

U.S. Department of the Interior Bureau of Land Management

Environmental Assessment
DOI-BLM-NV-B010-2021-0003-EA
DATE: DECEMBER 2020

Environmental Assessment

**Klondex Gold & Silver Mining Company
Fire Creek Mine Greater-Sage Grouse Habitat Improvement Project
Lander County, Nevada**

File Number: NVN-091111



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BLM COST: \$20,000**



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DOI-BLM-NV-B010-2021-0003-EA

**KLONDEX GOLD & SILVER MINING COMPANY
 FIRE CREEK MINE GREATER SAGE-GROUSE HABITAT
 IMPROVEMENT PROJECT
 ENVIRONMENTAL ASSESSMENT**

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ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
ARMPA	<i>2015 Record of Decision and Approved Resource Management Plan Amendments for the Great Basin Region, Including the Greater Sage-Grouse Sub-Regions of Idaho and southwestern Montana, Nevada and Northeastern California, Oregon, and Utah</i>
BLM	Bureau of Land Management
amsl	Above Mean Sea Level
APE	Area of Potential Effect
AUM	Animal Unit Month
BMD	Battle Mountain District
BMP	Best Management Practice
CCS	State of Nevada Conservation Credit System
CEQ	Council on Environmental Quality
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
cfs	cubic feet per second
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
FR	Federal Register
GHMA	General Habitat Management Area
GIS	Geographic Information Systems
GRSG	Greater Sage-Grouse
HFRA	Healthy Forest Restoration Act
HQT	Habitat Quantification Tool
I-80	Interstate 80
Klondex	Klondex Gold & Silver Mining Company
LR2000	BLM Land and Mineral Legacy Rehost 2000 System

MIM	multiple-indicator monitoring
Mine EA	Fire Creek Mine Project EA #DOI-BLM-B010-2015-0062-EA
Mine Plan	Fire Creek Mine Plan of Operations NVN-091111
Mine Project	Fire Creek Mine Project
Habitat Improvement Plan	Fire Creek Mine Greater Sage-Grouse Habitat Improvement Plan
MLFO	Mount Lewis Field Office
MOU	Memorandum of Understanding
MTBA	Migratory Bird Treaty Act
NAC	Nevada Administrative Code
NAD	North American Datum
NAGPRA	Native American Graves and Repatriation Act
NDEP	Nevada Division of Environmental Protection
NDOA	Nevada Department of Agriculture
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NNHP	Nevada Natural Heritage Program
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NTT	National Technical Team
OHMA	Other Habitat Management Area
PFC	Proper Functioning Condition
PHMA	Priority Habitat Management Area
PMU	Population Management Unit
RDF	Required Design Feature
RFFA	Reasonably Foreseeable Future Action
SETT	State of Nevada Sagebrush Ecosystem Technical Team
SFA	Sage Brush Focal Areas
SR	State Route
TCP	Traditional cultural property
USFWS	United States Fish and Wildlife Service
WRSF	Waste Rock Storage Facility
WSA	Wilderness Study Area

KLONDEX GOLD & SILVER MINING COMPANY FIRE CREEK MINE GREATER SAGE-GROUSE HABITAT IMPROVEMENT PROJECT ENVIRONMENTAL ASSESSMENT

1 INTRODUCTION

This Environmental Assessment (EA) has been prepared to analyze Klondex Gold & Silver Mining Company's (Klondex's) Greater Sage-Grouse Habitat Improvement Plan (Habitat Improvement Plan) at the Fire Creek Mine Project (Mine Project). The Habitat Improvement Plan was developed by Klondex, collaboratively with the Bureau of Land Management (BLM), Battle Mountain District (BMD), Mount Lewis Field Office (MLFO) and the grazing permittee within the mine area. The Habitat Improvement Plan involves implementing onsite habitat improvements to offset disturbance within Greater Sage-Grouse (GRSG) habitat management areas from the Mine Project that were not addressed through avoidance and minimization actions.

BLM and Klondex developed the Habitat Improvement Plan as voluntary measures for impacts from the Mine Project to GRSG habitat and the Habitat Improvement Plan follows the Approved Resource Management Plan Amendments for the Great Basin Region, Including the Greater Sage-Grouse Sub-Regions of Idaho and southwestern Montana, Nevada and Northeastern California, Oregon, and Utah (ARMPA) guidance for offsetting impacts to GRSG, including the consideration of using the State of Nevada's Credit Conservation System (CCS) and associated habitat analysis tools. The Proposed Action includes the actions proposed in the Habitat Improvement Plan.

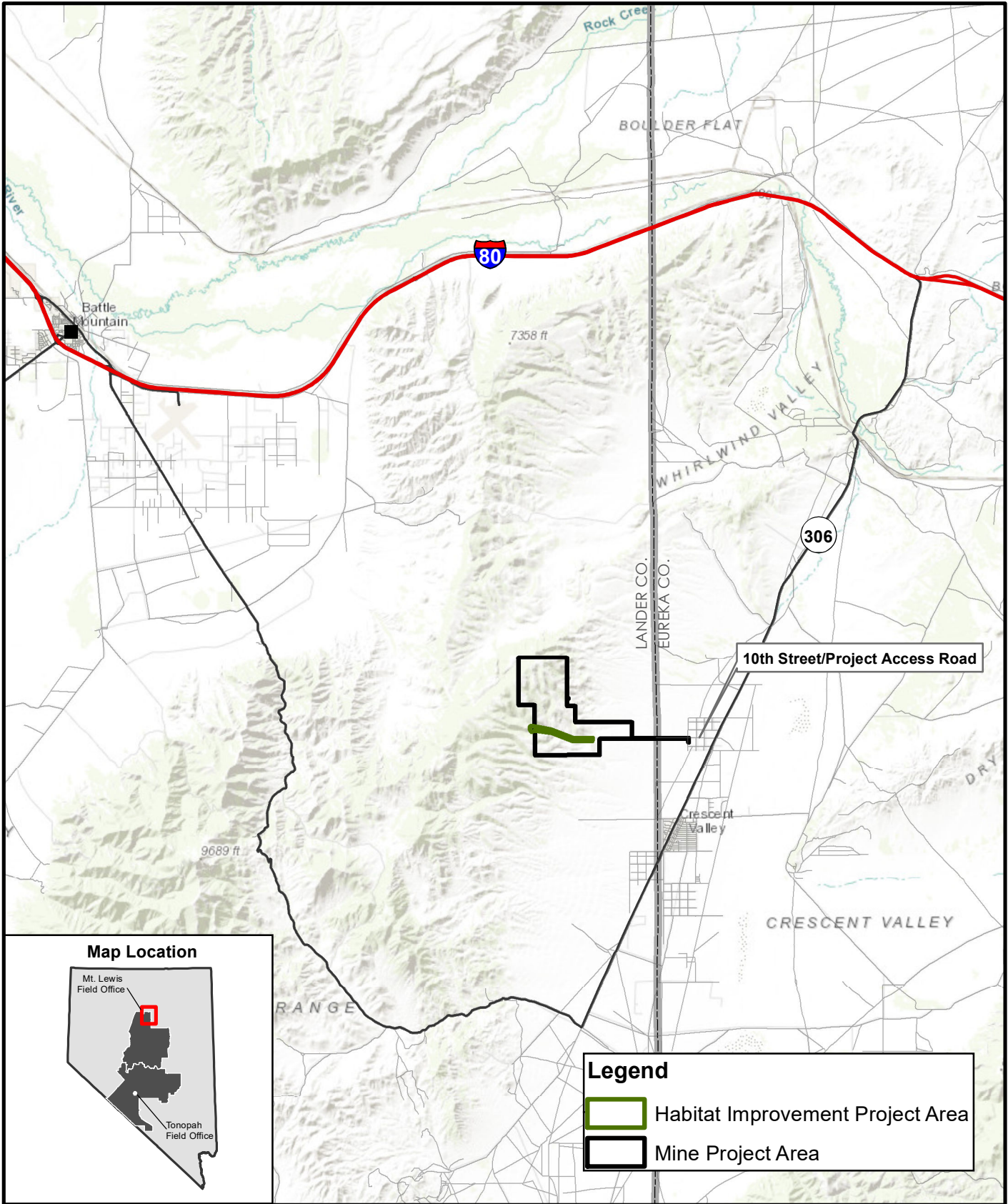
1.1 Project Location, Legal Description, and Surface Ownership

The Habitat Improvement Project is located on the northeast flank of the Shoshone Mountains, approximately 37 miles east of the town of Battle Mountain and four miles northwest of the town of Crescent Valley, in Lander County, Nevada. The Habitat Improvement Project Area is located within portions of Sections 21, 22, and 23 of Township 30 North and Range 47 East of the Mount Diablo Base and Meridian (**Figure 1-1**). The Habitat Improvement Project Area encompasses approximately 134 acres in total, of which 71 acres are on public lands and 63 acres are on private lands. The private land within the Habitat Improvement Project Area is controlled by Klondex with the exception of Section 21. However, the habitat improvements in Section 21 have been coordinated with the land owner.

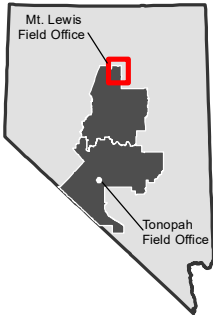
1.2 Background

Argenta Settlement Agreement Range Improvement Project



The proposed enclosure was originally a component of the Argenta Settlement Agreement Range Improvement Project. Based on extreme drought conditions and concerns about overgrazing during the drought, BLM issued a decision in August 2014 temporarily closing portions of the Argenta Allotment from grazing. Multiple parties appealed the temporary closure decision. Those appeals were resolved after BLM and grazing permittees entered into a settlement agreement on June 16, 2015. The settlement agreement included a limited number of lentic and lotic enclosures, including the Fire Creek enclosure. Based on additional coordination between BLM, Klondex, and the grazing permittee for the Fire Creek enclosure, it was decided that since the Fire Creek enclosure was located within the active Mine Project Area, it was more suitable for Klondex to fund, oversee, and manage while the mine was in operation. Subsequently, the need to offset mine disturbance was stipulated in the Decision Record issued for the Mine Plan. Therefore, the Habitat Improvement Plan outlined and analyzed in this EA was developed by BLM, Klondex, and the grazing permittee to address overgrazing issues in the Argenta Allotment, while tailoring the activities to directly address impacts to GRSG habitat from mine disturbance.



Map Location



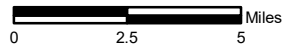
Legend

-  Habitat Improvement Project Area
-  Mine Project Area



Battle Mountain
BLM District
Mount Lewis Field Office

**FIRE CREEK
GREATER SAGE-GROUSE
MITIGATION PROJECT EA**



PROJECT LOCATION

FIGURE 1.1
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Greater Sage-Grouse Habitat Management Classifications and Habitat Improvement Acreage Calculations

In September 2015, BLM issued the ARMPA and the Record of Decision for the ARMPA, which details the Greater Sage-Grouse habitat management plan for Nevada (BLM 2015). This document and associated mapping identifies the following four habitat management categories:

- Sage Brush Focal Areas (SFA);
- Priority Habitat Management Areas (PHMA);
- General Habitat Management Areas (GHMA); and
- Other Habitat Management Areas (OHMA).

Approximately 127 acres of GHMA and 5 acres of OHMA are present within the Habitat Improvement Project Area. The ARMPA 2015 mapping data were reviewed and determined to be the same as the December 2015 mapping for the Mine Project Area and vicinity. The October 2015 dataset was used in the Mine EA habitat assessment and calculations. The GRSG habitat management areas approved in the ARMPA (2015; republished in April 2017) are shown on **Figure 1-2**.

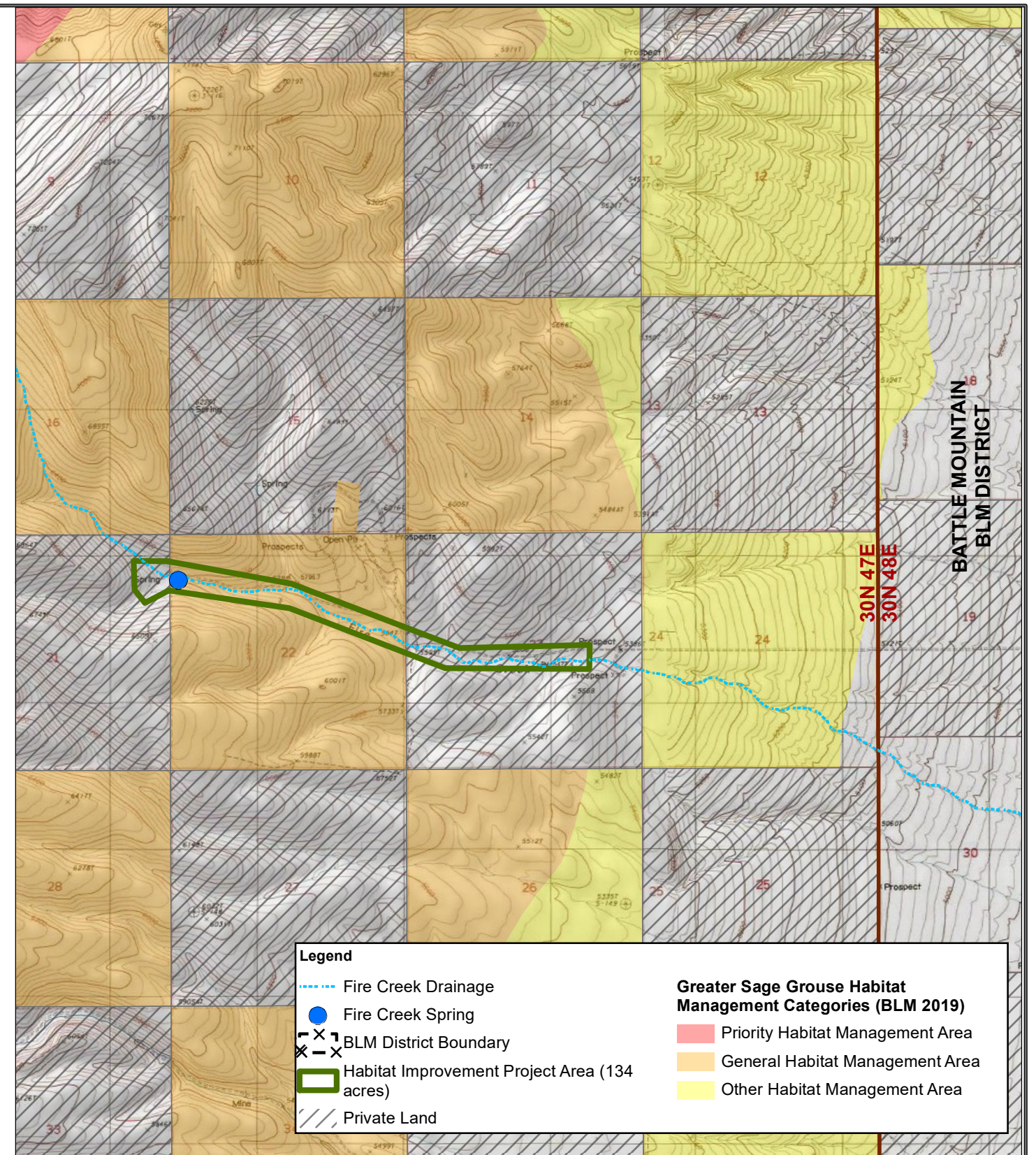
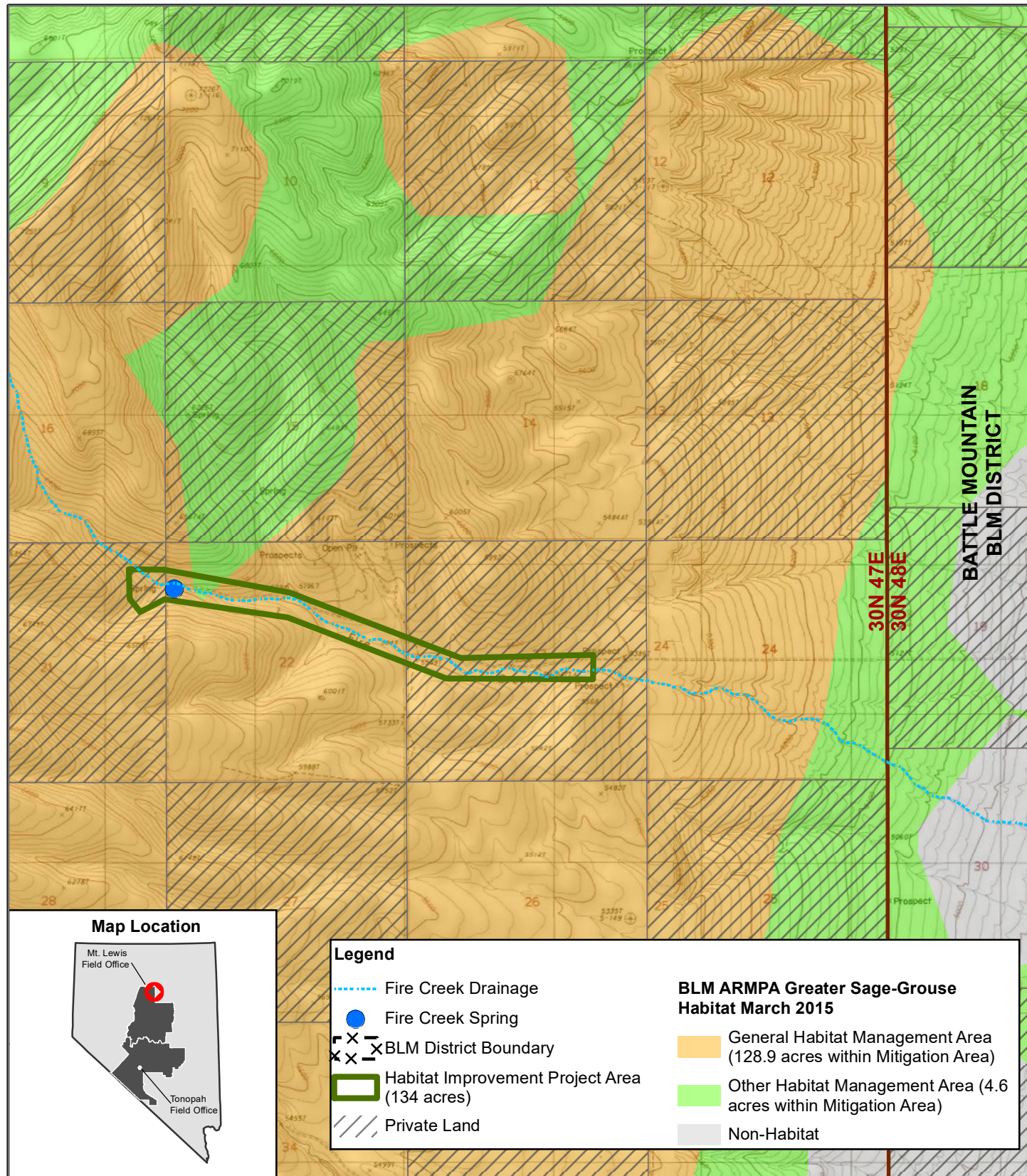
Although in October 2019 the U.S. District Court for the District of Idaho issued an order granting a motion for a preliminary injunction against the 2019 ARMPA, **Figure 2-1** is included to show the best available science on public land from 2019 (BLM 2019). BLM is responding to this injunction by preparing a Draft Supplemental Environmental Impact Statement in February 2020 to review its previous National Environmental Policy Act (NEPA) analysis, clarify and augment it where necessary, and provide the public with additional opportunities to review and comment (BLM 2020). At the time this EA was written, BLM was functionally using the data in the 2015 ARMPA until the challenge with the data in the 2019 ARMPA is resolved.

The Habitat Improvement Project has been developed to offset the disturbance previously authorized for the Mine Plan. Of the 79.86 acres of the authorized Mine Plan disturbance, approximately 50 acres of GHMA would be disturbed. This calculation also included the full build out of the waste rock storage facility (WRSF) since the location of that disturbance was known. Future phase disturbance may occur in classified habitat management areas (GHMA or OHMA). Therefore, the HQT conservatively assumed up to a total of approximately 150 acres may be disturbed in areas classified as GHMA (assuming all disturbance would be within habitat equal to GHMA) for the authorized Mine Project (Rubicon Environmental Consulting 2017). In addition, habitat improvements are proposed for disturbance on both private and public land. The approved Mine Plan disturbance, including exploration drill road and pads, within GRSG habitat is shown on **Figure 1-3**.

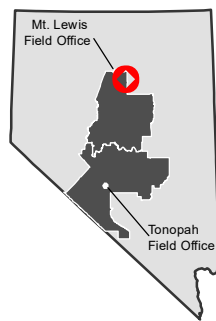
1.2.1 State of Nevada Habitat Quality Tool Assessment

Following the 2016 Mine Plan EA, BLM and Klondex coordinated with the State of Nevada Sagebrush Ecosystem Technical Team (SETT) to establish Mine Project debits using the HQT. A Geographic Information System (GIS) and Field HQT assessment was performed in September 2016 within the Mine Project Area to establish estimated functional acres that would be impacted by Mine Project surface disturbance. A large portion of the habitat within the Mine Project Area was subject to two wildland fires in 1996 and 2011 that have diminished habitat value.

Per the applicant committed measures included in the Mine Plan, it was decided by BLM, Nevada Department of Wildlife (NDOW), and United States Fish and Wildlife Service (USFWS) that the HQT results for indirect impacts would not be used to develop ratios as the indirect impacts were addressed in the Mine Plan through the use of Required Design Features (RDFs) and they took into consideration the existing mine disturbance and human activities present at the mine. The direct functional acres were determined to be 35 acres (Rubicon Environmental Consulting 2017).



Map Location



Legend

- - - - Fire Creek Drainage
- Fire Creek Spring
- X BLM District Boundary
- Habitat Improvement Project Area (134 acres)
- Private Land

BLM ARMPA Greater Sage-Grouse Habitat March 2015

- General Habitat Management Area (128.9 acres within Mitigation Area)
- Other Habitat Management Area (4.6 acres within Mitigation Area)
- Non-Habitat

Legend

- - - - Fire Creek Drainage
- Fire Creek Spring
- X BLM District Boundary
- Habitat Improvement Project Area (134 acres)
- Private Land

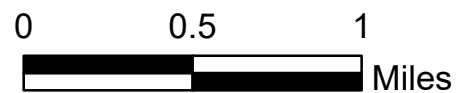
Greater Sage Grouse Habitat Management Categories (BLM 2019)

- Priority Habitat Management Area
- General Habitat Management Area
- Other Habitat Management Area



Battle Mountain
BLM District
Mount Lewis Field Office

**FIRE CREEK
GREATER SAGE-GROUSE MITIGATION PROJECT EA**



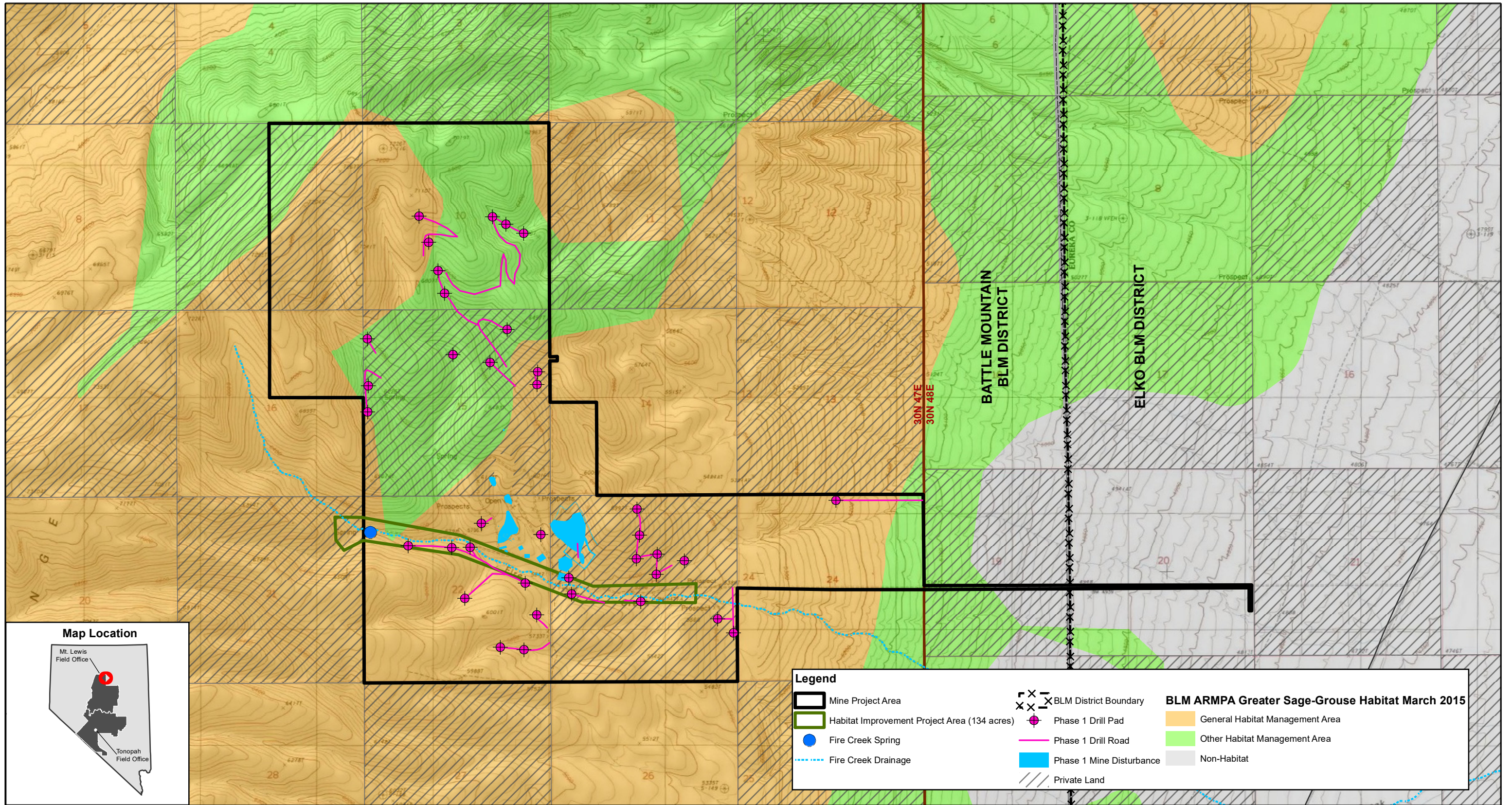
**GREATER SAGE-GROUSE
HABITAT MANAGEMENT AREAS**

FIGURE 1.2

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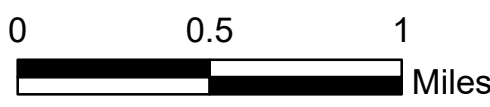
Legend

Mine Project Area	Phase 1 Drill Pad	BLM ARMPA Greater Sage-Grouse Habitat March 2015	
Habitat Improvement Project Area (134 acres)	Phase 1 Drill Road		General Habitat Management Area
Fire Creek Spring	Phase 1 Mine Disturbance		Other Habitat Management Area
Fire Creek Drainage	Private Land		Non-Habitat
	BLM District Boundary		

Map Location

Battle Mountain
BLM District
Mount Lewis Field Office

**FIRE CREEK
GREATER SAGE-GROUSE MITIGATION PROJECT EA**



**MINE PROJECT DISTURBANCE
GREATER SAGE-GROUSE HABITAT**

FIGURE 1.3	REVISION
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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 with other data.

The CCS was considered as an option, but it was decided to not use the CCS due to lack of suitable credits available. Both the agency and grazing permittee support of the enclosure project. Since the Habitat Improvement Project focuses on preserving, enhancing, and creating wet meadow habitat, the Meadow Habitat Power Factor of 8:1 (State of Nevada 2015) was applicable to use as a ratio per the CCS guidelines for functional habitat acres generated from the implementation of the Habitat Improvement Plan.

1.2.2 Habitat Improvement Plan Acres Calculations

Table 2-1 provides a summary of the Habitat Improvement Project Area acres, and estimated Habitat Improvement Plan functional acres of habitat generated.

Table 2-1: Summary of Habitat Improvement Plan and Functional Habitat Creation Acres

Habitat Improvement Type	Habitat Improvement Project Area Acres ³	Ratio	Habitat Improvement Plan Functional Habitat Creation Acres
Riparian Preservation ¹ (Existing Wetland and Riparian Wet Meadow Habitat)	4	8:1	32
Riparian Enhancement and Creation ²	39	1.1:1	42
Upland Enhancement ³	90	1.1:1	99
Total	134		173

¹ Wetland and riparian area within the enclosure fencing. Ratio represents the Meadow Power Factor (State of Nevada 2015).

² Existing habitat within the enclosure subject to wet meadow creation and upland enhancement.

³ Surrounding upland habitat within the Habitat Improvement Project Area, not including the enclosure and new disturbance from road realignment and stock well installation.

As shown in **Table 2-1**, the Habitat Improvement Plan would create/produce approximately 173 acres of functional habitat for GRSG, therefore creating a net gain in GRSG habitat.

1.3 Purpose and Need for the Proposed Action

BLM's purpose and need for the Proposed Action is to ensure that any action on public lands within qualifying GRSG habitat is managed in order to provide a net gain to the species and as stated in the Decision for the 2016 Mine Plan EA "to prevent unnecessary or undue degradation of greater sage-grouse habitat." The need for the action is established by BLM's responsibility under Section 302 (Management of use, occupancy, and development), Section 402 (Grazing Leases and Permits), and Section 701 (Effect on existing rights) of the Federal Land Policy and Management Act (FLPMA) and responsibility under the ARMPA to manage GRSG habitat.

1.4 Decision to be Made

The BLM Field Manager's Decision to be made pertaining to the updated Mine Plan (NVN-091111) proposed by Klondex with the inclusion of the Habitat Improvement Plan includes the following options:

- 1) Approve the Habitat Improvement Plan, with no modifications;
- 2) Approve the Habitat Improvement Plan, with additional environmental protection measures and conditions needed to prevent unnecessary or undue degradation of public lands; or
- 3) Does not approve the Habitat Improvement Plan.

1.5 Conformance with Policies, Plans, Programs, and Land Use Plan Conformance

The Habitat Improvement Plan is in conformance with the following Policies and Plans:

- Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment.

- Memorandum of Understanding Between the USDI Bureau of Land Management, Nevada State Office and California State Office and Nevada Department of Conservation and Natural Resources, and the USDA, Forest Service Humboldt-Toiyabe National Forest, signed April 2016.
- Shoshone-Eureka Resources Management Plan, signed 1986.
- Lander County Master Plan, prepared 2010.

1.6 Scoping and Identification of Issues

An interdisciplinary team meeting was held at the BMD-BLM office on May 19, 2016. Resource specialists discussed the Habitat Improvement Plan and while the Habitat Improvement Project is beneficial to many resources, other potential environmental issues were identified related to the resources present. The BLM interdisciplinary team determined that the following resource issues have the potential to occur:

- Cultural Resources – potential impacts to existing resources and unanticipated discoveries within the context of the Fire Creek Archaeological District;
- Migratory Birds – loss of, or disturbance to, habitat;
- Native American Religious Concerns – potential impacts to properties of religious importance;
- Noxious Weeds, Invasive, and Non-native Species – establishment and/or spread, prevention, and control measures;
- Water Quality – Surface Water and Groundwater – sedimentation, flow, potential for contamination;
- Wetlands and Riparian Zones – disturbance, change in function;
- Grazing Management – change/loss of Animal Unit Months (AUMs);
- Land Use Authorizations – conflicts with existing land uses and rights-of-way;
- Recreation – altering of existing opportunities;
- Soils – potential degradation or loss (erosion);
- Social Values and Economics – change in baseline conditions;
- Special Status Species (Wildlife) – potential mortality, disturbance, habitat loss/change;
- Transportation, Access, and Public Safety – potential for cumulative traffic volumes exceeding highway capacity with ore transportation route;
- Vegetation – change in community composition, reclamation;
- Water Quantity – potential impacts to water rights holders; and
- Wildlife – disturbance (noise/human presence), habitat loss/change.

An additional kick-off meeting was held via teleconference with NDOW and USFWS on July 6, 2016, to scope the Habitat Improvement Project. BLM also conducted a 30-day public scoping period for the Habitat Improvement Plan and EA by issuing a letter to interested parties on July 7, 2016.

2 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The Habitat Improvement Plan was developed to offset any potential for net loss of GRSG habitat from impacts from the Mine Plan (BLM 2016). Further details on the habitat improvements can be found in the Habitat Improvement Plan, which would be implemented in stages with the initial focus on the Fire Creek Spring and Fire Creek drainage headwaters area (Klondex 2020). This section of the creek is declining in health, with insufficient stabilizing species, numerous headcuts, and livestock-widened stream channels (see Section 3.6 for additional detail). By implementing the stream restoration and enclosure features in the upper stream segments first, natural revegetation and stream enhancement would occur downstream. Klondex would attempt to complete as many stages in a year as feasible. The stages of stream repair would occur in subsequent years as determined by monitoring for natural stabilization of the system. The Habitat Improvement Plan includes a tentative schedule as well as success criteria for each measure.

Figure 2-1 illustrates the location of key Habitat Improvement Project features. **Table 2-1** describes the features of the Habitat Improvement Project.

Table 2-1: Habitat Improvement Project Features

Project Feature	Description
Exclosure Fencing	The main part of the Habitat Improvement Project includes exclosure fencing around the Fire Creek Drainage and spring source to prevent grazing damage and provide improvement to the riparian and wetland habitat, and would include wood or metal jack rail fencing (10,470 linear feet) and standard BLM and NDOW-approved 4-strand barbwire fencing (8,550 linear feet) to encompass approximately 43 acres. All fencing would be wildlife and GRSG friendly.
Grazing Management	BLM would coordinate with the grazing permittee to ensure success of the habitat improvement. Should BLM and grazing permittee determine that it is appropriate to allow grazing for a limited time within the exclosure, weekly grazing monitoring would be conducted by BLM to prevent damage to habitat and habitat improvements if needed. Standard rangeland indicators would be used, on an as-needed basis, to determine: (1) when grazing is appropriate, and (2) the duration of grazing allowed in the exclosure.
Stock Water Replacement Well and Troughs	Troughs would be placed near the stock water well in the center of the Habitat Improvement Project Area, and the stockwater well would serve as the source of water for the trough from a short stretch of aboveground pipeline (approximately 261 feet in length). Water use for the Project would not exceed the combined annual duty associated with the well and spring at Fire Creek (8.96 acre-feet).
Spring Source Area Sheet Flow Spreader	A sheet flow spreader (or erosion control device) may be installed on private land near the spring source in the channel above the wet meadow to broaden the wetted perimeter and flow path along Fire Creek and reduce erosive energy from stormwater flow upstream of the spring.
Stream Headcut Repair	To stabilize the channel and prevent further erosion on the bed and banks of Fire Creek, a zuni bowl headcut control structure would be constructed to dissipate the energy of the water.
Road Dams, Baffles, and Weirs	Throughout the length of Fire Creek, small check dams, baffles, and weir structures would be used to stabilize the channel conditions and decrease channelization of the stream. The two weirs currently on Fire Creek would be left in place.
Relocation of Authorized Mine Facilities and Exploration Disturbance	As part of the Habitat Improvement Plan, the exploration roads and pads, and surface mine support facilities authorized in Phase I of the Mine would be relocated outside the Habitat Improvement Project Area.
Reclamation of Existing Exploration Disturbance in the Habitat Improvement Project Area	Two acres of surface disturbance from exploration activities would be reclaimed and revegetated, and not used again for exploration.
Stream Crossing Stabilization	Culverts would be installed and surfaces would be graveled at four stream crossings between the exclosure fence areas to prevent erosion from use by cattle. Also, the creek crossing outside the exclosure fence (where a small tributary that joins Fire Creek runs across the road) would be protected with a culvert, gabion cover, or other improvement.
Overseeding	Following surface disturbing activities, the wetland and riparian habitat would be overseeded with a BLM-developed seed mix.

Project Feature	Description
Noxious Weed Treatment	Under the Habitat Improvement Plan, Klondex would continue to monitor and treat weed species per the Noxious Weed Management Plan authorized for the Mine Plan.
Maintenance, Monitoring, and Success Criteria	Klondex would photograph monitoring stations and conduct: regular monitoring and maintenance activities including fence inspection and repairs; (2) proper functioning condition/multiple-indicator monitoring; (3) water quality monitoring; and (4) vegetation monitoring.
Adaptive Resource Management	The three main measurable criteria that would be monitored for are water quality improvements, increased vegetation cover and diversity, reduction in non-native vegetation species, and overall stream function through the Proper Functioning Condition (PFC) monitoring. These criteria are subject to modification through adaptive management and agency input.

The habitat improvements would primarily take place within the 42-acre enclosure area (**Figure 2-1**). Approximately 42 acres of habitat would be preserved, enhanced, or created through these actions. This includes the existing wetland and riparian habitat (four acres) and adjoining sage brush upland habitat (38 acres) within the enclosure area.

In addition, limiting mining and exploration activities and new disturbance in the entire Habitat Improvement Project Area would provide a buffer to the habitat within the enclosure. The upland habitat outside of the enclosure but within the Habitat Improvement Project Area would be enhanced. This additional area measures 91 acres, but new disturbance from the road realignment, well disturbance, and stream crossings would not be subject to habitat improvements (approximately one acre of new disturbance). Fencing would include up to 19,234 linear feet of fencing (with a width of 20 feet of disturbance during construction) and would result in approximately 9 acres of temporary surface disturbance. In total, the fence and other new disturbance from habitat improvements would not exceed one acre of permanent surface disturbance.

Since the timelines for the Mine Plan and Habitat Improvement Plan overlap, the Environmental Protection Measures (EPMs) for 2016 Mine Plan would be applicable to the Habitat Improvement Plan (listed in Section 2.1.15 of the 2016 Mine Plan EA). Additionally, the Habitat Improvement Plan is located within the footprint of the Mine Plan so all relevant EPMs would apply.

2.2 No Action Alternative

Under the No Action Alternative, the Habitat Improvement Plan would not be implemented. Grazing within the Fire Creek drainage and spring area would continue and the habitat would not be improved for GRSG use. Klondex would offset mine disturbance in GHMA on public land, but other options would have to be developed and may be subject to additional NEPA analysis.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

The following alternatives for habitat improvement were considered, but eliminated from detailed analysis.

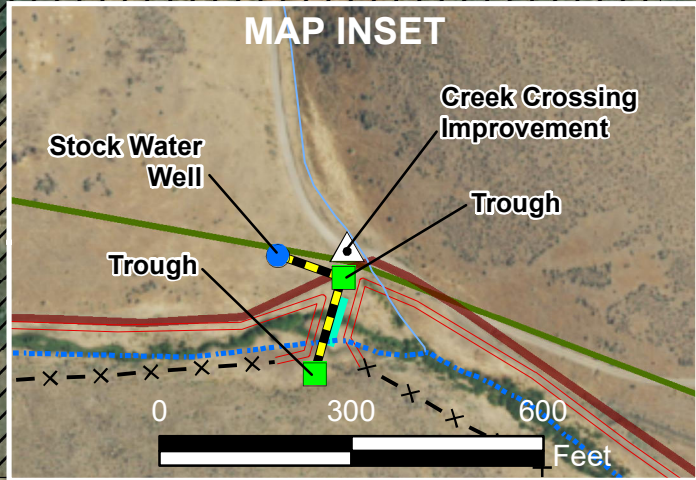
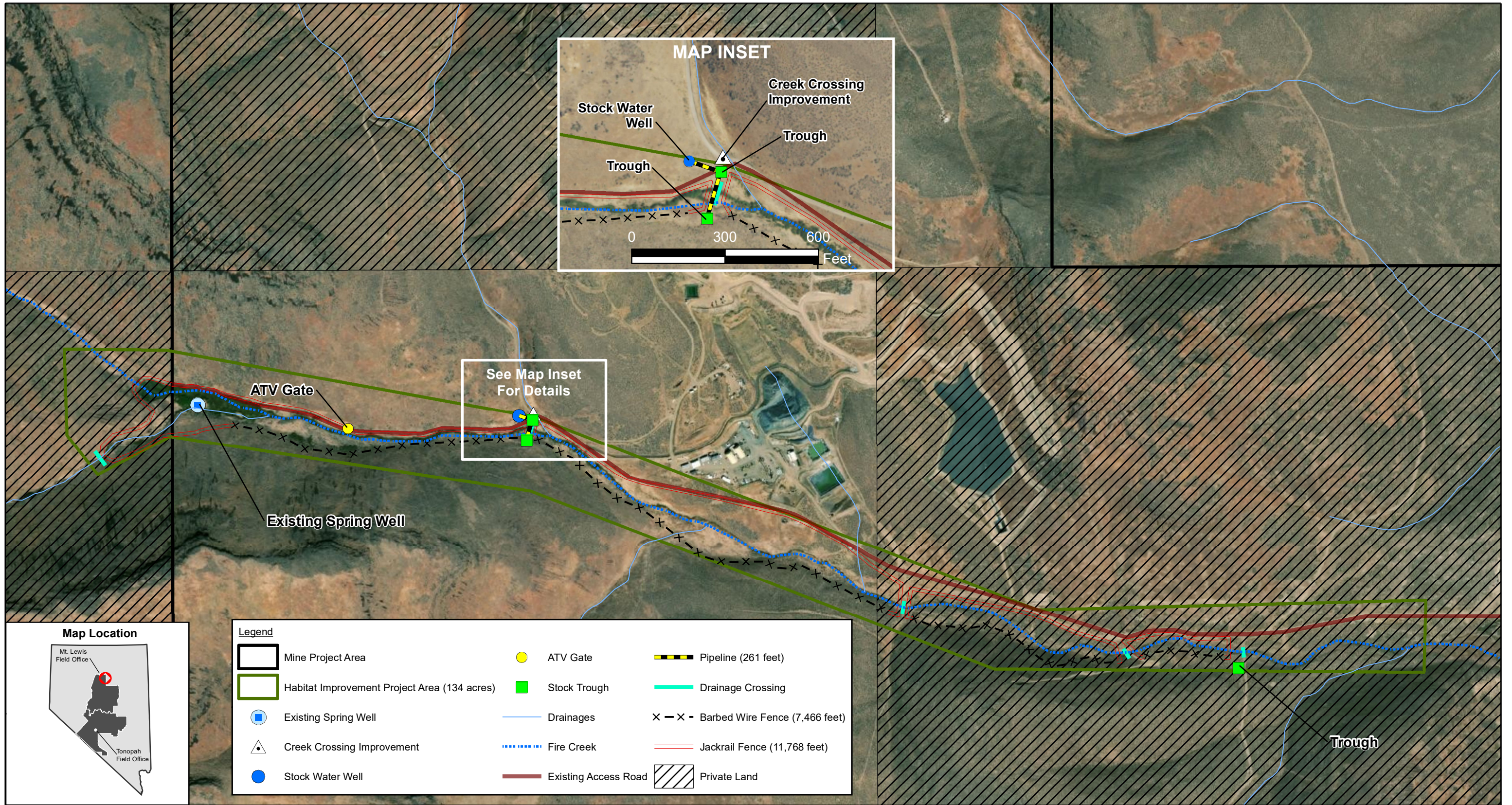
2.3.1 Nevada Conservation Credit System Alternative

At the time of developing the concept for this project, the Nevada Conservation Credit System had been launched, but credits suitable for this project were not available. BLM and Klondex consulted with the SETT on multiple occasions and used the HQT model to calculate debits for the Mine Project for use in the Proposed Action which is proponent driven. Therefore, using the CCS was considered, per the MOU, but the approach was timelier and using the CCS was eliminated from further consideration.

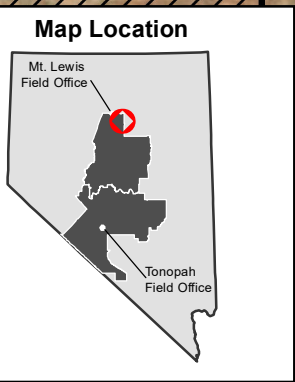
2.3.2 Offsite Habitat Improvement Project Alternative

Klondex researched the potential for implementing a habitat improvement project offsite by either purchasing a ranch to generate habitat credits, or buying into a mitigation bank. When the Decision Record for the Mine EA was prepared, no offsite habitat improvement options were readily available

in the area. It was subsequently determined that it would take much longer to pursue these options compared to implementing the Habitat Improvement Plan.



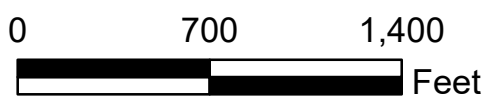
See Map Inset For Details



Legend					
	Mine Project Area		ATV Gate		Pipeline (261 feet)
	Habitat Improvement Project Area (134 acres)		Stock Trough		Drainage Crossing
	Existing Spring Well		Drainages		Barbed Wire Fence (7,466 feet)
	Creek Crossing Improvement		Fire Creek		Jackrail Fence (11,768 feet)
	Stock Water Well		Existing Access Road		Private Land

Battle Mountain
BLM District
Mount Lewis Field Office

**FIRE CREEK
GREATER SAGE-GROUSE MITIGATION PROJECT EA**



PROPOSED ACTION	
FIGURE 2.1	REVISION
10/20/2020	A

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 with other data.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter presents the Affected Environment and Environmental Consequences of the Proposed Action and alternatives. The Environmental Consequences sections analyze both beneficial and adverse impacts that would result from implementing the Proposed Action and alternatives considered in this EA.

This environmental consequences sections in this chapter describe the environmental impacts, including direct and indirect effects, and their significance for each alternative. In accordance with the Council of Environmental Quality (CEQ) regulations, direct, indirect, and cumulative impacts (Chapter 4) are described (40 Code of Federal Regulations [CFR] 1502.16) and the impacts are assessed in terms of context and intensity (40 CFR 1508.27). Where appropriate, mitigating measures of adverse impacts are also described and incorporated into the evaluation of impacts. The specific methods used to assess impacts for each resource may vary; therefore, these methodologies are described under each resource topic.

Supplemental authorities that are subject to requirements specified by statute or executive order (EO) must be considered in all BLM documents. **Table 3-1** lists the elements and their status as well as the rationale to determine whether an element present would be affected by the Proposed Action. Supplemental authorities that may be affected by the Proposed Action are analyzed in this chapter following the discussion of the Affected Environment for each element, resource, or land use. Those elements listed under the supplemental authorities that do not occur in the Habitat Improvement Project Area, would not be impacted by the Proposed Action or alternatives are not discussed or analyzed further in this EA. The elimination of nonrelevant issues follows CEQ regulations (40 CFR 1500.4).

In addition to the elements listed under supplemental authorities, BLM considers other important resources and uses that occur on public lands in which impacts may occur from implementation of the Proposed Action or alternatives. Other resources or uses of the human environment that have been considered for this EA are listed in **Table 3-2**. Resources that may be affected by the Proposed Action or alternatives are analyzed in this chapter following the discussion of the Affected Environment for each resource or use.

Table 3-1: Supplemental Authorities to be Considered

Supplemental Authority Element	Not Present	Present/ Not Affected	Present/May Be Affected	EA Section Number or Rationale for Elimination
Air Quality		X		The minor temporary disturbance related to the road realignment and well pad construction would not increase overall emissions. No other new source of emissions are proposed and therefore, air quality is not analyzed in this EA.
Areas of Critical Environmental Concern (ACEC)	X			No ACECs occur near the Habitat Improvement Project. This element is not analyzed further in this EA.
Cultural Resources			X	Effects to cultural resources would not occur through avoidance measures or treatment of sites prior to disturbance. See Section 3.2.

Supplemental Authority Element	Not Present	Present/ Not Affected	Present/May Be Affected	EA Section Number or Rationale for Elimination
Environmental Justice	X			Based on a review of existing baseline data, no minority or low-income groups would be disproportionately affected by health or environmental effects as a result of the implementation of the Proposed Action. This element is not present within the Habitat Improvement Project Area or vicinity. This element is not analyzed further in this EA.
Farm Lands (prime or unique)	X			No prime or unique farmlands occur near the Habitat Improvement Project. This element is not analyzed further in this EA.
Fish Habitat	X			No essential fish habitat is present in the Habitat Improvement Project Area or vicinity. This element is not analyzed further in this EA.
Floodplains	X			The Habitat Improvement Project Area is not located within Flood Emergency Management Agency zone. This element is not analyzed further in this EA.
Forests and Rangelands (Healthy Forest Restoration Act [HFRA] only)	X			The Habitat Improvement Project does not meet the requirements to qualify as a HFRA project. This element is not analyzed further in this EA.
Human Health and Safety (Herbicide Projects)	X			Herbicides may be used in the Habitat Improvement Project Area in accordance with Klondex's Weed Management Plan and consultation with BLM; however, Executive Order 13045 would not apply to the Habitat Improvement Project as herbicides and pesticides would not be used in locations where children would be exposed. This element is not analyzed further in this EA.
Migratory Birds			X	See Sections 3.3 and 4.1.1.
Native American Concerns			X	See Section 3.4.
Noxious Weeds, Invasive and Non-native Species			X	The monitoring and treatment of noxious weeds in the Habitat Improvement Project Area in accordance with Klondex's Weed Management Plan would minimize potential effects. See Section 3.5.
Threatened and Endangered Species (Plants and Animals)	X			No federally listed threatened or endangered species have been identified or have the potential to occur in the Habitat Improvement Project Area or vicinity. This element is not analyzed further in this EA. Reference Sections 3.3 and 4.1.2 for Greater Sage-Grouse.
Wastes and Materials, Hazardous or Solid	X			No impacts from Wastes and Materials are expected from the Habitat Improvement Project. This element is not analyzed further in this EA.
Water Quality, Surface/Groundwater			X	See Sections 3.6 and 4.1.3.
Wetlands and Riparian Zones			X	See Sections 3.6 and 4.1.3.
Wild and Scenic Rivers	X			No wild and scenic rivers occur in the Habitat Improvement Project Area or vicinity. This element is not analyzed further in this EA.
Wilderness/Wilderness Study Areas (WSAs)/ Lands with Wilderness Characteristics	X			Wilderness or WSAs are not present within the Habitat Improvement Project Area. BLM conducted a Lands with Wilderness Characteristics inventory (NV-060-499) in 2012 and 1980 and determined that no lands with wilderness characteristics are present in the Habitat Improvement Project Area. These elements are not analyzed further in this EA.

Table 3-2: Other Resources and Land Uses to be Considered

Other Resource/ Land Uses	Not Present	Present/ Not Affected	Present/May Be Affected	EA Section Number or Rationale for Elimination
Fish and Wildlife (General)			X	See Sections 3.3 and 4.1.1.
Geology and Minerals		X		The Habitat Improvement Project Area would be excluded from surface mining and exploration activities, and the Habitat Improvement Project would not restrict underground development for the adjacent mine in the future. This resource is not analyzed further in this EA.
Grazing Management			X	See Sections 3.7 and 4.1.4.
Land Use Authorizations		X		Existing land use authorizations are present within the Habitat Improvement Project Area, but no changes are proposed and these authorizations would not be affected by the Habitat Improvement Project. This resource is not analyzed further in this EA.
Noise		X		Only temporary construction noise would occur, but not at levels above existing baseline ambient conditions. Impacts from noise to wildlife and GRSG were analyzed in the Mine EA and addressed through design features. This resource is not analyzed further in this EA.
Paleontological Resources	X			BLM resource model was queried and geologic maps consulted. The formations in the Habitat Improvement Project Area are volcanic and in nature and do not have the potential to host significant paleontological resources. This resource is not analyzed further in this EA.
Recreation			X	See Section 3.8.
Social and Economic Values		X		The Habitat Improvement Project would not have a measurable impact on social values and economics. This resource is not analyzed further in this EA.
Soils			X	See Section 3.9.
Special Status Plant Species	X			No special status plant species have been observed and based on habitat conditions have the potential to occur within the Habitat Improvement Project Area. This resource is not analyzed further in this EA.
Special Status Fish and Wildlife Species			X	See Sections 3.3, 3.11, 4.1.1, and 4.1.2.
Transportation, Access, and Public Safety			X	See Section 3.10.
Vegetation			X	See Section 3.11.
Forestry and Woodland Resources	X			No forestry or woodland resources are present within the Habitat Improvement Project Area. This resource is not analyzed further in this EA.
Visual Resources		X		The Habitat Improvement Project would not have an effect on visual resources in the Visual Resource Management Class IV as analyzed in the Mine EA. This resource is not analyzed further in this EA.
Water Quantity			X	See Section 3.6.
Wild Horses and Burros	X			The Habitat Improvement Project is located outside the boundaries of designated herd management areas. This resource is not analyzed further in this EA.

3.2 Cultural Resources

The analysis area for direct and indirect impacts to cultural resources, or Area of Potential Effect (APE) is the Habitat Improvement Project Area. Cultural resources addressed include known resources that are determined or recommended eligible for inclusion in the National Register of Historic Places (NRHP) or that are unevaluated for NRHP inclusion. Cultural resources are eligible for the NRHP if they meet one or more of four significance criteria and retain historic integrity.

3.2.1 Affected Environment

Archaeological and historical data from cultural inventories indicate that a broad range of prehistoric and historic site types are possible in the Habitat Improvement Project Area. Prehistoric site types include quarries and opportunistic lithic procurement areas, lithic scatters, hunting blinds and rock stacks dating from the Paleoarchaic to Late Prehistoric. Prehistoric resources comprise at least 80 percent of the resources in the Fire Creek area (Cannon and Lennon 2008). Historic sites include mining features, refuse scatters, rock cairn claim markers, and remnants of historic roads from the late nineteenth to the mid-twentieth century. The Habitat Improvement Project is located within the Fire Creek Archaeological District, a National Register-eligible district. Two loci (Locus BW and Locus GM) within this District are located within the Habitat Improvement Project Area. There is an MOA for cultural resources that applies to the Habitat Improvement Project (Signed in October 2017).

3.2.2 Environmental Consequences

3.2.2.1 Effect Intensity Level Definitions for Cultural and Historic Resources

Compliance with Section 106 calls for implementation of a four-step process that includes the following: (1) consulting with appropriate parties (36 CFR 800.3); (2) identifying historic properties in the area of potential effect of an undertaking (36 CFR 800.4); (3) assessing adverse effects of the undertaking on historic properties within the area of potential effect (36 CFR 800.5); and (4) resolving any adverse effects (36 CFR 800.6). These steps involve a range of activities, such as defining the undertaking, identifying the proper consulting parties (e.g., the State Historic Preservation Office [SHPO] and Native American tribes and groups), delineating the APE, identifying and evaluating properties in the APE, applying the effects criteria, and resolving any adverse effects.

Under this four-step process, there are three possible effects determinations: (1) No Historic Properties Affected – A “no historic properties affected” determination indicates that no historic properties are in the APE, or that there are historic properties in the APE, but the undertaking would not alter the characteristics that qualify the historic property for inclusion in or eligibility for the National Register; (2) No Adverse Effect – A “no adverse effect” determination indicates that there would be an effect on the historic property by the undertaking, but the effect does not meet the criteria of adverse effect in 36 CFR 800.5(a)(1) and would not alter any of the characteristics that make the property eligible for listing in the National Register in a manner that would diminish the integrity of the historic property; or (3) Adverse Effect – An adverse effect determination indicates that the undertaking would alter, directly or indirectly, any of the characteristics that qualify it for inclusion in the National Register in a manner that would diminish the integrity of the property. Adverse effects may be resolved through development of a project specific Memorandum of Agreement (MOA) or a Programmatic Agreement among the project proponent, the SHPO, the Advisory Council on Historic Preservation, and other consulting or concurring parties, such as American Indian tribes (36 CFR 800.6). The agreement would specify the mitigating actions that must be taken to resolve the adverse effects, and the implementation and documentation protocols to be followed. The agreement must be executed by all required signatories (i.e., consulting parties) before implementation of a proposed action can be initiated.

Duration - Adverse effects to cultural resources are permanent.

Context

Localized: Effects would be limited to eligible sites within the APE boundary.
Regional: Effects would occur to eligible sites outside of the APE boundary.

3.2.2.2 Proposed Action

Potential adverse effects were identified at two loci (BW and GM) within the Fire Creek Archaeological District. An Historic Properties Treatment Plan (HPTP) has been prepared and received NV SHPO concurrence. The Habitat Improvement Plan would avoid impacts to Locus GM and implement treatment of Locus BW in accordance with the HPTP. Therefore, Klondex would be able to avoid or treat all eligible, contributing, or unevaluated sites prior to disturbance associated the Habitat Improvement Plan. Through the practice of avoidance and treatment of eligible or unevaluated sites, there would be no adverse direct or indirect effects to cultural resources resulting from the Proposed Action. The treatment of sites within the APE would add a localized, minor and permanent beneficial effect because if the sites were not treated, they would continue to be degraded by continued grazing in the APE.

3.2.2.3 No Action Alternative

Under the No Action Alternative, Klondex would continue existing authorized operations in the Habitat Improvement Project Area including exploration activities and surface mine support facilities (ancillary use area and security building with associated parking). Implementing a No Action Alternative would result in no fences being built and the other habitat improvements. This would result in the continuation of existing conditions and trends at these locations, most notably the continued degradation of the surface condition of known historic properties due to grazing in the enclosure area. The No Action Alternative would have a minor permanent localized, adverse effect on cultural resources in the APE.

3.3 Wildlife Resources (Including Migratory Birds and Special Status Species Wildlife)

3.3.1 Affected Environment

The analysis area for direct and indirect impacts to wildlife resources is the Habitat Improvement Project Area, but the study area includes the Habitat Improvement Area and nearby habitat.

Multiple wildlife surveys were conducted within the Project Area and vicinity. The results of the surveys are summarized in a Baseline Biological Resources Summary Report (Rubicon Environmental Consulting 2015a). All the species detected during wildlife surveys were those that are generally common throughout the Great Basin Region. Prior to conducting the surveys in 2012, 2013, and 2015, input was requested from NDOW, Nevada Natural Heritage Program (NNHP), and USFWS.

NDOW reported two known GRSG leks near the Habitat Improvement Project Area. One lek (Horse Heaven 2) is located within the 3.1-mile buffer distance from the Habitat Improvement Project Area, while the other lek (Horse Heaven 1) is located approximately 4.5 miles from it. Both leks are located northwest of the Habitat Improvement Project Area on the opposite side of the ridgeline. The ridgeline serves as topographical shielding and also serves as a noise barrier from the Habitat Improvement Project Area. Both of these leks are currently classified as having an “Unknown” status by NDOW. When these leks were surveyed in 2012, the Horse Heaven 1 lek was found to be active. However, surveys conducted in 2015, 2016, 2017, 2019, and 2020 showed both leks inactive.

NDOW also identified two hawk nests, three eagle nests, one falcon nest, and two owl nests in the vicinity of the Habitat Improvement Project Area. The Habitat Improvement Project is located within occupied distribution range of mule deer (*Odocoileus hemionus*) and pronghorn antelope (*Antilocapra americana*). NNHP determined that no known sensitive species populations occur within the vicinity of the Project Area. However, NNHP did specify that potential habitat within the Mine Project Area may be available for the pygmy rabbit (*Brachylagus idahoensis*), which is a Nevada BLM sensitive species. USFWS determined that one threatened species may be present: Lahontan cutthroat trout (*Oncorhynchus clarkii* ssp. *henshawi*) (USFWS 2020). No Lahontan cutthroat trout habitat is present within the Habitat Improvement Project Area. GRSG is present

within the and near the Habitat Improvement Project Area and is addressed as a Nevada BLM sensitive species.

3.3.2 Environmental Consequences

The levels of intensity of Habitat Improvement Project effects to wildlife have been analyzed, separately for migratory birds, general wildlife species, and special status species, including GRSG as outlined below. The definitions of effects intensity levels are described below.

Determination of the significance of potential impacts on wildlife is based on the duration, type, and intensity of impact; all are influenced by the scale (area) of impact. Impacts can be direct (i.e., an immediate result of the action) or indirect (i.e., resulting from the action but occurring later in time or removed from the location of direct physical impacts). Wildlife impact analysis was based on a qualitative assessment of the project area and the impacts anticipated as a result of the implementation of the Habitat Improvement Plan, ongoing maintenance, and restoration activities.

Impacts to wildlife could include those that would affect the size, continuity, or integrity of wildlife habitat, or result in unnatural changes in the abundance, diversity, or distribution of wildlife species. Effect intensity level definitions are described in **Table 3-3**.

Table 3-3: Wildlife Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible - Wildlife would not be affected, or effects would not result in a loss of individuals or habitat.</p> <p>Minor - Effects on wildlife would be measurable or perceptible and local; however, the overall viability of the population or subpopulation would not be affected and without further adverse effects the population would recover. Impacts on wildlife, such as displacement of nests or dens or obstruction of corridors, would be detectable. If mitigation is needed to reduce or rectify adverse effects, it would be relatively simple to implement.</p> <p>Moderate - Effects would be sufficient to cause a change in the population or subpopulation (e.g., abundance, distribution, quantity, or viability); however, the effect would remain local. The change would be measurable and perceptible, but the negative effects could be reversed. Mitigation would probably be necessary to reduce or rectify adverse effects.</p> <p>Major - Effects would be substantial, highly noticeable, and could be permanent in their effect on population or subpopulation survival without active management. Extensive mitigation would likely be necessary to reduce or rectify adverse effects, and its success could not be guaranteed. Effects to BLM sensitive species would result in need for future listing under the ESA.</p>	<p>Duration</p> <p>Short-term: One year or less for individuals or habitat; five years or less for a population.</p> <p>Long-term: Greater than one year for individuals or habitat; greater than five years for a population.</p> <p>Context</p> <p>Localized: Impacts are confined to a small part of the population, habitat, or range.</p> <p>Regional: Impacts would affect a widespread area of suitable habitat or the range of the population or species.</p>

3.3.2.1 Proposed Action

The Proposed Action would result in minimal (approximately 1 acre) long-term loss of wildlife, migratory bird habitat, and potential sensitive species habitat and is not anticipated to contribute to a loss of viability for any particular sensitive species. Although the total area in the enclosure is approximately 42 acres, the actual disturbance footprint is less than one acre total for the implementation of the Habitat Improvement Plan. Fence designs, for both the jack-rail and barbed wire fences as part of the Habitat Improvement Project would be in conformance with BLM

H-1741-1, Fencing Standards Manual (BLM 1990), and would minimize potential negative effects to wildlife species that utilize the area and allowing for safe ingress and egress to the water sources. The short lengths and design of the proposed enclosure would not impact or restrict big game and general wildlife movement patterns.

The increased noise from fence construction would be temporary and not expected to result in long term effects on big game and wildlife populations. The Proposed Action is expected to have a negligible short-term effect on wildlife species within the localized areas due to temporary disturbance from the construction of the Habitat Improvement Project features. However, the Habitat Improvement Plan would also result in increased habitat values for localized wildlife species creating a beneficial localized long-term impact from the improvements to the riparian and wetland habitats for nesting or foraging.

Migratory Birds

As identified in the EPMs in Mine EA, surveys for nesting migratory birds would be conducted prior to surface disturbance during nesting season (March 1 through July 31). If active nests are located in the Habitat Improvement Project Area, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nest material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) would be delineated and the buffer area avoided to prevent destruction or disturbance to nests or birds until they are no longer actively breeding or rearing young.

Up to nine acres of temporary new surface and one acre of long-term disturbance would be offset by the habitat improvement in the Habitat Improvement Project Area. The Proposed Action would benefit both resident and transitory migratory bird species in the Habitat Improvement Project Area through the creation and enhancement of both nesting and foraging habitat. The Proposed Action would have a moderate long-term and beneficial indirect effect on migratory bird habitat in the Habitat Improvement Project Area.

Special Status Wildlife Species

In conclusion, short-term impacts to special status wildlife species within the localized areas could occur from Project-related temporary disturbance during construction of the habitat improvements. However, the overall Habitat Improvement Plan would result in increased habitat values for localized special status wildlife species utilizing the riparian and wetland habitats for nesting or foraging, resulting in a regional, long-term beneficial effect.

Greater Sage-Grouse

The primary purpose of the Habitat Improvement Plan is to benefit GRSG through the preservation, enhancement, and creation of habitat. The Proposed Action would increase the opportunities for GRSG to utilize the area in the enclosure and add a net gain of habitat within the local Population Management Unit (PMU).

Approximately 42 acres of GRSG habitat would be exclosed to livestock grazing as part of the Habitat Improvement Plan. Adding new fences can lead to further fragmentation of the landscape and potential habitat loss but according to BLM Instruction Memorandum IM-2012-043, "Consider deferring fence construction unless the objective is to benefit GRSG habitat, improve land health, promote successful reclamation, or provide resource protection". BLM IM-20-043 further states, "...fences posing higher risk to GRSG include those where fence densities exceed 1.6 miles of fence per section (640 acres)." The Fire Creek enclosure does not exceed 1.6 miles per section and the construction of the enclosure would protect the riparian areas from further degradation thus enhancing the riparian areas and GRSG habitat over time. Federal Register (FR) 75 page 13,929 explains a few studies where long fences (over two miles) can negatively impact GRSG. There are no studies or mention in the FR 75 stating enclosures (less than one mile) negatively impact GRSG. FR 75 page 13,929 directly states "Not all fences present the same mortality risk to GRSG. Mortality risk appears to be dependent on a combination of factors including fence design, landscape topography, and spatial relationship with seasonal habitats".

The Sage-Grouse National Technical Team (NTT) report (2011) states to, “Design any new structural range improvements...to conserve, enhance, or restore sage-grouse habitat.” These three riparian areas are important brood-rearing habitat for GRSG and these enclosures would restore the riparian vegetation. According to Gregg and Crawford (2009), “GRSG chick and brood survival were directly linked to availability of food and cover and in areas of degraded habitat, active restoration may be necessary to increase availability of herbaceous vegetation and insects.”

The enclosure proposed would be designed to allow GRSG to enter riparian areas and springs. Jack rail fencing minimizes collisions and allows GRSG, as well as other wildlife including deer and antelope, safe access to riparian areas inside the enclosure.

A potential direct impact to GRSG from constructing the riparian enclosure is collision risk. The Habitat Improvement Plan includes installing fence markers on the barbed wire sections of fencing. A GRSG Fence Collision Risk Tool (Natural Resource Conservation Service [NRCS] 2012) was considered to model the enclosure to find the potential risk for GRSG collisions. The riparian enclosure would meet the GRSG and wildlife fencing safety specifications in order to avoid collision risks. Adding GRSG fence markers for barbed wire fencing has been shown to reduce collisions by 83 percent (Stevens 2011). Terrain ruggedness and distance to lek were found to be the most important variables associated with risk. However, it was determined that the proposed Fire Creek enclosure did not meet the criteria for distance to leks so the tool was not used.

Indirect effects from temporary construction noise is not anticipated to impact GRSG leks located approximately three and four miles from the Habitat Improvement Project with a ridgeline that serves as topographical shielding and noise barrier. Indirect impacts to GRSG from the enclosure would include possible perches for ravens and raptors species. Red-tailed hawks have been identified in the vicinity perched on nearby rock outcroppings. The July 2015 BLM National Riparian team assessment stated that “While fences and posts provide potential perch sites for birds of prey, there are numerous existing perches on rock outcrops that are available for perches; with normal wildlife mitigation no issues are added to threaten sage-grouse or other wildlife.” With natural perches already existing in the proposed enclosure area, the fencing would not contribute to additive mortality of GRSG by predation.

The enclosure is expected to allow the enclosed areas to return to proper functioning conditions. The Habitat Improvement Plan would result in localized higher quality riparian habitat to support the regional population of GRSG.

Sensitive Bird Species

In addition to GRSG, the sensitive bird species that have the potential to occur or are confirmed to use Mine Project Area include golden eagle, western burrowing owl, ferruginous hawk, loggerhead shrike, sage thrasher, and Brewer’s sparrow. Potential impacts to birds from proposed activities would include possible direct loss of nests (e.g., crushing) or indirect effects (e.g., abandonment) from increased noise and human presence within close proximity to an active nest site and disturbance to habitat. Although no raptor nests, including golden eagle nests, were located within the Habitat Improvement Project Area, direct impacts to these species would be avoided from implementation of pre-construction nesting surveys. The Proposed Action would benefit both resident and transitory sensitive bird species in the Habitat Improvement Project Area through the creation and enhancement of both nesting and foraging habitat. The Proposed Action would have a moderate long-term and beneficial indirect effect on sensitive bird habitat in the localized Habitat Improvement Project Area.

Pygmy Rabbit

No pygmy rabbit habitat or evidence of pygmy rabbit use were observed during surveys and, therefore, this species would not be affected by the Proposed Action.

Sensitive Bats

Nine sensitive bat species have been confirmed or have the potential to occur within the vicinity of the Habitat Improvement Project Area. The Habitat Improvement Plan would enhance bat foraging habitat within the Fire Creek drainage area having a beneficial, moderate, and long-term effect on localized bat populations.

3.3.2.2 No Action Alternative

Healthy riparian areas and wet meadow vegetation serve a crucial role for GRSG brood-rearing habitat. Specific requirements such as grass height for cover and forb diversity near riparian areas are important for GRSG chick survival (Hagen et al. 2007). Under the No Action Alternative, Klondex would continue existing authorized operations in the Habitat Improvement Project Area including exploration activities and surface mine support facilities (ancillary use area and security building with associated parking). Under this alternative, the Fire Creek drainage would continue to decline in health; trampling and hummocking would increase with continued livestock presence, resulting in destroyed riparian vegetation, increased sedimentation, altered stream banks, and more head-cuts. These impacts would be in addition to those predicted from climate change (e.g., drought conditions), further degrading conditions at Fire Creek. When compared to the Proposed Action, the No Action Alternative may affect special status species, but is not likely to adversely affect species or habitat as the current conditions would persist and support the baseline population currently utilizing the localized area. Similarly, impacts from the No Action to general wildlife species and their habitat would be moderate, long-term, and localized.

3.4 Native American Cultural Concerns

3.4.1 Affected Environment

Located within the traditional territory of the Western Shoshone, the MLFO administrative boundary contains spiritual, traditional, and cultural resources, and sites to engage in social practices that aid in maintaining and strengthening the social, cultural, and spiritual integrity of the Tribes. BLM conducted Native American consultation in June 2016, by contacting the Te-Moak Tribe of Western Shoshone and the Battle Mountain Band of the Te-Moak Tribe. To date the Te-Moak Tribe of Western Shoshone has not brought forward any concerns or comments.

3.4.2 Environment Consequences

The impact intensities criteria for Native American Cultural Concerns is based off of the results of Government to Government consultation with the Tribes identified to have a potential interest in the project or region. Specifically, if any Traditional Cultural Properties (TCPs) with significant importance to a group or of religious significance were identified in the proposed impact area. Effect intensity level definitions are described in **Table 3-4**.

Table 3-4: Native American Cultural Concerns Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible Effect - The impact would be at the lowest levels of detection, barely measurable, with no perceptible consequences either adverse or beneficial to cultural properties of significance.</p> <p>Minor Effect - The impact is measurable or perceptible, but it is slight and affects a limited area of a resource or group of resources with cultural, traditional, and spiritual use values.</p> <p>Moderate Effect - The impact is measurable and perceptible.</p> <p>Major Effect - The impact is substantial, noticeable, and permanent.</p>	<p>Duration</p> <p>Impacts to Native American Religious Concerns are considered permanent.</p> <p>Context</p> <p>Localized: Impacts are confined within the cultural resources APE.</p> <p>Regional: Impacts extend beyond the cultural resources APE.</p>

3.4.2.1 Proposed Action

No specific impacts related to Native American Cultural Concerns were identified during the Mine Project, which included exploration in the Habitat Improvement Project Area. Specific tribal consultation for this Project is on-going and would continue throughout the life of the Project.

3.4.2.2 No Action Alternative

Under the No Action Alternative, there would not be any implementation of the Habitat Improvement Plan and no further tribal consultation for this action would be conducted. Since no impacts were identified during tribal consultation during the Mine Plan, no impacts related to the No Action Alternative in relation to Native American Cultural Concerns are expected.

3.5 Noxious Weeds, Invasive and Non-Native Species

The analysis area for direct and indirect impacts related to noxious weeds, invasive, and non-native species is the Habitat Improvement Project Area.

3.5.1 Affected Environment

Multiple noxious weed surveys were performed within the Project Area and along access roads and focused on the current noxious weed list designated by the Nevada Department of Agriculture (NDOA) statute, found at Nevada Administrative Code (NAC) 555.010 (Rubicon Environmental Consulting 2015a). Scotch thistle (*Onopordum acanthium*) and bull thistle (*Cirsium vulgare*) have been observed along the Fire Creek drainage. Bull thistle is considered an invasive/non-native species, not a noxious weed. Invasive and non-native species observed during the surveys include pale madwort (*Alyssum alyssoides*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*Ericameria nauseosus*), halogeton (*Halogeton glomeratus*), tansy mustard (*Descurainia pinnata*), and cheatgrass (*Bromus tectorum*). These species were primarily observed in previously disturbed or burned areas intermixed with native species, and no large populations or monocultures of these species were noted in the Habitat Improvement Project Area.

3.5.2 Environmental Consequences

Effect intensity level definitions are described in **Table 3-5**.

Table 3-5: Noxious Weeds, Invasive and Non-Native Species Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible - There is a barely-perceptible increase in noxious weeds, invasive and non-native plant species as a result of implementing the Proposed Action; mitigation efforts would be small and success would be almost guaranteed. <i>Beneficial effect</i>: there is a barely-perceptible decrease in noxious weeds, invasive and non-native plant species as a result of implementing the Proposed Action.</p> <p>Minor - There is a slight increase in noxious weeds, invasive and non-native plant species as a result of implementing the Proposed Action, however effects can be easily managed and controlled through mitigation and the probability of success would likely be moderate to high. <i>Beneficial effect</i>: there is a slight decrease in noxious weeds, invasive and non-native plant species as a result of implementing the Proposed Action.</p> <p>Moderate - There is a measurable increase in noxious weeds, invasive and nonnative plant species as a result of implementing the Proposed Action; mitigation efforts would need to be implemented repeatedly and there would be a slight risk of failure and increased proliferation. <i>Beneficial effect</i>: there is a measurable</p>	<p>Duration</p> <p>Short-term: Effects would not alter the existing vegetation community, or would last four years or less.</p> <p>Long-term: Effects would alter the existing vegetation community and last for longer than four years.</p> <p>Context</p> <p>Localized: Effects would be limited to the treatment site.</p> <p>Regional: Effects would occur beyond the treatment site.</p>

Effects Definitions	Duration and Context Definitions
<p>decrease in noxious weeds, invasive and non-native plant species as a result of implementing the Proposed Action; monitoring and repeated action would be needed to maintain beneficial effects.</p> <p>Major - There is a measurable and noted increase in noxious weeds, invasive and non-native plant species as a result of implementing the Proposed Action, affecting large areas; mitigation efforts would likely fail and there would be a high risk of increased proliferation over more geographic areas. Beneficial effect: there is a measurable and noted decrease in noxious weeds, invasive and non-native plant species as a result of implementing the Proposed Action; monitoring would be needed to maintain beneficial effects, but native species would thrive over the long-term without much intervention.</p>	

3.5.2.1 Proposed Action

Under the Habitat Improvement Plan, initial facility construction and stream restoration activities new surface disturbance would increase the potential for promoting the spread and establishment of noxious weeds and invasive and non-native species. Direct impacts include increased vehicular traffic and increased soil disturbance, which could introduce or spread existing infestations. Indirect impacts may include an increased disturbance exposure to wind-born seed resulting in the spread of noxious weeds. However, once exclosure fencing is in place and the road relocated out of the wetland area, the reduction in the potential to introduce or spread noxious weeds and invasive species would result.

There would be a localized negligible short-term adverse effect and a localized moderate long-term beneficial effect from the implementation of the Proposed Action. Due to the expected benefit of the Habitat Improvement Plan on the prevention and control of noxious weeds and invasive species.

3.5.2.2 No Action Alternative

Under the No Action Alternative, there would be no change to the exiting noxious weed, invasive, and non-native species and potentially worsen without the exclosure. These impacts would be in addition to those predicted from climate change (e.g., drought conditions), further degrading conditions at Fire Creek. Therefore, the No Action Alternative is expected to have moderate, long-term, and localized effects on noxious weed management based on not excluding grazing in the Fire Creek drainage and wetland habitat areas.

3.6 Water Resources, Wetlands, and Riparian Zones

The analysis area for direct and indirect impacts to water resources, including wetlands and riparian zones, is the Habitat Improvement Project Area.

A PFC assessment on Fire Creek in 2013 showed the segment as non-functional and, therefore, would not meet the Standards for Rangeland Health. Of the seventeen indicators on the PFC assessment for the lotic sections, three were not applicable, five were positive, and nine were negative. The field notes indicated a low abundance of stabilizing species, numerous headcuts that were actively migrating and livestock trampling having widened stream channels. The banks were mostly bare dirt and significant sloughing documented.

A baseline hydrogeology report was prepared that summarizes the hydrogeological and surface hydrology conditions within the Mine Project Area and surrounding area (Interralogic 2015). This report incorporated all existing surface water and groundwater quality monitoring conducted in the Fire Creek drainage within the Habitat Improvement Project Area. In addition, a Seep and Spring Report was prepared detailing the riparian and wetland resources within the Project Area (Rubicon Environmental Consulting 2015b). The majority of the Project Area is located in Nevada Division

of Water Resources (NDWR) Crescent Valley Hydrographic Basin (#54) with a small portion in the northwest corner of the Mine Project Area located within the Whirlwind Valley Hydrographic Basin (#60).

3.6.1 Affected Environment

Groundwater

Various existing water rights are present within or adjacent to the Habitat Improvement Project Area including the following:

- Fire Creek Spring – Filippini Ranching Company
Stockwater Use, Permit 86077 – 8.96 acre-feet
- Fire Creek Proposed Stockwater Well – Filippini Ranching Company
Stockwater Use, Permit 87095 – 8.96 acre-feet
- Fire Creek Spring – Robert Browne
Wildlife Use, Permit 86903 – 4.49 acre-feet
- Fire Creek Spring Well – Klondex Gold & Silver Mining Company
Mining and Milling Use, Permit 75129/Certificate 18863 – 3.22 acre-feet

The water rights for the Fire Creek spring (Permit 86077) and stockwater well (Permit 87095) have a combined annual duty of 8.96 acre-feet.

Drainages

Within the Habitat Improvement Project Area, the main surface water feature is the Fire Creek drainage, which has a perennial segment with regular flow controlled by the Fire Creek Spring (Spring/Seep #3). Fire Creek flows on a seasonal basis for approximately 0.5 mile before fully infiltrating into the alluvial soils. There are multiple small tributary channels that connect with the Fire Creek drainage. In addition to storm water runoff and snowmelt, the source of water for the main northern tributary to the Fire Creek drainage is from groundwater seepage at two springs points (Rubicon Environmental Consulting 2015b).

There are no surface or receiving waterbodies located downgradient of the Project. All drainages terminate prior to entering the playa area within the center of Crescent Valley. There is no physical surface connection to the Humboldt River (Rubicon Environmental Consulting 2015b).

Project Area Seeps and Springs

A spring and seep assessment was performed to characterize hydrology, soils, and vegetative conditions of the Fire Creek Spring (Spring/Seep #3) within the Habitat Improvement Project Area (Rubicon Environmental Consulting 2015b). In addition, wetland and riparian vegetation was mapped along the drainages within the Habitat Improvement Project Area. The Fire Creek Spring source is located within the proposed enclosure and Habitat Improvement Project Area, and discharges into the Fire Creek drainage. This spring is also associated with the surface water monitoring point SS-1 that currently supports State of Nevada permit compliance monitoring for the Mine Project. Below monitoring station SS-1, the spring supports a seasonal flow within the Fire Creek drainage that extends a distance of approximately 0.5 mile before fully infiltrating into the alluvium. Flow rates are greatest during the spring, during snowmelt runoff, and lowest during the fall and winter when the streamflow is supplied by baseflow. Flow rate data along the reach of Fire Creek from SS-1 to a downgradient monitoring station range from approximately 0.05 cubic feet per second (cfs) to 0.30 cfs.

Wetland and Riparian Zones

The spring within the Habitat Improvement Project Area supports wetland and riparian vegetation within their associated drainage features. The wetland obligate species are concentrated near the spring discharge areas where the soils are moist. These species include sedges, rushes, and spikerush species. Within ponded water speedwell species and watercress were observed. Downstream of the spring, riparian scrub vegetation is present within the drainage channels where

seasonally moist soils are present. The dominant shrubs observed within the riparian vegetation is dominated by wild rose (*Rosa* spp.) and chokecherry (*Prunus virginiana*). The dominant forbs included stinging nettle (*Urtica dioica*), common yarrow (*Achillea millefolium*), and sheep sorrel (*Rumex crispus*). The riparian and wetland vegetation totals approximately four acres within the Habitat Improvement Project Area.

3.6.2 Environmental Consequences

Definitions of Intensity Levels of Effects for Water Resources

Water resources analysis was based on a qualitative assessment of water resources and impacts likely caused by construction, rehabilitation, operations, and maintenance activities associated with the Habitat Improvement Plan and the discharge point.

Types of water resources impacts include adding constituents to water, such as sediment; loss of or additions to the amount of water; changes in the flow rate or discharge of water; and impacts on water related resources, such as floodplains. Beneficial impacts would protect or improve natural flow conditions, water quality, and/or water quantity. Beneficial impacts may include restoration, such as elimination or containment of pollutant sources or removing impediments to flow (e.g., inefficient or blocked culverts). Adverse impacts would disrupt natural flow, degrade water quality, and/or alter water quantity. Levels of effects were determined different for surface and groundwater resources are included in **Table 3-6**.

Table 3-6: Water Resources Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible - Hydrology of the area would not be affected, or impacts would not be measurable. Any impacts on the hydrologic regime would be slight and short-term. Water quality would not be affected, or impacts would not be measurable and would not affect beneficial uses of receiving waters.</p> <p>Minor - Impacts on hydrology, such as an increase or decrease in surface or groundwater flow, would be detectable. If mitigation were needed to offset adverse effects, it would be relatively simple to implement. Effects on water quality would be detectable and could affect beneficial uses of receiving waters. If mitigation is needed to offset adverse effects, it would be relatively simple to implement.</p> <p>Moderate - Impacts on hydrology would be readily apparent. Mitigation would probably be necessary to offset adverse effects. Effects on water quality would be readily apparent and would affect beneficial uses of receiving waters. Mitigation would probably be necessary to offset adverse effects.</p> <p>Major - Impacts on hydrology would be readily apparent and would substantially change the hydrologic regime over the area. Similarly, impacts on water quality would be readily apparent and would substantially change beneficial uses of surface or groundwater. Substantial mitigation would probably be necessary to offset adverse effects, and its success could not be guaranteed.</p>	<p>Duration</p> <p>Short-term: One year or less and soils return to pre-disturbance condition the next year. Long-term: Greater than one year.</p> <p>Context</p> <p>Localized: Within the Habitat Improvement Project Area. Regional: Within the local watershed.</p>

Definitions of Intensity Levels of Effects for Wetlands and Riparian Zones

Determination of the significance of potential impacts on wetlands and riparian zones was based on the duration, type and intensity of impact. Actions that reduce the size or degrade the integrity or connectivity of wetlands were considered adverse impacts, whereas actions that preserve, enhance,

or restore these qualities were considered beneficial impacts. Levels of effects were determined different for wetland and riparian zones are included in **Table 3-7**.

Table 3-7: Wetlands and Riparian Zones Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible - Wetlands are not affected, or impacts do not result in a detectable change of wetland function or value.</p> <p>Minor - Impacts on wetlands are detectable and could result in a loss or gain of wetland function or value. If compensatory mitigation is needed to reduce or rectify adverse impacts, it would be relatively simple to implement and have a high probability of success.</p> <p>Moderate - Impacts on wetlands are readily apparent and result in a loss or gain of wetland function or value. Compensatory mitigation is probably necessary to reduce or rectify adverse impacts and would have a high probability of success.</p> <p>Major - Impacts on wetlands are readily apparent and substantially change the physical characteristics of wetlands or result in a significant net loss or gain of wetland function or value. Intensive compensatory mitigation is necessary to reduce or rectify adverse impacts, and its success is not guaranteed.</p>	<p>Duration</p> <p>Short-term: One year or less and soils return to pre-disturbance condition the next year.</p> <p>Long-term: Greater than one year.</p> <p>Context</p> <p>Localized: Within the Habitat Improvement Project Area.</p> <p>Regional: Within the local watershed.</p>

3.6.2.1 Proposed Action

Groundwater Resources and Beneficial Use

The Habitat Improvement Plan would have no direct impact on groundwater quality. Indirectly, the Habitat Improvement Plan would enhance groundwater quality through the increased infiltration of surface water within the Habitat Improvement Project Area.

The proposed stockwater well has been located in a structural block area that is separated from connection to the Fire Creek Spring and the underground mine workings (Interralogic 2015). The stockwater well would be installed and abandoned in conformance with State of Nevada regulations. The water rights associated with the stockwater well would not increase the usage of water at the spring since Project use would not exceed the total duty for the combined water rights for the spring and well of 8.96 acre-feet. Therefore, the well use and spring use to support cattle would remain the same. This would result in no change or impact to water quantity or beneficial uses beyond authorized uses.

Surface Water Resources

The Habitat Improvement Plan improves the quality of the surface water resources within the Habitat Improvement Project Area by enhancing the physiography and function of the Fire Creek Spring and channel. Indirectly, the water quality within the surface water features would improve based on a reduction in sedimentation, erosion, and exclusion of grazing in the creek. Livestock would not be able to trample the area and defecate directly in the spring water, thus improving water quality. The exclusionary fencing would enable riparian vegetation near the streams to recover. Over time, this would reduce soil compaction and erosion, increase porosity, and reduce stream bank alteration. The increased porosity and reduced surficial drainage, that is expected to occur after the installation of the livestock exclusion, would increase the soil’s storage capacity and help to stabilize flows in the stream.

It is expected that a reduction in nitrates, total dissolved and suspended solids would result in addition to an improvement in physical field parameters of the surface water including temperature, conductivity and pH. Existing monitoring stations SS-1, SW-1, and SW-2 would continue to be

monitored during all mine life operations and throughout the implementation and following activities acting as an indicator of success.

In the short-term, erosion and soil compaction associated with the land disturbance in the upland and riparian zones may increase from initial construction activities. However, the disturbance should revegetate and reverse the adverse effects caused by construction of the facilities and initial restoration of disturbed areas. It is expected that implementation of the Habitat Improvement Plan would result in moderate, long-term regional beneficial impacts to the riparian health and water quality would be realized from the implementation of the Habitat Improvement Plan.

3.6.2.2 No Action Alternative

The No Action Alternative does not incorporate the improvements to the Fire Creek drainage associated with the Habitat Improvement Plan. The direct and indirect impacts under the No Action Alternative would, therefore, have the potential for future degradation of the Fire Creek system from continued grazing within the spring and creek areas and impacts would be moderate, long-term, and localized. Also, under the No Action Alternative, the existing temporary discharge point would not be converted to a stockwater well, resulting in possible water management issues for mine operations.

3.7 Grazing Management

The analysis area for direct and indirect impacts to grazing management is the Argenta Allotment.

3.7.1 Affected Environment

The Habitat Improvement Project Area is located entirely within the Argenta Allotment. The Argenta Allotment consists of approximately 331,518 total acres of which 141,689 acres are administered by BLM. The Argenta Allotment is presently managed for approximately 18,025 AUMs annually. An AUM represents the amount of forage required to support one cow and her calf for a month. The average acreage per AUM within the Argenta Grazing Allotment is 7.8 acres. Livestock grazing is permitted year round (March 1 – February 28) on the allotment through a permit. The proposed Fire Creek enclosure is located in the Fire Creek Use Area and is primarily used by Shawn Mariluch with the Filippini Ranch. The Fire Creek Use Area is currently unfenced from other use areas and livestock of other permittees occasionally drift into the use area. The Habitat Improvement Plan has been designed in coordination with Shawn Mariluch.

3.7.2 Environmental Consequences

The analysis of Grazing Management in this EA used publicly available information on grazing allotments (i.e., acres, AUMs) to quantitatively assess anticipated impacts of proposed surface disturbance of the habitat improvements. Adverse impacts would include losses of AUMs that would require changes in current grazing management. Levels of effects were determined different for grazing are included in **Table 3-8**.

Table 3-8: Grazing Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible - Reductions in AUMs may occur, but the proportion relative to total AUMs within an allotment would be very small, and grazing management would not be altered. Reclamation of disturbance would have a high probability of success. Issuance of grazing waivers would not be required.</p> <p>Minor - Reductions in AUMs would occur, but grazing management would not be altered. Reclamation would have a high probability of success. Issuance of grazing waivers would not be required.</p> <p>Moderate - Reductions in AUMs and changes in grazing management would occur. Reclamation of</p>	<p>Duration</p> <p>Short-term: Impacts would not alter the natural vegetation community, or would last for up to three years.</p> <p>Long-term: Impacts would alter the natural vegetation community and last for longer than three years.</p> <p>Context</p> <p>Localized: Impacts would be limited to one site within one allotment.</p> <p>Regional: Impacts would occur throughout one or more allotments; multiple permittees may be affected.</p>

Effects Definitions	Duration and Context Definitions
<p>disturbance may require continued monitoring to ensure success. There would be issuance of grazing waivers.</p> <p>Major - Reductions in AUMs and changes in grazing management would occur. Adverse impacts would be minimized with implementation of environmental protection measures but reclamation would require long-term monitoring and maintenance. Effects would require the issuance of grazing waivers.</p>	

3.7.2.1 Proposed Action

The fencing would prevent grazing damage on the spring and stream segments within the enclosure. BLM would coordinate with the grazing permittee in and around the Habitat Improvement Project Area to ensure success of the habitat improvement. Should BLM and grazing permittee determine that it is appropriate to allow grazing for a limited time within the enclosure, weekly grazing monitoring would occur by BLM to prevent damage to habitat and habitat improvements if needed. At least one ATV gate/cattle guard would be installed to facilitate access in and out of the enclosure.

When livestock are excluded, the fencing would impact grazing distribution outside of the proposed enclosure; however, these impacts would be expected to be minimal and/or localized as a result of the proposed trough installations. Two troughs would be placed near the stock water well in the center of the Habitat Improvement Project Area and the stock water well would serve as the source of water for the troughs. These troughs would reduce grazing pressures around the riparian water sources outside of the enclosure from heavier-utilization, thereby preventing localized soil compaction, increased runoff and erosion, and increased probability of weed infestation.

Impacts from increased livestock trailing along new fence lines may occur. These impacts are typically small and would be further mitigated by much of the fence lines following existing roads, loafing areas and/or traversing steeper slopes where disturbance already exists or livestock typically avoid. In addition, stable stream crossings where cattle can water are included in the Habitat Improvement Plan along with the placement of troughs in areas that would not have an impact to habitat areas.

Distribution changes of livestock outside of the enclosure would not significantly change current management of public riparian resources in the Fire Creek Use Area. There are no other known springs on streams on public land in the Fire Creek Use Area. Water for livestock would still be available on public and private land outside of the enclosure. In addition, the permittee that primarily uses this use area in coordination with Klondex has developed additional water sources in the Fire Creek Use Area on private lands. Any changes in upland utilization due to the loss of available forage would be minimal. The enclosure would be approximately 42 acres out of 19,317 acres for the total use area making up about 0.2 percent of the Fire Creek Use Area. No permanent AUM loss would result from the Habitat Improvement Plan or grazing waivers required since the grazing permittee is a partner in the project, which would allow more sustainable grazing in the allotment. In summary, the Proposed Action would have a negligible, localized effect on grazing management.

3.7.2.2 No Action Alternative

The No Action Alternative would not allow for construction of the enclosure fences or troughs. Condition trends in the Argenta Allotment and Habitat Improvement Project Area would remain unchanged under the current management. This would continue to limit the ability of these riparian areas to recover from the current impacts of livestock grazing on the stream sections. Indirectly, the No Action Alternative has the potential to result in moderate, long-term, and localized effects to the creek from grazing and as a result cattle may be excluded earlier in the season than if the sensitive areas were not enclosed.

3.8 Recreation

The analysis area for direct and indirect impacts to recreation is the Habitat Improvement Project Area.

3.8.1 Affected Environment

The area around Fire Creek Mine is relatively isolated and undeveloped. There are no recreational facilities within the Habitat Improvement Project Area and vicinity, and in this part of Nevada, developed recreational opportunities are relatively sparse. In the local region, opportunities for public recreation are considered as dispersed in nature and primarily include off-highway vehicle use, hunting, and camping. Mountain biking, horseback riding, sightseeing, outdoor photography, nature study, wildlife viewing, bird watching, and rock collecting may also occur.

3.8.2 Environmental Consequences

Effect intensity level definitions are described in **Table 3-9**.

Table 3-9: Recreation Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible - The majority of recreationists would not notice any effects or changes in recreation patterns and levels and the effects would not change their experience of recreation resources and values. Mitigation would not be necessary.</p> <p>Minor - Recreationists might be able to detect the effects of changes in recreation patterns and levels, and the changes might have a slight but detectable effect on their experience of recreation resources and values. If mitigation were needed to offset adverse effects to the recreation experience, it would be relatively simple to implement and would likely be successful.</p> <p>Moderate - Recreationists would be aware of the effects of changes in recreation patterns and levels, as well as the effects on their experience of recreation resources and values. Some recreationists might feel displaced and need to pursue their desired activity in another recreation area. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.</p> <p>Major - The majority of recreationists would be highly aware of the effects associated with changes in recreation patterns and levels, as well as the effects on their experience of recreation resources and values. Many recreationists would feel displaced and need to pursue their desired activity in other areas. Mitigation measures to offset adverse effects would be needed, they would have to be extensive, and their success could not be guaranteed.</p>	<p>Duration</p> <p>Short-term: The effect is transitory or that largely disappears over a period of hours or days.</p> <p>Long-term: The effect lasts more than three weeks, or months or years.</p> <p>Context</p> <p>Localized: Effects would be limited to the Habitat Improvement Project Area.</p> <p>Regional: Effects would extend beyond the Project Area.</p>

3.8.2.1 Proposed Action

The Proposed Action would not change existing access to public lands within the Habitat Improvement Project Area for recreational uses. The existing access road that runs through the Fire Creek Spring area would be relocated to provide continual access to private and public lands west of the mine. The Habitat Improvement Project Area is not known as a popular destination for public use, and no annual commercial or competitive permitted events occur in the area. The enclosure area would prevent recreational use in these areas, however, because of the limited recreational potential and small size of the Habitat Improvement Project Area impacts to recreation are not anticipated.

3.8.2.2 No Action Alternative

Under this alternative, BLM would not approve the Habitat Improvement Plan. The riparian areas in the Fire Creek drainage would continue to be degraded from overuse by livestock and motorized vehicles would continue to be able to access the spring at the Fire Creek area. The continued degradation would lead to further soil erosion from the inability of plant communities to stabilize the stream banks. This could lead to deeply incised streams and loss of ecological function. This cascading effect would reduce wildlife populations in the area and decrease hunting or other recreational opportunities in the short and long-term following the closure and reclamation of the mine. Impacts to recreation from the No Action alternative would be moderate, long-term, and regional.

3.9 Soils

The analysis area for direct and indirect impacts to soils is the Habitat Improvement Project Area.

3.9.1 Affected Environment

The NRCS Websoil Survey was reviewed for the soil associations and complexes within the Habitat Improvement Project Area. According to the NRCS Websoil Survey (NRCS 2020), there are four soil units within the Habitat Improvement Project Area (**Table 3-10**).

Table 3-10: Soils Effect Intensity Level Definitions

Soil Unit ID	Soil Unit Name	Setting/Profile	Associated Ecological Sites	Acres Habitat Improvement Project Area
901/1041	Tenabo-Ricert association	4,700 to 5,100 feet above mean sea level (amsl), slope 0 to 4%, fan piedmonts/ gravelly, silty, clay, sandy loam	Loamy 5-8 p.z. (R024XY002NV)	4
1085	Trunk-Dewar-Stingdorn association	5,500 to 6,000 feet amsl, slope 8 to 50%, mountains, hills, fan remnants/ very cobbly loam, gravelly loam	Loamy 8-10 p.z. (R024XY005NV) and Loamy 5-8 p.z. (R024XY002NV)	3
1201	Slaven-Linrose-Cleavage association	6,500 to 7,200 feet amsl, slope 4-75%, mountains/ gravelly loam	South slope 13-16 p.z. (R024XY029NV), Steep gravelly loam 14+ p.z. (R024XY042NV), and Claypan 12-16 p.z. (R024XY027NV)	36
3127	Walti-Cleavage-Softscrabble Association	6,500 to 7,900 feet amsl, slope 15 to 30%, mountains/ gravelly loam	Claypan 12-16 p.z. (R024XY027NV), Mountain Ridge (R024XY016NV), and Loamy slope 12-14 p.z. (R024XY021NV)	90
Total Acres				134

3.9.1 Environmental Consequences

Soils analysis was based on a qualitative assessment of generalized soil types. Types of soil impacts include those resulting from soil removal, profile mixing, compaction, erosion, contamination, and restoration. Beneficial impacts would protect soils from erosion or restore natural soil conditions; adverse impacts would degrade chemical or physical properties of soils or result in the loss or temporary removal of soils. Impact threshold definitions for soils are as follows. Effect intensity level definitions are described in **Table 3-11**.

Table 3-11: Soils Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible - Impacts on soils, such as removal of topsoil, would not occur or would be so slight as to be immeasurable.</p> <p>Minor - Impacts on soils, such as removal of topsoil, would occur but would be barely measurable or perceptible.</p> <p>Moderate - Impacts on soils would be readily apparent. Mitigation would probably be necessary to offset adverse impacts.</p> <p>Major - Impacts on soils would be readily apparent and would substantially change the soil characteristics of the area. Extensive mitigation would probably be necessary to offset adverse impacts, and its success could not be guaranteed.</p>	<p>Duration</p> <p>Short-term: Less than six months. Long-term: Greater than six months.</p> <p>Context</p> <p>Localized: Within the Habitat Improvement Project Area. Regional: Within the local watershed.</p>

3.9.1.1 Proposed Action

The implementation of the Habitat Improvement Plan is estimated to directly impact approximately one acre of soil through the introduction of equipment, construction crews, and the installation of small permanent structures. The disruption of soils would only be temporary and conducted in phases. The construction crews would utilize existing roads and minimize overland travel paths to reduce the amount of new soil disturbance.

The Habitat Improvement Plan would benefit soil health as well as water quality by reducing erosion and sedimentation potential. However, impacts to soils from concentrated livestock trailing along fence lines are expected. These impacts would include soil compaction, increased wind driven soil erosion as vegetation is denuded. Increased soil erosion via water could occur during storm events in areas where vegetation has been denuded. These impacts areas along fence lines are typically small and would be further mitigated by following existing roads or traversing steeper slopes where disturbances already exist or livestock typically avoid. Additionally, it is anticipated that larger areas within the enclosure would see a reduction of soil erosion and compaction through the removal of livestock use, thus creating a net positive effect.

The Habitat Improvement Area would increase soil stability and water holding capacity in fenced off areas, allowing riparian vegetation to expand. The increased root structure and surface roughness would reduce future erosion and downstream sedimentation.

It is expected there would be a localized short-term negligible adverse effect on soils during the construction phase of the Habitat Improvement Plan; however, once stream restoration activities are in place including headcut repair and road relocation, there would be a localized minor beneficial effect on soils from the reduction in sedimentation and soil loss.

3.9.1.2 No Action Alternative

The No Action Alternative would result in continued impacts to soils from livestock trampling of the wet soils around the Fire Creek Spring and drainage. Livestock would continue to alter the soil health near throughout this reach without the installation of the enclosure fencing and other soil stabilization measures included in the Habitat Improvement Plan. Klondex would continue to implement Best Management Practices (BMPs) as authorized in the Mine Plan to reduce impacts to soils from the mining and exploration activities, including reclamation. Impacts to soils from the No Action alternative would be moderate, long-term, and localized.

3.10 **Transportation, Access, and Public Safety**

The analysis area for direct and indirect impacts related to transportation, access, and public safety is the Habitat Improvement Project Area.

3.10.1 **Affected Environment**

The Project access road is an unpaved two-lane road that connects the Mine Project Area to State Route 306. This road is maintained by Klondex in coordination with Eureka and Lander Counties. The western portion of this road cuts through the Fire Creek drainage and wetland area within the Habitat Improvement Project Area and is subject to relocation under the Habitat Improvement Plan.

3.10.2 **Environmental Consequences**

The analysis was based on a qualitative assessment of transportation routes, access to public and private lands, and human health and safety measures. Types of impacts include those resulting from restricting access, overloading transportation arteries, and the development of hazards to the public. Beneficial impacts would improve access, improve the road system, and enhance public safety. Impact threshold definitions for transportation, access, and public safety are as follows. Effect intensity level definitions are described in **Table 3-12**.

Table 3-12: Transportation Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible - Impacts on access, road conditions, and human health and safety are not detectable or changed from existing conditions.</p> <p>Minor - Impacts on access, road conditions, and human health and safety are measurable, but would not require mitigation or protection measures to offset changes.</p> <p>Moderate - Impacts on access, road conditions, and human health and safety would require the implementation of alternate routes, mitigation measures, and public safety measures.</p> <p>Major - Impacts on access, road conditions, and human health and safety would result in major changes to infrastructure, eliminating access, and threatening public health and safety. Extensive mitigation would probably be necessary to offset adverse impacts.</p>	<p>Duration</p> <p>Short-term: Less than four years. Long-term: Greater than four years.</p> <p>Context</p> <p>Localized: Within the Habitat Improvement Project Area. Regional: Within the surrounding vicinity of the Habitat Improvement Project and transportation network.</p>

3.10.2.1 **Proposed Action**

The relocation of the portion of the access road within the Habitat Improvement Project Area would improve access to public and private land west of the mine area and also improve the condition of the road. The road is currently subject to major rutting and widening as road use continues to expand the disturbance around this road within the wetland area. The private land owner west of the Mine Project Area did not agree to road improvements on their land, so the improvements would end on public land in this area.

The Proposed Action would have a localized, long-term minor beneficial effect on transportation infrastructure, by improving access conditions to adjacent properties and improving road conditions thereby enhancing public health and safety. Due to the expected benefit of the Habitat Improvement Plan on this resource.

3.10.2.2 **No Action Alternative**

Under the No Action Alternative, the Habitat Improvement Plan would not be implemented and the road segment within the wetland area would continue to degrade. Access to private and public land

would still be available through alternate routes. Impacts to transportation from the No Action alternative would be minor, long-term, and localized.

3.11 **Vegetation**

The analysis area for direct and indirect impacts to vegetation is the Habitat Improvement Project Area.

3.11.1 **Affected Environment**

The Project is located within the Intermountain Region, Great Basin Division, Central Great Basin Section floristic zone (Cronquist et al. 1972). Approximately 99 acres within the Habitat Improvement Project Area burned in 1996. Dominant native vegetation in the hilly portions of the Project Area include sagebrush and various grass species and desert scrub species in the lower alluvial portions of the Project Area. Some forbs and understory species are present in the more intact habitat areas, primarily outside of the burn areas. Four ecological sites were observed within the Habitat Improvement Project Area (**Table 3-10**).

3.11.2 **Environmental Consequences**

Determination of the significance of potential impacts on vegetation is based on the context, duration, type, and intensity of impact that could result from actions associated with implementation of the Proposed Action, specifically the Habitat Improvement Plan. Vegetation impact assessment was based on a qualitative analysis of Project Area vegetation and the potential effects anticipated as a result of ongoing maintenance, construction, or rehabilitation. The qualitative analysis also considered areas that were likely to be affected by the enclosure fencing and the road relocation components of the Habitat Improvement Plan.

The essential qualities of native plant communities include their spatial extent, integrity (consistency) of species composition, repeated association with natural features, and vigor in terms of the growth and reproduction of constituent species. Actions that reduce/degrade these qualities are considered to have adverse impacts; actions that preserve or restore these qualities have beneficial impacts.

The Proposed Action has a variety of different components that would affect vegetation, including temporary ground disturbance, alteration of drainage patterns, changes in vehicle and cattle grazing, and active revegetation and restoration measures. Effect intensity level definitions are described in **Table 3-13**.

Table 3-13: Vegetation Effect Intensity Level Definitions

Effects Definitions	Duration and Context Definitions
<p>Negligible - Effects on native vegetation—beneficial or adverse--would be so small it would not be measurable or perceptible.</p> <p>Minor - Effects on native vegetation—beneficial or adverse--would be detectable, measurable and perceptible but small, localized, and of little consequence. Adverse effects can be minimized or fully mitigated and would be relatively simple to implement and would have a high probability of success.</p> <p>Moderate - Effects on native vegetation—beneficial or adverse--would be readily apparent, measurable, large and of consequence, but localized. Adverse effects would require mitigation and restoration. Mitigation could be extensive, but most likely effective.</p>	<p>Duration</p> <p>Short-term: One year or less. Long-term: Greater than one year.</p> <p>Context</p> <p>Localized: Affecting the Habitat Improvement Project Area or treatment site. Regional: Affecting an area beyond the Habitat Improvement Project or treatment site.</p>

Effects Definitions	Duration and Context Definitions
<p>Major - Effects on native vegetation—beneficial or adverse--would be readily apparent and would substantially change the biological value of the native plant community in the context of the project area or region. Changes would be widespread, and could have permanent consequences for the resource. Restoration would be necessary to reduce or rectify adverse effects, and its success could not be guaranteed.</p>	

3.11.2.1 Proposed Action

The Habitat Improvement Plan would benefit vegetation structure, composition, and health within the Habitat Improvement Project Area. The installation of facilities, including enclosure fencing, stream crossings, road realignment, and other stream repair structures is estimated to have a less than one acre direct impact to vegetation. Based on the total length of fencing to be installed (19,234 linear feet) with a 20-foot buffer, it is estimated that approximately nine acres of vegetation would be indirectly and temporarily disturbed and no more than one acre would be disturbed in the long term. Short-term disturbance would occur as a result of overland travel, site and road work, and installation of the fencing. These impacts are expected to be small, where construction crews would be working. These short-term impacts would be minimized and mitigated by having construction crews use areas that are not vegetated to reduce overall disturbance, and seeding of areas impacted by these activities to re-establish vegetation. Due to the relatively small surface area disturbed by the installation of the Habitat Improvement Plan, revegetation of the disturbed area would consist of hand seeding and hand raking.

Long-term disturbance would result from trampling of vegetation due to increased trailing along the fence lines by livestock. These impacts are typically small and would be further mitigated by placing most of the fence lines along existing roads, loafing areas or traversing steeper slopes where disturbances already exist or livestock typically avoid. The area inside the enclosure that would benefit from removal of livestock use would be larger than any areas negatively impacted due to trailing along fence lines. The placement of the fencing around the streams would limit activity in these areas as long as the fencing remains.

In addition, the benefit to vegetation communities and structure in the Habitat Improvement Project Area and reclamation of the road area in the wetland and existing exploration disturbance would offset and provide a net positive impact to the vegetation within the Mine Project Area. Riparian vegetation is expected to improve overtime as a result of restricting livestock access to the stream segments. As vegetation growth recovers around the stream segments, evapotranspiration could increase through greater surface area and increased plant vegetation. However, as vegetation stabilizes the soils, water would travel through the system much more slowly (subsurface vs. overland), increasing the amount of water being stored in the soils. Overtime, this would expand the extent of the riparian area and increase the frequency and composition of riparian vegetation.

The implementation of the Habitat Improvement Plan, would have a short-term minor effect on vegetation in the immediate area of the stream restoration activities and enclosure fencing; however, long-term, the Habitat Improvement Plan would have a moderate beneficial, but localized effect on vegetation quality and structure within the Habitat Improvement Project Area. The expected positive impact of the Habitat Improvement Plan on vegetation is expected to be negligible, short-term, and localized.

3.11.2.2 No Action Alternative

Under the No Action Alternative vegetation degradation around the Fire Creek Spring and drainage from livestock trampling and utilization would continue. The road currently in the wetland area would not be relocated to upland habitat and other restoration and habitat enhancement activities would not take place as outlined in the Habitat Improvement Plan. Current vegetation trends would

continue within the Habitat Improvement Project Area, and impacts to vegetation would be moderate, long-term, and localized.

4 CUMULATIVE EFFECTS

The Mine EA included a comprehensive evaluation of cumulative effects on resources related to the Mine Plan. For this EA, past, present, and reasonably foreseeable future actions (RFFAs) were analyzed using BLM’s Legacy Rehost 2000 (LR2000) System records and aerial photography.

The extent of the Cumulative Effects Study Area (CESA) would vary with each resource, based on the geographical or biological limits of that resource. As a result, the list of projects considered under the cumulative analysis varies according to the resource being considered. In addition, the length of time for cumulative effects to occur would vary according to the duration of impacts from each Proposed Action on the particular resource. This analysis takes a quantitative approach to documenting the impacts within each CESA identified; however, it should be noted that the Habitat Improvement Project as analyzed in Chapter 3 would result in less than one acre of permanent surface disturbance and approximately nine acres of temporary surface disturbance, and the enclosure would encompass approximately 42 acres. The overall effects of the Habitat Improvement Project would be beneficial and minute relative to the other actions in the CESA quantified below.

Based upon the analysis conducted for each resource in Sections 3.2 through 3.11, it was determined necessary to analyze cumulative impacts for the resources listed in **Table 4-1**. Based in the direct and indirect analysis, cumulative impacts are not expected to the following resources: Cultural Resources; Native American Cultural Concerns; Noxious Weeds, Invasive and Non-native Species; Recreation; Soils; Transportation, Access, and Public Safety; and Vegetation.

4.1 Cumulative Effects Study Areas

The geographical areas considered for the analysis of cumulative effects vary in size and shape to reflect each evaluated environmental resource and the potential area of impact. The descriptions of the CESA boundaries are described in **Table 4-1** and shown in **Figure 4-1**.

Table 4-1: Cumulative Effects Study Areas by Resource

Element/Resource	CESA Description	CESA Name	Acres
Wildlife Resources (includes General & Migratory Birds)	Immediate Shoshone Mountain Range	Wildlife CESA	257,588
Greater Sage-Grouse	Shoshone Greater Sage-Grouse Population Management Unit	Greater Sage-Grouse CESA	663,299
Water Quality, Surface/Groundwater	Crescent Valley + Whirlwind Valley Hydrographic Basins	Watershed CESA	160,400
Grazing Management	Argenta Allotment	Grazing CESA	331,521

This section of this EA includes activities that could interact with the Proposed Action and alternatives in a manner that would result in cumulative impacts. The projects are listed in the past, present, and RFFAs acreage table by resource (Table 4.2-2). Surface disturbance characteristics were selected to describe the projects because it allows the combined surface disturbance impacts of all projects to be totaled; thus, providing a quantitative analysis for most resources. Impacts to social values and economics are discussed qualitatively since they are difficult to quantify.

Table 4-2: Past, Present, and Reasonably Foreseeable Future Actions for the Fire Creek Habitat Improvement Project

Element/ Resource	Wildlife Resources (includes General, Migratory Birds, & Sensitive Species)		Greater Sage-Grouse		Water Quality, Surface/Groundwater		Grazing Management	
	Past and Present Actions (acres)	Future Actions (acres)	Past and Present Actions (acres)	Future Actions (acres)	Past and Present Actions (acres)	Future Actions (acres)	Past and Present Actions (acres)	Future Actions (acres)
Mineral Development	11,127	3,040	16,041	14,384	7,729	3,039	8,943	3,039
Oil, Gas, and Geothermal	279	0	279	0	278	2	279	2
Roads, Railroads, and Govt. Subdiv.	83	0	348	0	131	0	131	0
Utilities, Infrastructure, & Public Purpose	3,759	1	14,365	4	2,956	0	3,675	2
Wind Infrastructure	3,800	1	3,802	0	3,800	2	3,800	0
Disturbance Acres	19,048	3,042	18,515	14,388	14,894	3,043	16,828	3,043
Total Past, Present, RFFAs	22,090		32,903		17,937		19,871	
Disturbance Percent in CESA	9		5		11		6	
Wildfires	80,835		204,909		114,580		88,352	

Note: Livestock grazing and dispersed recreation have occurred and would continue to occur in the CESAs, but no quantifiable data are associated with these activities.

4.1.1 Wildlife Resources (includes General Species & Migratory Birds)

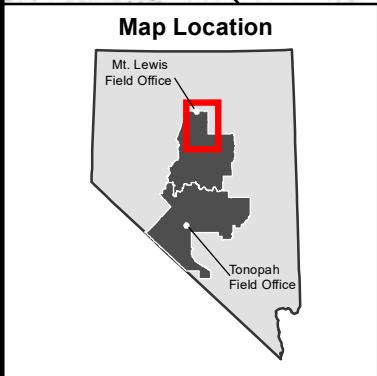
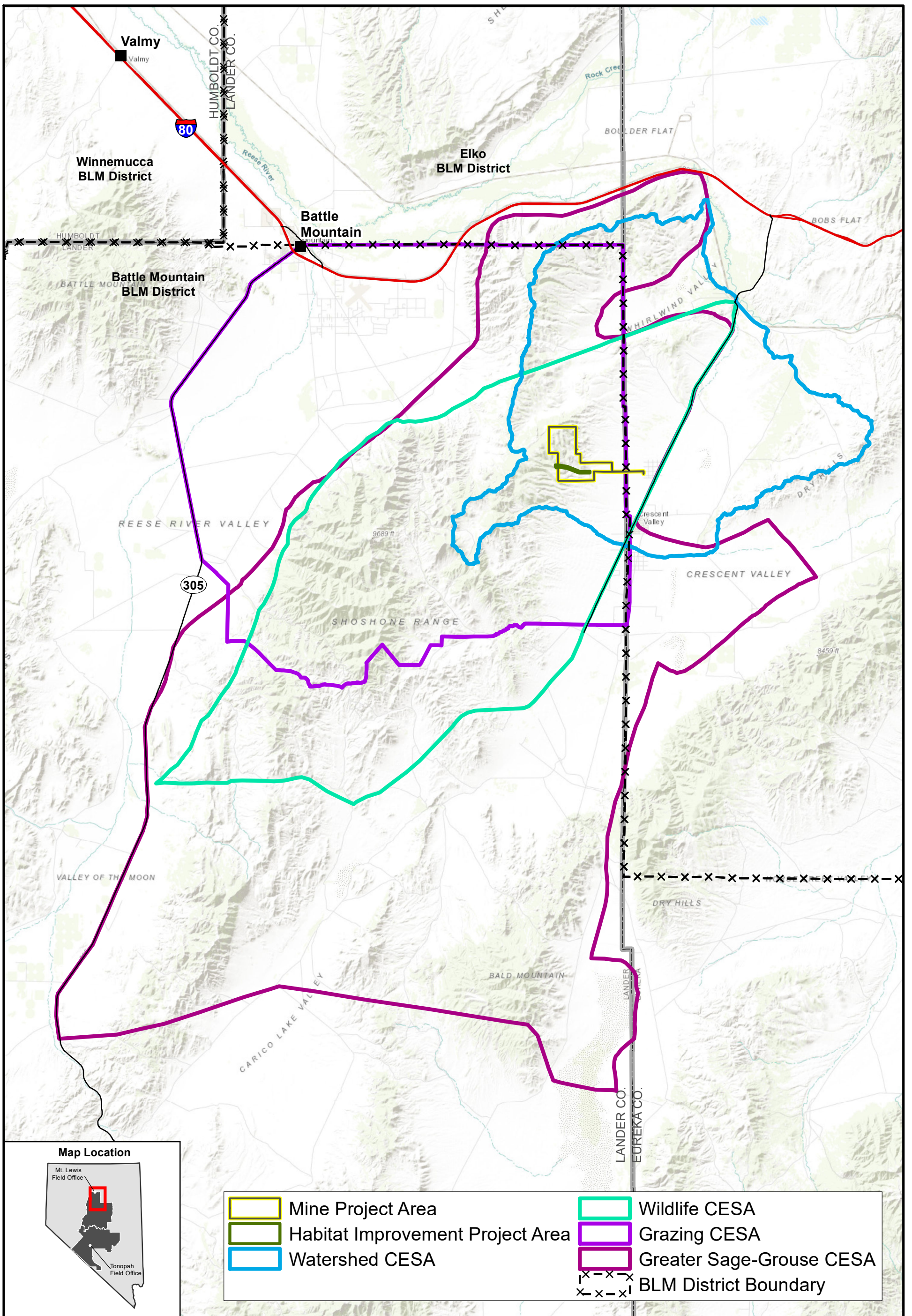
Of the 257,588 acres covered by the Wildlife CESA, approximately 22,090 acres of disturbance are associated with past, present, and RFFAs. Combined with the 9 acres associated with the Proposed Action, the total disturbance in the CESA would be approximately 22,099 acres, or approximately 9 percent of the CESA (Table 4.2-2).

Past and present actions cause behavioral disturbances to individuals and modify native vegetation, which act as wildlife habitat. This would displace individuals into adjacent occupied territories, increasing local competition for food/water resources, nesting, and cover.


4.1.2 Greater Sage-Grouse

Of the 663,299 acres covered by the GRSG CESA, approximately 32,903 acres of disturbance are associated with past, present, and RFFAs. Combined with the 9 acres associated with the Proposed Action, the total disturbance in the CESA would be approximately 32,912 acres, or approximately five percent of the CESA (Table 4.2-2).

Cumulative impacts to GRSG would be similar to those described for above for wildlife. Additionally, fences from past, present, and RFFAs could cause an increase in hazard for GRSG. These can interrupt seasonal migration, by entangling flying GRSG moving through the landscape. Any type of surface development (e.g., pipelines, roads, canals) can also interrupt GRSG movement, fragmenting habitat and populations. These can have important regional implications for winter feeding areas, leks, and nesting habitat.

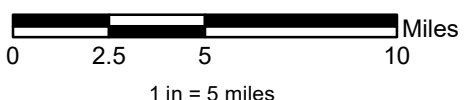


- | | | | |
|--|----------------------------------|--|--------------------------|
| | Mine Project Area | | Wildlife CESA |
| | Habitat Improvement Project Area | | Grazing CESA |
| | Watershed CESA | | Greater Sage-Grouse CESA |
| | | | BLM District Boundary |




Battle Mountain
BLM District
Mount Lewis Field Office

**FIRE CREEK
GREATER SAGE-GROUSE
MITIGATION PROJECT EA**



0 2.5 5 10 Miles
1 in = 5 miles



**CUMMULATIVE EFFECTS
STUDY AREA MAP**

FIGURE 4.1	REVISION
10/20/2020	A

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 with other data.

4.1.3 Water Quality, Surface/Groundwater

Cumulative impacts in the Watershed CESA are created by past, present, and RFFAs and include surface disturbance (surface water) and other dewatering projects (groundwater). Surface disturbances are detailed in **Table 4.2-2**. Of the 160,400 acres covered by the Watershed CESA, approximately 17,937 acres of disturbance have been identified associated with past, present, and RFFAs. Combined with the 9 acres associated with the Proposed Action, the total disturbance within the CESA would be approximately 17,946 acres, or 11 percent of the CESA (**Table 4.2-2**).

Impacts to water resources within this CESA are predominantly created by mining (Mule Canyon and Fire Creek Mines), wind infrastructure (Argenta Wind Project), and infrastructure. The largest action in the CESA with past and present impacts to water quality is Mule Canyon Mine, which has five persistent pit lakes which are part of a flow-through groundwater system (BMRR 2017).

4.1.4 Grazing Management

Of the 331,521 acres covered by the Grazing CESA, approximately 19,871 acres of disturbance are associated with past, present, and RFFAs. Combined with the 9 acres associated with the Proposed Action, the total disturbance in the CESA would be approximately 19,880 acres, or approximately six percent of the CESA (**Table 4.2-2**).

Impacts to grazing management within the CESA have resulted from development and subsequent loss of AUMs from developing areas previously used for rangelands.

4.2 Cumulative Impacts

4.2.1 Proposed Action

4.2.1.1 Wildlife Resources

The Wildlife CESA represents the immediate area of the Shoshone Mountain Range in which the project area is located, bounded by major roads and drainages thereby representing the use area for wildlife species and encompasses 257,588 acres.

When combined with the cumulative impacts to wildlife from past, present, and RFFAs, the Habitat Improvement Plan, would have a small net benefit to wildlife species in the local area. The enclosure fencing would not inhibit wildlife movement and use in the area. The enhancement of the riparian and stream conditions would support wildlife species utilizing the immediate area around the mine. However, these positive incremental impacts to wildlife, when combined with the impacts of the past and present actions and RFFAs, are expected to be minimal in the CESA.

4.2.1.2 Greater Sage-Grouse

The Shoshone GRSG PMU is the CESA for GRSG and encompasses 663,299 acres. It is estimated that the GRSG population within this area is approximately 1,400 individuals, with approximately 0.002 breeding birds per acre (State of Nevada 2014).

The Habitat Improvement Plan would have an incremental benefit to GRSG habitat within the Shoshone PMU. The Habitat Improvement Project Area would create approximately 173 functional acres for GRSG, which represents 0.03 percent of the CESA. While this is a small percentage, the preservation and creation of riparian habitat is important as this is a very small component of the PMU and a critical component of to the life cycle of the species.

4.2.1.3 Water Quality (Surface and Ground) and Wetlands and Riparian Resources

The CESA for water quality and wetlands and riparian resources is the immediate watershed area measuring approximately 160,400 acres. In addition to the past and present actions and RFFAs analyzed in the Mine EA in this CESA, on September 2, 2015, BLM approved six additional spring enclosures that would exclude approximately 23 acres. These projects are

expected to have a minor positive effect on water quality and wetland resources within the watershed.

The Habitat Improvement Project Area where water quality would be improved through stream restoration and installation of the enclosure represents 0.08 percent of the CESA. When combined with the additional enclosures in the area, the Proposed Action has an incremental net benefit to water quality within the watershed. Therefore, based on the above analysis and findings, incremental impacts from water resources and water quality as a result of the Proposed Action, when combined with the impacts of the past and present actions and RFFAs analyzed in the Mine EA, are expected to be minimal.

The Habitat Improvement Plan is expected to have an incremental net benefit to wetland and riparian zones that are very localized. Therefore, based on the above analysis and findings, incremental impacts from riparian and wetland area disturbance as a result of the Proposed Action, when combined with the impacts of the past and present actions and RFFAs, are expected to be minimal.

4.2.1.4 Grazing Management

The CESA for grazing management is the Argenta Allotment boundary. The CESA encompasses approximately 331,521 acres of which 141,689 acres area BLM administered lands.

The enclosure of approximately 42 acres under the Proposed Action represents 0.01 percent of the Argenta Allotment. The overall net benefit to rangeland health in the allotment is expected with the proposed enclosure and the other six approved enclosures in the allotment. No AUM losses would result from the Proposed Action. Therefore, based on the above analysis and findings, incremental impacts from grazing management as a result of the Proposed Action, when combined with the impacts of the past and present actions and RFFAs, are expected to be insignificant.

4.2.2 No Action Alternative

4.2.2.1 Wildlife Resources

The No Action Alternative would have the same cumulative effects as analyzed in the Mine EA without the benefit of localized improved habitat from implementation of the Habitat Improvement Plan.

4.2.2.2 Greater Sage-Grouse

Under the No Action Alternative, the Habitat Improvement Plan would not be implemented and habitat within the Fire Creek area would not be improved to support late brood rearing. This would result in no incremental benefit to GRSG habitat and the species.

4.2.2.3 Water Quality (Surface and Ground) and Wetlands and Riparian Resources

The No Action Alternative is expected to have similar but incrementally less benefit to water quality within the CESA as previously analyzed in the Mine EA. Cumulative impacts to wetlands and riparian zones was not analyzed in the previous EA as the Mine Plan did not have any impacts to these resources.

4.2.2.4 Grazing Management

Under the No Action Alternative, cumulative impacts to grazing management would be the same as analyzed in the Mine EA, which were minimal.

5 CONSULTATION AND COORDINATION

This EA was prepared at the direction of BLM, MLFO, BMD by Stantec Environmental Consulting under a contract with Klondex. Following is a list of persons, groups, organizations, and agencies consulted, as well as a list of individuals responsible for the preparation and review of this EA.

5.1 Persons, Groups, Organizations, and Agencies Consulted

Federal Agencies

USFWS

State Agencies

NDOW, NNHP, SETT

Native American Tribes

Te-Moak Tribe of Western Shoshone, Battle Mountain Band of the Te-Moak Tribe

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