HYCROFT MINE GOLDEN EAGLE CONSERVATION PLAN
HUMBOLDT AND PERSHING COUNTIES, NEVADA

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LIST OF ACRONYMS AND ABBREVIATIONS

ACP	Advanced Conservation Practices
APLIC	Avian Power Line Interaction Committee
BBCS	Bird and Bat Conservation Strategy
BCR	Bird Conservation Region
BLM	Bureau of Land Management
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
Module 1 Guidance	USFWS 2013 Eagle Conservation Plan Guidance, Module 1- Land-based Wind Energy, Version 2
EA	Environmental Assessment
Eagle Act	Bald and Golden Eagle Protection Act
ECP	Eagle Conservation Plan
EIS	Environmental Impact Statement
GPS	Global Positioning System
HRDI	Hycroft Resources and Development, Inc.
JBR	JBR Environmental Consultants, Inc.
KDE	Kernel Density Estimators
MBTA	**Migratory Bird Treaty Act**
NDOW	Nevada Department of Wildlife
PoO	Plan of Operations
ROD	Record of Decision
ROW	Right-of-Way
SwReGAP	Southwest Regional Gap Analysis Project
US	United States
USFWS	United States Fish and Wildlife Service
WRC	Wildlife Resources Consultants

DRAFT HYCROFT MINE GOLDEN EAGLE CONSERVATION PLAN
HUMBOLDT AND PERSHING COUNTIES, NEVADA

1.0 PURPOSE OF THIS PLAN

The purpose of the Hycroft Mine Eagle Conservation Plan (ECP) is to support a request to remove inactive golden eagle (Aquila chrysaetos) nests and an eagle take permit application under the Bald and Golden Eagle Protection Act (Eagle Act) Title 50 CFR §22.25 and 50 CFR §22.26, respectively. This request relates to current and proposed operations at the mine site by Hycroft Resources and Development, Inc. (HRDI), as summarized below. Title 50 CFR §22.25 allows for "take [of] alternate golden eagle nests during a resource development or recovery operation if the taking is compatible with the preservation of golden eagles." Title 50 CFR §22.26 is the regulation that allows the USFWS to issue permits for "Eagle take that is associated with, but not the purpose of, an activity." Per Eagle Act regulations, the USFWS Director can utilize permit applications to authorize take of golden eagles and their inactive/alternate nests in accordance with issuance criteria that, "authorizes take of bald eagles and golden eagles where take is compatible with the preservation of the bald eagles and golden eagles; necessary to protect an interest in a particular locality; associated with but not the purpose of the activity."

Some terminology and definitions were updated in the revised Eagle Act permit regulations, as defined in the PEIS (USFWS 2016). In this ECP, we present both the old terminology and updated terminology together when sensible.

Current Operations

The United States (US) Department of the Interior, Bureau of Land Management (BLM) Winnemucca District, Black Rock Field Office completed an Environmental Impact Statement (EIS) on a proposal by HRDI, a wholly owned subsidiary of Hycroft Mining Corp., to expand mining and mineral exploration activities on private and BLM-administered lands at the existing Hycroft Mine, located near the historical town of Sulphur in Pershing and Humboldt Counties, Nevada. The BLM issued a Record of Decision (ROD) on the EIS in August 2012.

The authorized expansion area includes mining of the Silver Camel feature, a rocky hill in the southwestern extent of the existing mine area. During baseline surveys performed for the EIS in late April 2011, a golden eagle nest and two older nests were discovered on an outcrop at the northern end of the Silver Camel feature. Although mining of the Silver Camel feature has been authorized, removal of the eagle nests has not. Mining of the Silver Camel feature and the occurrence of the nests were both analyzed in the EIS.

In 2013, HRDI submitted a major modification to the Plan of Operations (PoO) for a Rail Spur Expansion. The BLM analyzed impacts under an Environmental Assessment (EA) for the PoO modification that also includes a well field project and 120 kV powerline that would tie-in to existing transmission lines. The Rail Spur Expansion project will add a rail spur and expand associated infrastructure, while the well field would provide water for mining and milling. The BLM issued a ROD for the EA in January 2015.

Proposed Operations

In April 2014, HRDI submitted a modification to the PoO for the Phase II Expansion to the BLM. Subsequently, HRDI submitted an updated PoO for the Phase II Expansion detailing certain changes to the plan because of an updated mine plan supported by a feasibility study dated October 31, 2016. The Phase II Expansion is presently under review by the BLM as an EIS and includes activities associated with expansion of the PoO boundary to the east, construction of a Northeast Tailings Facility and expansion and dewatering of the Brimstone Pit.

Golden eagle baseline surveys identified three additional nests (in addition to the Silver Camel nests mentioned under Current Operations) within the footprint of the proposed Northeast Tailings Facility. The cliff face where two of the nests are located will not be physically altered, however, the construction of the dam may cause disturbance to existing nests. In addition, twenty percent of the South of Sawtooth breeding territorial area would be lost by construction of the Northeast Tailings Facility. This territory would likely be lost due to incidental disturbance and loss of habitat. HRDI is requesting authorization to take the three nests at Silver Camel and one fallen and deteriorated nest in the Northeast Tailings Facility Area, as well as a disturbance take of five nests in the Northeast Tailings Facility area, to proceed with approved and proposed expansion activities in this area under the Bald and Golden Eagle Protection Act (Eagle Act) Title 50 Code of Federal Regulations [CFR] Part 22, Subpart C- Eagle Permits §22.25. Because these takes may result in the loss of three breeding territories, HRDI must apply for a programmatic take permit application under Eagle Act Title 50 CFR §22.26. Based on this information, the United States Fish and Wildlife Service (USFWS) agreed to serve as a cooperating agency in the current EIS.

ECP and Permit Application Overview

This document presents HRDI's request for authorization for take (i.e., removal) of three nests (two viable and one deteriorated) on the Silver Camel feature within the existing mine area; a take and removal of a deteriorated nest within the proposed Northeast Tailings Facility footprint; and for incidental disturbance take associated with nest removals and mining activities that would could result in the loss of up to three golden eagle nesting territories (Silver Camel, East

Kamma, and South of Sawtooth). This ECP serves as the foundation for HDRI's eagle take permit application.

This ECP has been developed in consultation with USFWS to ensure HRDI's request for take of golden eagle nests and any associated take is consistent with the Eagle Act and has been prepared following the USFWS recommended process. We adapted the procedures outlined in the USFWS Eagle Conservation Plan Guidance document entitled *Eagle Conservation Plan Guidance Module 1 – Land-based Wind Energy, Version 2* (Module 1 Guidance; USFWS 2013) in development of this ECP to support our take permit application.

Components of this ECP include:

- A short history of mining activity at the Hycroft Mine;
- A description of approved and proposed activities at the mine;
- The regulatory framework related to programmatic/incidental permitting activities involving the take of golden eagles and golden eagle nests, and guiding the development of this plan;
- A review of golden eagle biology;
- A discussion of habitats found in the study area;
- A description of the Hycroft Mine golden eagle area-nesting population;
- A risk analysis;
- Protection measures and adaptive management;
- Mitigation measures; and
- A monitoring plan designed to assess the efficacy of existing and proposed protection and conservation practices and status and trend of the local area-nesting population.

2.0 BACKGROUND

2.1 MINE HISTORY

As described in the Hycroft Mine Expansion Project EIS (BLM, 2012a), mining activities near the Hycroft Mine began in 1875, when sulfur was discovered in the area. Over 200,000 tons of sulfur, as well as small amounts of silver, potash and mercury, were produced by underground mining methods from the 1870s through the early 1950s.

In 1984, after exploration drilling conducted by Homestake Mining Company on claims owned by the Crofoot family delineated a small bulk-mineable gold deposit near the north end of the existing Hycroft Mine project area, the Standard Slag Corporation constructed the Lewis Mine on patented and unpatented lands. HRDI acquired the Crofoot claim block in 1985 and facilities and leases in the area from Standard Slag Corporation in 1987. The Crofoot heap leach processing facility was constructed, and precious metal production resumed in October 1987. Open pit mining and heap leach process operations continued until 2004 when the mine went into care and maintenance due to low precious metal prices.

In 2007, HRDI became a wholly owned subsidiary of Hycroft Mining Corp. (formerly known as Allied Nevada Gold Corp). By the third quarter of 2008, HRDI reactivated open pit mining as an open pit, gold and silver heap leach mine. Operating activities include ore extraction and processing, management of water, engineering and environmental studies, permit compliance, and exploration. Active mining ceased at Hycroft in June 2015 due to low metal prices, though processing of pregnant solution from the leach pad continued through early April 2017. No new ore has been placed on the leach pads since June 2015. On October 22, 2015, Allied Nevada emerged from financial restructuring and changed its name to Hycroft Mining Corporation.

2.2 EXISTING AND AUTHORIZED ACTIVITIES

In August 2012, HRDI, a wholly owned subsidiary of Hycroft Mining Corp., received authorization from the United States (US) Department of the Interior, Bureau of Land Management (BLM) to conduct the Hycroft Mine Expansion Project (BLM, 2012a; 2012b) (also known as the Phase I Expansion Project). The project, located near the historical town of Sulphur in Pershing and Humboldt Counties, Nevada (Appendix A, Figures 1 and 2), was authorized by the BLM's Record of Decision (ROD) and approval of the Hycroft Mine Plan of Operations (PoO; DOI-BLM-NV-WO30-2011-001-EIS and PoO number NVN-064641). Figure 3 (Appendix A) shows the locations of the new authorized disturbance at the Hycroft Mine as approved with the signing of the BLM's ROD in August 2012 (BLM, 2012b).

Through the 2012 ROD, HRDI is authorized to create approximately 2,172 acres of new surface disturbance on private and BLM-administered land, for a total project surface disturbance of

5,235 acres. The authorization increases the mine life by an additional 12 years and expands the existing project boundary, which previously encompassed approximately 8,858 acres, to 14,753 acres of private and BLM-administered land (Appendix A, Figure 3). As conditions of the authorization, the ROD contained several stipulations and applicant committed environmental protection measures. Stipulation 1 addresses the loss of the Silver Camel nests and requires that, "[t]he identified golden eagle nest removal shall be coordinated with the US Fish and Wildlife Service (USFWS). The nest removal shall occur outside of golden eagle nesting season. Prior to the removal of the nest, a biologist shall survey the nest to ensure that it is not active."

In 2013, HRDI submitted a PoO Modification under an EA for a Rail Spur Expansion and Well Field Project (PoO; DOI-BLM-NV-W030-2013-0003-EA and PoO NVN-064641). The Well Field project area is 3,823.5 acres in size and is located approximately 1 mile west of the southwest corner of the Hycroft Mine PoO boundary (Appendix A, Figure 3). The Well Field project includes a 1.8-mile road corridor along Jungo Road and a 1.4-mile pipeline corridor. Through the 2015 ROD, HRDI is authorized to create approximately 909 acres of new surface disturbance on private and BLM-administered land, for a total project surface disturbance of 6,144 acres. The well construction would impact a small portion of the Well Field project area, which consists of nearly flat salt desert scrub vegetation (potential foraging habitat) that lacks any natural potential golden eagle nesting habitat. The BLM issued a ROD for the 2013 EA in January 2015.

The Rail Spur Expansion project adds a rail spur and associated facilities; construction of a utility pipeline and road access for authorized milling; and pit and waste rock facility expansions. The rail spur will be constructed next to the existing Union Pacific Railroad tracks north of the mine and would facilitate delivery of items that are used in high volumes and shipment of concentrate from the milling process. Use of the rail spur would significantly reduce product transportation and traffic along Jungo Road, the main access route to the Hycroft Mine.

In April 2014, HRDI submitted a PoO revision to the BLM called the Phase II Expansion. Subsequently, in March 2017, HRDI submitted an amendment to the 2014 PoO (2017 Amended PoO) to reflect changes made to the mine plan for a smaller mill and updated mine plan, as detailed in the October 2016 feasibility study. The Phase II Expansion is currently under review by the BLM as an EIS. A total of 8,796 acres of new disturbance is proposed, for a total project surface disturbance of 14,940 (Appendix A, Figure 3).

Based on the 2015 eagle survey results, there were a total of six golden eagle nests within the project area, including three within the proposed footprint of the Northeast Tailings Facility, one of which is fallen and has not been occupied during the period of monitoring. Due to the golden

eagle nests identified, USFWS was requested to be a cooperating agency with the BLM. In a July 29, 2015 letter, USFWS requested a programmatic take permit application be completed by HRDI to include golden eagle nest removal and loss of territories because of the 2012 EIS approval and the Phase II Expansion.

HRDI has developed a Bird and Bat Conservation Strategy (BBCS) as a separate document that includes measures to minimize the risk of avian and bat mortality and to minimize the risk of impacts on golden eagles and golden eagle nesting near the mine. The BBCS presents HRDI's good-faith efforts to minimize the possibility of unintentional but unavoidable take of birds, including golden eagles, and bats to comply with the provisions of the Migratory Bird Treaty Act (MBTA) and the Eagle Act and ensure the Hycroft golden eagle area-nesting population is sustained. The avoidance/minimization measures included in the BBCS as they apply to golden eagles are the following:

- NDOW Industrial Artificial Pond Permit
- MBTA – seasonal restrictions and clearance surveys
- Monitoring Surveys
- APLIC standards to minimize the potential for avian electrocution
- Seasonal avoidance buffers during the breeding season, defined as spanning from the arrival of adults on a territory to post-fledging dependency of young.

This document presents HRDI's request for authorization for the take of six nests, including four that would be removed (102 and 8A-8C) and five that would be a disturbance take (3A,3B, 821A, 821B, and 101), and associated take of the three golden eagle territories directly affected on the Silver Camel feature and within the Northeast Tailings Facility footprint. The Hycroft Mine Eagle Conservation Plan (ECP) has been developed by adapting the procedures outlined in the USFWS document entitled *Eagle Conservation Plan Guidance Module 1 – Land-based Wind Energy, Version 2* (Module 1 Guidance; USFWS, 2013). (Although the Module I Guidance was written to cover wind energy industry under 50 Code of Federal Regulations (CFR) 22.26, it is the best guidance available.) HRDI is applying under 50 CFR 22.25 and 50 CFR 22.26 for the take of golden eagle nests and loss of territories resulting from the Phase I and Phase II Expansion projects. HRDI understands that development of a stand-alone ECP will assist the USFWS to support a permit decision.

2.3 PROPOSED EXPANSION

The proposed Phase II Expansion increases the mine life to year 2041 and includes expanding the PoO boundary to the east. An additional 8,796 acres of disturbance is proposed, for a total project surface disturbance of 14,940 acres. The existing Brimstone Pit would be expanded and

would also be mined below the water table. Active dewatering would be affected through installation of dewatering wells. Passive dewatering would be conducted within the expanded footprint.

Processing of mined ore through a mill would require construction of a Northeast Tailings facility with a pipeline and corridor and a North heap leach facility with process ponds. The rate of process water pumping would be expanded to accommodate these activities to 2041. The South Waste Rock Facility (WRF) would be expanded and a second option for a Southwest WRF to be constructed in place of the approved South Processing Complex is proposed, if needed. Lastly, site facilities to support the facility expansions would be modified including waste backfill areas, haul road and secondary road expansions for access, construction and operation of an oxygen plant, construction and operation of an ambient oxidation and leaching process as part of the milling operation, additional storm water controls, and additional growth media stockpiles. All would be completed in conjunction with the proposed mining plan.

3.0 REGULATORY FRAMEWORK

The USFWS is charged with implementing statutes that protect eagles, including the Eagle Act and the MBTA.

3.1 EAGLE ACT

The Eagle Act of 1940, as amended, prohibits the "take" or possession of bald and golden eagles with limited exceptions. Take, as defined in the Eagle Act, includes, “to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” Disturb means, “to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding or sheltering behavior.”

The Eagle Act authorizes the USFWS to issue eagle take permits when the take is compatible with the preservation of each eagle species, defined as “consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units (EMUs) and the persistence of local populations throughout the geographic range of each species” (USFWS, 2016). The permits are designed to ensure cumulative take does not exceed levels that would result in regional or local eagle population declines from historic levels.

In January 2017, the USFWS revised the regulations for eagle nonpurposeful/incidental take permits and eagle nest take permits. Revisions include changes to permit issuance criteria and duration, definitions, compensatory mitigation standards, criteria for eagle nest removal permits, permit application requirements, and fees. The USFWS intended for the revisions to add clarity to the eagle permit regulations, improve their implementation, and increase compliance, while maintaining strong protection for eagles. As a result, some terminology and definitions were updated in the revised Eagle Act permit regulations, as defined in the PEIS (USFWS 2016). HRDI had been in coordination with the USFWS for several years, and both the old and updated terminology is contained within this ECP and various reports and documents. In this ECP, we attempted to reduce confusion by presenting both the old terminology and updated terminology together when sensible. HRDI has elected to apply for a 30-year permit under the updated 2017 Eagle Act regulations, which would account for the extended mine life.

Under the Eagle Act, the USFWS may issue a permit for inactive/alternate nest removal during a resource development or recovery operation if the taking is compatible with the preservation of golden eagles (50 CFR 22.25). The USFWS may also issue a permit that “authorizes incidental take of bald and golden eagles where the take is compatible with the preservation of the bald eagle and golden eagle; necessary to protect an interest in a particular locality; associated with

but not the purpose of the activity and cannot practicably be avoided."

3.2 EAGLE CONSERVATION PLAN GUIDANCE

The Module 1 Guidance (USFWS, 2013) describes the circumstances under which a proponent may apply for a permit to take an eagle nest and reviews the issues that the USFWS will consider in determining the applicability of such a permit. The Module 1 Guidance was developed specifically for wind energy projects to provide a vehicle to address permit requirements (presented within 50 CFR 22.26 and 50 CFR 22.27) but, with modification, may be applied to other types of projects. As stated in the Module 1 Guidance, "Eagle take permits may be issued only in compliance with the conservation standards of Eagle Act. This means that the take must be compatible with the preservation of each species, defined (in USFWS 2009) as consistent with the goal of stable or increasing breeding populations." In addition, "for programmatic take permits, the regulations require that any authorized take must be unavoidable after the implementation of advanced conservation practices (ACPs)." The ACPs are discussed as being used on an "experimental" basis in the Module 1 Guidance due to the fact that they would not meet the current definition of an ACP in the eagle regulations.

In the Module 1 Guidance and accompanying appendices (USFWS, 2013), the USFWS attempts to quantify sustainable take for eagles. In this document, the USFWS notes that for falconry, an annual take level of five percent of annual production is considered sustainable for a range of healthy raptor populations, and that annual take level of one percent of annual production is considered relatively benign when population status is considered uncertain (USFWS, 2013). The population for which this take is calculated is regional. Specifically, the population considered is defined as the population within the Bird Conservation Region (BCR).

The Module 1 Guidance calls on renewable energy developers and others whose projects may affect eagles to consult with the USFWS in a five-tiered process that includes:

1) Early landscape-level site assessments;
2) Site-specific surveys;
3) Risk assessment;
4) Avoiding, minimizing, and mitigating impacts; and
5) Post-construction monitoring.

The Module 1 Guidance calls for categorizing the projects into one of three categories:

Category 1 – High risk to eagles with low potential to avoid or mitigate impacts;
Category 2 – High to moderate risk to eagles with opportunities to mitigate impacts; and
Category 3 – Minimal risk to eagles.

3.3 MBTA

The MBTA (16 United States Code 703-712) is administered by the USFWS and is the cornerstone of migratory bird conservation and protection in the US. The MBTA implements a series of international treaties that provide for migratory bird protection. The Act authorizes the Secretary of the Interior to regulate the taking of migratory birds. The Act provides that it shall be unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird" (16 United States Code 703); but the Act does not regulate habitat. The list of species protected by the Act was revised in March 2010 and includes almost all bird species (1,007 species) that are native to the US.

3.4 EXECUTIVE ORDER 13186

Signed on January 11, 2001, this Executive Order directs each federal agency taking actions that are likely to have a measureable effect on migratory bird populations to develop and implement a Memorandum of Understanding with the USFWS that promotes the conservation of migratory bird populations. The USFWS' Memorandum of Understanding with the BLM states, in part, that both parties shall, as practicable, protect, restore, and conserve habitat of migratory birds; follow the USFWS Bald Eagle Management Guidelines; follow other migratory bird conservation measures as appropriate and consistent with agency missions; work collaboratively to identify and address issues that affect species of concern; promote and contribute migratory bird population and habitat data to interagency partnership databases (BLM, 2010). The Memorandum of Understanding also commits the BLM to, among other measures, participate in planning efforts of Bird Conservation Regions and, at the project level, evaluate the effects of the BLM's actions on migratory birds during the National Environment Policy Act process (BLM, 2010).

4.0 GOLDEN EAGLE BIOLOGY

4.1 GENERAL BIOLOGY

The golden eagle is a bird of open and semi-open habitats (Kochert et al., 2002). The species is found primarily in mountainous canyon land, rimrock terrain of open desert, tundra, and grassland areas of the western US. Golden eagles typically forage in open habitats including grasslands and steppe. Preferred foraging habitat in southwestern Idaho is shrubland, particularly sagebrush (*Artemisia* spp.), and rabbitbrush (*Chrysothamnus/Ericameria* spp.) habitats. Similar habitat is present at the Hycroft Mine project area. Salt desert scrub and sagebrush shrubland make up approximately 72 percent of the 10-mile buffer surrounding the existing mine and expansion areas (JBR unpubl).

Food is primarily small- to medium-sized mammals, particularly black-tailed jackrabbits (*Lepus californicus*), but golden eagles have been known to take larger prey (Kochert et al., 2002). Black-tailed jackrabbits and cottontails (*Sylvilagus nuttallii*) are reported to be the main prey in the Great Basin, with yellow-bellied marmots (*Marmota flaviventris*) and Paiute ground squirrels (*Spermophillus mollis*) or rock squirrels (*S. variegatus*) as the chief secondary prey (Arnell, 1971; Bloom and Hawks, 1982). Marzluff et al, (1997) reported that black-tailed jackrabbits, Townsend's ground squirrels (*Spermophilus townsendii*), and rock doves (*Columba livia*) were the primary prey species taken during a 1992 to 1994 study in the Snake River Birds of Prey area in southwestern Idaho. Kochert et al. (2007) stated that leporids (rabbits and hares) and sciurids (squirrels) constituted 49 to 94 percent of individual prey items taken during the nesting season, as reported in 24 studies throughout western North America. The abundance of black-tailed jackrabbits identified as the principal prey of golden eagles in several of these studies, tends to be cyclical, and populations may vary by nine-fold over the course of these cycles (Best, 1996; Gross et al., 1974).

Golden eagles are territorial, defending an area of approximately 7.7 to 11.5 square miles from other eagles. Three studies conducted in southeastern Idaho found that breeding-season home range varied from approximately 11 to 13 square miles. Breeding home ranges may be smaller than winter home ranges, and patterns of use may shift seasonally. Home range boundaries may remain fairly consistent for long periods (over 20 years), but pairs may expand their home range into adjacent vacant territories (Kochert et al., 2007).

It has been noted that golden eagles do not use all areas within their home range but instead concentrate activity within core areas (Platt, 1984; in Kochert et al., 2007; Marzluff et al,. 1997). Radio-tagging studies conducted in southwestern Idaho found that 95 percent of detections were recorded in core areas, but these areas occupied less than 15 percent of the breeding-season home

range and about 25 percent of the non-breeding season range (Marzluff et al,. 1997). These studies also found that the ranges of neighboring pairs overlapped slightly in the breeding season, but that overlap increased during non-breeding season. Kochert et al. (2007) notes that related individuals may be tolerant of each other, citing a case of four generations of six related individuals flying together on multiple occasions. Trios of birds have also been reported together during the nesting season.

Golden eagles typically nest on cliffs or outcrops, but they also nest in trees, and occasionally on transmission line structures and other anthropogenic features. Ground nests have also been reported in areas where no other suitable substrate occurs, such as on the tundra in Alaska. The nest site often provides a commanding view of the surrounding landscape (Beecham, 1970; Kochert et al., 2002). In Nevada, golden eagles generally nest on cliffs and outcrops or, less commonly, in trees.

Nest building may begin one to three months prior to egg laying, though material may be added to nests at any time (Kochert et al., 2002). Peak nest building or refurbishing occurs from January to March (Watson, 1997). Bowl construction, the final stage of nest construction, occurs during the final three to four weeks before egg laying. Alternate nests are common, with the number of alternate nests within a single territory varying from 2 to 14 (Kochert et al., 2002). Of 65 golden eagle pairs nesting on cliffs in the Snake River Canyon, all had alternate nests (USGS, unpublished, in Kochert et al., 2002).

A more recent study conducted by Kochert and Steenhof (2012) documented as many as 18 alternate nests within a single territory. In a long-term southwestern Idaho study conducted between 1966 and 2011, Kochert and Steenhof (2012) found that the period between reuse of nests ranged from 1 to 39 years. This study found that over a period of 45 years, golden eagles used a total of 454 nests in 66 territories. Individual nests were used between 1 and 26 times. Nest switching was associated with turnover of at least one member of an eagle pair, but also occurred due to unknown factors. Golden eagles utilized the same nest for 3 to 20 consecutive years. This study also found the distance between alternate nests varied from less than 1 meter (3.3 feet) to more than 1,800 meters (1.1 miles). Only 10 percent of these alternate nests were more than 500 meters (1,640.4 feet) apart. Kochert and Steenhof note, however, that this study was conducted in an area with a relatively high density of nesting golden eagles, with nesting habitat distributed in a linear fashion along the Snake River in southwestern Idaho. Greater distances between alternate nests have been reported in habitats with non-linear and presumably less dense potential nesting habitat (McGahan, 1968; Lockie and Ratcliffe, 1964).

Golden eagles typically breed after attaining adult plumage, which is usually acquired in the fifth summer, but are capable of breeding earlier (Steenhof et al., 1984). Egg laying begins as early as late January or early February in southwestern Idaho and southern California (Dixon, 1937; Hickman, 1968). In northern Nevada, Worley (1984) recorded eagles on nests as early as late February. Females are reported to settle into an incubation posture on the nest before the first egg is laid. Incubation ranges from 41 to 45 days (Kochert et al., 2002). In southwestern Idaho, hatching dates were correlated with both winter severity and jackrabbit abundance; eagles hatched earlier when rabbits were abundant and later after severe winters (Steenhof et al., 1997). Young are reported to leave the nest as early as 45 days of age (USGS, unpublished, in Kochert et al., 2002) and as late as 81 days (Gordon, 1955). US Geological Survey data documented 101 chicks from 61 broods in southwestern Idaho averaged 64.4 days (a range of 45 to 77 days) old at departure from nest (USGS, unpublished, in Kochert et al., 2002).

Reproductive success varies from year to year depending on prey availability and weather. In southwestern Idaho, the percentage of females that laid eggs each year was positively related to jackrabbit abundance and inversely related to winter severity, while the percentage of females successfully raising broods was positively related to rabbit abundance and inversely related to the frequency of hot spring days, when nestlings are susceptible to heat stress (Steenhof et al., 1997). Steenhof et al. (1997) noted that in southwestern Idaho, jackrabbit abundance limited reproduction during 15 of 23 years. Several authors have noted that many pairs do not lay eggs during periods of low prey abundance (Smith and Murphy, 1979; Steenhof et al., 1997; McIntyre and Adams, 1999). Kochert et al. (2007) stated that the percentage of pairs that lay eggs each year was the most variable reproductive component in both southwestern Idaho and in interior Alaska. Steenhof et al. (1997) found that over a 22-year period in southwestern Idaho, this percentage varied from 38 to 100 percent. Over a 10-year period in Denali National Park, McIntyre and Adams (1999) found this figure varied from 33 to 90 percent of pairs.

Kochert et al. (2007) cite several studies that found that the percentage of eggs that hatch varies from 57 to 86 percent of eggs laid, and that the percentage of hatched young that fledge varies from a low of 46 percent in Montana (Reynolds, 1969) to 77 percent in southwestern Idaho and 80 percent in Utah.

Kochert et al. (2002) cite several studies that indicate the number of successfully fledged young per year from individual nests varies from 0.66 young per nest per year in Alaska to 1.08 young per nest per year in Oregon. The number of successfully fledged young may be somewhat higher in Nevada. Newmont (2012) provides a review of golden eagle biology and population status in Nevada. The Newmont review cites a study by Page and Seibert (1973) that found 50 nests in Elko County fledged an average of 1.1 young fledged per nest per year. Worley (1984)

documented a fledging rate of over 1.7 young per nest per year from 27 northeastern Nevada nests studied in 1979 and 1980. Ryser (1985) notes the Nevada Department of Wildlife (NDOW) also documented a fledging rate of 1.7 young per nest per year during this same two-year period (Herron and Lucas, 1979; Herron et al., 1980). These studies date to the 1980s or earlier and may not capture more recent habitat changes caused by wildland fire within Nevada. Recent research by fire ecologists has documented that over the last four decades, wildfires have become larger, and large fires have become more frequent across the western US (Miller and Safford, 2012); that increases in fire-adapted grasses, primarily cheatgrass, have increased the rate of fire spread (Chambers, 2008); and that cheatgrass invasion has resulted in fires burning arid salt desert scrub ecosystems that did not previously burn (Brooks and Pyke, 2001). These changes may reduce the golden eagle prey base and in turn, result in lower fledging rates. In southwestern Idaho for example, Kochert et al. (1999) note that "some pairs abandoned territories after wildfires destroyed jackrabbit habitat adjacent to Snake River Canyon; remaining pairs expanded their ranges and subsumed neighboring vacant territories, resulting in a smaller nesting population."

Per the Module 1 Guidance (USFWS 2013), the extent of golden eagle take that may be allowable is determined by population estimates for the BCR and cumulative impacts at the Local Area Population level. The Hycroft Mine project area is located within the Great Basin BCR, which includes portions of northeastern California, eastern Oregon and Washington, most of Nevada, western Utah, southern Idaho, and southern British Columbia. Newmont (2012) notes that data on golden eagle population trends in the US are inconsistent, but that it is generally believed golden eagle populations are declining. Data gathered from migration observation count sites ("watchsites") and used as the basis to develop a Raptor Population Index also suggests a decline in golden eagle numbers in the western US (Bildstein et al., 2008). Farmer et al. (in Bildstein et al., 2008) note the declines in the mid-1980s and in the late 1990s through the early 2000s reflected in the Raptor Population Index data correlate to periods of drought in the interior west. These authors note other factors that may contribute to observed declines in the western US golden eagle migration counts are cyclical prey populations and the loss of shrubland habitat due to wildland fire, a factor also identified by Kochert et al., (1999). A second study based on dedicated golden eagle transects correlated with Breeding Bird Survey counts suggests the western US golden eagle population was relatively stable from 2006 to 2010 (Millsap et al., 2013). Note that the methodologies of these two trend studies differ considerably.

For Nevada, Newmont cites the population estimates of Herron et al. (1985), which suggest a population of 1,200 golden eagle pairs, and Rich et al. (2004), who estimated the golden eagle population in the Great Basin BCR to be 12,000 birds. In another study, Blancher et al. (2007) provided a population estimate of 6,000 golden eagles in the Great Basin BCR based on

Breeding Bird Survey data from the 1990s. The USFWS cites an estimated golden eagle population in the Great Basin BCR of 6,859 (USFWS, 2009a).

Kochert et al. (2002) attribute over 70 percent of golden eagle mortality to direct and indirect anthropogenic causes. Accidental trauma, including collisions with vehicles, power lines, or other structures is the leading cause of death at 27 percent, followed by electrocution at 25 percent, gunshot at 15 percent, and poisoning at 6 percent (Franson et al., 1995; Kochert et al., 2002). Kochert at al. (2002) also note that golden eagles are vulnerable to collision and electrocution when landing on power poles. Less-adept immature eagles are most susceptible to electrocution and the risk of electrocution increases when inclement weather hampers flight or when wet feathers increase conductivity (APLIC, 2006). The Module 1 Guidance notes that golden eagles are electrocuted more often than any raptor in North America. Most electrocution mortalities occur during winter in the western US in areas where natural perches are lacking (USFWS 2011).

4.2 Recent Research on Golden Eagles in Arid Landscapes

Recent research on the biology of the golden eagle in the Great Basin and other arid landscapes shows that these populations have unique characteristics, often differing substantially from populations in less arid landscapes where much golden eagle research has been done. The arid landscape research is valuable for evaluating data collected on golden eagles in the Hycroft area, and is reviewed below.

Golden eagles are widely distributed across western North America, in highly variable habitats. In areas such as the Snake River in southwestern Idaho or Altamont Pass in California, prey is relatively abundant and high-density golden eagle breeding populations are clustered in areas of quality nesting habitat. Much of the research on golden eagles has been conducted in these areas. In the Great Basin, however, overall prey density tends to be far lower due to reduced annual precipitation. In these areas, nesting populations of golden eagles are less dense, and both territory size and eagle use of territories are likely different than in dense nesting populations.

Katzner et al. (2012) used GPS telemetry to evaluate breeding season home range in the Mojave Desert of California. Data from the 2012 breeding season were analyzed using both 50 percent and 90 percent Kernel Density Estimators (KDE). Home ranges based on the 50 percent KDE did not overlap, but the home ranges based on the 90 percent KDE did. This suggests that the 50 percent KDE may represent core areas as described in Section 4.2. The size of these 50 percent KDE home ranges varied from 1.2 (0.5) to 35 (13.5) square kilometers (square miles). Home ranges based on the 90 percent KDE ranged from to 10.9 to 290 square kilometers. Katzner et al.

(2012) note, “these home ranges are larger than typical for eagles, perhaps to be expected because of the relatively low prey densities in the Mojave.”

Katzner et al. (2012) also found the distance from the nest to the farthest edge of the home range estimated by the 90 percent KDE ranged from 1.6 to 40.6 kilometers, and for the 50 percent KDE from 0.8 to 13.7 kilometers. They also noted:

> The large difference between the closest and farthest edge of home ranges shows that eagles do not necessarily nest in the middle of their home range. Their movements are in some cases limited by barriers (likely topographic features that mark intersections of defended territories), but in other cases may extend for much larger distances. Likewise, core areas of the home range (50 percent KDE) include areas close to the nest as expected, but also include regions quite distant from nests. These distant core areas suggest that important resources such as food sources may not always be obtained near nest sites.

In a long-term study of eagles in the Utah West Desert, an area ecologically similar to the Great Basin of northern Nevada, Slater et al. (2013) found that 90 percent of alternate nests were found within 1.5 kilometers of each other, three times the distance cited above by Kochert and Steenhof (2012) for the Snake River area. Ninety percent of all nests in separate territories were at least 2 kilometers apart. Based on average and median territory spacing, Slater et al. (2013) used 4-kilometer radius buffers around nests to represent golden eagle territories in their study area.

In an analysis of 21 Utah Great Basin territories with a minimum of 25 years consecutive nest survey data, Slater et al. (2013) found that from 1 to 8 nests were used for egg laying at least once (mean=3.14; S. E. = 0.43) over the period of monitoring within a single territory. They compare this to southern Idaho, where between 1 to 18 nests (mean = 6.9) were used in a territory (Kochert and Steenhof 2012). These data suggest that Great Basin territories tend to have fewer alternate nests.

Occupancy is the typical standard for evaluating reproductive status of a nest. As defined by Pagel et al. (2010), occupancy requires evidence of a breeding attempt. Pagel et al. (2010) do not provide recommendations for terminology standards when referring to a territory. Slater et al. (2013) use the terms occupancy (birds present) and activity (eggs laid) to define the status of territories. Although the use of these terms in reference to a territory can be confusing, as they have a different specific meaning when applied to a nest, we will use them in references to territories throughout the rest of this section to allow for consistency with relevant published

literature. For clarity, when referring to a territory, we will specifically use the term territory occupancy.

Slater et al. (2013) examined long-term trends in rates of territory occupancy and activity in the Utah Great Basin. Generally, rates of territory occupancy tended to be at least 10 to 20 percent higher than rates of territory activity. The highest differences between territory occupancy and activity rates tended to be years when territory activity was low, presumably years of low prey abundance. Territory occupancy rates were more stable over time than territory activity rates, and appeared less susceptible to environmental variability.

These findings suggest that Utah Great Basin eagles move to territories early in the breeding season, evaluate environmental conditions (prey abundance), and make breeding attempts based on conditions encountered during this early period of developing affinities for specific nests. Monitoring for territory occupancy therefore requires observations early in courtship and nest selection, when birds are active and visible (Driscoll, 2010).

Available research suggests that rates of territory occupancy are lower in Great Basin populations than in less arid, higher-density populations. Slater et al. (2013) found that long-term rates of territory occupancy generally varied from 50 to 70 percent in western Utah. In contrast, territory occupancy rates in southwestern Idaho, where eagle nesting density is high, ranged from 81 to 89 percent between 1986 and 1994 (Kochert et al. 1999). In an assessment of the very high density golden eagle population near Altamont Pass in California, Hunt (2002) states “a healthy population of golden eagles fills all serviceable breeding locations.””.

In high density populations, it may be advantageous for pairs to remain on territory even in years when prey conditions are unfavorable for reproduction to avoid losing territories to competitors (Newton, 1979). For populations in arid landscapes, where prey availability may be more of a limiting factor to nesting populations than the availability of suitable nesting substrate, the fidelity to territories in years of low prey availability may be low. Katzner et al. (2012), in their telemetry studies of eagles in the Mojave desert, note that the three largest home ranges measured were from eagles that, when breeding attempts failed, changed their behavior and dramatically increased the amount of space used.

In most if not all eagle populations, productivity is not equal among territories. Driscoll (2010) notes that, in a healthy golden eagle population, there are usually primary and secondary breeding areas. Primary breeding areas are consistently occupied and productive, while secondary breeding areas are reproductively less consistent. Driscoll (2010) suggests that habitat quality is the main variable responsible for productivity.

Variability in productivity among territories has been noted in Great Basin eagle populations, and may be more pronounced than in high-density nesting populations. Pair experience may also be more important than habitat in determining productivity. For example, the Utah Legacy Raptor Project (2013) recommends providing additional protection to experienced breeders based on research by Slater et al. (2013), noting that, "In the West Desert of Utah, it is not uncommon to find proximate eagle territories occupying similar habitats, but with vastly different reproductive output, suggesting that individual or pair experience and fitness may be more important than local habitat quality. A handful of territories in the West Desert are consistently active (i.e., eggs are laid) and produce a disproportionate number of fledglings across years."

5.0 HABITAT TYPES WITHIN THE STUDY AREA

USFWS Module 1 Guidance recommends that an analysis of potential impacts on nesting golden eagles include a project area itself and a surrounding 10-mile buffer area (Pagel et al., 2010). Vegetation communities in the Hycroft Mine project area and the USFWS-recommended 10-mile buffer area have been mapped by the Southwest Regional Gap Analysis Project (ReGAP) in land cover files (USGS, 2011). The ReGAP mapping shows approximately 48 percent of the Hycroft Mine project area and surrounding 10-mile buffer is mapped as Inter-Mountain Basins Mixed Salt Desert Scrub (Appendix A, Figure 4). Other common mapped vegetation types in the area include Inter-Mountain Basins Big Sagebrush Shrubland, which comprises approximately 24 percent of the area, Inter-Mountain Basins Playa that comprises approximately 12 percent of the Hycroft Mine project area and surrounding buffer, and Inter-Mountain Basins Greasewood Flat, which comprises about seven percent of the Hycroft Mine project area and surrounding buffer. The vegetation communities and their relevance for eagle use are described below.

Inter-Mountain Basins Mixed Salt Desert Scrub

This extensive ecological system includes open-canopied shrublands of typically saline basins, alluvial slopes, and plains across the intermountain western US. The vegetation is characterized by a typically open to moderately dense shrubland composed of one or more *Atriplex* species. Other shrubs may include *Artemisia tridentata* ssp. *wyomingensis*, *Chrysothamnus viscidiflorus*, *Ericameria nauseosa*, *Ephedra nevadensis*, *Grayia spinosa*, *Krascheninnikovia lanata*, or *Tetradymia* spp. Various forbs are also present in the Inter-Mountain Basins Mixed Salt Desert Scrub vegetation type (USGS, 2011). This community occurs within and north of the Hycroft Mine project area and represents potential golden eagle foraging habitat. The potential golden eagle prey base is limited, as much of the mammalian fauna that occurs in this habitat type includes small nocturnal mammals, but black-tailed jackrabbits do occur in this habitat type.

Inter-Mountain Basins Big Sagebrush Shrubland

This ecological system occurs throughout much of the western US, typically in broad basins between mountain ranges, plains, and foothills between 1,500 and 2,300 meters (4,920 to 7,550 feet) in elevation. These shrublands are dominated by *Artemisia tridentata* ssp. *tridentata* and/or *Artemisia tridentata* ssp. *wyomingensis*. Scattered *Juniperus* spp., *Sarcobatus vermiculatus*, and *Atriplex* spp. may be present in some stands. Perennial herbaceous components typically contribute less than 25 percent vegetative cover (USGS, 2011).

Within the Hycroft Mine eagle-use area, this community occurs in foothills and mountains at higher elevations, in contrast to the mixed salt desert scrub or greasewood flats that are found at lower elevations. A more diverse diurnal golden eagle prey base occurs in this habitat type than

is found in the two lower-elevation communities. In addition to black-tailed jackrabbits, mountain cottontails and larger diurnal rodents, including yellow-bellied marmots, may be found in this community. As such, this community would represent higher-value golden eagle foraging habitat.

Inter-Mountain Basins Greasewood Flat

This ecological system occurs throughout much of the western US in the intermountain basins and extends onto the western Great Plains. It typically occurs near drainages on stream terraces and flats or may form rings around more sparsely vegetated playas. Sites typically have saline soils, a shallow water table, and flood intermittently but remain dry for most growing seasons. The water table in these areas remains high enough to maintain vegetation despite salt accumulations. This system usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or codominated by *Sarcobatus vermiculatus*. Occurrences are often surrounded by mixed salt desert scrub (USGS, 2011). Like the mixed salt desert scrub community, potential golden eagle prey base is limited because much of the potential prey species present in this community is small and nocturnal.

Inter-Mountain Basins Playa

This ecological system is composed of barren and sparsely vegetated playas (generally less than 10 percent plant cover) found in the intermountain western U.S. Salt crusts are common throughout, with small saltgrass (*Distichlis spicata*) beds in depressions and sparse shrubs around the margins. These systems are intermittently flooded and the water is prevented from percolating through the soil by an impermeable soil subhorizon, leaving it to evaporate. The soil salinity varies greatly with soil moisture and greatly affects species composition (USGS, 2011).

This community type is found northwest of the Hycroft Mine and characterizes the Black Rock Desert that continues north and west of the mine. The lack of vegetation limits the types of prey species (e.g., nocturnal species). This community represents poor golden eagle foraging habitat.

6.0 GOLDEN EAGLE NESTING POPULATION

To assess risks to golden eagles from the Hycroft Mine Expansion and the impact of removing the Silver Camel and Northeast Tailings Facility nests, the following landscape-level assessment broadly identifies potential eagle nesting habitat in the Hycroft Mine project area and within the surrounding 10-mile buffer area, which is defined as the golden eagle "area-nesting population."

In support of the Hycroft Mine Expansion Project EIS, eagle nest surveys were conducted annually by JBR Environmental Consultants, Inc. (JBR) between 2010 and 2013, and an aerial nest survey was conducted by NDOW in 2011. Nest surveys were also conducted by Wildlife Resource Consultants LLC (WRC) in 2014, 2015, 2016, and 2017, including intensive monitoring early in the 2014 breeding season to assess eagle use of nests and territories near the mine. A summary of monitoring and assessment prior to 2014 is provided in Sections 6.1.1 and 6.1.2. A summary of findings from the 2014 - 2017 monitoring surveys is provided in Sections 6.1.3 to 6.1.6.

Data from these baseline surveys have been evaluated and identify the mountainous areas of the Kamma and southern Jackson Mountains, a portion of the Antelope Range to the east, and the Majuba Mountain to the southwest as potential golden eagle nesting habitat (Appendix A, Figure 2). Habitats in the Kamma Mountains and areas to the north and west of the mine may be used as foraging habitat, but except for anthropogenic features such as transmission line structures, the areas north and northwest of the mine largely lack potential nesting features. The survey findings from the Hycroft Mine project area represent Stage 2 of the risk assessment (USFWS 2013, Appendix C) described in Section 7.0 of this document.

The status of a golden eagle nest is determined by occupancy. Three potential statuses are defined in the Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols (Pagel et al., 2010), and were applied in this document, previous versions of this document and other HRDI reports. Some terminology and definitions were updated in the revised Eagle Act permit regulations, as defined in the PEIS (USFWS 2016, 50 CFR 22.3). Both the old and updated terminology is contained within the various reports and documents. To reduce confusion, this ECP presents both the old terminology and updated terminology together when sensible. In the definitions presented below, the updated terminology appears before the old terminology.

> **In-use/Occupied Nest** - A nest used for breeding in the current year by a pair. Presence of an adult, eggs, or young, freshly molted feathers or plucked down, or current years' mutes (whitewash) suggest site occupancy. Additionally, for the purposes of these guidelines, all breeding sites within a breeding territory are deemed occupied while

raptors are demonstrating pair bonding activities and developing an affinity for a given area. If this culminates in an individual nest being selected for use by a breeding pair, the other nests in the nesting territory are no longer considered occupied for the current breeding season. A nest site remains occupied throughout the periods of initial courtship and pair-bonding, egg laying, incubation, brooding, fledging, and post-fledging dependency of the young.

Alternate/Unoccupied Nests - Those nests not selected by raptors for use in the current nesting season. Nests are also considered unoccupied for the non-breeding period of the year. The exact point in time when a nest becomes unoccupied should be determined by a qualified wildlife biologist based upon observations and that the breeding season has advanced such that nesting is not expected. Inactivity at a nest site or territory does not necessarily indicate permanent abandonment.

Alternate/Vacant Nest - Old nests that do not appear to have been utilized for an extended period of time (e.g., more than five years), as evidenced by absence of any whitewash, general lack of maintenance, or degradation of nest materials.

In addition, the following terms are utilized based on the definitions noted:

Area-nesting Population - The USFWS term used to describe the golden eagle population nesting within a 10-mile radius of a project area and known to have made a nesting attempt during the preceding 12 months.

Local Area Population – A recent USFWS term identifying the golden eagle population occurring within 109 miles of a project area.

6.1 GOLDEN EAGLE NESTING SITES

Golden eagle surveys have been conducted in relationship to the Hycroft Mine since 2010. The survey area and survey intensity varied between years, as listed below:

- 2010 – 4-mile buffer ground surveys (JBR);
- 2011 – 10-mile buffer aerial survey (conducted by NDOW);
- 2011 – 5-mile buffer ground survey (JBR);
- 2012 – 5-mile buffer ground survey (JBR);
- 2013 – ground surveys and 10+-mile buffer aerial surveys (JBR);
- 2014 – ground surveys and 10+-mile buffer aerial surveys (WRC);
- 2015 – 10+mile buffer aerial surveys (WRC);

- 2016 – 10+mile buffer aerial surveys (WRC); and
- 2017 – ground surveys and 10+mile buffer aerial surveys (WRC).

The results of each survey are presented in sections 6.1.1 to 6.1.6. A compilation of nest data and nest productivity data over all survey years is presented in Appendix B. The nest locations and territories from the most recent survey (2017) are shown in Appendix A, Figure 5.

6.1.1 2010 – 2013 Survey Results

Table 1 lists the occupied, unoccupied, or vacant golden eagle and possible golden eagle nests found during surveys conducted from 2010 to 2013. The Silver Camel nests are listed as Nest Site 8 and the two East Kamma nests that are located in the Northeast Tailings Facility area as Nest Site 3. Figure 6 (Appendix A) depicts the locations of these nests. The nests surveyed by JBR personnel are described below, followed by a summary of nests reported by NDOW. Note that in this latest version of the report, individual nests or groups of nests are referred to as "nest sites," rather than territories, since the extent of individual territories and the relation between nests or groups of nests is not always clear.

The nest site descriptions below represent nests that were known prior to the 2013 nesting season and were the focus of the 2013 monitoring effort. The 2013 golden eagle monitoring survey identified an additional 37 nests. Most did not appear to be newly constructed, and were found in areas that had not been previously surveyed. Including the 2013 surveys, a total of 54 nests were identified. Based on proximity, these nests appeared to represent on the order of 28 to 29 territories. Locations of the newly recorded nests are provided in *Hycroft Mine 2013 Golden Eagle Nests Monitoring Report* (JBR, 2013).

Nest Site 1, North Cliff Nests

The North Cliff face is an approximately 0.75-mile long, 100-foot-high cliff band located between the Hycroft Mine and Jungo Road, north of the existing mine facilities within the Hycroft Mine PoO boundary. At least three alternate golden eagle nests have been built on this feature. One of the three nests has been occupied and produced fledglings in all four years that baseline studies have been conducted (from 2010 to 2013), though a different nest was used in each year from 2010 through 2012. The nest used in 2013 is the same nest that was used in 2010.

Nest Site 2, Mandalay Spring Narrows Nests

A series of three vacant golden eagle nests were present on a dark cliff north of Jungo Road southeast of the Mandalay Springs area. Two more nests were located on top of the outcrop east of the cluster of three nests. While a prairie falcon pair has nested on this cliff during each year

Table 1. Status of Golden Eagle Nests in the Hycroft Mine Survey Area 2010-2013

Nest Site	Easting	Northing	2010 JBR Status	2011 JBR Status	2011 NDOW Status	2012 JBR Status	2013 JBR Status	Comments
Nest Site 1, 2010 North Cliff Nest No. 1 (2010 nest site)	358705	4528578	Occupied	Unoccupied	-	-	Occupied	One of at least three nests on cliff face. Single young fledged in 2013.
Nest Site 1, 2011 North Cliff Nest No. 2 (2011 nest site)	358771	4528723	-	Occupied	Occupied	Third nest in this territory occupied in 2012	Unoccupied	Nest in same territory as 2010 North Cliff Nest pair; 2011 nest located approximately 100 yards east of 2010 nest. NDOW identified two large young in the nest in 2011. A third nest in this same territory was occupied in 2012
Nest Site 1, 2012 North Cliff Nest No. 3 (2012 nest site)	-	-	-	-	-	Occupied	Unoccupied	Nest in same territory as 2010 and 2011 North Cliff Nest pair; A third nest in this same territory was occupied in 2012.
Nest Site 2, Mandalay Spring Narrows Nests	362683	4529033	Unoccupied /Vacant	Unoccupied /Vacant	Unoccupied	Unoccupied /Vacant	Unoccupied	Five unoccupied and apparently vacant nests.
Nest Site 3, East Kamma Mountains Nest	363511	4525375	Occupied	Occupied	Occupied	Unoccupied	Occupied	JBR identified one large downy young in this nest in May 2010; NDOW identified one large dark young in the nest in May 2011. No activity observed in 2012. Single young fledged in 2013.
Nest Site 4, Sawtooth Knob Nests	370019	4524494	-	Occupied	Occupied	Occupied	Unoccupied	Four nests on south side of Sawtooth Knob feature. NDOW identified one young in the nest in 2011. In 2012, the nest used in 2011 was occupied by a red-tailed hawk and an alternate nest on the same feature was occupied by a golden eagle. No nesting activity observed in 2013.

Nest Site	Easting	Northing	2010 JBR Status	2011 JBR Status	2011 NDOW Status	2012 JBR Status	2013 JBR Status	Comments
Nest Site 5, Rosebud Canyon Nests	359720	4516860	Occupied	Unoccupied	Unoccupied	Unoccupied	Unoccupied	Three nests in close proximity on the same cliff face in Rosebud Canyon. Attendant adult observed at nest in 2010.
Nest Site 6, Upper Rosebud Nest	362310	4516380	Occupied	Occupied	Occupied	Occupied	Unoccupied	A single young was visible in this nest in 2010. NDOW identified two large young in the nest in 2011. An adult was observed on this nest in 2012. No nesting activity observed in 2013.
Nest Site 7, South Woods Canyon Nest No. 1	365090	4534605	Unoccupied /Vacant	Unoccupied /Vacant	-	-	Unoccupied	Very old vacant nest.
Nest Site 7, North Woods Canyon Nest No. 2	365382	4535244	-	Unoccupied	Unoccupied	Unoccupied	Unoccupied	JBR identified a territorial prairie falcon in 2011. NDOW identified six nests on the rocky outcrop in 2011. No active eagle nests identified in 2011, 2012, or 2013.
Nest Site 8, Silver Camel Nest	356735	4524480	-	Unoccupied	Unoccupied	Unoccupied	Unoccupied	Nest on northwest side of Silver Camel outcrops, 2010. NDOW identified two alternate nests on other sides of outcrop – one old and one occupied by ravens in 2011. Birds present but no nesting, 2012 and 2013.
Nest Site 9, West Jungo Flat Nest No. 1	380983	4530131	-	-	Occupied	-	Occupied	NDOW identified one adult in the area and two young in the nest in 2011. Occupied alternate nest found in 2013; one young believed fledged.
Nest Site 10, West Jungo Flat Nest No. 2	379504	4528827	-	-	Occupied	-	Unoccupied	NDOW identified two adults nearby and one small young on the nest in 2011. No nesting activity observed in 2013.

Nest Site	Easting	Northing	2010 JBR Status	2011 JBR Status	2011 NDOW Status	2012 JBR Status	2013 JBR Status	Comments
Nest Site 11, Wild Rose Nest	358745	4522024	-	-	Unoccupied / Vacant (?)	-	Unoccupied	Empty nest with old nest debris below probably vacant site.
Nest Site 12, West Kamma Mountains Nest No. 1	359606	4514132	-	-	Unoccupied	-	Unoccupied	Large old, unoccupied nest presumed to be golden eagle, 2011. No nesting activity observed in 2013.
Nest Site 13, West Kamma Mountains Nest No. 2	358876	4513020	-	-	Unoccupied	-	Unoccupied	Large unoccupied nest presumed to be golden eagle, 2011. No nesting activity observed in 2013.
Nest Site 14, West Kamma Foothills Nest No. 1	357361	4511119	-	-	Unoccupied	-	Unoccupied	Large unoccupied nest presumed to be golden eagle, 2011. No nesting activity observed in 2013.
Nest Site 15, Rabbithole Nest	354086	4510194	-	-	Occupied	-	Unoccupied	NDOW identified one young in the nest in 2011. No nesting activity observed in 2013.
Nest Site 16, Sulphur Power Line Nest	354326	4526192	-	-	Occupied	-	No longer present	NDOW identified this nest in a transmission pole with three young present in 2011. Identification as a golden eagle nest uncertain. Nest fell or removed in 2013.
Nest Site 17, West Kamma Foothills Nest No. 2	357619	4512704	-	-	-	-	Unoccupied	Found by JBR during ground surveys in March, 2013. Possibly an alternate to the West Kamma Foothills nest. Not occupied in 2013, but much whitewash present. Possibly occupied in 2012.

-: No data collected

from 2010 to 2013, and a ferruginous hawk nested on the outcrop in 2012, no eagles have been found nesting on this feature during the last four years, and all eagle nests present on this feature appear old and unmaintained.

Nest Site 3, East Kamma Mountains Nests

Two nests have been built on a cliff east of the Kamma Mountains. One of these nests was occupied in 2010, with a single young observed in the nest. NDOW observed one large, dark young in the nest in 2011. Eagle activity was not observed at either nest in 2012. One of the East Kamma nests became active and fledged a single young in 2013.

Nest Site 4, Sawtooth Knob Nests

Sawtooth Knob is a prominent rocky feature located south of Jungo Road approximately four miles east of the Hycroft Mine project area. The area was not surveyed in 2010, but an occupied golden eagle nest was found on the southern side of the feature in 2011. A group of four nests were located on the western side of the feature. In 2011, the NDOW documented one young in a nest on the feature. In 2012, one of the nests on the western side of the feature was occupied by golden eagles, while the nest on the southern side of the feature (which was occupied by golden eagles in 2011) was occupied by red-tailed hawks in 2012. In 2013, one to two eagles were observed perched on top of the Sawtooth Knob feature during three ground visits, but no activity was observed on any of the nests.

Nest Site 5, Rosebud Canyon Nests

A series of three nests were found on a cliff on the eastern side of Rosebud Canyon, above the Rosebud Canyon Road. An attendant adult eagle was present at one of these nests in 2010, but no eagles were seen near these nests in either 2011 or 2012. No nesting occurred in 2013, although in late March 2013, an adult bird landed in one of the nests. JBR biologists did observe one instance of an eagle flying into the Silver Camel nests from the direction of the Rosebud Canyon nests; however, the relationship was not determined.

Nest Site 6, Upper Rosebud Canyon Nest

The Upper Rosebud Canyon nest was located on the southeastern side of a rock pinnacle east of the upper end of Rosebud Canyon. This nest was occupied during three years of the surveys in 2010 through 2012. A single young was observed in the nest in May 2010. NDOW documented two young in this nest in May 2011. An adult was present on this nest in May 2012, and the nest was heavily whitewashed when checked in August 2012, suggesting young had been present in the nest. No activity was observed in 2013.

Nest Site 7, Woods Canyon Nests

The Woods Canyon nests were located on a red basaltic feature located approximately four miles north of the Hycroft Mine project area. Only the southernmost of several outcrops was surveyed in 2010. Eagles were not observed in the area at that time. Surveys were extended to the north in 2011 and identified two large nests on a large outcrop north of the site surveyed in 2010 but no evidence of eagle activity was noted. NDOW documented a total of six nests in this area in 2011, none of which were occupied. No evidence of occupancy was found at these nests when the area was visited in 2012. A pair of golden eagles was observed in the area of the Woods Canyon nests in March 2013, but no eagles were observed in the area on several subsequent visits.

Nest Site 8, Silver Camel Nests

Two birds were observed at the Silver Camel nest in late April 2011, but no reproductive activity, in the form of incubation or evidence of egg laying or brood rearing, was observed. The nest was located on the north side of an outcrop on the Silver Camel feature, in the southwestern portion of the Hycroft Mine. In May 2011, three weeks after birds were observed at the site, the NDOW observed no birds in the area and the nest was identified as inactive and unoccupied. A single bird was observed roosting at the site in the spring of 2012, but the nest showed no sign of having produced young. The limited whitewash present later in the season indicated young were not raised in this nest in 2012. In 2013, a pair of eagles with white plumage indicating they were juveniles was repeatedly observed at the Silver Camel feature. New nesting material was brought to the nest early in the breeding season. Later in the breeding season, one bird was observed rearranging sticks on the nest; however, the nest was not used for reproduction in 2013. An old dilapidated nest is present on a second outcrop on the feature.

In addition to the nests described above, NDOW reported nests at the following locations:

Nest Site 9, West Jungo Flat Nest No. 1

The NDOW found 2 nests west of the Jungo Flat area of Desert Valley, approximately 10 and 11 miles east of the Hycroft Mine project area. One of these nests was located near the edge of the 10-mile buffer around the Hycroft Mine project area; the other was located outside of this buffer area but was included in NDOW's 2011 aerial raptor survey (Appendix A, Figure 5). The northern nest, located beyond the 10-mile buffer, held 2 young in late May 2011. During aerial monitoring conducted on June 3, 2013, a large, dark young was found in a nest located 0.15 mile to the north of the nest used in 2011. It is presumed that this is an alternate nest.

Nest Site 10, West Jungo Flat Nest No. 2

The second nest found west of Jungo Flat in 2011 was approximately 1.2 miles southwest of the Jungo Flat Nest No. 1, and north of irrigated fields in the western portion of Desert Valley. This nest was just within the 10-mile buffer around the Hycroft Mine project area. A single young was present in this nest at the time of the May 2011 NDOW flight. No activity was observed in 2013.

Nest Site 11, Wild Rose Canyon Nest

NDOW identified two nests in Wild Rose Canyon, which is located south of the active mine area at the boundary of the Hycroft Mine PoO. The NDOW described an older, fallen nest on a north-facing outcrop in the canyon below Wild Rose Spring. A large amount of older nest material was located beneath the nest which strongly suggests that material was from an old golden eagle nest. Another raptor or common raven (*Corvus corax*) has been the most recent occupant of the site. A follow-up visit to this nest determined the size and amount of material present on the ground below the nest suggested the nest was probably constructed by golden eagles. The second nest, closer to Wild Rose Spring, was occupied by common ravens at the time of the NDOW 2011 flight. This nest was clearly smaller than known golden eagle nests in the area, and no birds of any species were seen near the nest in 2013. The lower Wild Rose Canyon nest was approximately two miles southeast of the Silver Camel nests and represented the closest known potential nesting habitat to Silver Camel.

Nest Site 12, West Kamma Mountains Nests No. 1

The NDOW flight identified three nests in the higher parts of the Kamma Mountains west of Rosebud Canyon. None of these nests were occupied at the time of the May 2011 NDOW flight. Two of the nests were approximately 0.3 miles apart. One of these nests was small and was probably a raven nest. The two were described as a single site. In 2013, two eagles were observed perched on top of the outcrop near the larger nest early in the breeding season. No activity was observed in the area during three subsequent visits.

Nest Site 13, West Kamma Mountains Nests No. 2

A third nest (Nest Site 13), described by NDOW as an older nest, was found approximately 0.6-miles northeast of the Nest Site 12, West Kamma Mountains No. 1 nests. Two were large nests, possibly golden eagle nests. It is uncertain if these West Kamma Mountains nests were alternate nests in the same territory, or if the nests represented different territories. A fourth nest found farther west in the foothills of the range was identified as the West Kamma Foothills nest. No activity was observed at these nests in 2013.

Nest Site 14, West Kamma Foothills Nests

As noted above, the NDOW identified a fourth large but unoccupied/inactive nest farther to the west in the West Kamma Mountains, east of the Rabbithole Creek drainage. A probable alternate nest to the West Kamma Foothills nest was located during 2013 monitoring (Nest Site 17). The nest was heavily whitewashed and may have been occupied in 2012. No activity was observed at this nest in 2013.

Nest Site 15, Rabbithole Nests

The NDOW found an occupied golden eagle nest with a single young near the Rabbithole Creek drainage, west of the Kamma Mountains. No activity was observed at this nest in 2013.

Nest Site 16, Sulphur Power Line Nest

The NDOW identified a nest constructed on a power pole paralleling the Union Pacific Railroad tracks north of the Hycroft Mine as a golden eagle nest. The nest held three young at the time of the May 2011 flight, but apparently, no adult birds were observed at this nest, making identification of this nest as a golden eagle nest uncertain. The nest was fairly small and did not contain large nest material that would be typical of an eagle nest. In 2013, the nest was not observed and was either blown away by wind or removed.

Nest Site 17, West Kamma Foothills Nest No. 2

The West Kamma Foothills Nest No. 2 was found by JBR in March 2013. It is likely an alternate nest to the other Kamma Foothills nest based upon proximity, but the nest was not occupied in 2013. A lot of white wash was present indicating recent use in past years.

6.1.2 2013 Monitoring Results

Monitoring results for the 2013 nesting season are described in the *Hycroft Mine 2013 Golden Eagle Nests Monitoring Report* (JBR 2013). In 2013, JBR monitored the 16 nests that had been identified in previous surveys. A 17th nest was identified during 2013 ground surveys. All nests were visited on multiple occasions during the 2013 nesting season, with emphasis placed on nests nearest to the mine (within the calculated 3.6-mile inter-nest distance). Between March and June 2013, the golden eagles were observed incubating eggs through the date young fledged from nests. Nests that became active (used in reproduction) were monitored for periods of up to several days every other week.

In addition to nest monitoring, a new expanded 10-mile buffer area was defined to include additional activities being conducted or considered at the mine. Aerial surveys were conducted of the new 10-mile buffer area. The first of these flights was conducted over a two-day period in

early June (June 3 and 4, 2013). A total of 37 new golden eagle nests (several near and recorded with a single Global Positioning System [GPS] point) were identified within the expanded 10-mile buffer. Most of these newly identified nests were outside of the areas previously surveyed, though a few additional nests were found in areas that had been included in previous surveys. These latter nests did not appear to be newly constructed but were probably missed during previous surveys. Eight of the new nests found were just beyond the revised 2013 10-mile buffer survey area but were none-the-less recorded as they represent additional data points. Including the 2013 surveys, a total of 54 nests were identified within approximately 10 to 15 miles of the Hycroft Mine. Based on proximity, these nests appeared to represent 28 to 29 territories. Some of these nests are older and may not represent recently active territories (but see Kochert and Steenhof, 2013). Except for one nest located near the West Kamma Foothills Nest (Nest No. 14) found during the 2013 ground surveys, these newly located nests were identified by the GPS point number used to record the nest during the aerial surveys. The new nest found near the West Kamma Foothills Nests was identified as the West Kamma Foothills No. 2 Nest (Nest No. 17).

The 2013 monitoring and nest searches documented very limited golden eagle reproduction in the Hycroft area in 2013. Incubating or brooding golden eagles were found in only two of the original 16 nests that had been identified during previous years' surveys. Both of these nests (the North Cliffs Nest, Nest No. 1, and the East Kamma Nest, Nest No. 3) fledged a single young, each. A third nest, believed to be an alternate to the Jungo Flats Nest No. 1 (Nest No. 9) but only discovered in 2013, is also believed to have fledged a single young. Eagles were observed near several other nests, but no evidence of incubation or brooding was observed. JBR believed the very low nesting effort observed in 2013 was due at least in part to a low prey base (see Smith and Murphy, 1979; Steenhof et al., 1997; McIntyre and Adams, 1999). In their twice-monthly visits to the survey area, JBR biologists monitoring the Hycroft nests (up to four personnel per monitoring visit) did not observe a single jackrabbit. The area was also experiencing its second below-normal precipitation year in a row, resulting in limited vegetation productivity and presumably reducing alternate (non-jackrabbit) golden eagle prey populations.

Of the four nest sites closest to the Silver Camel nests, two nest sites were assigned to separate territories (the North Cliffs nests, Nest Site 1; and the East Kamma Mountains, Nest Site 3). A third nest site continued to be inactive, though non-nesting prairie falcons were observed at this site (Wild Rose Canyon, Nest Site 11); and the fourth nest site no longer supports a nest and was likely reported as an eagle nest in error (Sulphur Power Line; Nest Site 16).

6.1.3 2014 Monitoring Results

Hycroft Mine project area golden eagle monitoring was conducted in 2014 by Wildlife Resource Consultants LLC (WRC). Monitoring results for the 2014 nesting season are described in the *Hycroft Mine 2014 Raptor Nesting Surveys and Golden Eagle Monitoring Report* (WRC 2014). Two types of monitoring were conducted in 2014. Intensive nesting surveys were conducted early in the breeding season, focused on Silver Camel and other nesting areas close to the mine. The objective per the 2012 ROD stipulations and USFWS correspondence was to better understand the relationship of Silver Camel nests to other nests and breeding areas near the mine. Aerial surveys were conducted later in the breeding season, focused on quantifying breeding attempts and fledging success in the 10-mile buffer area.

Intensive Early Breeding Season Monitoring of Silver Camel Nests

The targeted time for intensive monitoring in 2014 was early in the breeding season, during the period of nest selection, egg laying, and early incubation. To assure that intensive monitoring occurred during this period, reconnaissance surveys were conducted on February 13 and 14, and on February 21. No eagles were seen on February 14, but birds were seen at both the North Cliffs (JBR Nest Site 1) and Silver Camel (JBR Nest Site 8) areas on February 21. Intensive surveys were therefore scheduled to begin on February 25.

Initially, intensive monitoring was planned for two full weeks. However, nest attendance was continuous at nearly all sites in the survey area by March 3, and incubation was observed at most. Because eagles are very sensitive to disturbance in early incubation, the first intensive monitoring session was terminated on March 3 to avoid disturbance that could result in the loss of nests. A second period of monitoring was conducted from March 12 to March 18, with the primary intent of verifying the status of nests in the survey area and investigating nest status in other portions of the 10-mile buffer around the mine.

The objective of the intensive monitoring surveys was to clarify the relationship of nests on Silver Camel to other surrounding areas. The study area therefore included all nesting areas within the inter-nest distance calculated by JBR in Section 6.1.2: North Cliffs (JBR Nest Site 1); Mandalay Springs Narrows (JBR Nest Site 2); East Kamma (JBR Nest Site 3); Rosebud Canyon (JBR Nest Site 5); Upper Rosebud Canyon (JBR Nest Site 6); Wild Rose Canyon (JBR Nest Site 14); and JBR Nest Site 804, just south of Rosebud Canyon. Simultaneous observations by three biologists were made at different locations in the survey area with the objective of gathering the following types of information to assist in delineating nest and territory relationships:

1) Continuous observations of golden eagles in transit between Silver Camel and other locations;

2) Simultaneous observations of eagles attendant at nests in different locations, which indicates that the locations are located within separate territories. Over long periods of observation, the lack of eagle presence in one area while another is attended suggests that the nests being observed may be in the same territory;

3) Departures of eagles from one location closely followed by arrivals at another, suggesting transit between the nests.

During the first two days of the first monitoring session, February 25 and 26, the three biologists visited nests throughout the survey area evaluating patterns of eagle use. Significant eagle activity was observed to the south and east of Silver Camel. Therefore, observation effort for the rest of the first session, February 27 through March 2, was focused on nests to the south and east of Silver Camel, which were nearly continuously monitored. Silver Camel itself was continuously monitored from February 27 through March 2, with a nest check on March 28.

During the second session, March 12 to 18, Pagel et al. (2010) protocol surveys were conducted at all nest sites in the survey area. Nests were observed until verification of occupancy/incubation, or for four hours. Three protocol surveys were conducted at Silver Camel during this period.

As in previous years, eagles were observed at Silver Camel early in the breeding season. Eagles were present on February 21, 25, 27, and March 1. On February 27, two birds were observed on the nest for a brief period. Nest decoration and copulation were also recorded. Nest decoration occurred on March 1. No eagle presence was observed after March 1, and at no point was incubation posture indicative of a breeding attempt observed.

On two of the days that birds were present at times at Silver Camel (February 27 and March 1), observers were also stationed at nest sites to the south in Rosebud Canyon and at East Kamma. Like the experiences of JBR in 2013, it was not possible, due to steep topography and lack of communications, to continuously maintain observations of eagles from one nest site to another. However, simultaneous observations recorded by the multiple biologists indicated that eagles active at Silver Camel were also active at Rosebud Canyon (JBR Nest Site 5). On three separate instances (twice on February 27 and once on March 1), an observer recorded eagle departures from one nest site, traveling in the direction of the other, closely followed by an observer at the second site recording the arrival of a golden eagle. In one instance on February 27, an observer stationed on Rosebud Peak midway between the two nest sites recorded an observation of the eagle in transit. In addition, although observers were present the entire day at both Silver Camel and Rosebud Canyon on February 27 and 28, and March 1, at no time were eagles observed simultaneously at both sites.

Other findings of the intensive surveys included:

- Multiple observations of eagles transiting between Rosebud Canyon (JBR Nest Site 5) and JBR Nest Site 804, to the south, indicating that this nest site was also visited by Silver Camel birds. This nest site was included in a Geographic Information System database provided by JBR, which indicated that two nests are present, but only one was found during aerial surveys conducted in 2014.
- Simultaneous observations of eagles at North Cliffs, East Kamma, Rosebud Canyon (JBR Nest Site 5) and Upper Rosebud Canyon (JBR Nest Site 6), suggesting that these areas all represent individual territories. No eagles were observed during the intensive monitoring period at Wild Rose Canyon (JBR Nest Site 6).
- Nest occupancy (incubation posture) was confirmed at North Cliffs, East Kamma, and Rosebud Canyon (JBR Nest Site 5). Nest occupancy was suspected at Upper Rosebud Canyon, but observations points with clear views into the nest were not available without disturbing the eagles.

Data collected during 2014 intensive monitoring was thought to support the conclusion that nests on the Silver Camel feature are part of a larger territory that includes the Rosebud Canyon nest site (JBR Nest Site 5) and JBR Nest Site 804. This however was proven incorrect during the 2015 golden eagle monitoring surveys as both Silver Camel nest 8 and nest 804 were occupied. Although the territory would be relatively large, it is within the range of published home ranges for eagles in the Great Basin region. Slater et al. (2013), in their study of west Utah eagles, state that regional home range sizes have been found to average near 23 square kilometers but were as large as 83 square kilometers (equivalent to a circle with a radius of 5.1 kilometers). Based upon past monitoring and current known data, the Silver Camel nests are considered to be in their own territory.

Aerial Nesting Surveys

Two aerial surveys were conducted of the 10-mile buffer around the Hycroft Mine in 2014. The first, on May 14, established nest occupancy and the status of breeding attempts. Fledging success was evaluated on the second aerial survey conducted on June 10. Breeding attempts were documented at eight nests (Table 2). Of these, six nests successfully fledged young.

Of the nest sites near the Hycroft Mine included in intensive surveys, North Cliffs and East Kamma were both successful. As suspected during intensive monitoring surveys, a nesting attempt did not occur at Upper Rosebud Canyon (JBR Nest Site 6). The nest within the Silver Camel/Rosebud Canyon territory contained two eggs on the first flight but was unattended by an

Table 2. Aerial Survey Nest Status, 2014

JBR Nest Site	May 14 Status	June 10 Status
North Cliffs, Nest Site 1	1 chick	Successful (1 fledgling)
East Kamma, Nest Site 3	1 chick, 1 egg	Successful (1 fledgling)
Silver Camel/Rosebud Canyon, Nest Site 5	2 eggs	Unsuccessful
Woods Canyon, Nest Site 7	2 chicks	Successful (2 fledglings)
Rabbithole, Nest Site 15	2 chicks	Successful (2 fledglings)
Nest Site 724	1 chick	Successful (1 fledgling)
Nest Site 756	1 chick	Successful (1 fledgling)
Nest Site 821	1 chick	Unsuccessful

adult. The second flight confirmed that the eggs did not hatch, and the nesting attempt was unsuccessful.

The North Cliffs territory (successful in five of five years of monitoring) and the East Kamma territory (successful four of five years) are clearly primary breeding areas. It is interesting to note that neither of these territories appears to be in areas of high habitat quality; North Cliffs is mostly surrounded by vegetation communities dominated by greasewood, and the East Kamma territory is located near areas that have recently burned. Pair experience may be an important factor in the success of these territories, as described by other researchers (see Section 4.0). Other territories near the mine, including the Silver Camel/Rosebud Canyon territory, are located in presumably higher-value sagebrush habitats but have lower rates of success over the period of monitoring. These secondary breeding areas may be occupied by less experienced birds, a possible explanation for the unsuccessful breeding attempt at the Rosebud Canyon nest, occupied by birds that were also active at Silver Camel. This is consistent with observations made by JBR in 2013 that eagles active at Silver Camel may have been sub-adults.

6.1.4 2015 Monitoring Results

The 2015 golden eagle nest monitoring was conducted by WRC. Monitoring results for the 2015 nesting season are described in *the Hycroft Mine 2015 Raptor Nesting Surveys and Golden Eagle Monitoring Report* (WRC 2015). Early season intensive ground nesting surveys were not completed. Instead, two aerial surveys were conducted 30-days apart, focused on quantifying rearing attempts and fledging success in the 10-mile buffer around the full proposed expansion boundary. The aerial surveys did focus on evaluating all new and old nests, not just known nests in the radius. Based upon the information being collected and the need to provide detailed information, nests were individually labeled versus previous use of numbering an area containing a closely distributed number of nests. For example, Silver Camel rock outcrop nests in previous JBR surveys were labeled as one site, Nest site 8. The three separate nests have now been labeled for clarity as Nests 8A, 8B, and 8C.

Aerial Nesting Surveys

The aerial survey monitoring in 2015 was conducted during the rearing season versus the early breeding and nest selection phase conducted in 2014. The aerial survey did however focus on searching for nests missed during earlier surveys or that had recently been constructed. The surveys were completed with recommendations from NDOW for recording nest attributes. This information is summarized in the *Hycroft Mine 2015 Raptor Nesting Surveys and Golden Eagle Monitoring Report* (WRC 2015).

Two aerial surveys were conducted of the 10-mile buffer around the Hycroft Mine. The first, in May, and the second in June 2015. The first survey established nest rearing but not attempts of breeding. Fledging success was evaluated on the second aerial survey and is summarized in Table 3.

Table 3. Aerial Survey Nest Status, 2015

Nest ID	May Status No. of Young	June Status No. of Young (Fledged)
9	2	0 (2 fledgling)
722	2	2 (2 fledgling)
748	2	0
8B	2	1 (1 fledglings)
53	1	0 (1 fledglings)
7B	1	1 (1 fledgling)
66	2	1 (1 fledgling)
5B	2	0
78	1	0 (2 fledgling)
79	2	0
Total Number of Fledglings		**10**

The results of the 2015 monitoring showed there were approximately 22 territories that contributed to the local area nesting population. Thirteen territories were occupied. However, due to refinements in the spatial arrangement of territories in 2017, the number of territories was increased to 24, and the 2015 occupancy was recalculated as 63% (see Section 6.1.6) (WRC 2017).

The productivity for 2015 was recalculated in 2017 as 1.08 golden eagles fledged per occupied territory. The mean brood size was one to 1.4 fledglings, resulting in a nest success rate of 76.9%. A compilation of nest data from 2010 to 2017 is provided in Appendix B.

One nest, designated 8B, on the Silver Camel outcrop was active and successful in fledging one young. The second aerial survey had revealed one young approximately 10-weeks old in the nest while one egg had not hatched.

The nests in the Phase II Expansion area (Appendix A, Figures 5 and 6) includes six separate nest sites, which were not active in 2015, including the East Kamma Nests 3A, and 3B. The other nests include Nest 101, Nest 102 that is classified as fallen and deteriorated, and Nests 821A and B. The 2014 surveys showed two of the sites 3A and 821B active. The surveys did indicate nest decoration took place in a few locations.

6.1.5 2016 Monitoring Results

The 2016 golden eagle nest monitoring was conducted by WRC. Monitoring results for the 2016 nesting season are described in the *Hycroft Mine 2016 Raptor Nesting Surveys and Golden Eagle Monitoring Report* (WRC 2016). Two aerial surveys were conducted, the first on April 7, 2016, and the second on June 1, 2016. The two surveys were separated by 55 days. Early spring weather in 2016 was relatively cool and stormy. During the first survey, numerous eagles were observed on nests with no eggs. In a few instances, eggs were observed. Based on these observations, the first survey in the Hycroft area was conducted during late courtship-early incubation. The second was conducted during late rearing, near when fledging would occur. Fledging success was evaluated on the second aerial survey and is summarized in Table 4.

Table 4. Aerial Survey Nest Status, 2016

Nest ID	April Status No. of Young/Eggs	June Status No. of Young (Fledged)
717	0	1
721	2 eggs	0
762B	1 egg	1
767	0	3
771B	1 egg	0
8B	0	1
5B	0	2
821B	0	2
51B	1 chick	1
53	2 chicks	2
60A	0	2
63	0	2
66	2 chicks	1
88	1 egg	1
7B	0	1
Total estimated number of Fledglings		**20**

The results of the 2016 monitoring showed there are 24 territories in the local nesting population area. Territories were classified as occupied when they contained at least one occupied nest. Twenty-two of the 24 estimated territories were occupied in 2016. Therefore, the territory occupancy rate reported in the 2016 survey report was 92% (WRC 2016). However, due to

refinements in the spatial arrangement of territories in 2017, the 2016 occupancy was recalculated as 79% (see Section 6.1.6) (WRC 2017).

The productivity for 2016 (number of young fledged / number of occupied territories) was 0.91. There were 20 fledged young. The mean brood size was one to 1.54 fledglings. A compilation of nest data from 2010 to 2017 is provided in Appendix B.

The nest designated 8B on the main Silver Camel outcrop was active in 2016. The nest was successful and a single eaglet in the nest was estimated to be nine to ten weeks old on the second flight. This nest also fledged one young in 2015, estimated to be ten weeks old on the second flight. Eagles were also observed at this nest in 2013 and 2014.

No new golden eagle or other raptor nests were found in the Phase II Expansion area during the 2016 Surveys. Six nests classified as golden eagle are located within this area, one of which (Nest 102) is fallen and deteriorated. Nest 3A was designated occupied based on an adult bird sitting in the nest and another adult bird perched on top of the rock outcrop during the first survey flight. No activity was recorded on the second flight. One of the golden eagle nests in the proposed Phase II Expansion area was active in 2016 – Nest 821B. Two chicks fledged from this nest. This nest was last recorded as active in 2014, with one chick observed on the first flight, but no activity on the second flight.

6.1.6 2017 Monitoring Results

The 2017 golden eagle nest monitoring was conducted by WRC. Monitoring results for the 2017 nesting season are described in the *Hycroft Mine 2017 Raptor Nesting Surveys and Golden Eagle Monitoring Report* (WRC 2017).

Ground Occupancy Survey

A ground occupancy survey was conducted on February 25, 2017 at territories most likely to be affected by mine activities and accessible by road at the time. A summary of the results is presented in Table 5.

Table 5. Ground Survey Occupancy Status, 2017

Nest ID	Territory	Status
8A-C	Silver Camel	Nest/territory was occupied. The eagles were in the period of courtship/nest establishment.
3A-B	East Kamma	Nest/territory was occupied. The eagles were either in late courtship/nest establishment or early incubation.
1A-D	North Cliffs	Occupancy was likely, but not conclusive. Courtship behavior was not observed.

Nest ID	Territory	Status
5A-C	West Rosebud Canyon	Occupancy was questionable.
6, 68	East Rosebud Canyon	Nest/territory was classified as occupied. The eagles at this site were in courtship/nest establishment.

Aerial Nesting Survey

Two aerial surveys were conducted, the first on March 1-2, 2017, and the second on May 31, 2017. The two surveys were separated by 89 days. Early spring weather in 2017 was relatively cool and stormy. During the first survey, numerous eagles were observed on nests with no eggs. In a few instances, eggs were observed. Based on these observations, the first survey in the Hycroft area was conducted during late courtship-early incubation. The second was conducted during late rearing, near when fledging would occur.

Seventeen golden eagle nests were occupied by golden eagles in 2017, including 14 active nests. The other three golden eagle nests occupied by golden eagles were classified as occupied based on the presence of an adult sitting on the nest or two adults in the vicinity. No eggs or young were seen in these nests on the second flight. Fledging success was evaluated on the second aerial survey and is summarized in Table 6.

Table 6. Aerial Survey Nest Status, 2017

Nest ID	Evidence of Occupancy	Number of Young, May 31	No. of Young (Fledged)
10	Active	1	0.5
54	Adult on nest	0	0
78	Active	2	2
101	Active	2	2
678	Active	2	2
748	Active	2	2
764	Active	2	1
774	Two adults nearby	0	0
13A	Active	2	2
1C	Active	2	1
3A	Active	1	1
4D	Active	2	2
51A	Active	1	1
5A	Active	2	2
756A	Active	1	1
7A	Eagle on nest, another nearby	0	0
8A	Active	1	1
Total estimated number of fledglings			**20.5**

Territory Occupancy

The results of the 2017 monitoring showed there are 24 territories in the local nesting population area. The spatial organization of the territories was adjusted in 2017 based on the nests that were active during each year throughout the period of monitoring (2010-2017) (Appendix A, Figure 5). In 2014, there were an estimated 18 territories, compared with the current estimate of 24. As the current map is the best estimate of territory distribution, all golden eagle nests have been assigned to a territory based on it. Occupancy of individual nests was then used to evaluate individual territory occupancy and recalculate project area territory occupancy rates over the period of monitoring (Table 7). Territories were classified as occupied when they contained at least one occupied nest. Seventeen of the 24 estimated territories were occupied in 2017. This results in a territory occupancy rate of 71%. The project area occupancy rate, based on the 10-mile buffer around the project area, can be calculated and compared from 2015 through 2017 (Table 7). It varied from 63% to 79% (WRC 2017).

Table 7. Golden Eagle Territory Occupancy Status, 2010 to 2017[1]

Territory Number	Territory Name	2010	2011	2012	2013	2014	2015	2016	2017
1	Silver Camel	ns	***occ***	***occ***	***occ***	***occ***	occ	occ	occ
2	North Cliffs	occ	occ	occ	occ	occ	unocc	unocc	occ
3	Rabbithole Peak	ns	***inact***	ns	***inact***	***inact***	occ	occ	unocc
4	West Jungo Flats 2	ns	occ	ns	unocc	***inact***	unocc	occ	occ
5	West Jungo Flats 1	ns	occ	ns	occ	***inact***	occ	unocc	occ
6	Alkali Flats	ns	ns	ns	inact	***inact***	unocc	unocc	unocc
7	Haystack Mine	ns	ns	ns	unocc	***inact***	occ	occ	occ
8	Moonshine Spring	ns	ns	ns	***inact***	***inact***	unocc	unocc	occ
9	Woods Canyon	***inact***	***inact***	***inact***	unocc	occ	occ	occ	occ
10	Black Rock Point	ns	ns	ns	***inact***	***inact***	occ	occ	unocc
11	Sheep Spring	ns	***inact***	ns	***inact***	***inact***	unocc	occ	unocc
12	Lava Beds Creek	ns	***inact***	ns	***inact***	***inact***	occ	occ	occ
13	West Jackson Mtns.	ns	ns	ns	***inact***	occ	occ	occ	unocc
14	Majuba Mountain	ns	ns	ns	***inact***	***inact***	occ	occ	occ
15	Antelope Range	ns	***inact***	ns	***inact***	occ	occ	occ	occ
16	South of Sawtooth	ns	***inact***	ns	***inact***	occ	unocc	occ	occ
17	Abel Camp Spring	ns	***inact***	ns	***inact***	***inact***	unocc	occ	unocc
18	Placerites	ns	***inact***	ns	***inact***	***inact***	unocc	occ	occ
19	East Kamma	occ	occ	***inact***	occ	occ	occ	occ	occ
20	Sawtooth Knob	ns	occ	occ	***occ***	***inact***	unocc	unocc	occ
21	West Rosebud Canyon	occ	***inact***	***inact***	***occ***	occ	occ	occ	occ
22	Cow Creek	ns	***inact***	ns	***inact***	***inact***	occ	occ	occ
23	Rabbithole Creek	ns	occ	ns	unocc	occ	occ	occ	unocc
24	East Rosebud Canyon	occ	occ	occ	***occ***	***occ***	occ	occ	occ
			Project-area Yearly Territory Occupancy				**0.63**	**0.79**	**0.71**

[1] Territories not surveyed in each year denoted with ns. Where the territory was surveyed for activity (egg laid) but data are insufficient to assess occupancy it was given the status inactive (inact). Where occupancy determinations have been revised from the original reports based on updated occupancy definition the status is in bold italics.

Of territories that have been surveyed throughout all or most of the monitoring period (2010-2017), East Rosebud Canyon is the only territory that has been confirmed occupied in all survey years. While the Silver Camel territory was never active (an egg was laid) prior to 2015, it was occupied (adult birds present) all years except 2010, when it was not surveyed. Occupancy over the period of monitoring has also been consistent at the West Rosebud, East Kamma and North Cliffs territories.

Nest Productivity

The productivity for 2017 (number of young fledged / number of occupied territories) was 1.21. There were 20.5 fledged young. The mean brood size was one to 1.46 fledglings, making the nest success 82.4 percent.

The nest designated 8A on the smaller, northerly Silver Camel outcrop was active in 2017. This nest has not previously been occupied in the period of monitoring. The nest was successful and a single eaglet in the nest was estimated to be seven to eight weeks old on the second flight. An alternate nest on the nearby main Silver Camel outcrop (Nest 8B) was active and successful in 2015 and 2016. Eagles were also observed at this nest in 2013 and 2014 and it was therefore occupied under the definition in Section 1.1.2.

No new golden eagle nests were found in the Phase II Expansion Area during the 2017 survey. Nest 3A was active and produced one fledgling in 2017. This nest was occupied but not active in 2015 and 2016. Prior to 2017, it was last active in 2014, with two chicks fledged. Nest 3B is very small, and confidence that it is currently a viable eagle nest is low, but it is nonetheless classified as an eagle nest.

Nest 101 in the southeast corner of the Phase II Expansion Area was also active in 2017, and fledged two young. This nest has been surveyed since 2015 and has not been active before this year. Nearby Nest 102 was classified as deteriorated and fallen off the nesting platform when first found in 2015, and it was in the same unsuitable condition in 2017.

Nests 821A and 821B, likely part of the same territory as Nests 101 and 102, were both unoccupied in 2017. Nest 821B was active in both 2014 and 2016; Nest 821A has not been active in the period of monitoring.

6.2 Nest Density

During 2010 to 2012 surveys, NDOW and JBR biologists identified a total of 32 nests potentially representing approximately 12 golden eagle nesting territories, occupied and unoccupied, within 5 miles of the Hycroft Mine project area. Based on these surveys, the average nest density within 5 miles of the Hycroft Mine project area (179 square miles) is one territory per 14.9 square

miles. Within 10 miles of the Hycroft Mine project area (336 square miles), the average nest density is lower, at one territory per 22.4 square miles. The 2013 surveys identified additional nests within the 5- and 10-mile areas around the Hycroft project but did not change the earlier findings that there is a higher nest density within 5 miles of the mine, and density decreases with distance from the mine (JBR, 2013). The higher density of nests closer to the Hycroft Mine project area can be attributed to a concentration of suitable nesting habitat located in the Kamma Mountains within the 5-mile buffer, and the lack of habitat associated with the large area of barren and sparsely vegetated playa north and northwest of the mine within the 10-mile buffer. The playa habitat lacks potential golden eagle nesting substrate, such as cliffs, outcrops, or trees.

Note that the Module 1 Guidance states that, "where eagle nesting density is especially high and data are available (either from prior studies or a pilot study) to do so, the project area inter-nest distance can be calculated and used as the width of the perimeter survey area, as the territories immediately adjacent to the footprint are the ones most likely to be affected by the project. This approach is especially appropriate in areas with high densities of nesting bald eagles" (USFWS, 2011). Potential golden eagle nesting habitat is not uniformly distributed in the Hycroft Mine 10-mile buffer area. Specifically, the areas northwest of the mine contain minimal areas of potential golden eagle nesting habitat. Accordingly, the USFWS recommends surveying the full 10-mile buffer area for golden eagle nests. This in fact was done during golden eagle monitoring and nest searches conducted in 2013-2017.

6.3 Nest Productivity

A compilation of nest data from 2010 to 2017 organized by territory is provided in Appendix B. Twenty-three of the 24 territories have been documented as active over the period of monitoring, and 22 have been documented to have successfully fledged young.

Surveys in 2010 and 2012 were part of general baseline wildlife surveys and not focused on golden eagle nesting. While nest activity was detected at some sites, the surveys did not provide sufficient data to calculate productivity parameters that are comparable to later surveys. Monitoring in 2011 consisted of one comprehensive aerial survey in late May, but this survey was conducted on a slightly smaller area than surveys from 2013 to 2017 and territory occupancy was not assessed. While there was sufficient data to calculate metrics such as mean brood size, productivity parameters based on occupied territories could not be determined.

Nesting surveys from 2013-2014 were comprehensive across the larger, 10-mile buffer survey area. The 2013 and 2014 surveys both consisted of two aerial flights, and these were augmented in 2013 with early season ground surveys at territories closest to the mine. However, in both years, occupancy was assessed according to interpretation of the 2010 USFWS definition and is

not therefore comparable to 2015-2017. In monitoring years 2015-2017, two aerial surveys were conducted, and nest and territory occupancy were assessed consistently according to the USFWS 2013 guidance.

Productivity was low in 2012 and 2013, but has increased significantly since then, from three fledglings in 2013 to 20.5 in 2017, likely in response to an increase in abundance of jackrabbits; our qualitative observation in this part of the Great Basin are that rabbit abundance has been increasing since 2013 and may be at or nearing a peak in the cycle.

The area-nesting golden eagle population appears to be relatively high and self-sustaining, based on the production estimate obtained from the 2011 NDOW flight (between 1.4 and 1.6 young fledged per active nest in 2011). A single young (1.0) fledged per nest from three occupied nests in 2013, but 2013 was considered an unusually low year for nesting attempts. Rates seen in 2014, 2015, 2016, and 2017 were 1.3, 1.4, 1.54, and 1.46 young fledged per nest, respectively. The relatively high rate of fledgling in 2014-2017 indicate a stable area nesting population.

7.0 RISK ASSESSMENT

Part of the ECP process is assessing the level of risk of a project on local-area golden eagle breeding populations. Related to the wind-energy industry, the USFWS (2013) identified three project categories by their potential risk to eagles:

- Category 1—High risk to eagles; potential to avoid or mitigate impacts is low
- Category 2—High or moderate risk to eagles; opportunity to mitigate impacts
- Category 3—Minimal risk to eagles

The standard operations associated with the mining and mineral exploration industry pose a low risk to golden eagles. There is a low risk for interaction with most of the operations and facilities on a mine site. HRDI currently employs protection measures associated with the BBCS, the 2012 ROD and the 2015 ROD. Additional applicant-committed protection measures are included in the amended 2014 PoO related to the proposed Phase II expansion (see Section 8.0). By implementing these protection measures, the risk to eagle interactions is lowered even further.

A major component of the risk assessment is to identify project activities that could result in a take. HRDI is requesting to remove three nests from the Silver Camel Nest site (8A-8C). Two of these nests have been documented as active in the period of monitoring (8A-8B). One of the nests (8C) is smaller and deteriorated. Currently, the best estimate is that there are four nests within the Silver Camel territory; however, the fourth nest (11) is completely fallen. Removal of 8A-8C therefore will therefore likely result in the loss of an eagle territory. Mitigation would be required for the loss of productivity until it could be shown that productivity is restored. This could be achieved by monitoring that shows the establishment of a successful nest within the current Silver Camel territory, at a new location, or potentially at a rebuilt nest 11, with evidence of no displacement of birds at neighboring territories (*i.e.* active nests in neighboring territories).

Two nests (3A-3B), are within a territory focused on the East Kamma mountains. Although nests will not be removed, they will be disturbed by the construction and operation of a tailing facility in clear sight lines of the nests and within a few hundred feet. It is likely that these impacts will result in the loss of an eagle territory. In 2017, three additional nests were assigned to the East Kamma territory (Nests 2C, 2D and 2E). The nests are on an outcrop just north of the main Jungo Road near Mandalay Springs. The Mandalay Springs nests are very near the county road (<500 feet) and have never been active or occupied in the period of monitoring. Given their proximity to the road, it is highly unlikely that they would be used for breeding. Therefore, a disturbance take of nests 3A and 3B would result in the loss of a breeding territory. Mitigation would be required to replace this productivity until it could be shown that productivity is

restored. This could be through monitoring that shows the establishment of a successful nest within the current East Kamma territory, at a new location, or potentially at the Mandalay Springs nest site, with evidence of no displacement of birds at neighboring territories (*i.e.* active nests in neighboring territories).

One deteriorated nest (102) will be removed within the footprint of the Northeast Tailings Facility in the South of Sawtooth territory. This nest is not currently viable.. The South of Sawtooth territory contains three additional alternate nests (nests 821A, 821B, and 101) located as a cluster of nests all in close proximity to each other. Approximately 20 percent of the habitat that comprises the South of Sawtooth breeding territorial area would be lost by construction of the Northeast Tailing Facility. The USFWS has determined that this territory would likely be lost due to incidental disturbance and loss of habitat. The South of Sawtooth territorial pairs may continue to occupy their territory in the short term, although it is expected that disturbance from construction of the tailings facility would ultimately cause them to abandon the territory.

8.0 PROTECTION MEASURES AND ADAPTIVE MANAGEMENT

HRDI currently employs protection measures associated with the BBCS, the 2012 ROD and the 2015 ROD. Additional applicant-committed protection measures are included in the 2014 amended PoO related to the proposed Phase II expansion. Ongoing or proposed management techniques to avoid deaths or reduce the risk to the maximum degree practicable include:

1. Silver Camel nest complex removal will occur outside of the nesting season and a biologist will confirm that the nests are not active;
2. Compliance with the NDOW Artificial Pond Permit which contains measures that are intended to prevent wildlife mortality from occurring as a result of exposure to chemicals at the heap leach facility and chemical-laden water impoundments. Specifically, the permit includes specifications for fencing and covering and containment, as well as reporting requirements for mortalities;
3. Monitoring surveys within 10 miles of the project area (project area population) (see Section 10) to demonstrate trends;
4. APLIC standards to minimize the potential of avian electrocution and collision;
5. Spatial buffers will be applied to active nests (a nest in which eggs have been laid) during the nesting season, here defined as spanning from the arrival of adults on a territory to post-fledging dependency of young. The buffer size will depend on the nature and duration of the disturbance and whether the nest is within line-of sight. The buffer size will be decided with input from the USFWS, NDOW, and/or the BLM;
6. Daily inspections of heap leach pad for ponding to minimize chance of cyanide poisoning;
7. Inspections of wildlife exclusion measures at process ponds;
8. Employee training;
9. Facility design considerations and speed limits to reduce chances of collision; and
10. Regular reviews of avoidance and protection measures and application of adaptive management.

9.0 MITIGATION

With the goal of maintaining stable or increasing breeding populations in all eagle management units, and the persistence of local populations throughout the geographic range of each species, the following mitigation measures will be implemented to compensate for the removal of nests and the possible loss of breeding territories:

1. HRDI will contribute to the USFWS' Pacific Southwest Region Bald and Golden Eagle Mitigation Account with the National Fish and Wildlife Federation; or a bond authorized under 43 CFR Subpart 3809: Surface Management. The contributions will be applied to retrofitting high-risk power poles within the same Eagle Management Unit (Pacific Flyway), although efforts will be made to implement mitigation within the natal dispersal range (109 mile-radius) if practicable. HDRI will work in coordination with BLM, USFWS, and NDOW to implement compensatory mitigation locally if practicable. The goal is to implement all or most of the retrofits on Harney Electric's poles located within the Kings River area.

   The amount of compensatory mitigation required will be determined through the USFWS Golden Eagle Resource Equivalency Analysis (GOEA REA) (USFWS 2013). Currently, the compensation rate is 6.49 eagles per territory lost. Therefore, compensatory mitigation equivalent to 19.5 golden eagles would be required to offset take of three territories. A range of 305–701 electric utility poles would be retrofitted to offset impacts of three lost territories. The exact number of retrofits depends on the longevity of each pole's retrofit.

2. HRDI may construct or repair nests to enhance potential breeding habitat within the eagle management unit, the local area population, or to encourage relocation of nesting activity within the vicinity of the mine. Nest sites will be chosen in coordination with the USFWS and the BLM. Nesting platforms may be placed on larger power transmission line towers and/or constructed as independent structures. Nests may be created or repaired within the territories where nests will be removed or disturbed to serve as alternate nests within those territories.

3. HRDI will coordinate with the USFWS and the BLM on the creation of suitable nest platforms on the Hycroft pit high walls during mine closure. Mine planning activities including pit wall design and development will consider suitable nesting platforms for post operation nesting sites.

4. Nest site mitigation could entail treating nests or young for parasites if they are identified as occupying nests or contributing to efforts within the EMU.

5. HRDI will minimize the disturbance to the South of Sawtooth and East Kamma nest sites by conducting construction activities on the Northeast Tailings Facility and the stormwater diversion ditch south of the tailings facility outside of the breeding season. Monitoring of the East Kamma nests will focus on a return to occupancy status post construction as it is expected that no disturbance will take place during operations.

6. HRDI will provide annual environmental training for personnel working onsite during operations. The training will include eagle recognition, identification and ecology awareness to encourage proper operational conduct, response and reporting if an eagle is observed or encountered onsite. Any eagle mortality encountered by personnel will be immediately reported to onsite environmental staff, who will in turn report to BLM, USFWS and NDOW within 24 hours of discovery.

7. HRDI will continue to maintain safety netting over open process ponds to avoid eagle injury or mortality through contact with process solution.

10.0 MONITORING

HRDI proposes to continue monitoring during operations within a 10-mile radius of the active Hycroft project area to obtain additional data on golden eagle nests following removal of the Silver Camel feature and disturbance of the nests located within the proposed Northeast Tailings Facility in the East Kamma and South of Sawtooth sites.

Current monitoring of the area-nesting population, includes a 10-mile buffer around the Hycroft Mine project area, and focuses on nest occupancy and productivity. The current monitoring effort follows the USFWS Interim Monitoring Protocols (Pagel et al. 2010), two aerial surveys will be conducted each year, separated by at least one month. The timing of the first survey will be determined in conjunction with the USFWS. These data will be used for the following purposes:

1) To further delineate and refine understanding of eagle territories near the mine.
2) To evaluate trends in rates of territory occupancy and activity. Territory occupancy will be particularly valuable, as rates tend to be more stable over time than rates of activity, which vary from year to year due to environmental conditions.
3) To assess any potential effects on territories near the mine following removal of the Silver Camel nests and disturbance of the East Kamma and South of Sawtooth nests.
4) To determine what level of mitigation, if any, is required for a loss of breeding territories.

In addition, adult golden eagles that may be affected by the disturbance or loss of breeding territories as a result of the proposed mine expansion will be fitted with transmitters during the 2018 breeding season. The eagles will be tracked for multiple years over a period that spans pre- and post-mine expansion. The data collected will help inform Hycroft and the regulatory agencies about golden eagle breeding behavior and movements within breeding territories in relation to mining activities.

Continued data collection will allow for evaluation of trends in nest occupancy and success which will lead to a determination of whether the local-area population appears to be stable. Post-project monitoring requirements will be determined during the current EIS process. In addition, the monitoring methodology and frequency may be adjusted based on the analysis and recommendations developed in the EIS currently being prepared and may be adjusted over time because of new data and scientific information related to golden eagle biology. Survey results will be provided annually to BLM and USFWS.

A monitor can be assigned to any in-use/occupied nests that are within one-mile of mining activities during the breeding season (January 1 to July 31). Monitoring will be conducted in accordance with 'USFWS Bald Eagle Monitoring Guidelines (2007)' or an equivalent protocol. The purpose of monitoring will be to evaluate the behavioral response of the adult eagles or their chicks to mining activities and detect any abnormal behavior that could result in abandonment of the nest or death of the eggs or eaglets. In lieu of continued biomonitoring, an appropriate spatial buffer can be applied to the nest site based on the behavioral response of the eagles to the disturbance.

11.0 CONCLUSION

Within the 10-mile buffer of the project area, a total of 183 nests were observed and recorded in 2017. Ninety-five nests were classified as likely belonging to golden eagles, of which 14 were active with golden eagles. Twenty-three (23) nests were active with other raptors (WRC 2017).

HRDI is requesting authorization for removal of inactive nests and disturbance take associated with nest removals and mining activities that could result in the loss of up to three golden eagle nesting territories (Appendix A, Figure 6). HRDI is requesting a permit that would allow for removal of four nests (8A-8C; and 102), two of which are currently viable under 50 CFR 22.25. Disturbance take authorization is also requested for planned mining activities near five additional nests (3A, 3B, 821A, 821B, and 101) and to the Silver Camel feature should these actions result in the loss of breeding territories under 50 CFR 22.26 per July 29, 2015 USFWS correspondence. Three nests are located on the Silver Camel feature, a rocky outcrop located immediately southwest of the existing Hycroft Mine approved for mining in the 2012 BLM's ROD for the Hycroft Expansion. Six additional nests are in the Phase II Expansion area, specifically the North Tailings Facility, currently being evaluated as an EIS by the BLM jointly prepared with the USFWS. Two of the North Tailings Facility nests (3A-3B) would only be a disturbance take during the construction phase of the facility and are expected to be used during operation. The removal of one deteriorated nest (102) and a loss of habitat and incidental disturbance take to three additional nests (821A, 821B, and 101) could result in the loss of the South of Sawtooth breeding territory. Actions presented in this ECP represent HRDI's good-faith effort to comply with the provisions of the Eagle Act and to ensure the area-nesting golden eagle population is sustained. All nests are located on BLM-administered lands. No loss of golden eagles would occur as the nest removal would occur outside of the nesting season.

This ECP is a living document which will be updated and finalized after the current EIS process.

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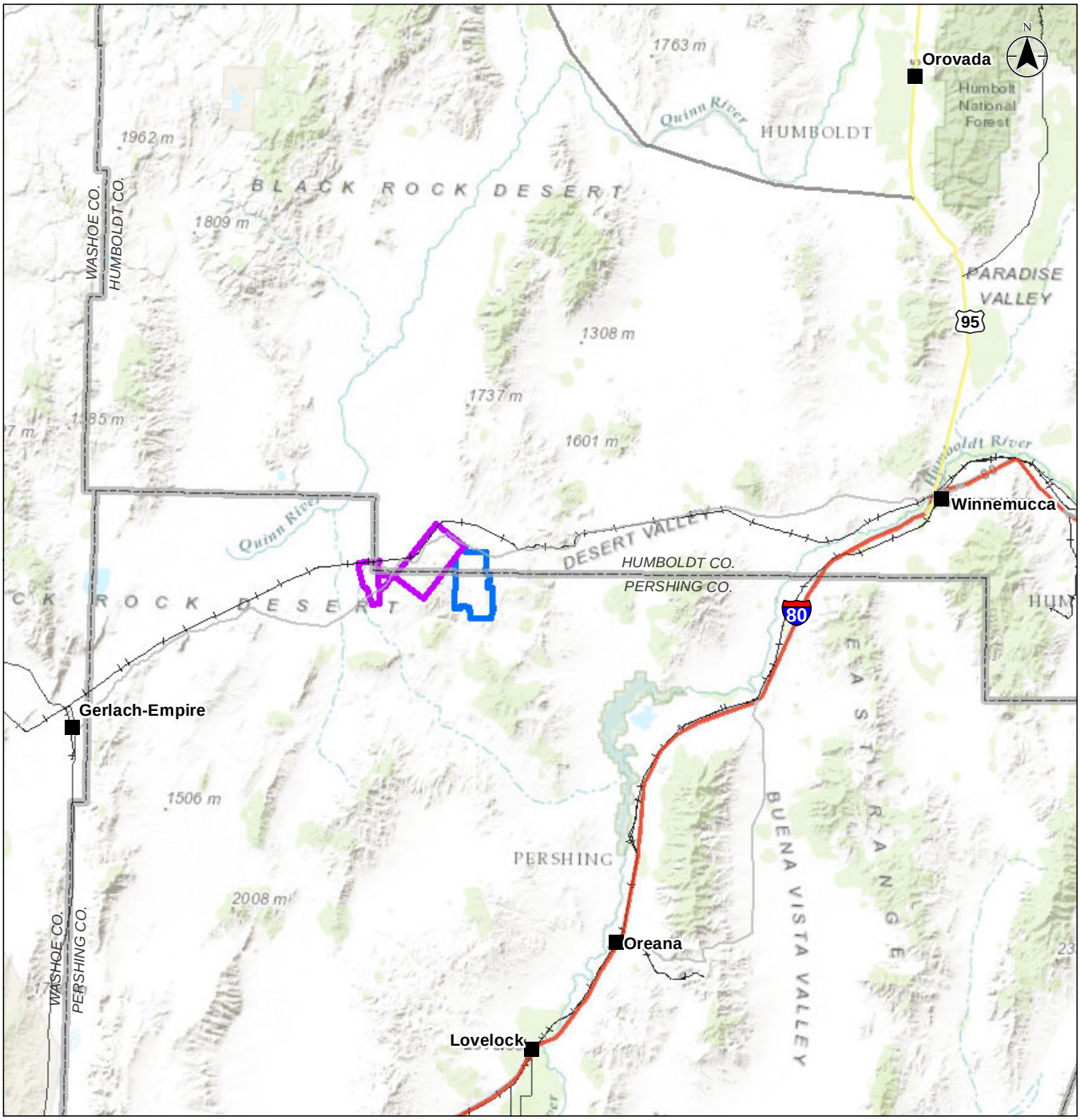
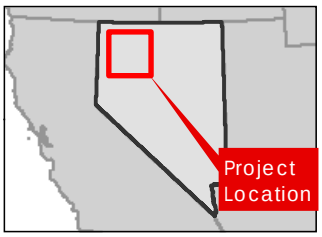
APPENDIX A

Figures

X:\NV\Clients\Allied\Hycroft Mine Phase II Expansion\203703039\MXDs\Working\MXDs\Biological\ECP\Fig 1 Project Location.mxd Revised: 2015-09-11 By: chjohnson





Authorized Project Area

Proposed Phase II Expansion Plan Area

0 7.5 15 miles

1:950,400 (at original document size of 8.5x11)

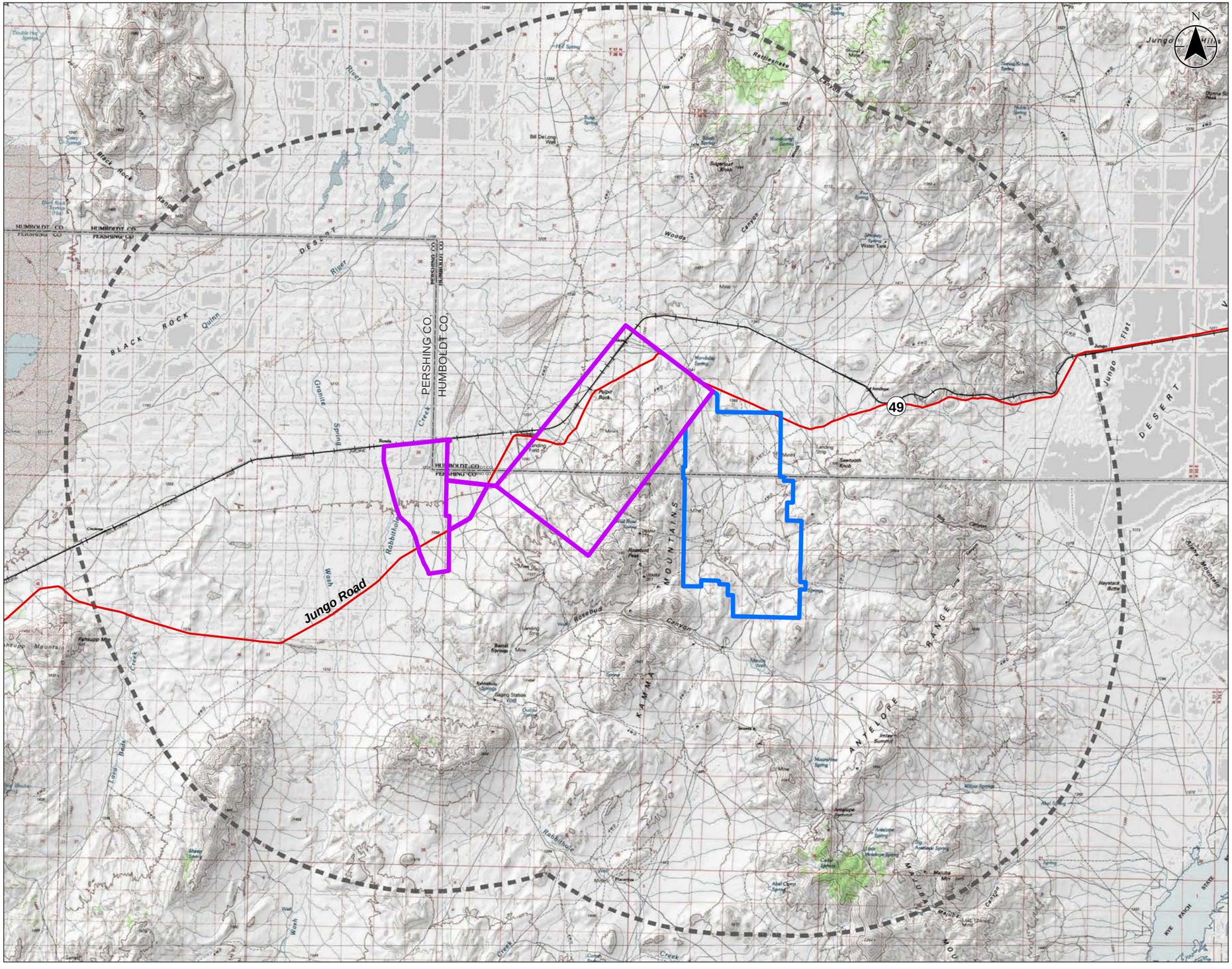
Notes
1. Coordinate System: NAD 1983 UTM Zone 11N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
3. Orthoimagery © First Base Solutions, 20xx.

Project Location
Humboldt & Pershing Co. NV

Project No.: 203703039
Prepared by CJ on 9/11/2015
Review by NK on 9/11/2015

Client/Project
Hycroft Resources and Development, Inc.
Eagle Conservation Plan

Figure No./Title
Figure 1
Project Location



- Authorized Project Area
- Proposed Phase II Expansion Plan Area
- 10-mile Buffer around POO Area and Phase II Expansion Area

0 3½ 7 Miles

1 in = 17,000 feet (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 11N
2. Basemap: Copyright:© 2013 National Geographic Society, i-cubed

Project Location
Humboldt &
Pershing Counties, NV

Project No.: 203703039
Prepared by JT on 9/14/2015
Tech. Review by NK on 9/14/2015

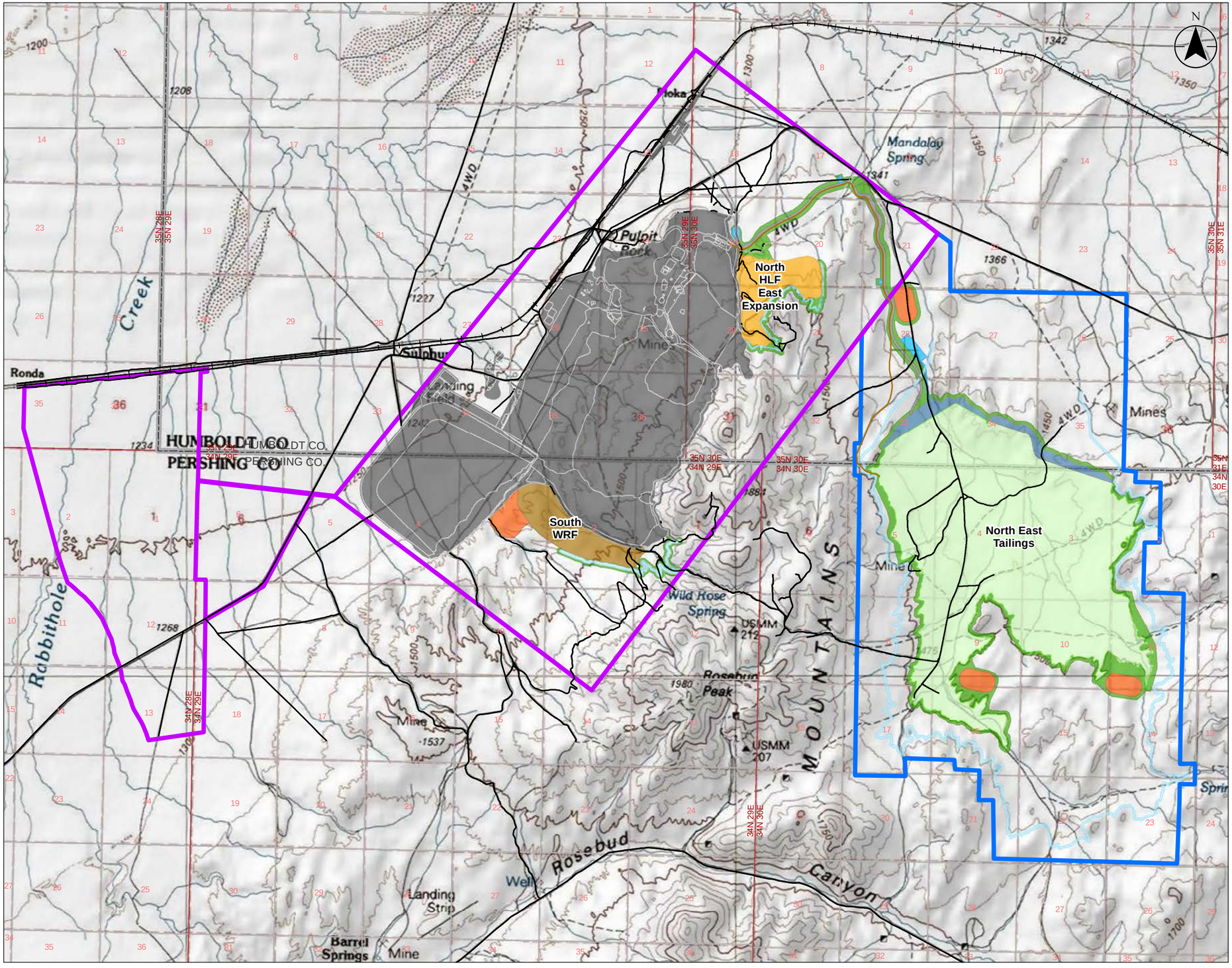
Client/Project

Hycroft Resources and Development, Inc.
Eagle Conservation Plan

Figure Number/Title

Figure 2
Study Area

X:\NV\Clients\Allied\Hycroft_Mine_Phase_II_Expansion_203703039\MXDs\Working\MXDs\Biological\ECP\Fig_2_Study_Area.mxd Revised: 2015-09-14 By: jtrook



Authorized Project Area
Proposed Phase II Expansion Plan Area
Road
Railroad
Proposed Conveyance Ditch
Pre-2015 Surface Disturbance (Existing/Authorized/Pending Authorization)

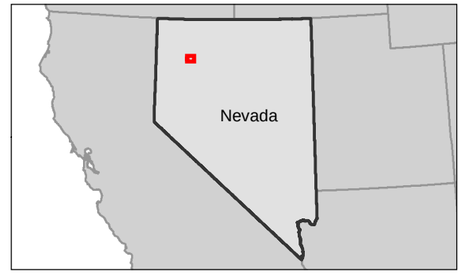
Phase II Proposed Disturbance and Facilities

- Growth Media Stockpile
- Haul Road
- Leach Pad
- Light Duty Road
- Miscellaneous
- Pond
- Stormwater Diversion
- Tailings
- Tailings Dam
- Waste Rock Dump

0 6,000 12,000 Feet

1 in = 6,000 feet (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 11N
2. Basemap: Copyright:© 2013 National Geographic Society, i-cubed



Project Location
Humboldt & Pershing Counties, NV

Project No.: 203703039
Prepared by JT on 9/14/2015
Tech. Review by NK on 9/14/2015

Client/Project

Hycroft Resources and Development, Inc.
Eagle Conservation Plan

Figure Number/Title

Figure 3
Project Surface

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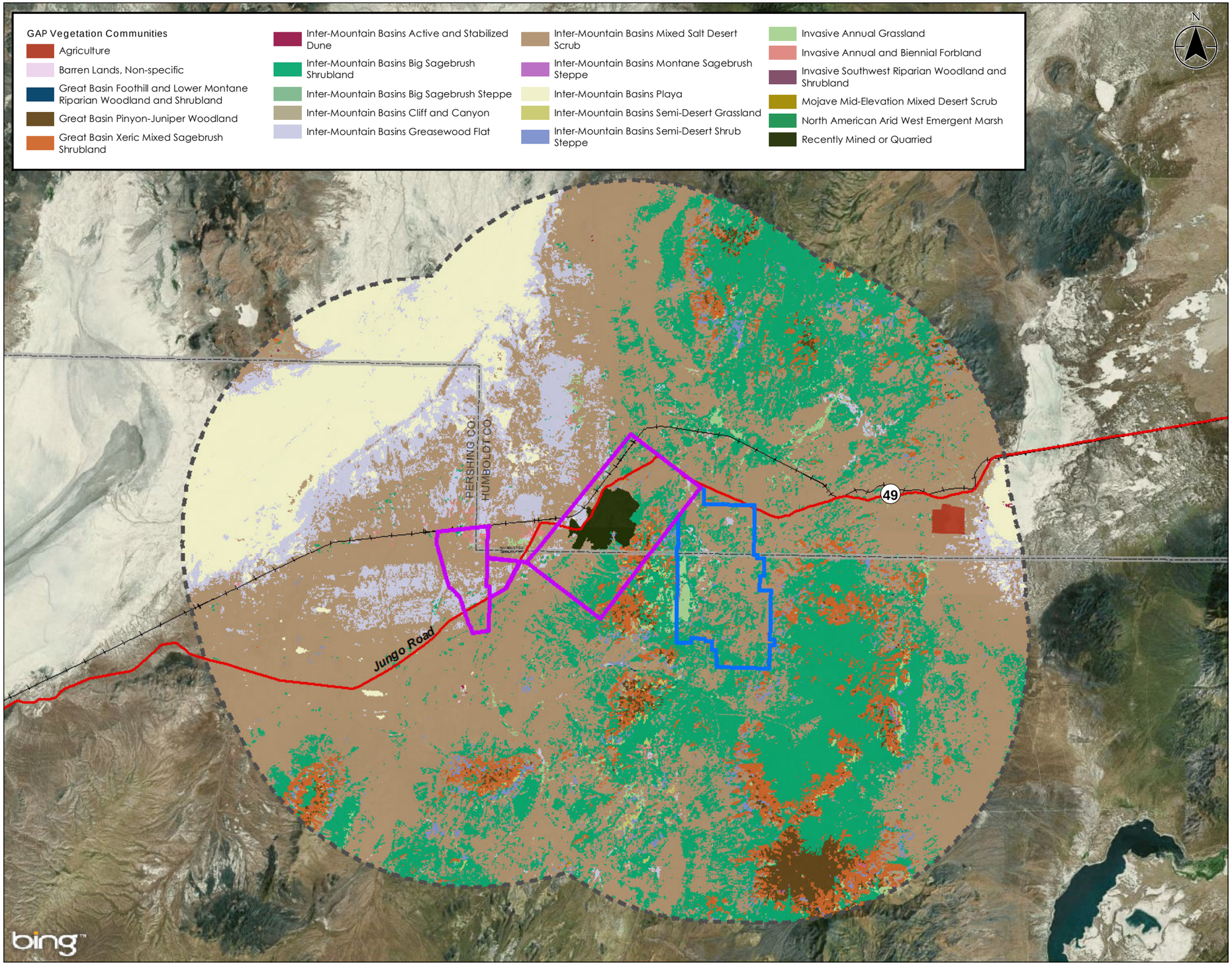

Authorized Project Area

Proposed Phase II Expansion Plan Area

10-mile Buffer around POO Area and Phase II Expansion Area

0 3½ 7 Miles

1 in = 21,000 feet (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 11N
2. Basemap: NAIP 2013 Image

Project Location
Humboldt &
Pershing Counties, NV

Project No.: 203703039
Prepared by JT on 9/11/2015
Tech. Review by NK on 9/11/2015

Client/Project

Hycroft Resources and Development, Inc.
Eagle Conservation Plan

Figure Number/Title

Figure 4
Hycroft Mine Expansion Buffer Area
Southwest ReGAP Vegetation

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Hycroft Mine Eagle Conservation Plan

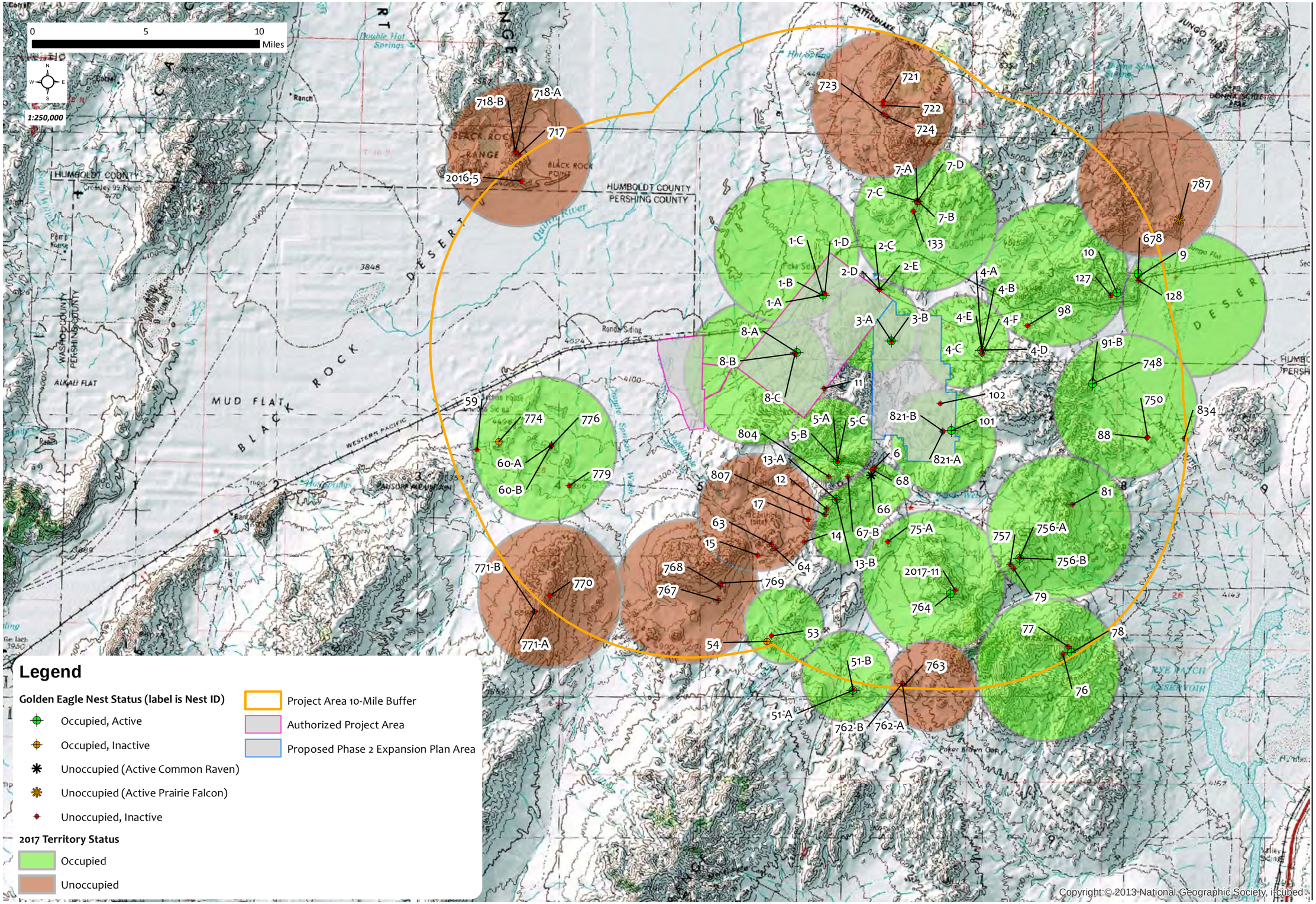

Figure 5. 2017 Golden Eagle Nest Status and Estimated Territories and Occupancy

Base data ESRI and National Geographic Society. Other data provided by Allied and Stantec.
Projection UTM NAD 83.

This map contains confidential information.

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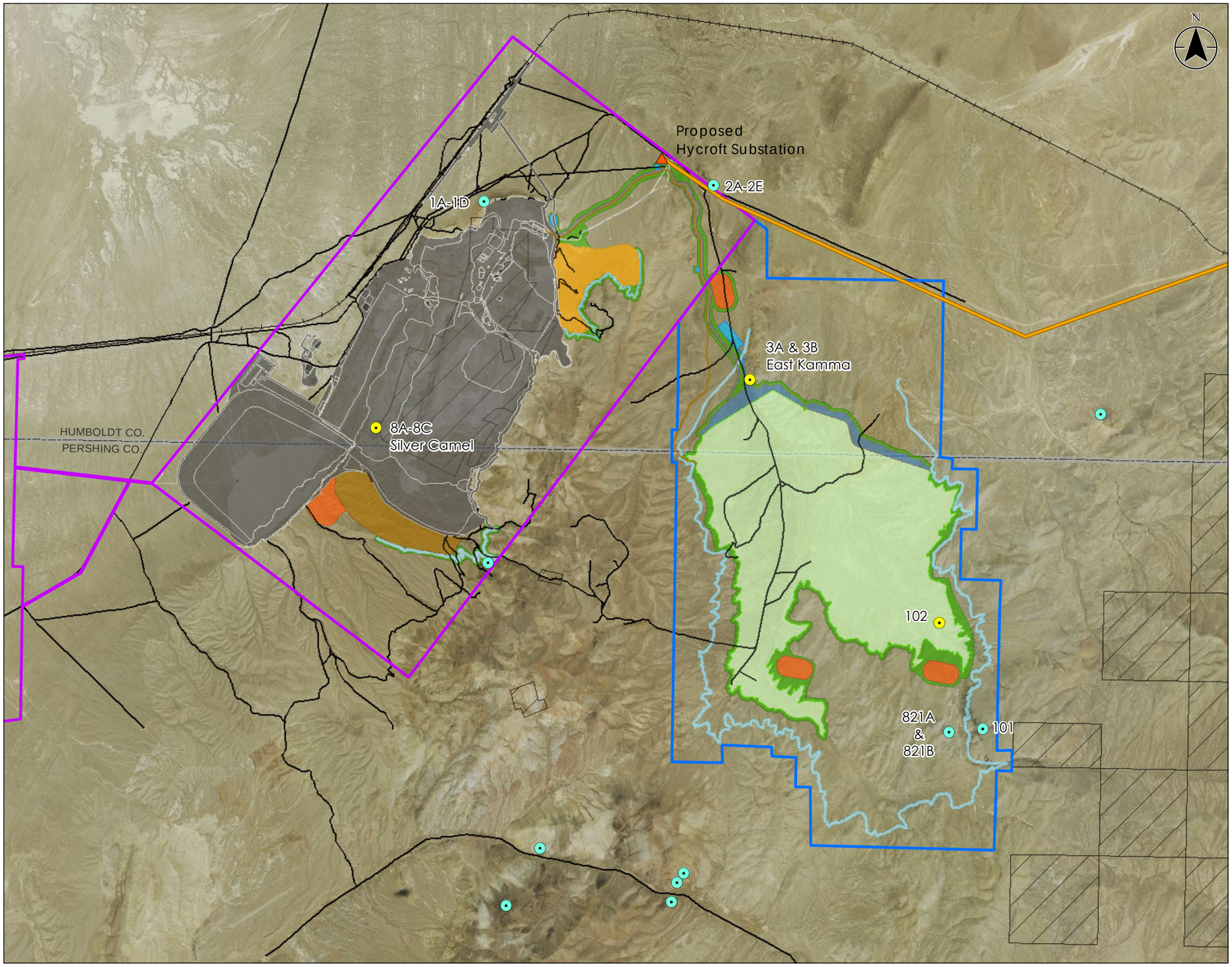
Cedarville, CA 96104



- Golden Eagle Nests
- Golden Eagle Nests Proposed For Take
- Authorized Project Area
- Proposed Phase II Expansion Plan Area
- Private
- Proposed 345 kV Transmission Line
- Road
- Railroad
- Proposed Conveyance Ditch
- Existing and Authorized Disturbance

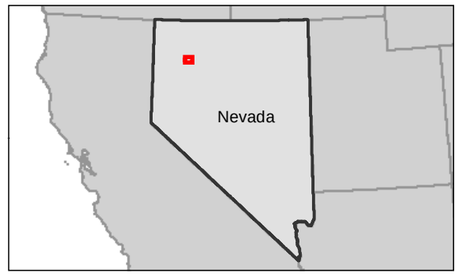
Proposed Disturbance and Facilities

- Growth Media Stockpile
- Haul Road
- Leach Pad
- Light Duty Road
- Miscellaneous
- Pond
- Stormwater Diversion
- Tailings
- Tailings Dam
- Waste Rock Dump

0 3,000 6,000 Feet

1 in = 6,000 feet (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 11N
2. Basemap: 2013 National Agriculture Imagery Program (NAIP)



Project Location
Humboldt &
Pershing Counties, NV

Project No.: 203703039
Prepared by JT on 9/11/2015
Tech. Review by NK on 9/11/2015

Client/Project

Hycroft Resources and Development, Inc.
Eagle Conservation Plan

Figure Number/Title

Figure 6
Golden Eagle Nests Proposed For Take

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APPENDIX B

Golden Eagle Summary of Nest Data 2010 to 2017

Table A-1 Summary of Nest Data 2010 to 2017
Taken from Wildlife Resource Consultants 2017 Raptor Nesting Surveys and Golden Eagle Monitoring Report

Notes: This database created by WRC 2017. Represents all potential raptor nests identified in 2017 surveys.
Prior nest status from several sources, including JBR GIS databases and reports (2010-2013) and WRC databases and reports (2014-2016)
* NS represents not surveyed

Site_ID	E_UTM_83	N_UTM_83	type_	last_act	goea_terr	nest_size	nest_cond	nest_prot	nest_ht	sub_ht	occ_2010	act_2010	occ_2011	act_2011	occ_2012	act_2012	occ_2013	act_2013	occ_2014	act_2014	occ_2015	act_2015	occ_2016	act_2016	occ_2017	act_2017	2017_1ad	2017_1adsp	2017_1adbeh	2017_1recuse	2017_1egg	2017_1yo	2017_1age	2017_1ph	2017_1no	2017_2ad	2017_2adsp	2017_2adbeh	2017_2recuse	2017_2young	2017_2age	2017_2ph	2017_2no
6	362318	4516370	GOEA	goea	24	3	I	CB	40	50	goea	act	goea	act	goea	act	unocc	inact	goea	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	30-31	nest 6 changed to occupied, inactive in 201	0	0	0	0	0	0	none	
9	380969	4529927	GOEA	goea	5	3	I	CB	30	35	ns	ns	goea	act	unocc	inact	goea	inact	unocc	inact	goea	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	191		0	0	0	0	0	0	none	
10	379504	4528779	GOEA	goea	4	3	I	CO/CB	20	30	ns	ns	goea	act	ns	ns	unocc	inact	unocc	inact	unocc	inact	goea	inact	goea	act	1	goea	f	0	0	0	0	186-187		1	goea	p	0	1	5-6	75-77	
11	358746	4522027	GOEA	none	1	3	D	CB	15	40	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	90		1	prfa	b	0	3	?	99-105	
12	358936	4513474	GOEA	goea	24	3	I	CB	20	25	ns	ns	unocc	inact	unocc	inact	goea	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	1	goea	P	0	0	0	0	24-25	1 adult perched on rock above nest	0	0	0	0	0	0	none	
14	357344	4511137	GOEA	goea	23	3	I	CB	15	25	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	goea	inact	goea	inact	unocc	inact	0	0	0	0	0	0	0	22		0	0	0	0	0	0	none	
15	354050	4510205	GOEA	goea	23	3	D	CB	75	125	ns	ns	goea	act	ns	ns	unocc	inact	goea	act	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0		40-42		0	0	0	0	0	0	none	
17	357619	4512704	GOEA	none	23	3	I	CB	40	45	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	23		0	0	0	0	0	0	none	
52-A	355250	4504321	SR	none		1	D	CO/CB	5	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	9	crashed	0	0	0	0	0	0	none	
52-B	355250	4504321	CORA	none		1	I	CB	15	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	10		0	0	0	0	0	0	none	
53	355009	4504463	GOEA	goea	22	3	I	CB	5	10	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	goea	act	goea	act	unocc	inact	0	0	0	0	0	0	0	12		0	0	0	0	0	0	none	
54	354688	4504096	GOEA	none	22	2	I	CB	5		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	goea	inact	1	goea	b/i	0	0	0	0	11	1 adult on nest	0	0	0	g	0	0	none	
55	356171	4505649	CORA	none		0	I	CH	8	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	13		0	0	0	0	0	0	none	
56	356235	4505620	CORA	none		0	I	CH	80	200+	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	14		0	0	0	0	0	0	none	
57	343632	4503969	SR	none		0	D	CB	30	80	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none		0	0	0	0	0	0	none	
58	333323	4513925	LR	cora		2	I	CB	5	10	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	cora	act	cora	act	0	0	0	0	0	0	0	52		1	cora	i/b	0	0	0	none	
59	334152	4517685	GOEA	none	12	3	D	CB	15	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none	nest gone, land slide	0	0	0	0	0	0	none	
61	339016	4517609	FEHA	none		3	I	O	20	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	55		0	0	0	0	0	0	none	
62	351745	4514180	CORA	cora		0	I	CB	10	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	cora	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	60		0	0	0	0	0	0	none	
63	355038	4510966	GOEA	goea	23	2	I	CB	10	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	158		0	0	0	0	0	0	none	
64	355271	4510674	GOEA	none	23	3	D	CB	50	60	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	159-160		0	0	0	0	0	0	none	
65	357000	4510865	LR	cora		2	I	CO/CB	10	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	cora	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	21		0	0	0	0	0	0	none	
66	362092	4515845	GOEA	cora	24	3	I	CB	20	25	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	goea	act	goea	act	cora	act	0	0	0	g	0	0	0	26-28		1	cora	b	0	1	?	none	
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74	362981	4527949	SR	cora		1	I	CO/CB	5	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	cora	act	unocc	inact	0	0	0	0	0	0	0	64-65		0	0	0	0	0	0	none	
75-A	363276	4511163	GOEA	none	8		D				ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	138-139		0	0	0	0	0	0	none	
75-B	363276	4511163	CORA	cora		1	I	CO/CB	10	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	cora	act	cora	act	unocc	inact	0	0	0	0	0	0	0	138-139		0	0	0	0	0	0	none	
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82	375604	4514560	CORA	prfa		0	I	CB	50	70	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	cora	act	prfa	act	unocc	inact	0	0	0	0	0	0	0	174-175		0	0	0	0	0	0	none	
83	376381	4515748	SR	none		1	I	CB	30	35	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	176		0	0	0	0	0	0	none	
84	377303	4516808	SR	cora		1	I	CO/CB	15	60+	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	cora	act	unocc	inact	0	0	0	0	0	0	0	178		0	0	0	0	0	0	none	
85-A	378668	4517780	CORA	cora		0	I	CH	15	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	cora	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	179		0	0	0	0	0	0	none	
85-B	378668	4517780	CORA	none		0	I	CH	15	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	179		0	0	0	0	0	0	none	
86	384341	4518405	SR	none		0	DET	CB	3	10	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	214-216		0	0	0	0	0	0	none	
88	381629	4518515	GOEA	goea	7	3	I	CB	10	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	212		0	0	0	0	0	0	none	
89	376206	4521798	SR	none		1	I	CB	15	25	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	180		0	0	0	0	0	0	none	
90	377153	4521634	SR	prfa		0	I	CO/CB	20	25	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	prfa	act	unocc	inact	0	0	0	0	0	0	0	181		0	0	0	0	0	0	none	
91-A	377765	4522573	SR	none		1	I	CO/CB	15	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	205		0	0	0	0	0	0	none	
91-B	377765	4522573	GOEA	none	7		D				ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	0	0	0	0	0	0	0	205	destroyed	0	0	0	0	0	0	none	
92	373679	4524145	FEHA	feha		3	I	O	25	25	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	feha	act	0	0	0	0	0	0	0	156		0	0	0	0	1	?	132-133	
93	373733	4524163	FEHA	none		3	I	O	8	8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	157		0	0	0	0	0	0	none	
94	373990	4524395	FEHA	none		3	I	O	25	25	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	155		0	0	0	0	0	0	none	
95	373785	4524757	CORA	cora		0	I	CO/CB	20	22	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	cora	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	152		0	0	0	0	0	0	none	
96	374792	4525993	LR	none		2	I	CH	5	10	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none	crashed and rat looking sticks	1	cora	i/b	0	0	0	none	
97	374794	4526134	FEHA	feha		3	I	O	4	4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	feha	act	unocc	inact	0	0	0	0	0	0	0	150		0	0	0	0	0	0	none	
98	373152	4526460	GOEA	none	4	3	I	CB	90	100+	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	149		0	0	0	0	0	0	none	
99	369762	4523322	CORA	none		0	I	CB	10	14	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	146-148		0	0	0	0	0	0	none	
100	367868	4518396	CORA	none		0	D	CB	10	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none	nest gone	0	0	0	0	0	0	none	
101	367771	4519007	GOEA	goea	16	3	I	CB	10	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	goea	act	1	goea	i/b	0	0	0	0	136		0	0	0	0	2	10-11	123-126	
102	366982	4520935	GOEA	none	16	3	D	CO/CB	4	8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	133	prairie falcon flying in vicinity	0	0	0	0	0	0	none	
103	366128	4525981	SR	prfa		0	I	CH	15	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	prfa	act	prfa	act	unocc	inact	0	0	0	0	0	0	0	132	prairie falcon flying in vicinity	0	0	0	0	0	0	none	
104	366556	4525161	CORA	cora		0	D	PPOLE	60	60	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	cora	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none		0	0	0	0	0	0	none	
105	362077	4519578	CORA	cora		0	D	PPOLE	60	60	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	cora	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none		0	0	0	0	0	0	none	
106	360827	4520774	CORA	none		0	I	CO/CB	20	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none		0	0	0	0	0	0	none	
107	360761	4520778	CORA	none		1	I	CO/CB	6	8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none		0	0	0	0	0	0	none	
109	362423	4527548	CORA	none		0	D				ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	63		0	0	0	0	0	0	none	
110	360769	4532142	FEHA	feha		3	I	O	30	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	feha	act	0	0	0	0	0	0	0	none		1	feha	b	0	2	?	117-118	
111	359017	4532324	SR	prfa		0	I	CO/CB	25	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	prfa	act	prfa	act	prfa	act	0	0	0	0	0	0	0	114	prairie falcon	0	prfa	0	0	3	?	none	
112	359167	4532394	SR	none		1	DET	CB	10	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none		0	0	0	0	0	0	none	landslide took out nest
113	359281	4532405	LR	none		2	I	CB	5	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	116		0	0	0	0	0	0	none	landslide took out nest
114	359966	4528615	LR	none		2	I	CH	15	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	71	prairie falcon on ledge above nest	0	0	0	0	0	0	none	
115	359429	4528777	SR	none		0	D	CH	30	45	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	prfa	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none	nest not found; one adult stooped down fa	0	0	0	0	0	0	none	
117	357956	4528176	SR	cora		1	I	CH	40	45	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	cora	act	0	0	0	0	0	0	0	76		1	cora	i/b	0	0	0	none	
118	357655	4528240	SR	none		1	I	CH	60	65	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	77		0	0	0	0	0	0	none	
119	358871	4522762	SR	none		1	DET	CO/CB	10	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none		0	0	0	0	0	0	none	
120	359127	4523110	SR	prfa		1	I	CO/CB	10	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	prfa	act	unocc	inact	0	0	0	0	0	0	0	89		0	0	0	0	0	0	none	
121	359242	4522986	SR	none		1	I	CH	10	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	87-88		0	0	0	0	0	0	none	
122	358051	4519038	SR	prfa		0	I	CB	50	70	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	prfa	act	prfa	act	unocc	inact	0	0	0	0	0	0	0	91	lots snow on nest	0	0	0	0	0	0	none	
123	358046	4519072	SR	none		1	DET	CB	50	70	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	92		0	0	0	0	0	0	none	
124	337361	4536625	LR	none		2	D	CH	100+	200+	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	104		0	0	0	0	0	0	none	
125	335913	4536913	CORA	none		0	I	CH	20	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	95		0	0	0	0	0	0	none	
126	336077	4536876	CORA	none		0	I	CH	190+	200+	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	101		0	0	0	0	0	0	none	
127	379059	4528598	GOEA	none	4	3	I	CB	25	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	185		0	0	0	0	0	0	none	
128	381044	4529663	GOEA	none	5	3	I	CO/CB	15	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	goea	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	188		0	0	0	0	0	0	none	
129	377119	4529989	LR	prfa		2	I	CH	20	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	prfa	act	unocc	inact	0	0	0	0	0	0	0	184		1	cora	i/b	0	0	0	none	
131	375440	4530571	FEHA			3	I	O	10	10	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	204	two eagles seen flying in the vicinity, but nc	0	0	0	0	0	0	none	
132	382155	4532739	LR	none		3	I	CB/O	10	13	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	198		0	0	0	0	0	0	none	
133	365069	4534586	GOEA	none	9	3	DET	CB	40	45	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	118		0	0	0	0	0	0	none	
134	365414	4534955	CORA	prfa		0	I	CO/CB	10	25	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	prfa	act	unocc	inact	0	0	0	0	0	0	0	119-120	small pile of sticks above and left of nest, c	0	0	0	0	0	0	none	
138	360639	4532105	FEHA	none		3	I	O	40	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	115		0	0	0	0	0	0	none	
678	381001	4530123	GOEA	goea	5	3	I	CB	30	50	ns	ns	ns	ns	ns	ns	goea	act	unocc	inact	unocc	inact	unocc	inact	goea	act	1	goea	i/b	0	0	0	0	192-194		0	goea	0	0	2	9-10	78-81	
717	337098	4538598	GOEA	goea	10	3	I	CB	40	100	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	105-106		0	0	0	0	0	0	none	
721	362948	4542363	GOEA	goea	13	3	I	CB	20	100	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	111		0	0	0	0	0	0	none	
722	362918	4542098	GOEA	goea	13	3	I	CO/CB	40	80	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	goea	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	112		0	0	0	0	0	0	none	
723	362936	4541447	GOEA	none	13	3	I	CO/CB	80	90	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	113		0	0	0	0	0	0	none	
724	363196	4541278	GOEA	goea	13	3	DET	CB	150+	200+	ns	ns	ns	ns	ns	ns	unocc	inact	goea	act	unocc	inact	unocc	inact	unocc	inact	ns	ns	ns	ns	ns	ns	ns	none	not found first flight, but surveyed second	0	0	0	0	0	0	none	
731	378763	4538028	LR	none		3	I	CO/CB	30	40	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	203		0	0	0	0	0	0	none	
748	377760	4522341	GOEA	goea	7	3	I	CB	25	100+	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	goea	act	goea	inact	goea	act	0	0	0	0	0	0	0	206-208		0	0	0	0	2	8	127-131	
749	381681	4518756	FEHA	none		3	I	O	15	15	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	209-211		0	0	0	0	0	0	none	
750	381673	4518564	GOEA	none	7	3	I	CB	15	20	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	213		0	0	0	0	0	0	none	
751-A	381383	4518882	FEHA	none		3	I	O	10	10	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none	crashed, not rebuilt	0	0	0	0	0	0	none	
751-B	381383	4518882	FEHA	none		3	D				ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none		0	0	0	0	0	0	none	
757	371918	4509535	GOEA	none	15	3	I	O	8	8	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	goea	inact	unocc	inact	0	0	0	0	0	0	0	162		0	0	0	0	0	0	none	

763	364440	4500981	GOEA	none	17	3	I	CH	60	65	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	6		0	0	0	0	0	0	none	
764	367692	4507449	GOEA	goea	8	3	I	CB	20	40	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	goea	act	1	goea	i/b	0	0	0	0	144-145	saw 1 goea perched ~0.5 miles from nest	0	0	0	0	2	8-9	85-87	
767	351263	4506986	GOEA	goea	3	3	I	CO/CB	6	10	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	goea	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	44-45	small pile of sticks above and left of nest, c	0	0	0	0	0	0	none	
768	351422	4507982	GOEA	none	3	3	I	CO/CB	6	10	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	46		0	0	0	0	0	0	none	
769	351444	4508220	GOEA	none	3	3	I	CB/CH	10	14	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0		47		0	0	0	0	0	0	none	
770	339335	4507322	GOEA	none	11	3	I	CB	20	30	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	48-49		0	0	0	0	0	0	none	
774	335700	4518246	GOEA	none	12	2	I	CB	10	15	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	goea	inact	2	goea	F	0	0	0	0	53-54	one of the two goea has white dorsal wing	0	0	0	0	0	0	none	
776	339402	4517916	GOEA	none	12	3	I	CB	20	40	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	ns	ns	ns	ns	ns	ns	ns	none		0	0	0	0	0	0	none	
779	340693	4515110	GOEA	none	12	3	I	CB	25	30	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	prfa	act	unocc	inact	unocc	inact	0	0	0	0	0	0	0	59		0	0	0	0	0	0	none	
787	383933	4533959	GOEA	prfa	6	3	DET	CB	30	35	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	prfa	act	0	0	0	0	0	0	0	202		0	0	0	0	3	?	73-74	
804	359080	4515777	GOEA	none	21	3	I	CB	40	100+	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	33		0	0	0	0	0	0	none	
807	358794	4513060	GOEA	none	24	3	D	CB	30	45	ns	ns	ns	ns	ns	ns	unocc	inact	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none	fallen or missing	0	0	0	0	0	0	none	
809-A	358289	4510098	FEHA	none		3	I	O	20	20	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	19-20		0	0	0	0	0	0	none	
809-B	358289	4510098	FEHA	none		3	I	O	20	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	19-20		0	0	0	0	0	0	none	
817-A	362159	4510784	FEHA	none		3	I	O	20	20	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	140		1	feha	f	0	0	0	none	
817-B	362159	4510784	CORA	none		1	I	CO	20	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	140		0	0	0	0	0	0	none	
817-C	362272	4510794	FEHA	none		3	I	O	10	10	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	141		0	0	0	0	0	0	none	
834	384278	4518480	GOEA	none	7	3	I	CB	30	50	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	217-218		0	0	0	0	0	0	none	
11-A	358746	4522027	SR	prfa		1	I	CB	15	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	prfa	act	unocc	inact	prfa	act	0	0	0	0	0	0	0	none		1	prfa	f	0	3	?	99-105	
13-A	359610	4514144	GOEA	goea	24	3	I	CB	70	80	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	goea	act	0	0	0	0	0	0	0	none		0	0	0	0	2	8	92-95	
13-B	359611	4514144	GOEA	prfa	24	2	I	CO/CB	60	80	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	prfa	act	prfa	act	unocc	inact	0	0	0	0	0	0	0	none		0	0	0	0	0	0	none	
1-A	358685	4528618	GOEA	none	2	3	I	CB	60	100	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	73		0	0	0	0	0	0	none	
1-B	358664	4528603	GOEA	goea	2	3	I	CB	60	100	goea	act	unocc	inact	unocc	inact	goea	act	goea	act	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	74		0	0	0	0	0	0	none	
1-C	358673	4528610	GOEA	goea	2	3	I	CO/CB	40	100	unocc	inact	unocc	inact	goea	act	unocc	inact	unocc	inact	unocc	inact	unocc	inact	goea	act	0	0	0	0	0	0	0	75		0	0	0	0	2	3-4	111-116	
1-D	358800	4528735	GOEA	none	2	3	DET	CO	50	100	unocc	inact	goea	act	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	72		0	0	0	0	0	0	none	
2-A	362896	4528903	FEHA	feha		3	I	O	25	25	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	feha	act	feha	act	feha	act	0	0	0	0	0	0	0	70		1	feha	b	0	?	?	none	tated so did not stick around for count of young or photo
2-B	362780	4528974	FEHA	none		3	I	O	30	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	69		0	0	0	0	0	0	none	
2-C	362679	4529047	GOEA	none	19	3	I	CB	75	80	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	69		0	0	0	0	0	0	none	
2-D	362680	4529037	GOEA	none	19	3	I	CB	75	85	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	68		0	0	0	0	0	0	none	
2-E	362674	4529025	GOEA	none	19	3	I	CB	30	85	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	67		0	0	0	0	0	0	none	
2-F	362553	4529174	SR	prfa		1	I	CO/CB	25	30	ns	ns	ns	ns	ns	ns	ns	ns	prfa	act	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	66		0	0	0	0	0	0	none	
2-G	362521	4529248	SR	none		1	I	CB	80	80	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	66		0	0	0	0	0	0	none	
3-A	363527	4525360	GOEA	goea	19	3	I	CB	60	120+	goea	act	goea	act	unocc	inact	goea	act	goea	act	goea	inact	goea	inact	goea	act	1	goea	i/b	0	0	0	0	61-62		0	0	0	0	1	9-10	119-122	
3-B	363526	4525361	GOEA	none	19	1	I	CB	30	120	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	61-62		0	0	0	0	0	0	none	
4-A	369925	4524736	GOEA	goea	20	3	D	CB	70	100	ns	ns	unocc	inact	unocc	inact	unocc	inact	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	127-131		0	0	0	0	0	0	none	
4-B	369925	4524736	GOEA	goea	20	3	I	CB	20	100	ns	ns	goea	act	goea	act	goea	inact	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	127-131		0	0	0	0	0	0	none	
4-C	369925	4524736	GOEA	none	20	3	I	CB	40	100	ns	ns	unocc	inact	unocc	inact	unocc	inact	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	127-131		0	0	0	0	0	0	none	
4-D	369925	4524736	GOEA	goea	20	3	I	CB	50	100	ns	ns	unocc	inact	unocc	inact	unocc	inact	ns	ns	unocc	inact	unocc	inact	goea	act	1	goea	i/b	0	0	0	0	127-131		0	0	0	0	2	8-9	134-137	
4-E	369925	4524736	GOEA	none	20	3	I	CB	50	100	ns	ns	unocc	inact	unocc	inact	unocc	inact	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	127-131		0	0	0	0	0	0	none	
4-F	369962	4524486	GOEA	rtha	20	3	I	CB	30	130	ns	ns	unocc	inact	rtha	act	unocc	inact	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	127-131		0	0	0	0	0	0	none	
51-A	360802	4500628	GOEA	goea	18	3	DET	CB	20	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	goea	act	1	goea	p	0	0	0	0	7	1 adult perched ~200 feet west on top of rc	1	goea	f	0	1	9-10	82-84	
51-B	360802	4500634	GOEA	goea	18	3	I	CO	20	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	8		0	0	0	0	0	0	none	
5-A	359697	4516823	GOEA	goea	21	3	I	CB	40	100	goea	inact	unocc	inact	unocc	inact	goea	inact	goea	act	unocc	inact	unocc	inact	goea	act	1	goea	b/i	0	0	0	0	36-39		0	0	0	0	2	9-10	96-98	
5-B	359695	4516821	GOEA	goea	21	3	I	CB	40	100	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	goea	act	goea	act	unocc	inact	0	0	0	0	0	0	0	36-39		0	0	0	0	0	0	none	
5-C	359692	4516822	GOEA	none	21	2	I	CB	40	100	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	36-39		0	0	0	0	0	0	none	
60-A	339426	4518016	GOEA	goea	12	3	I	CB	40	60	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	goea	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	56		0	0	0	0	0	0	none	
60-B	339426	4518016	GOEA	none	12	1	I	CB	40	60	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	57-58		0	0	0	0	0	0	none	
718-A	336851	4538780	GOEA	none	10	3	I	CB	60	100+	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	107	only one nest found	0	0	0	0	0	0	none	
718-B	336854	4538783	GOEA	none	10	3	D	CB	60	100+	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	goea	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	none	nest not located in 2017; destroyed	0	0	0	0	0	0	none	
756-A	372607	4509981	GOEA	goea	15	3	I	CB/O	15	20	ns	ns	ns	ns	ns	ns	unocc	inact	goea	act	unocc	inact	unocc	inact	goea	act	1	goea	i/b	0	0	0	0	163-165		0	0	0	0	1	10	138-140	
756-B	372617	4510008	GOEA	none	15	3	I	CB/O	8	12	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	166		0	0	0	0	0	0	none	
761-A	364304	4501779	LR	none		2	I	CB	10	20	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	1		0	0	0	0	0	0	none	
761-B	364298	4501798	LR	none		2	D	CB	10	20	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	2	nest fell	0	0	0	0	0	0	none	
762-A	364278	4501105	GOEA	none	17	3	I	CB/CH	17	20	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	4-5		0	0	0	0	0	0	none	
762-B	364278	4501103	GOEA	goea	17	3	I	CB/CH	15	20	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	4-5		0	0	0	0	0	0	none	
771-A	338243	4506214	GOEA	none	11	3	I	CB	10	25	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	50-51		0	0	0	0	0	0	none	
771-B	338242	4506211	GOEA	goea	11	3	I	CB	14	25	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	50-51		0	0	0	0	0	0	none	
7-A	365360	4535276	GOEA	goea	9	3	I	CB	25	80	unocc	inact	unocc	inact	ns	ns	unocc	inact	goea	act	unocc	inact	unocc	inact	goea	inact	2	goea	i/b; f	0	0	0	0	125-126	one on nest; another flying nearby	0	0	0	0	0	0	none	
7-B	365379	4535289	GOEA	goea	9	3	I	CO/CB	30	50	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	goea	act	goea	act	unocc	inact	0	0	0	0	0	0	0	123-124		0	0	0	0	0	0	none	
7-C	365379	4535291	GOEA	none	9	2	I	CO/CB	15	50	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	125-126		0	0	0	0	0	0	none	
7-D	365319	4535232	GOEA	none	9	3	I	CO/CB	10	30	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	125-126		0	0	0	0	0	0	none	
821-A	367155	4518936	GOEA	none	16	3	I	CB	5	15	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	134		0	0	0	0	0	0	none	
821-B	367162	4518988	GOEA	goea	16	3	I	CB	2	15	ns	ns	ns	ns	ns	ns	unocc	inact	goea	act	unocc	inact	goea	act	unocc	inact	0	0	0	0	0	0	0	135		0	0	0	0	0	0	none	
8-A	356818	4524563	GOEA	goea	1	3	I	CO/CB	15	25	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	goea	act	1	goea	P	0	0	0	0	78-84	perched on topmost part of rock above ne	0	0	0	0	1	7-8	106-110	
8-B	356704	4524490	GOEA	goea	1	3	I	CO/CB	20	30	ns	ns	goea	inact	goea	inact	goea	inact	goea	inact	goea	act	goea	act	unocc	inact	0	0	0	0	0	0	0	85-86		0	0	0	0	0	0	none	
8-C	356691	4524471	GOEA	none	1	3	I	CB	15	30	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	unocc	inact	unocc	inact	0	0	0	0	0	0	0	85-86		0	0	0	0	0	0	none	
2016-1	358808	4509287	LR	none		3	I	O	30	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	0	0	0	0	0	0	0	15	El Aero WPT 138, new nest in 2016	0	0	0	0	0	0	none	
2016-2	383756	4532752	CORA	none		1	I	CB	5	10	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	0	0	0	0	0	0	0	199	El Aero WPT 139, new nest in 2016; looks ra	0	0	0	0	0	0	none	
2016-3	365465	4535204	LR	none		2	I	O	20	50	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	0	0	0	0	0	0	0	121	El Aero WPT 140, new nest in 2016	0	0	0	0	0	0	none	
2016-4	360912	4532148	FEHA	feha		3	I	O	5	5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	feha	act	unocc	inact	0	0	0	0	0	0	0	117	El Aero WPT 141, new nest in 2016	0	0	0	0	0	0	none	
2016-5	337274	4536713	GOEA	none	10	3	DET				ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	unocc	inact	0	0	0	0	0	0	0	102-103		0	0	0	0	0	0	none	
2017-1	364140	4501239	CORA	none		0	I	CH	15	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	3	looks ratty	1	cora	i/b	0	0	0	none	
2017-2A	359389	4509029	CORA	none		1	I	CH	10	12	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	16-18		0	0	0	0	0	0	none	
2017-2B	359389	4509029	FEHA	none		3	I	O	12	12	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	16-18		0	0	0	0	0	0	none	
2017-8	336826	4539888	SR	none		2	I	CH	50	80	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	108-110		0	0	0	0	0	0	none	
2017-9	365443	4535230	LR	none		3	I	CB	30	50	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	122		0	0	0	0	0	0	none	
2017-11	368038	4507719	GOEA	none	8	3	I	CB	10	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	142-143		0	0	0	0	0	0	none	
2017-15	376153	4512971	SR	none		1	I	CB	10	30	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	171-172		0	0	0	0	0	0	none	
2017-16	376701	4516151	LR	none			D				ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	177	fallen on ground	0	0	0	0	0	0	none	
2017-17	376812	4529800	LR	none		3	I	CB	40	50	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	182-183		0	0	0	0	0	0	none	
2017-18	380907	4529803	LR	none		3	I	CB	90	120	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	189-190		0	0	0	0	0	0	none	
2017-19	378791	4533134	SR	none		1	I	CB	60	90	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	196-197		0	0	0	0	0	0	none	
2017-20	383754	4532780	SR	none		2	I	CB	20	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	unocc	inact	0	0	0	0	0	0	0	198-201		0	0	0	0	0	0	none	

Table A-2 Summary of Nesting Data 2010 to 2017
Taken from Wildlife Resource Consultants *2017 Raptor Nesting Surveys and Golden Eagle Monitoring Report*
(Ns—Not Surveyed; Nd-- Not Determined)

	Year															
	2010		2011		2012		2013		2014		2015		2016		2017	
Territory (Nests)	Active	No. of Young	Active	No. Fledged	Active	No. of Young	Active	No. Fledged	Active	No. Fledged	Active	No. Fledged	Active	No. Fledged	Active	No. Fledged
North Cliffs (1-A, B, C, D)	yes	ND	yes	2	yes	ND	yes	1	yes	1	no	0	no	0	yes	1
East Kamma (3-A, B)	yes	1	yes	1	no	0	yes	1	yes	1	no	0	no	0	yes	1
Sawtooth Knob (4-A, B, C, D, E, F)	NS	NS	yes	1	yes	ND	no	0	no	0	no	0	no	0	yes	2
West Rosebud Canyon (5-A, B, C)	yes	ND	no	0	no	0	no	0	yes	0	yes	1	yes	2	yes	2
East Rosebud Canyon (6, 66, 68, 12, 13-A, B, 807)	yes	ND	yes	2	yes	ND	no	0	no	0	yes	1	yes	1	yes	2
Wood Canyon (7-A, B C, D)	no	0	no	0	no	0	no	0	yes	2	yes	1	yes	1	no	0
Silver Camel (8-A, B, C, 11)	NS	NS	no	0	no	0	no	0	no	0	yes	1	yes	1	yes	1
West Jungo Flats #1 (9, 128, 678)	NS	NS	yes	2	NS	NS	yes	1	no	0	yes	2	no	0	yes	2
West Jungo Flats #2 (10, 127, 98)	NS	NS	yes	1	NS	NS	no	0	no	0	no	0	no	0	yes	0.5
Rabbithole Creek (14, 15, 17, 63, 64)	NS	NS	yes	1	no	0	no	0	yes	2	no	0	yes	2	no	0
Cow Creek (53, 54)	NS	NS	no	0	NS	NS	NS	NS	NS	NS	yes	1	yes	2	no	0
Majuba Mountain (76, 77, 78)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	yes	2	no	0	yes	2
Antelope Range (79, 81, 756-A, B, 757)	NS	NS	no	0	NS	NS	no	0	yes	1	yes	1	no	0	yes	1
West Jackson Mountains (721, 722, 723, 724)	NS	NS	NS	NS	NS	NS	no	0	yes	1	yes	2	yes	0	no	0
Haystack Mine (88, 91-B, 748, 750, 834)	NS	NS	NS	NS	NS	NS	no	0	no	0	yes	2	yes	1	yes	2
South of Sawtooth (821-A, B, 101, 102)	NS	NS	no	0	NS	NS	no	0	yes	0	no	0	yes	2	yes	2
Black Rock Point (717, 718-A, B, 2016-5)	NS	NS	NS	NS	NS	NS	no	0	no	0	no	0	yes	1	no	0
Abel Camp Spring (762-A, B, 763)	NS	NS	no	0	NS	NS	no	0	no	0	no	0	yes	1	no	0
Rabbithole Peak (767, 768, 769)	NS	NS	no	0	NS	NS	no	0	no	0	no	0	yes	3	no	0
Sheep Spring (770, 771-A, B)	NS	NS	no	0	NS	NS	no	0	no	0	no	0	yes	0	no	0
Placerites (51-A, B)	NS	NS	no	0	NS	NS	NS	NS	NS	NS	no	0	yes	1	yes	1
Lava Beds Creek (59, 60-A, B, 774, 776, 779)	NS	NS	no	0	NS	NS	NS	NS	NS	NS	no	0	yes	2	no	0
Alkali Flats (787)	NS	NS	NS	NS	NS	NS	no	0	no	0	no	0	no	0	no	0
Moonshine Spring (75-A, 764, 2017-11)	NS	NS	NS	NS	NS	NS	no	0	no	0	no	0	no	0	yes	1
Total Active Territories	ND		ND		ND		ND		ND		10		15		14	
Total Occupied Territories	ND		ND		ND		ND		ND		13		22		17	
Successful Nests	ND		7		ND		3		6		10		13		14	
Total Fledged Young	ND		10		ND		3		8		14		20		20.5	
Nest Success (no. of successful nests/ no. occupied territories, %)	ND		ND		ND		ND		ND		76.92%		59.09%		82.35%	
Mean Brood Size (no. of young fledged/no. of successful nests)	ND		1.43		ND		1.00		1.33		1.40		1.54		1.46	
Productivity (no. of young fledged/no. of occupied territories)	ND		ND		ND		ND		ND		1.08		0.91		1.21	

[1] Flight conducted in late May, and therefore represents a reasonable estimate of number fledged.

[2] Number of young undetermined; this is a minimum estimate of fledglings.

[3] Only one flight was conducted this year; no estimate of early breeding area occupancy available.