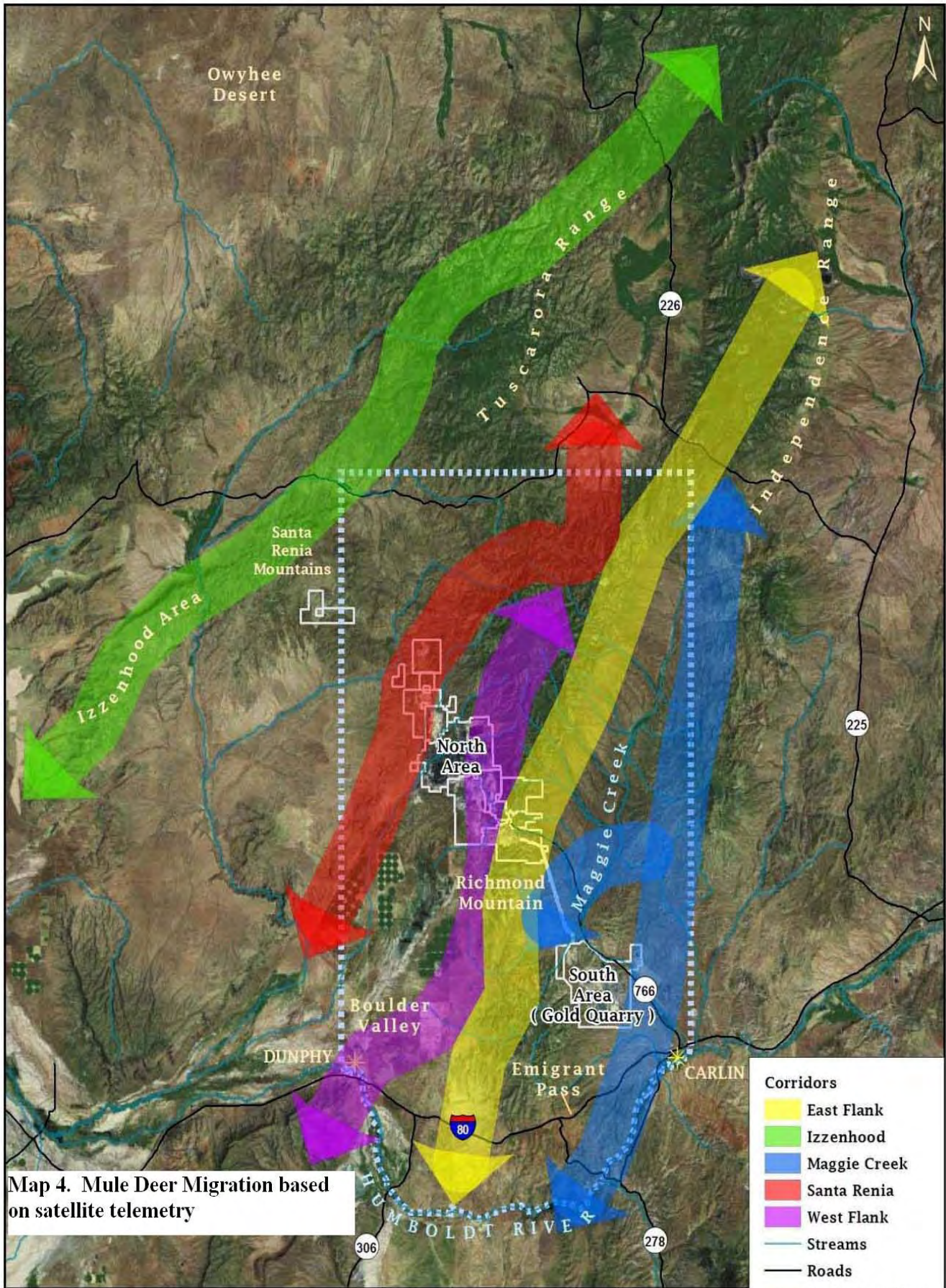
AREA_TYPE

- CRUCIAL WINTER DEER
- INTERMEDIATE DEER
- 1980-2000
- Mule Deer Migration Corridor
- Other Trend Existing Corridor



Map 3. Pete Pit and Carlin Mine Area General Deer Movement Routes

-  Deer Movement Routes
-  Ancillary Facility
-  Leach Pad
-  Pit
-  Waste Rock Dump
-  Plan Boundaries



Map 4. Mule Deer Migration based on satellite telemetry

Corridors

- East Flank
- Izenhood
- Maggie Creek
- Santa Renia
- West Flank
- Streams
- Roads
- Study Boundary
- Plan Boundaries

Appendix 3

Annual Habitat Management Plan Meeting Sample Agenda

Annual Carlin Trend Mule Deer Habitat Management Plan Meeting

Sample Agenda and Framework

Opening:

Brief description of the purpose of the meeting.

Deer migration update and population estimates.

Introductions:

Information Sharing:

Habitat Conditions and revised maps:

Migration Corridors

Winter Range

Critical Habitat

Fire Issues and Rehabilitation

Grazing

Weed Control

Mining Issues: Barrick and Newmont

Existing Operations

Reclamation activities

Future Projects

Other Stakeholder Issues

HMP review and effectiveness.

Discussion of completed remediation, reclamation, and restoration.

Discussion of future work to be completed

Field Trips – Scheduled before the annual meeting

Visit mine sites and look at existing impediments to deer movement, areas for improvement, reclamation efforts.

Visit and evaluate condition of Winter Range.

Visit successfully enhanced areas.

Visit areas that actions were not successful.

Suggested List of Attendees:

BLM – wildlife biologists, geologists, range specialists

NDOW – habitat and big game biologists

Barrick – environmental engineers, reclamation specialists, mine engineers and others involved in design and reclamation

Newmont - environmental engineers, reclamation specialists, mine engineers and others involved in design and reclamation

Any Additional stakeholders interested in attending the meeting

Appendix 4

Specialist Contact List

Specialist Contact List

Agency	Title	Name	Phone Number	Email Address	Area of Expertise
Nevada Department of Wildlife	Supervisory Habitat Biologist	Steve Foree	775-777-2306	sforee@ndow.org	habitat, big game
Nevada Department of Wildlife	Big Game Biologist	Ken Gray	775-777-2322	kgray@ndow.org	Area 6 big game
Nevada Department of Wildlife	Mining Biologist	Katie Miller	775-777-2368	kmiller@ndow.org	habitat, reclamation, wildlife
Bureau of Land Management	Supervisory Natural Resources	Wendy Fuell	775-753-0262	wendy_fuell@blm.gov	range resouces, grazing
Bureau of Land Management	Wildlife Biologist	Nycole Burton	775-753-0350	nycole_burton@blm.gov	wildlife
Bureau of Land Management	Hydrologist	Mark Dean	775-753-0224	mark_dean@blm.gov	air, water, soils
Bureau of Land Management	Geologist	Kirk Laird	775-753-0272	kirk_laird@blm.gov	geology, NEPA
Bureau of Land Management	Archeologist	Bill Fawcett	775-753-0278	bill_fawcett@blm.gov	archeology
Bureau of Land Management	Emergency Stabalization and Rehabilitation	Tom Warren	775-753-0355	tom_warren@blm.gov	fire rehabilitation, seedings
Bureau of Land Management	Range Specialist	Scott Standfill	775-753-0261	scott_standfill@blm.gov	range resources
Bureau of Land Management	Range Specialist	Karl Scheetz	775-753-0280	karl_scheetz@blm.gov	range resources
Agency	Title	Name	Phone Number	Email Address	Area of Expertise

Barrick North America - Goldstrike	Environmental Department Manager	Joe Giraudo	775-778-8140	jgiraudo@barrick.com	Mine site environmental management
Barrick North America - Goldstrike	Senior Project Engineer	Clark Burton	775-778-8244	cburton@barrick.com	Tailings facilities, reclamation and closure
Barrick North America - Goldstrike	Environmental Engineer	Krysta Paudyn	775-778-8319	kpaudyn@barrick.com	Reclamation, bioremediation, potable and waste water
Newmont Corp. - North America	Environmental Director	Jeff White	775-778-2519	jeff.white@newmont.com	North American Operations Environmental Manager
Newmont Corp. - Carlin Trend Properties	Environmental Coordinator	Beth Ericksen	775-778-4587	beth.ericksen@newmont.com	Compliance
Newmont Corp. - Carlin Trend Properties	Mine Engineer	Eric Bates	775-778-4341	eric.bates@newmont.com	Mine design
Newmont Corp. - Carlin Trend Properties	Mine Engineer	Alyson Boye	775-778-4077	alyson.boy@newmont.com	Mine design

Appendix 5

Grazing Information for Area Six

Grazing Information for Area Six

Number	Allotment Name	Season of Use	Total Acres	Public Acres	Private Acres	Area 06 Habitat	Total Acres	Total Public Acres
1	ANDRAE LIME MOUNTAIN FIELD	4/1 - 6/30	19004.2	17102.7	1901.4	Migration	50999.9	36541.7
1	MORI	4/16 - 7/11	19717.6	8836.2	10766.3	2 Migration		
1	SIX MILE	3/1 - 9/30	11251.2	9753.6	1497.6	Migration		
1		4/20 - 6/10	1026.9	849.2	177.7			
2	ANDRAE	4/1 - 6/30	19004.2	17102.7	1901.4	Migration	57946.8	41211.9
2	CORNUCOPIA LIME MOUNTAIN FIELD	4/1 - 8/8, 5/1 - 2/28	19225.0	15273.0	3952.0			
2		7/1 - 10/30	19717.6	8836.2	10766.3	2 Migration		
3	ANDRAE	4/1 - 6/30 H, 7/1 - 9/30, 5/1 - 11/4	19004.2	17102.7	1901.4	Migration	544213.2	398471.3
3	ELEVEN MILE FLAT	4/1 - 4/20 S, 11/1 - 11/30, 11/4 - 2/15	62245.3	27089.1	35155.8			
3	SPANISH RANCH	3/25 - 10/31, Yearly	189204.9	142173.6	47515.7			
3	SQUAW VALLEY	4/8 - 7/15, 10/21 - 11/20	273758.8	212105.9	59471.4	6 Migration,C Winter		
4	BLUE BASIN	4/1 - 11/15	50878.2	37700.8	13250.0	5 Migration,C Winter	50878.2	37700.8
5	BOULDER FIELD	3/1 - 5/31	11894.0	6135.7	5758.2	Crucial Winter	124472.4	64110.8
5	TAYLOR CANYON	4/16 - 9/15 H	13801.1	8672.1	5129.0			
5	TUSCARORA	3/1 - 2/28 H, 3/1 - 12/15	98777.3	49303.0	49257.1			
6	CARLIN CANYON FFR	5/1 - 6/15	3085.0	1022.1	2062.9	Crucial Winter	182766.3	52794.6
6	CARLIN FIELD	4/1 - 12/20	23283.7	18797.9	4485.8	Crucial Winter		
6	HADLEY	5/1 - 12/20	96641.2	27323.4	69314.4	2 Migration,C Winter		
6	MCKINLEY FFR	4/1 - 11/29	59756.4	5651.2	54385.7	3 Migration,C Winter		

7	EAGLE ROCK	4/1 - 10/31 H, 3/1 - 2/28 CU	38309.0	27685.0	10623.7		49545.8	33231.1
7	FOX SPRINGS	4/1 - 9/30	8904.4	3259.3	5645.1			
7	QUARTER CIRCLE S	3/1 - 2/28 CU, 4/1 - 8/1	2332.4	2286.9	45.5			
8	ELEVEN MILE FLAT	4/1 - 4/30	62245.3	27089.1	35155.8		336004.1	239195.1
8	SQUAW VALLEY	3/16 - 11/30, 3/1 - 2/20 CU	273758.8	212105.9	59471.4	6 Migration,C Winter		
9	MARYS MOUNTAIN	2/15 - 10/31	34985.6	15808.0	19177.6	Crucial Winter		
9	HORSESHOE	Yearly	27746.7	14014.1	13732.6	Crucial Winter 6 Migration,C		
9	T LAZY S	2/15 - 11/30, 3/1 - 2/28 FFR	176851.2	68797.4	108078.2	Winter		

Number	Allotment Name	Season of Use	Total Acres	Public Acres	Private Acres	Area 06 Habitat	Total Acres	Total Public Acres
10	LITTLE HUMBOLDT	4/4 - 1/31 CU, 4/16 - 10/15	84064.2	68880.0	15184.2	Crucial Winter	84064.2	68880.0
11	OWYHEE	3/1 - 11/30, 3/1 - 12/15 H	374513.8	370300.6	4248.9	Crucial Winter		
12	MIDAS	3/1 - 2/28 CU, 5/10 - 10/9	6912.9	3992.6	2920.4		6912.9	3992.6
13	25 ALLOTMENT	3/1 - 2/28	517065.4	309390.6	214693.4	10 Migration,C Winter	517065.4	309390.6
14	ADOBE	4/16 - 10/15	3328.6	2484.3	844.2	Crucial Winter 5 Migration,C Winter	3328.6	2484.3
15	BLUE BASIN	4/1 - 11/15	50878.2	37700.8	13250.0		50878.2	37700.8
16	TAYLOR CANYON	4/16 - 10/15	13801.1	8672.1	5129.0		13801.1	8672.1
17	PALISADE	4/1 - 12/31	21183.4	10635.0	10548.4	Crucial Winter	21183.4	10635.0
18	LONE MOUNTAIN	4/15 - 11/15	51324.5	32927.8	18396.4	Migration,C Winter	51324.5	32927.8
							657581.2	401810.6
H = Horses, CU = Custodial S = Sheep, FFR = FFR								

Appendix 6

Glossary of Terms

Glossary of Terms

Back burns - Back burning is a way of reducing the amount of flammable material during a fire by starting small fires along a man made or natural firebreak in front of a main fire front. It is called back burning because the small fires are designed to 'burn back towards the main fire front'. The basic reason for back burning is so that there is little material that can burn when the main fire reaches the burnt area. The firebreaks that may be used to start a line of fires along could be a river, road, or a bulldozed clearing. This method of fire control can increase the total acreage of land impacted by fire and reduce available habitat for wildlife.

Carlin Trend – The mining district and geographic area northwest of Carlin, NV in the southern Tuscarora Mountain range, which contains the largest Carlin-type gold reserves in the world.

Concurrent – An adjective used to describe ground disturbing or reclamation activity that is occurring or existing simultaneously or in close proximity to other ground disturbing or reclamation activity.

Crucial migration/movement corridor - Movement Corridors that are constricted and no reasonable alternatives are available to migrating animals.

Crucial mule deer winter range - Winter ranges that are vital or crucial to the continued existence of the population during moderate to severe winters.

Habitat management practices – Similar to Best Management Practices. These are a suite of techniques that guide or may be applied to management actions to aid in achieving desired outcomes to a given habitat type or area.

Historic fire - A Bureau of Land Management classification of fire activity. It refers to a fire that has occurred more than two years from today's date. It is ineligible for emergency stabilization funding. It is eligible for rehabilitation and restoration funding.

Hydrogeomorphology – The science relating to the study of geographical, geological, and hydrological aspects of water bodies and changes of these in response to flow variations and to natural and human caused events.

Management Unit 064 – Those portions of Elko and Eureka Counties bounded on the north by State Route No. 226, on the east by State Route No. 225, on the south by the northernmost railroad track that runs from Elko to Winnemucca, and on the west by the Maggie Creek Road from Carlin to its junction with State Route No. 226.

Management Unit 067 – That portion of Elko County bounded on the east by State Route No. 226, on the south by the Midas-Willow Creek Reservoir-Tuscarora Road, and on the west and north by the Scrapper Spring-Deep Creek Road.

Management Unit 068 – Those portions of Elko, Eureka and Lander Counties bounded on the east by State Route No. 226 and the Maggie Creek Road, on the south by the northernmost railroad track that runs from Elko to Winnemucca, on the west by the Humboldt County line, and on the north by the Midas-Willow Creek Reservoir-Tuscarora Road.

Migration impediments – Any obstacle that slows, deters, or prevents a deer from passing or crossing during its migration.

Migration/movement corridor - A corridor used by animals to move or migrate between seasonal ranges; movement corridors are not necessarily exclusive of seasonal ranges.

New disturbance – For deer, new disturbance is any surface disturbing activity that alters existing habitat or impairs deer movement and usability.

Perennial grass – Any grass that lives for more than two years. Perennials grow over the spring and summer and then die back every autumn and winter, then return in the spring from their root-stock rather than seeding themselves as an annual plant does.

Reclamation – For deer, an area within transitional habitat may be considered “reclaimed” if it has been recontoured to allow for deer movement and seed has been applied. This definition is separate and distinct from the definition of “reclaimed” for bond release purposes.

Recent fire – A Bureau of Land Management classification of fire activity. It refers to a fire that has occurred within the past two years from today’s date. These fires are eligible for emergency stabilization funding.

Riparian area – The area of interface between land and stream. Plant communities along these margins are classified by hydrophilic vegetation.

Appendix 7

Revegetation Techniques and Tools

Revegetation Techniques and Tools

There are several revegetation techniques that have been successfully used by both public and private entities. Success is dependant upon a variety of variables, including, but not limited to: application tools, growth media, seed virility, moisture and applicant experience. Such variables preclude a single, effective HMP for all reclamation activities. As such, here we provide the link and introduction to a document created by Texas A&M University, the Rangeland Technology and Equipment Council, USDA Forest Service, and the USDI BLM. This document provides a comprehensive description of tools and techniques for revegetative success. This document provides more detail and background than what the Technical Team could have developed on its own. Below is the web link and introduction.

<http://reveg-catalog.tamu.edu/index.htm>

Revegetation Equipment Catalog

The catalog provides descriptions, applications, pictures, and sources for equipment used on rangeland.



Produced in cooperation with:

Rangeland Technology & Equipment Council
USDA Forest Service
USDI Bureau of Land Management

Rangeland Technology Equipment Council

The Rangeland Technology and Equipment Council (RTEC) is an informal organization of land managers, engineers, academia, and private industry representatives interested in developing new rehabilitation equipment and strategies. The roots of RTEC go back to 1946 when the need for new site preparation and seeding equipment to increase forage production on western USA rangelands led to the organization of the Reseeding Equipment Development Committee that was later (1958) renamed the Range Seeding Equipment Committee. These committees were instrumental in developing the rangeland rehabilitation equipment, the rangeland drill being the most well known implement and it is still in use today.

In 1974 this committee was renamed the Vegetative Rehabilitation and Equipment Workshop (VREW) to reflect the diversity and broadened interest of new members. Annual VREW meetings were held in association with the Society for Range Management's (SRM) annual meeting (meetings continue to this day) and the proceedings of these meeting were published by the Forest Service until 1991. Several other RTEC publications, "Facilities for Handling, Sheltering and Trailing Livestock" and "Fences" are available for purchase through the SRM at: http://www.rangelands.org/publications_handbooks.shtml.

In 1990, VREW was reorganized as RTEC to include new emphasis on innovative technology and strategies to improve revegetation success on disturbed rangelands. The RTEC mission statement is to:

Promote the wise use and improvement of rangelands through the supporting functions of equipment development and application of innovative technology.

Focus areas and goals for RTEC include:

1. Site Preparation and Seeding--- Encourage the development of innovative site preparation and seeding equipment.
2. Plant Materials---Promote the management, evaluation and selection of plant materials that fulfill resource needs.
3. Fire---Promote rangeland improvement through the application of the latest fire technology and equipment.
4. Seedbed Ecology---Determine site characteristics and seed establishment relationships and improve seeding success utilizing new technologies.

5. Weed Management---Develop new strategies and equipment to manage or eradicate weed infestations.
6. Structures---Promote the development of innovative, effective and economical range improvements.
7. Information and Publications---Assemble and widely distribute information concerning equipment and new technology.

In 2001 RTEC undertook the updating of the 1980 VREW publication, “Revegetation Equipment Catalog.” This catalog served as a valuable resource for land managers but was sorely outdated. Funding to update this catalog was provided by the USDI Bureau of Land Management’s Great Basin Restoration Initiative via the “Great Basin Native Plant Selection and Increase Project” and the USFS Rocky Mountain Research Station. Professor Harold Wiedemann (former RTEC Chair) was contracted to update the catalog that is now posted on this Texas A&M website. This publication is web-based to facilitate updates and additions to the equipment descriptions.

Appreciation is given to Texas A&M University’s Departments of Biological and Agricultural Engineering for technical assistance and hosting the website, the Rangeland Ecology and Management Department for photographic assistance, and to Nancy Shaw, FS Rocky Mountain Research Station, for contract administration and manuscript review. Finally, the efforts of Harold Wiedemann and Steve Monsen in sustaining RTEC and having the vision and drive to update the Equipment Catalog are greatly appreciated.

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Appendix 8

Additional Literature for Review

Additional Literature for Review

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