FINAL SUMMARY REPORT
FOR GOLDEN EAGLE ACTIVITY ON AIR FORCE RANGES
IN THE WESTERN UNITED STATES

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ACRONYMS AND ABBREVIATIONS

%	percent
AF	Air Force
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AMEC	AMEC Environment & Infrastructure, Inc.
BRC	BioResource Consultants
cm	Centimeter
CTT	Cellular Transmitter Terminal
DNA	deoxyribonucleic acid
g	gram(s)
GIS	Geographic Information System
GPS	Global Positioning System
JBR	Juniper Butte Range
m	meter(s)
MAFR	Melrose Air Force Range
MHz	Megahertz
MOA	Military Operations Area
NDOW	Nevada Department of Wildlife
NSST	North Star Science and Technology
NTTR	Nevada Test and Training Range
PTT	Platform Transmitter Terminal
SCR	Saylor Creek Range
U.S.	United States
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UTTR	Utah Test and Training Range
VHF	Very High Frequency

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1.0 INTRODUCTION

This report provides a final summary of data collected during the two-year span of golden eagle studies at five United States (U.S.) Air Force (AF) ranges in the western U.S. AMEC Environment & Infrastructure, Inc. (AMEC) conducted this two-year study on behalf of the Air Force Civil Engineer Center (AFCEC) under contract to the U.S. Army Corps of Engineers (USACE). This work was conducted in accordance with the January 2013 *Technical and Management Work Plan* (Work Plan) prepared by AMEC, and this report fulfills a performance requirement (Data Analysis and Summary Report) under USACE contract W9126G-14-C-0034. The AMEC project team is defined in the Work Plan along with key team member roles and qualifications. Fieldwork, data collection, management, and data analysis for the project was carried out as a joint effort by staff identified in the Work Plan. Prior to initiation of field studies, the Work Plan was approved by each AF Base (AFB), AFCEC, and Brian Millsap of the U.S. Fish and Wildlife Service (USFWS). This report includes a summary and final data analysis for data collected by the combined project team from February 2013 through October 2014. All map figures referred to in this report are provided in Appendix A.

1.1 Study Need and Purpose

Golden eagle (*Aquila chrysaetos*) populations may be declining throughout much of their range. Habitat loss that results from a wide array of land use changes often conflicts with the ecological requirements necessary to support viable nesting populations. Recent studies in the intermountain west indicate steady declines in golden eagle numbers (Kochert and Steenhoff 2002, Hoffman and Smith 2003, Good et al. 2007). The cause of these declines is believed to be associated with habitat loss due to human activities that result in large-scale land/habitat conversions. These changes may eliminate nesting habitat, which often includes the availability of required prey resources needed to successfully fledge offspring. These changes may also result from subtle but significant levels of human activity and disturbance to eagles near nesting locations which, over time, cause nesting sites with long histories of use to become permanently abandoned even though the nesting substrate remains seemingly intact. Land use changes, including those related to drought cycles, may also negatively affect local eagle prey populations, thus disrupting longstanding eagle nesting in certain areas.

AF training ranges in the western U.S. may provide large areas of foraging habitat and important nesting sites for golden eagles. In order to comply with the Bald and Golden Eagle Protection Act as codified in 16 U.S.C. 668-668c[1], the AF seeks to collect field data on golden

[1] The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald or golden eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

For purposes of these guidelines, "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."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother

eagle activity on these ranges sufficient to develop site-specific conservation measures and guidelines for compliance. This requires collection and analysis of data on golden eagle populations on ranges by season, recording of nesting activity and nest productivity, and information on daily activities, especially habitat use and flight patterns, of golden eagles in the area of AF mission activities.

The AMEC team has completed two field study seasons per Work Plan objectives, the results of which are presented in this final summary report. This information can be used to develop reasonable and credible conservation measures for incorporation into the Integrated Natural Resources Management Plans for each AF installation. The final summary report also provides data and results suitable for developing a Golden Eagle Conservation Plan should an application for a take permit be necessary.

1.2 Study Location

Data is provided from field activities carried out at the following AF ranges: Nevada Test and Training Range (NTTR) and adjacent Military Operations Areas (MOAs), Utah Test and Training Range (UTTR), Juniper Butte Range (JBR), Saylor Creek Range (SCR), and Melrose Air Force Range (MAFR). The location of each of the ranges within the western U.S. is shown in Figure 1-1. The project study areas include each training range and its associated air space. Range boundaries and Restricted Air Space limits are shown on Figures 1-2a through 1-2d. AFBs associated with each range are identified and described below.

Mountain Home AFB, Idaho

- SCR is a 109,400-acre range located 12 miles southeast of Bruneau, in southeastern Idaho in the Bruneau Desert of Owyhee County. The range is east of the Bruneau River. SCR topography varies from flat and rolling buttes and ridgelines, with the dominant vegetation consisting of sagebrush.
- JBR is a 12,000-acre range located 37 miles southeast of Bruneau in the Inside Desert of Owyhee County, in the vicinity of Clover Creek, accessed by Clover-Three Creek Road. JBR topography varies from river gorges to open desert, with the vegetation consisting of sagebrush or riparian areas.

Nellis AFB, Nevada

- NTTR occupies 4,687-square miles (2.9 million acres) of southern Nevada and extends from south of Tonopah to about 40 miles north of Las Vegas, spanning Nye, Lincoln, and Clark counties.
- NTTR's North Range lies primarily within the Great Basin Desert, while the ecology of NTTR's South Range is more representative of the northern Mojave Desert.

Cannon AFB, New Mexico

an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

- MAFR is a 60,000-acre range located in eastern New Mexico, about 25 miles west of Cannon AFB outside of Clovis, in Curry and Roosevelt counties. The range is about 3 miles south of U.S. Route 84/60. Shortgrass prairie is the dominant plant community. The range is relatively flat with the exception of several drainages, small canyons, and a minor amount of topographic relief associated with an unnamed mesa.

Hill AFB, Utah

- UTTR North encompasses 370,000 acres and is located about 80 miles west of Salt Lake City, in western Utah, in Boxelder and Tooele counties. It is within habitats typical of the Great Salt Lake Desert bordered by the Great Salt Lake to the east, and is about 20 miles north of Interstate 80 (I-80).
- UTTR South encompasses 590,000 acres and is located about 80 miles west of Salt Lake City, in Tooele County, about 10 miles south of I-80 in the Great Salt Lake Desert.

1.3 Project Objectives

The project objectives below were presented by the AF in their Statement of Objectives dated August 1, 2012. Ongoing studies at each range and in their vicinities contribute to addressing these objectives, which are summarized below. The following objectives have been met for the 2013 and 2014 field seasons:

1. Acquired census data for JBR, SCR, MAFR, NTTR, and UTTR to estimate the population of golden eagles for wintering, migration, and nesting season for breeding and non-breeding golden eagles. To date, survey data has been completed to cover both of the two consecutive breeding and migratory seasons. Breeding season surveys were timed early enough to note courtship and nest defense behavior.
2. Acquired data on daily flight patterns and habitat use by golden eagles on selected AF ranges during 2013 and 2014. Geospatial data on flight patterns of golden eagles were being collected on AF ranges by area, time of day, and altitude that is sufficient to determine potential conflicts between golden eagles and military overflights and range use during 2013 and 2014. Diurnal flight patterns of golden eagles were evaluated at SCR, JBR, and UTTR and have been evaluated in areas adjacent to NTTR. Golden eagle territories and home ranges have been estimated using geospatial data on eagle locations and habitat use. Data were collected sufficient to establish baseline populations, risk analysis and characterization, and other essential information to develop a Golden Eagle Conservation Plan should an application for a take permit be necessary.
3. Golden eagle nest site locations and nest occupancy were documented for the 2013 and 2014 breeding seasons on JBR, SCR, MAFR, NTTR, and UTTR. Geospatial data is provided on these nest locations. Number of golden eagle progeny and fledgling success rate was recorded for both nesting seasons.

4. A preliminary evaluation of the golden eagle prey base for each range has been conducted based upon research literature, interviews with local wildlife biologists, and direct observations made during the study.
5. A complete Summary Report presenting all data collection protocols, statistical analysis methods, results, and conclusions of the 2013 and 2014 field studies is provided herein. The Summary Report includes an analysis of the potential for conflicts between military activities and golden eagles for each range studied. Additionally, the Summary Report includes suggested management guidelines and conservation measures that can be used at all military ranges in the western U.S. This report serves to fulfill this project objective.

2.0 METHODS

In order to best evaluate seasonal golden eagle populations and habitat use at each of the AF Ranges, we applied a multi-level approach to data acquisition and analysis. Our study comprised the following methodologies which are described in this section:

- Historical data acquisition and analysis
- Attachment of GPS transmitters to eagles and analysis of telemetry data
- Nesting season surveys for occupancy and productivity
- Prey item analysis
- Baited remote camera stations
- Roadside transect/point count surveys

2.1 Historical Data Acquisition

AMEC conducted a comprehensive historical nest site record search to collect and digitally compile historically known and recently found locations of golden eagle nests within, or close to, the ranges. Data from ongoing golden eagle studies or incidental observations from each range were gathered to focus our study approach and provide the study foundation. Kickoff meetings were held with Natural Resources Managers for each range in October and November 2012 to review existing data and ongoing golden eagle survey programs. Additionally AMEC completed a search of all publicly available databases and resource agency records, plus any available records from public or private sources including the results of more recent helicopter/ground surveys that were conducted in the region of each range. AMEC contacted a variety of reliable and knowledgeable sources for golden eagle nesting information including the USFWS, HawkWatch, and state wildlife agencies such as Nevada Department of Wildlife (NDOW). We acquired any available golden eagle nesting survey data developed as a result of any previous golden eagle surveys. These locations were entered into our central nest locations database using Microsoft Excel software. The individual nest location records were made as complete as possible in terms of attribute data, locations, years of occupancy, etc. with their coordinates uploaded into Global Positioning System (GPS) units for easy reference during subsequent field surveys. All of these locational and attribute data have been linked into a centralized Geographic Information System (GIS) database for spatial analyses and data presentation and mapping in this final Summary Report.

GIS analysis of the survey areas was completed to best identify suitable potential golden eagle nesting habitat on the ranges. This analysis enabled the team to narrow the geographical focus of the field and aerial surveys to what was determined to be known and/or suitable nesting habitat, thus focusing the level of effort. We applied a simplified species distribution model approach to the total study area. The GIS team analyzed three basic variables likely to support golden eagle nests:

- degree of slope

- topographical relief and effective height
- habitat type(s).

The resulting area was compared with favorable characteristics to all range areas. These data combined with a helicopter site reconnaissance of each range conducted between November 2012 and January 2013 helped determine how to best census the ranges for nesting golden eagles and identify where suitable winter foraging habitat was likely to occur. Portions of the study areas that are the subject of ongoing eagle nest surveys and monitoring under separate contracts were removed from our survey area during this exercise. The combined results of the 2013–2014 data collection are presented here in the final Summary Report.

2.2 Telemetry for Eagle Habitat Use, Activities, Movements, and Risk Analysis

Telemetry is the remote collection and transmission of data and, in this study, involves trapping and attaching transmitters to a mix of resident golden eagles, fledgling or sub-adult eagles, and wintering eagles. It offers the advantage of collecting an enormous amount of important and otherwise unobtainable data on golden eagle habitat use. These data include location, altitude, speed, and heading and are used to track flight patterns and regional movements. Habitat utilization or other ecological information can be inferred from this data, and should an eagle die, the remains can be recovered and examined for sources of mortality. Telemetry is the only way to accurately collect data on golden eagle daily flight patterns including geospatial data on eagle locations and habitat utilization. During development of the Work Plan, it was determined to be the most effective way to identify and analyze potential risks and conflicts with AF activities. Compared to conducting field surveys, telemetry is extremely cost effective in terms of the amount of data collected. Telemetry continuously provided data throughout the life of the project. The USFWS and local AF bases have assumed responsibility for collection of telemetry data beyond the duration of this contract.

2.2.1 Trapping Methods

Based on the review of existing data, site reconnaissance results, and base approvals, the focus of trapping and telemetry efforts in 2013 occurred at UTTR, SCR, and JBR. Trapping efforts in 2014 were focused at NTTR and additional priority areas at UTTR. Brian Latta and Gregg Doney of BioResource Consultants (BRC) led eagle trapping efforts. Mr. Latta and Mr. Doney obtained all necessary state and federal permits for eagle trapping and transmitter attachment prior to trapping efforts; all relevant permits are provided in Attachment B. Trapping of adults/subadults was conducted in late February/early March at the Utah and Idaho ranges just prior to the critical time when birds are on nests and winter weather conditions allowed. Additional adult/subadult trapping efforts were conducted in June once chicks were a minimum of three weeks old. On lands adjacent to NTTR, transmitters were placed on 7-8-week old chicks in May/June 2014 via nest climbs.

With the exception of chicks, trapping methods employed use of radio-controlled bownets. Radio-controlled bownets are used to selectively capture large raptors such as bald and golden eagles. The bownet used for this study is 1.9 meters in diameter and can be remotely triggered from a distance of up to 800 meters (Jackman et al. 1994). It is composed of a hinged hoop with a net stretched loosely across and secured around the perimeter of the hoop. The hoop has two components: the stationary frame and the bow. The stationary frame is comprised of a metal channel, 8 centimeters (cm) wide x 8 cm deep, in the shape of a semi-circle or arc. The arc is bridged by a tubular shaft that holds the springs that power the bow. A crosspiece from the center of the arc to the center of the tubular shaft adds rigidity. The bow is made of 1.6 cm in diameter aluminum tubing bent into an arc and padded with foam pipe insulation. The bow is hinged to the stationary frame and, when set, is folded along with the net back into the channel and secured with the trigger. The radio-controlled trigger consists of a model airplane or car radio-control system (transmitter, receiver, servo, and power source) modified to activate an archery release (trigger), which holds the bow in place until the trap is set off. The receiver, servo, power source, and archery release are mounted in a waterproof case and attached to the bow through a hole in the top of the arc of the channel.



Bownet in open position

The whole unit is then buried at ground level and camouflaged so that only the antenna wire from the trigger is above ground. Bait is then secured to the center of the tubular shaft. The trap is placed at a site frequented by the target bird in a relatively open area that can be viewed from above, usually a grassy slope. The trap is usually installed and set prior to dawn to prevent eagles from seeing the trap placement. Bait used for trapping golden eagles is either carrion (e.g., dead jackrabbit or deer leg) or live (domestic rabbit). Typically a domestic rabbit is used in this study. The trap is observed from a blind or a vehicle at a distance of 50 to 800 meters using a spotting scope. When the target bird is feeding on the bait and the researcher is certain that

the bird is centered in the trap, the bownet is triggered by toggling a lever on the transmitter. The transmitter sends a signal to the receiver that turns the servo, pulling the trigger on the archery release that releases the bow. When triggered, the bow pulls the net up and over the target bird, safely encircling it. The radio-control systems operate on radio frequency bands of 27 Megahertz (MHz), 72 MHz, and 2.4 gigahertz.



Bownet placed in open position with bait for trapping

In order to attach transmitter backpacks to nestling golden eagles, a two-man climbing team hikes to the top of the cliff directly above the subject eagle nest. The climbers rig a self-equalizing anchor system using one inch tubular nylon webbing and a combination of oval and locking carabiners, using standard rock-climbing methods of tying off to natural terrain features (i.e. boulders), using rock-climbing protection devices (e.g., pitons, chocks, camming-devices), or 24-inch steel construction stakes driven into the ground with a mallet. The self-equalizing anchor utilizes three or more anchor points and distributes the weight of the climber and ropes evenly, minimizing the strain on each anchor. Two 11-mm static climbing ropes are attached to the self-equalizing anchor. Depending on the height and topography of the cliff, these ropes are either long enough to reach the base of the cliff or long enough to reach just past the nest. A climber/biologist rappels down to the nest. The second climber monitors the anchor system in case the primary climber needs assistance. During the rappel the climber carefully cleans the route (removes loose rocks) so that the ropes will not dislodge any rocks during the ascent from the nest. A second two-man team vocally directs the climber to the nest from below and stands by in case a chick were to fledge prematurely in which case they could retrieve it. Once at the nest, the climber secures the chick(s) by wrapping their feet in Vetwrap and placing them in a

padded, ventilated duffel bag. They then either rappels to the bottom of the cliff or ascends the ropes using mechanical ascenders with the chicks. Once the climber is safely off-rope measurements and blood and feather samples are taken from the chick(s) and the transmitter backpack attached as described below. The climber then re-accesses the nest and returns the chicks. The climber then leaves the nest, and the climbing team will pulls up the ropes, dismantles the anchor system, and hikes back to the vehicles.



Biologist repelling into nest to retrieve chick for transmitter attachment

2.2.2 Handling and Transmitter Attachment

The methods described below were used to handle captured eagles and outfit them with transmitter units. Given that the capture offers a rare opportunity to collect individual data, standard measurements and blood samples for pesticide and deoxyribonucleic acid (DNA) analysis were also taken from each bird. Eagles were also banded according to U.S. Geological Survey (USGS) Bird Banding Lab protocols.

2.2.2.1 Securing

1. **Hoods:** The most important stimulus to raptors is visual. When handling raptors (except young nestlings) standard falconry hoods are used to keep them calm. The hood is placed on the bird immediately after capture and remains on until release. This reduces the stress to the bird and is safer for the biologists.



Hooded eagle fitted with CTT transmitter

2. **Securing feet:**
   a. Vetwrap – An eagle can typically exert 25,000-psi pressure at the tip of its talons. For this reason, eagles' feet are restrained once captured to protect both the bird and biologists. Vetwrap, a commercially available self-adhering elastic bandaging tape, is wrapped around each closed foot (4–6 wraps) to secure the talons.

   b. Booties: The strength of a nestling eagle is not fully developed and simple booties made from small fleece drawstring bags are used to secure them.

3. **Restraining devices:**
   a. Aba – Is a cloth jacket which is fitted over the wrists and back of a bird and is secured with a few wraps of elastic around the ankles, which has been used in Arabia for hundreds of years. This immobilizes the wings and feet but allows the breast to remain uncovered. It can also be arranged so that one wing can be extended for blood taking while the other wing and feet remain secured. The aba allows one person to safely handle a raptor (see Maechtle 1998).

   b. Triangular bandage – A standard triangular bandage is used to restrain eagles for weighing by placing it over the back of the bird, bringing the long ends around the wings and tying over the bird's breast. The loose ends of the knot are then tied around the bird's ankles.

c. Toddler T-shirt – A toddler-sized T-shirt is sometimes used if it is necessary to immobilize an eagle for longer periods (>30 minutes). It is slipped over the bird's hooded head and stretches to enclose the wings and body.

2.2.2.2 Banding

If not already banded, USFWS bands were placed on the bird's leg above the foot. These are aluminum bird bands issued by the USGS Bird Banding Lab (see *USGS Federal Bird Banding Manual*). Bands have a numeric code and are sized to fit golden eagles.

2.2.2.3 Measurements

Birds were weighed with a metric spring scale while hooded and in a restraint device. Standard morphological characteristics including wing chord, tail length, beak, and talons were measured using a metric tape measure and calipers. Measurements, molt characteristics, and plumage were recorded and used to age and sex individuals whenever possible. A photographic record was kept for each bird transmittered and banded.



Taking measurements from Pahroc nestling in Nevada

2.2.2.4 Blood Samples for Pesticide and DNA Analysis

See Redig in Cade et al. (1996), *Guide to Management of Peregrine Falcons at the Eyrie*, for standard blood sample collection methods. Details regarding blood draw procedures can be found in the project Work Plan (AMEC 2013).

2.2.2.5 Transmitter Attachment

GPS satellite transmitters weighing less than 2 percent (%)–3% of the eagle's total body weight (Bird Banding Lab Standard) were attached for this study; the two types of transmitters weigh 55 grams (g) and 65 g. To accommodate these larger transmitters with their multi-year lifespan, a backpack mount was used. All attachments are designed to allow the transmitter to fall off in due course. All transmitter-equipped eagles will be monitored for the duration of attachment.



Eagle fitted with PTT transmitter

Transmitters were attached as follows: two lengths of Teflon ribbon are threaded through channels in the top and bottom of the transmitter and knotted to prevent slippage. This creates four straps. The transmitter is centered on the bird's back, 1 cm below the lowest cervical vertebrae. The two top straps are brought over the shoulders on either side of the neck until they cross over the breast. The lower straps are passed along the body under the wing and above the leg. All four straps are gathered at a point where they cross just below the top of the keel so they lie flat against the breast and are clamped in place with a pair of hemostats. The straps are adjusted until the proper fit is achieved (the transmitter is centered over the spine, the anterior end is just below the neck, and there is approximately 3.5 cm–5.0 cm of space is approximately 3.5 cm–5.0 cm of space between the back of the bird and the bottom of the transmitter when it is pulled strongly away from the bird's back). The straps are then secured with stitches of waxed cotton embroidery thread tied with square knots. Each stitch passes through all four straps where they overlap. The strap ends are then trimmed and the edges sealed with "Fray Check" to prevent unraveling. The backpacks are attached with enough slack to allow freedom of movement and growth while not allowing the transmitter to be flipped over. The stitches will deteriorate over time and allow the transmitter to fall off. The number of stitches determines how long the bird will wear the transmitter, approximately one year per stitch, in moist climates, two or more years per stitch in drier climates. Four stitches were used in this study.

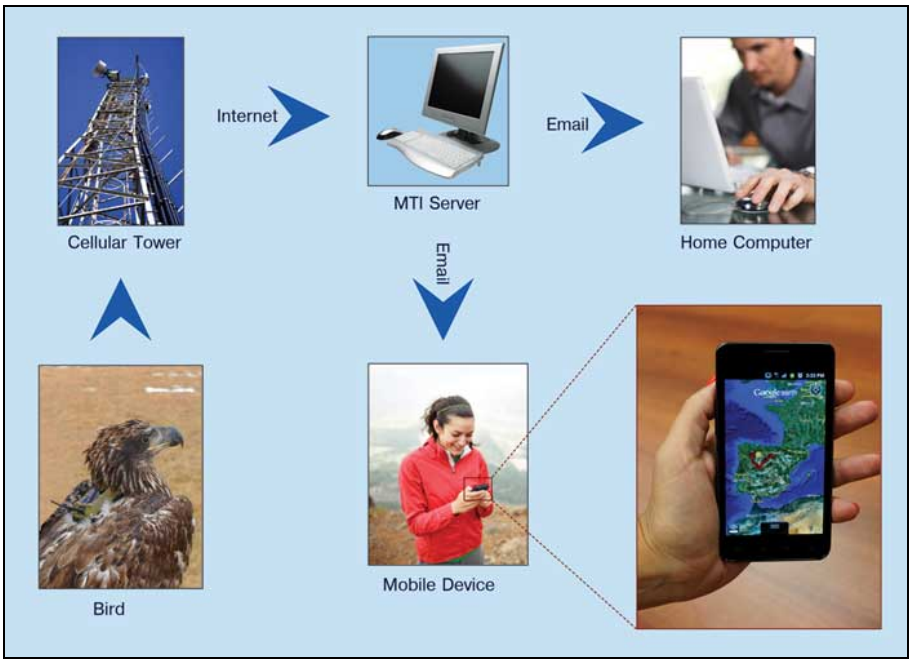


Completed stitching of transmitter backpack straps and sealing with "Fray Check"

2.2.3 Transmitter Systems

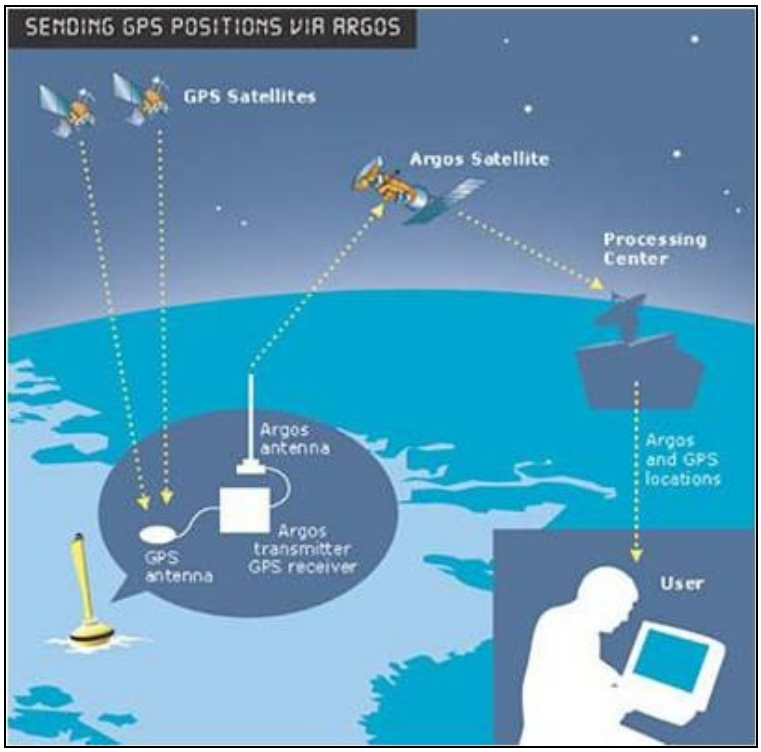
Two types of transmitters were used for this study. For locations where AT&T cell coverage is available and eagle flights may at least sporadically fall within range of cellular telephone towers, Cellular Transmitter Terminals (CTTs) were used as approved by range operations, while in more remote locations with no adequate cellular telephone coverage, Platform Transmitter Terminals (PTTs) were used. These are described in more detail below. Detailed manufacturer specifications were provided in the Work Plan (AMEC 2013).

CTTs communicate with researchers via Global System for Mobile cellular towers. We acquired and deployed five CTTs (three in Idaho and two in Utah) made by North Star Science and Technology (NSST). They are equipped with a GPS engine that takes precise locations on a programmed schedule. Each time they acquire a location they then attempt to contact a cellular tower and transmit that location to NSST's web portal. If unsuccessful, that location is archived for transmittal the next time a connection is made. A successful connection transmits the current location plus as many as 49 archived locations, beginning with the oldest. When locations are received by the web portal they are immediately available. Each location is time-stamped and also provides the number of satellites used to determine that location, the battery's voltage, and the altitude, speed, and heading of the CTT. Communication between the web portal and CTT is two-way during connection with cellular towers, so each CTT's duty cycle can be reprogrammed by requesting changes on the web portal. Locations may be viewed in Google Earth on the portal and downloaded in comma separated value format. The CTTs deployed are powered by solar panel, weigh ~55 g and transmit to cell towers with 1–2 watts of power at 850, 900, 1800, and 1900 MHz. They have battery-powered very high frequency (VHF) transmitters weighing 3.6 g attached to aid in recovery of downed subjects for the following ~441 days after deployment.



CTT data collection and transmission

Platform Transmitter Terminals communicate with the Argos satellite system. Argos is a cooperative among the Centre National d'Etudes Spatiales (France), the National Aeronautics and Space Administration (U.S.), and the National Oceanic and Atmospheric Administration (U.S.). Administered in the U.S. by CLS America, Argos allows researchers to remotely track natural resources anywhere in the world. All PTTs transmit at ~401.65 MHz with a unique ID and under a duty cycle set by the researcher and implemented during manufacture. During "on" periods the PTT broadcasts its transmissions to any Argos satellite in view. CLS America estimates PTT locations using the principles of Doppler Shift in signal frequency as received by its satellite. They calculate the distribution within which the estimate lies; the standard deviation of this distribution estimates the accuracy of the location, and it is placed in a location class. Class 3 locations are considered the most accurate, and are estimated at better than 150 meters (m) on both axes, with a 250 m radius. Doppler PTTs as described generate only location estimates. GPS PTTs generate those same location estimates, but also have an incorporated GPS engine and transmit to Argos satellites the actual GPS locations taken in accordance with their programming. We fielded six total GPS PTTs in Utah and five in Nevada. They are solar powered, weigh ~65 g, transmit to Argos satellites eight of each 45 hours at ~225 megawatts (mW), are programmed to acquire 12 GPS locations daily, and have battery powered VHF transmitters weighing 3.6 g attached to aid in recovery of downed subjects for the following ~441 days after deployment. We downloaded data from CLS America each week and processed files to derive and assess location and sensor values. In addition to location estimates and GPS locations, data from PTTs include battery voltage and activity values that should increment as a viable subject moves, as well as temperature and altitude.



PTT data collection and transmission

Battery-powered VHF transmitters incorporated in CTT and PTT packages are easily tracked by receiver and directional antenna from the ground and by air. To arrive at frequencies to deploy in the field, we queried state, federal, AFB, and non-governmental organization researchers in Idaho, Utah, Nevada, and New Mexico. The frequencies between 149.940 and 150.999 MHz were approved by state and federal officials in Idaho, Utah, and New Mexico. We obtained lists of exact frequencies in use and arrived at those that would not conflict. CTT and PTT units were ordered with the appropriate VHF frequencies. NTTR limited the VHF frequency to 237 MHz to avoid potential conflict with range operations. Thus, PTTs and VHF units were ordered to accommodate that requirement for use in Nevada.

2.2.4 Telemetry Data Analysis

GPS locations and associated attributes such as time, date, heading, and altitude for each bird's PTT or CTT were downloaded from the Argos system and North Star Portal. Argos data was converted to a usable format for GIS and all data points were reviewed to remove erroneous outliers. Telemetry locations for each bird were plotted in ArcGIS and home ranges were analyzed using the Kernel Density Estimate tool (Silverman 1986, Wand & Jones 1995). Since locations were recorded at set diurnal intervals of up to 12 per day, every single movement for each bird is not tracked. In addition, GPS locations could not be recorded on some days or for periods of time due to perching out of view of GPS satellites or low battery voltage that may have been the result of perch locations, weather conditions, or feather coverage. Thus, the Kernel Density statistical application was used to derive home range probability maps from the recorded telemetry locations. Utilization contours which represent the odds of re-locating the bird within that area were created based on the analysis. The 95% Home Range corresponds to the area in which the probability to find (relocate) the animal is equal to 0.95. The 50% Core Range is the area with a 0.50 relocation probability. The Core Range is always smaller than the 95% Home Range. All available altitude data was plotted for each bird over time to generate a scatter chart in Microsoft Excel. Altitude measurements indicate the height (in feet) of the bird above the surface of the earth at their recorded GPS location. The GPS engine in the transmitters utilizes a mathematical model which roughly approximates the geodetic model of the earth at that location and references the bird's altitude to this model.

2.3 Nesting Surveys

Aerial and ground surveys were conducted following established eagle survey protocols (Pagel et al. 2010, Driscoll 2010, USFWS 2011).

2.3.1 Aerial Surveys

Helicopter surveys are the preferred technique for locating golden eagle nests and determining their annual occupancy when large areas of difficult terrain must be covered. Surveys were conducted following procedures for aerial surveys outlined in the *Interim Golden Eagle Inventory and Monitoring Protocols* issued by USFWS (Pagel et al. 2010) and recent *Draft Eagle Conservation Plan Guidelines* (USFWS 2011).

Golden eagle nest surveys consisted of visually inspecting all suitable cliff faces, other vertical or nearly vertical substrates, and some types of trees, for the presence of stick nests and nesting eagles. All medium- to large-sized nest locations were recorded using a hand-held GPS. The nests were photographed and data were collected in a field notebook and transferred to data sheets. The accuracy of the sex/age class determinations of each observed eagle was based on the field experience of the observers. Only experienced and highly qualified observers conducted the surveys. The route typically included all canyons, drainages, and forested slopes within the study area. Two biologists (a primary and secondary surveyor) sitting on opposite sides of the helicopter conducted each survey.

Each canyon or cliff face was flown up-gradient and then down to view all cliffs and trees from the primary surveyor's side of the aircraft. Contouring passes were made at different elevations to fully cover tall cliffs and long, steep slopes. In areas of mild slopes and flatlands with numerous trees suitable for nesting, a grid pattern was often flown with 500 meters separating flight lines. Two or more passes were performed at slower speeds at cliffs that had large nests, copious whitewash, or that were otherwise suspected of having nests, to allow closer observation, marking, photography, and documentation of nest conditions, presence of nestlings and adult birds. Average speed during cliff observation flights was approximately 10 to 20 miles per hour. Distance from the helicopter to the various potential nesting structures ranged from 20 m–200 m. In addition to cliffs, canyons, and trees in the flight survey area, any transmission lines traversing the survey areas were surveyed.

Prior to the start of the 2013 breeding season, a winter reconnaissance helicopter survey was conducted to search for suitable habitat and potential nests for previously un-surveyed areas on MAFR, SCR, and JBR. The UTTR reconnaissance had to be cancelled due to weather conditions (heavy fog) which grounded the helicopter. Helicopter nest surveys were completed between March 16 and May 29, 2013; and March 22 and May 17, 2014. Specific dates of these surveys are provided in Table 2-1. After initial nesting surveys were completed, these were followed up with either aerial or ground surveys to determine fledgling success rates.

Table 2-1.
Summary of Aerial Survey Days

Location	Winter Reconnaissance 2012/2013	2013 Nest Surveys	2014 Nest Surveys
SCR and JBR	December 21 & 22, 2012	March 16, 2013	March 22, 2014 May 17, 2014 (productivity)
UTTR	Scheduled January 22 & 24, 2013 – Flights were not feasible due to weather conditions	March 18 & 19, 2013 (1/2 of area completed) May 24–27, 2013 (completed survey of Restricted Airspace)	April 7-9, 2014 (completed aerial survey of ranges and RA)
MAFR	January 26, 2013	March 30, 2013 (surveys completed)	None
NTTR	November 11 & 12, 2012	May 29, 2013 (MOA to recon potential nests for trapping)	None

Aerial nest surveys were completed for the 2013 and 2014 nesting season by qualified raptor biologists Brian Latta and Mike Yates of BRC. These surveys were conducted within suitable nest habitat at UTTR, SCR, JBR, MAFR, and associated Restricted Airspace where existing nest information or on-going programs was lacking. Portions of the suitable habitat on UTTR were excluded from the aerial survey area as active nests had been documented as recently as 2012 and were monitored from the ground by Select Engineering Services in 2013 and by UTTR biologists in 2014. In addition, ongoing eagle nest surveys and migratory studies are being conducted by other contractors at Dugway and by Hawkwatch within the UTTR Restricted Airspace beyond the military ranges. The areas that are adequately covered to meet study objectives under this contract were excluded to avoid duplicating efforts, and the remaining study area was surveyed by the AMEC team for the 2013 and 2014 field seasons. Excluded areas include mountain ranges within the southeastern portion of the Restricted Airspace and are shown on the nest survey maps in Section 3. Dugway and Hawkwatch nest survey data was not made available for inclusion in this report. Access approvals to fly over UTTR and the associated restricted airspace limited the survey timeframes in 2013, thus portions of the study area could only be covered during the late spring survey for that year (May 24–27, 2013). A full survey of the UTTR and restricted airspace aerial study area was completed in April 2014.

NTTR has an ongoing aerial survey program for the entire range under separate contract that was continued through 2013 and 2014. The results of these surveys are included herein. A portion of the MOA was surveyed in 2013 via helicopter in order to identify active nest sites and potential birds for trapping. The extent of the survey area was limited to the eastern portions of the MOA based on NTTR operation approvals.

The entirety of the MAFR, JBR, and SCR, as well as the associated Restricted Airspace, was surveyed via helicopter in 2013 as a full nest survey had not been previously conducted for these ranges according to USFWS protocols. Based on a lack of nest suitable habitat and absence of golden eagle nesting territories, it was determined that aerial nest surveys were not warranted for MAFR in 2014. A full aerial nest survey of SCR and JBR was conducted in 2014.

2.3.2 Ground-Based Surveys

In some instances, follow-up ground surveys for golden eagle occupancy/productivity were more appropriate than conducting addition aerial surveys. Ground surveys were conducted either on foot, using all-terrain vehicles, or using other suitable off-road vehicles or some combination of these methods. For safety reasons, field surveyors surveyed remote areas as two-person teams. They were sent to pre-determined locations to search any landscape features where golden eagle nesting was expected or known to occur based on previous survey efforts. The observers were all experienced with identifying golden eagles and their nesting behaviors. They were assisted by the use of binoculars (10x–12x) and spotting scopes (70 millimeter, 20x–60x). Free-flying eagles were aged according to Bloom and Clark (2002). Nestling eaglets were aged according to Hoechlin (1976). Following aerial nest surveys, 11 days of follow-up ground surveys were completed in 2013 within the SCR and JBR focusing on previously documented nest sites. These surveys were completed on May 24, 26-30, and June 1-4, 6, 2013. Ground-based nest productivity surveys were completed in June 2014 for

UTTR. No ground- based surveys occurred at SCR/JBR in 2014 as productivity surveys were conducted in mid-May via helicopter.

2.3.3 Occupancy and Productivity

Occupancy was defined by the number of golden eagle pairs holding territories throughout the breeding season, whether or not they attempted to breed in a given year. Occupancy was determined by observation of eagle pairs performing courtship activities (e.g., undulating flight displays, nest building, and copulation) prior to egg-laying (late December to mid-March). By having two biologists observe together or from separate observation points while maintaining communications with handheld radios, it was possible to follow both members of a pair of eagles and or any additional eagles in the area (sub-adults, intruding adults, and neighboring pair members). While occupancy is best determined by ground observations, we attempted to determine occupancy during aerial surveys in parts of the study area where ground access was limited by determining whether new material had been added to existing nests or by observation of resident pairs if egg-laying had not occurred within a given territory.

Productivity is the number of young produced per occupied territory. Productivity data was collected either by helicopter or by ground survey teams. The preferred method for second visits to nesting locations was determined based on logistical considerations and cost effectiveness of each optional method.

2.4 Prey Analysis

Observations of the available golden eagle prey base (e.g., lagomorphs and rodents) were recorded incidentally during ground surveys. In addition, at the end of the 2013 nesting season, a team of two biologists examined the prey contents at a representative sample of active nest sites on UTTR and SCR. This was conducted by climbing into the nest after young fledged and collecting all prey remains. Nest climbs occurred in August 2013 at five nest sites on UTTR (Figure 2-1) and one nest site on SCR/JBR (Figure 2-2). Prey remains were sorted and identified by Dr. Paul Collins, Santa Barbara Museum of Natural History. No nest climbs occurred in 2014 for purposes of prey analysis.



Prey remains collected at nest site

2.5 Bait Stations

A variety of raptors, including golden eagles, are likely to spend all or some of their non-breeding seasons (fall and winter) on the ranges being studied. Systematic ground surveys/point-counts to document and quantify golden eagle and other diurnal raptor use of each range were not feasible due to access restrictions on ranges such as NTTR and UTTR South. Standardized raptor surveys were conducted in the vicinity or in overlapping study areas for all ranges with the exception of MAFR[2].

To augment population data being collected by other parties, bait stations were included in this study. Bait stations were set in an open area and a carcass (e.g., road-killed deer, antelope, elk, or livestock) was laid out for eagles to feed upon. Stations were generally located in areas such as open grassy slopes where eagles were likely to be comfortable landing on the ground. Remote cameras with motion sensors were installed to record images of animals coming to feed on carcasses. Periodically, a biological technician put out a new carcass and exchanged the camera chip on which the images are stored for a new one. This was typically done every 3 to 4 weeks based on persistence of the carcasses and to avoid habituating animals to sites. A detailed bait station setup and monitoring protocol developed for NTTR is attached as Appendix C. Permits from state wildlife agencies were obtained for roadkill carcass collection (Appendix B). Where feasible, contact was made with local ranchers to procure dead livestock.

[2] *Cannon AFB could not allow us to install active carcass stations at the MAFR during the week when training operations are on-going due to concerns about collisions between aircraft and eagles. The mobilization/demobilization would be substantial to deploy stations each weekend and this would not result in a worthwhile level of sampling effort. Therefore we were unable to set up bait stations within MAFR.*

In total, 14 bait stations with remote cameras were set up in strategic locations at UTTR, SCR/ JBR, and NTTR by our biologists. Data was collected for the 2013 and 2014 field seasons. Specific bait station locations are shown on Figure 2-3 (UTTR), Figure 2-4 (SCR/JBR), and Figure 2-5 (NTTR).

All photos from each camera station were reviewed by a biologist after collection of the camera chip. Species captured by the camera were identified and the number of presumed individuals recorded based on time gaps as recorded for each photo. Several consecutive photos within a short period of time were assumed to represent the same individuals continuously setting off the camera. Time gaps were estimated based on perceived time of day in the photographs. All photos from NTTR were previewed by operations staff before they were released to AMEC.

2.6 Point Counts

Since base restrictions did not allow for the establishment of bait stations at MAFR, a roadside survey route was developed covering the range and Restricted Airspace as an alternative. A total of 25-point count locations along this route were established in consultation with Cannon AFB natural resources staff (Figure 2-6). Point count locations are surveyed monthly by biologist George Britt, allowing us to gather seasonal data regarding golden eagle use of the site in a systematic way. The surrounding areas of each point count location were scanned for 10 to 30 minutes with the aid of binoculars and/or spotting scopes. Data on any raptors observed was recorded on standardized field datasheets.

Road transect surveys for raptors on MAFR began in August 2013 to capture the start of the non-breeding season and were initially conducted every two weeks. As a result of limited data from the two-week time protocol, surveys were changed to once a month. Each transect was driven by car for maximum coverage and efficiency. Transect areas were organized into four different routes/areas that were labeled A, B, C and D. These routes averaged 20 miles in length. Each transect area and had 6-7 point count stations labeled A1, A2, and so forth for stationary observations. Surveys were conducted during daylight hours between 0800 and 1800, and on days of forecasted clement weather. Transects were rotated so that the first survey session started with Transect A, followed by B, C and D in order. The fifth survey session started at Transect A through D again, but from the opposite end. Transects were driven at approximately 15-20 miles per hour, while continuously searching for raptors. Point count stops were limited to 5 minutes, with the observer in a location that gives 360 degree views. When a raptor was sighted, the vehicle was stopped and observers recorded data. Data records included the following: location of observer by GPS or station number; species; distance and direction to bird from observer; number of individuals; flight direction and height; bird behavior and notes of interest. Survey tracks were recorded by handheld GPS units. Road transect surveys were concluded in April 2014. At this point, birds were breeding in suitable areas off site and no longer likely to migrate through the area. Thus, further surveys were not likely to yield data on golden eagles.

3.0 RESULTS

With the exception of the transmitter summary below, study results are discussed in this section by individual range.

3.1 Summary of Transmitters Deployed

3.1.1 Transmitters Deployed in 2013

A total of eight transmitters were deployed in 2013 (four PTTs and four CTTs) on golden eagles captured at UTTR and SCR. Capture dates, location, and other details for each bird are provided below in Table 3-1 and shown on Figure 3-1 (UTTR) and Figure 3-2 (SCR/JBR). Capture forms are provided in Appendix D and photos are provided in Appendix E and Appendix F. As described in more detail below, trapping (and associated deployment of transmitters) in the NTTR MOA was unsuccessful in the fall of 2013. Trapping at MAFR was attempted but was also unsuccessful as only wintering birds were present on site due to a lack of suitable nest habitat.

Table 3-1.
Summary of Transmitters Deployed on Golden Eagles in 2013

	Capture Date	Breeding Area	GOEA ID	UTM	Sex	Transmitter	VHF Frequency	USFWS Band #
UTTR	22-Feb-13	Charlie	UTTR-AM01	12T 0328008, 455168	M	CTT QJ5U4P	150.3507	0679-04940
	25-Feb-13	Cathedral	UTTR-AM02	12T 0337020, 4558615	M	PTT 126218	150.152	0629-42959
	27-Feb-13	Bravo	UTTR-AM03	12T 322518, 4539335	M	PTT 126221	150.89	0679-04946
	15-Jun-13	West Knoll	N/A	12T 0337510, 4542611	M	PTT126220	150.253	0679-04954
	22-Jun-13	Gold Hill	N/A	12T 0262332, 4452409	F	PTT126222	150.91	0679-04957
SCR/JBR	26-Feb-13	Bruneau Plain	ID-AF01	11T 608765, 4728208	F	CTT9SZKXO	0.102	0679-04956
	27-Feb-13	Bruneau Canyon	ID-AF02	11T 608765, 4728208	F	CTT T5QIQX	149.9705	0679-04958
	3-Mar-13	Browns Cyn-Saylor Creek	ID-AM01	11T 614452, 4740436	M	CTT IGHWDM	150.301	0679-04959

3.1.2 Transmitters Deployed on Adults in 2014

A total of three transmitters were deployed in 2014 (two PTTs and one CTTs) on adult golden eagles captured by bownet at UTTR. Capture dates, location, and other details for each bird are provided below in Table 3-2 and shown on Figure 3-1 (UTTR). A reconnaissance of potential trap sites at NTTR was conducted in early February 2014 with range operations; however access to NTTR for trapping of adult birds was not possible before the nest sites were at a

stage where it would have been a potential risk to the survival of the eggs or chicks. Therefore, additional trapping efforts were focused at UTTR until May when chicks would be 3-6 weeks old at NTTR.

Two additional birds associated with high priority nest territories given their proximity to UTTR operations were captured and outfitted with a PTT (Grassy Mountain) and CTT (Clive Skull) transmitter in February 2014. Given the proximity of the Clive Skull nest territory to I-80 and the presence of adequate cell coverage, a CTT that downloads data to the NSST web portal could be used for better accessibility by the AF. The original PTT transmitter deployed on the West Knoll bird in June 2013 (PTT 126220) stopped transmitting data in October 2013. Visual sightings confirmed that the bird was still alive and he was therefore recaptured in February 2014 and outfitted with a new transmitter (PTT 126219). Capture forms for 2014 birds are provided in Appendix D and photos are provided in Appendix F.

A trapping effort was approved and conducted on the ECS range of NTTR for adult eagles May 12-13, 2014. This effort was conducted in an area several miles from active nest sites and was not successful. More optimal adult trapping locations could not be approved by NTTR. Trapping and associated deployment of transmitters for SCR/JBR in 2013 exceeded the target number of captures, and therefore was not attempted in 2014.

Table 3-2.
Summary of Transmitters Deployed on Adult Golden Eagles in 2014

	Capture Date	Breeding Area	GOEA ID	UTM	Sex	Transmitter	VHF Frequency	USFWS Band #
UTTR	21-Feb-14	Clive Skull	UTTR-AF02	12T 0318696, 4499591	F	CTT 3BCEHC	150.030	0679-04981
	24-Feb-14	West Knoll	UTTR-AM04	12T 0337111, 4543652	M	PTT 126219-GD-087	149.940	0679-04954-PREV
	24-Feb-14	Grassy Mtn.	UTTR-AM05	12T 0329129, 4525134	M	PTT 126223-GD-091	150.202	0629-49203

3.1.3 Transmitters Deployed on Nestlings in 2014

The option of conducting nest climbs within range boundaries for transmitter attachment to chicks could not be approved by NTTR. In late May 2014, meetings occurred with other parties (USGS, USFWS, Beatty mine) conducting eagle survey work on lands adjacent to NTTR (including the MOA) to evaluate options for transmitter attachment on eaglets at the appropriate age (6-8 weeks). These parties were amenable and granted access to nest sites. A total of five PTT transmitters were deployed in 2014 on golden eagle nestlings captured during nest climbs on lands in the vicinity of NTTR. These nest locations were within the NTTR MOA adjacent to the western (near Beatty) and eastern (near Alamo) boundaries of NTTR. Transmitters allocated for NTTR were attached to a total of five 6-8 week old golden eagle chicks, male and female, from nest sites located in the Beatty Wash and North Pahroc Range. Helicopter flights of the NTTR MOA were flown to locate additional chicks for transmitter attachment. All other chicks found were greater than 8 weeks old and could not be handled at that stage in development.

Capture dates, location, and other details for each bird are provided below in Table 3-3 and shown on Figure 3-3 (NTTR). Capture forms are provided in Appendix C for the Beatty Wash captures and photos are provided in Appendix F.

Table 3-3.
Summary of Transmitters Deployed on Nestling Golden Eagles in 2014

	Capture Date	Breeding Area	GOEA ID	UTM	Sex	Transmitter	VHF Frequency	USFWS Band #
NTTR MOA	6-Jun-14	Beatty Wash	N/A	11S 530452, 4090428	M	PTT 126227-GD-155	237.149	0679-04983
	6-Jun-14	Beatty Wash	N/A	11S 530452, 4090428	F	PTT 126226-GD-154	237.099	0679-04982
	23-May-14	N. Pahroc Range	136624	11S 684017, 4176577	M	PTT-133624	GPS Only	0679-04949
	23-May-14	N. Pahroc South	136625	11S 676128, 4171955	F	PTT-136625	GPS Only	0679-04947
	23-May-14	N. Pahroc Range	136626	11S 684017, 4176577	F	PTT-133626	GPS Only	0679-04948

3.2 Saylor Creek Range and Juniper Butte Range

3.2.1 Telemetry

A total of three golden eagles within the SCR were outfitted within CTTs and data received through October 2014 was analyzed. As expected, the quality and timeliness of data received by CTTs have been dependent upon the individual subjects' tendencies to utilize habitats where contact with cell towers is possible and to perch in places where GPS satellites are in view. CTTs can be tracked through the NSST web portal, and duty cycles have been changed proactively as needed. It should be noted, however, that an individual's frequent use of perches less accessible to GPS satellites equally affects GPS acquisition on PTTs. Two of the SCR individuals (Bruneau Plain and Bruneau Canyon) did not contact cell towers for extended periods in summer and fall. All three CTT subjects were confirmed to be viable during an aerial tracking flight conducted on August 27, 2013. They did show up on the web portal and downloaded data during winter 2014 movements, which were more likely to be within view of satellites.

Summaries of telemetry observations of golden eagle subjects within SCR/JBR are as follows:

- **Bruneau Plain, CTT 9SZKXO –** Deployed on an adult female near the eastern road overlook to the Bruneau River Canyon on February 26, 2013. This individual was not associated with a nest and wandered into the area where captured. Figure 3-4 shows

her recorded movements throughout the study period and estimated home range based on the data received and kernel analysis. A total of 1,418 GPS locations were received for two main time periods: February 26, 2013 – June 10, 2013 and February 20, 2014 – April 10, 2014. This bird spent minimal time on the SCR and JBR however the outskirts of both ranges are considered to be within the 95% Home Range. Her recorded movements are scattered across a portion of southwest Idaho and into northern Nevada that covers 90 miles by 110 miles. Given her widespread movements and the data gaps, her Core Home Range is also spread out by over 65 miles. The 50% utilization contours shown on Figure 3-4 represent the Core Home Range and reflect locations primarily from the spring 2013 time period. Given the lack of data received in late spring and summer, it is assumed that this bird spent the breeding seasons nesting within one of the river canyons nearby, where her transmitter was not in view of GPS satellites. As shown by the altitude graphs provided in Appendix G, this bird typically stayed between altitudes of 1,000 to 2,500 feet.

The bird is presumed to be alive as a few locations were downloaded in September and October 2014; however, the transmitter seems to be malfunctioning as no archived locations from spring and summer months were downloaded at these times.

- **Bruneau Canyon, CTT T5QIQX –** Deployed on a near-adult female near the eastern road overlook to the Bruneau River Canyon on February 27, 2013. This female's CTT only connects to cell towers on the few occasions she soars at > 1,600 feet above ground level to the east of her capture site. The data show her spending most time within the canyon and perched where view of GPS satellites is problematic. The August 27, 2013 VHF tracking flight found her alive along the canyon wall as expected. Archived locations uploaded gradually during the study period and the complete database represents GPS locations from February 2013 through April 2014. She occupies a very narrow home range centered on the Bruneau River Canyon just west of SCR (Figure 3-5). She does make periodic trips into the surrounding plains, primarily during the spring, but generally remains within a few miles of her Core Home Range. As shown on the altitude graph provided in Appendix G she infrequently ventures above 1,200 feet above ground level. GPS locations were not received after May 2014, thus it is assumed that the transmitter has malfunctioned likely due to lack of charging for long periods of time when the transmitter is not receiving sun.
- **Browns Canyon/Saylor Creek, CTT IGHWDM –** Deployed on an adult male near the "Saylor Creek" nest on March 3, 2013. Since deployment this subject has been in frequent contact with cell towers, providing >7,400 GPS locations with attendant altitudes and demonstrating the full capabilities of the technology. The locations shown on Figure 3-6 represent a complete dataset through October 2014, the duration of the study. This bird's Core Home Range centers on the Saylor Creek nest site where active nesting occurred in 2013. The nest was maintained in 2014 although no eggs were laid that year. Most of his activities occur on the SCR and associated Restricted Airspace. As the summer progresses each year this bird ranges farther afield from his well-defined local area, but has stayed within the general area of military operations except for a July 26–29, 2013 round trip 100 miles to the northeast that took him near Craters of the Moon National Monument and a trip in mid-September 2014 to agricultural fields just west of

Twin Falls, Idaho. The altitude graph provided in Appendix G depicts the highly accurate altitudes of this eagle during thousands of locations between 1000 and 1900 Mountain Daylight Time as resolved by ≥ 8 satellites. Altitudes are heavily weighted toward perching and low-level flight, but between the times of 1200 and 1730 soaring flights at higher altitudes associated with thermal formation are more common.

3.2.2 Nest Surveys

A total of six occupied golden eagle territories were documented during the 2013 helicopter and ground surveys for SCR (Figure 3-7) and JBR (Figure 3-8). Three are located in the canyon east of JBR within Restricted Airspace, one is located on SCR, and two in the canyon west of SCR within Restricted Airspace. These territories were determined to be occupied based on observations of adult golden eagle pairs as well as active and maintained golden eagle nests during the 2013 breeding season. Of these territories, only one nest site, Browns Canyon/Saylor Creek, was determined to be active in 2013. This nest failed and therefore there were no chicks produced at SCR in 2013. No breeding was observed within the other territories. Photos of representative nest sites are provided in Appendix E.

A total of seven occupied golden eagle territories were documented during the 2014 helicopter surveys for SCR and JBR (Figure 3-9). One is located northeast of JBR within Restricted Airspace and was occupied in 2013, four are located west of SCR within Restricted Airspace and two are located on SCR (Table 3-4). These territories were determined to be occupied based upon observations of adult golden eagle pairs as well as active and maintained golden eagle nests during the 2014 breeding season. The JBR territory in East Fork Clover Creek was determined to be active based on the presence of incubating adult on the nest during the March survey. Two nests in the SCR territories and Crowbar Canyon and Hairpin were determined to be active based on the presence of an incubating adult on the nest during the March survey. All three nests were determined to have failed during the May survey and therefore there were no chicks produced at SCR and JBR in 2014. The Crowbar and East Fork Clover Creek nests were empty and the Hairpin nest still had two abandoned eggs present that were unattended by adults. No breeding was observed within the other territories. Photos of representative nest sites are provided in Appendix F.

Table 3-4.
Synopsis of Idaho 2014 GOEA Survey Results

	Saylor Creek	Juniper Butte	Total
# Confirmed Occupied Territories*	7	1	8
# Unconfirmed Territories**	0	1	1
# Nest Determined to be Active	2	1	3
# Determined to be Successful	0	0	0
# Unable to Determine Success	0	0	0
# young observed	0	0	0

Table 3-4.
Synopsis of Idaho 2014 GOEA Survey Results (Cont.)

2014 Occupied Territories, Saylor Creek Range	Status	Outcome	# chicks
Saylor Creek	Occupied	No Breeding	0
Browns Canyon	Occupied	No Breeding	0
Bruneau Overlook	Occupied	No Breeding	0
Crowbar Canyon	Active	Failed	0
Hairpin	Active	Failed	0
Austin	Occupied	No Breeding	0

2014 Occupied Territories, Juniper Butte Range	Status	Outcome	# chicks
East Fork Clover Creek	Active	Failed	0

Notes:
* Based on observations of adult GOEA pairs, active and maintained GOEA nests during the 2014 breeding season
** Based on adult GOEA observed not associated with or proximal to active or maintained nests.

2014 Unoccupied Territories***, Juniper Butte Range	Status	Outcome	# chicks
Robinson	Inactive	Inactive	0
Wells Crossing	Inactive	Inactive	0

Notes:
*** These territories were occupied during the 2013 breeding season but considered inactive in 2014

3.2.3 Bait Stations

Four bait stations as shown on Figure 2-4 were in operation on or within the vicinity of SCR and JBR from May 27, 2013 through May 24, 2014. A summary of data collected for all monitoring periods through September 9, 2013 is provided in Table 3-5. A summary of data collected for all monitoring periods from September 2013 through May 2014 is provided in Table 3-6. Station 4 was relocated at the end of August 2013 to location 4.1 in anticipation of potential access issues during the wet season.

Overall, coyotes (*Canis latrans*) were the predominant detection at each of the bait stations. Turkey vultures (*Cathartes aura*) were also frequent visitors and common ravens (*Corvus corax*) were detected regularly. Several burrowing owls (*Athene cunicularia hypugaea*) were observed at Station 3 throughout the September and October monitoring periods. Two ferruginous hawks (*Buteo regalis*), two black-billed magpies (*Pica hudsonia*), and one unknown raptor were observed during the overall period. Stations 1 and 4 did not operate from July 24 - August 18, 2013. Station 2 malfunctioned during the December 2013 through mid February 2014 period and therefore provided no data for those months. Station 1 had no wildlife observances for the entire monitoring period of February through May 2014. The carcass remained intact.

Golden eagles were detected at all SCR and JBR camera bait stations. Peak observances of golden eagles were during the months of September (2013) and February (2014). Representative photos are provided in Appendices E and F.

3.2.4 Prey Item Analysis

The results of prey item analysis at representative nest sites are provided in Table 3-7. Prey items were analyzed from the active Saylor Creek nest site in 2013 and are dominated by rodents and lagomorphs, although ungulate, badger, waterfowl, and raptor remains were found as well. Of note, remains of the pygmy rabbit (*Brachylagus idahoensis*) were identified at this nest site; however, additional confirmation of this identification should be obtained as it is based on a single bone.

Table 3-5.
SCR/JBR Bait Station Summary May-Sept 2013

Species Detected	27 May-6 Jun				6 Jun-24 Jul				24 Jul-18 Aug				18 Aug-9 Sep			
	Station 1	Station 2	Station 3	Station 4	Station 1	Station 2	Station 3	Station 4	Station 1	Station 2	Station 3	Station 4*	Station 1	Station 2	Station 3	Station 4.1
Golden Eagle	0	0	0	0	0	0	0	0	N/A	0	0	N/A	0	0	0	0
Turkey Vulture	0	6	63	22	1	8	73	40	N/A	32	53	N/A	44	0	24	25
Ferruginous Hawk	0	0	1	0	0	0	0	0	N/A	0	0	N/A	0	0	0	0
Common Raven	0	0	46	0	0	0	0	0	N/A	0	0	N/A	0	0	5	0
Coyote	2	5	24	3	0	13	17	13	N/A	26	28	N/A	1	22	24	0
Badger	0	0	0	0	0	0	1	0	N/A	0	0	N/A	0	0	0	0
Pronghorn	1	2	0	0	1	1	0	0	N/A	0	1	N/A	1	1	0	0
Kangaroo Rat	0	0	0	0	1	0	0	0	N/A	0	0	N/A	0	0	0	0
Unknown	0	0	0	0	0	0	1	0	N/A	0	0	N/A	0	0	0	0
Human	0	2	1	0	0	0	0	0	N/A	0	0	N/A	0	0	0	0

Notes:
* moved camera to 4.1

Table 3-6.
SCR/JBR Bait Station Summary Sept 2013-May 2014

	Golden Eagle	Coyote	Ferruginous Hawk	Turkey Vulture	Common Raven	Black-billed Magpie	Burrowing Owl	Unknown Raptor
Station 1	12	3	0	65	0	0	0	0
Station 2	4	24	1	5	2	0	0	0
Station 3	13	14	0	1	3	2	7	1
Station 4.1	11	4	0	4	55	0	0	0

Table 3-7.
Prey Item Analysis

Collection Site Number	Nest Site	Species	Scientific Name	MNI*	Notes
1	Saylor Creek 2012 Nest	Mallard	*Anas platyrhynchos*	1	2 bones
		Golden Eagle	*Aquila chrysaetos*	1	1 bone, 2 pellets
		Barn Owl	*Tyto alba*	1	2 bone fragments, 1 feather, 3 pellets
		Jackrabbit/Hare	*Lepus* sp.	3	22 bones, 2 teeth
		Pygmy Rabbit^	*Brachylagus idahoensis*	1	1 bone
		Cottontail Rabbit species	*Sylvilagus* sp.	2	1 bone, 1 skull fragment
		Unidentified Rodent	Rodentia	N/A	20 unidentified rodent bones
		Pocket Gopher species	*Thomomys* sp.	1	1 bone, 1 pelvis fragment
		American Badger	*Taxidea taxus*	1	1 lower mandible, juvenlie
		Mule Deer	*Odocoileus hemionus*	1	1 pelvis fragment, juvenile
		Unidentified Ungulate	Ungulate	N/A	24 tooth fragments
2	UTTR - Gunsight Alternate, 2013 cliff (Bones found in cave directly below alternate nest on 2013 nest cliff)	Herring Gull	*Larus argentatus*	1	2 bones
		Jackrabbit/Hare	*Lepus* sp.	2	40 bones
		Domestic Sheep	*Ovis aries*	1	14 bones
3	UTTR - Gunsight West (Alternate nest cliff with 3 nests not used in 2013)	American Coot	*Fulica americana*	1	nearly complete carcass
		Jackrabbit/Hare	*Lepus* sp.	2	11 bones
4	UTTR - West Knoll 2013	Golden Eagle	*Aqula chrysaetos*	N/A	31 pellets,
		Unidentified Snake	Serpentes	1	scales
		Jackrabbit/Hare	*Lepus* sp.	5	73 bones and 1 skull fragment

Table 3-7.
Prey Item Analysis (Cont.)

Collection Site Number	Nest Site	Species	Scientific Name	MNI*	Notes
5	UTTR - West Knoll Alternate (Huge alternate nest 100 m upslope of 2013 nest)	Prairie Falcon	*Falcon mexicanus*	1	1 bone
		Golden Eagle	*Aquila chrysaetos*	N/A	2 pellets
		Common Raven	*Corvus corax*	1	3 bones, immature
		Great-tailed Grackle	*Quiscalus mexicanus*	1	2 wing feathers
		Jackrabbit/Hare	*Lepus* sp.	3	30 bones
		Pygmy Rabbit^	*Brachylagus idahoensis*	1	1 bone
		Kangaroo Rat	*Dipodomys* sp.	1	1 bone
		Pig	*Sus scrofa*	1	1 rib
6	UTTR - Grouse Creek (Collected from massive amount of fallen nest material including the cores of two previously active fallen nests)	Unidentified Snake	Serpentes	1	12 vertebrae
		Golden Eagle	*Aquila chrysaetos*	1	1 leg bone
		Jackrabbit/Hare	*Lepus* sp.	21	288 bones
		Unidentified Rodent	Rodentia	1	1 pelvis fragment

Notes:
* MNI = Minimum Number of Individuals (Individual prey animals)
^ Additional confirmation of ID may be necessary

3.3 Utah Test and Training Range

3.3.1 Telemetry

A total of seven golden eagles within UTTR and surrounding Restricted Airspace lands were outfitted with transmitters. Of these seven, five were outfitted within PTTs and two with CTTs. As expected, the quality and timeliness of data received by CTTs have been dependent upon the individual subjects' tendencies to utilize habitats where contact with cell towers is possible and to perch in places where GPS satellites are in view. The latter factor has been an issue with the CTT deployed on the Charlie bird at UTTR however it has not been an issue with the Clive Skull bird. It should be noted, however, that an individual's frequent use of perches less accessible to GPS satellites equally affects GPS acquisition on PTTs as well. In addition, the GPS engine on the Charlie CTT failed prematurely as described below.

Summaries of telemetry observations of golden eagle subjects within the UTTR are as follows:

Charlie, CTT QJ5U4P – Deployed on the adult male at "Charlie" nest February 22, 2013. This CTT failed to connect with a cell tower for months. The subject was regularly observed in the vicinity of the nest and the CTT antenna was visible, but a VHF signal was not detected. On July 23, 2013 the CTT finally began to regularly contact cell towers and upload archived data; however, then-current positions were always blank. Once all archived data were received it was confirmed that the CTT's GPS engine had failed on July 4, 2013. NSST determined that the equipment was at fault and the CTT unit itself was replaced for use on a bird more frequently within cell range. A final database on this unit consists of 1,017 GPS locations, confirming that this individual seldom traveled far from the nest (Figure 3-10). Altitudes also remained relatively stable at about 1,300 feet above ground level (Appendix G).

Cathedral, PTT 126218 – Deployed on the adult male at the "Cathedral" nest February 25, 2013. Some 6,200 GPS locations received confirm that this male seldom travels far from the nest area during the spring and summer breeding seasons. More than 95% of locations (Figure 3-11) are < 4 miles from the nest, and 50% are < I mile in the February through August time period. Most altitude readings were recorded between 1,300 and 1,600 feet (Appendix G). This bird did travel approximately 80 miles south in the fall/winter of 2013 to the mountains east of the Dugway Proving Grounds and Tooele. Ultimately, his signal remained stationary on about January 4, 2014. Field staff recovered his body on January 13, 2014 on Tooele Army Depot lands. There were no obvious signs of trauma to the bird's body. He was sent for necropsy to the University of Georgia, College of Veterinary Medicine as directed by the USFWS. The necropsy report is provided in Appendix H.

The final diagnosis of the necropsy was emaciation and starvation based on the extremely poor body condition. There was no evidence of an underlying infectious disease. This bird was estimated to be 15 years old. Starvation is commonly diagnosed as the cause of mortality in juvenile animals, but is less common in mature animals that are more experienced at foraging. An old wound was present on the leading edge of the right wing that may have impaired the

bird's ability to fly and forage properly. There were also bony proliferations affecting the vertebrae (likely age related) that could also have impaired his movement.

Bravo, PTT 126221 – Deployed on the adult male at "Bravo" nest February 27, 2013. This individual remained close to the nest until early April, then began to undertake more extensive movements both north (near the Idaho border) and south (Deseret Peak), but always returning to the nest area (Figure 3-12). In late June he began to spend much more time to the north, in southern Idaho and along the northeast shore of the Great Salt Lake. Altitude data showed a tendency to soared at higher altitudes (>2,500 feet) in the summer months. Through August 4, 2013 approximately 1,500 GPS locations were received, after which no data was received until April 2014. The low number relative to those received by other birds probably reflects a tendency by this individual to perch in spots where reception by GPS satellites is problematic or feather coverage of the solar panel as battery voltage was extremely low. Only two days worth of data was received in April 2014, which showed the bird in the immediate vicinity of the known nest site, and no additional location data was received by the conclusion of the study in October 2014. Therefore, it is suspected that the transmitter has ultimately failed.

West Knoll, PTT 126220/126219 – Deployed on the adult male at "West Knoll" nest June 15, 2013. He immediately flew south after deployment to spend the night near Deseret Peak, but returned to the nest area the following day and remained in the vicinity (Figure 3-13). This was a successful nest with one chick in 2013. On July 22, 2013 he headed north and then west the following morning to the western side of Nevada's Pequop Mountains, > 90 miles from the nest. He had returned to the nest area by July 26, 2013, but made another round trip to the same Nevada area in early August and mid-September, then headed southeast to the Dugway area. The flights were direct rather than meandering, and are likely "business trips" for foraging or scouting of territories by an adult that knows and uses this remote range repeatedly. This transmitter malfunctioned (capacitor failed) and stopped transmitting in October 2013. The bird was recaptured in February 24, 2014 and PTT 126219 attached to replace the failed unit. The combined dataset represents more than 8,400 GPS locations and the new transmitter was still functioning well at the end of the study in October 2014.

This bird spent a fair amount of time around the nest site in early spring 2014 as also confirmed by helicopter flights documenting a maintained nest site. However, no breeding actually occurred at this nest in 2014 and by June he was straying south of Interstate 80. Similar long distance trips as those made in summer 2013 were made to the north and west from July through October 2014 with intermittent nest site returns. The October 2014 trip extended as far west as the Humboldt National Forest (140 miles from the nest) just east of Elko, Nevada. As shown by the altitude graphs in Appendix G higher altitude flights were more common after the breeding period.

Gold Hill (Rube Mine), PTT 126222 – Deployed on the adult female at "Gold Hill" nest June 22, 2013. The vast majority of the 3,000 GPS locations show this female spending most of her time near the nest at the north end of the Deep Creek mountain range during the breeding season (Figure 3-14). This was a successful nest with two chicks in 2013. There are occasional movements to the south within the Deep Creek range. Movements to this area became more

frequent and extended greater distances (>30 miles away) in fall 2013 after the commencement of nesting season. Flight altitudes were variable and primarily within the range of 1,300 to 2,300 feet (Appendix G). Her position did not change after November 20, 2013 and an attempt was made to find her via the VHF receiver. Her body was eventually recovered approximately three miles west of the nest site on January 12, 2014. She was laying chest down behind small rocks with a gunshot to the right side of the chest (below crop) about 300 yards from a small dirt road. The transmitter unit was intact and there were no signs of wear from the harness ribbon or damage to her back (pressure ulcer, abrasion, etc) due to the unit. The female's body and feather condition was considered to be excellent. Her chest indicated that she was successful in maintaining a healthy weight. Her body was turned over to the law enforcement division of the USFWS for further investigation of the shooting.

Clive Skull, PTT 3BCEHC - Deployed on the adult female at the “Clive Skull” nest on February 21, 2014. This transmitter has functioned well as the nest site and area of primary activity is located within the northeast corner of the UTTR South Range, just south of Interstate 80. Consistent data, comprised of 4,326 GPS locations, was recorded from February 2014 until the end of the study period in October 2014. Data shows that this bird’s Core Range is within seven miles of the nest site during the nesting season, with infrequent flights east to the Cedar Mountains and Skull Valley during the later part of the nest season (Figure 3-15). This nest was successful yielding one chick in 2014. Longer trips east began in mid-September with travel up to 60 miles to the Tooele area. This bird had frequent and sustained altitude spikes between the range of 1,300 and 3,500 feet (Appendix G).

Grassy Mountain, PTT 126223 - Deployed on the adult male at the “Grassy Mountain” nest south and east of the UTTR North Range boundaries on February 24, 2014. The transmitter recorded 7,344 GPS locations from February through October 2014. The Core Home Range and most of the bird’s time is spent within five miles of the nest site during the winter and spring nest period (Figure 3-16). Grassy Mountain was an active nest site in 2014 however it is believed to have failed to yield any chicks. Beginning in June, he ventures up to 40 miles southeast of the nest site into the Wasatch National Forest. Flight altitudes consistently range between 1,300 and 1,800 feet.

3.3.2 Nest Surveys

A total of 28 occupied golden eagle territories were documented during the 2013 helicopter and ground surveys of UTTR (Figure 3-17). Eighteen were located on UTTR North and associated Restricted Airspace and 10 on UTTR South and associated Restricted Airspace. These territories were determined to be occupied based on observations of adult golden eagle pairs as well as active and maintained golden eagle nests during the 2013 breeding season. Of these territories, 21 were determined to have active nests in 2013. No breeding was observed within the other territories. Eleven of these nests were successful and a total of 15 chicks were observed between them. The other nine nests failed. The details for each territory are summarized in Table 3-8. Photos of representative nest sites are provided in Appendix E.

A total of 37 occupied golden eagle territories were documented during the 2014 helicopter and ground surveys of UTTR (Figure 3-18). Twenty-three are located on UTTR North and associated Restricted Airspace and 14 territories were found on UTTR South and associated Restricted Airspace. These territories were determined to be occupied based on observations of adult golden eagle pairs, as well as active and maintained golden eagle nests during the 2014 breeding season. Of these territories, 23 were determined to have active nests in 2014 based on the presence of incubating adults or chicks during the April survey. No breeding was observed within the other territories. Eleven of the 23 nests were successful and a total of 13 chicks were observed between them. Eight nests were determined have failed based on a lack of activity at the nest. Success could not be determined at four of the nest sites due to access limitations during the appropriate survey window. The details for each territory are summarized in Table 3-9. Photos of representative nest sites are provided in Appendix F.

3.3.3 Bait Stations

Four bait stations as shown on Figure 2-3 have been in operation on or within the vicinity of UTTR North from May 17, 2013 through April 24, 2014. Two additional stations were added on or in the vicinity of UTTR South on August 21, 2013 and removed by late April 2014. A summary of data collected for all monitoring periods through September 5, 2013 is provided in Table 3-10 a summary of data collected from September 2013 through May 2014 is provided in Table 3-11. Stations 1 and 4 were relocated at the end of August 2013 to locations 1.1 and 4.1 in anticipation of potential access issues during the wet season.

3.3.3.1 May 2013 through September 5, 2013

Turkey vultures were the predominant detection at all bait stations at of the end of August 2013 with the exception of the original Station 4 and newly added Stations 5 and 6. Coyotes were also frequent visitors to all stations except Stations 5 and 6. Several burrowing owls (*Athene cunicularia hypugaea*) were detected at Station 4.1 after its establishment at the new location in August. Pronghorns, kangaroo rats, and common ravens were observed multiple times at various stations. A single northern harrier (*Circus cyaneus*), rabbit (*Sylvilagus* sp.), and grey fox (*Urocyon cinereoargenteus*) were observed during the overall period from May through early September. A few badgers, ground squirrels (*Spermophilus* sp.), and wood rats (*Neotoma sp.*) were recorded over the monitoring period. A single golden eagle was detected at Station 1.1 on August 23, 2013.

3.3.3.2 September 2013 through May 2014

The predominant detection at all UTTR bait stations was golden eagles after September 2013. Stations 2 and 3 saw the most golden eagles, followed by station 1.1 and 4.1. Golden eagles were observed most frequently at all stations from October through April. A single bald eagle (*Haliaeetus leucocephalus*) was captured on camera with a pair of adult golden eagles at Station 6 in February.

Common ravens and burrowing owls were observed multiple times at various stations. Red fox (*Vulpes vulpes*) and grey fox (*Urocyon cinereoargenteus*) were observed at stations 1.1 and 2.

Rough-legged hawks (*Buteo lagopus*), northern harriers (*Circus cyaneus*), and a single prairie falcon (*Falco mexicanus*) were recorded over the monitoring period. Several cowboys and their cattle were captured passing through Station 2, while herding dogs were captured at Station 6. Stations 5 and 6 both malfunctioned at different points in time. Representative photos are provided in Appendices E and F.

3.3.4 Prey Item Analysis

Detailed findings from the prey item analysis for five 2013 nest sites at UTTR are provided in Table 3-7. Avian and mammal bones were found at each nest site and reptile (snake) bones were found at one of the sites. Jackrabbits appear to be the primary food source for nesting golden eagles at UTTR. The greatest prey item diversity is represented by the West Knoll Alternate nest site. Additional confirmation of the pygmy rabbit remains identified at this site should be obtained as it is based on a single bone.

Table 3-8.
Synopsis of UTTR 2013 GOEA Survey Results

	North	South	Total
# Confirmed Occupied Territories*	18	10	28
# Unconfirmed Territories**	5	4	9
# Nest Determined to be Active	14	7	21
# Determined to be Successful	7	4	11
# young observed	9	6	15

2013 Occupied Territories, North Range	Status	Outcome	# chicks
Charlie	Active	Successful	1
Cathedral	Active	Failed	0
Candy Mtn.	Occupied	No Breeding	0
Gunsight	Active	Successful	1
Bravo	Active	Failed	0
German Valley	Active	Failed	0
West Knoll	Active	Successful	1
East Ridge	Active	Failed	0
Jedediah Mtn.	Active	Successful	1
Diddle Knoll	Active	Failed	0
Grassy Mtn.	Occupied	No Breeding	0
Grassy Mtn. South	Active	Undetermined	Unknown
Eagle Knolls	Active	Failed	0
Craners	Active	Successful	2
Big Pass	Active	Successful	2
Miner's Basin	Occupied	No Breeding	0
Corral Hollow	Occupied	No Breeding	0
Grouse Creek	Active	Successful	1

Table 3-8.
Synopsis of UTTR 2013 GOEA Survey Results (Cont.)

2013 Occupied Territories, South Range	Status	Outcome	# chicks
Kittycat	Occupied	No Breeding	0
Wildcat	Active	Failed	0
Clive-Skull	Active	Failed	0
Wilson Hill	Active	Failed	0
Rube Mine (Gold Hill)	Active	Successful	2
Rodenhouse	Occupied	No Breeding	0
Willow Spring	Occupied	No Breeding	0
Ocher Mtn.	Active	Successful	1
Birch Creek	Active	Successful	2
Johnson Creek	Active	Successful	1

Notes:
* Based on observations of adult GOEA pairs, active and maintained GOEA nests during the 2013 breeding season
** Based on adult GOEA observed not associated with or proximal to active or maintained nests.

Table 3-9.
Synopsis of UTTR 2014 GOEA Survey Results

	North	South	Total
# Confirmed Occupied Territories*	23	14	37
# Unconfirmed Territories**	4	1	5
# Nest Determined to be Active	14	9	23
# Determined to be Successful	7	4	11
# Unable to Determine Success	3	1	4
# young observed	8	5	13
2014 Occupied Territories, North Range	**Status**	**Outcome**	**# chicks**
Candy Mtn.	Active	Successful	1
Gunsight	Active	Successful	1
Bravo	Occupied	No Breeding	0
German Valley	Occupied	No Breeding	0
West Knoll	Occupied	No Breeding	0
East Ridge	Occupied	No Breeding	0
Diddle Knoll	Active	Failed	0
Grassy Mtn.	Active	Failed	0
Eagle Knolls	Active	Successful	1
Craners	Active	Undetermined	Unknown
Miner's Basin	Active	Undetermined	Unknown
Corral Hollow	Active	Undetermined	Unknown
Grouse Creek	Active	Failed	1
Echo	Active	Successful	1
Lost Canyon	Active	Successful	1
Patterson Spring	Active	Failed	0

Table 3-9.
Synopsis of UTTR 2014 GOEA Survey Results (Cont.)

2014 Occupied Territories, North Range	Status	Outcome	# chicks
Pilot Well	Occupied	No Breeding	0
South Silver	Occupied	No Breeding	0
Bonneville	Active	Successful	1
Hogan's Alley	Active	Successful	1
Mountain Sheep Canyon	Occupied	No Breeding	0
Raven Cave	Occupied	No Breeding	0
Cathedral	Occupied	No Breeding	0

2014 Occupied Territories, South Range	Status	Outcome	# chicks
Kittycat	Active	Failed	0
Wildcat	Active	Undetermined	Unknown
Clive-Skull	Active	Successful	1
Wilson Hill	Active	Failed	0
Lead Mine Hills	Active	Successful	2
Rube Mine (Gold Hill)	Occupied	No Breeding	0
Rodenhouse	Occupied	No Breeding	0
Lower Granite Creek	Occupied	No Breeding	0
Trail Gulch	Active	Successful	1
Feber HIlls	Active	Failed	0
Willow Spring	Occupied	No Breeding	0
Rocky Point	Active	Successful	1
Ocher Mtn.	Active	Failed	0
Johnson Creek	Occupied	No Breeding	0

Notes:
* Based on observations of adult GOEA pairs, active and maintained GOEA nests during the 2014 breeding season
** Based on adult GOEA observed not associated with or proximal to active or maintained nests.

2014 Unoccupied Territories, North/South Ranges***	Status	Outcome	# chicks
Charlie	Inactive	Inactive	0
Jedediah Mtn.	Inactive	Successful	0
Grassy Mtn.	Unknown	Unknown	Unknown
Big Pass	Inactive	Inactive	0
Birch Creek	Inactive	Inactive	0

Notes:
*** These territories were occupied during the 2013 breeding season but considered inactive in 2014

Table 3-10.
UTTR Bait Station Summary May 2013-September 2013

Species	17 May-24 Jul				24 Jul-20 Aug				21 Aug- 5 Sep					
	Station 1	Station 2	Station 3	Station 4	Station 1*	Station 2	Station 3	Station 4**	Station 1.1	Station 2	Station 3	Station 4.1	Station 5	Station 6
Golden Eagle	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Turkey Vulture	6	6	5	0	0	11	0	0	0	39	0	3	0	0
Northern Harrier	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Burrowing Owl	0	0	0	0	0	0	0	1	0	0	0	14	0	0
Common Raven	0	0	0	0	0	0	0	0	0	0	0	1	4	10
Coyote	3	1	0	0	5	11	0	2	9	5	1	6	0	0
Grey Fox	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Badger	0	0	0	1	0	0	0	1	0	0	0	0	0	0
Pronghorn	3	6	0	4	0	0	0	0	1	0	0	0	0	0
Rabbit	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Ground Squirrel	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Kangaroo Rat	3	0	1	28	1	0	0	2	0	0	0	0	0	0
Woodrat	0	0	0	0	0	1	0	2	0	0	0	0	0	0
Unknown Mammal	0	0	1	1	1	0	1	2	0	0	0	0	0	0

Notes:
* moved camera to 1.1
** moved camera to 4.1

Table 3-11.
UTTR Bait Station Summary September 2013- April 2014

	Golden Eagle	Bald Eagle	Turkey Vulture	Prairie Falcon	Rough-legged Hawk	Northern Harrier	Common Raven	Burrowing Owl	Coyote	Red Fox	Grey Fox	Humans	Cows	Domestic Dog
Station 1.1	60	0	5	0	0	0	2	7	28	0	2	0	0	0
Station 2	70	0	51	0	0	2	4	1	13	5	0	multiple	multiple	0
Station 3	72	0	0	0	2	0	1	0	11	0	0	0	0	0
Station 4.1	52	0	0	1	0	0	7	24	8	0	0	0	0	0
Station 5	26	0	0	0	0	0	1	0	0	0	0	0	0	0
Station 6	19	1	5	0	0	0	1	0	0	0	0	0	0	6

3.4 Nevada Test and Training Range

3.4.1 Telemetry

The NTTR North Range was the preferred location for deployment of transmitters in Nevada given the number of known nest sites (Figures 3-19 and 3-20). In mid January 2013, NTTR range operations approved the testing of up to two PTT transmitters (VHF frequency 237 MHz) on golden eagles in the MOA east of NTTR. The MOA is technically outside of the project study area; however, testing outside of the NTTR boundaries was required before transmitters could be deployed on range to confirm that interference would not occur with range operations. Also in January 2013, nest data was obtained from NDOW for the MOA. Since the MOA is not part of the actual NTTR study area, nest surveys and productivity monitoring are not being conducted as a component of this study. Nonetheless, additional reconnaissance was conducted to determine the best trap sites as the available information showed potential nest locations however recent activity information from this dataset was limited. This reconnaissance was conducted in late May to capture the time period after chicks hatched to best identify active nest sites. The reconnaissance was conducted via helicopter to further streamline the time needed to cover this large area although it covered only a limited area approved by NTTR operations. The earliest that trapping could occur in the NTTR MOA was May-June 2013 after chicks hatched. Trappers must avoid the time period when females are sitting on eggs (~March-April 2013). Based on the May reconnaissance two active nests were found that could be targeted (Figure 3-21); however, it was determined by the eagle biologists that trapping would need to be delayed until temperatures were cooler. Temperatures in this area were already reaching the 100s which only allows a window of a few hours in the morning before bait becomes too stressed. Additional surveys were conducted in October 2013 to establish that these birds were residents and then trapping began in the MOA in November 2013. This trapping effort was unsuccessful.

Locating additional birds for trapping in the MOA was difficult given the lack of current active nest data and the time of year. A driving test of the transmitters was conducted in December 2013 as testing an alternative. All transmitters were tested and approval for their use was received from NTTR shortly thereafter. However, as described in Section 3.1 access to nest areas and obtaining approval for the activities needed to carry out either adult trapping efforts or nest climbs for transmitter attachment to chicks could not be obtained at NTTR in time for the necessary windows in winter and spring 2014.

As discussed in Section 3.1.3, transmitters were attached to five chicks at their nests within the MOA lands in the vicinity of NTTR (Figure 3-3). Nest climbs took place in May/June 2014 at one nest with two chicks (male and female) in a wash near Beatty, just west of NTTR and the MOA boundaries, and at two additional nests in the Pahroc Mountains approximately 40 miles east of NTTR boundaries. The North Pahroc nest included a male and a female bird and the North Pahroc South nest included just one female. Only PTT's were deployed per the request of NTTR and VHF frequencies were consistent with NTTR requirements as described in Section 2.3.3. Summaries of telemetry observations of golden eagle subjects within the NTTR MOA are as follows:

Beatty Wash Nestling Female, PTT 126226 – Deployed on the 8-week old female nestling at the Beatty Wash" nest June 6, 2014. The nest is located off of Beatty Wash Road, just outside the MOA boundaries. GPS locations, 1,735 in total, were received beginning the next day through the end of the study period in late October. Telemetry data shows the bird at the nest site until late June when she began making short flights ¼ mile along the wash. In late July and August she began making flights <5 miles east into the MOA with periodic returns back to the nest area. On September 1st she began traveling east across the NTTR (Figure 3-22), covering approximately 60 miles in three hours. She spent the next day traversing the rest of the MOA in a northeastern flight path, covering approximately 90 more miles. On September 3rd she travelled another 140 miles crossing into southern Utah where she has spent much of her time within lands of Fishlake National Forest located north of Bryce Canyon National Park. She has also made 170 mile roundtrips south to the lands east of the Grand Canyon. Flight altitudes show a marked increase in early September from less than 1,500 to over 2,000 feet as she moved farther east into southern Utah (Appendix G). It is presumed that she was alive and well at the conclusion of the current study.

Beatty Wash Nestling Male, PTT 126227 – Deployed on the 8-week old male nestling at the "Beatty Wash" nest June 6, 2014. GPS locations, 526 in total, were received beginning the next day through September 12, 2014, although there was a gap in data from mid June until the end of July. During this time battery level was not likely charging due to feather coverage on the solar panel. Once the bird learned to better preen his feathers the battery recharged and data was captured regularly from late July through early September. This bird followed a similar flight and dispersal pattern to his sibling beginning with short flights (<5 miles from the nest) in late July and August into the MOA, although he maintained his distance and did not make returns back to the immediate nest area. He began to travel farther east into NTTR and the eastern MOA in late August (Figure 3-23). After September 1st he did not return to lands within the NTTR. His movements within NTTR and the MOA during this time period were more scattered and less direct than those of his female sibling. Flight altitudes show a marked increase in late August from less than 1,500 to over 2,000 feet as he moved farther east and north. By September 3rd he had made his way north of Ely, NV along State Route 93. He spent several days in the mountains of this area and interim valley until his signal was lost after September 12th. His partial remains were recovered at the last recorded GPS location in a recently mowed alfalfa field on October 16th by Joe Barnes of NDOW. According to the farmer, the mowing had occurred in early October. So presumably the bird died in the field prior to the mowing. The remains were too damaged to determine the cause of death. The transmitter was also destroyed by the mower. Correspondence with USFWS, NDOW, and BRC related to the recovery is provided in Appendix H.

North Pahroc Nestling Male, PTT 136624 - Deployed on the 7-week old male nestling at the "North Pahroc Range" nest May 23, 2014. The nest is located approximately eight miles north of State Route 93, between Pioche and Alamo, within the eastern MOA boundaries. GPS locations, 946 in total, were received beginning the next day through September 15, 2014. Although similar to the Beatty male, there was a gap in data from June 1st until the beginning of July. During this time battery level was not likely charging due to feather coverage on the solar

panel. Once the bird learned to better preen his feathers the battery recharged and data was captured regularly from early July through mid-September. Data shows this bird spending most of his time in July and August within five miles of the nest site while intermittently making longer flights (up to 55 miles) into various portions of the eastern MOA (Figure 3-24). On September 3rd, he started traveling north beyond the MOA and remained approximately 50 miles from the northern boundary in the vicinity of Lund, NV. Flight altitudes ranged consistently between 1,500 2,000 feet with periodic increases above 2,500 feet beginning in August and likely associated with the longer distance flights (Appendix G). After September 15th his signal stopped transmitting approximately 7 miles due west of Lund. This bird was also recovered by Joe Barnes of NDOW on October 16th. The cause of death was not available for inclusion in this report.

North Pahroc Nestling Female, PTT 136626 - Deployed on the 7-week old female nestling at the "North Pahroc" Range nest May 23, 2014. GPS locations, 1,510 in total, were received beginning the next day through the end of the study period in October 2014. Similar to her sibling, there was a gap in data from May 29th until the beginning of July, also likely due to feather coverage affecting battery charge. Similar to her sibling, data shows this bird spending most of her time in July and August within close proximity of the nest site while intermittently making longer flights into various portions of the eastern MOA. However, her movements around the nest remained within a tighter radius and travels away were less frequent and ranged within a smaller distance from the nest (<20 miles) up until late August (Figure 3-25). By late August, she moved just north of the MOA into the White River Valley where she remained until September 1st. After which she traveled approximately 60 miles northwest to reside in the mountains and valleys near Eureka, NV through the end of the study period. Flight altitudes range between 1,500 2,000 feet in July and August and increased above 2,000 feet as she moved north (Appendix G). It is presumed that she was alive and well at the conclusion of the current study.

North Pahroc South Nestling Female, PTT 136625 - Deployed on the 7.5-week old female nestling at the North Pahroc Range South nest May 23, 2014. The nest is located approximately six miles southwest of the North Pahroc nest (Figure 3-3). GPS locations, 683 in total, were received beginning the next day through the end of the study period in October 2014, with a data gap during the month of July that may be attributed to low battery voltage and feather coverage. This bird's 95% Home Range encompasses an area that does not extend more than seven miles beyond her nest site (Figure 3-26). Even late October GPS locations were recorded less than ¼ mile from the nest. All of her movements have been within the boundaries of the MOA with the exception of a single trip to the northeastern corner of the NTTR in late September. Travel beyond her 95% Home Range has been infrequent and has not exceeded 40 miles. At the conclusion of the study period she was alive and still residing in the portion of the MOA immediately surrounding the nest site. Flight altitudes range primarily between 1,500 2,000 feet, although several over the study period are at approximately 200 feet above ground level.

3.4.2 Nest Surveys

Eleven territories were found to be occupied by active nests that successfully produced 16 total young during the 2013 NTTR nest surveys (Figure 3-19). These territories were determined to be successful based on observations of adult golden eagle pairs and chicks within active golden eagle nests during the 2013 breeding season.

A total of 22 occupied golden eagle territories were documented during the 2014 helicopter surveys of NTTR (Figure 3-20). Seven territories were newly documented in 2014. Seven nests are located to the southeast, and fourteen are in the northwest. One nest is located outside the range boundary but within the MOA. All other nests are located within the range boundaries. These territories were determined to be occupied based on observations of adult golden eagle pairs, as well as active and maintained golden eagle nests during the 2014 breeding season. Of these territories, 11 were determined to have active nests in 2014. No breeding was observed within the other territories. Six of the 11 nests were successful and a total of 7 chicks were observed. Two nests were determined to have failed and three are listed as unknown outcome due to accessibility issues. Details for each territory are summarized in Table 3-12.

Table 3-12.
Synopsis of NTTR 2014 GOEA Survey Results

2014 Summary	Total
# Confirmed Occupied Territories*	22
# Unconfirmed Territories**	0
# Nest Determined to be Active	11
# Determined to be Successful	6
# Unable to Determine Success	3
# young observed	7

2014 Occupied Territories, NTTR	Status	Outcome	# chicks
N4	Active	Unknown outcome	Unknown
N5	Occupied	No breeding	0
N11A	Occupied	No breeding	0
N17	Active	Successful	1
N28	Occupied	No breeding	0
N38	Active	Successful	1
N35C	Active	Successful	2
N47	Active	Successful	1
N48	Occupied	No breeding	0
N49A	Occupied	No breeding	0
N50	Occupied	No breeding	0
N51	Occupied	No breeding	0
N52	Occupied	No breeding	0

Table 3-12.
Synopsis of NTTR 2014 GOEA Survey Results (Cont.)

2014 Occupied Territories, NTTR	Status	Outcome	# chicks
N53	Occupied	No breeding	0
N54	Occupied	No breeding	0
S10A	Active	Failed	0
S83A	Active	Unknown outcome	Unknown
S25B	Active	Successful	1
S43B	Active	Failed	0
S24	Occupied	No breeding	0
S35	Active	Unknown outcome	Unknown
S53	Active	Successful	1

Notes:
* Based on observations of adult GOEA pairs, active and maintained GOEA nests during the 2014 breeding season
** Based on adult GOEA observed not associated with or proximal to active or maintained nests.

3.4.3 Bait Stations

Four bait stations were installed on NTTR (Figure 2-5) that provided photo data for July/August 2013 through December of 2013. Two stations were installed on the North Range (1 and 2) on June 29, 2013 and two on the South Range on July 28, 2013 (3 and 4).

A review of motion-triggered photographs revealed that the highest number of golden eagle visits (13) occurred at Station 2 during November and December. Station 1 followed Station 2 with two golden eagle recordings during November and December as well. Overall, the bait stations attracted a large variety of predators and other wildlife including a bobcat (*Lynx rufus*), kit fox (*Vulpes macrotis* sp.), white-tailed antelope squirrel (*Ammospermophilus leucurus*), Say's phoebe (*Sayornis saya*), and jackrabbit (*Lepus* sp.). The most common visitors were coyotes, white-tailed antelope squirrels, and common ravens.

Due to accessibility issues, the camera at Station 3 only provided photo data during the month of September 2013. No golden eagles were observed visiting this Station during that time frame. Station 4 had little success with attracting golden eagles, as the bait was preyed upon by common ravens, coyotes, and kit foxes only. No golden eagles were observed at this station for the entire monitoring period.

White-tailed antelope squirrels were frequent visitors to Station 2. Station 3 detected only common ravens, turkey vultures, and coyotes. Kit fox were regular visitors to Station 4. The most variety was observed at stations 1 and 2, with several different passerine sightings of western bluebirds, Say's phoebes, an unknown sparrow species, and loggerhead shrikes. A single bobcat (*Lynx rufus*), one kangaroo rat *(Dipodomys sp.*), one kit fox, an unknown cottontail rabbit (*Sylvilagus* sp.), and two chipmunks (*Neotamis* sp.) were observed at Station 2. Black-tailed jackrabbits (*Lepus californicus*) were documented visiting Station 1 over the monitoring period. A summary of the findings for each station is provided in Table 3-13. Representative photos are provided in Appendix E and F.

Table 3-13.
NTTR Bait Station Summary July 2013- December 2013

Species	Station 1	Station 2	Station 3	Station 4
Golden Eagle	2	13	0	0
Turkey Vulture	14	23	2	0
Common Raven	31	3	27	51
Loggerhead Shrike	3	0	0	0
Say's Phoebe	2	0	0	0
Western Bluebird	6	0	0	0
Unknown Sparrow Species	1	0	0	0
Coyote	70	21	22	18
Kit Fox	0	1	0	26
White-tailed Antelope Squirrel	1	94	0	0
Black-tailed jackrabbit	7	0	0	0
Unknown Kangaroo Rat Species	0	1	0	0
Bobcat	0	1	0	0
Pronghorn	1	0	0	0
Unknown chipmunk species	0	2	0	0
Unknown cottontail rabbit species	0	1	0	0

3.5 Melrose Air Force Range

3.5.1 Telemetry

No transmitters were deployed in New Mexico. Based on historical and reconnaissance data, one winter migrant golden eagle was known to inhabit the MAFR study area. Additional eagles were observed during the 2012/2013 winter season on land adjoining MAFR that was recently gifted to the AF from the State of New Mexico. An attempt was made to trap these wintering individuals in early 2013; however biologists were unsuccessful in capturing any golden eagles at MAFR. As these birds were winter migrants and no active golden eagle nest sites were found within MAFR or the Restricted Airspace during further survey efforts, additional trapping efforts were not pursued as they were not likely to be successful without the presence of resident birds.

3.5.2 Aerial Nest Surveys

Five golden eagles were observed perching or flying through MAFR during the winter helicopter reconnaissance in January 2013. No golden eagles were observed during the follow up nest survey in March. Several other raptor species and small stick nests were observed, although none were considered potential golden eagle nests based on their size. Due to the lack of suitable eagle nest habitat, no further helicopter surveys were conducted.

3.5.3 Point Count Surveys

Monthly surveys of the established roadside transect survey route, including point count stations, were conducted at MAFR and the associated Restricted Airspace as shown in Figure 2-6. Surveys were conducted from August 2013 through April 2014 to capture the time period that resident migrant golden eagles were assumed to be away from breeding territories and more likely to be detected at MAFR. Raptor species observed during these point counts included the following: golden eagle, northern harrier, rough-legged hawk, merlin, American kestrel, red-tailed hawk, Swainson's hawk, prairie falcon, zone-tailed hawk, turkey vulture, Cooper's hawk, ferruginous hawk, burrowing owl, barn owl, great-horned owl, and long-eared owl.

Golden eagles were only observed during the October, December, and February surveys, at eight different point count locations as shown on Figure 3-27. A total of nine golden eagles were observed during the surveys and most observations were made on the eastern portion of lands within the MAFR boundaries. Golden eagle observation dates, age, and behavior during observation are provided in Table 3-14.

Table 3-14.
Golden Eagles Observed During MAFR Transect and Point Count Surveys

Survey Date	Transect/Point Count Location	UTM	Age	Behavior
October 26, 2013	A043	622628; 3790415	Adult	Perched
December 6, 2013	A051	616919; 3794888	Adult	Perched
December 6, 2013	A052	No data	Juvenile	Circling
December 20, 2013	A057	No data	Adult	Hunting/Foraging
December 20, 2013	A063	622379; 3792209	Adult	Perched
February 20, 2014	A066	617790; 3794900	Juvenile	Perched
February 20, 2014	B3	604864; 3796348	Juvenile	Soaring
February 21, 2014	D079	623682; 3824046	Juvenile	Perched
February 21, 2014	D079	623682; 3824046	Juvenile	Hunting/Foraging

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4.0 SUMMARY AND CONCLUSIONS

4.1 Saylor Creek Range/Juniper Butte Range

4.1.1 Nesting and Productivity

Only limited nesting habitat is available within the SCR/JBR and Restricted Airspace boundaries. Nest habitat is located primarily within the large river gorge canyons that are present just outside of range boundaries within the Restricted Airspace. During 2013 and 2014 seven different occupied territories were documented. No nest sites were found to be active on JBR in 2013. Only one nest site, Browns Canyon-Saylor Creek, was determined to be active in 2013 on the SCR. However, this nest failed and no chicks were produced. Two nest sites were found to be active on SCR and one on JBR in 2014. All of these nests failed and no chicks were produced. Therefore, no chicks were produced at SCR/JBR during the two year study.

4.1.2 Telemetry

The following eagles were captured on SCR and CTT transmitters attached in February/March 2013:

- Bruneau Plain female
- Bruneau Canyon female
- Browns Canyon/Saylor Creek male

The Bruneau Plain female's activities were widespread and she did not show a particular affinity for use of the SCR/JBR lands as compared to other surrounding habitats. The Bruneau Canyon female rarely strayed beyond the canyon located within the Restricted Airspace just west of the SCR where her nest site is located. The Saylor Creek male's nest site is located within the northern portion of SCR and extensive data on movement patterns was captured during the study period. During the breeding season activity is concentrated at the nest site and moves farther beyond the range boundaries as the summer progresses. The northern and eastern portions of the SCR and area immediately surrounding the nest site appear to be important to sustaining this pair of eagles.

4.1.3 Prey Item Analysis

The primary prey items supporting the Saylor Creek nest site are rodents, rabbits, and jackrabbits. However, a variety of prey remains were found in the nest indicating opportunistic foraging habits.

4.1.4 Bait Stations

All bait stations recorded eagles during the fall, winter, and spring months when eagles would be traveling longer distances from nest sites and migrating through the area. A similar number

of distinct eagle records were made at each station (11, 12, and 13 eagles), with the exception of Station 4 (4 eagles). This was likely due to it is malfunction from December through February. It is difficult to determine if these captures are of resident eagles with nest territories in the vicinity versus migrants. Station 1 was the closest to the Saylor Creek pair who made up at least one-third of the visits to this Station.

4.1.5 Conclusions

Based on the nest survey data, it can be concluded that at least seven golden eagle pairs occupy the SCR/JBR and associated restricted airspace during the nest season. Telemetry and bait station data shows that the nesting pairs rely on these lands in the non-breeding season as well with varying degrees of nest site fidelity during that time. The prey base is primarily rodents and lagomorphs and it is assumed that a portion of the bait station detections are non-resident eagles that also forage on AF range lands. The Saylor Creek pair did supplement their diet with a variety of other animals including birds. Lack of productivity of the nest sites at SCR/JBR may be linked to prey populations but requires more investigation. Flight patterns of telemetered eagles reflect that altitudes between 1,000 to 1,500 feet are most common in this landscape.

4.2 Utah Test and Training Range

4.2.1 Nesting and Productivity

Of the 28 occupied golden eagle territories at UTTR, 21 were determined to have active nests in 2013. No breeding was observed within the other territories. Eleven of these nests were successful and a total of 15 chicks were observed between them. Of the 37 occupied golden eagle territories at UTTR, 23 were determined to have active nests in 2014. No breeding was observed within the other territories. Eleven of these nests were successful and a total of 13 chicks were observed between them.

4.2.2 Telemetry

The following seven eagles were captured on UTTR or the surrounding Restricted Airspace and transmitters attached in 2013 and 2014:

- Charlie male (CTT – unit failed after a few months)
- Cathedral male (PTT)
- Bravo male (PTT)
- West Knoll male (PTT)
- Gold Hill female (PTT)
- Clive Skull female (CTT)
- Grassy Mountain male (PTT)

All of these birds were captured within their nest territories. The telemetry data shows movement pattern variability but the tendency is for both male and female birds to stay within close proximity (<5 miles) of nest sites during the breeding period, particularly early in the breeding season, with movements afar increasing as the breeding season progressed. The timing (e.g. June vs. August), distance of movement (30 vs. 140 miles), and direction of travel varied by individual.

4.2.3 Prey Item Analysis

Based on the prey item analysis and field observations jackrabbits are the primary prey source for nesting golden eagles at UTTR.

4.2.4 Bait Stations

Only one golden eagle was detected at the UTTR bait stations during the breeding period and it was captured at the end in late August. From October through April, golden eagles were documented regularly at all six bait stations. Stations 1, 2, and 3 (60, 70, and 72, respectively), which were placed in a portion of the North Range where several nest territories are concentrated, captured the most eagles. It is difficult to determine if these captures are of resident eagles with nest territories in the vicinity versus migrants. Given the number of distinct records, it is presumed that several nonresident eagles were documented as they moved through the area in the non-breeding season.

4.2.5 Conclusions

Based on the nest survey data, it can be concluded that at least 37 golden eagle pairs occupy the UTTR and associated restricted airspace during the nest season. Telemetry and bait station data shows that the nesting pairs rely on these lands in the non-breeding season as well with varying degrees of nest site fidelity during that time. UTTR is a productive range for nesting eagles with several successful nests. Availability of jackrabbits to prey upon is likely closely tied to nest success rates. Movement patterns indicate that habitats within a few miles of nest sites are very important to the success of nesting pairs, particularly in the early part of the nest season. Bait station data indicates that many non-resident and migrating birds also utilize these lands for winter foraging or dispersal. Flight patterns of telemetered eagles reflect that altitudes around 1,300 feet are most common in this landscape. Although higher altitude flights 2,500-4,500 feet were frequent for some individuals.

4.3 Nevada Test and Training Range

4.3.1 Nesting and Productivity

Eleven active nests successfully produced 16 chicks on NTTR in 2013. Of the 22 occupied golden eagle territories at NTTR, 11 were determined to have active nests in 2014. No breeding was observed within the other territories. Six of the eleven nests were successful and a total of 7 chicks were observed. The majority of the successful nests are located on the NTTR North Range.

4.3.2 Telemetry

The following five nestlings were captured on the NTTR MOA and transmitters attached in 2014:

- Beatty Wash nestling female (PTT)
- Beatty Wash nestling male (PTT)
- FWS North Pahroc nestling male (PTT)
- FWS North Pahroc nestling female (PTT)
- FWS North Pahroc South nestling female (PTT)

Telemetry data consistently shows nestlings remaining close to their nest sites (<5 miles) within the first two months after fledging. There is individual variation during this time with some birds making periodic trips 20-50 miles beyond the immediate nest area. Four of the five nestlings began long distance dispersals from the nest starting in late August or early September, traveling hundreds of miles to new territories to the north and east. None of these birds returned to the nest site after dispersal. In contrast, one nestling remained within the immediate vicinity of her nest site and did not disperse during the study period.

4.3.3 Bait Stations

Of the four bait stations, only 1 and 2 on the North Range detected golden eagles. Most golden eagle observations were recorded in the months of November and December. Station 2 (13) resulted in more detections than Station 1 (2). These stations are close to two occupied nest territories and were likely visited by those pairs, however it is expected that non residents flying through the area during these months are reflected by the data.

4.3.4 Conclusions

At least 22 occupied golden eagle nest territories are present on NTTR, with the majority occurring the North Range. Wintering non-residents are also presumably utilizing the North Range based on several bait station detections. The North Range supports more eagles than the South Range likely due to prey availability; however, prey analysis could not be completed as part of this study. Accessibility limited the ability to collect prey remains from nests and transmitter birds on the range itself; therefore, data on movement patterns of the breeding pairs could not be obtained. Information on movement patterns of nestlings produced in the MOA indicate that their nest sites and the surrounding lands within approximately 50 miles are important to their maturation during the first two months of fledging. After which most dispersed outside of the NTTR and the MOA onto non AF lands. However, one nestling did remain on the MOA and it may become her established home range. None of fledglings spent a substantial portion of time on the NTTR itself and the lands were primarily used as a dispersal route east. Flight patterns of the juvenile eagles reflect that altitudes between 1,500 to 2,000 feet are most common in this landscape.

4.4 Melrose Range

Helicopter nest surveys were conducted in spring 2013 at MAFR; however, no golden eagle territories were observed. It was determined that no suitable nest habitat is present within MAFR and no further helicopter surveys were conducted in 2014. Trapping at MAFR was attempted but was unsuccessful as only wintering birds were present on site due to a lack of suitable nest habitat. Additional trapping efforts had limited likelihood of success at MAFR therefore telemetry efforts were concentrated at the other ranges as discussed in this report. Point count surveys resulted in the detection of nine golden eagles in fall and winter. Two eagles were typically observed during each survey in this time period. Behaviors varied between perching, foraging, and soaring. Based on point count data that was collected at regular intervals from August through April, the MAFR and surrounding Restricted Airspace is important wintering habitat for golden eagles however it is not likely of particular value during the nest season.

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5.0 RECOMMENDATIONS

Given the prevalent use by golden eagles of Western AF Ranges examined in this study, it is recommended that operations and new construction or development consider potential effects to the species (in accordance with the federal Bald and Golden Eagle Protection Act) and effects of species presence and flight behavior on military assets (namely aircraft). Below is an overview of the golden eagle study findings and associated recommendations that may help guide compliance:

- The area within 5 miles of nest sites is most important to golden eagles for daily activities during the early part of the nesting season (February-June). Programming for construction activities or other ground disturbance should carefully consider potential impacts to this zone and seasonal sensitivity.
- Depictions of the 5-mile zones around territories occupied in 2014 are provided in Figures 5-1, 5-2, and 5-3. Continued monitoring of occupied and active nest sites at each AF Range is recommended to adaptively manage the population and update this mapping based on annual fluctuations in occupancy.
- Based on the telemetry data, the 1,000 -2,000 foot altitude range is most frequently utilized by eagles in flight. It is recommended that this vertical flight zone be taken into consideration when planning flight operations near active golden eagle territories, particularly within 5 miles of active nest sites.

The USFWS does not advocate the use of any particular conservation measures but rather provides recommendations in their *Eagle Conservation Plan Guidance* document (USFWS 2013). Project developers or operators may propose and implement site-specific conservation measures in cooperation with local USFWS representatives in order to meet the regulatory standard of reducing take to a level that is unavoidable.

General conservation measures recommended by the USFWS (2013) for consideration in planning new facility construction and continuing operations that may apply to AF Ranges include:

- Heightened awareness mechanisms / training for pilots – particularly during the nesting season
- Training of any construction staff with respect to identification of eagles and limiting / eliminating eagle attractants (e.g., food waste)
- Site new structures away from high eagle use areas and the flight zones between them.
- Follow the Avian Power Line Interaction Committee (APLIC) guidance on new power line construction and design (APLIC 2006).

- Avoid construction designs that increase the risk of collision, such as meteorological towers and guy wires. If guy wires are used, mark them with bird flight diverters (according to the manufacturer's recommendation).
- Take actions to reduce vehicle collision risk to wildlife by removing carcasses from roads that may be attractive to golden eagles (*e.g.* deer, livestock, etc.).

Instruct personnel and visitors to drive at low speeds (< 25 mph) and be alert for wildlife, especially in low visibility conditions.

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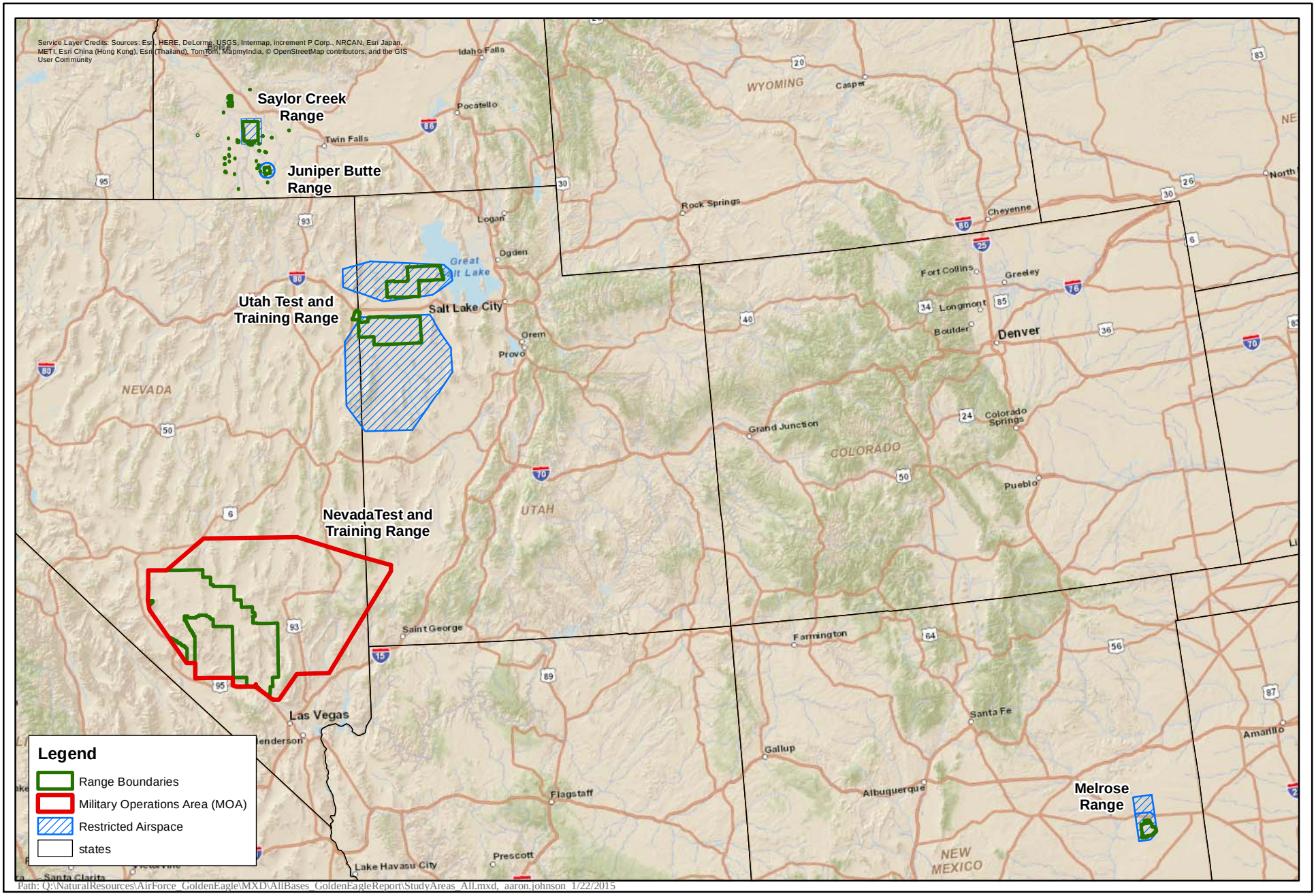
Wand & Jones 1995. Kernel Smoothing (book).

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APPENDIX A

FIGURES

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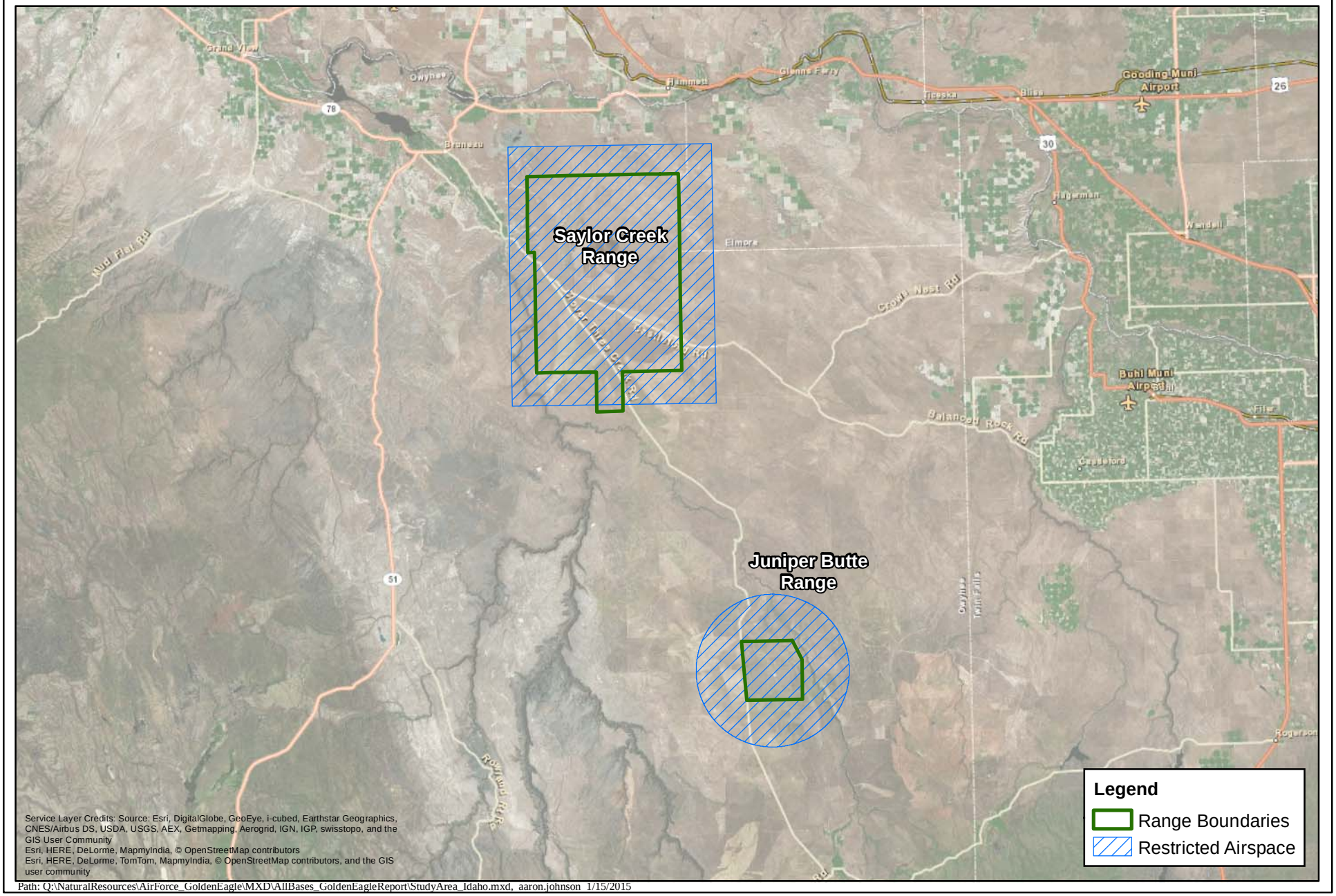
amec

Location of Study Areas
Golden Eagle Study
Western Air Force Ranges

1 inch = 100 miles
0 50 100 Miles

N

FIGURE
1-1



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\StudyArea_Idaho.mxd, aaron.johnson 1/15/2015

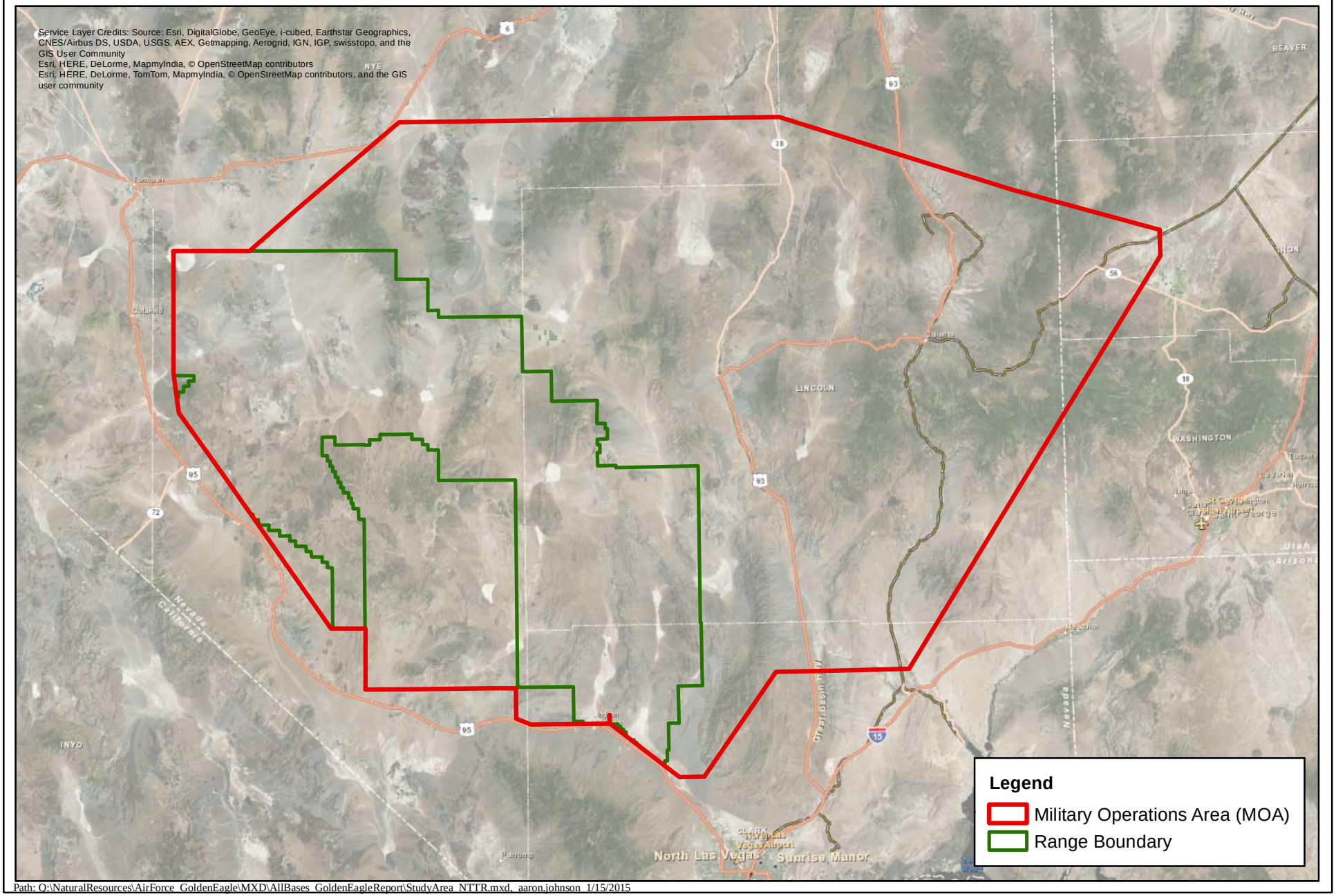
amec

Saylor Creek/Juniper Butte Ranges, Mountain Home AFB, Idaho
Golden Eagle Study
Western Air Force Ranges

1 inch = 10 miles
0 4.75 9.5
Miles

N

FIGURE
1-2a



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\StudyArea_NTTR.mxd, aaron.johnson 1/15/2015

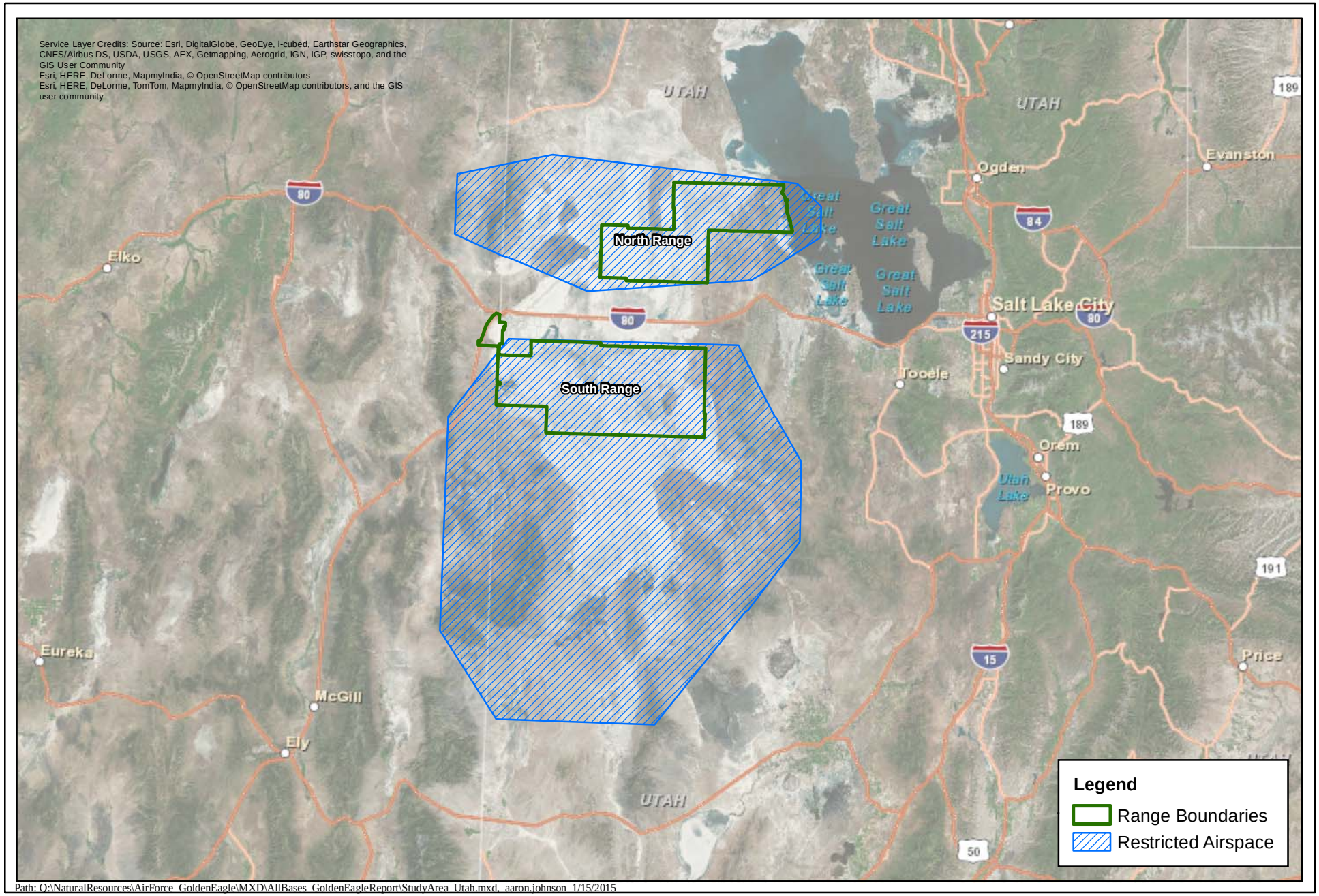
amec

Nevada Test and Training Range, Nellis AFB, Nevada
Golden Eagle Study
Western Air Force Ranges

1 inch = 25 miles
12.5 6.25 0 12.5 Miles

N

FIGURE
1-2b



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\StudyArea_Utah.mxd, aaron.johnson 1/15/2015

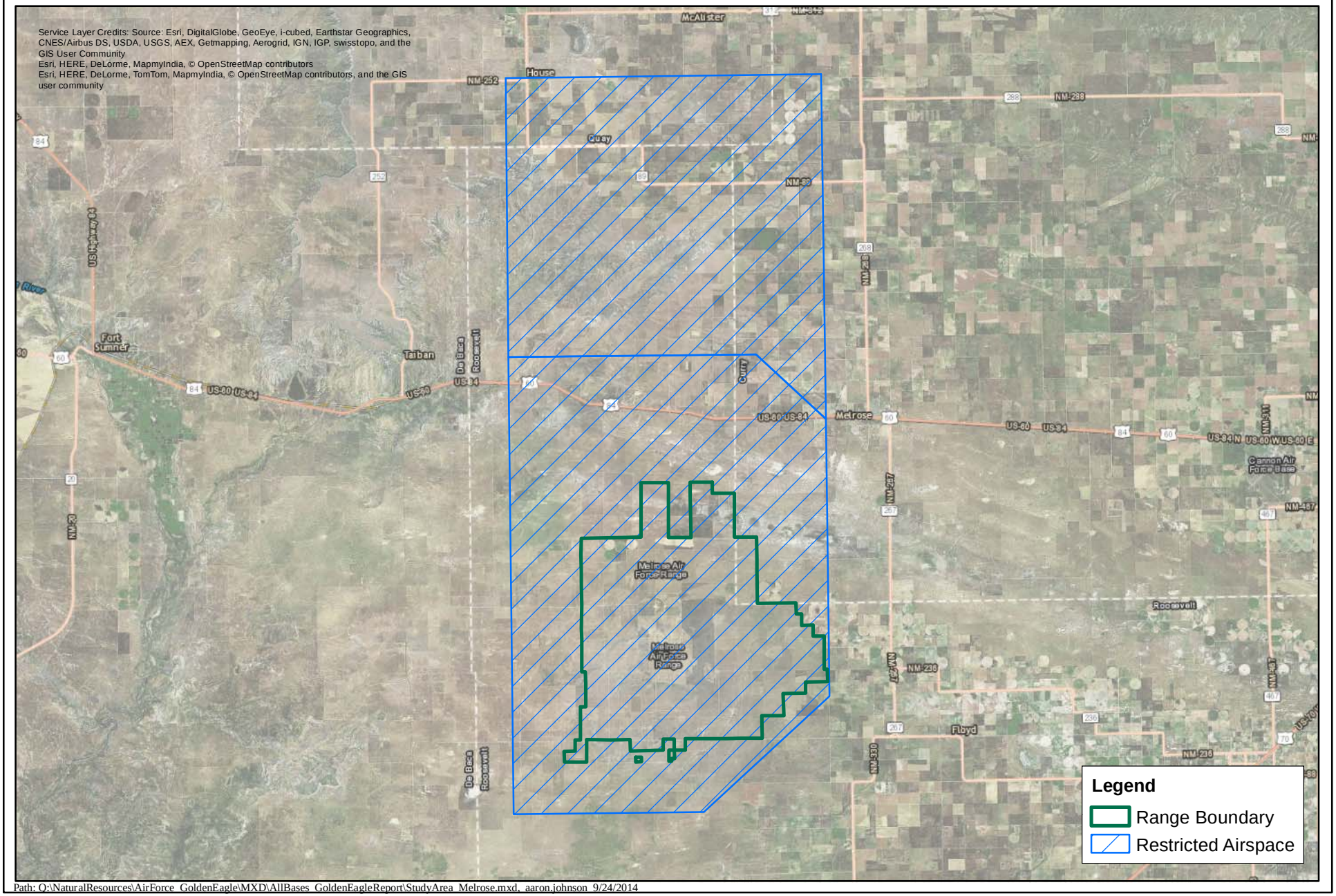
amec

Utah Test and Training Range, Hill AFB
Golden Eagle Study
Western Air Force Ranges

1 inch = 30 miles
0 15 30 Miles

N

FIGURE
1-2c



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\StudyArea_Melrose.mxd, aaron.johnson 9/24/2014

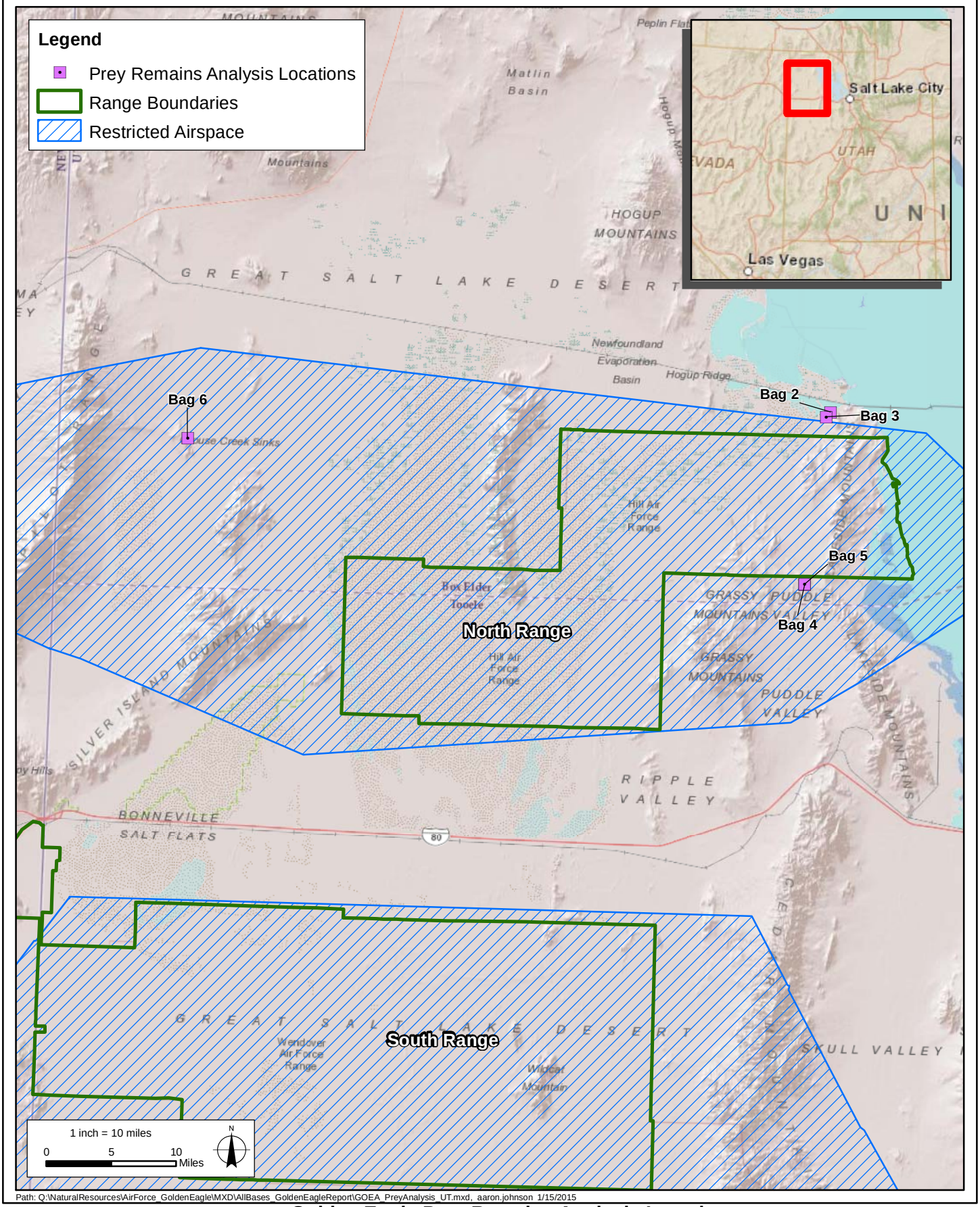
amec

Melrose Range, Cannon AFB, New Mexico
Golden Eagle Study
Western Air Force Ranges

1 inch = 6 miles
0 3 6 Miles

N

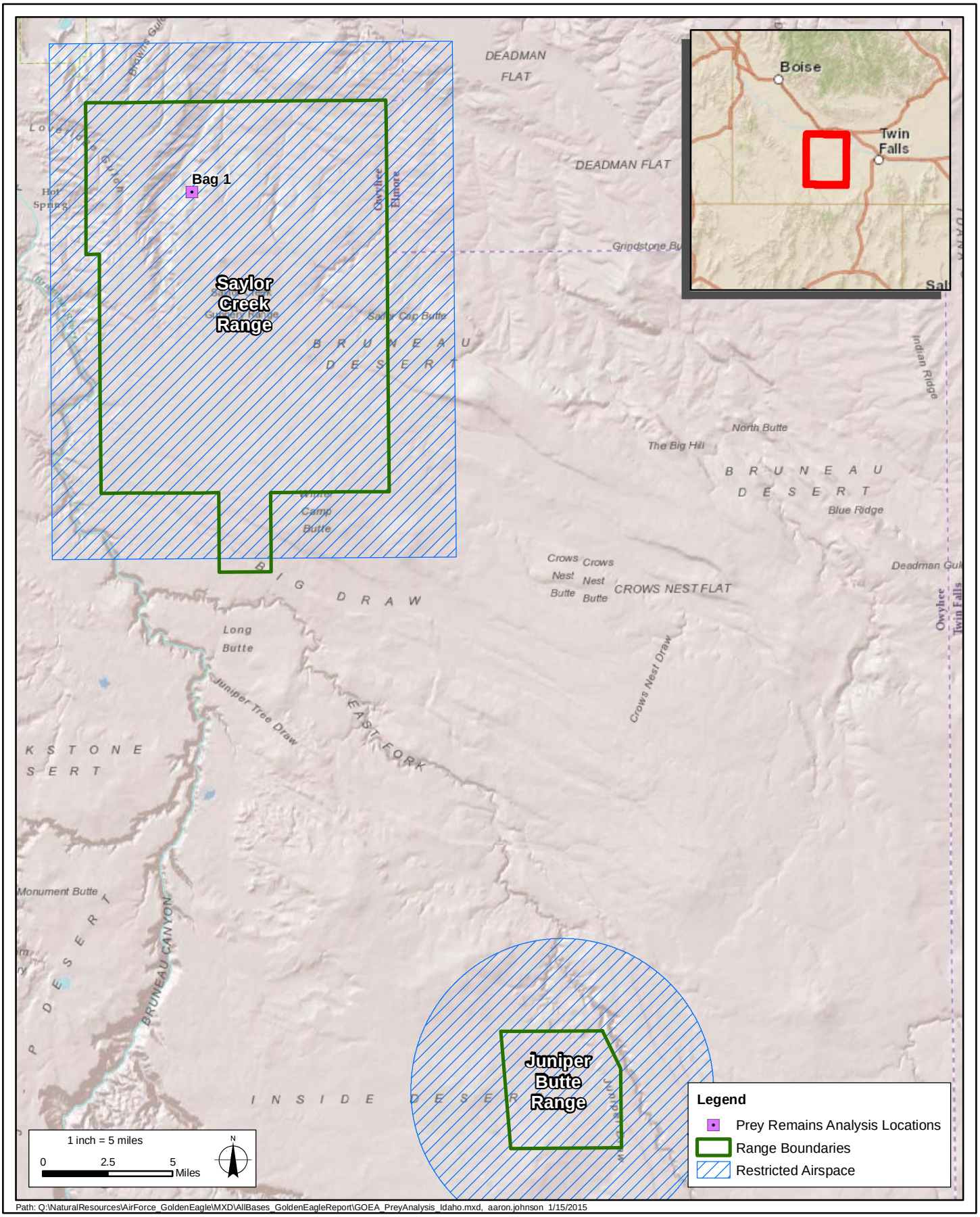
FIGURE
1-2d



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\GOEA_PreyAnalysis_UT.mxd, aaron.johnson 1/15/2015

Golden Eagle Prey Remains Analysis Locations
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

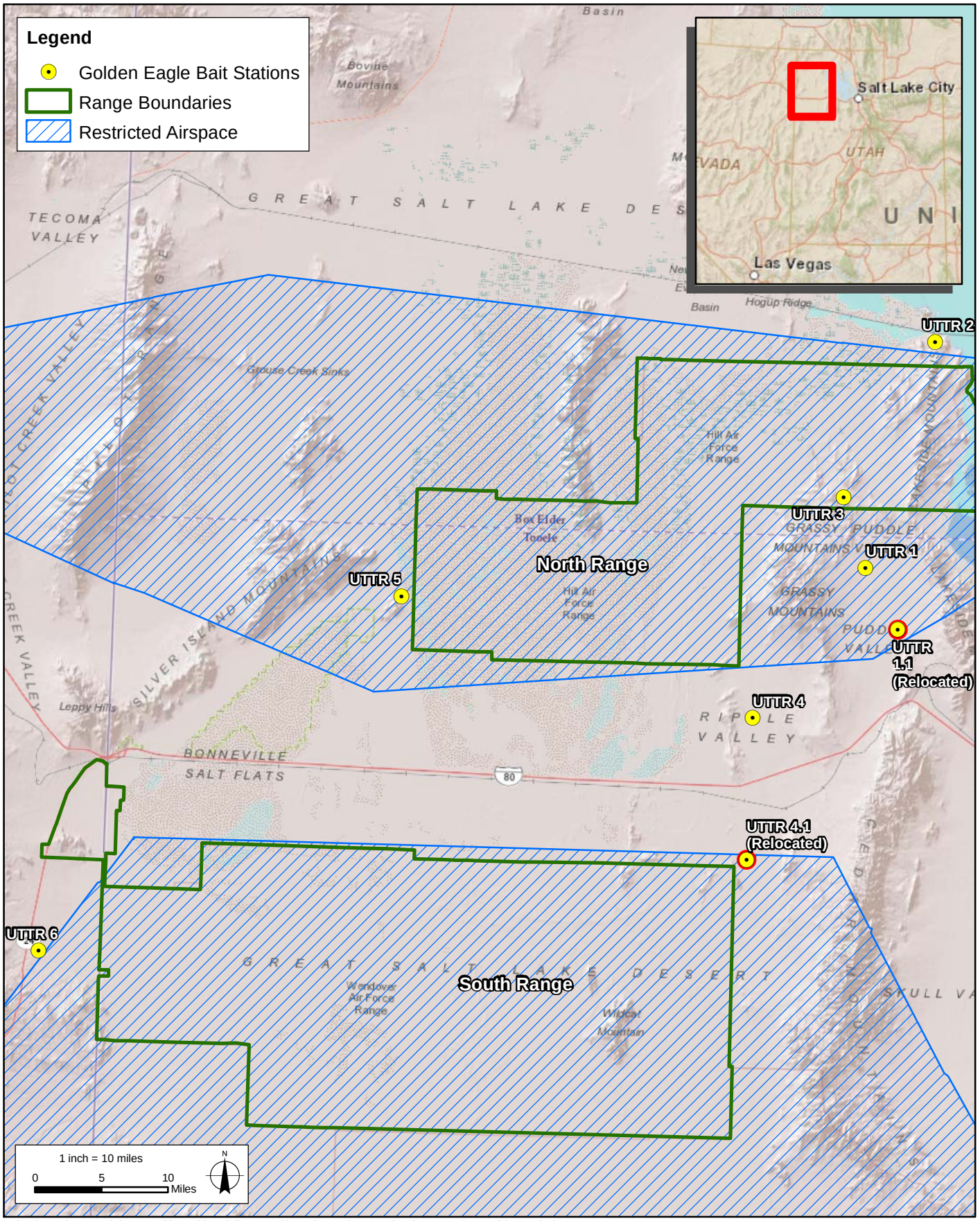
FIGURE 2-1



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\GOEA_PreyAnalysis_Idaho.mxd, aaron.johnson 1/15/2015

Golden Eagle Prey Remains Analysis Locations
Mountain Home AFB, Idaho
Golden Eagle Study
Western Air Force Ranges

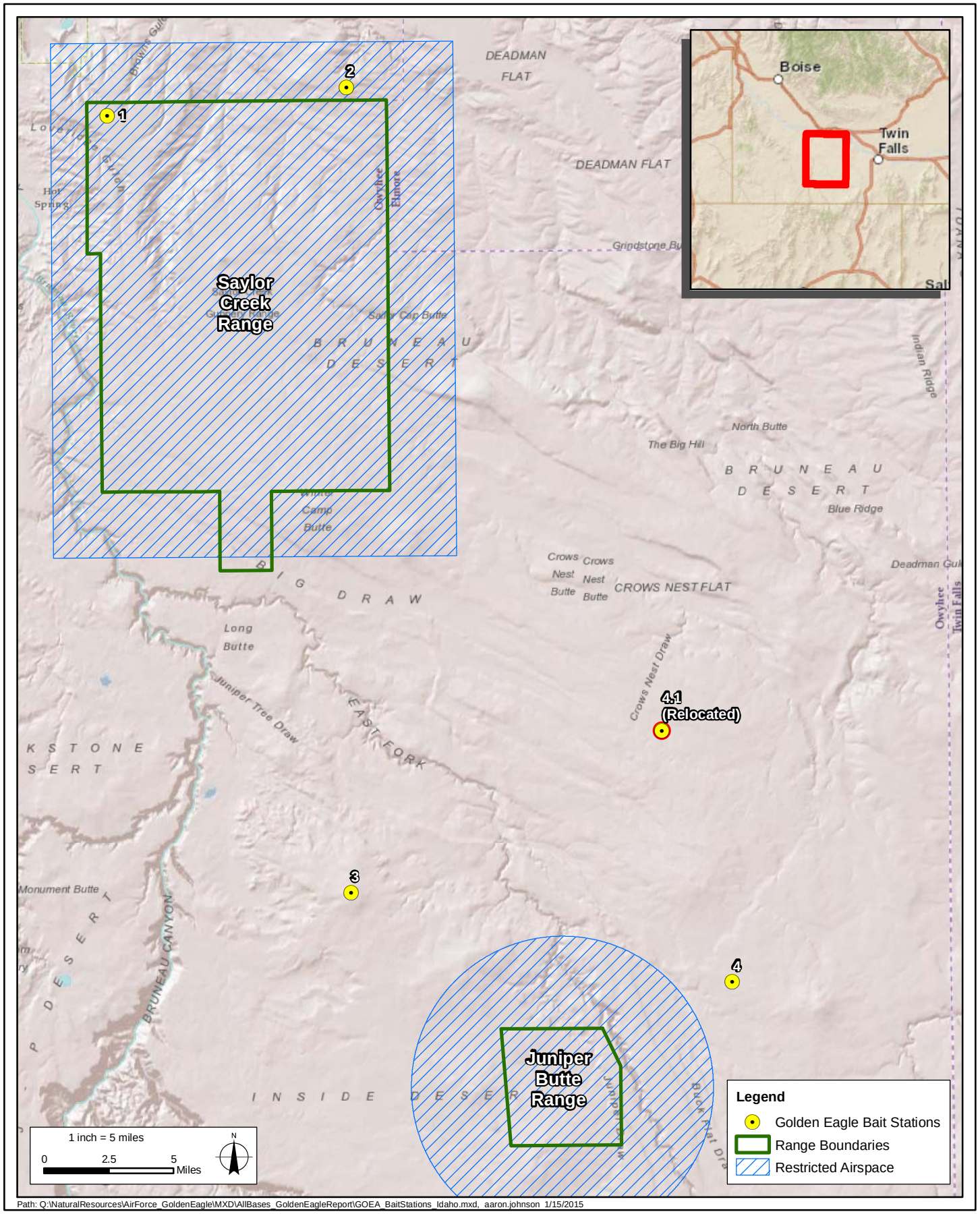
FIGURE
2-2



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Golden Eagle Bait Station Locations
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

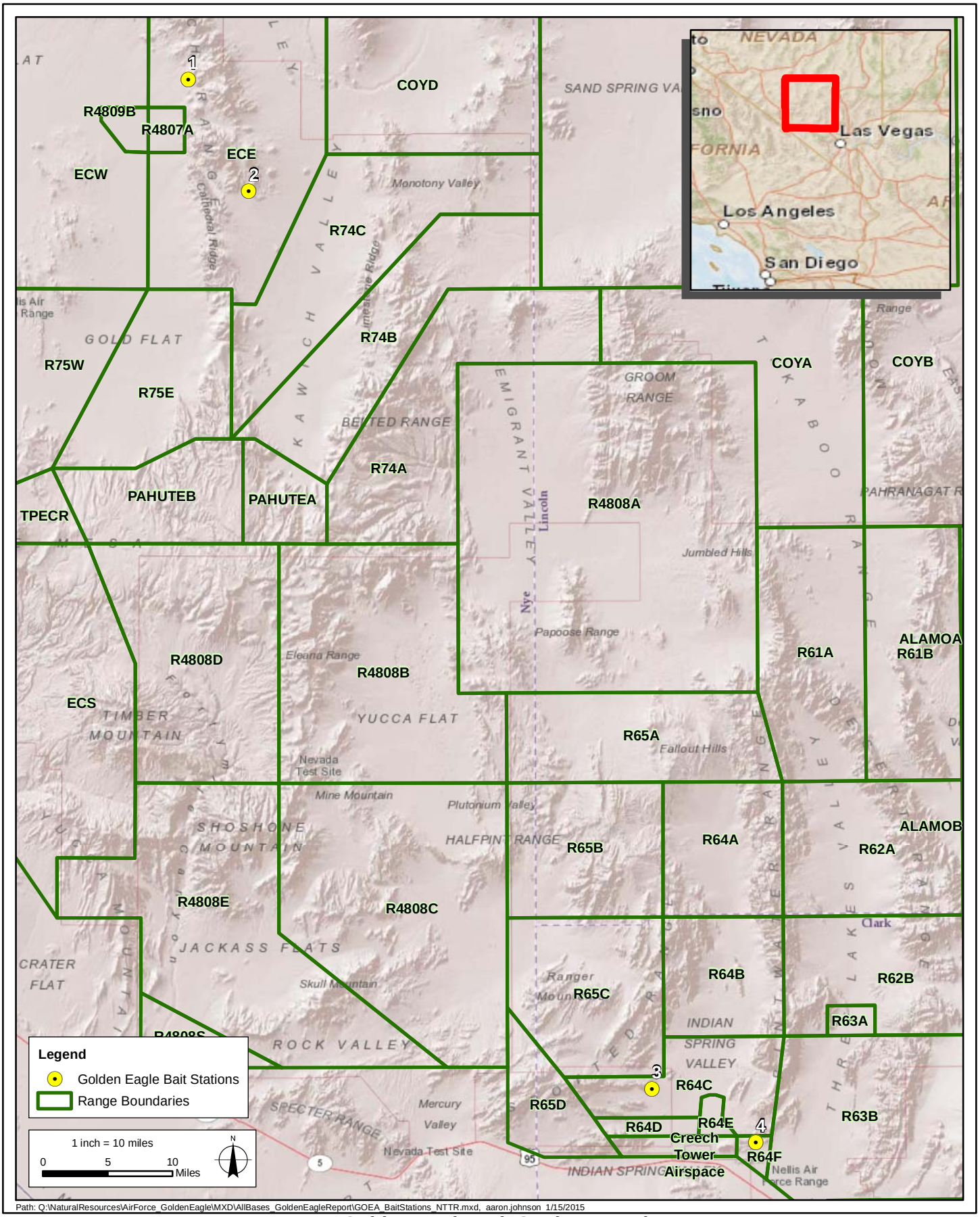
FIGURE 2-3



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\GOEA_BaitStations_Idaho.mxd, aaron.johnson 1/15/2015

Golden Eagle Bait Station Locations
Mountain Home AFB, Idaho
Golden Eagle Study
Western Air Force Ranges

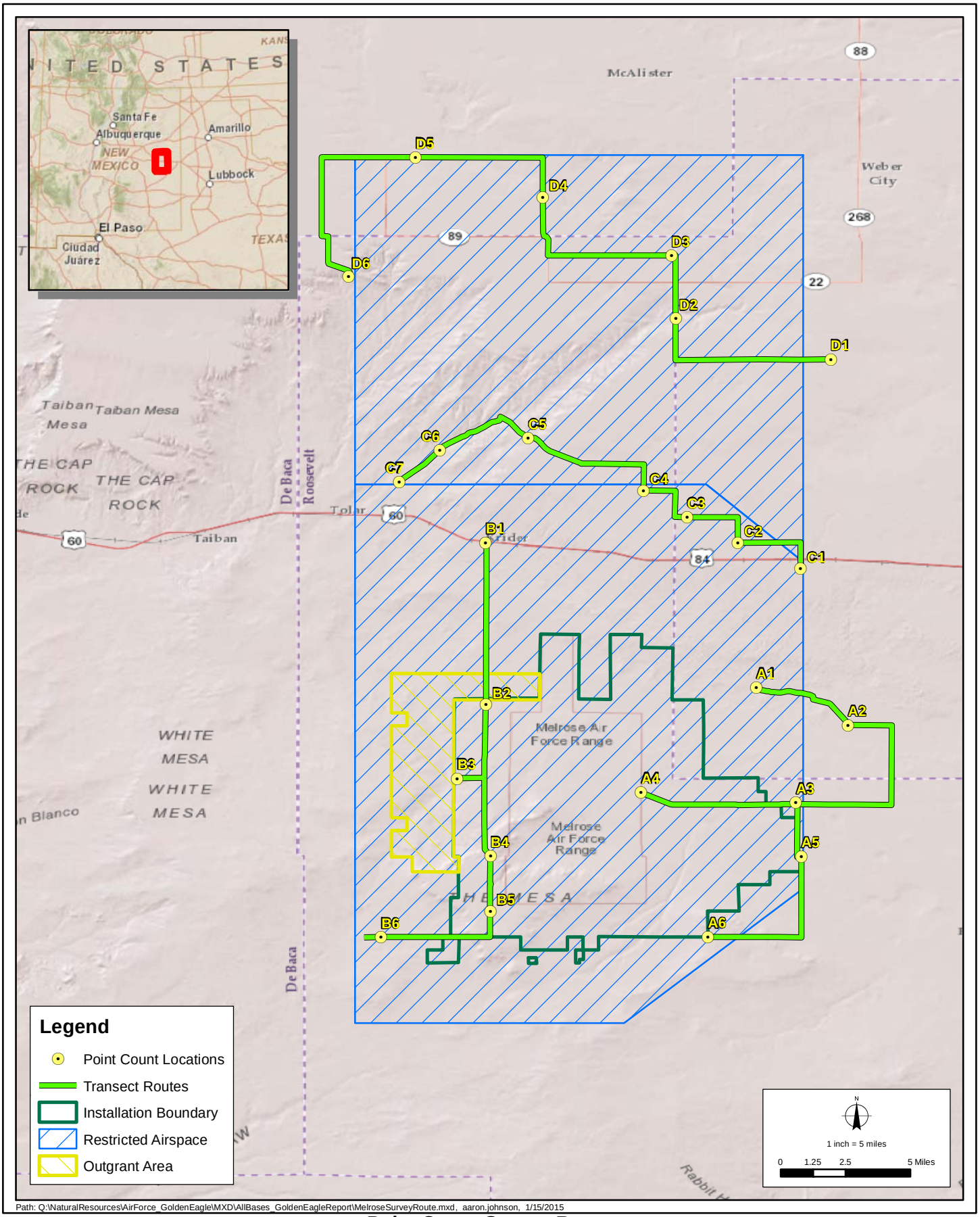
FIGURE
2-4



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\GOEA_BaitStations_NTTR.mxd, aaron.johnson 1/15/2015

Golden Eagle Bait Station Locations
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

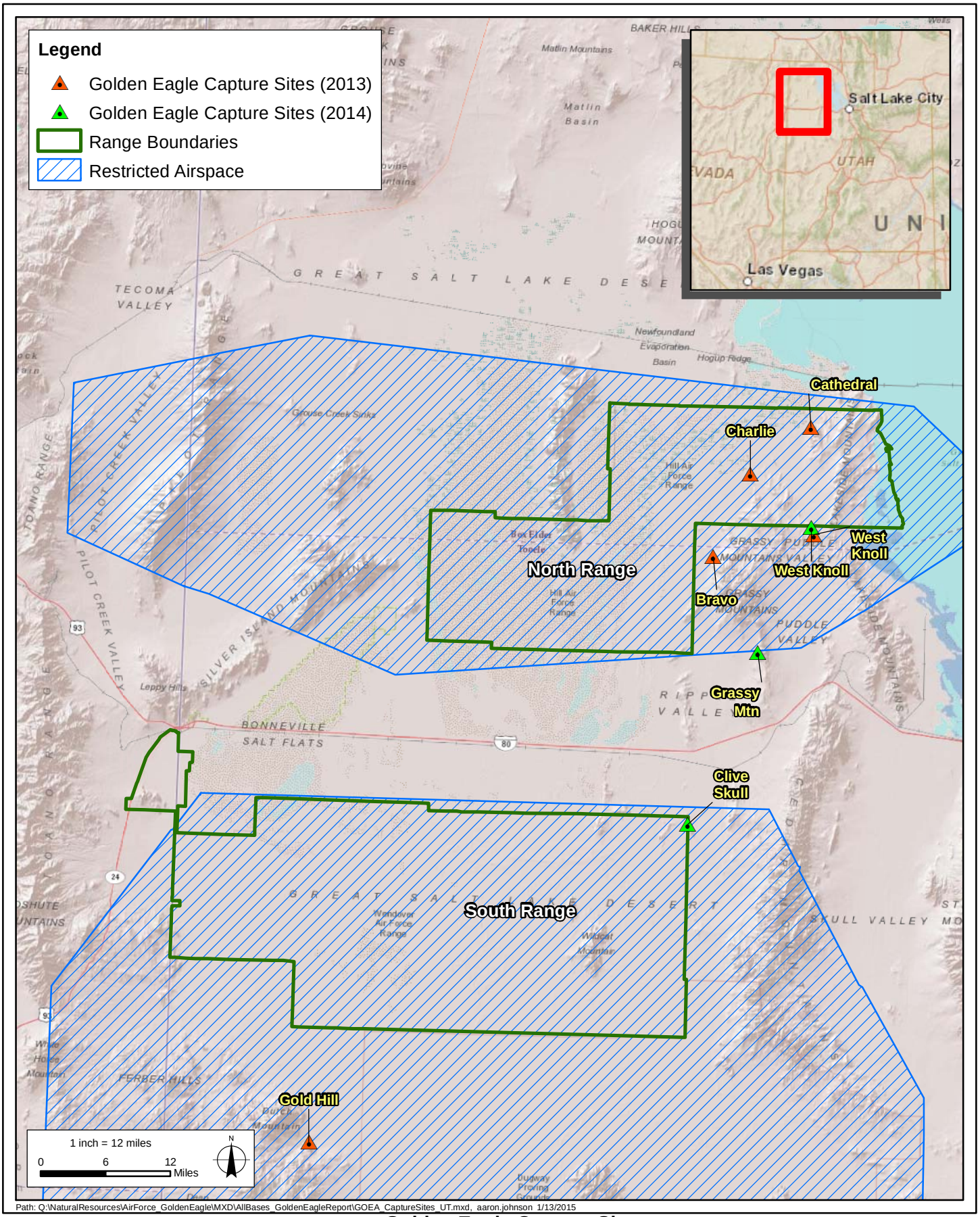
FIGURE
2-5



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Point Count Survey Route
Melrose Range, Cannon AFB, New Mexico
Golden Eagle Study
Western Air Force Ranges

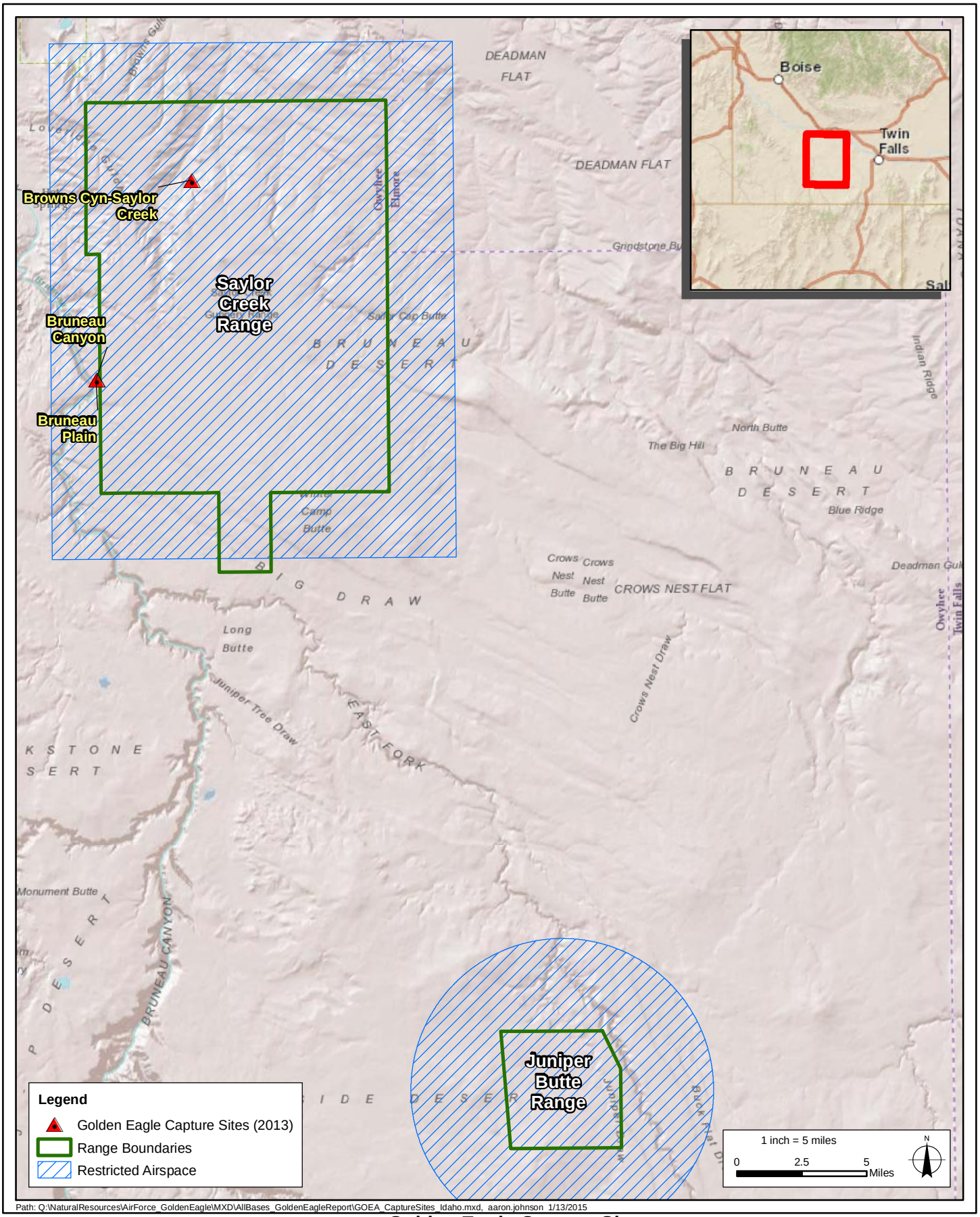
FIGURE
2-6



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\GOEA_CaptureSites_UT.mxd, aaron.johnson 1/13/2015

Golden Eagle Capture Sites
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

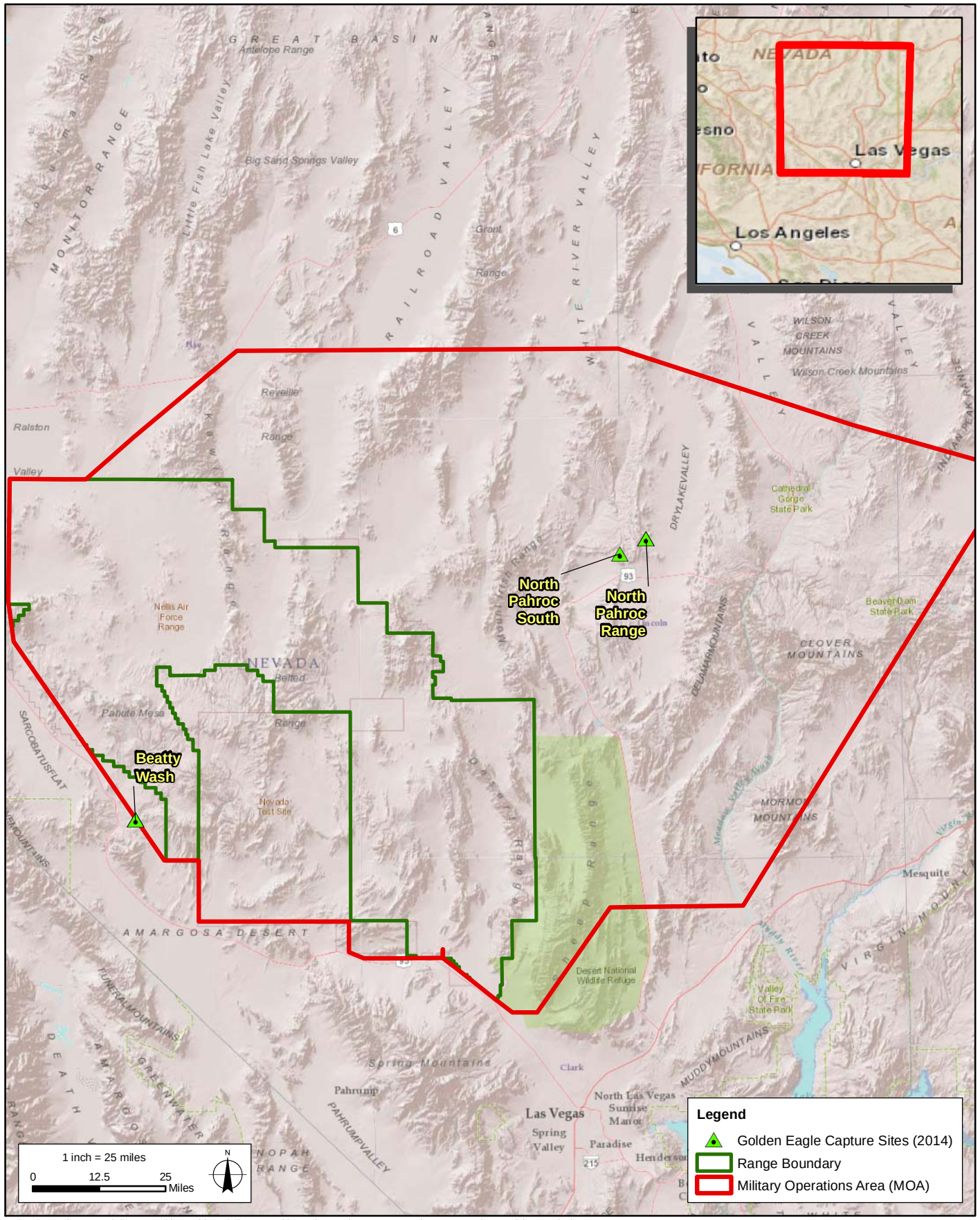
FIGURE 3-1



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Golden Eagle Capture Sites
Saylor Creek Range and Juniper Butte Range, Idaho
Golden Eagle Study
Western Air Force Ranges

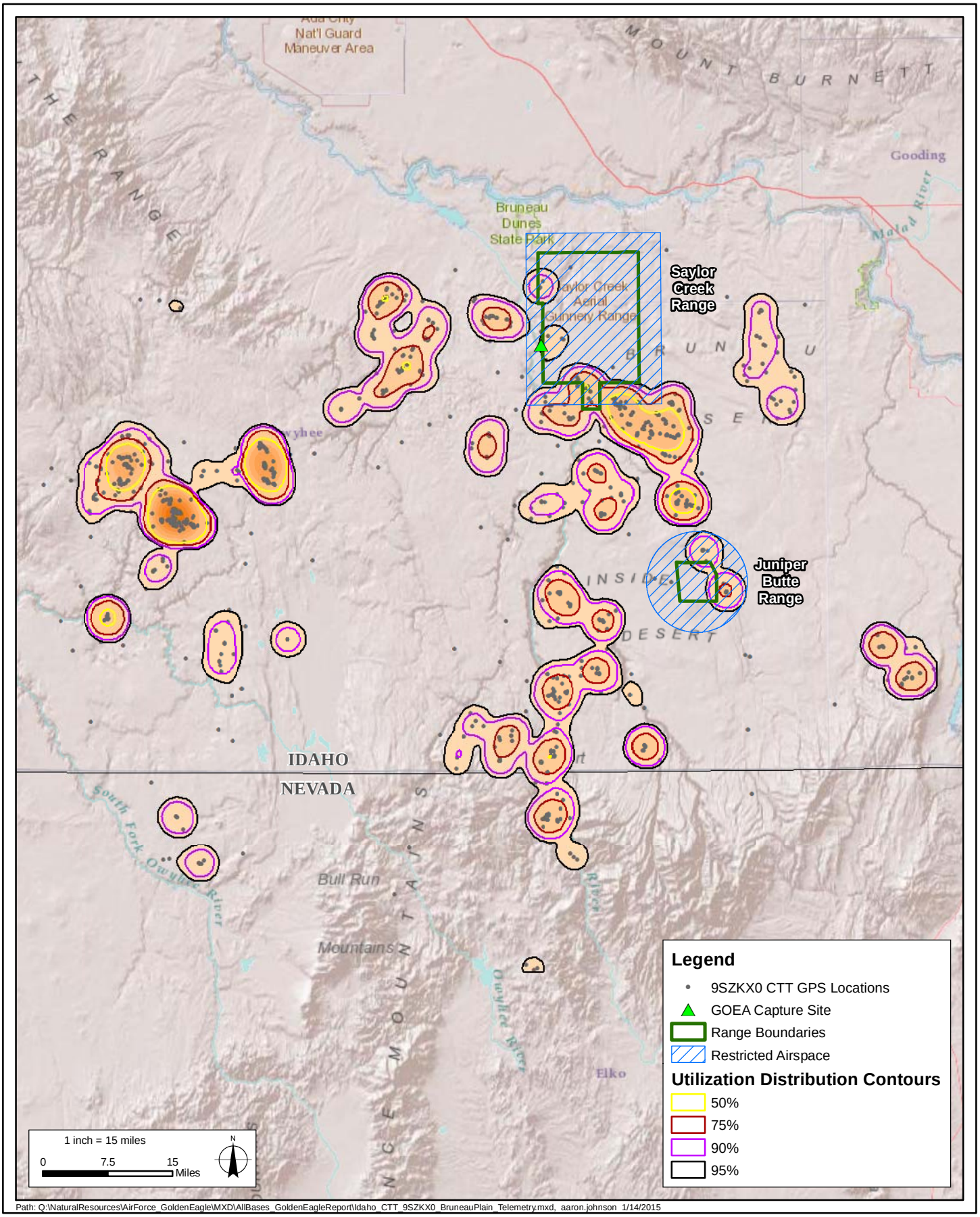
FIGURE
3-2



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\GOEA_CaptureSites_NTTR.mxd, aaron.johnson 9/26/2014

Golden Eagle Capture Sites
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

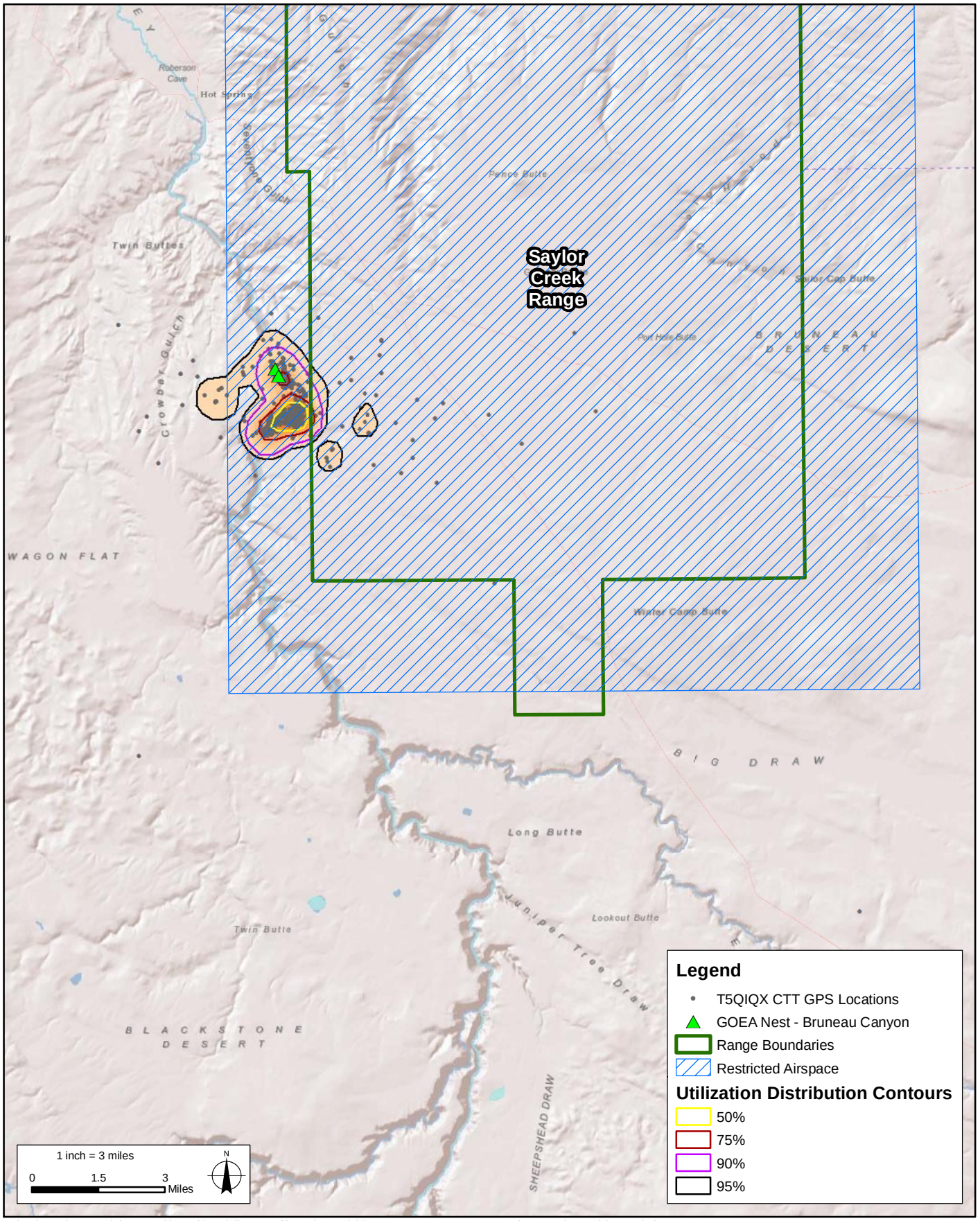
FIGURE
3-3



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\Idaho_CTT_9SZKX0_BruneauPlain_Telemetry.mxd, aaron.johnson 1/14/2015

CTT 9SZKX0 Telemetry Data - Bruneau Plain
Mountain Home AFB, Idaho
Golden Eagle Study
Western Air Force Ranges

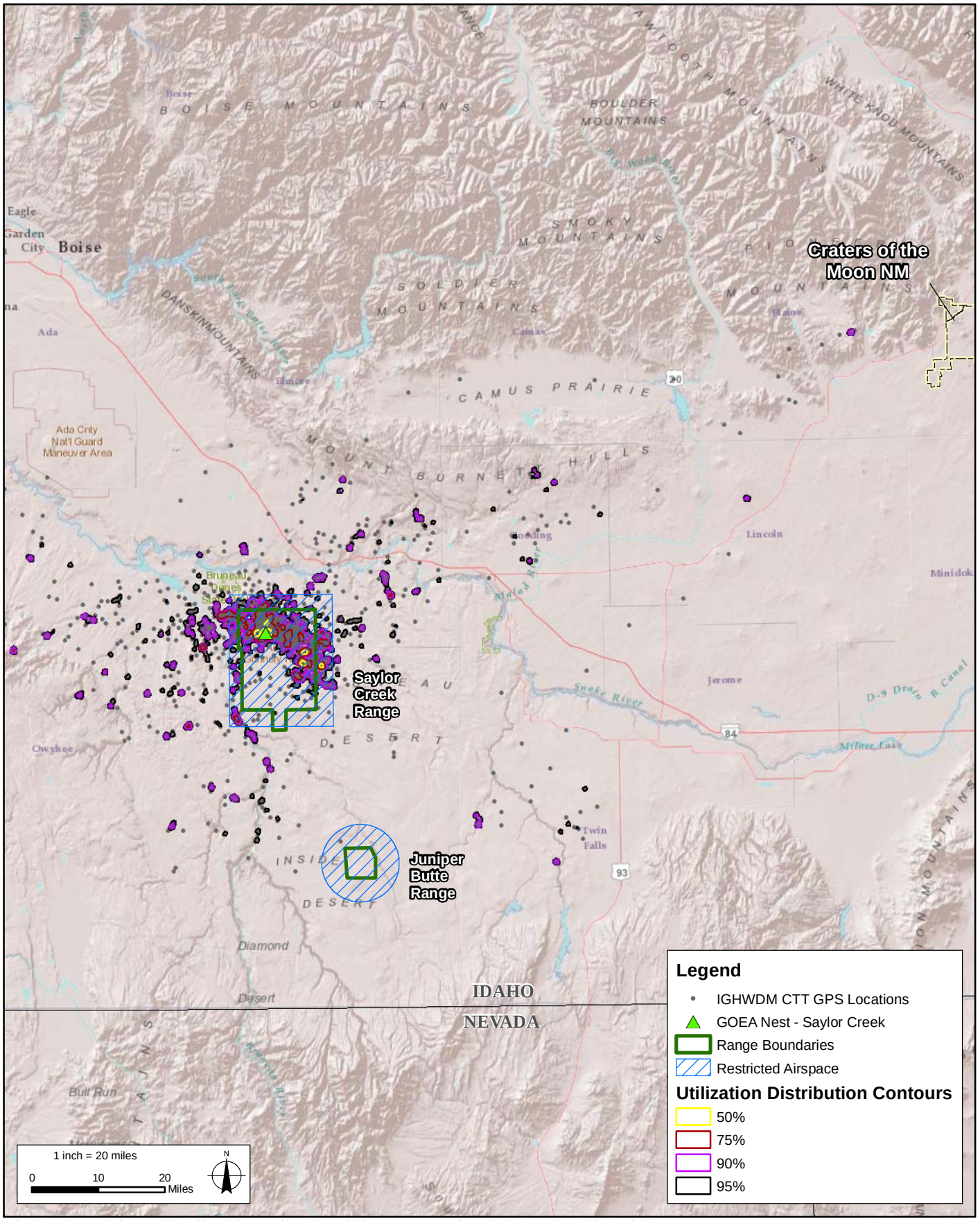
FIGURE
3-4



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CTT T5QIQX Telemetry Data - Bruneau Canyon
Mountain Home AFB, Idaho
Golden Eagle Study
Western Air Force Ranges

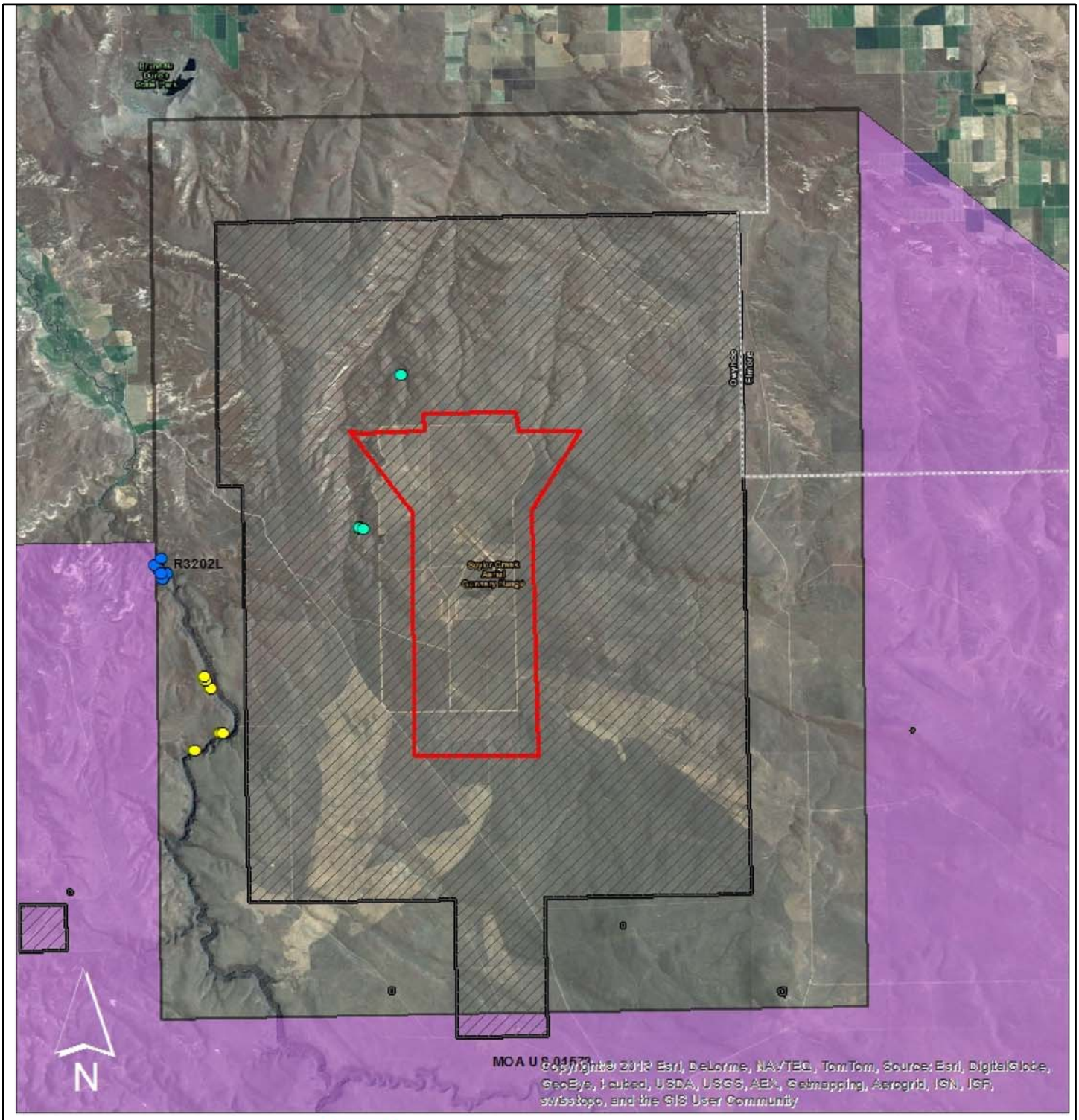
FIGURE
3-5



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CTT IGHWDM Telemetry Data - Saylor Creek
Mountain Home AFB, Idaho
Golden Eagle Study
Western Air Force Ranges

FIGURE
3-6



BRC 2013 Survey GOEA Nests

- Browns Cyn Territory
- Bruneau Overlook Territory
- Crowbar Cyn Territory

- ACC Military Range
- Installation Boundary
- Military Operations Area
- Restricted Airspace
- Range Area

amec

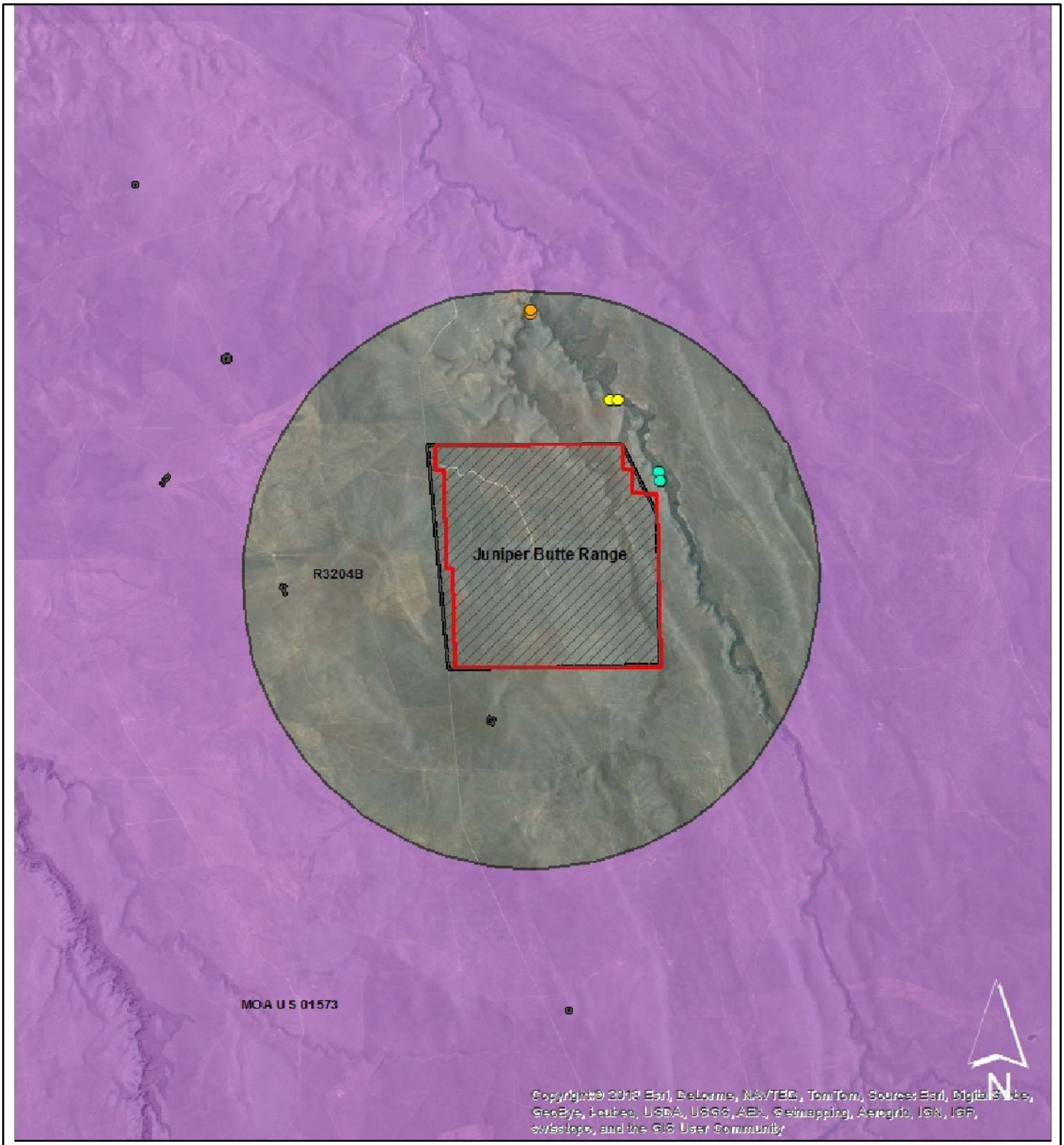
BRC
BioResource Consultants Inc.

FIGURE 3-7

Saylor Creek Range
2013 Occupied Territories
Golden Eagle Study
Western Air Force Ranges

0 1.25 2.5 5 Miles

Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\SaylorCreek_2013ActiveTerritories.mxd, aaron.johnson 1/15/2015



BRC 2013 Survey GOEA Nests

- East Fork Clover Creek Territory
- Robinson Territory
- Wells Crossing Territory

- ACC Military Range
- Installation Boundary
- Military Operations Area
- Restricted Airspace
- Range Area

amec

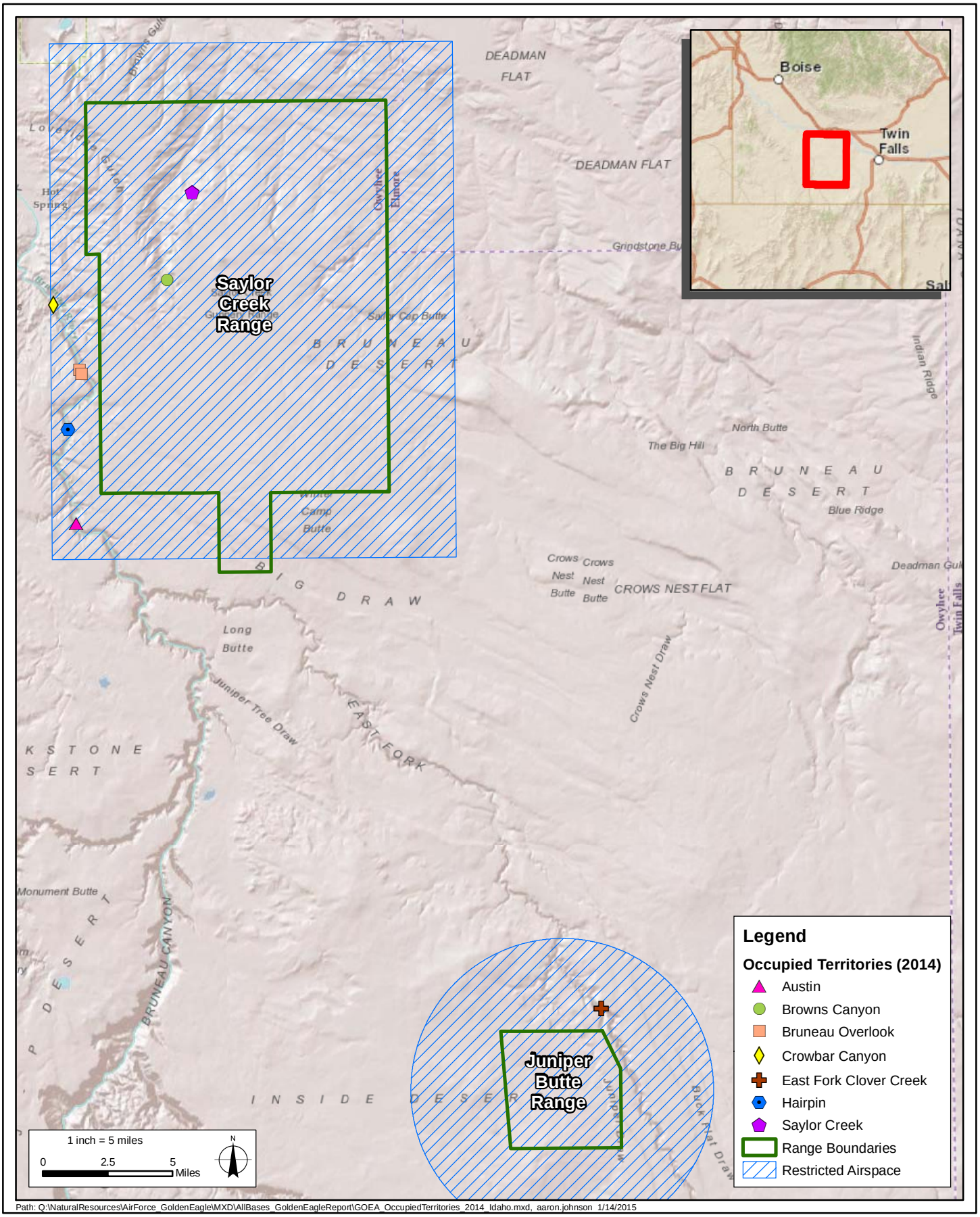
BRC
BioResource Consultants Inc.

FIGURE 3-8

Juniper Butte Range
2013 Occupied Territories
Golden Eagle Study
Western Air Force Ranges

Miles
0 1 2 4

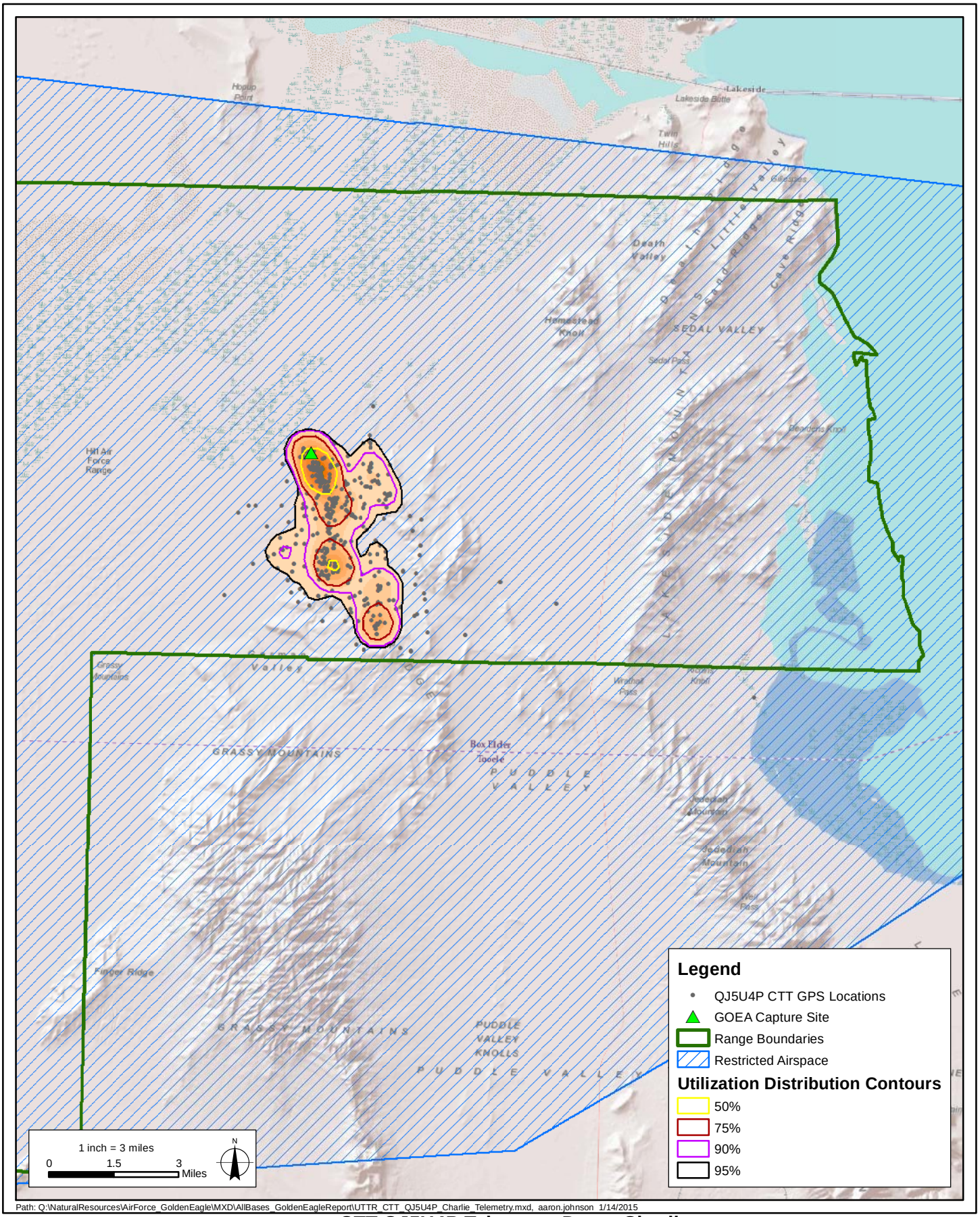
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2014 Occupied Territories
Mountain Home AFB, Idaho
Golden Eagle Study
Western Air Force Ranges

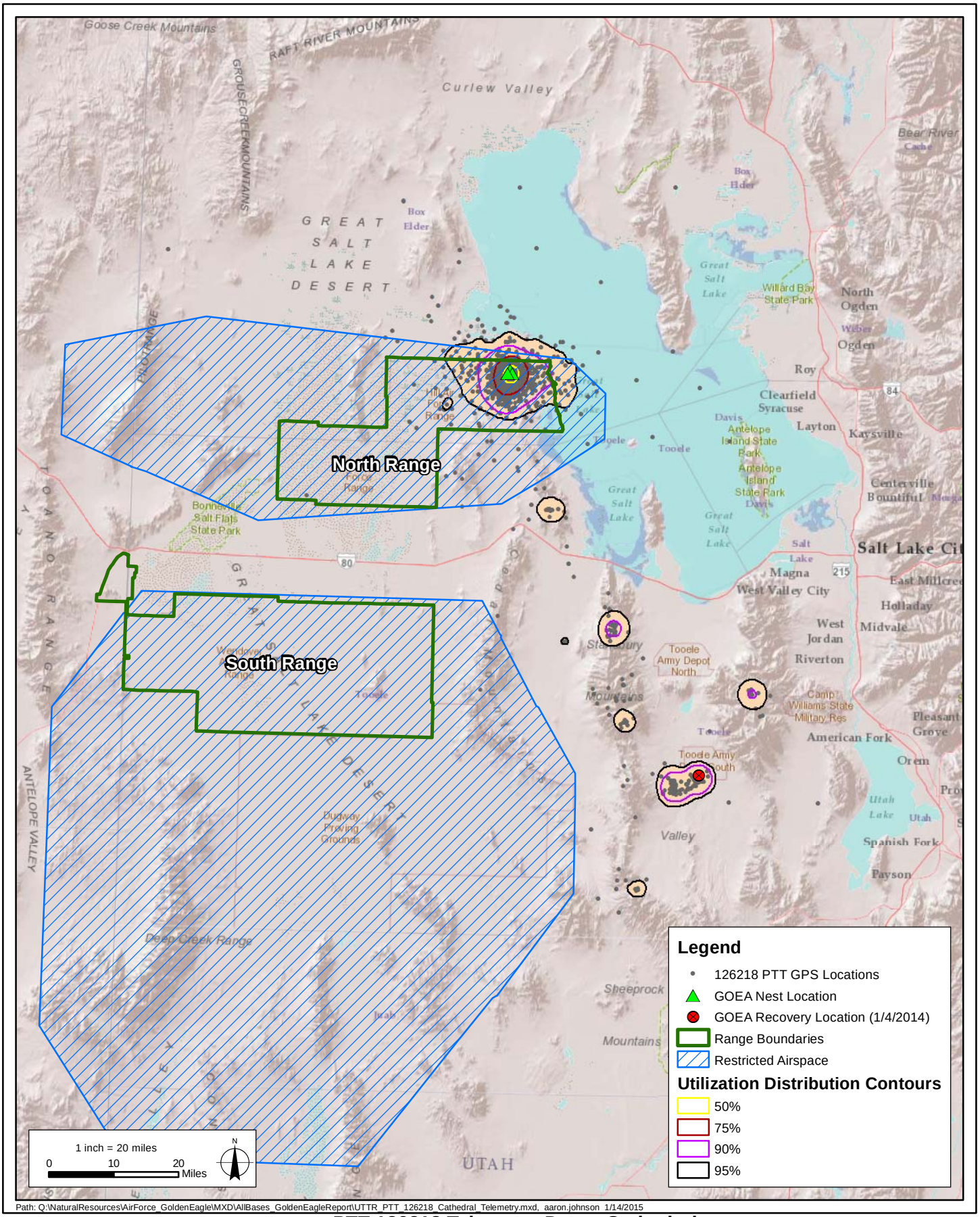
FIGURE
3-9



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CTT QJ5U4P Telemetry Data - Charlie
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

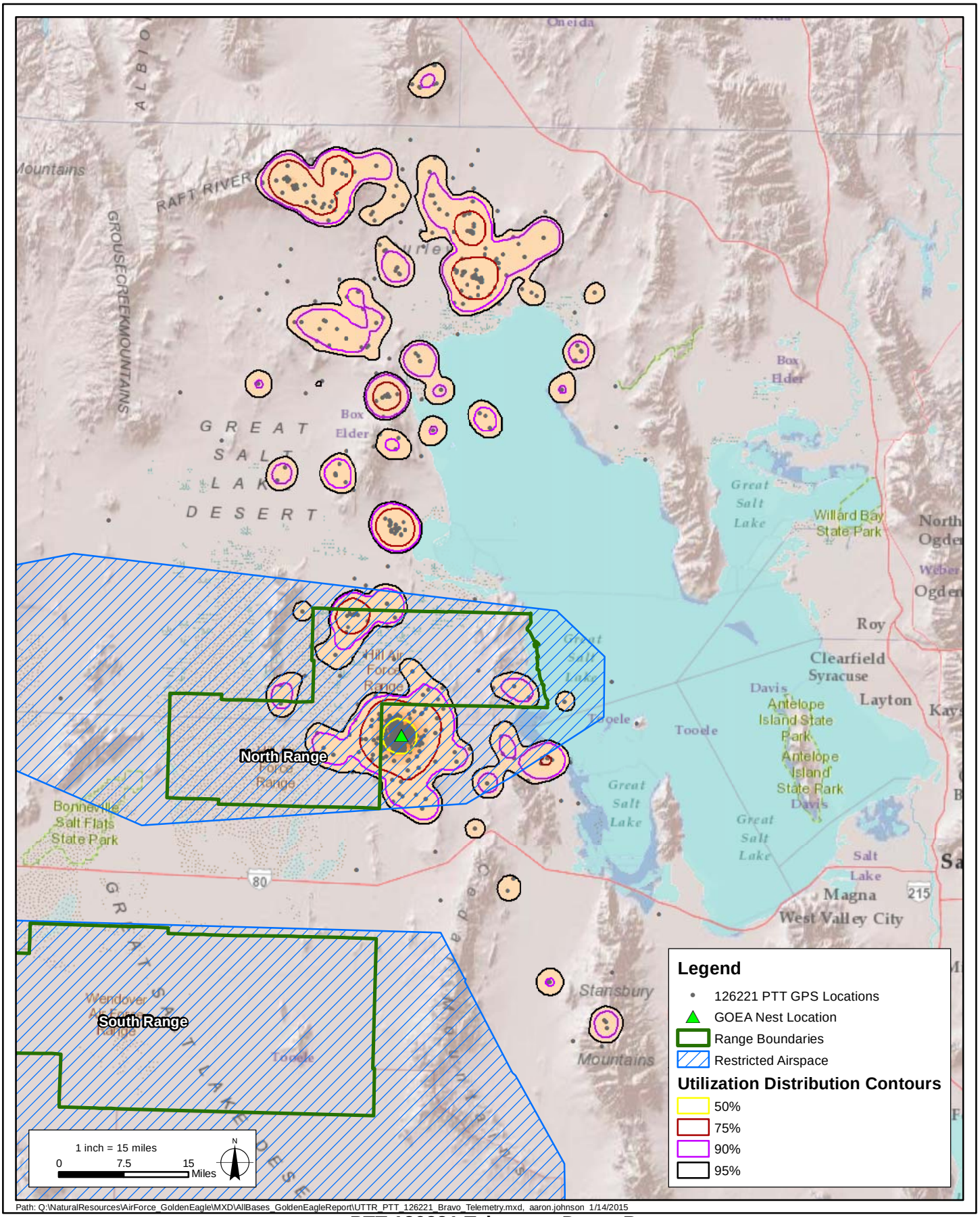
FIGURE 3-10



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PTT 126218 Telemetry Data - Cathedral
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

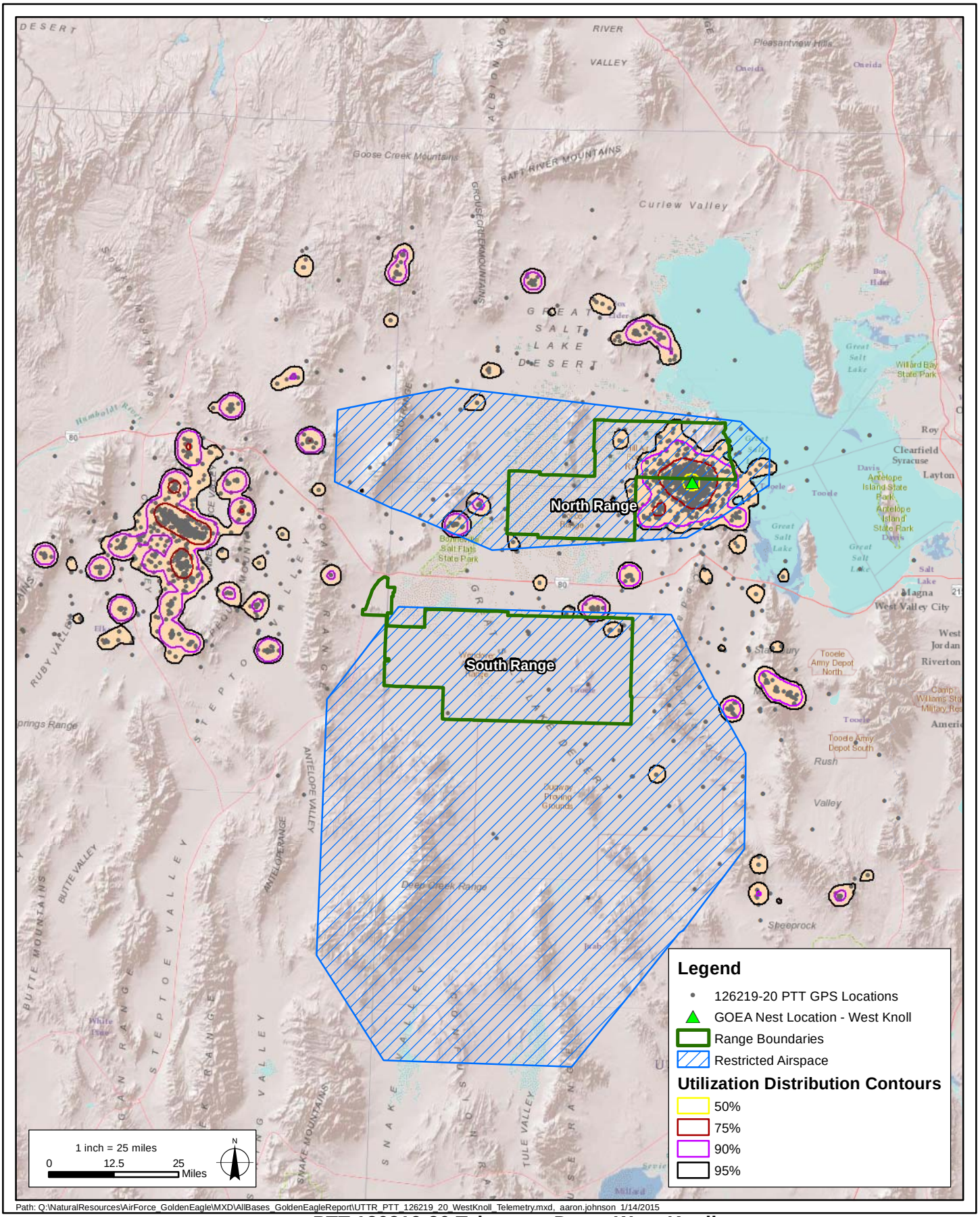
FIGURE
3-11



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PTT 126221 Telemetry Data - Bravo
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

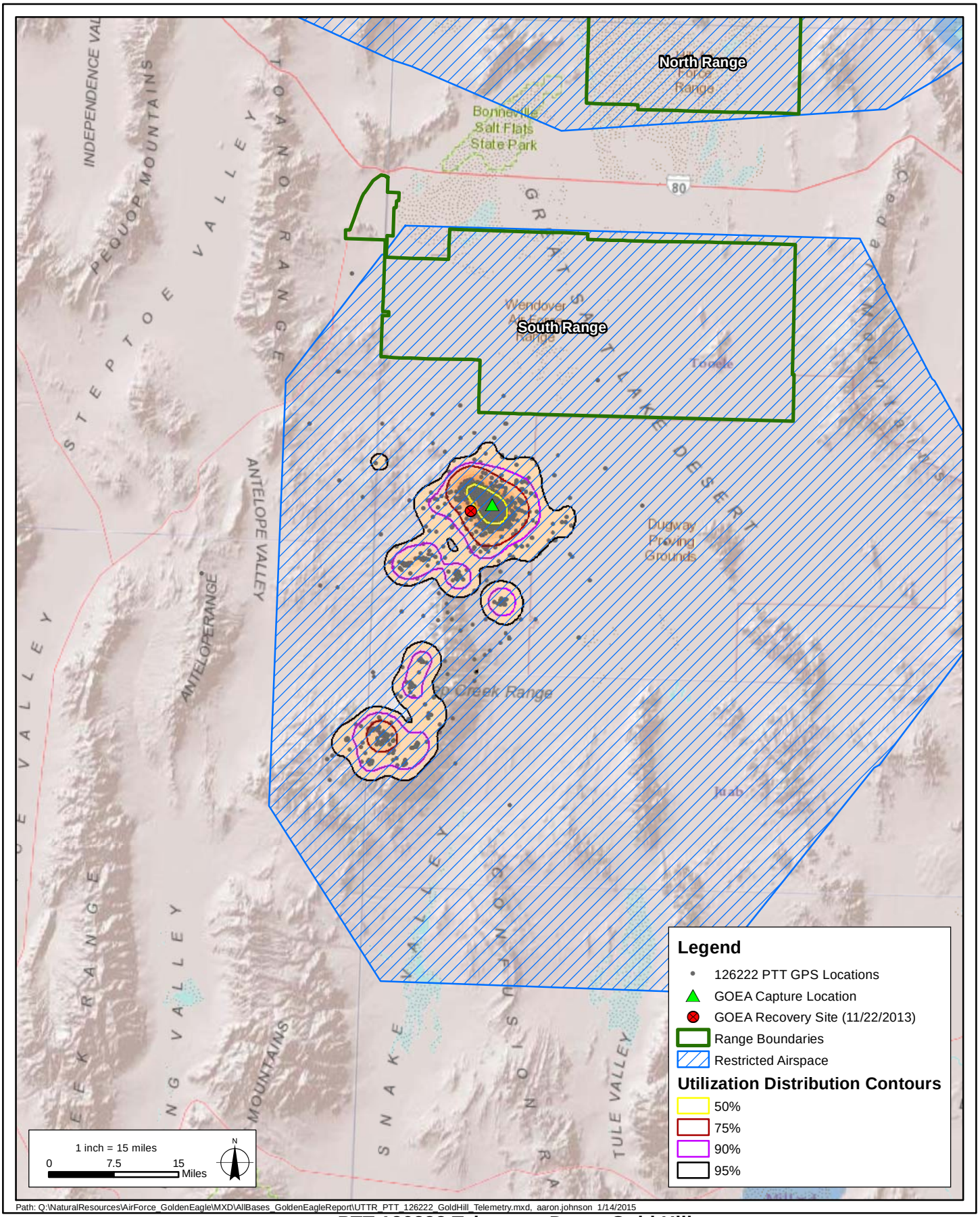
FIGURE
3-12



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PTT 126219-20 Telemetry Data - West Knoll
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

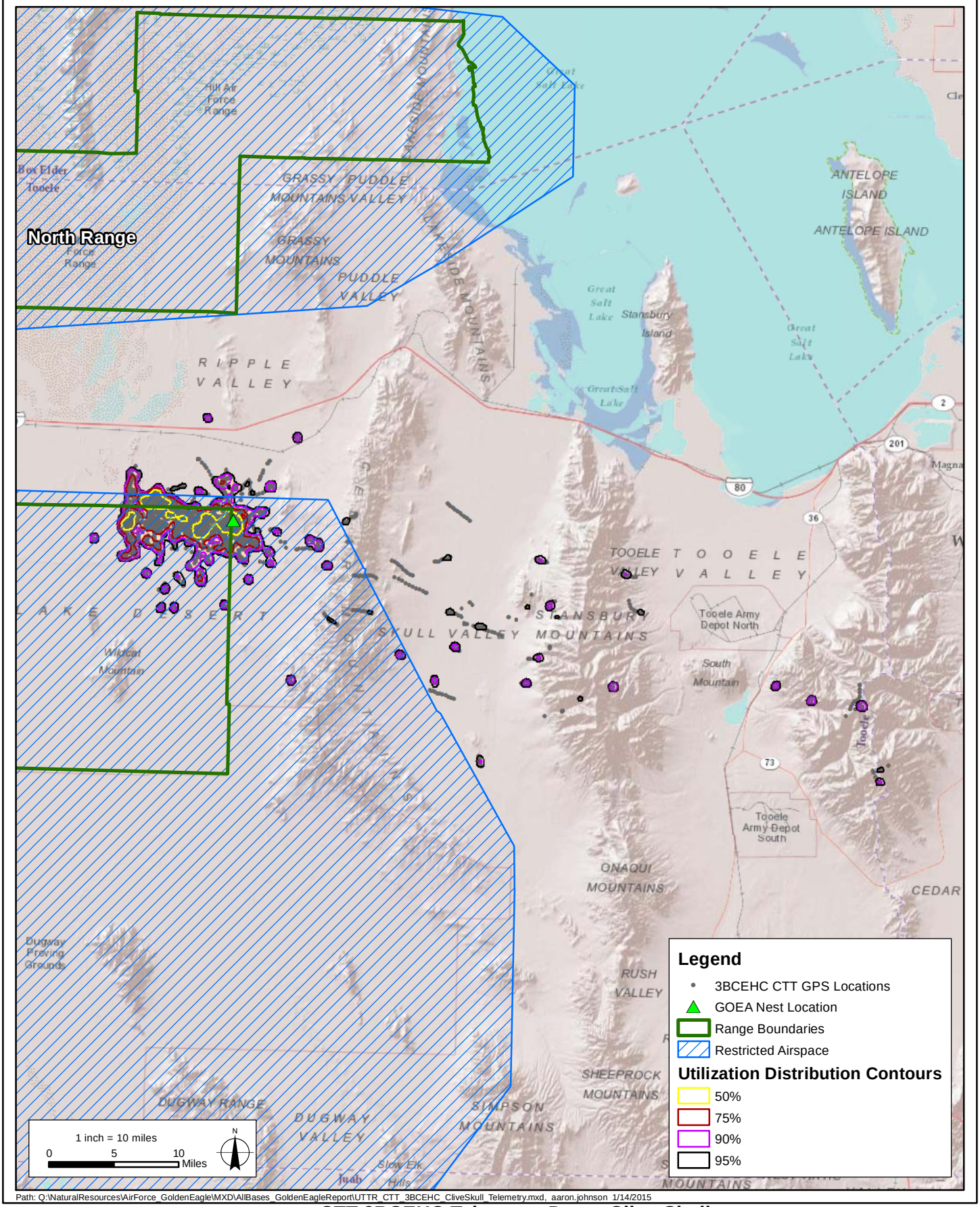
FIGURE
3-13



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PTT 126222 Telemetry Data - Gold Hill
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

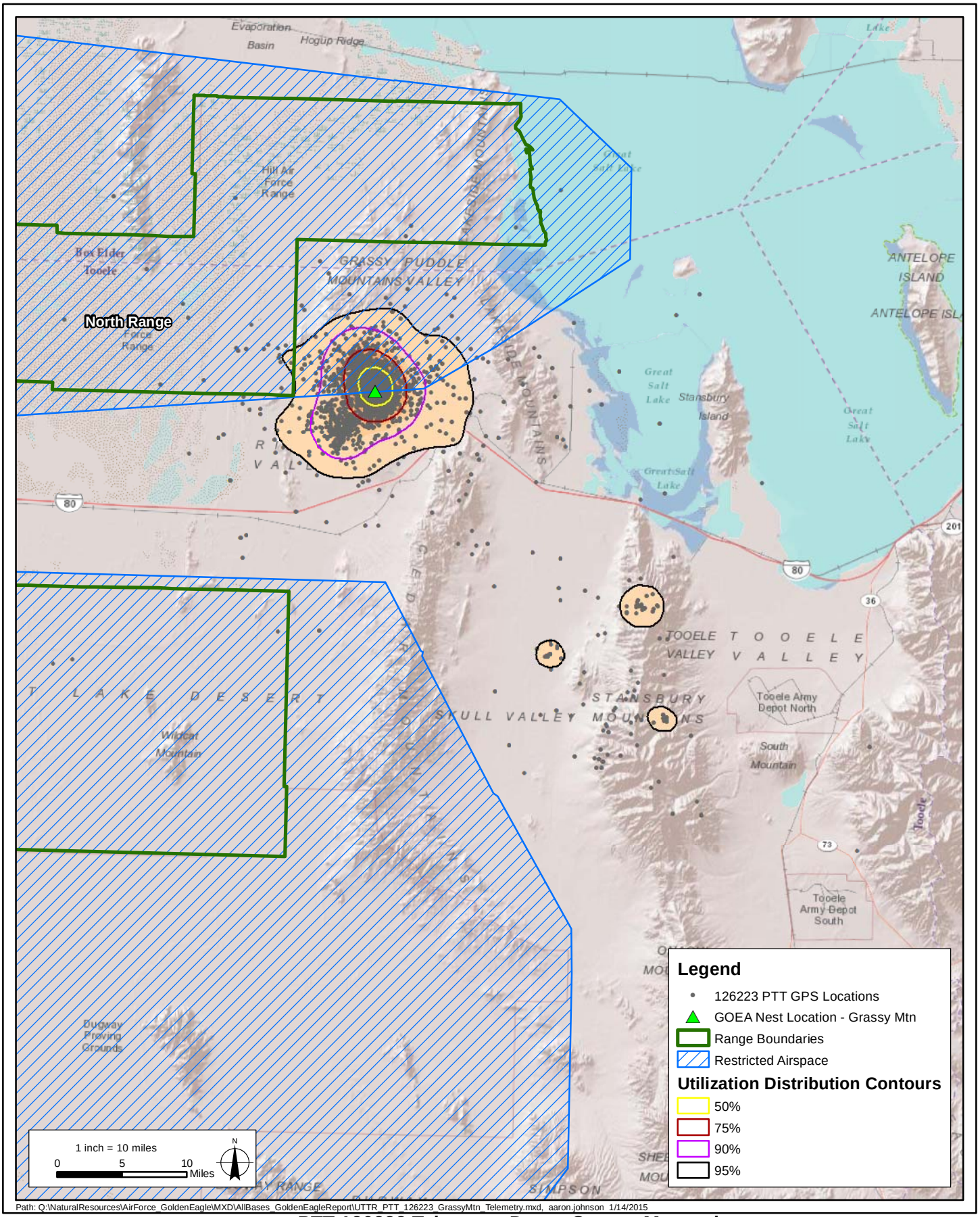
FIGURE 3-14



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CTT 3BCEHC Telemetry Data - Clive-Skull
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

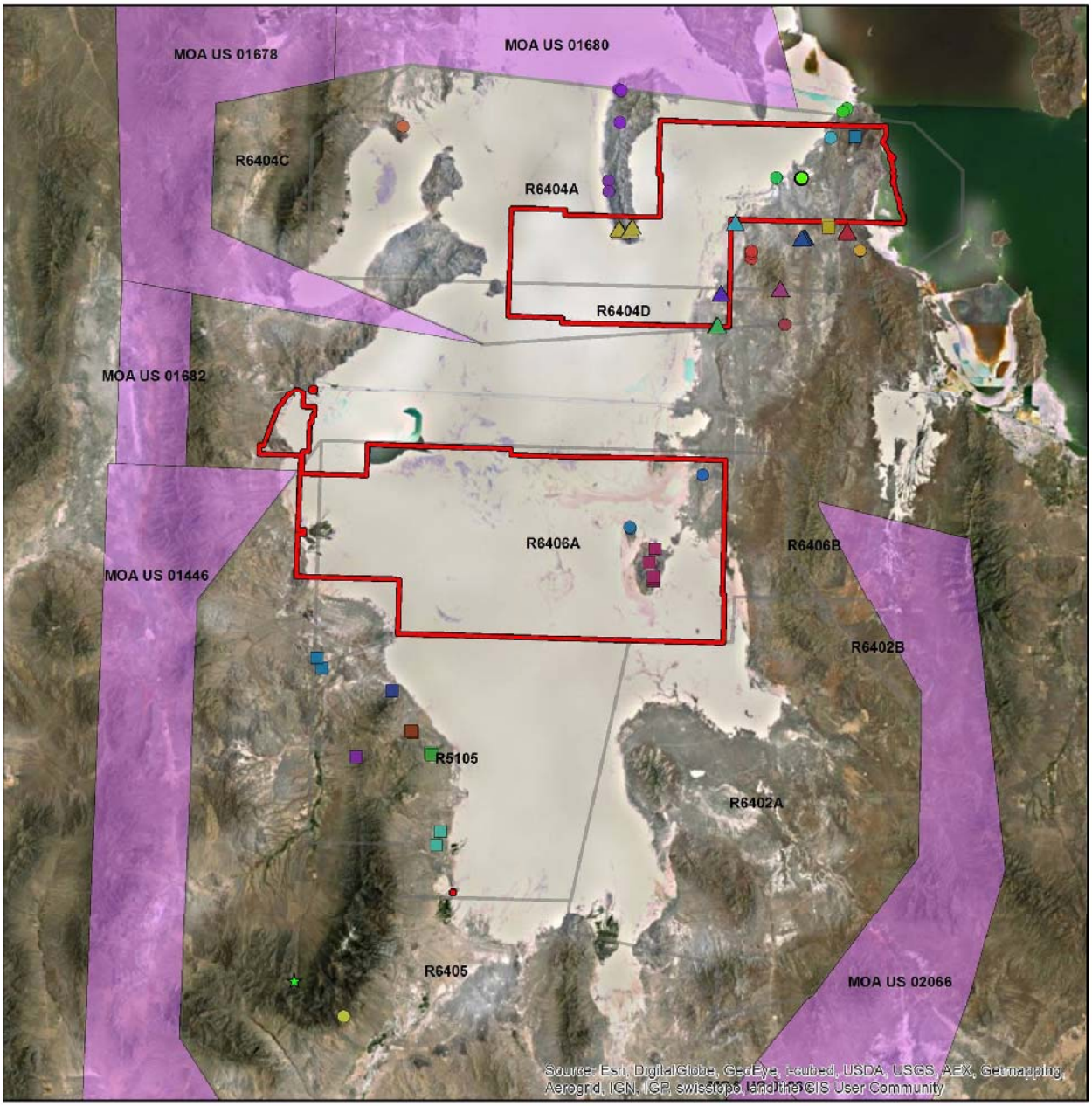
FIGURE
3-15



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\UTTR_PTT_126223_GrassyMtn_Telemetry.mxd, aaron.johnson 1/14/2015

PTT 126223 Telemetry Data - Grassy Mountain
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

FIGURE 3-16



BRC 2013 Survey GOEA Nests

- Big Pass
- Birch Creek
- Bravo
- Candy Mtn.
- Cathedral
- Charlie
- Clive-Skull
- Craners
- Diddle Knoll
- Eagle Knolls
- East Ridge
- Echo
- German Valley
- Grassy Mountain
- Grassy Mtn South
- Grouse Creek
- Gunsight
- Jedediah Mtn
- Kittykat
- Miners Basin
- Ochre Mtn
- Rodenhouse
- Rube Mine
- Unknown
- West Knoll
- Wildcat
- Willow Spring
- Wilson Hill
- Johnson Creek

ACC Military Range
Installation Boundary
Military Operations Area
Restricted Airspace

BRC BioResource Consultants Inc.

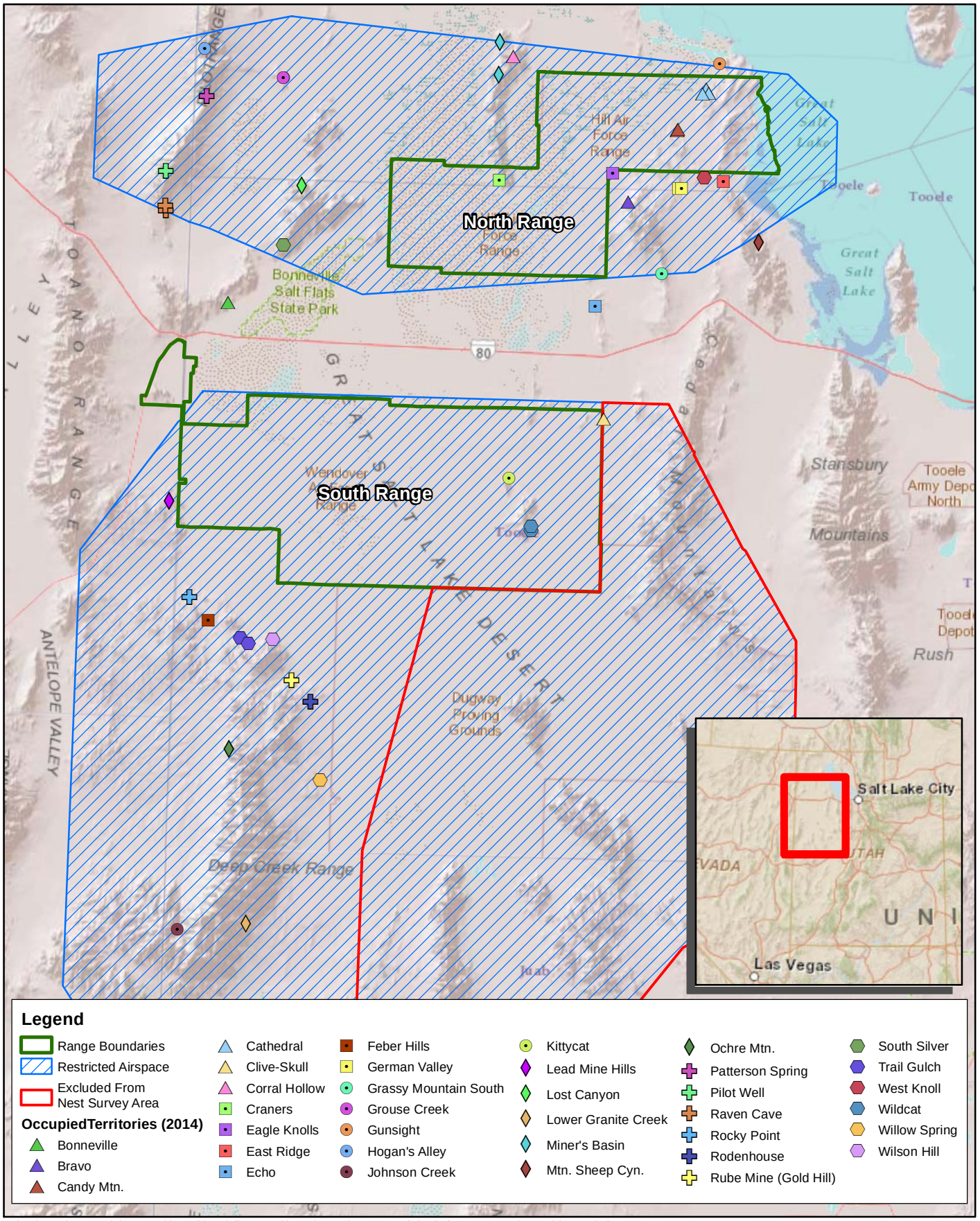
Miles
0 5 10 20

FIGURE 3-17

2013 Occupied Territories
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

amec

Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\GOEA_OccupiedTerritories_2013_UT.mxd, aaron.johnson 1/15/2015

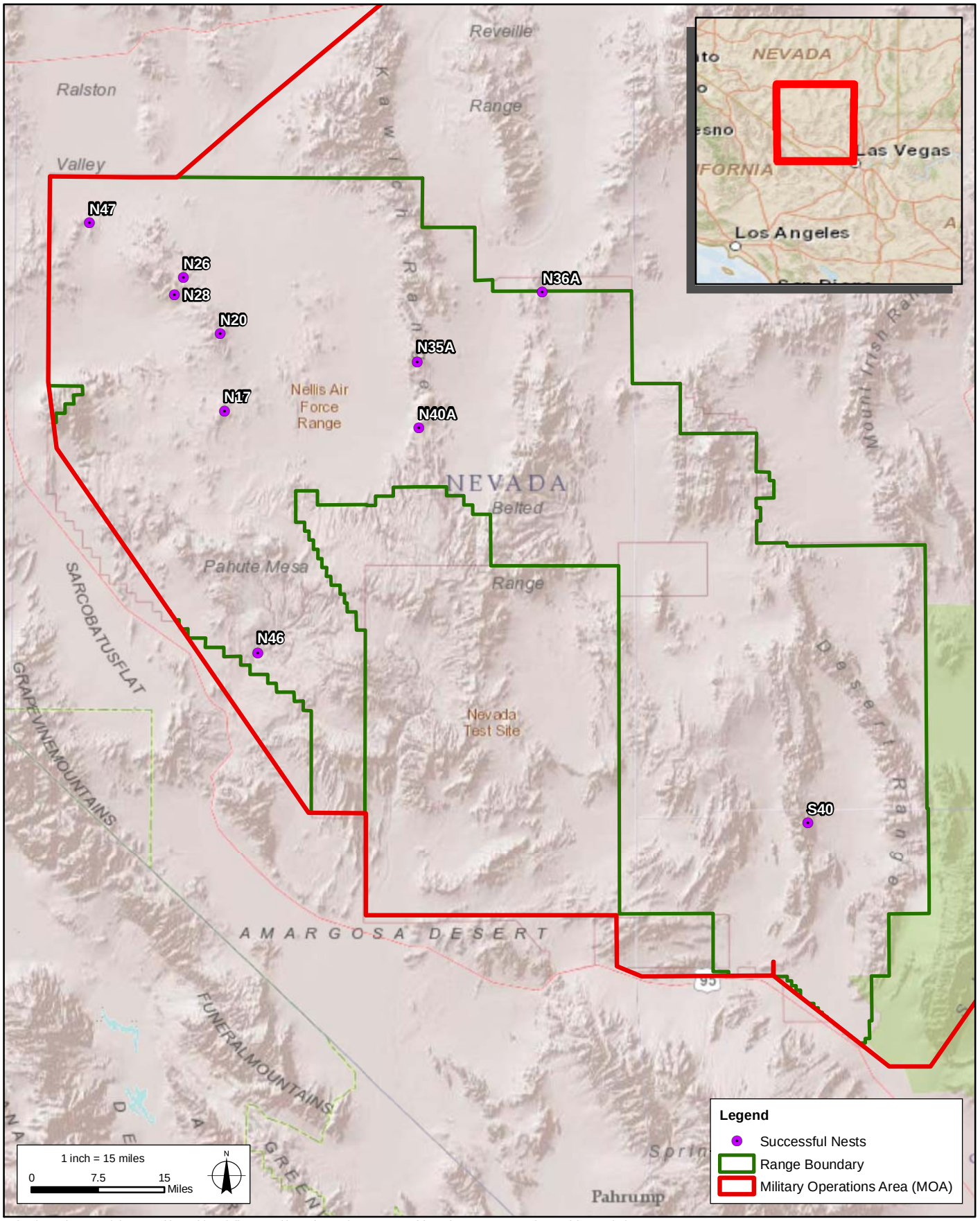


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2014 Occupied Territories
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

1 inch = 15 miles
0 7.5 15 Miles

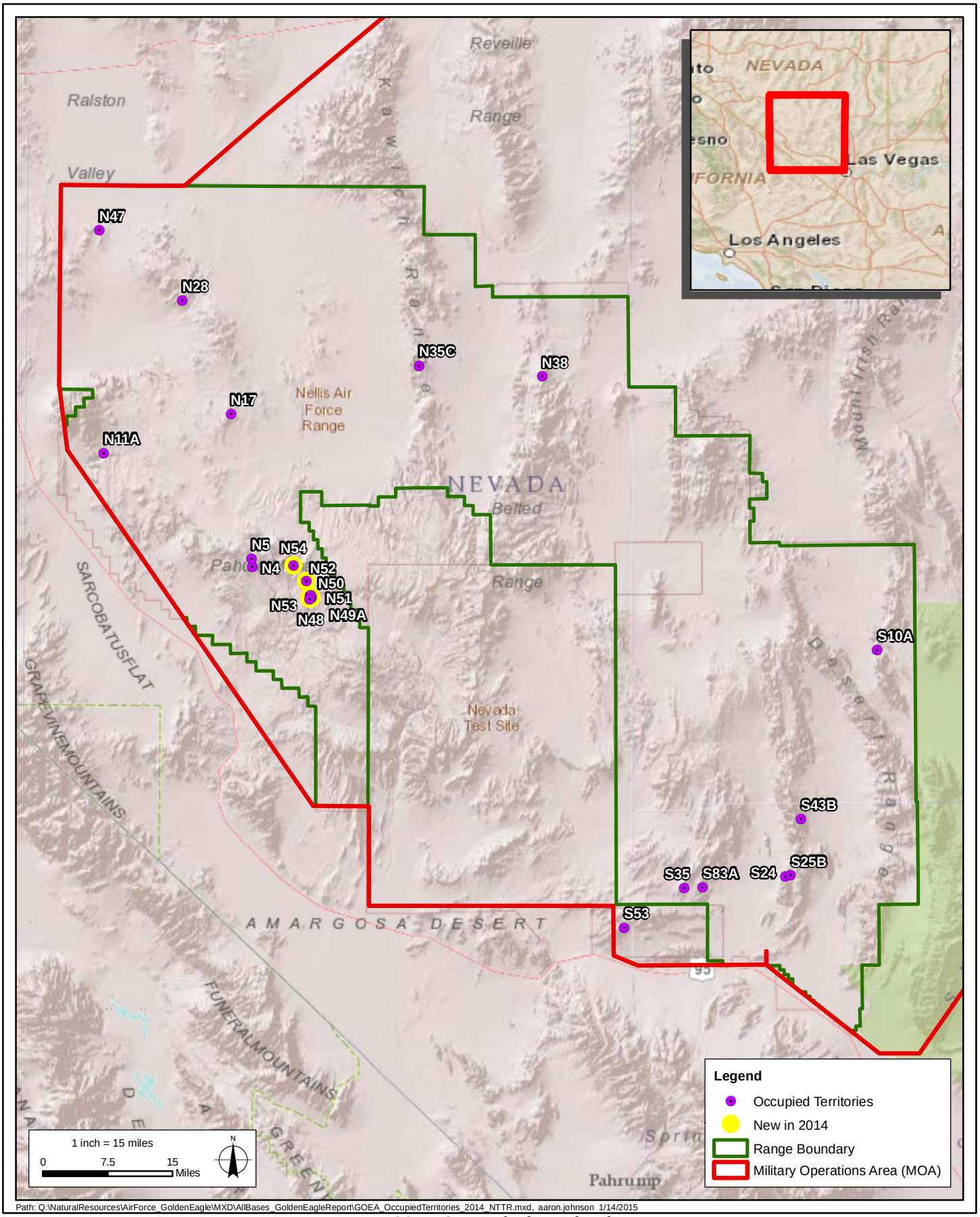
FIGURE 3-18



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2013 Successful Nests
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

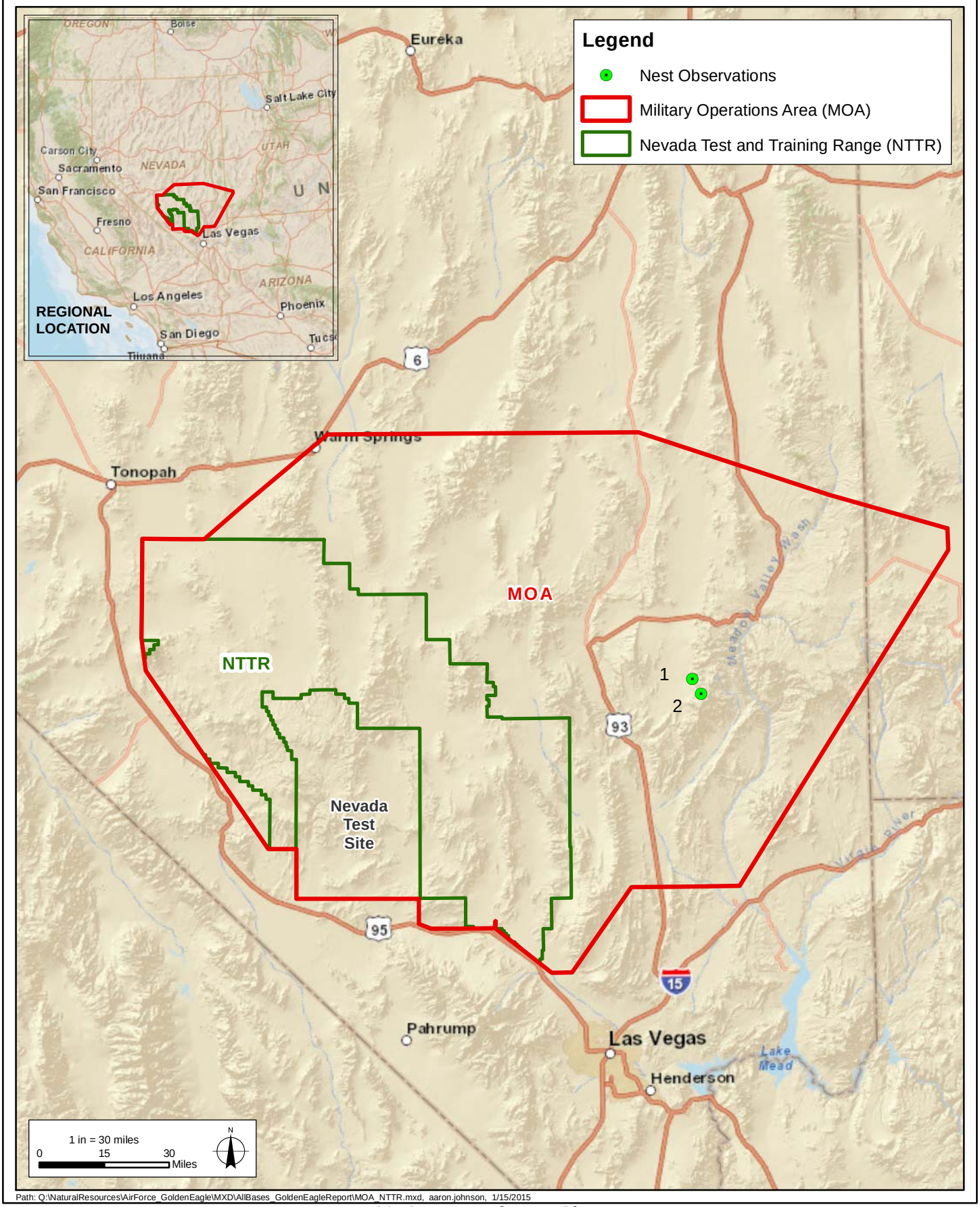
FIGURE
3-19



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2014 Occupied Territories
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

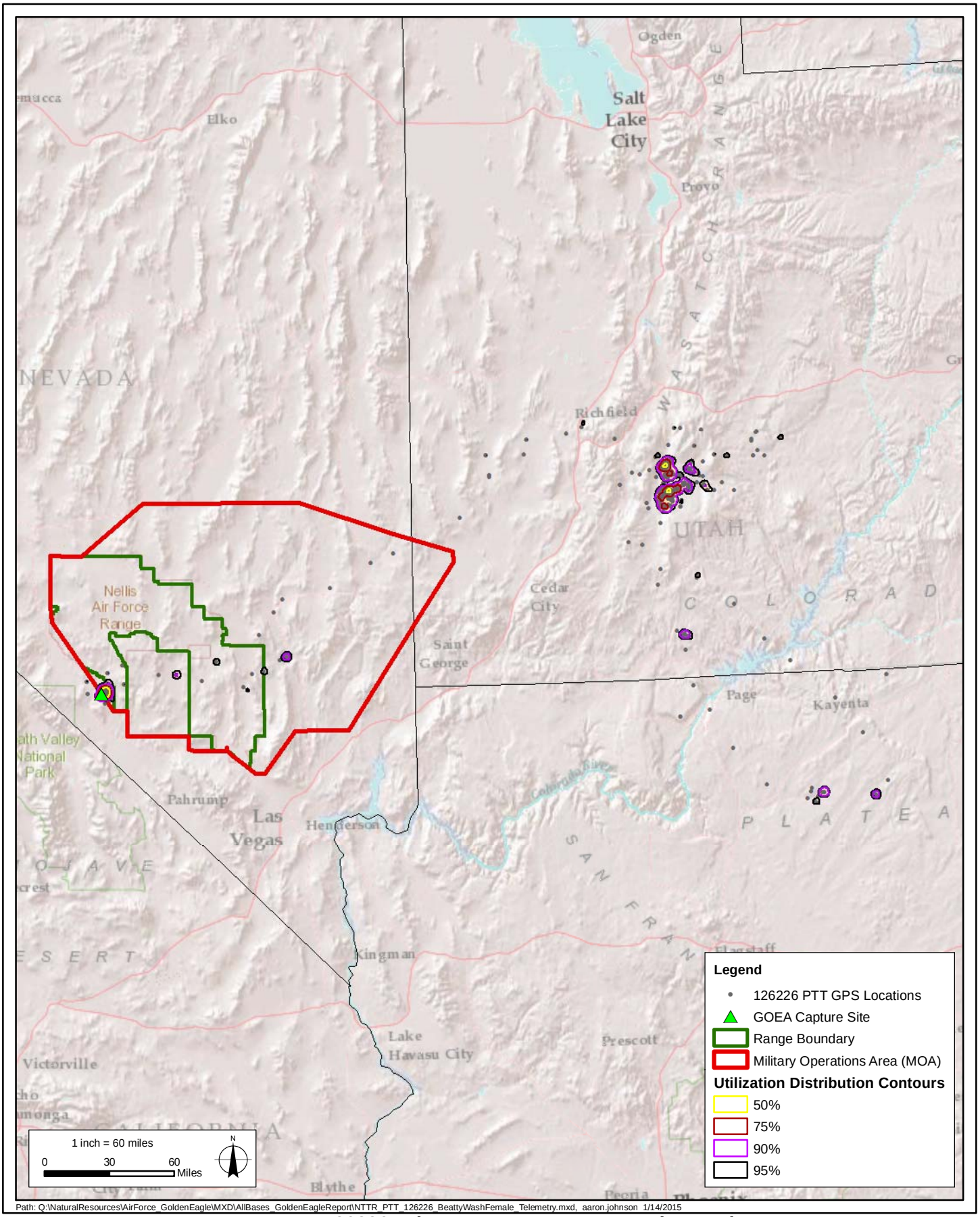
FIGURE
3-20



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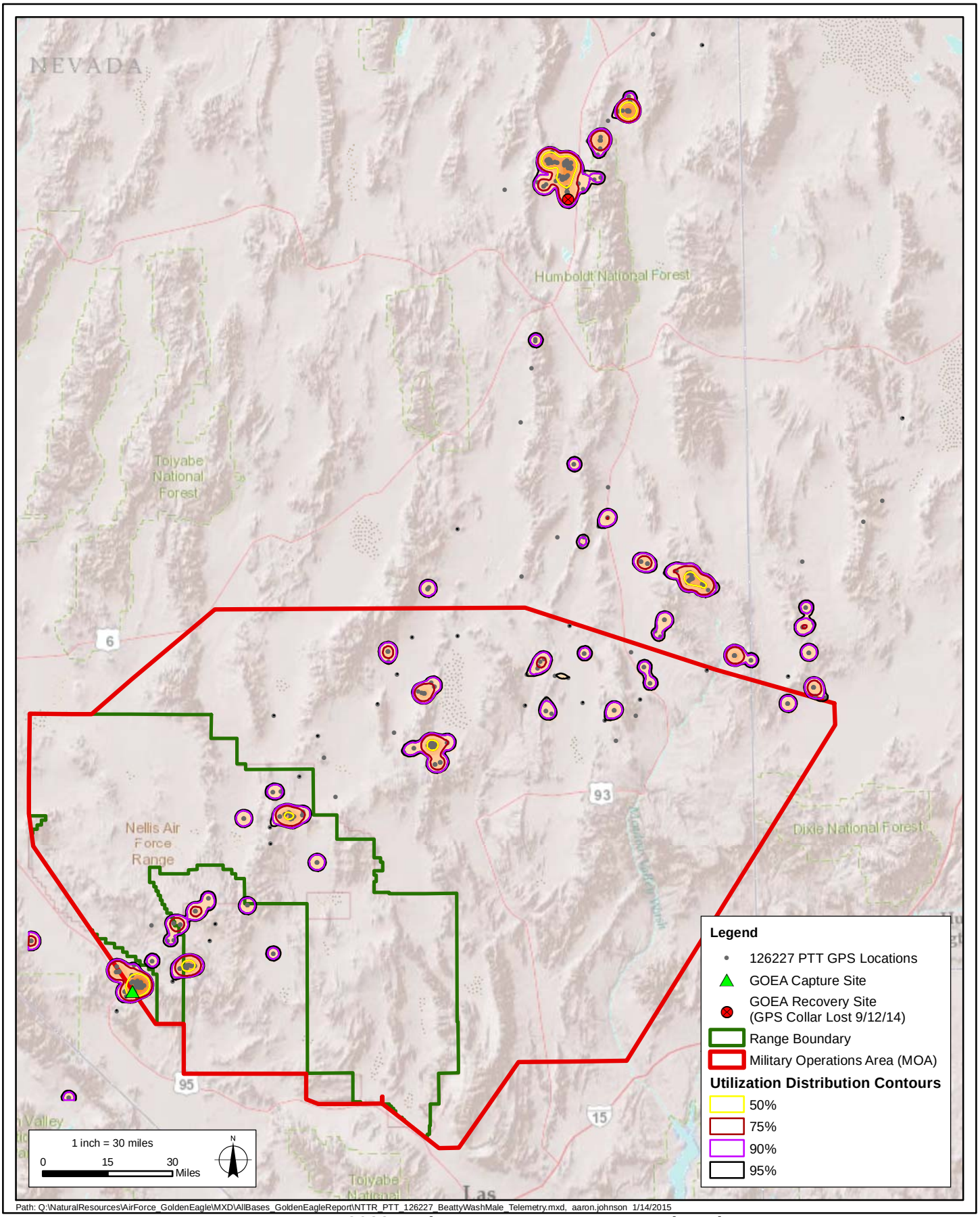
2013 Targeted Nest Sites
Nevada Test and Training Range and Military Operations Area
Golden Eagle Study
Western Air Force Ranges

FIGURE
3-21



PTT 126226 Telemetry Data - Beatty Wash Female
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

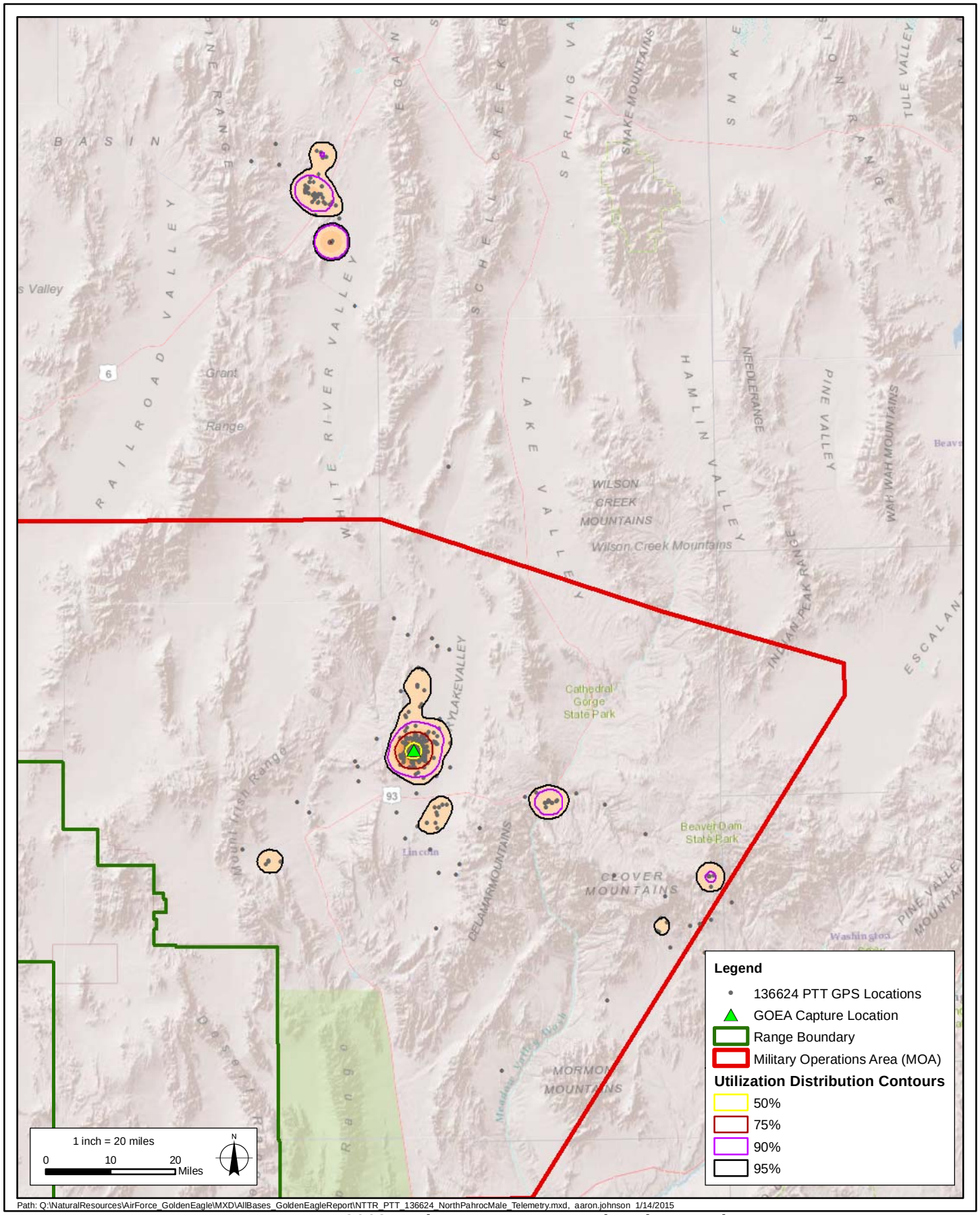
FIGURE
3-22



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\NTTR_PTT_126227_BeattyWashMale_Telemetry.mxd, aaron.johnson 1/14/2015

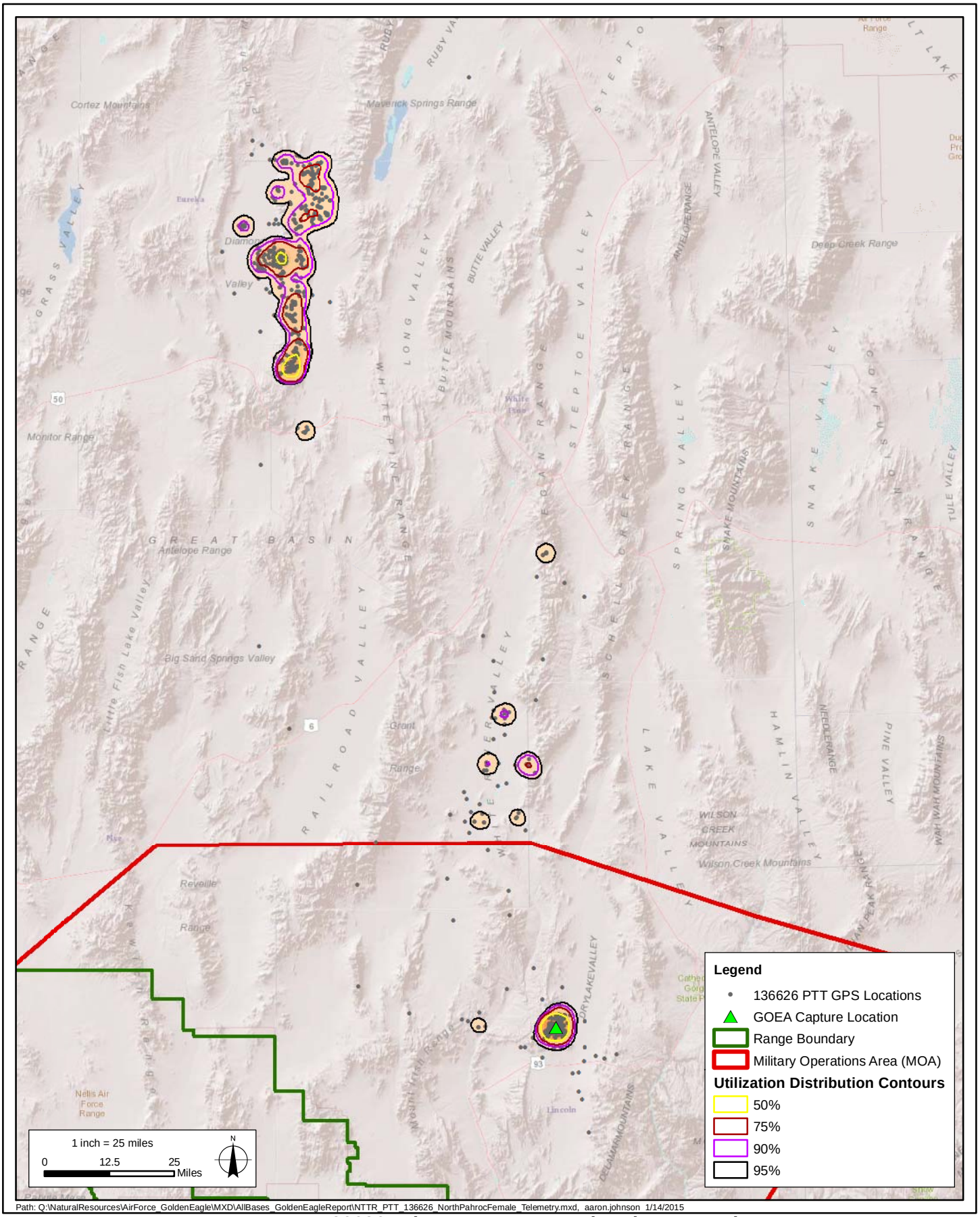
PTT 126227 Telemetry Data - Beatty Wash Male
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

FIGURE
3-23



PTT 136624 Telemetry Data - North Pahroc Male
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

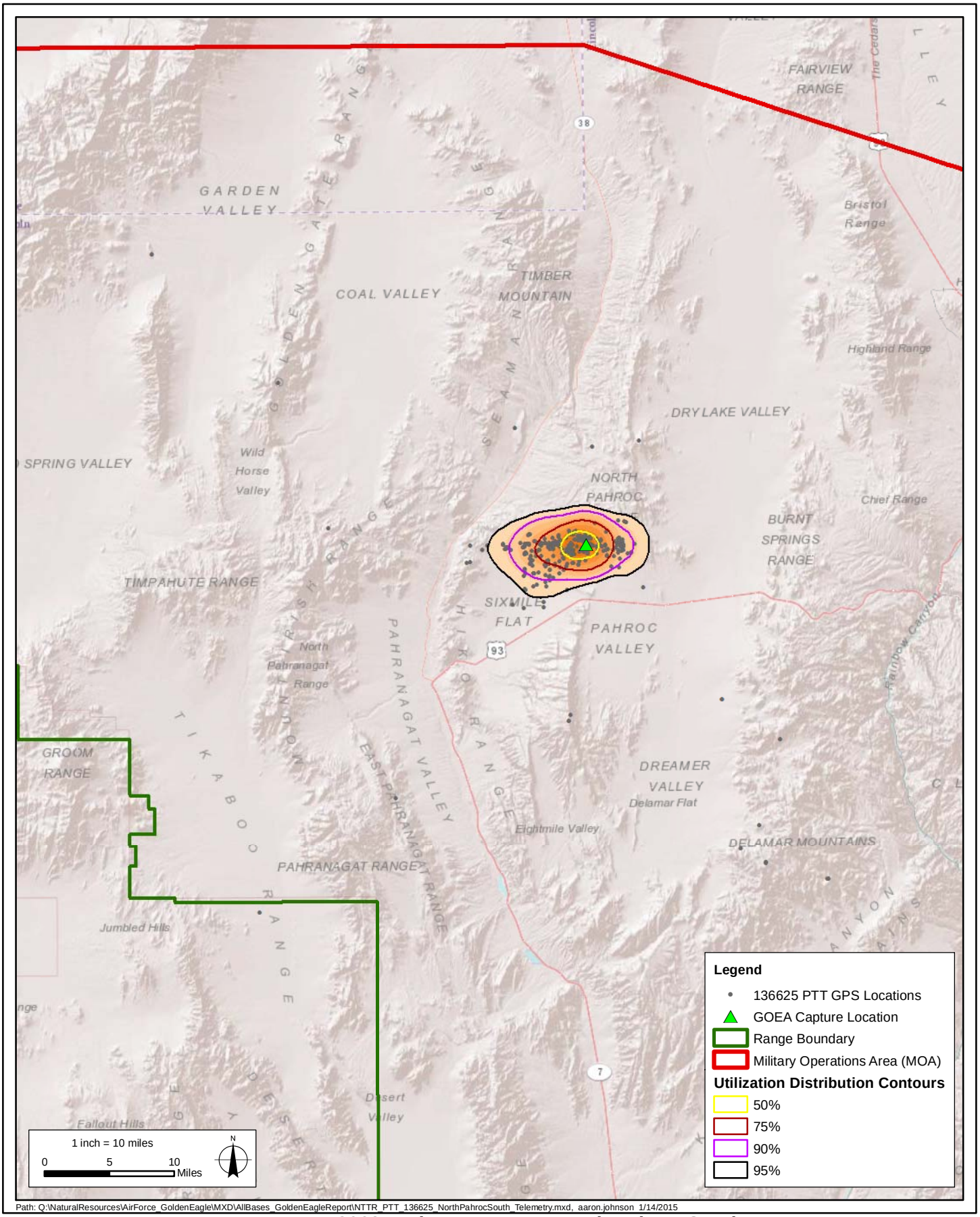
FIGURE
3-24



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\NTTR_PTT_136626_NorthPahrocFemale_Telemetry.mxd, aaron.johnson 1/14/2015

PTT 136626 Telemetry Data - North Pahroc Female
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

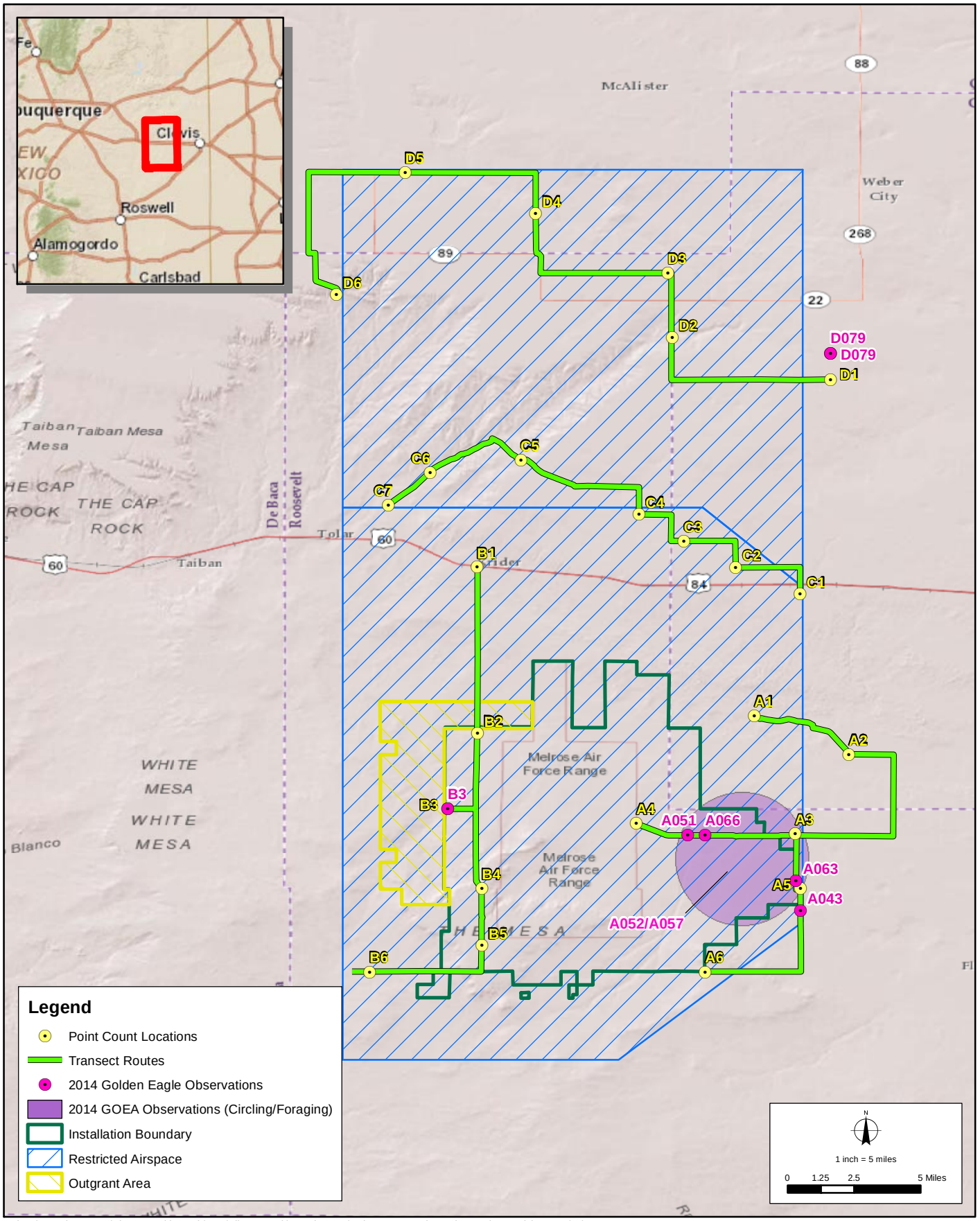
FIGURE
3-25



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\NTTR_PTT_136625_NorthPahrocSouth_Telemetry.mxd, aaron.johnson 1/14/2015

PTT 136625 Telemetry Data - North Pahroc South
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

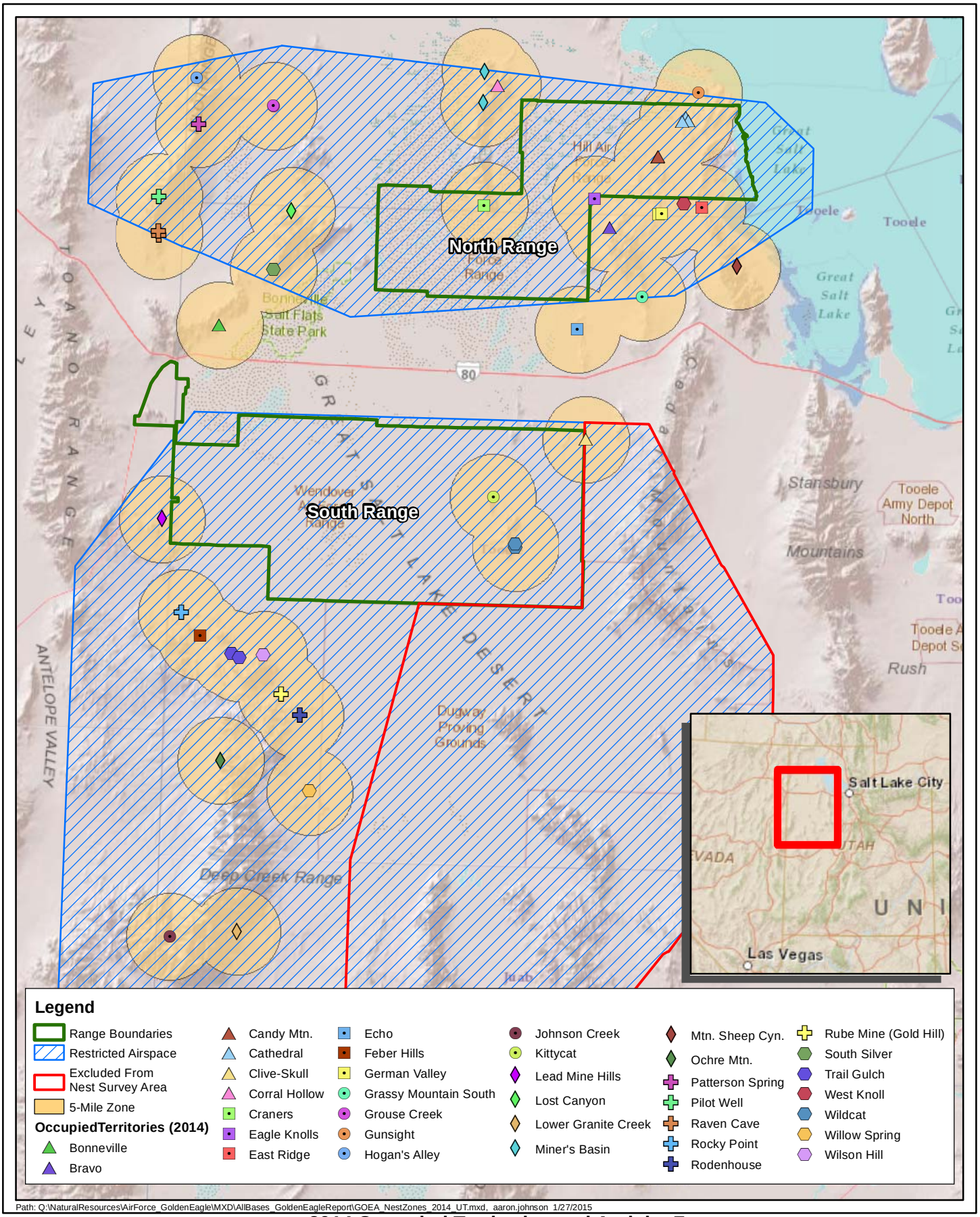
FIGURE
3-26



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\Melrose_GOEA_Observations.mxd, aaron.johnson, 1/14/2015

2014 Golden Eagle Observations
Melrose Range, Cannon AFB, New Mexico
Golden Eagle Study
Western Air Force Ranges

FIGURE
3-27

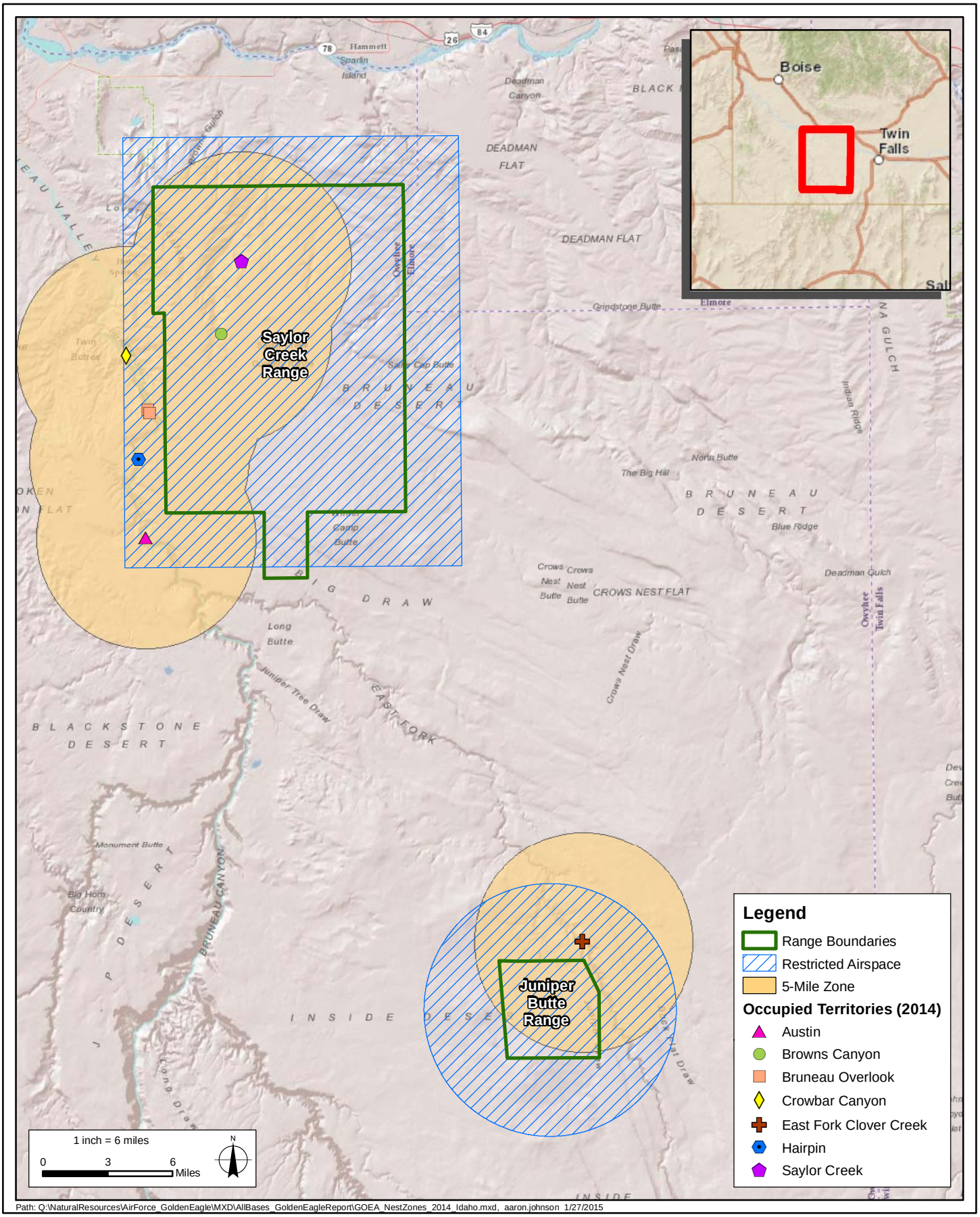


Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\GOEA_NestZones_2014_UT.mxd, aaron.johnson 1/27/2015

2014 Occupied Territories and Activity Zone
Utah Test and Training Range
Golden Eagle Study
Western Air Force Ranges

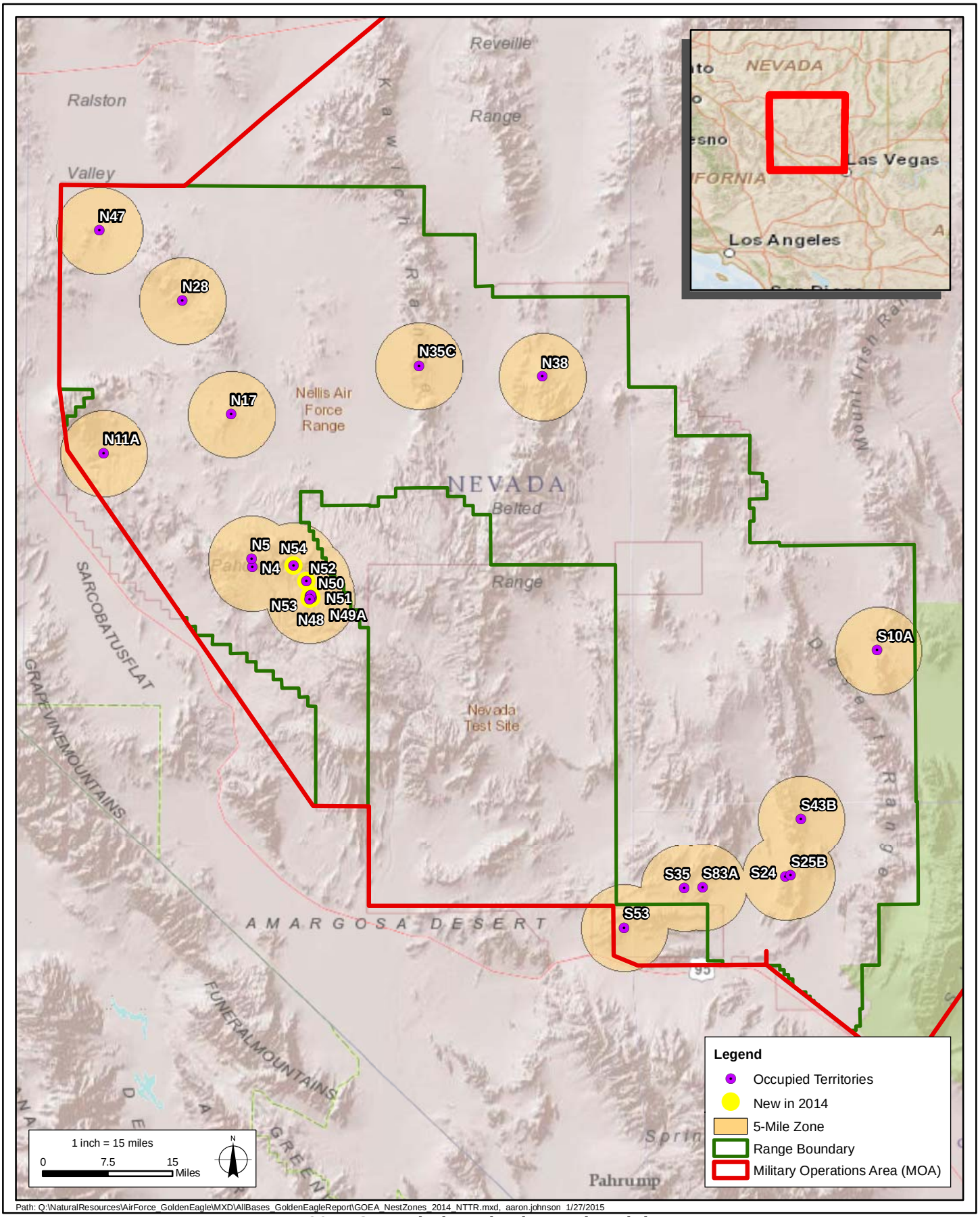
1 inch = 15 miles
0 7.5 15 Miles

FIGURE 5-1



2014 Occupied Territories and Activity Zone
Mountain Home AFB, Idaho
Golden Eagle Study
Western Air Force Ranges

FIGURE
5-2



Path: Q:\NaturalResources\AirForce_GoldenEagle\MXD\AllBases_GoldenEagleReport\GOEA_NestZones_2014_NTTR.mxd, aaron.johnson 1/27/2015

2014 Occupied Territories and Activity Zone
Nevada Test and Training Range
Golden Eagle Study
Western Air Force Ranges

FIGURE
5-3

APPENDIX B

STATE AND FEDERAL PERMITS

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BRIAN SANDOVAL
Governor

STATE OF NEVADA

DEPARTMENT OF WILDLIFE

4600 Kietzke Lane, Ste D-135
Reno, Nevada 89502

(775) 688-1500 • Fax (775) 688-1509

KENNETH E. MAYER
Director

RICHARD L. HASKINS II
Deputy Director

PATRICK O. CATES
Deputy Director

PERMITTEE:

Michael A Yates
2656 Wade St
Minden NV 89423

Permit No.: S 35768
Date Issued: 06/27/2012
Date Effective: 07/1/2012
Period of Sampling: See Condition #4
Expiration Date: 06/30/14
Annual Report Due: 07/30/13 & 07/30/14
Fed. Permit No.: 20127

SCIENTIFIC COLLECTION PERMIT NO. S 35768
***AMENDED 11/29/2012**

In compliance with the conditions listed below and pursuant to provisions of NRS 503.597 & 503.650, the permittee, each permit year during the designated sampling period, is authorized to

a. Unlimited capture, band, sample and release Peregrine falcons and all other migratory birds, except threatened and endangered species. Unlimited blood and feather samples may be obtained for contaminant analysis.

b. 12 Common Loons and 28 miscellaneous raptors as indicated on federal permit may be fitted with satellite transmitters which do not exceed 3% of the birds' bodyweight. Stomach contents (via flushing) may be obtained from Common loons.
Prior to project, permittee is contact NDOW Western Region Biologist Jenni Jeffers @ 775-423-3171 ext 234 to discuss food habits portion of study.

*c. 12 Golden Eagles as indicated on federal permit to be capture, fitted with satellite transmitters which do not exceed 3% of the birds' bodyweight and released.

CONDITIONS:

1. A copy of this permit and any permits required by the U.S. Fish and Wildlife Service must be in the possession of the permittee and any authorized collectors while conducting collection/salvage activities. The permittee must comply with all terms, conditions and restrictions of the federal permit. This permit is invalid for the taking, collection, or salvage of migratory birds, threatened or endangered species, absent any permit required by the Service for that activity.

   Activities authorized under this permit to collect and/or possess wildlife, parts thereof, or their progeny, shall be in compliance with all other state and federal regulations.

2. Authorized Sampling Area: Common Loon - Walker Lake, Mineral Co., Pyramid Lake, Washoe Co., Topaz Lake, Douglas Co.; Miscellaneous raptors –Statewide; *Golden Eagle –Nevada Test and Training Range in Nye, Lincoln & Clark Counties.

   This permit does NOT authorize trespass and/or collecting activities on state or federal wildlife refuges or reserves, or other public and private property without the permission from landowner or custodian.

3. Number Authorized: Indicated above.

4. Period of Field Collection: Common Loon - 7/1/12 – 11/30/12; 4/1/13 – 11/30/13; 4/1/14 – 6/30/14; Miscellaneous raptors – 7/1/12 - 6/30/14; *Golden Eagles – 12/1/12 – 5/31/14.

5. Destination of Collection: Blood samples will be submitted to Samples to Boise State Univ., Raptor Research Center, USGS Snake River Field Station, 970 Lusk Ave., Boise, ID.

6. Annual Report: A record will be created for each specimen (or group of specimens of a single species) taken at each site-locality. "Taken" means salvaged; captured & released; collected; banded; trapped & killed; seined; netted; snared; sacrificed; reduced to possession; etc. The following information will be recorded for each specimen taken: By date, the number of specimens of each species taken; species name; the habitat type where each specimen was taken; numeric breakdown of sex whenever possible; and a description of the location where each specimen was taken, by the following method: (*Don't use common geographic names*) – UTM Coordinates, NAD 83, Zone 11, rounded to the nearest meter;

The records must be submitted to the Nevada Department of Wildlife License Office – Scientific Collection Report, 4600 Kietzke Ln D-135, Reno, NV 89502, by 7/30/13 for 2012/2013 "take" activities; and 7/30/14 for 2013/2014 "take" activities. Digital reports in Excel spreadsheet (*preferred*) or Quattro Pro are accepted (please follow column sequence as outlined in the Department report form, 22.85-5.)

7. A copy of all pertinent research or technical papers must be submitted to the Department.

8. All specimens authorized under the authority of this permit, including offspring, are property of the State of Nevada and as such, they shall not be sold, bartered, traded, converted to personal use or otherwise disposed of without written approval of the Department, except as provided in Condition #5. This condition remains in effect indefinitely.

9. No fee may be charged to the public for the privilege to view wildlife which is held under the authority of this permit.

10. Permit Cancellation: A violation of a condition or stipulation is cause for the cancellation of the permit.

11. Additional Authorized Collectors: Brian Latta and any authorized personnel under the direction of the Permittee.

Julie Meadows
Program Officer I

jgm
enclosures

DIVISION OF WILDLIFE RESOURCES . 1594 West North Temple . Salt Lake City, UT 84114-6301. (801) 538-4701

CERTIFICATE OF REGISTRATION

Registrant Name and Address

DANIEL DRISCOLL
AMERICAN EAGLE RESEARCH INSTITUTE
PO BOX 748
APACHE JUNCTION AZ 85117

Phone - (480) 216-3001

COR Number **1BAND9103**

Fee Received **$85.00**

Application for new COR due: **1/01/2014**

Effective Dates:

From: **2/12/2013** To: **12/31/2013**

COR Type: **CAPTURE/BAND/RELEASE, SALVAGE (FEDERAL PERMIT NO. MB041248-1)**

Activities Report Due Date: **12/31/2013**

Methods: RADIO-CONTROLLED BOWNET, RADIO-CONTROLLED POWER-SNARE, EAGLE DHO-GAZA, NET-LAUNCHERS

Specific Provisions: AUTHORIZED TO CAPTURE, TAG, AND RELEASE THOSE SPECIES OF BIRDS IDENTIFIED HEREIN AND FROM THE LOCATIONS IDENTIFIED HEREIN. ALSO AUTHORIZED TO SALVAGE ROAD-KILLED DEER AND ELK FOR USE AS BAIT FOR EAGLES.

SUBPERMITTEES: GREGG DONEY, BRIAN LATTA, DAVID HAINES, NICK TODD, ANDREW GRANT, JOE BARNES

REPORT OF ACTIVITIES DUE DECEMBER 31. LOCATIONS WHERE EAGLES ARE CAPTURED MUST BE REPORTED IN UTM COORDINATES, ZONE 12, NAD 83.

FAILURE TO SUBMIT THE APPROPRIATE RECORDS AND REPORTS MAY RESULT IN REVOCATION OR DENIAL OF A CERTIFICATE OF REGISTRATION. (R657-3-16)

COR shall be in possession of registrant when exercising any activity hereunder. This COR is nontransferable.

Change of address/phone number of registrant must be reported immediately to the Wildlife Registration Office, 1594 W N Temple, Suite 2110, Box 146301, Salt Lake City, UT 84114-6301. Amendments to this COR that require additional review by the Division will be subject to an amendment fee. Registrant must receive prior authorization for any use or activity not authorized under this COR or any rule pertaining thereto. This includes, but is not limited to, change in location, species or numbers of animals.

The validity of this COR is dependent upon complying with provisions in R657-3, Title 23, Utah Code, and all applicable foreign, federal, local, or other state law, and specific provisions stipulated herein. Activities authorized herein must be carried out in accordance with and for the purposes described in the application/amendment request submitted. This COR is valid only for the dates indicated herein and gives no rights, either express or implied, to registrant for issuance or denial of future applications.

Issued this 12th day of February, 2013, under authority granted by R657-3 and Title 23, Utah Code.

By Suzanne McMullin
COR Specialist

Registrant signature

Parent signature if registrant is a minor

County	Township, Range, Section	General Location
1. BOX ELDER/TOOELE	1.	1. UTAH TEST AND TRAINING RANGE
Species	**Numbers**	**Disposition**
1. GOLDEN EAGLE	1. UP TO 10 (EITHER SEX)	1. CAPTURE, BAND, WEIGH, MEASURE, TAKE BLOOD AND FEATHER SAMPLES, ATTACH TRANSMITTER, AND RELEASE AT SITE OF CAPTURE.

United States Department of the Interior
U.S. GEOLOGICAL SURVEY
PATUXENT WILDLIFE RESEARCH CENTER
BIRD BANDING LABORATORY
12100 BEECH FOREST ROAD STE-4037
LAUREL, MD 20708-4037
301-497-5790

FEDERAL BIRD BANDING PERMIT

Permittee: Personal	Permit Number:	Action:	Action Date:	Issue Date:	Valid Until:
MR MICHAEL A YATES	20127	Renew	12/05/12	09/07/71	12/31/15
2656 WADE STREET	Signature of Issuing Official, Chief, Bird Banding Laboratory: Bruce Peterjohn				
MINDEN, NV 89423	Signature of Permittee: Michael A. Yates				

Permittee agrees to band in accordance with the general conditions of this permit and with the specific authorization/s listed below:

Permittee is Authorized To Band:

All Species Except Endangered/Threatened Species Unless Specified

In the States of:

AK * CA * ID * IA * MD * NE * NV * NJ * NM * PA * SD * TX * UT * VA * WV *

With Special Authorization to:

Use USGS Bands On Above Listed North American Migrants in * Greenland * Upon Host Country Approval
Band
Take, possess and transport blood samples-not to exceed 1% body mass
Trap

And Additionally Authorized to Use The Following Auxiliary Marking Authorization/s:

Marker Type	Species	Colors	Locations	Seg #	Comments
Anodized Color Leg Band (01B)	PEREGRINE FALCON	Miscellaneous	MD TX VA	12	ACRAFT BANDS ONLY PER PEREGRINE PROTOCOL
Anodized Color Leg Band (01B)	PEREGRINE FALCON	Miscellaneous	AK Greenland	13	ACRAFT BANDS ONLY PER PEREGRINE PROTOCOL
Multiple areas Dye/Paint (08E)	PEREGRINE FALCON	Blue, Red, Yellow	MD TX VA	14	
Multiple areas Dye/Paint (08E)	PEREGRINE FALCON	Blue, Red, Yellow	AK Greenland	15	
Transmitter (89)	PEREGRINE FALCON		MD TX VA	16	NTE 3% TOTAL BODY WT; SATELLITE TRANSMITTERS;BACKPACK ATTACHMENT
Transmitter (89)	PEREGRINE FALCON		AK Greenland	17	NTE 3% TOTAL BODY WT; SATELLITE TRANSMITTERS;BACKPACK ATTACHMENT
Radio Transmitter (back pack) (81B)	FERRUGINOUS HAWK GOLDEN EAGLE NORTHERN GOSHAWK PEREGRINE FALCON PRAIRIE FALCON RED-TAILED HAWK ROUGH-LEGGED HAWK SWAINSON'S HAWK		Tooele, UT	18	All bands, auxiliary markers and attachment materials not to exceed 3% total body weight.

Permittee: Personal	Permit Number:	Action:	Action Date:	Issue Date:	Valid Until:
MR MICHAEL A YATES	20127	Renew	12/05/12	09/07/71	12/31/15
2656 WADE STREET	Signature of Issuing Official, Chief, Bird Banding Laboratory: Bruce Peterjohn				
MINDEN, NV 89423	Signature of Permittee: Michael A. Yates				

Permittee agrees to band in accordance with the general conditions of this permit and with the specific authorization/s listed below:

Marker Type	Species	Colors	Locations	Seg #	Comments
Satellite/ Cell/ GPS Transmitter (back pack) (80B)	GOLDEN EAGLE		Owyhee, ID Elmore, ID Clark, NV Lincoln, NV Nye, NV Curry, NM Box Elder, UT	19	All bands, auxiliary markers and attachment materials not to exceed 3% total body weight.

The following Subpermittee/s are authorized to band under the direction of the above permittee, in accordance with the same general conditions, and the subpermittee specific authorizations listed below:
(Number of Active Sub Permittees 5)

20127 - D TAYLOR K MR P O BOX 715 ATLANTIC, VA 23303

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified

In the States Of:

MD * TX * VA *

With Special Authorization to:

Band
Auxiliary mark
Trap

20127 - F SEEGAR W S MR 12265 HARFORD ROAD GLEN ARM, MD 21057

Is Authorized To Band:

All Species Except Waterfowl and Endangered/Threatened Species Unless Specified

In the States Of:

AK * MD * TX * VA *

With Special Authorization to:

Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Trap

Permittee: Personal	Permit Number:	Action:	Action Date:	Issue Date:	Valid Until:
MR MICHAEL A YATES	20127	Renew	12/05/12	09/07/71	12/31/15
2656 WADE STREET	Signature of Issuing Official, Chief, Bird Banding Laboratory: Bruce Peterjohn				
MINDEN, NV 89423	Signature of Permit: Michael A. Yates				

Permittee agrees to band in accordance with the general conditions of this permit and with the specific authorization/s listed below:

20127 - G MR B J DAYTON 5235 GEORGIE'S LANE CHINCOTEAGUE IS, VA 23336

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified

In the States Of:

MD * NJ * PA * TX * VA *

With Special Authorization to:

Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Trap

20127 - H MR STEWART S SOMERS 307 WINTER QUARTERS DR. POCOMOKE CITY, MD 21851

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified

In the States Of:

MD * TX * VA *

With Special Authorization to:

Band
Auxiliary mark
Trap

20127 - R TOM CONRAD MAUGANS SEEGAR 2005 FLOYD AVENUE APT#3 RICHMOND, VA 23220

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified

In the States Of:

MD * TX * VA *

With Special Authorization to:

Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Trap

FEDERAL BIRD BANDING PERMIT

Under the provisions of Regulations issued under the Migratory Bird Treaty Act of July 3, 1918 (40 Stat. 755) as amended, or the Bald Eagle Act of June 8, 1940 (54 Stat. 250) as amended, the person named hereon is authorized to capture, for scientific banding or marking purposes, those migratory birds described hereon and to salvage birds accidentally killed during normal banding activities.

This permit is subject to the terms, exceptions and restrictions expressed herein or on the reverse side hereof and is further subject to any applicable Territorial, State, Tribal or Federal Regulations.

This permit is invalid unless accompanied by any required State permits or licenses.

GENERAL CONDITIONS

1. The Permittee is not authorized to capture or possess migratory birds for any reason other than banding, marking or salvage of banding mortalities for scientific purposes. NOR IS THE PERMITTEE ALLOWED TO HOLD MIGRATORY BIRDS FOR A PERIOD OF MORE THAN 24 HOURS. Live birds shall be released as soon as practical after capture.
2. You may donate dead migratory birds or any parts thereof (except bald eagles and golden eagles, and species listed as threatened and endangered) without additional authorization from the migratory bird permit issuing office to public institutions (as specified in 50 CFR 10.12) or individuals or entities authorized by permit to acquire and possess migratory bird specimens for educational purposes. All dead specimens that you do not transfer to another authorized party must be disposed of by such means as are necessary to ensure that they are not exposed to animals in the wild.
3. You may not salvage and must immediately report to the USFWS Office of Law Enforcement any dead or injured migratory birds that you encounter that appear to have been poisoned, shot, electrocuted, have collided with industrial power generation equipment, or were otherwise killed or injured as the result of potential criminal activity. Please contact BBL for more information.
4. All eagle feathers and/or whole eagle carcasses must be shipped to the National Eagle Repository. Contact: U.S. Fish and Wildlife Service, National Eagle and Wildlife Repository, 5650 Havana St., RMA, Building 128, Commerce City, Colorado 80022, (303) 287-2110.
5. The Permittee shall keep RECORDS accounting for the use of all bands received. Periodic RECORDS COVERING THE USE OF THESE BANDS shall be submitted to the Bird Banding Laboratory in accordance with the instructions received there from. Failure to provide data in accordance with the instructions received from the Bird Banding Laboratory is sufficient justification for the revocation of this permit. The Permittee shall keep records of disposition of salvaged banding mortalities for a period of five years and shall be reported to the Bird Banding Laboratory upon request.
6. The holder of this permit shall not sell, exchange, or transfer bands to unauthorized banders or to the general public. All transfers to authorized banders must be communicated to the Bird Banding Laboratory prior to the transfer of bands. Any unused bands remaining when this permit is voluntarily returned, revoked, or expired must be returned to the Bird Banding Laboratory.
7. The Permittee shall, at all reasonable hours, allow any authorized representative of the U. S. Geological Survey or the U.S. Fish and Wildlife Service to ENTER and INSPECT the premises where operations authorized by this permit are being conducted and shall allow such representative to inspect the records relating to such operations.
8. This permit may be SUSPENDED or REVOKED by the Director of the U.S. Geological Survey or authorized representative, if the Permittee violates any of the provisions in the regulations under which this permit is issued or if the Permittee fails to render promptly any reports required. This permit is, at all times, subject to suspension or revocation at the discretion of the Director or representative.
9. This permit is not transferable and must be in possession of the Permittee when exercising the authorizations granted herein.
10. All traps, nets or other capture devices shall bear a TAG or LABEL showing the name, address and permit number of the Permittee; alternatively the trapping area shall be adequately marked with POSTERS provided by the Bird Banding Laboratory. The Permittee's name, address and permit number shall be legibly displayed on such posters.
11. This permit DOES NOT authorize the capture of any birds on any property, public or private without the CONSENT OF THE OWNER OR CUSTODIAN THEREOF.
12. All Banding under this permit is in accordance with the principles, spirit, and intent of the Animal Welfare Act of 1970 and the most recent revision of The Ornithological Council's Guidelines in the Use of Wild Birds in Research.
13. Unless specifically noted on the reverse, the following ARE NOT AUTHORIZED:

a. The taking of blood or feather sampling from any bird.

b. The use of ANY BAND, clip, paint, dye, signal-sending device or any marking device other than the official numbered leg bands issued by the Bird Banding Laboratory.

c. The use of MIST NETS or other nets for the capturing of birds.

d. The use of TRANQUILIZING DRUGS OR OTHER CHEMICALS for the purpose of capturing birds.

e. Trapping or disturbing the nests or nestlings, for the purpose of banding or marking, of species designated by the Secretary of Interior as "ENDANGERED "or "THREATENED."

f. The handling of any PREVIOUSLY BANDED BIRD in any manner which may bias data on file in the Bird Banding Laboratory which pertain to that bird or which may alter that bird's survival potential, behavior or other normal characteristics. This specifically includes adding markers to or removing markers from previously banded birds.

Form 9-475
(April 2011)

STATE OF NEVADA

DEPARTMENT OF WILDLIFE

4600 Kietzke Lane, Ste D-135
Reno, Nevada 89502

(775) 688-1500 • Fax (775) 688-1509

BRIAN SANDOVAL
Governor

GEORGE K. TSUKAMOTO
Acting Director

RICHARD L. HASKINS II
Deputy Director

PATRICK O. CATES
Deputy Director

PERMITTEE:

Daniel Driscoll
American Eagle Research Institute
PO Box 748
Apache Junction AZ 85117

Permit No.: S35849
Date Issued: 8/27/2012
Date Effective: 8/27/2012
Period of Sampling: See Condition #4
Expiration Date: 6/30/2014
Annual Report Due: 7/30/2013 & 7/30/2014
Fed. Permit No.: MB041248-1; 23723

SCIENTIFIC COLLECTION PERMIT NO. S35849
***AMENDED 3/14/2013**

In compliance with the conditions listed below and pursuant to provisions of NRS 503.597 & 503.650, the permittee, each permit year during the designated sampling period, is authorized to: Capture, band, cellular transmitter, morphology data and collect blood samples from *20 Golden Eagles *(Aquila chrysaetos)*, 40 Peregrine Falcon *(Falco peregrines)* and 10 Prairie Falcon *(Falco mexicanus).*

Note: Prior to any handling activities in Southern Nevada, permittee is to contact NDOW Southern Region Supervising Biologist Cris Tomlinson @ 702-486-5127 ext 3700; North / West Nevada, NDOW Western Region Supervising Biologist David Catalano @ 775-688-1412.
***Prior to any planned aerial surveys, permittee must contact NDOW Southern Region Biologists Steve Kimble or Cris Tomlinson @ 702-486-5127 for appropriate timing and avoidance measures relative to BHS lambing seasons and use areas.**

CONDITIONS:

1. A copy of this permit and any permits required by the U.S. Fish and Wildlife Service must be in the possession of the permittee and any authorized collectors while conducting collection/salvage activities. The permittee must comply with all terms, conditions and restrictions of the federal permit. This permit is invalid for the taking, collection, or salvage of migratory birds, threatened or endangered species, absent any permit required by the Service for that activity.

   Activities authorized under this permit to collect and/or possess wildlife, parts thereof, or their progeny, shall be in compliance with all other state and federal regulations.

2. Authorized Sampling Area: *10 Golden Eagles - Washoe, Storey, Douglas, Lyon and Carson counties. *10 Golden Eagles – Nellis Air Force Base and NevadaTest & Training Range and adjacent Military Operations Center in Clark, Lincoln and Nye Counties.
   Peregrine Falcon and Prairie Falcon – within/and surrounding the Lake Mead National Recreation Area in Clark and Lincoln counties.

   This permit does NOT authorize trespass and/or collecting activities on state or federal wildlife refuges or reserves, or other public and private property without the permission from landowner or custodian.

3. Number Authorized: *20 Golden Eagles *(Aquila chrysaetos)*; 40 Peregrine Falcon *(Falco peregrines)*; 10 Prairie Falcon *(Falco mexxicanus).*

4. Period of Field Collection: August 27, 2012 – June 30, 2014.

5. Destination of Collection: N/A

6. Annual Report: A record will be created for each specimen (or group of specimens of a single species) taken at each site-locality. "Taken" means salvaged; captured & released; collected; banded; trapped & killed; seined; netted; snared; sacrificed; reduced to possession; etc. The following information will be recorded for each specimen taken: By date, the number of specimens of each species taken; species name; the habitat type where each specimen was taken; numeric breakdown of sex whenever possible; and a description of the location where each specimen was taken, by the following method: (*Don't use common geographic names*)
   – UTM Coordinates, NAD 83, Zone 11, rounded to the nearest meter;

   The records must be submitted to the Nevada Department of Wildlife, License Office – Scientific Collection Report, 4600 Kietzke Ln D-135, Reno, NV 89502, by 7/30/2013 for 2012/2013 "take" activities; and 7/30/2014 for the 2013/2014 "take" activities. Digital reports in Excel spreadsheet (*preferred*) or Quattro Pro are accepted (please follow column sequence as outlined in the Department report form, 22.85-5.)

7. A copy of all pertinent research or technical papers must be submitted to the Department.
   ***NDOW is to receive copies of any and all Summary Reports.**

8. All specimens authorized under the authority of this permit, including offspring, are property of the State of Nevada and as such, they shall not be sold, bartered, traded, converted to personal use or otherwise disposed of without written approval of the Department, except as provided in Condition #5. This condition remains in effect indefinitely.

9. No fee may be charged to the public for the privilege to view wildlife which is held under the authority of this permit.

10. Permit Cancellation: A violation of a condition or stipulation is cause for the cancellation of the permit.

11. Additional Authorized Collectors: Gregg Doney, Joe Barnes, David Haines, Andrew Grant and Nick Todd, Brian Latta, Ron Jackman and Paul Andreano.

Julie Meadows
Program Officer I

jgm
enclosure

STATE OF IDAHO
IDFG WILDLIFE BUREAU
WILDLIFE COLLECTION / BANDING / POSSESSION PERMIT

Name:	Daniel Driscoll	**Permit No.:**	130206
Address:	PO Box 748	**Issued:**	2/13/13
	Apache Junction, AZ 85117	**Renewed:**	
E-mail:	eaglestudies@gmail.com	**Revised:**	
Phone No.:	480-216-3001	**Expires:**	12/31/13
Affiliation (If any):	American Eagle Research Institute	**Receipt No.**	**764-13-000040**

Height 5'10" Weight 175 lbs Eye Color Brown Hair Color Brown

Permission is hereby granted to the permittees to collect wildlife in Idaho under the following terms and conditions:

Purpose of permit: Band and attach transmitters to golden eagles. Salvage road kill deer & elk for eagle bait.

Species (numbers of each with common and scientific names): Up to 10 Golden Eagles (*Aquila chrysaetos*).

Methods of capture and equipment to be used (METHODS NOT LISTED ARE PROHIBITED): Bownets, power snares, and net launcher.

Specific Geographic area(s) or waters: Saylor Creek Range, Juniper Butte Range, and Mtn Home AFB.

Depository or disposition of specimens: Release at capture site.

Federal permit number, if required: BBL23723, MB-041248-1

Permit Provisions:

1. This permit is not transferable, nor may its authority be delegated.
2. A report specifying the number and location (GPS location with datum and coordinate system identified) of each species of wildlife captured, banded, possessed, sold or traded and their disposition shall be submitted within 30 days following expiration of this permit to the IDFG Wildlife Bureau, Wildlife Diversity Program, Box 25, Boise, ID, 83707. No renewal will be considered until such report is received.
3. This permit and any wildlife in possession shall be produced for inspection upon request of any conservation officer or other authorized representative of the Idaho Department of Fish and Game.
4. Any abuse or misuse of privileges granted by this permit shall be grounds for revocation and appropriate legal action.
5. All stationary equipment used to capture wildlife (nets, traps, etc.) will have an attached metal tag bearing, in legible English, the name and current address of the permit holder.
6. No capture, banding, and/or collections shall be made under this permit until the local IDFG conservation officer or the appropriate Regional office(s) listed below are notified where and when the capture and/or collections are to be made. A record of dates, times and persons notified shall be kept and submitted as part of the annual report and permit renewal process.
7. Release of animals anywhere except the site of capture is not permitted. Animals to be released alive and unharmed must not be removed from the site of capture. Repatriation of captive animals is not permitted under any circumstances.

Additional information/stipulations:

Subpermittee(s): Gregg Doney, Brian Latta, David Haines, Nick Todd, Andrew Grant and Joe Barnes.

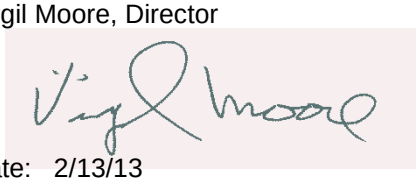
cc:

Southwest - (208) 465-8465

Magic Valley - (208) 324-4359

USFWS

IDAHO DEPARTMENT OF FISH AND GAME
Virgil Moore, Director

By 

Date: 2/13/13

United States Department of the Interior
U.S. GEOLOGICAL SURVEY
PATUXENT WILDLIFE RESEARCH CENTER
BIRD BANDING LABORATORY
12100 BEECH FOREST ROAD STE-4037
LAUREL, MD 20708-4037
301-497-5790

FEDERAL BIRD BANDING PERMIT

Permittee: Personal	Permit Number:	Action:	Action Date:	Issue Date:	Valid Until:
MR DANIEL E DRISCOLL	23723	Revise	02/07/13	01/24/11	02/28/14
AMERICAN EAGLE RES INSTITUTE P.O. BOX 748 APACHE JUNCTION, AZ 85117	Signature of Issuing Official, Chief, Bird Banding Laboratory: Bruce Peterjohn Signature of Permittee: Dan E Driscoll				

Permittee agrees to band in accordance with the general conditions of this permit and with the specific authorization/s listed below:

Permittee is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified
BALD EAGLE
GOLDEN EAGLE

In the States of:

AZ * CA * CO * ID * NV * NM * UT *

With Special Authorization to:

Use USGS Bands On Above Listed North American Migrants in * Mexico * Upon Host Country Approval
Band
Take, possess and transport blood samples-not to exceed 1% body mass
Take, possess and transport feather samples
Hand capture
Use Bal-chatris
Use Bow nets
Use Cannon nets
Use Dho-gazas
Use Mist nets
Use Net launchers
Use Rocket nets
Trap

Comments: Authorized to use Power Snares & Phai Traps per BP 01-17-12

And Additionally Authorized to Use The Following Auxiliary Marking Authorization/s:

Marker Type	Species	Colors	Locations	Seg #	Comments
Satellite/ Cell/ GPS Transmitter (back pack) (80B)	BALD EAGLE GOLDEN EAGLE		AZ CA CO ID NV NM UT Mexico	2	NTE 3% total body weight, PTT/GSM transmitters, with VHF units 164 MHz. Backpack harness.
Satellite/Cell/GPS Transmitter (tail mount) (80A)	BALD EAGLE GOLDEN EAGLE		AZ CA CO ID NV NM UT Mexico	3	NTE 3% total body weight, PTT/GSM transmitters, with VHF units 164 MHz.

Permittee: Personal	Permit Number:	Action:	Action Date:	Issue Date:	Valid Until:
MR DANIEL E DRISCOLL	23723	Revise	02/07/13	01/24/11	02/28/14
AMERICAN EAGLE RES INSTITUTE P.O. BOX 748 APACHE JUNCTION, AZ 85117	Signature of Issuing Official, Chief, Bird Banding Laboratory: Bruce Peterjohn Signature of Permittee: Dan E Driscoll				

Permittee agrees to band in accordance with the general conditions of this permit and with the specific authorization/s listed below:

Marker Type	Species	Colors	Locations	Seg #	Comments
Anodized Color Leg Band (01B)	PEREGRINE FALCON PRAIRIE FALCON	Black	Mohave, AZ Lincoln, NV Clark, NV	4	Acraft bands, 2 Alphanumeric Vertical Symbols

The following Subpermittee/s are authorized to band under the direction of the above permittee, in accordance with the same general conditions, and the subpermittee specific authorizations listed below:
(Number of Active Sub Permittees 7)

23723 - A MR GEGG E DONEY 4701 HELBERG DRIVE HELENA, MT 59602

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified
BALD EAGLE
GOLDEN EAGLE

In the States Of:

AZ * CA * CO * ID * NV * NM * UT *

With Special Authorization to:

Use USGS Bands On Above Listed North American Migrants in * Mexico * Upon Host Country Approval
Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Take, possess and transport feather samples
Hand capture
Use Bal-chatris
Use Bow nets
Use Dho-gazas
Use Mist nets
Use Net launchers
Trap

Comments:

Authorized to use Power-Snares & Phai Traps per BP 01/17/12

Permittee: Personal	Permit Number:	Action:	Action Date:	Issue Date:	Valid Until:
MR DANIEL E DRISCOLL	23723	Revise	02/07/13	01/24/11	02/28/14
AMERICAN EAGLE RES INSTITUTE P.O. BOX 748 APACHE JUNCTION, AZ 85117	Signature of Issuing Official, Chief, Bird Banding Laboratory: Bruce Peterjohn Signature of Permittee: Daniel E Driscoll				

Permittee agrees to band in accordance with the general conditions of this permit and with the specific authorization/s listed below:

23723 - B MR J. NICK TODD 1541 GAMBY WAY SOLVANG, CA 93463

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified
BALD EAGLE
GOLDEN EAGLE

In the States Of:

AZ * CA * CO * ID * NV * NM * UT *

With Special Authorization to:

Use USGS Bands On Above Listed North American Migrants in * Mexico * Upon Host Country Approval
Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Take, possess and transport feather samples
Hand capture
Use Bal-chatris
Use Bow nets
Use Dho-gazas
Use Mist nets
Use Net launchers

Comments:

Authorized to use Power-Snares & Phai Traps per BP 01/17/12

23723 - C MR RONALD EDWARD JACKMAN 1260 MOUNTAIN SHADOWS BLVD REDDING, CA 96003

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified
BALD EAGLE
GOLDEN EAGLE

In the States Of:

AZ * CA * CO * ID * NV * NM * UT *

With Special Authorization to:

Use USGS Bands On Above Listed North American Migrants in * Mexico * Upon Host Country Approval
Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Take, possess and transport feather samples
Hand capture
Use Bal-chatris
Use Bow nets
Use Dho-gazas
Use Mist nets
Use Net launchers

Comments:

Authorized to use Power Snares & Phai Traps per BP 01-17/12

Permittee: Personal	Permit Number:	Action:	Action Date:	Issue Date:	Valid Until:
MR DANIEL E DRISCOLL	23723	Revise	02/07/13	01/24/11	02/28/14
AMERICAN EAGLE RES INSTITUTE P.O. BOX 748 APACHE JUNCTION, AZ 85117	Signature of Issuing Official, Chief, Bird Banding Laboratory: Bruce Peterjohn				
	Signature of Permittee:				

Permittee agrees to band in accordance with the general conditions of this permit and with the specific authorization/s listed below:

23723 - D MR BRIAN CUTLER LATTA 230 ROSS STREET SANTA CRUZ, CA 95060

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified
BALD EAGLE
GOLDEN EAGLE

In the States Of:

AZ * CA * CO * ID * NV * NM * UT *

With Special Authorization to:

Use USGS Bands On Above Listed North American Migrants in * Mexico * Upon Host Country Approval
Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Take, possess and transport feather samples
Hand capture
Use Bal-chatris
Use Bow nets
Use Dho-gazas
Use Mist nets
Use Net launchers

Comments:

Authorized to use Power Snares & Phai traps per BP 01/17/12

23723 - E MR DAVID HAINES 4518 DUNROBIN AVENUE LAKEWOOD, CA 90713

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified
BALD EAGLE
GOLDEN EAGLE

In the States Of:

AZ * CA * CO * ID * NV * NM * UT *

With Special Authorization to:

Use USGS Bands On Above Listed North American Migrants in * Mexico * Upon Host Country Approval
Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Take, possess and transport feather samples
Hand capture
Use Bal-chatris
Use Bow nets
Use Dho-gazas
Use Mist nets
Use Net launchers

Comments:

Authorized to use Power Snares & Phai Traps per BP 01/17/12

Permittee: Personal	Permit Number:	Action:	Action Date:	Issue Date:	Valid Until:
MR DANIEL E DRISCOLL	23723	Revise	02/07/13	01/24/11	02/28/14
AMERICAN EAGLE RES INSTITUTE P.O. BOX 748 APACHE JUNCTION, AZ 85117	Signature of Issuing Official, Chief, Bird Banding Laboratory: Bryce Peterjohn Signature of Permittee: Daniel E Driscoll				

Permittee agrees to band in accordance with the general conditions of this permit and with the specific authorization/s listed below:

23723 - F MR JOSEPH G BARNES 2291 W HORIZON RIDGE, APT 4121 HENDERSON, NV 89052

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified
BALD EAGLE
GOLDEN EAGLE

In the States Of:

AZ * CA * CO * ID * NV * NM * UT *

With Special Authorization to:

Use USGS Bands On Above Listed North American Migrants in * Mexico * Upon Host Country Approval
Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Take, possess and transport feather samples
Hand capture
Use Bal-chatris
Use Bow nets
Use Dho-gazas
Use Mist nets
Use Net launchers

Comments:

Authorized to use Power Snares & Phai Traps per BP 01/17/12

23723 - G MR PAUL D ANDREANO 1000 MONTECITO ROAD #3 CAYUCOS, CA 93430

Is Authorized To Band:

All Raptors Except Eagles or Endangered/Threatened Species Unless Specified
BALD EAGLE
GOLDEN EAGLE

In the States Of:

AZ * CA * CO * ID * NV * NM * UT *

With Special Authorization to:

Use USGS Bands On Above Listed North American Migrants in * Mexico * Upon Host Country Approval
Band
Auxiliary mark
Take, possess and transport blood samples-not to exceed 1% body mass
Take, possess and transport feather samples
Hand capture
Use Bal-chatris
Use Bow nets
Use Dho-gazas
Use Mist nets
Use Net launchers

Comments:

Authorized to use Power Snares & Phai Traps per BP 01/17/12

FEDERAL BIRD BANDING PERMIT

Under the provisions of Regulations issued under the Migratory Bird Treaty Act of July 3, 1918 (40 Stat. 755) as amended, or the Bald Eagle Act of June 8, 1940 (54 Stat. 250) as amended, the person named hereon is authorized to capture, for scientific banding or marking purposes, those migratory birds described hereon and to salvage birds accidentally killed during normal banding activities.

This permit is subject to the terms, exceptions and restrictions expressed herein or on the reverse side hereof and is further subject to any applicable Territorial, State, Tribal or Federal Regulations.

This permit is invalid unless accompanied by any required State permits or licenses.

GENERAL CONDITIONS

1. The Permittee is not authorized to capture or possess migratory birds for any reason other than banding, marking or salvage of banding mortalities for scientific purposes. NOR IS THE PERMITTEE ALLOWED TO HOLD MIGRATORY BIRDS FOR A PERIOD OF MORE THAN 24 HOURS. Live birds shall be released as soon as practical after capture.
2. You may donate dead migratory birds or any parts thereof (except bald eagles and golden eagles, and species listed as threatened and endangered) without additional authorization from the migratory bird permit issuing office to public institutions (as specified in 50 CFR 10.12) or individuals or entities authorized by permit to acquire and possess migratory bird specimens for educational purposes. All dead specimens that you do not transfer to another authorized party must be disposed of by such means as are necessary to ensure that they are not exposed to animals in the wild.
3. You may not salvage and must immediately report to the USFWS Office of Law Enforcement any dead or injured migratory birds that you encounter that appear to have been poisoned, shot, electrocuted, have collided with industrial power generation equipment, or were otherwise killed or injured as the result of potential criminal activity. Please contact BBL for more information.
4. All eagle feathers and/or whole eagle carcasses must be shipped to the National Eagle Repository. Contact: U.S. Fish and Wildlife Service, National Eagle and Wildlife Repository, 5650 Havana St., RMA, Building 128, Commerce City, Colorado 80022, (303) 287-2110.
5. The Permittee shall keep RECORDS accounting for the use of all bands received. Periodic RECORDS COVERING THE USE OF THESE BANDS shall be submitted to the Bird Banding Laboratory in accordance with the instructions received there from. Failure to provide data in accordance with the instructions received from the Bird Banding Laboratory is sufficient justification for the revocation of this permit. The Permittee shall keep records of disposition of salvaged banding mortalities for a period of five years and shall be reported to the Bird Banding Laboratory upon request.
6. The holder of this permit shall not sell, exchange, or transfer bands to unauthorized banders or to the general public. All transfers to authorized banders must be communicated to the Bird Banding Laboratory prior to the transfer of bands. Any unused bands remaining when this permit is voluntarily returned, revoked, or expired must be returned to the Bird Banding Laboratory.
7. The Permittee shall, at all reasonable hours, allow any authorized representative of the U. S. Geological Survey or the U.S. Fish and Wildlife Service to ENTER and INSPECT the premises where operations authorized by this permit are being conducted and shall allow such representative to inspect the records relating to such operations.
8. This permit may be SUSPENDED or REVOKED by the Director of the U.S. Geological Survey or authorized representative, if the Permittee violates any of the provisions in the regulations under which this permit is issued or if the Permittee fails to render promptly any reports required. This permit is, at all times, subject to suspension or revocation at the discretion of the Director or representative.
9. This permit is not transferable and must be in possession of the Permittee when exercising the authorizations granted herein.
10. All traps, nets or other capture devices shall bear a TAG or LABEL showing the name, address and permit number of the Permittee; alternatively the trapping area shall be adequately marked with POSTERS provided by the Bird Banding Laboratory. The Permittee's name, address and permit number shall be legibly displayed on such posters.
11. This permit DOES NOT authorize the capture of any birds on any property, public or private without the CONSENT OF THE OWNER OR CUSTODIAN THEREOF.
12. All Banding under this permit is in accordance with the principles, spirit, and intent of the Animal Welfare Act of 1970 and the most recent revision of The Ornithological Council's Guidelines in the Use of Wild Birds in Research.
13. Unless specifically noted on the reverse, the following ARE NOT AUTHORIZED:

a. The taking of blood or feather sampling from any bird.

b. The use of ANY BAND, clip, paint, dye, signal-sending device or any marking device other than the official numbered leg bands issued by the Bird Banding Laboratory.

c. The use of MIST NETS or other nets for the capturing of birds.

d. The use of TRANQUILIZING DRUGS OR OTHER CHEMICALS for the purpose of capturing birds.

e. Trapping or disturbing the nests or nestlings, for the purpose of banding or marking, of species designated by the Secretary of Interior as "ENDANGERED "or "THREATENED."

f. The handling of any PREVIOUSLY BANDED BIRD in any manner which may bias data on file in the Bird Banding Laboratory which pertain to that bird or which may alter that bird's survival potential, behavior or other normal characteristics. This specifically includes adding markers to or removing markers from previously banded birds.

APPENDIX C

BAIT STATION PROTOCOL

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July 8, 2013

Field Protocol for Golden Eagle Bait Station Set-up and Maintenance

Study of Golden Eagle Activity on Air Force Ranges in the Western United States

Nevada Test and Training Range

USACE Contract Number: W9126G-11-D-0040, TO 0003

1.0 Introduction

Golden eagles (*Aquila chrysaetos*) occur on US Air Force (AF) training ranges in the western US which may provide large areas of foraging habitat and important nesting sites for golden eagles. In order to comply with the Bald and Golden Eagle Protection Act, the AF seeks to collect field data that results in a report on golden eagle activity on these ranges sufficient to develop site-specific conservation measures and guidelines for compliance.

AMEC and subconsultant BioResource Consultants, Inc. (BRC) have been contracted to conduct field surveys, including the use of bait stations equipped with automated cameras, to attract and document seasonal use of the sites by golden eagles. The primary purpose of the bait stations is to obtain additional data regarding use by non-resident birds. These bait stations include a motion-activated camera station baited with one or two animal carcasses. Periodic maintenance includes replacing bait carcasses, exchanging camera memory cards and batteries, and minor maintenance of the stations.

Four bait stations are planned for Nevada Test and Training Range (NTTR). Two stations located at the Northern Range within the ECW and ECE areas, and two at the Southern Range with within the 64 Charlie and 63 Bravo areas. The final locations of these stations have been coordinated with the AF base natural resources staff and base operations personnel, with preference given to sites with suitable biological characteristics balanced with security concerns and relative ease of access. The approved locations are shown on the attached figures (**Attachment 1**).

2.0 Bait Station Set Up and Maintenance

This scope of work will be carried out at NTTR. The following tasks will be carried out by the bait station maintenance contractor to meet the project Statement of Objectives and Requirements per the U.S Army Corps of Engineers Purchase Order (W9126G-11-0040 - 003) issued to AMEC on September 26, 2012. The anticipated set up date is June 29, 2013, and the study duration is anticipated to continue through June of 2014.

Location

Bait stations will be set up in open areas, and up to two bait carcasses (e.g. roadkilled deer, elk, antelope, or cattle) will be laid out and secured for eagles to feed upon. Carcasses should be cut open along the abdomen to provide easier access for birds. The stations will generally be located in an area such as an open grassy slope at least 300 feet from the road where eagles are likely to be comfortable landing on the ground and not susceptible to ambush by other predators. An attempt will be made to place the stations in locations that are accessible by road and where access is generally not restricted by test and training operations. If issues arise with attracting flocking species such as ravens/vultures, or if there are logistical problems making the site difficult to maintain, an adaptive strategy will be employed with the stations, including potential relocation as approved by AF personnel.

Camera Set Up

Remote cameras with motion sensors will be installed to record images of animals coming to feed on the carcass. The remote camera will be camouflaged from behind with native brush or rocks and mounted on a tripod about 1 to 3 feet off the ground. It will be placed about 6 feet from the bait which will be placed in

an open area. The camera will be labeled with the bait station number. Vegetation in front of and within the active camera zone should be cleared to the extent feasible to avoid false triggers from wind. Bait will be attached to a buried rebar stake with bailing wire to keep animals from dragging it off out of the camera's field of view. If possible, the camera should be oriented north to ensure the sun is to the side or behind the camera. Photos of the camera station set up and materials are provided in **Attachment 2**.

The largest possible memory card that is compatible should be utilized in the camera. The camera should be set to a take 1-3 pictures every 1 minute when activated. This interval provides multiple pictures of a single individual without taking so many that cards fill up quickly. The camera will be activated and tested upon set up and at the end of each maintenance visit. Before leaving the station, the camera will be triggered once to record time of setting. A set up data form will be filled out as provided in **Attachment 3.**

Bait Acquisition

Bait is being provided by John Stever, a Deputy Sheriff out of Pioche. John will collect road kill as authorized by Nevada Department of Wildlife (NDOW) under Scientific Collecting Permit (SCP) 35768 (**Attachment 4**) and process (gut and quarter as needed), store, and deliver it for our use. A copy of the SCP must be carried by all staff that collect and/or transport carcasses to be used as bait. For South Range bait stations, carcasses can be stored in the chest freezer at the Nellis AFB Recycling Center. John will reload this freezer as it is depleted. For North Range stations, carcasses can be picked up from John on the way to the north range at a meeting spot close to the intersections of 93 and 375. The bait station maintenance contractor will be responsible for coordinating bait pickups and deliveries as needed. John's cell phone number is 775-962-1143. Carcasses should always be handled with gloves to reduce the transfer of human scent.

Maintenance

At approximately two-week intervals, the bait station maintenance contractor will do the following:

- Place out a new carcass
- Exchange the camera memory card on which the images are stored for a new one
- Exchange batteries if needed
- Check the camera condition and settings
- Check the positioning of the camera
- Adjust or replace stakes as needed
- Reactivate and test camera
- Fill out data form

Old carcasses may be detached from the stakes and left at the station site. This will be done as frequently as once every two weeks by one technician depending on how many animals are feeding on the carcass. The bait replacement interval can be increased if carcasses and memory cards last longer than two weeks. A bait station maintenance data form will be filled for each visit out as provided in **Attachment 3.**

Equipment List

<u>Set Up</u>
Camera and memory cards
Camera batteries – AA lithium

Tripod
Carcasses and bins
Knife
Garbage bags
Gloves
Camera tag
Rope to drag or cart to carry carcass
Bailing wire to tie carcass to stake
3 foot pieces of rebar for camera tripod (2-3 per camera)
Rebar stakes for bait
Mallet to pound stakes
Wire cutters
Data forms
GPS with station location
Card reader to test camera function

Maintenance
Memory cards
Camera batteries – AA lithium
Carcasses and bins
Knife
Garbage bags
Gloves
Rope to drag or cart to carry carcass
Bailing wire to tie carcass to stake
Replacement rebar stakes for bait
Mallet to pound stakes
Wire cutters
Data forms
GPS with station location
Card reader to test camera function

3.0 Period of Performance and Schedule

This phase of the project is planned to start in June 2013. AMEC will deploy and initially bait the North Range stations in late June with NAFB staff. NAFB staff and the bait station maintenance contractor will then set the South Range stations in the subsequent weeks. Up to 26 bi-weekly maintenance visits will be made to each station by the bait station maintenance contractor through June/July 2014.

4.0 Key Personnel Roles

Project Lead. A project lead will be designated by the maintenance contractor to be the primary Point of Contact with AMEC. The project lead will work with AMEC to coordinate scheduling and procedures, and be responsible for scheduling and coordinating field visits with the field technicians. The project lead will

collect memory cards from the field technicians and photos will be sent to AMEC for analysis of images. The project lead may be required to coordinate with identified suppliers on the logistics of picking up/receiving carcasses.

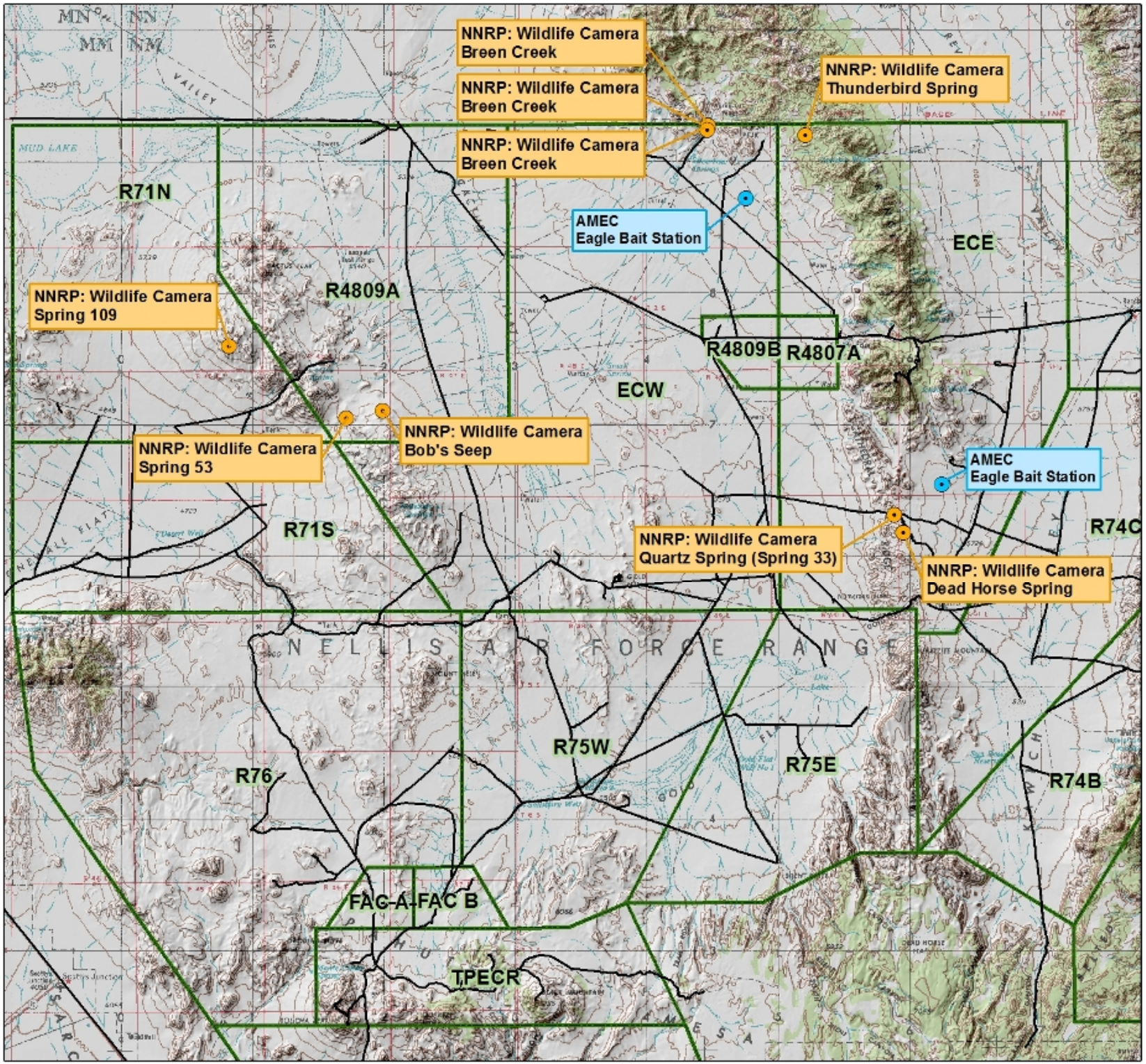
Field Technicians. Field technicians will be responsible for picking up/receiving carcasses from a supplier arranged by AMEC, and transporting them to the bait stations. Carcasses will be wrapped and handled with proper gloves and personal protective equipment (PPE) to minimize contact according to the AMEC Health and Safety Plan (**Attachment 5**). Carcasses will be carried to the bait stations and placed following procedures outlined above. Memory cards will be exchanged in the cameras, and batteries changed, as required, in the automated equipment. General maintenance of the station and equipment (minor cleaning and adjustment) may be required. Field technicians will take and provide notes on the condition of the stations and other observations.

Personnel Requirements:

Contractor personnel must hold base approved clearance and authorization to access the bait station areas on the North and South Ranges. Personnel must be able to handle animal carcasses, potentially weighing from 40 to 100+ pounds, loading up to eight per session (up to two for each of four stations) in and out of trucks and moving them to the bait station locations, short distances over potentially uneven terrain.

Attachments

Attachment 1. Bait Station Location Maps
Attachment 2. Photos of Bait Station Set Up
Attachment 3. Data Forms
Attachment 4. Scientific Collecting Permit
Attachment 5. Supplement to the AMEC Health and Safety Plan



Department of the Air Force
Air Combat Command
Civil Engineer Squadron

Proposed Wildlife Camera Locations - North Range

Key to Features

- Eagle Bait Station
- Wildlife Camera
- Range Boundary

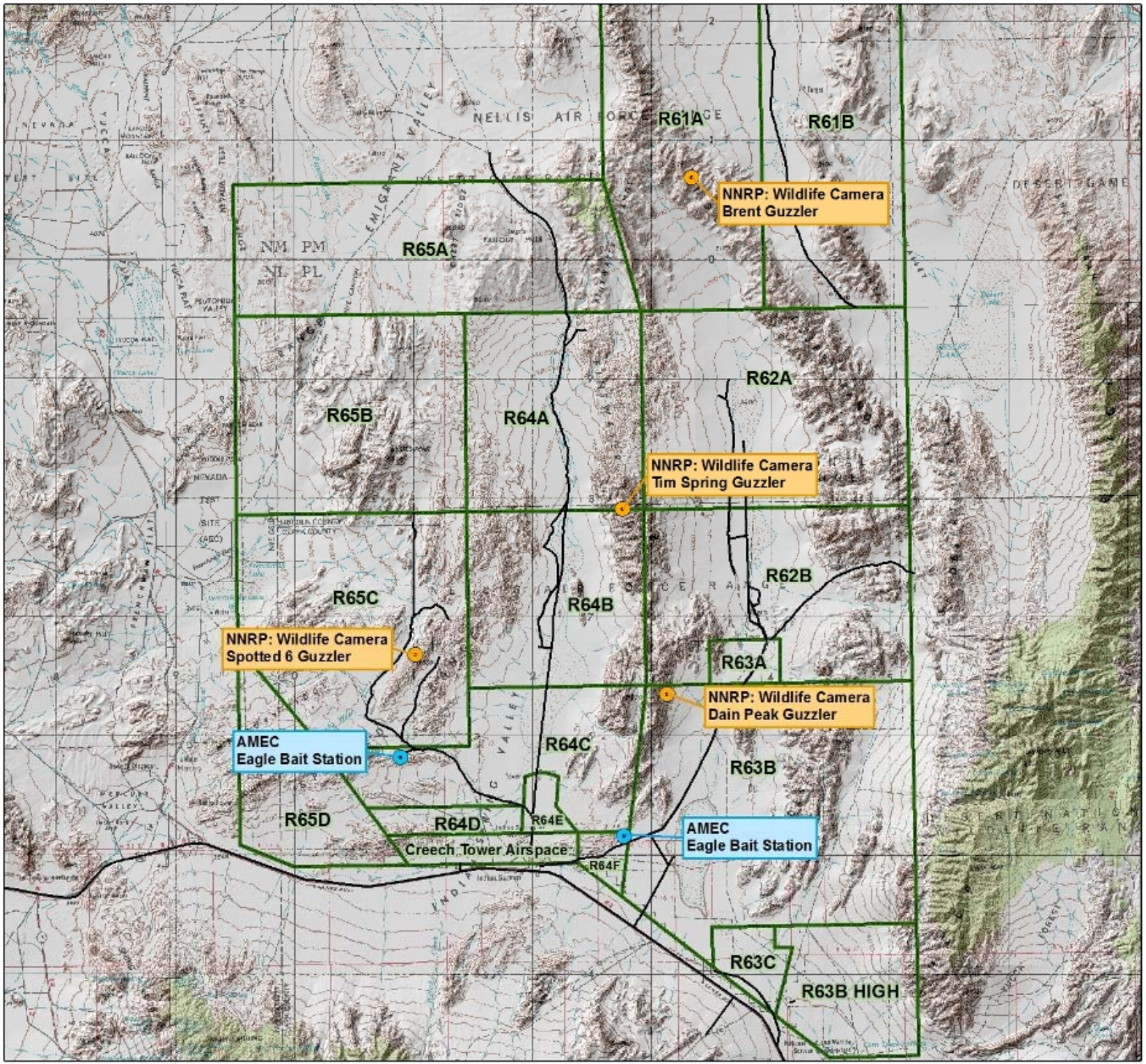
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1:400,000

Nellis AFB, Las Vegas, NV

Coordinate System: WGS 84, UTM, Zone11N, Meters
Prepared By: VSCI - Nellis AFB 99th CES/CEIEA



Department of the Air Force
Air Combat Command
Civil Engineer Squadron

Proposed Wildlife Camera Locations - South Range

Key to Features

- Eagle Bait Station
- Wildlife Camera
- Range Boundary

This map is for reference only. Although every effort has been made to ensure the accuracy of information, errors and conditions originating from physical sensors used to develop the database may be reflected on this map. GeoBase shall not be liable for any errors, omissions, or damages that result from inappropriate use of this document.

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1:441,912

Nellis AFB, Las Vegas, NV

Coordinate System: WGS 84, UTM, Zone11N, Meters
Prepared By: VSC - Nellis AFB 99th CES/CEIEA



Remote camera aimed at bait and camouflaged by vegetation.



Note placement of camera and distance of road in background.



Rebar stakes for bait.

Golden Eagle Bait Station Setup Data Form
Nevada Test and Training Range

Range number: _____

Station number: _____

Date: _____

Time: _____

Observers: _____

GPS coordinates: _____

Direction of camera (aimed to the north is preferred): _____

Distance between bait and camera: _____

Camera model: _____

Camera number: _____

Type of bait: _____

Setting Station:
□ Remove any vegetation which may block camera view or trigger camera
□ Wire bait securely to buried rebar
□ Confirm memory card and charged batteries are in camera
□ Check camera settings (set to take photos 1 minute apart when triggered)
□ Check that camera is properly aimed at bait
□ Test camera

Notes:

Golden Eagle Bait Station Follow Up Visit Data Form
Nevada Test and Training Range

Range number: _____

Station number: _____

Date: _____

Time: _____

Observers: _____

Visit number: _____

Existing bait status (circle one): untouched partially consumed skeleton all gone

Action taken (circle one): station removed station re-baited

Camera batteries replaced (circle one): yes no

Type of bait (replacement bait): _____

Re-baiting Station:
□ Turn off camera
□ Replace bait and wire fresh bait securely to buried rebar
□ Remove any vegetation which may block camera view or trigger camera
□ Replace batteries if level is below 80%
□ Replace memory card
□ Re-arm camera
□ Check camera settings (set to take photos 1 minute apart when triggered)
□ Check that camera is properly aimed at bait
□ Test camera

Notes:

BRIAN SANDOVAL
Governor

STATE OF NEVADA

DEPARTMENT OF WILDLIFE

4600 Kietzke Lane, Ste D-135
Reno, Nevada 89502

(775) 688-1500 • Fax (775) 688-1509

TONY WASLEY
Director

RICHARD L. HASKINS II
Deputy Director

PATRICK O. CATES
Deputy Director

PERMITTEE:

Michael A Yates
2656 Wade St
Minden NV 89423

Permit No.: S 35768
Date Issued: 06/27/2012
Date Effective: 07/1/2012
Period of Sampling: See Condition #4
Expiration Date: 06/30/14
Annual Report Due: 07/30/13 & 07/30/14
Fed. Permit No.: 20127

SCIENTIFIC COLLECTION PERMIT NO. S 35768
*AMENDED 6/25/2013

In compliance with the conditions listed below and pursuant to provisions of NRS 503.597 & 503.650, the permittee, each permit year during the designated sampling period, is authorized to

a. Unlimited capture, band, sample and release Peregrine falcons and all other migratory birds, except threatened and endangered species. Unlimited blood and feather samples may be obtained for contaminant analysis.

b. 12 Common Loons and 28 miscellaneous raptors as indicated on federal permit may be fitted with satellite transmitters which do not exceed 3% of the birds' bodyweight. Stomach contents (via flushing) may be obtained from Common loons.
Prior to project, permittee is contact NDOW Western Region Biologist Jenni Jeffers @ 775-423-3171 ext 234 to discuss food habits portion of study.

c. 12 Golden Eagles as indicated on federal permit to be capture, fitted with satellite transmitters which do not exceed 3% of the birds' bodyweight and released.

d. *Salvage/possess road-kill deer, antelope and elk in Lincoln County. Transport to Lincoln, Clark and Nye counties for use at bait stations and on the Nevada Test and Training Ranges.

CONDITIONS:

1. A copy of this permit and any permits required by the U.S. Fish and Wildlife Service must be in the possession of the permittee and any authorized collectors while conducting collection/salvage activities. The permittee must comply with all terms, conditions and restrictions of the federal permit. This permit is invalid for the taking, collection, or salvage of migratory birds, threatened or endangered species, absent any permit required by the Service for that activity.

   Activities authorized under this permit to collect and/or possess wildlife, parts thereof, or their progeny, shall be in compliance with all other state and federal regulations.

2. Authorized Sampling Area: Common Loon - Walker Lake, Mineral Co., Pyramid Lake, Washoe Co., Topaz Lake, Douglas Co.; Miscellaneous raptors –Statewide; Golden Eagle –Nevada Test and Training Range in Nye, Lincoln & Clark Counties. *Salvage road-kill deer, antelope and elk, Lincoln County.

This permit does NOT authorize trespass and/or collecting activities on state or federal wildlife refuges or reserves, or other public and private property without the permission from landowner or custodian.

3. Number Authorized: Indicated above.

4. Period of Field Collection: Common Loon - 7/1/12 – 11/30/12; 4/1/13 – 11/30/13; 4/1/14 – 6/30/14; Miscellaneous raptors – 7/1/12 - 6/30/14; Golden Eagles – 12/1/12 – 5/31/14. *Salvage road-kill – 6/24/2013 – 6/30/2014.

5. Destination of Collection: Blood samples will be submitted to Samples to Boise State Univ., Raptor Research Center, USGS Snake River Field Station, 970 Lusk Ave., Boise, ID. *Salvage road-kill – Nellis AFB and bait stations on the NTTR ranges in Lincoln, Clark and Nye counties.

6. Annual Report: A record will be created for each specimen (or group of specimens of a single species) taken at each site-locality. "Taken" means salvaged; captured & released; collected; banded; trapped & killed; seined; netted; snared; sacrificed; reduced to possession; etc. The following information will be recorded for each specimen taken: By date, the number of specimens of each species taken; species name; the habitat type where each specimen was taken; numeric breakdown of sex whenever possible; and a description of the location where each specimen was taken, by the following method: (*Don't use common geographic names*) – UTM Coordinates, NAD 83, Zone 11, rounded to the nearest meter;

The records must be submitted to the Nevada Department of Wildlife License Office – Scientific Collection Report, 4600 Kietzke Ln D-135, Reno, NV 89502, by 7/30/13 for 2012/2013 "take" activities; and 7/30/14 for 2013/2014 "take" activities. Digital reports in Excel spreadsheet (*preferred*) or Quattro Pro are accepted (please follow column sequence as outlined in the Department report form, 22.85-5.)

7. A copy of all pertinent research or technical papers must be submitted to the Department.

8. All specimens authorized under the authority of this permit, including offspring, are property of the State of Nevada and as such, they shall not be sold, bartered, traded, converted to personal use or otherwise disposed of without written approval of the Department, except as provided in Condition #5. This condition remains in effect indefinitely.

9. No fee may be charged to the public for the privilege to view wildlife which is held under the authority of this permit.

10. Permit Cancellation: A violation of a condition or stipulation is cause for the cancellation of the permit.

11. Additional Authorized Collectors: Brian Latta and any authorized personnel under the direction of the Permittee.

*Authorized handlers for possess/transport of road-kill: Clayton Kraft, Angie Harbin-Ireland, Ann Bedlion and Roger Schofield.

*Authorized Collector for Salvage/possess/transport of road-kill: John Stever

Julie Meadows
Program Officer I

jgm
enclosures

SUPPLEMENT TO THE ACCIDENT PREVENTION PLAN AND SITE-SPECIFIC HEALTH AND SAFETY PLAN FOR THE STUDY OF GOLDEN EAGLE ACTIVITY ON AIR FORCE RANGES IN THE WESTERN UNITED STATES (CARCASS HANDLING) IN SUPPORT OF CONTRACT NO: W9126G-11-D-0040-0003

Prepared For
Air Force Civil Engineer Center
Mr. Kevin Porteck, Natural Resources SME
2261 Hughes Avenue, Suite 155
Lackland Air Force Base, Texas 78236-9853

Prepared By
AMEC Environment & Infrastructure, Inc
9210 Sky Park Court, Suite 200
San Diego, California 92123
(858) 300 4300
(858) 300 4301 (Fax)

April 2013

AMEC Project No. 912640003

This supplement to the *Accident Prevention Plan and Site-Specific Health and Safety Plan for the Study of Golden Eagle Activity On Air Force Ranges in The Western United States* (AMEC Environment & Infrastructure, Inc [AMEC] 2012) provides additional guidance for tasks requiring the handling of animal carcasses.

The activity may include acquiring either fresh livestock carcasses or roadkilled wild animal carcasses (e.g., deer) and transporting them to remote sites for use as bait. The purpose is to use the carcasses to attract golden eagles to remote camera stations.

Identified hazards include the potential for exposure of personnel, equipment, or vehicles to body fluids and potentially associated pathogens. In the case of wild animal carcasses, there is also the potential for the transfer of ectoparasites (fleas, ticks, lice, mites, etc.) to personnel. These parasites can act as vectors for a number of diseases.

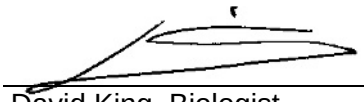
The use of personal protective equipment (PPE), proper handling procedures, and maintaining good hygiene will reduce the risk of contamination and possible disease, as detailed in the activity hazard analysis below.

Table 1.
Supplemental Activity Hazard Analyses

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Wildlife Surveys	**Pathogen / Parasite Exposure (Carcass Handling)** This activity may involve transporting roadkilled wild animals or unbutchered livestock carcasses to remote sites.	<u>Prevention</u> • Wear proper PPE to minimize exposure to pathogens and parasites – disposable rubber gloves when handling, doubled where necessary; safety glasses/disposable dust/surgical mask to protect the eyes, nose and mouth from spatter; disposable apron or disposable protective clothing if carcass must be “manhandled” or carried, where body contact may occur. • Use proper de-gloving and glove disposal. Dispose of all disposable materials that have contacted carcass by bagging, sealing material and depositing in an appropriate waste container (with lid to avoid attracting scavenging/domestic animals). • Carry carcass in a thick, sturdy plastic bag to minimize exposure to personnel and vehicle. Keep bag tightly sealed to prevent the escape of parasites and leaking of fluids. If sufficiently large bag cannot be acquired, wrap the carcass in plastic and place on a plastic sheet in the bed of the truck in such a way as to trap any leaking fluid. • Keep carcass cool during transport to delay spoilage. Where practical, keep carcass iced, especially with wild/roadkill carcasses. Reject roadkill carcasses if they appear too far decomposed to safely transport – use your judgment.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
		• Carry putrid carcasses on pickup beds only, not inside vehicle. • Be aware of parasites such as ticks, fleas, lice, that may attempt to migrate to you from the carcass, especially if roadkill/wild animal carcasses are used. These parasites can be vectors for a variety of diseases including typhus, Lyme disease, spotted fever, tularemia, and others. With roadkill, examine yourself at the end of the day for ticks or other parasites. • Follow blood-borne pathogen precautions (reference project accident prevention plan/site-specific health and safety plan [APP/HASP]) to minimize contact with body fluids. • Do not work with carcasses if you have open cuts, scratches, or sores.s • Wash hands and arms thoroughly following handling (bring soap and water). “Gel” type disinfectants may help, but only if material and fluids are first physically removed with washing. If fluid gets in the eyes, mouth, nose, or open cuts, wash the area thoroughly with soap and hot water, seek a follow-up medical examination. • Avoid eating, drinking, and smoking when handling carcass. • If you suspect that you have contracted a disease from a carcass, do not allow it to be disposed of until it can be tested for pathogens.
Wildlife Surveys (Bait Stations)	**Lifting / Back Injury Prevention** This activity involves lifting heavy carcasses in and out of vehicles, and carrying to bait station sites. Improper lifting technique or lifting weight beyond one’s capacity can lead to back injuries.	<u>Prevention</u> • Lift using the knees, not the back. • Do not attempt to lift objects that are too heavy or bulky for you to lift alone; ask for help. Per AMEC policy, no one is required to lift more than 50 pounds without assistance. • Do not attempt to lift heavy objects if you have existing injuries or conditions that may be aggravated by heavy lifting. • Report any lifting-related injuries and seek medical assistance if needed.

Supplement Prepared By:

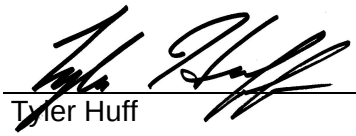


02 April 2013

David King, Biologist
AMEC Environment & Infrastructure, Inc.
Telephone: (858) 300-4331

Date

Supplement Approved By:



02 April 2013

Tyler Huff
San Diego Office Safety Officer
Telephone: (858) 300-4322

Date

Supplement Concurrence By:



02 April 2013

Angie Harbin-Ireland
Project Manager
Telephone: (858) 300-4338

Date

APPENDIX D

CAPTURE FORMS

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AMERICAN EAGLE RESEARCH INSTITUTE

USFWS Band – Right Leg Computer Entry Date __-__-__

GOLDEN EAGLE CAPTURE FORM Date FEB 22, 2013

Bird Number UTTR-AM01 Capture UTM 12T-0328008-4551681 NAD 83
Breeding Area CHARLIE-Utah Sex: (Male), Female, Unknown County = Tooele, Utah
Personnel N. TODD, B. LANDA, D. DZIECIOL, HAINES Capture Technique BOWNET
Estimated Age (Years): Adult, 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5
Time: Captured 0828 Secured 0840 Released 1000
Processing 0905 Processed ____ Total ____
USFWS Band Number 067904940 Leg: (Right) Left
Transmitter: Type CTT/VHF Position Back Pack Number 25U4P
Frequency 150.3507 Pulse/Min: Normal ____ Mortality N/A
Blood (3+cc): 2 Drops: Gender DNA Genetics 3 Purple Top 1cc vials (Lead + Archive)
Feather Samples: Back (DNA) Breast (Lead) Molts Collected: ____

Morphology:

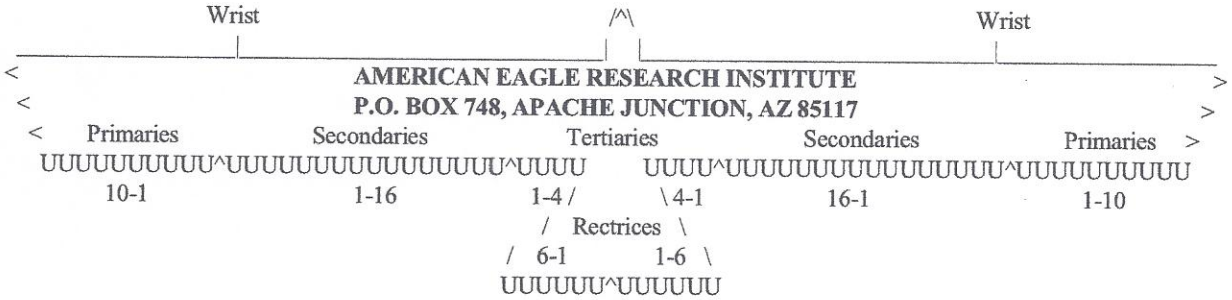
	Right	Left
Hallux Length (mm)	49.9	50.4
Tarsus Width - Dorsal/Ventral (mm)	13.8	13.8
Tarsus Width - Lateral (mm)	11.8	11.6
Wing Chord Length (cm) (over wing)	61.1	61.1
Wing Chord Arc (cm) (under wing)	58.1	59.2
Eighth Primary Length (cm)	45.4	43.0

Central Rectrix Length (cm) 31.3
Culmen Length (mm) 41.5 Beak Depth (mm) 27.5
Crop: Full, Partial, (Empty) Weight (kg) 3.95kg

Sternum:
1.0) Keel bladed - minimal breast muscle
2.0) Keel bladed - more prominent breast muscle
(Normal) 3.0) Keel protrudes slightly above breast muscle
4.0) Keel flush with breast muscle
5.0) Keel inundated in breast muscle

1.5 2.5 (3.5) 4.5

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, (Adult) (Note Adult Feathers)
New Primaries: Right: 1 2 3 4 5 6 7 8 9 10 Left: 1 2 3 4 5 6 7 8 9 10
New Secondaries: Right: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Left: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
New Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Adult Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Iris: Yellow-Gold, Gold, Orange-Brown, Light Brown, Brown, Sepia, Other Top: Gold / Bottom: Brownish Gold
Feather Lice: (None), One, Several, Many Mexican Chicken Bugs: None, One, Several, Many
Comments: Very Healthy



Eagle originally banded as nestling on 14 May 1999 by Kent Keller Near Delle, Utah. Eagle is 14 years old. Center of 10 minute block is 40.91667 - 112.75 ≈ 30 miles SE of Nest Cliff.

AMERICAN EAGLE RESEARCH INSTITUTE

USFWS Band – Right Leg Computer Entry Date ___-___-___

GOLDEN EAGLE CAPTURE FORM

Date 2/25/2013

Elevation 4213 feet NAD 83

Bird Number AM02-UTTR Capture UTM 12T-0337020-4558615

Breeding Area Cathedral Sex: (Male), Female, Unknown

Personnel BCL DED Capture Technique Bownet/Deer Carcass

Estimated Age (Years): (Adult), 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5 14 Years Old

Time: Captured 1638 Secured ____ Released 1800

Processing ____ Processed 1711 Total ____

USFWS Band Number 629-42959 Leg: (Right) Left upside down

Transmitter: Type PTT/VHF Position BP Number Argos ID 126218

Frequency 150.152 Pulse/Min: Normal N/A Mortality N/A

Serial Number GD086 S/N GD086

Blood (3+cc): 2 Drops: (Gender DNA) (Genetics) (3 Purple Top 1cc vials (Lead + Archive))

Feather Samples: (Back (DNA)) (Breast (Lead)) Molts Collected: ____

Morphology:	Right	Left
Hallux Length (mm)	45.9	45.7
Tarsus Width - Dorsal/Ventral (mm)	13.5	13.8
Tarsus Width - Lateral (mm)	12.0	11.9
Wing Chord Length (cm) (over wing)	61.4	61.8
Wing Chord Arc (cm) (under wing)	58.2	58.0
Eighth Primary Length (cm)		
Central Rectrix Length (cm)	30.2	
Culmen Length (mm)	40.2	
Beak Depth (mm)	~~26.9~~ 27.8	
Crop: Full, Partial, (Empty)	Weight (kg)	3.6

Sternum:
1.0) Keel bladed - minimal breast muscle 1.5
2.0) Keel bladed - more prominent breast muscle 2.5
(Normal) (3.0) Keel protrudes slightly above breast muscle 3.5
4.0) Keel flush with breast muscle 4.5
5.0) Keel inundated in breast muscle

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, (Adult) (Note Adult Feathers)

New Primaries: Right: 1 2 3 4 5 6 7 8 9 10
Left: 1 2 3 4 5 6 7 8 9 10

New Secondaries: Right: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Left: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

New Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6

Adult Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6 Top ½ / Bottom ½

Iris: Yellow-Gold, Gold, Orange-Brown, Light Brown, Brown, Sepia, Other Gold / Brown Blue Gold

Feather Lice: (None) One, Several, Many Mexican Chicken Bugs: None, One, Several, Many

Comments: Seen Snail.
Healthy. Plumage Sun bleached - Hackles, Undertail Coverts, Back
White on back like RT (see Photos)

Wrist Wrist

AMERICAN EAGLE RESEARCH INSTITUTE
P.O. BOX 748, APACHE JUNCTION, AZ 85117

< Primaries Secondaries Tertiaries Secondaries Primaries >
UUUUUUUUUU^UUUUUUUUUUUUUUUU^UUUU UUUU^UUUUUUUUUUUUUUUU^UUUUUUUUUU
10-1 1-16 1-4 / \4-1 16-1 1-10
/ Rectrices \
/ 6-1 1-6 \
UUUUUU^UUUUUU

AMERICAN EAGLE RESEARCH INSTITUTE

USFWS Band – Right Leg Computer Entry Date __-__-__

GOLDEN EAGLE CAPTURE FORM Date 2-27-2013

Bird Number UTTR-AM03 Bird Name Big Male
Breeding Area Bravo Sex: (Male), Female, Unknown Elevation 4311 feet
Capture Location 12T-322518-4539335 Capture Technique Bownet
Estimated Age (Years): (Adult), 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5
Personnel BL+OD Pictures __-__
Time: Captured 0905 Secured ____ Released 1115
Long hike in snow to set Processing 1000 Processed ____ Total ____
USFWS Band Number 679-04946 Leg: (Right), Left serial # GD089
Transmitter: Type NorthStar Position Backpack Number 126221
Frequency 150.890 Pulse/Min: Normal ____ Mortality ____
Blood (cc): 3 2 Drops: (ZooGen) (DNA) (Genetics) (Lead (1cc)) (Archive (1cc))

Morphology:	Right	Left
Hallux Length (mm)	46.1	46.0
Tarsus Width - Dorsal/Ventral (mm)	15.3	14.8
Tarsus Width - Lateral (mm)	13.3	13.3
Wing Chord Length (cm) (over wing)	61.6	60.7
Wing Chord Arc (cm) (under wing)	57.4	57.7
Eighth Primary Length (cm)		44.3
Central Rectrix Length (cm)	29.1	
Culmen Length (mm)	41.3	
Beak Depth (mm)		29.3
Crop: Full, Partial, (Empty)	Weight (kg)	4.2

Sternum:
1.0) Keel bladed - minimal breast muscle 1.5
2.0) Keel bladed - more prominent breast muscle 2.5
(Normal) (3.0) Keel protrudes slightly above breast muscle 3.5
4.0) Keel flush with breast muscle 4.5
5.0) Keel inundated in breast muscle

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, (Adult) (Note Adult Feathers)
New Primaries: Right: 1 2 3 4 5 6 7 8 9 10
o Left: 1 2 3 4 5 6 7 8 9 10
New Secondaries: Right: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Left: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
New Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Adult Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Iris: Yellow-Gold, (Gold), Orange-Brown, Light Brown, Brown, Sepia, Other Gold Top - Goldish - brown Bottom
Feather Lice: None, One, Several, Many Mexican Chicken Bugs: None, One, Several, Many
Comments: All Rectrices adult, #4 Right New with white on inside of rachis. (see photo). Same tan under tail coverts as other adults here. Very Big Male Eagle.

Wrist /^\ Wrist

< AMERICAN EAGLE RESEARCH INSTITUTE >
< P.O. BOX 748, APACHE JUNCTION, AZ 85117 >

< Primaries Secondaries Tertiaries Secondaries Primaries >
UUUUUUUUUU^UUUUUUUUUUUUUUUU^UUUU UUUU^UUUUUUUUUUUUUUUU^UUUUUUUUUU
10-1 1-16 1-4 / \4-1 16-1 1-10
/ Rectrices \
/ 6-1 1-6 \
UUUUUU^UUUUUU

Easting Northing
UTM = Zone 11T - 608765 - 4728208

Bruneau - Idaho

AMERICAN EAGLE RESEARCH INSTITUTE

USFWS Band – Right Leg Computer Entry Date ___-___-___

GOLDEN EAGLE CAPTURE FORM Date 24-FEB-2013

Bird Number ID-AF01 Capture LL DD 42.69867, 115.67208
Breeding Area BRUNEAU OVERLOOK - ID Sex: Male, (Female), Unknown
Personnel AD, GD Capture Technique BN / CAN
Estimated Age (Years): (Adult), 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5
Time: Captured 0740 Secured 0750 Released 1035
Processing ___ Processed ___ Total 2h 55min
USFWS Band Number 0679-04956 Leg: (Right), Left
Transmitter: Type GTT Position BP Number 9827KX10
Frequency 0.102 Pulse/Min: Normal ___ Mortality ___
(Blood (3+cc)) 2 Drops: Gender DNA Genetics - 2 (3) Purple Top 1cc vials (Lead + Archive)
Feather Samples: Back (DNA) No (Breast (Lead)) Molts Collected: ∅

Morphology:	Right	Left
Hallux Length (mm)	53.2	52.9
Tarsus Width - Dorsal/Ventral (mm)	16.2	16.9
Tarsus Width - Lateral (mm)	14.9	13.9
Wing Chord Length (cm) (over wing)	66.2	66.7
Wing Chord Arc (cm) (under wing)	63.2	63.3
Eighth Primary Length (cm)	46.9	46.3
Central Rectrix Length (cm)	32.1 TIPPED	
Culmen Length (mm)	47.3	Beak Depth (mm) 32.8
Crop: (Full), Partial, Empty		Weight (kg) 4.6

Sternum: (Normal)
1.0) Keel bladed - minimal breast muscle
2.0) Keel bladed - more prominent breast muscle
3.0) Keel protrudes slightly above breast muscle
4.0) Keel flush with breast muscle
5.0) Keel inundated in breast muscle
1.5 2.5 (3.5) 4.5

LargeBeak

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, (Adult) (Note Adult Feathers)
New Primaries: Right: (1 2 3 4 5) 6 7 8 9 (10) - in Bird ½ in
Left: (1 2 3) 4 5 (6) 7 8 9 (10)
New Secondaries: Right: 1 2 3 4 (5 6 7 8 9 10 11) 12 13 14 15 16
Left: (1) 2 3 (4) (5) (6 7 8) 9 10 11 12 13 14 15 16
New Rectrices: Right: 1 2 3 4 5 (6) Left: (1) (2) 3 (4) (5) 6 - Decks - are Broken But Old AD
Adult Rectrices: Right: (1) 2 3 4 (5) (6) Left: (1) (2) 3 (4) (5) 6
Iris: Yellow-Gold, Gold, Orange-Brown, (Light Brown), Brown, Sepia, Other TAN/Gold Tone of Eye
Feather Lice: None, One, (Several), Many Mexican Chicken Bugs: None, One, Several, Many
Comments: white on top ⅓ of L. #6 Rectrix; both #3's, top ½ of R #2

White on Left #6 + #3
Right #4 + #2

NEVER FEATHERS - W/ EATEN VEINS - Not BROKEN SHEATHS
FEATHER LICE -
OLD FEATHERS - DRY
2-AA, 2 subs at cliff

Wrist Wrist

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Primaries Secondaries Tertiaries Secondaries Primaries
10-1 1-16 1-4 / \4-1 16-1 1-10
/ Rectrices \
/ 6-1 1-6 \

Easting Northing
UTM=Zone 11T- 608765-4728208 Has Molted P10, S9, R5 - 2 Adult Decks
Just turned 4.0 in January
Lots of White in Tail

Bruneau
Idaho

AMERICAN EAGLE RESEARCH INSTITUTE

USFWS Band – Right Leg Computer Entry Date ___-___-___

GOLDEN EAGLE CAPTURE FORM Date 27 FEB 2013

Bird Number ID-AF02 Capture UTM DD 42.69867, 115.67208
Breeding Area Bruneau Overlook – Sex: Male, (Female), Unknown
Personnel AD, GD Capture Technique BN/CAIF
Estimated Age (Years): Adult, (4.5), (4.0), 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5
Time: Captured 1520 Secured 1525 Released 1730
Processing ___ Processed ___ Total 2 hrs. 10 min
USFWS Band Number 0679-04958 - Double Washlee Leg: Right, Left
Transmitter: Type ATT Position BP Number T5Q1QX – No Receiver to Check
Frequency 149.9705 (T) Pulse/Min: Normal – Mortality –
Blood (3+cc): 2 Drops: Gender DNA Genetics (2) (3) Purple Top 1cc vials (Lead + Archive)
Feather Samples: (Back (DNA)) (Breast (Lead)) Molts Collected: 1 R-P1

Morphology:

	Right	Left
Hallux Length (mm)	51.9	54.1
Tarsus Width - Dorsal/Ventral (mm)	18.7	18.7
Tarsus Width - Lateral (mm)	15.1	15.3
Wing Chord Length (cm) (over wing)	66.7	66.8
Wing Chord Arc (cm) (under wing)	62.8	62.7
Eighth Primary Length (cm)	48.2	48.2
Central Rectrix Length (cm)	29.7 (tipped)	
Culmen Length (mm)	X	
Beak Depth (mm)		X
Crop: Full, Partial, (Empty)	Weight (kg)	5.9

Calipers Broken

Sternum:
1.0) Keel bladed - minimal breast muscle
2.0) Keel bladed - more prominent breast muscle
(Normal) 3.0) Keel protrudes slightly above breast muscle
(4.0) Keel flush with breast muscle
5.0) Keel inundated in breast muscle
1.5 2.5 3.5 4.5

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, (Adult) (Note Adult Feathers)
New Primaries: Right: (1 2 3 4 5) 6 7 8 9 (10) Left: (1 2 3 4 5) 6 7 8 9 (10) Never
New Secondaries: Right: 1 2 3 (4) 5 6 (7 8 9 10 11) 12 13 14 15 16 Left: (1) 2 3 (4) 5 6 (7 8 9) 10 11 12 13 14 15 16 fell out-molted
New Rectrices: Right: (1) 2 (3) 4 5 (6) Left: (1) 2 3 (4) (5) 6
Adult Rectrices: Right: (1) 2 3 4 5 6 Left: (1) 2 3 4 5 6 ALL - White on - 5+6 both sides
Iris: Yellow-Gold, (Gold), Orange-Brown, Light Brown, Brown, Sepia, Other Gold/tan
Feather Lice: (None), One, Several, Many Mexican Chicken Bugs: None, One, Several, Many
Comments:
IN EXCELLENT PLUMAGE Molted #5 Rectrix Left-missing
- From Behavior - Most Likely Breeding Female - Decks are adult
- 2 Ad + 2 Subs at Cliff

Wrist Wrist

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< Primaries 10-1 | Secondaries 1-16 | Tertiaries 1-4 / \4-1 | Secondaries 16-1 | Primaries 1-10 >
/ Rectrices \ 6-1 1-6 \

Gregg Observed Copulation with Male for female with white on tail.

Rectrix #6 +3 Right + #4 Left are new, but subadult Decks appear to be adult.
#5 Left Molted during processing.

Easting Northing
UTM = Zone 11T - 614452 - 4740436

Brown's Canyon - Saylor Creek - Idaho

AMERICAN EAGLE RESEARCH INSTITUTE

USFWS Band – Right Leg Computer Entry Date ___-___-___

GOLDEN EAGLE CAPTURE FORM Date 03 MAR 2013

Bird Number ID-AM01 Capture ~~UTM~~ DD 42.80793, 115.60019
Breeding Area BROWNS CYN - SAYLOR CR. - ID Sex: (Male,) Female, Unknown
Personnel AD, CDT Capture Technique BN / DEER
Estimated Age (Years): (Adult,) 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5
Time: Captured 1115 Secured 1125 Released 1240
Processing ___ Processed ___ Total 1 Hr. 25 min.
USFWS Band Number 0679-04959 Leg: (Right,) Left
Transmitter: Type ATT Position BP Number 164 HDM
Frequency 150.301 (5) Pulse/Min: Normal – Mortality –
Blood (3+cc): 2 Drops: Gender DNA Genetics-(2) (3) Purple Top 1cc vials (Lead + Archive) – OUT OF GENDER TUBES
Feather Samples: (Back (DNA)) (Breast (Lead)) Molts Collected: ___

Morphology:	Right	Left
Hallux Length (mm)	50.8	51.1
Tarsus Width - Dorsal/Ventral (mm)	14.2	14.0
Tarsus Width - Lateral (mm)	11.16	11.6
Wing Chord Length (cm) (over wing)	61.2	62.3
Wing Chord Arc (cm) (under wing)	57.7	58.1
Eighth Primary Length (cm)	44.5	44.4
Central Rectrix Length (cm)	32.0	
Culmen Length (mm)	41.6	
Beak Depth (mm)	28.2	
Crop: Full, Partial, (Empty)	Weight (kg)	3.8

Sternum:
1.0) Keel bladed - minimal breast muscle — 1.5
2.0) Keel bladed - more prominent breast muscle — 2.5
(Normal) 3.0) Keel protrudes slightly above breast muscle — 3.5
(4.0) Keel flush with breast muscle — 4.5
5.0) Keel inundated in breast muscle

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, (Adult) (Note Adult Feathers)
New Primaries: Right: 1 2 3 (4) (5) 6 (7) (8) 9 10
Left: (1) 2 3 4 (5) 6 (7) (8) 9 10
New Secondaries: Right: 1 (2) 3 4 5 (6) 7 8 9 10 11 (12) 13 14 15 16
Left: 1 (2) 3 4 (5) (6) (7) 8 9 (10) 11 12 (13) 14 15 16
New Rectrices: Right: 1 2 (3) 4 5 (6) Left: 1 2 3 4 5 (6)
Adult Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6 – ALL
Iris: Yellow-Gold, Gold, Orange-Brown, Light Brown, Brown, Sepia, Other DARK BROWN
Feather Lice: (None,) One, Several, Many Mexican Chicken Bugs: (None) One, Several, Many
Comments:
EXCELLENT PLUMAGE & CONDITION
– T 3's - HAVE WHITE LENGTH OF VENT FEATHERS –

Wrist Wrist

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Primaries 10-1 | Secondaries 1-16 | Tertiaries 1-4 / \4-1 | Secondaries 16-1 | Primaries 1-10
Rectrices: 6-1 / \ 1-6

Saylor Creek and Juniper Butte GE caps and Bait Station points:

UTM = 11T-608765- 4728208

9SZKXO – Bruneau Overlook – 0679-04956 - (26-FEB-2013), Released – 1115. Capture Location – 42.69867, 115.67208. Downloaded recently but roaming.

T5Q1QX – Bruneau Overlook – 0679-04958 - (27-FEB-2013), Released-1730. Capture Location – 42.69867, 115.67208. On Monday (04-MAR-2013), we got a visual and VHF signal on this bird 2X, near the point (east side), just downstream of the Bruneau Overlook and the cliffs directly across the canyon. They are good places to scan on the next flight.

IGHWDM – Brown's Canyon – 0679-04959 - (03-MAR-2013), Released-1240. Capture Location – 42.80793, 115.60019. Downloaded and on territory.

UTM = 11T 614452 - 4740436

Bait Station 1 – 42.84363303, 115.6635514

Bait Station 2 – 42. 85853614, 115.4843084

Bait Station 3 - 42.41470121, 115.4850316

Bait Station 4 – 42.36377637, 115.2012464

Carcass info – some numbers to start with are listed below.

-Dairy - (calves) -Marla and Mark Hegerhorst - 208-845-2973

-Idaho DOT – Highway Maintenance (Mountain Home) – 208-587-7966 – (have not reached them yet.)

-IDF&G – Carl knows Jeff Day (IDF&G) who talked with Nampa and Jerome offices to keep an eye out for road kills.

Nampa IDF&G – 208-465-8465

Jerome IDF&G – 208-324-4359

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USFWS Band – Right Leg Computer Entry Date ___-___-___

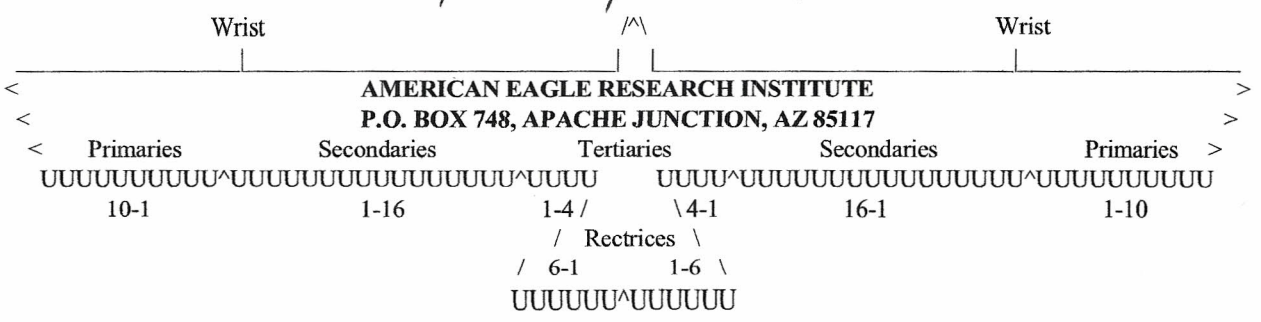
GOLDEN EAGLE CAPTURE FORM Date 6/6/14

Bird Number _____ Capture UTM 11S 530452, 4090428
Breeding Area Beatty Wash, NV Sex: Male, Female, Unknown
Personnel J. Barnes, C. Tomlinson, B. Latta Capture Technique Nest Climb
Estimated Age (Years): Adult, 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5 Nestling - 8 wks.
Time: Captured 1215 Secured 1230 Released 1445
Processing 2 hrs. Processed 1430 Total 2.5 hrs.
USFWS Band Number 0679-04983 Leg: Right, Left
Transmitter: Type PTT/VHF Position Backpack Number 126227 S/N 60155
Frequency 237.149 Pulse/Min: Normal — Mortality —
NorthStarPTT Holohil VHF
Blood (3+cc): 2 Drops: Gender DNA Genetics 3 Purple Top 1cc vials (Lead + Archive)
No Samples Feather Samples: Back (DNA) Breast (Lead) Molts Collected: _____

Morphology:	Right	Left
Hallux Length (mm)	42.5	42.6
Tarsus Width - Dorsal/Ventral (mm)	11.8	11.9
Tarsus Width - Lateral (mm)	11.9	11.5
Wing Chord Length (cm) (over wing)	48.0	48.3
Wing Chord Arc (cm) (under wing)	45.2	45.2
Eighth Primary Length (cm)	30.9	30.6
Central Rectrix Length (cm)	22.6	
Culmen Length (mm)	36.0	
Beak Depth (mm)	~~16.6~~ 16.6	
Crop: Full, Partial, Empty	Weight (kg)	3.0 Kg

Sternum:
1.0) Keel bladed - minimal breast muscle — 1.5
2.0) Keel bladed - more prominent breast muscle — 2.5
(Normal) 3.0) Keel protrudes slightly above breast muscle — 3.5
4.0) Keel flush with breast muscle — 4.5
5.0) Keel inundated in breast muscle

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, Adult (Note Adult Feathers)
New Primaries: Right: 1 2 3 4 5 6 7 8 9 10
Left: 1 2 3 4 5 6 7 8 9 10
New Secondaries: Right: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Left: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
New Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Adult Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Iris: Yellow-Gold, Gold, Orange-Brown, Light Brown, Brown, Sepia, Other _____
Feather Lice: None, One, Several, Many Mexican Chicken Bugs: None, One, Several, Many
Comments: Nest covered w/ Jack Rabbit legs
Several Flat flies on nestlings
Very Hot day, No samples collected



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USFWS Band – Right Leg Computer Entry Date ___-___-___

GOLDEN EAGLE CAPTURE FORM Date 6/6/14

Bird Number _____ Capture UTM 11S 530452, 4090428
Breeding Area Beatty Wash NV Sex: Male, (Female), Unknown
Personnel J. Barnes C. Tomlinson B. Hatt Capture Technique Nest Climb
Estimated Age (Years): Adult, 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5 Nestlings & Wks
Time: Captured 1215 Secured 1230 Released 1445
Processing 1 hour Processed 1330 Total 2.5 hours
USFWS Band Number 0679-04982 Leg: (Right) Left
Transmitter: Type PTT/VHF Position Backpack Number PTT ID 126226
VHF Frequency 237.099 Pulse/Min: Normal — Mortality —
Blood (3+cc): 2 Drops: Gender DNA Genetics 3 Purple Top 1cc vials (Lead + Archive)
Feather Samples: Back (DNA) Breast (Lead) Molts Collected: _____
Morphology:

	Right	Left
Hallux Length (mm)	46.3	47.3
Tarsus Width - Dorsal/Ventral (mm)	16.1	15.0
Tarsus Width - Lateral (mm)	12.6	12.7
Wing Chord Length (cm) (over wing)	48.5	48.3
Wing Chord Arc (cm) (under wing)	43.0	44.0
Eighth Primary Length (cm)	31.4	30.9

Central Rectrix Length (cm) 24.0
Culmen Length (mm) 39.7 Beak Depth (mm) 18.0
Crop: Full, Partial, Empty Weight (kg) 3.5 kg

Sternum:
1.0) Keel bladed - minimal breast muscle — 1.5
2.0) Keel bladed - more prominent breast muscle — 2.5
(Normal) 3.0) Keel protrudes slightly above breast muscle — 3.5
4.0) Keel flush with breast muscle — 4.5
5.0) Keel inundated in breast muscle

Plumage: (Juvenile), Subadult I, Subadult II, Near-Adult, Adult (Note Adult Feathers)
New Primaries: Right: 1 2 3 4 5 6 7 8 9 10
Left: 1 2 3 4 5 6 7 8 9 10
New Secondaries: Right: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Left: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
New Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Adult Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Iris: Yellow-Gold, Gold, Orange-Brown, Light Brown, (Brown), Sepia, Other _____
Feather Lice: None, One, Several, Many Mexican Chicken Bugs: (None), One, Several, Many
Comments: Nest covered w Jack rabbit legs
Several Flat Flies present on nestlings

Very hot day, no samples collected

North Star PTT
Holohil VHF

No Samples

S/N GD 154

Wrist /^\ Wrist

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Primaries Secondaries Tertiaries Secondaries Primaries
UUUUUUUUUU^UUUUUUUUUUUUUUUUU^UUUU UUUU^UUUUUUUUUUUUUUUUU^UUUUUUUUUU
10-1 1-16 1-4 / \4-1 16-1 1-10

/ Rectrices \
/ 6-1 1-6 \
UUUUUU^UUUUUU

AMERICAN EAGLE RESEARCH INSTITUTE

USFWS Band – Right Leg Computer Entry Date __-__-__

GOLDEN EAGLE CAPTURE FORM Date 15 JUNE 2013

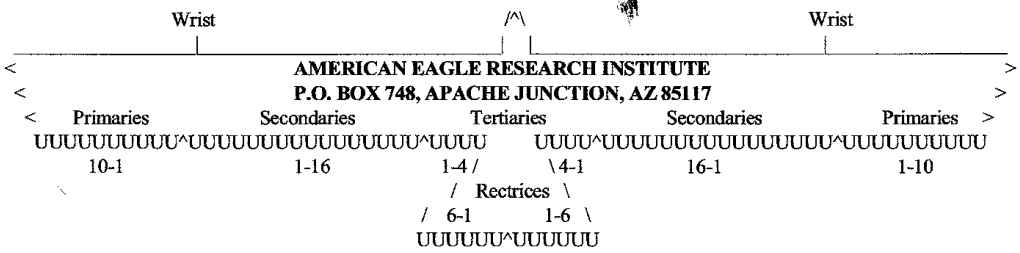
Bird Number _____ Capture UTM 12T 0337510, 4542611 NAD-83
Breeding Area WEST KNOLL - UTTR Sex: (Male), Female, Unknown
Personnel AG, GD Capture Technique BN/RABBIT
Estimated Age (Years): (Adult), 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5
Time: Captured 1040 Secured 1050 Released 1240
Processing ____ Processed ____ Total 2 hrs.
USFWS Band Number 0679 – 04954 Leg: (Right), Left 1260220
Transmitter: Type PTT Position BP Number MD-088 150.252 BEST
Frequency 150.253 (2) Pulse/Min: Normal – Mortality –
Blood (3+cc): 2 Drops: (Gender) (DNA) Genetics (2) (3)Purple Top 1cc vials (Lead + Archive) –
Feather Samples: Back (DNA) (2) Breast (Lead) (1) Molts Collected: Assorted - (3)

Morphology:

	Right	Left
Hallux Length (mm)	48.4	48.9
Tarsus Width - Dorsal/Ventral (mm)	14.1	14.1
Tarsus Width - Lateral (mm)	12.4	12.5
Wing Chord Length (cm) (over wing)	63.1	62.6
Wing Chord Arc (cm) (under wing)	60.2	59.3 - TIPPED
Eighth Primary Length (cm)	45.5	45.6
Central Rectrix Length (cm)	31.7 TIPPED	
Culmen Length (mm)	39.1	Beak Depth (mm) 28.0
Crop: Full, Partial, (Empty)		Weight (kg) 3.2

Sternum:
1.0) Keel bladed - minimal breast muscle 1.5
2.0) Keel bladed - more prominent breast muscle 2.5
(Normal) (3.0) Keel protrudes slightly above breast muscle 3.5
4.0) Keel flush with breast muscle 4.5
5.0) Keel inundated in breast muscle

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, (Adult) (Note Adult Feathers)
New Primaries: Right: 1 (2) (3) 4 (5) 6 7 (8) 9 (10) 5 - 3/4 in, 2 - 7/8
Left: 1 2 (3) 4 (5) 6 7 (8) 9 (10)
New Secondaries: Right: (1) (2) (3) 4 5 6 (7) 8 (9) (10) (11) 12 (13) 14 15 16
Left: (1) (2) 3 4 (5) (6) 7 (8) (9) 10 (11) 12 13 14 15 16
New Rectrices: Right: 1 2 (3) (4) 5 6 Left: 1 2 (3) (4) 5 6 – L - DARK - MOLTED - GONE
Adult Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6 – ALL
Iris: (Yellow-Gold), Gold, Orange-Brown, Light Brown, Brown, Sepia, Other Y-G TOP W/ BROWN FLECKING BOTTOM
Feather Lice: (None), One, Several, Many Mexican Chicken Bugs: (None), One, Several, Many
Comments:
- BAD NET ABRASION ON R WING
- GOOD CONDITION
- NESTLING W/ 1 + YNG - BELOW NEST
- MADE 2+ DAY TRIP SOUTH AFTER CAP. – AG - RECEIVED VHF SIGNAL IN NEST VICINITY - 6/19/13.



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USFWS Band – Right Leg Computer Entry Date __-__-__

GOLDEN EAGLE CAPTURE FORM Date 6/22/13

Bird Number _____ Capture UTM 12T 0262332, 4452409 NAD-83
Breeding Area Gold Hill - UTTR Sex: Male, (Female), Unknown
Personnel AD, GD Capture Technique BN/Rabbit
Estimated Age (Years): (Adult), 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5
Time: Captured 0638 Secured 0659 Released 0840
Processing _____ Processed _____ Total 2 hr 2 min
USFWS Band Number 0679-04957 Leg: (Right), Left GD-090
Transmitter: Type PTT Position BP Number 126222
Frequency 150.910 (2) Pulse/Min: Normal — Mortality —
Blood (3-1cc): 2 Drops: (Gender DNA) (Genetics) (2) (3) Purple Top 1cc vials (Lead + Archive)
Feather Samples: (Back (DNA)) (Breast (Lead)) Molts Collected: LEG/BODY + DOWN
Morphology: (1) (1)

	Right	Left
Hallux Length (mm)	54.6	54.6
Tarsus Width - Dorsal/Ventral (mm)	15.5	15.8
Tarsus Width - Lateral (mm)	14.2	14.2
Wing Chord Length (cm) (over wing)	68.5 (TIPPED)	67.8
Wing Chord Arc (cm) (under wing)	63.8 (TIPPED)	62.9
Eighth Primary Length (cm)	48.6	48.2 TIPPED

Central Rectrix Length (cm) 34.3
Culmen Length (mm) 46.4 Beak Depth (mm) 31.1
Crop: Full, Partial, (Empty) Weight (kg) 4.5

Sternum:
1.0) Keel bladed - minimal breast muscle 1.5
2.0) Keel bladed - more prominent breast muscle 2.5
(Normal) (3.0) Keel protrudes slightly above breast muscle 3.5
4.0) Keel flush with breast muscle 4.5
5.0) Keel inundated in breast muscle

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, (Adult) (Note Adult Feathers)
New Primaries: Right: 1 (2) (3) 4 5 6 7 8 9 10
Left: 1 2 3 4 5 6 7 8 9 10
New Secondaries: Right: 1 2 (3) 4 5 (6) 7 8 9 10 11 12 13 (14) 15 16 RS 3 = ½ WAY GROWN
Left: 1 2 3 4 5 (6) 7 8 9 10 11 12 13 14 15 16
New Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Adult Rectrices: Right: 1 2 3 (4) 5 6 Left: 1 2 3 4 5 6 R4 = ¾ GROWN
Iris: (Yellow-Gold), Gold, Orange-Brown, Light Brown, Brown, Sepia, Other _____
Feather Lice: (None), One, Several, Many Mexican Chicken Bugs: (None), One, Several, Many
Comments:
- GOOD CONDITION -
- NESTING W/ 2 8+ WK YNG.
- LITTLE MOLT INITIATED THIS YEAR

Wrist Wrist

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Primaries 10-1 | Secondaries 1-16 | Tertiaries 1-4 / \4-1 | Secondaries 16-1 | Primaries 1-10
Rectrices / 6-1 1-6 \

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USFWS Band – Right Leg Computer Entry Date ___-___-___

GOLDEN EAGLE CAPTURE FORM Date 2/24/14

Bird Number UT-AM05 Capture UTM 12T 0329129E, 4525134N
Breeding Area Grassy Mtn. South UTTR Sex: (Male,) Female, Unknown
Personnel Bilella, D.L. Aulman Capture Technique Bownet/deer carcass
Estimated Age (Years): Adult, 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5
Time: Captured 0845 Secured 0855 Released 1035
Processing 0910 Processed 1030 Total ___

Previously Banded →

USFWS Band Number 629-49203 Leg: (Right,) Left
Transmitter: Type NorthStar PTT/VHF Position Backpack Number 126223 S/N: GD091
Frequency 150.202 Pulse/Min: Normal — Mortality —
Blood (3+cc): 2 Drops (Gender DNA) Genetics X1 (3 Purple Top 1cc vials (Lead + Archive))
Feather Samples: (Back (DNA)) (Breast (Lead)) Molts Collected: None

Morphology:	Right	Left
Hallux Length (mm)	48.5	48.5
Tarsus Width - Dorsal/Ventral (mm)	13.1	13.0
Tarsus Width - Lateral (mm)	11.7	12.5
Wing Chord Length (cm) (over wing)	62.8	63.0
Wing Chord Arc (cm) (under wing)	58.1	57.8
Eighth Primary Length (cm)	45.5	41.2
Central Rectrix Length (cm)	30.3	
Culmen Length (mm)	40.9	
Beak Depth (mm)		28.5
Crop: Full, Partial, (Empty)	Weight (kg)	4.1

Sternum:
1.0) Keel bladed - minimal breast muscle — 1.5
2.0) Keel bladed - more prominent breast muscle — 2.5
(Normal) 3.0) Keel protrudes slightly above breast muscle — (3.5)
4.0) Keel flush with breast muscle — 4.5
5.0) Keel inundated in breast muscle

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, Adult (Note Adult Feathers) You call it

New Primaries: Right: (1) (2) (3) 4 5 (6) 7 (8) 9 (10)
Left: (1) (2) (3) 4 5 6 (7) 8 (9) (10)

New Secondaries: Right: 1 (2) 3 (4) (5) 6 (7) (8) (9) (10) 11 12 (13) 14 15 16
Left: 1 (2) 3 4 (5) 6 7 (8) (9) (10) 11 (12) (13) (14) 15 16

New Rectrices: Right: (1) 2 (3) 4 (5) (6) Left: 1 2 3 4 5 (6)
Adult Rectrices: Right: (1) 2 (3) 4 (5) (6) Left: (1) 2 3 4 5 (6)

Iris: Yellow-Gold, (Gold,) Orange-Brown, Light Brown, Brown, Sepia, Other ___
Feather Lice: (None,) One, Several, Many Mexican Chicken Bugs: (None,) One, Several, Many
Comments: Perched on Grassy Mtn S. cliff like he owned it - drove juv off carcass after juv ate for 2 hours - Lots of white on older feathers. New feathers all adult, 10s new. Adult ♂ + juv. observed later in the day.

Wrist /^\ Wrist

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< Primaries Secondaries Tertiaries Secondaries Primaries >
UUUUUUUUUU^UUUUUUUUUUUUUUUU^UUUU UUUU^UUUUUUUUUUUUUUUU^UUUUUUUUUU
10-1 1-16 1-4 / \4-1 16-1 1-10

/ Rectrices \
/ 6-1 1-6 \
UUUUUU^UUUUUU

AMERICAN EAGLE RESEARCH INSTITUTE

USFWS Band – Right Leg Computer Entry Date __-__-__

GOLDEN EAGLE CAPTURE FORM Date 24 FEB. 2014

Bird Number UT-AM09 Bird Name

Breeding Area WEST KNOLL - UTTR Sex: (Male,) Female, Unknown

Capture Location 12T 0337111, 4543652 Capture Technique BN / DEER

Estimated Age (Years): (Adult,) 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5

Personnel DH, GD Pictures __-__

Time: Captured 1332 Secured 1338 Released 1515

Processing Processed Total

USFWS Band Number 0679-04952 - PREV Leg: (Right,) Left

* Transmitter: Type PTT Position BP Number 126219 - GD-U87

Frequency 149.940 Pulse/Min: Normal – Mortality –

Blood (cc): 3 Wing: Right, (Left) ZooGen (2 drops): (Yes,) No -(2X) DNA-(1X)

Morphology:

	Right	Left
Hallux Length (mm)	50.3	50.8
Tarsus Width - Dorsal/Ventral (mm)	14.4	14.2
Tarsus Width - Lateral (mm)	13.3	13.2
Wing Chord Length (cm) (over wing)	632	611 - TIPPED
Wing Chord Arc (cm) (under wing)	589	576 "
Eighth Primary Length (cm)	453	456

Central Rectrix Length (cm) BADLY TIPPED - 2cm

Culmen Length (mm) 396 Beak Depth (mm) 384

Crop: Full, Partial, (Empty) Weight (kg) 3.6

Sternum:
1.0) Keel bladed - minimal breast muscle
1.5
2.0) Keel bladed - more prominent breast muscle
2.5
(Normal) 3.0) Keel protrudes slightly above breast muscle
(3.5) +
4.0) Keel flush with breast muscle
4.5
5.0) Keel inundated in breast muscle

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, Adult

New Primaries: Right: 1 2 3 4 5 6 7 8 9 10
Left: (1) 2 (3) 4 5 6 7 8 9 10

← Omitted – He was Ready to GO

New Secondaries: Right: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Left: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

New Tertiaries: Right: 1 2 3 4
Left: 1 2 3 4

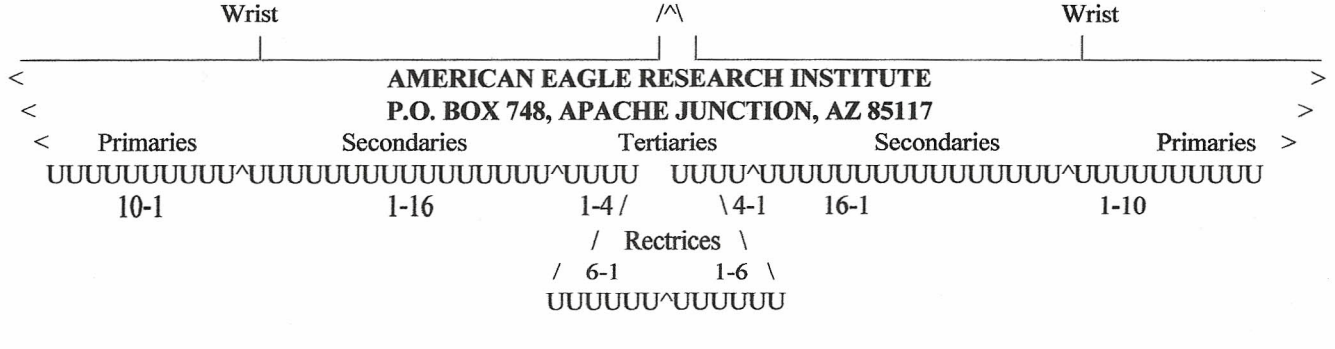
New Rectrices: Right: 1 2 3 4 5 6
(Note Adult Feathers) Left: 1 2 3 4 5 6

Iris: (Yellow-Gold,) Gold, Orange-Brown, Light Brown, Brown, Sepia, Other W/ BROWN LOWER FLECKING

Feather Lice: (None,) One, Several, Many

Comments: GOOD CONDITION - PLUMAGE A LITTLE DRY

* REPLACE - PTT - 126222, GD-088. - Good Fit on TRANSMITTER
NO SIGN OF WEAR ON BACK OR HARNESS.



AMERICAN EAGLE RESEARCH INSTITUTE

USFWS Band – Right Leg Computer Entry Date ___-___-___

GOLDEN EAGLE CAPTURE FORM Date 2/21/14

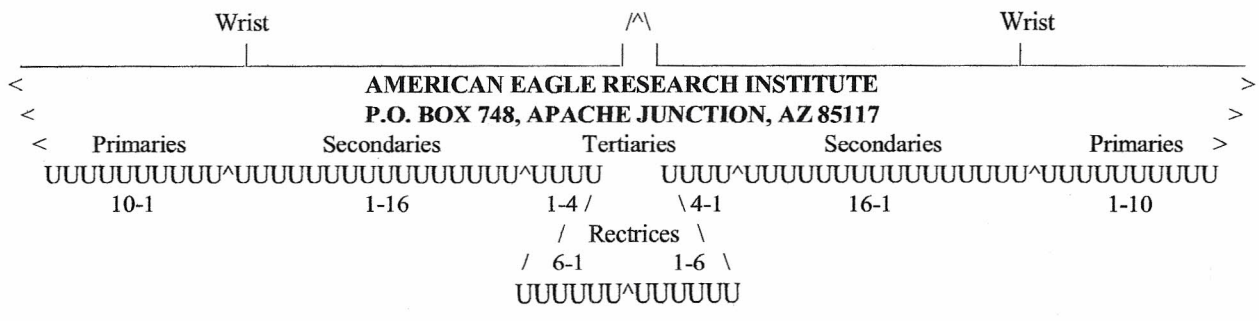
Bird Number UT-AF-02 Capture UTM 318696E, 4499591N
Breeding Area Recycle Yard/Clive-Skull Sex: Male, (Female), Unknown
Personnel BCL/DLA Capture Technique B-net, deer
Estimated Age (Years): Adult, 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.5
Time: Captured 1230 Secured 1237 Released 1412
Processing 95 min Processed ___ Total 102 min
USFWS Band Number 0679-04981 Leg: (Right), Left
Transmitter: Type CTT/VHF Position Back Pack Number 3BCEHC
VHF Frequency 150.030 x2 Pulse/Min: Normal — Mortality —
Blood (3+cc): 2 Drops: Gender DNA Genetics X1 3 Purple Top 1cc vials (Lead + Archive) X2
Feather Samples: Back (DNA) Breast (Lead) Molts Collected: yes 1 breast, 2 body contours

Morphology:

	Right	Left
Hallux Length (mm)	54.3	54.4
Tarsus Width - Dorsal/Ventral (mm)	15.4	15.0
Tarsus Width - Lateral (mm)	13.2	13.0
Wing Chord Length (cm) (over wing)	68.0	68.4
Wing Chord Arc (cm) (under wing)	63.2	62.5
Eighth Primary Length (cm)	46.0 tipped	51.8
Central Rectrix Length (cm)	33.5	
Culmen Length (mm)	44.3	
Beak Depth (mm)		30.4
Crop: Full, Partial, (Empty)	Weight (kg)	5.45

Sternum:
1.0) Keel bladed - minimal breast muscle — 1.5
2.0) Keel bladed - more prominent breast muscle — 2.5
(Normal) 3.0) Keel protrudes slightly above breast muscle — 3.5
(4.0) Keel flush with breast muscle — 4.5
5.0) Keel inundated in breast muscle

Plumage: Juvenile, Subadult I, Subadult II, Near-Adult, (Adult) (Note Adult Feathers)
New Primaries: Right: 1 2 3 4 5 6 7 8 9 10
Left: 1 2 3 4 5 6 7 8 9 10
New Secondaries: Right: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Left: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
New Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Adult Rectrices: Right: 1 2 3 4 5 6 Left: 1 2 3 4 5 6
Iris: (Yellow-Gold), Gold, Orange-Brown, Light Brown, Brown, Sepia, Other ___
Feather Lice: (None), One, Several, Many Mexican Chicken Bugs: (None), One, Several, Many
Comments: May be member of new pair "Recycle Yard" or may be "Clive-Skull" female w/ alt. nest cliff



APPENDIX E

2013 PHOTOS

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Photograph 1. Photograph showing the typical setup of motion activated camera installation at golden eagle bait station on Utah Test and Training Range (UTTR).



Photograph 2. Photograph showing the typical setup of motion activated camera installation at golden eagle bait station. Whenever possible the carcass is placed in a minimally vegetated area. Golden eagles are more likely to scavenge on the ground within minimally vegetated areas. The camera is set away from the carcass in a concealed location as not to impede the behavior of wildlife feeding at the site.



Photograph 3. An adult golden eagle observed perched on a cliff edge within the Juniper Butte Range pictured on 12/21/2012 during a helicopter reconnaissance survey.



Photograph 4. This photograph was taken on 3/16/2013 of an adult goldn eagle on the nest incubating within Browns Canyon of the Saylor Creek Range. Follow-up surveys on 5/28/2013 confirmed that this nest was unsuccessful.



Photograph 5. This photograph was taken during 1/26/2013 during a helicopter reconnaissance survey at the Melrose Air Force Range. This juvenile golden eagle was observed flushing from an old irrigation windmill platform.



Photograph 6. This photograph was also taken during the 1/26/2013 helicopter reconnaissance survey at the Melrose Air Force Range. An adult and sub-adult golden eagle are seen here flying over open savannah surrounded by rim rock.



Photograph 7. The typical motion activated camera placement at a golden eagle bait station at Nevada Test and Training Range. The camera location is chosen partially based on camouflage to avoid deterring golden eagle from feeding on the carcass. Here the camera is set up against a Juniper tree to decrease its obviousness. When possible, cameras are set up next to, or within shrubs to aid in camouflage.



Photograph 8. Carcasses are secured using sewn-in metal wiring that is attached to posts staked into the ground. This helps prevent carcasses from being dragged out of the camera view by non-target scavengers.



Photograph 9. This photograph shows the setup of a golden eagle bait station at Nevada Test and Training Range. Whenever possible the carcass is placed in a minimally vegetated area. Golden eagles are more likely to scavenge on the ground within minimally vegetated areas. The camera is set away from the carcass in a concealed ocation as not to impede the behavior of wildlife feeding at the site.



Photograph 10. This is another photograph showing the general setup of a golden eagle bait station at Nevada Test and Training Range.



Photograph 11. Photograph taken on 5/29/2013 of an active golden eagle nest located within the Military Operations Area at Big Lime Mountain. This survey concluded that the nest was unsuccessful. A dead 7-8 week old golden eagle nestling is shown here.



Photograph 12. Photograph showing a golden eagle chick within a nest at Ochre Mountain within the Utah Test and Training Range, South Range. This nest was later confirmed to be successful.



Photograph 13. A photograph taken on 3/18/2013 of the active "Clive Skull" golden eagle nest containing two eggs at the Utah Test and Training Range, South Range. Follow-up surveys confirmed that this nest was unsuccessful.



Photograph 14. Photograph taken on 3/18/2013 of the "Craners" adult golden eagle observed incubating at the Utah Test and Training Range, North Range. Follow-up surveys confirmed that two young successfully fledged from this nest.



Photograph 15. "Jedediah Mountain" female golden eagle observed incubating nest on 3/18/2013 within the Utah Test and Training Range, North Range. Follow-up surveys confirmed that one chick successfuly fledged from this nest.



Photograph 16. "Charlie" nest identified within the Utah Test and Training Range, North Range during the 2013 breeding season. The adult male of this golden eagle pair was outfitted with a CTT radio transmitter and was confirmed wearing the transmitter backpack on 6/12/2013 when this photograph was taken. Follow-up surveys confirmed that one golden eagle successfully fledged from this nest.



Photograph 17. Photograph taken on 3/19/2013, shows adult golden eagle incubating massive nest located within the North Range at Utah Test and Training Range (Cathedral). The male of this golden eagle pair was captured and outfitted with a PTT radio transmitter. Subsequent surveys confirmed that this nest was unsuccessful.



Photograph 18. This photograph shows the "Cathedral" adult male golden eagle that was captured and outfitted with a PTT radio-transmitter on 2/25/2013 at the Utah Test and Training Range, North Range. This particular male had been previously banded with a USFWS band. The PTT can be seen attached to the back of the eagle and the eagle has been hooded to minimize stress to the bird.



Photograph 19. This photograph shows a USFWS band on the "Cathedral" male GOEA that was captured on 2/25/2013 at Utah Test and Training Range, North Range.



Photograph 20. A photograph showing two young "Birch Creek" golden eagle nestlings at Utah Test and Training Range, South Range. Subsequent visits to this nest confirmed that these two chicks successfully fledged.



Photograph 21. A photograph from above of two young golden eagle nestlings at "Birch Creek" nest as described Photograph 20.



Photograph 22. This is an example of a golden eagle nest that was maintained but never became active during the 2013 nesting season. It is evident that fresh plant material has been added to the nest indicating its activity. This photograph was taken 3/18/2013 of a “Willow Spring” nest at Utah Test and Training Range, Sourth Range.



Photograph 23. Photograph taken 3/18/2013 of an adult golden eagle observed during helicopter nest surveys at the Utah Test and Training Range, South Range.



Photograph 24. This photograph was taken on 3/19/2013 of an adult golden eagle incubating on nest within the Utah Test and Training Range, South Range at Gold Hill. The female of this breeding pair was outfitted with a PTT radio-transmitter on June 22, 2013. Follow-up surveys of this nest confirmed that two golden eagles successfully fledged from this nest.



Photograph 25. This is a photograph taken on 5/26/2013 of the same nest as pictured in Photograph 24. An adult golden eagle can be seen here perched next to two 2-3 week old nestlings.



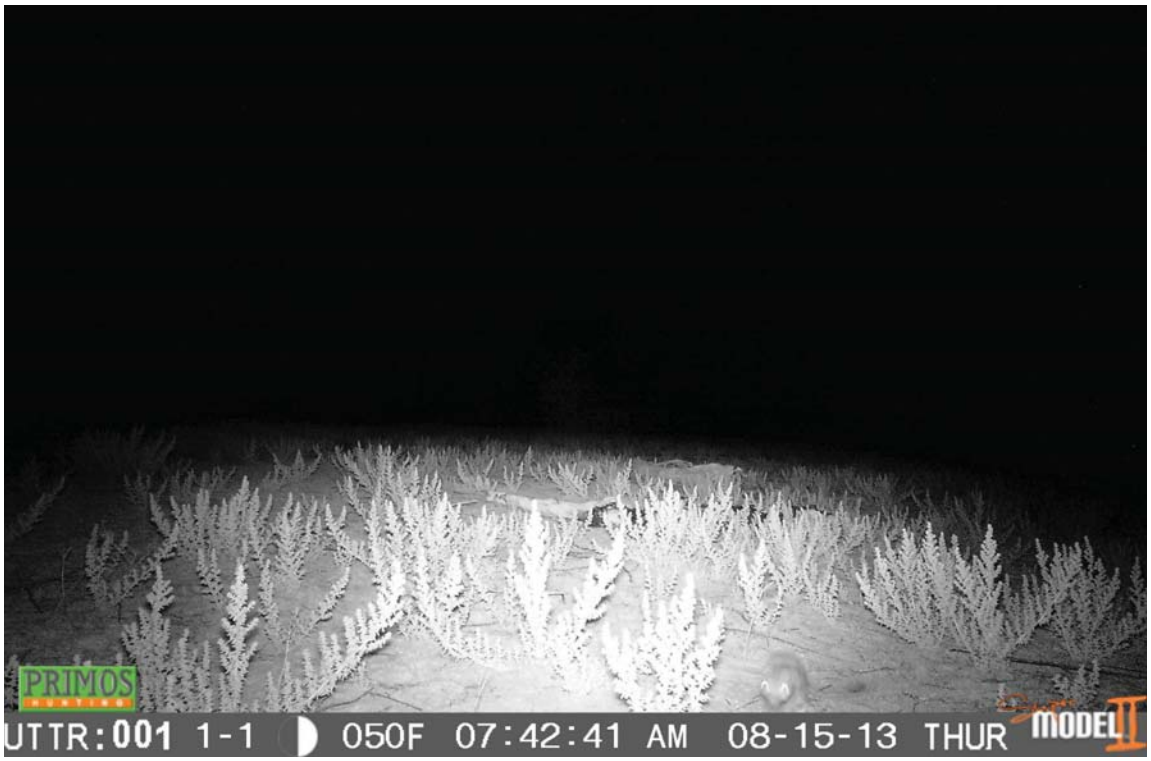
Photograph 26. "Wilson Hill" adult golden eagle shown here incubating nest on 3/19/2013 within the Utah Test and Training Range, South Range. This pair was observed to have two alternate nests that were not utilized during the 2013 breeding season for nesting; however one of these was maintained. Subsequent visits to this site confirmed the nest was empty on 5/26/2013, confirming that it was not successful.



Photograph 27. Nighttime photograph taken from Utah Test and Training Range bait station 4.1 on 9/2/2013 showing a burrowing owl in the foreground.



Photograph 28. Motion triggered photograph taken on 8/23/2013 at bait station 1.1. This was the only golden eagle observed in bait station photographs during the May -September 2013 time period.



Photograph 29. A nighttime photograph showing a weasel in the foreground. This photograph was taken on 8/15/2013 by bait station camera 1.1 at Utah Test and Training Range.



Photograph 30. This photograph was taken on 7/27/2013, showing a flock of turkey vultures feeding on a carcass at Idaho bait station 1.1.



Photograph 31. A common raven is shown here feeding on a pronghorn carcass at an Nevada Test and Trainging Range bait station 2 on 7/3/2013.



Photograph 32. A turkey vulture observed on 7/2/2013 feeding on a pronghorn carcass at an Nevada Test and Trainging Range bait station 1.

APPENDIX F

2014 PHOTOS

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Photograph 1. Location: North Range, Utah, Bait Station No.: UT1, Photo Date: 9/5/13



Photograph 2. Location: North Range, Utah, Bait Station No.: UT1, Photo Date: 9/10/13



Photograph 3. Location: North Range, Utah, Bait Station No.: UT1, Photo Date: 2/13/14



Photograph 4. Location: North Range, Utah, Bait Station No.: UT1, Photo Date: 2/17/13



Photograph 5. Location: North Range, Utah, Bait Station No.: UT2, Photo Date: 1/22/10



Photograph 6. Location: North Range, Utah, Bait Station No.: UT2, Photo Date: 12/3/13



Photograph 7. Location: North Range, Utah, Bait Station No.: UT2, Photo Date: 12/5/13



Photograph 8. Location: North Range, Utah, Bait Station No.: UT2, Photo Date: 1/12/14



Photograph 9. Location: North Range, Utah, Bait Station No.: UT3, Photo Date: 12/14/13



Photograph 10. Location: North Range, Utah, Bait Station No.: UT3, Photo Date: 2/7/14



Photograph 11. Location: North Range, Utah, Bait Station No.: UT3, Photo Date: 3/26/14



Photograph 12. Location: North Range, Utah, Bait Station No.: UT3, Photo Date: 4/14/14



Photograph 13. Location: South Range, Utah, Bait Station No.: UT4, Photo Date: 10/30/13



Photograph 14. Location: South Range, Utah, Bait Station No.: UT4, Photo Date: 11/4/13



Photograph 15. Location: South Range, Utah, Bait Station No.: UT4, Photo Date: 1/3/14



Photograph 16. Location: South Range, Utah, Bait Station No.: UT4, Photo Date: 2/8/14



Photograph 17. Location: North Range, Utah, Bait Station No.: UT5, Photo Date: 2/22/14



Photograph 18. Location: North Range, Utah, Bait Station No.: UT5, Photo Date: 3/19/14



Photograph 19. Location: North Range, Utah, Bait Station No.: UT5, Photo Date: 3/19/14



Photograph 20. Location: North Range, Utah, Bait Station No.: UT5, Photo Date: 4/13/14



Photograph 21. Location: South Range, Utah, Bait Station No.: UT6, Photo Date: 10/3/13



Photograph 22. Location: South Range, Utah, Bait Station No.: UT6, Photo Date: 1/2/14



Photograph 23. Location: South Range, Utah, Bait Station No.: UT6, Photo Date: 1/3/13



Photograph 24. Location: South Range, Utah, Bait Station No.: UT6, Photo Date: 2/5/14



Photograph 25. Location: Saylor Creek Range, Idaho, Bait Station No.: ID1, Photo Date: 9/7/13



Photograph 26. Location: Saylor Creek Range, Idaho, Bait Station No.: ID1, Photo Date: 9/7/13



Photograph 27. Location: Saylor Creek Range, Idaho, Bait Station No.: ID1, Photo Date: 9/9/13



Photograph 28. Location: Saylor Creek Range, Idaho, Bait Station No.: ID1, Photo Date: 9/9/13



Photograph 29. Location: Juniper Butte Range, Idaho, Bait Station No.: ID3, Photo Date: 3/12/12



Photograph 30. Location: Juniper Butte Range, Idaho, Bait Station No.: ID3, Photo Date: 3/12/12



Photograph 31. Location: Juniper Butte Range, Idaho, Bait Station No.: ID3, Photo Date: 3/12/12



Photograph 32. Location: Juniper Butte Range, Idaho, Bait Station No.: ID3, Photo Date: 10/8/13



Photograph 33. Location: Juniper Butte Range, Idaho, Bait Station No.: ID4, Photo Date: 9/12/13



Photograph 34. Location: Juniper Butte Range, Idaho, Bait Station No.: ID4, Photo Date: 1/14/14



Photograph 35. Location: Juniper Butte Range, Idaho, Bait Station No.: ID4, Photo Date: 1/15/14



Photograph 36. Location: Juniper Butte Range, Idaho, Bait Station No.: ID4, Photo Date: 2/20/14



Photograph No. 37

Location: North Range, NTTR, Bait Station No.: 1 Photo Date: 12/17/13



Photograph No. 38

Location: North Range, NTTR, Bait Station No.: 2 Photo Date: 12/02/13



Photograph 1. Bird ID: Browns Canyon - Saylor Creek, Location: Saylor Creek Range, Idaho, Capture Date: March 3, 2013, Sex: Male, Transmitter: CTT IGHWDM



Photograph 2. Bird ID: Browns Canyon - Saylor Creek, Location: Saylor Creek Range, Idaho, Capture Date: March 3, 2013, Sex: Male, Transmitter: CTT IGHWDM



Photograph 3. Bird ID: Bruneau Plain, Location: Saylor Creek Range, Idaho Capture Date: February 26, 2013, Sex: Female, Transmitter: CTT 9SZKXO



Photograph 4. Bird ID: Bruneau Plain, Location: Saylor Creek Range, Idaho Capture Date: February 26, 2013, Sex: Female, Transmitter: CTT 9SZKXO



Photograph 5. Bird ID: Bruneau Canyon, Location: Saylor Creek Range, Idaho
Capture Date: February 27, 2013, Sex: Female, Transmitter: CTT T5QIQX



Photograph 6. Bird ID: Cathedral, Location: North Range, Utah
Capture Date: February 25, 2013, Sex: Male, Transmitter: PTT 126218



Photograph 7. Bird ID: Cathedral, Location: North Range, Utah
Recovery Date: January 13, 2014, Sex: Male, Transmitter: PTT 126218



Photograph 8. Bird ID: Charlie, Location: North Range, Utah
Capture Date: February 22, 2014, Sex: Male, Transmitter: CTT QJ5U4P



Photograph 9. Bird ID: Charlie, Location: North Range, Utah
Capture Date: February 22, 2014, Sex: Male, Transmitter: CTT QJ5U4P



Photograph 10. Bird ID: Gold Hill, Location: South of South Range (Restricted Air Space), Utah Capture Date: June 22, 2013, Sex: Female, Transmitter: PTT 126222



Photograph 11. Bird ID: Gold Hill, Location: South of South Range (Restricted Air Space), Utah Recovery Date: January 12, 2014, Sex: Female, Transmitter: PTT 126222



Photograph 12. Bird ID: Grassy Mountain, Location: North Range, Utah Capture Date: February 24, 2014, Sex: Male, Transmitter: PTT 126223



Photograph 13. Bird ID: Grassy Mountain, Location: North Range, Utah Capture Date: February 24, 2014, Sex: Male, Transmitter: PTT 126223



Photograph 14. Bird ID: West Knoll, Location: North Range, Utah
Capture Date: October 24, 2014, Sex: Female, Transmitter: PTT 126220/126219



Photograph 15. Bird ID: West Knoll, Location: North Range, Utah
Capture Date: October 24, 2014, Sex: Female, Transmitter: PTT 126220/126219



Photograph 16. Bird ID: Clive-Skull, Location: South Range, Utah
Capture Date: February 21, 2014, Sex: Female, Transmitter: CTT 3BCEHC



Photograph 17. Bird ID:Clive-Skull, Location: South Range, Utah
Capture Date: February 21, 2014, Sex: Female, Transmitter: CTT 3BCEHC



Photograph 1. Location: Nevada MOA, Beatty Wash, PTTS: 126226 (female) and 126227 (male), Photo Date: June 6, 2014



Photograph 2. Location: Nevada MOA, Beatty Wash, PTTS: 126226 (female) and 126227 (male), Photo Date: June 6, 2014



Photograph 3. Location: Nevada MOA, North Pahrocs, PTTS: 136624 (male), 136625 (female), and 136626 (female), Photo Date: May 23, 2014



Photograph 4. Location: Nevada MOA, North Pahrocs, PTTS: 136624 (male), 136625 (female), and 136626 (female), Photo Date: May 23, 2014



Photograph 1. Location: Saylor Creek Range, Idaho, Nest Site: Crowbar Canyon, Photo Date: March 22, 2014



Photograph 2. Location: Saylor Creek Range, Idaho, Nest Site: Crowbar Canyon, Photo Date: March 22, 2014



Photograph 3. Location: Saylor Creek Range, Idaho, Nest Site: Crowbar Canyon, Photo Date: May 17, 2014



Photograph 4. Location: Saylor Creek Range, Idaho, Nest Site Hairpin, Photo Date: March 22, 2014



Photograph 5. Location: Saylor Creek Range, Idaho, Nest Site: Hairpin, Photo Date: May 17, 2014



Photograph 6. Location: Juniper Butte Range, Idaho, Nest Site East Fork Clover, Photo Date: March 22, 2014



Photograph 7. Location: Juniper Butte Range, Idaho, Nest Site: East Fork Clover, Photo Date: May 17, 2014



Photograph 8. Location: Saylor Creek Range, Idaho, Nest Site: Saylor Creek, Photo Date: March 22, 2014



Photograph 1. Location: South Range, Utah, Nest Site: Wildcat,
Photo Date: April 7, 2014



Photograph 2. Location: South Range, Utah, Nest Site: Clive Skull,
Photo Date: April 7, 2014



Photograph 3. Location: North Range, Utah, Nest Site: Echo,
Photo Date: April 7, 2014



Photograph 4. Location: North Range, Utah, Nest Site: Eagle Knolls,
Photo Date: April 7, 2014



Photograph 5. Location: North Range, Utah, Nest Site: Candy Mtn,
Photo Date: April 7, 2014



Photograph 6. Location: South Range, Utah, Nest Site: Lead Mine Hills,
Photo Date: April 7, 2014



Photograph 7. Location: South Range, Utah, Nest Site Feber Hills,
Photo Date: April 7, 2014



Photograph 8. Location: South Range, Utah, Nest Site: Wilson Hill,
Photo Date: April 7, 2014



Photograph 9. Location: North Range, Utah, Nest Site: Grouse Creek, Photo Date: April 7, 2014



Photograph 10. Location: North Range, Utah, Nest Site: Lost Canyon, Photo Date: April 7, 2014



Photograph 11. Location: North Range, Utah, Nest Site: Craners,
Photo Date: April 8, 2014



Photograph 12. Location: North Range, Utah, Nest Site: Corral Hollow,
Photo Date: April 8, 2014



Photograph 13. Location: North Range, Utah, Nest Site: Pattterson Spring, Photo Date: April 9, 2014



Photograph 14. Location: North Range, Utah, Nest Site: Hogan's Alley, Photo Date: April 9, 2014

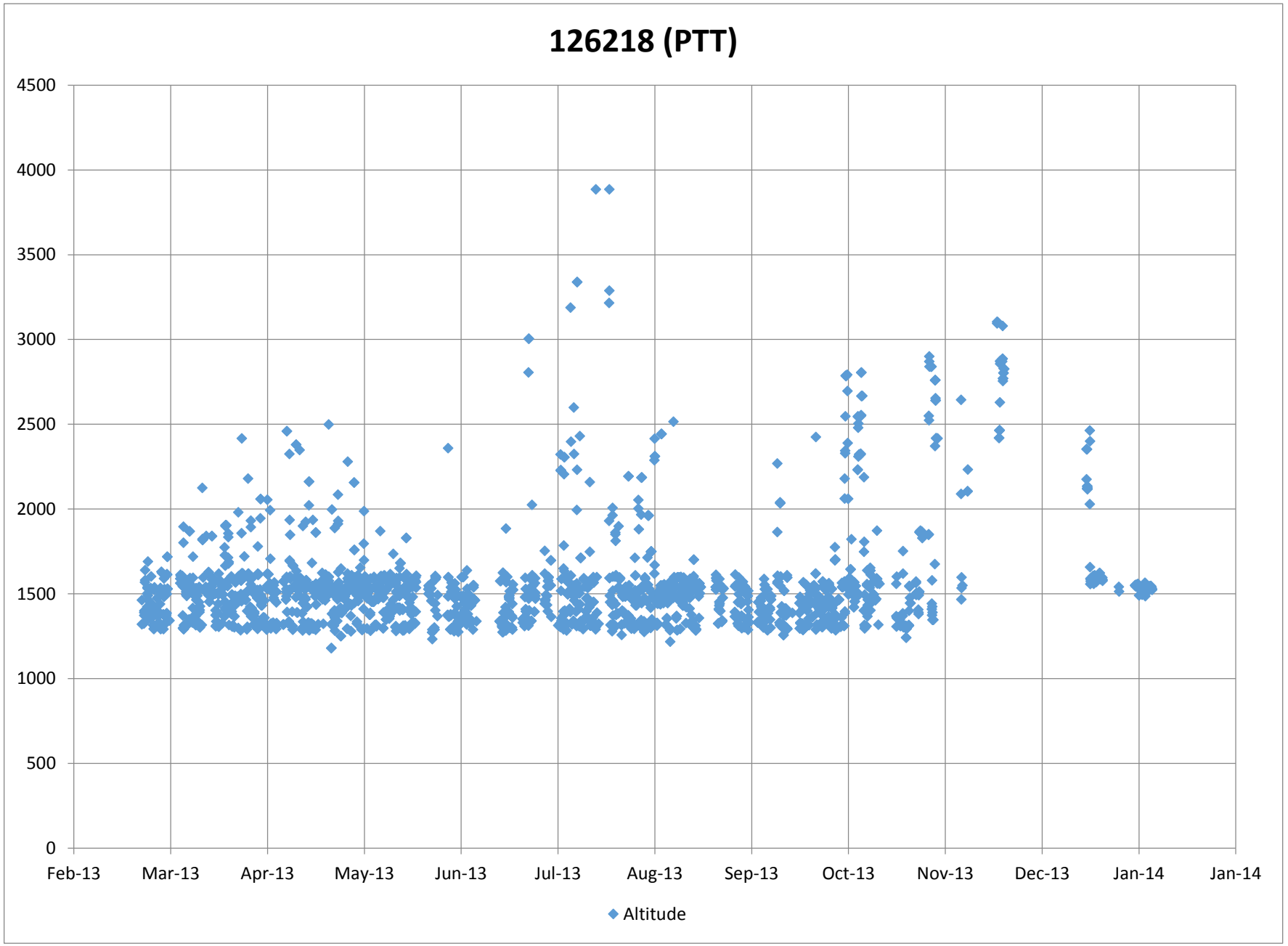


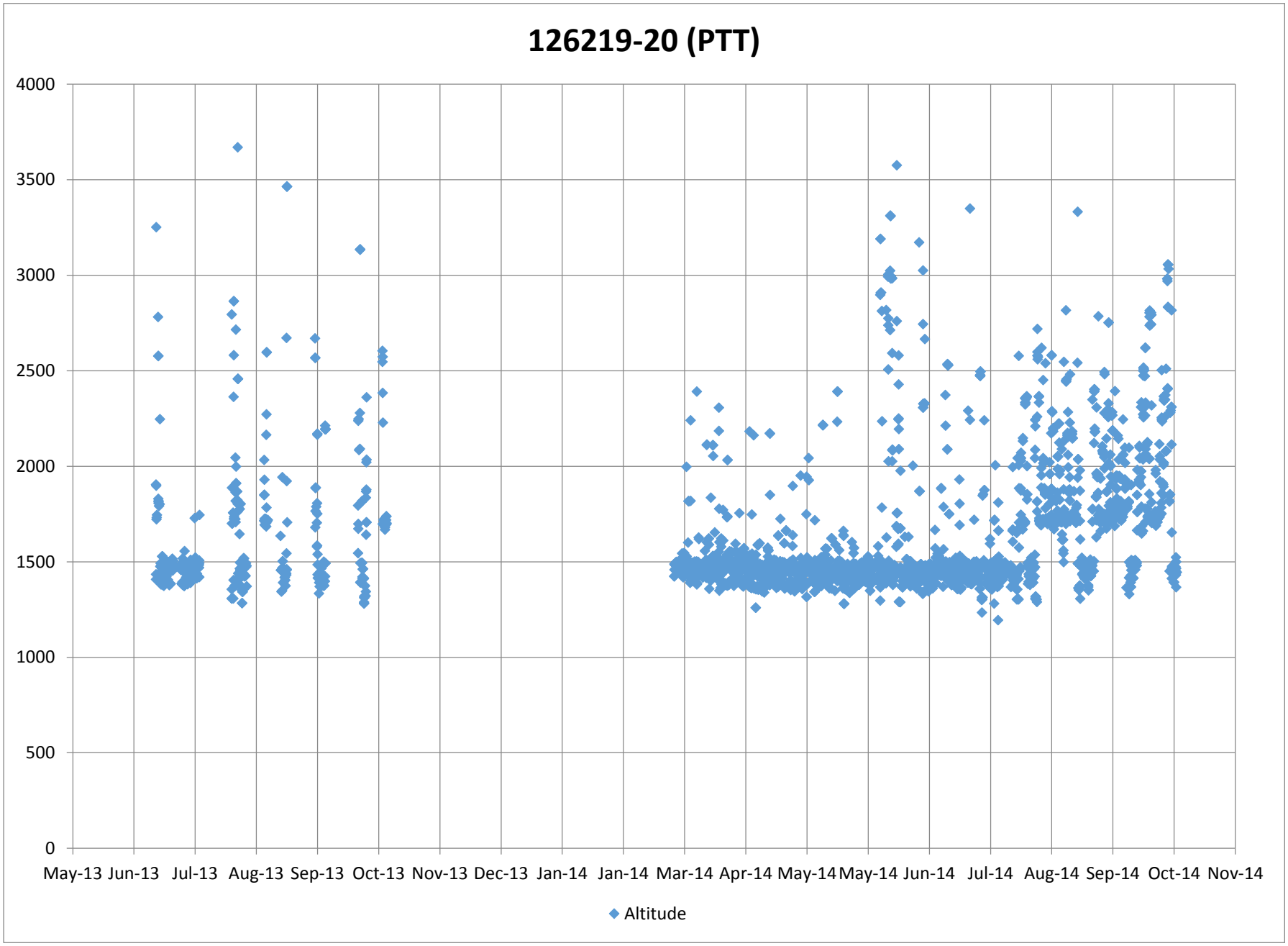
Photograph 15. Location: North Range, Utah, Nest Site: Echo,
Photo Date: June 19, 2014

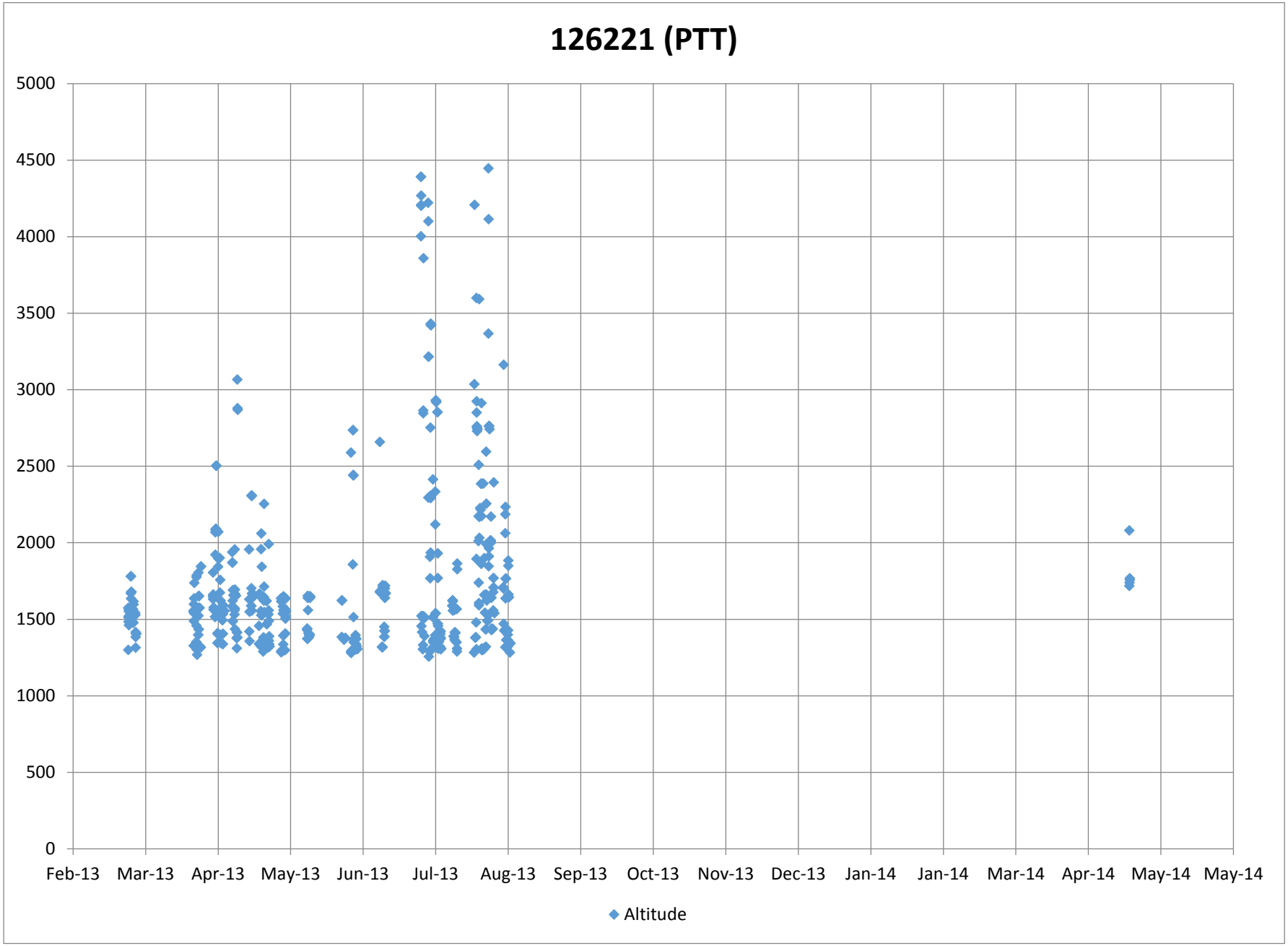
APPENDIX G

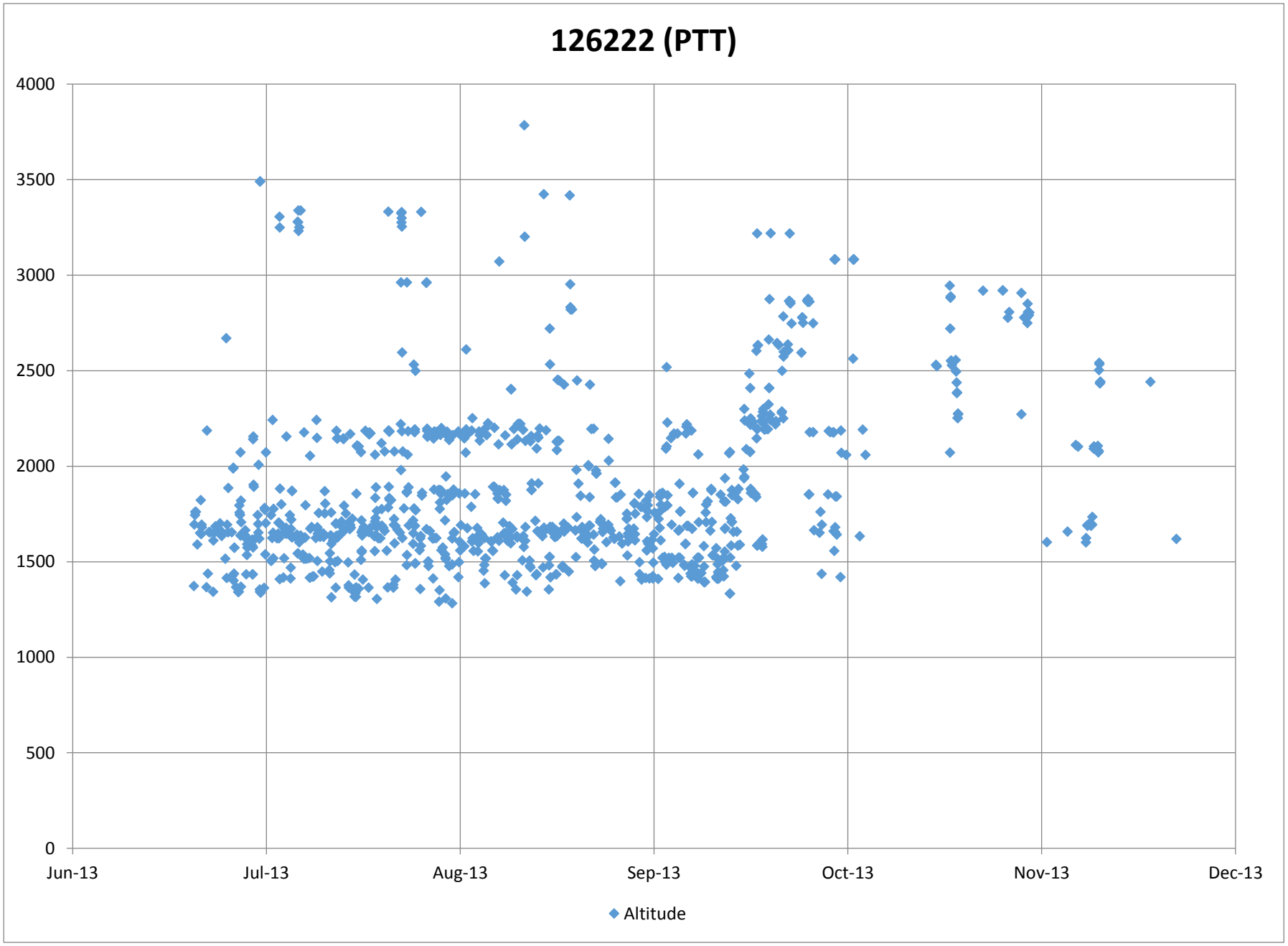
ALTITUDE GRAPHS

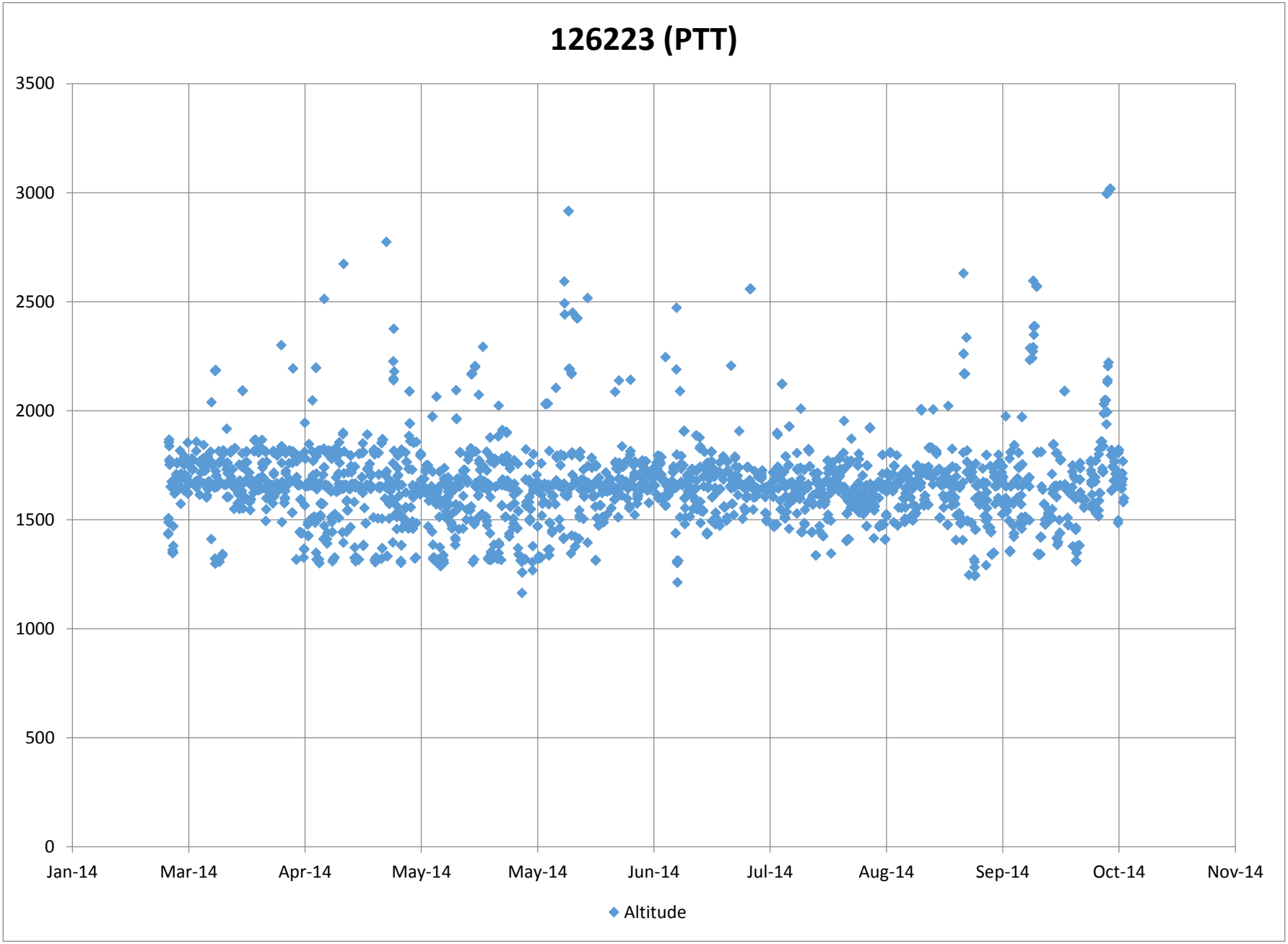
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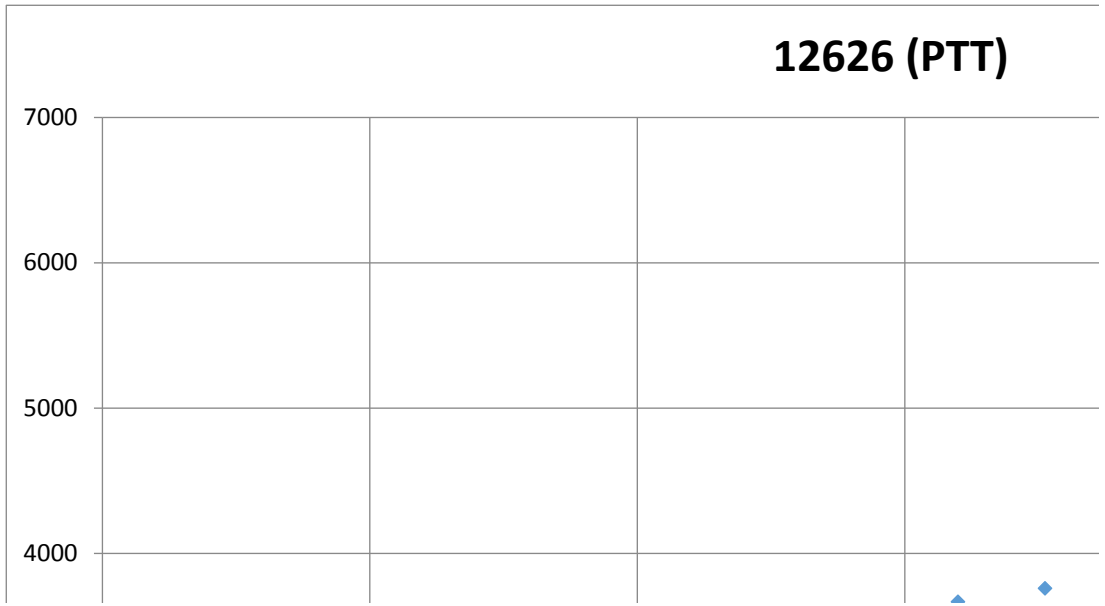

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Nov-13
Dec-13
Jan-14
Jan-14
Altitude

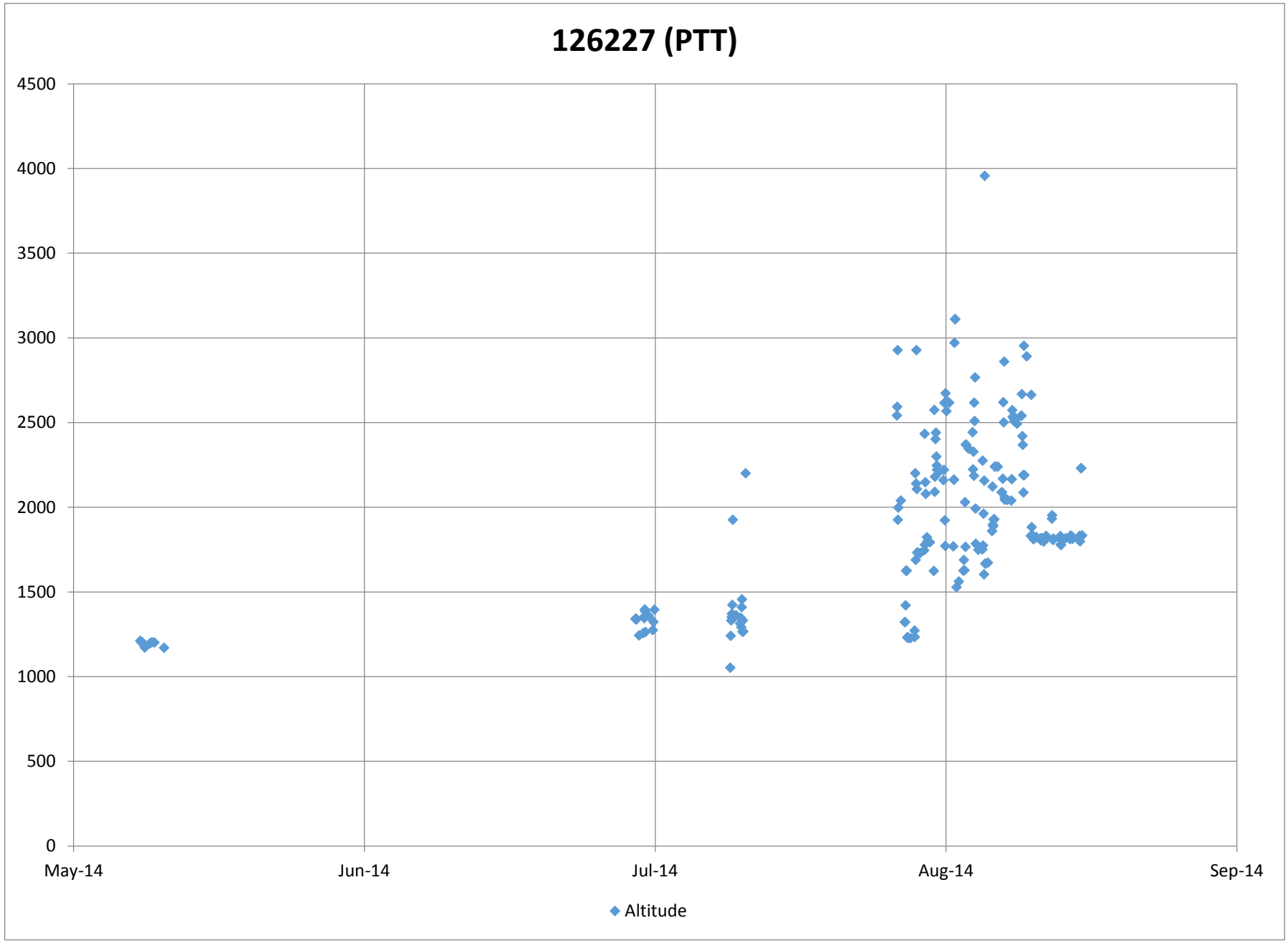

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Altitude

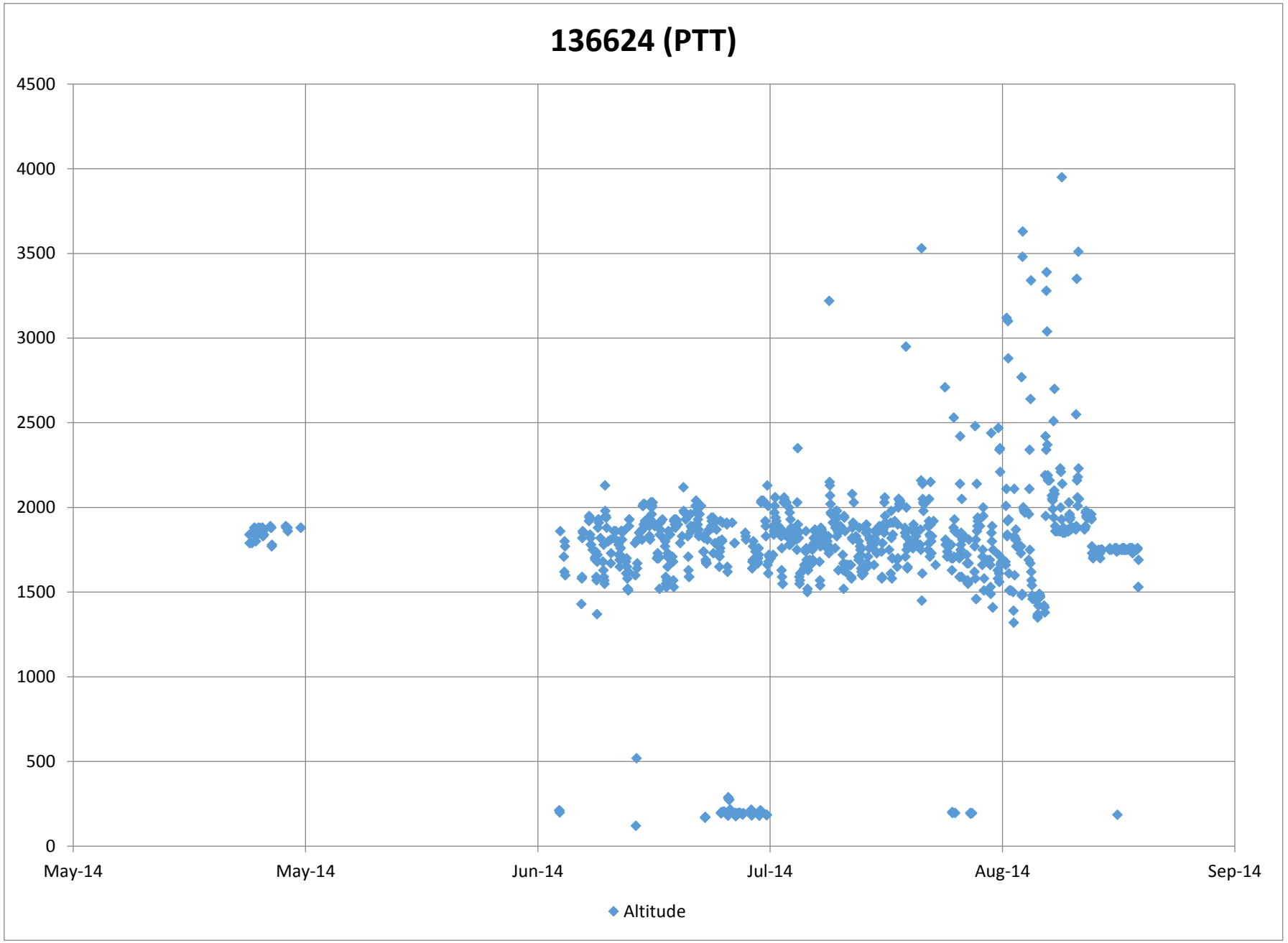

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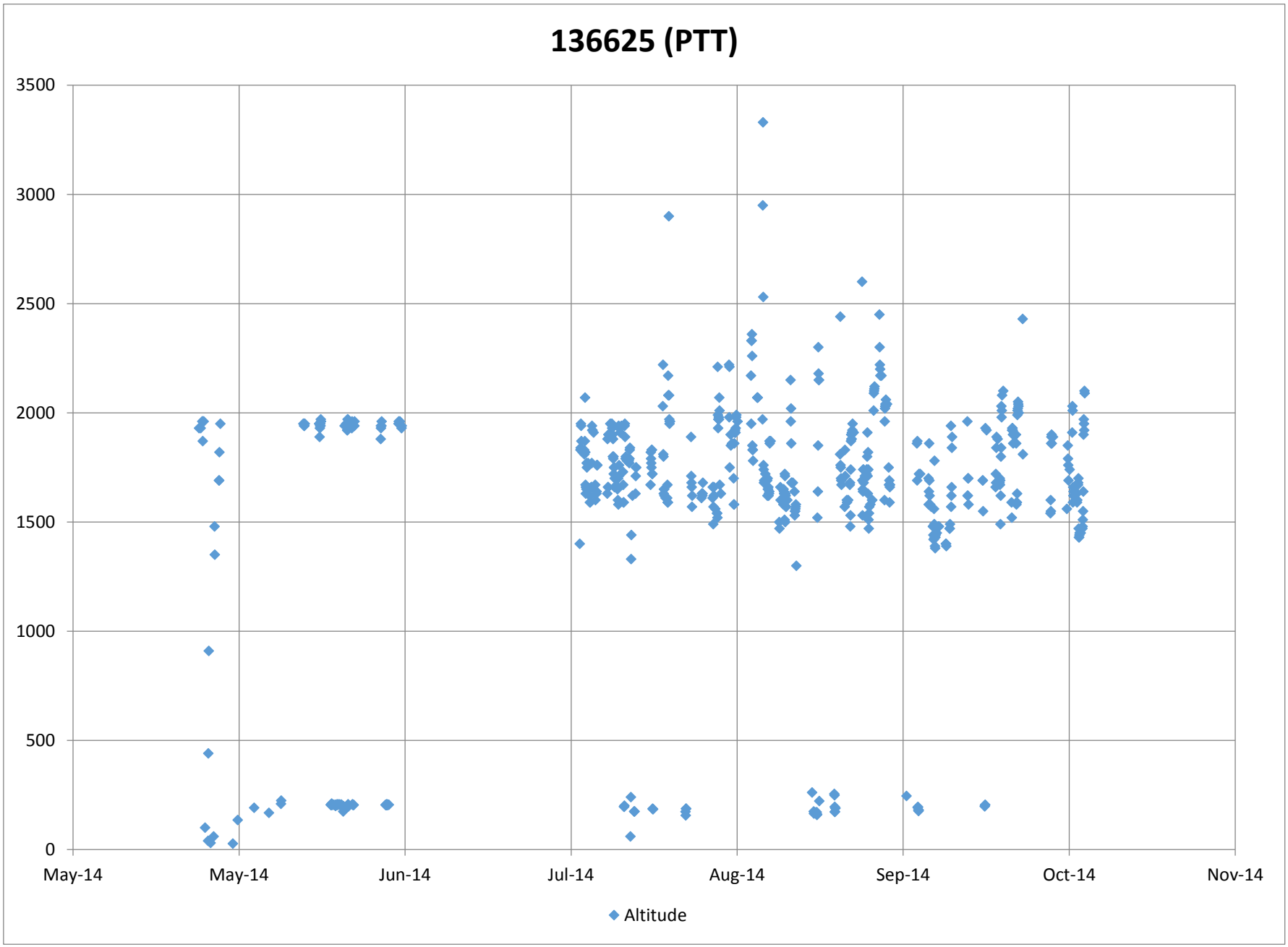

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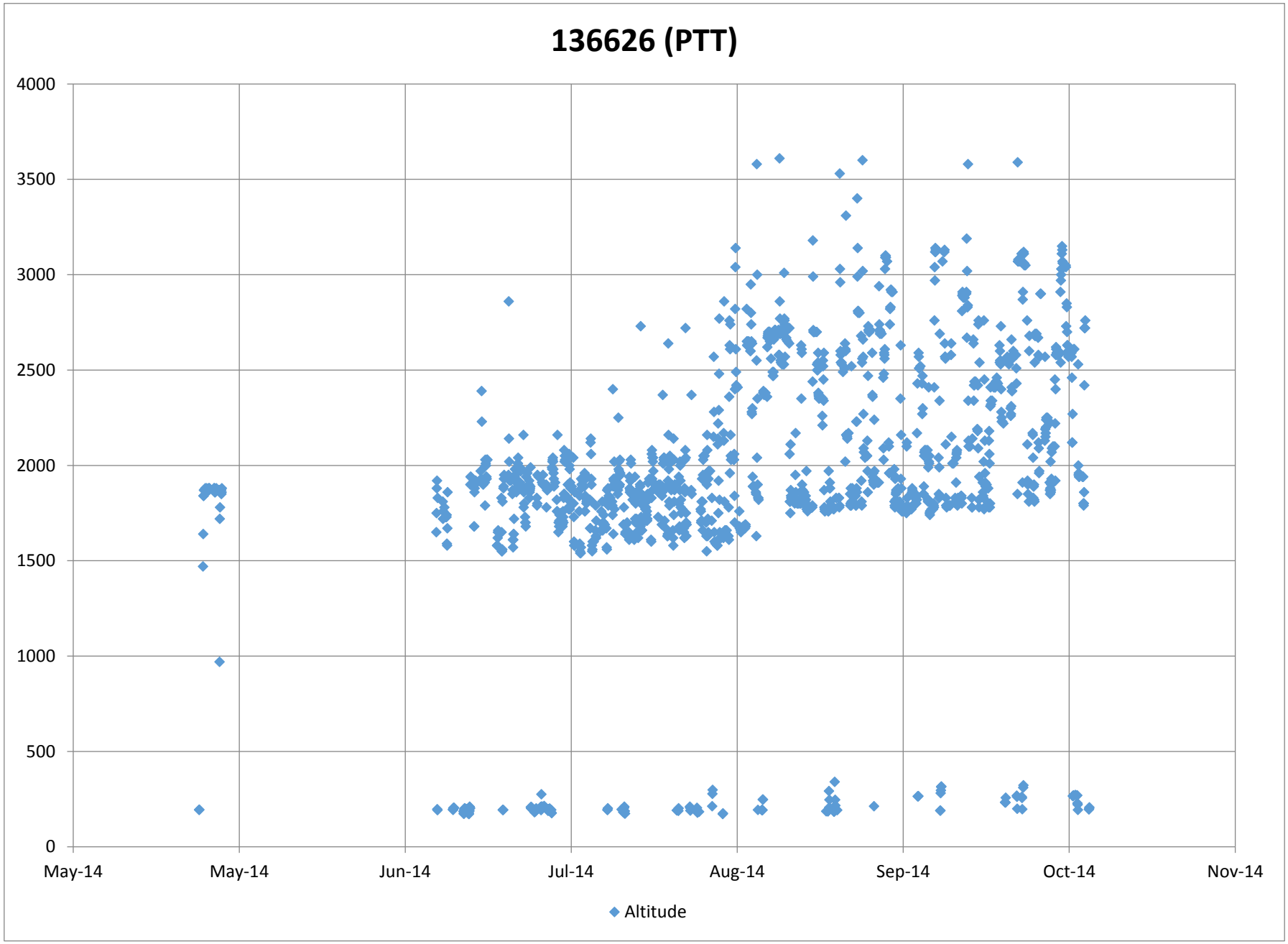

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Nov-14
Altitude

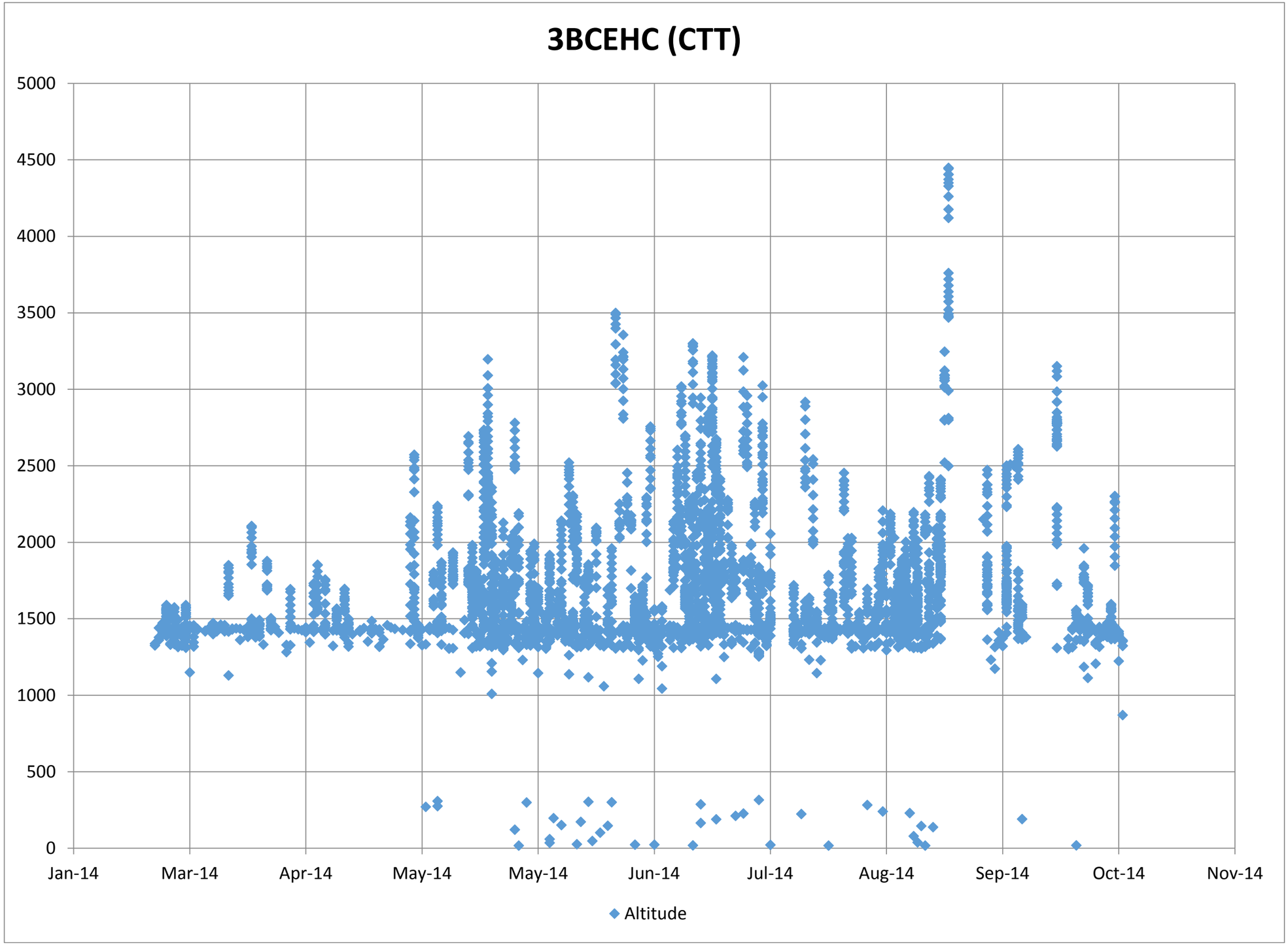

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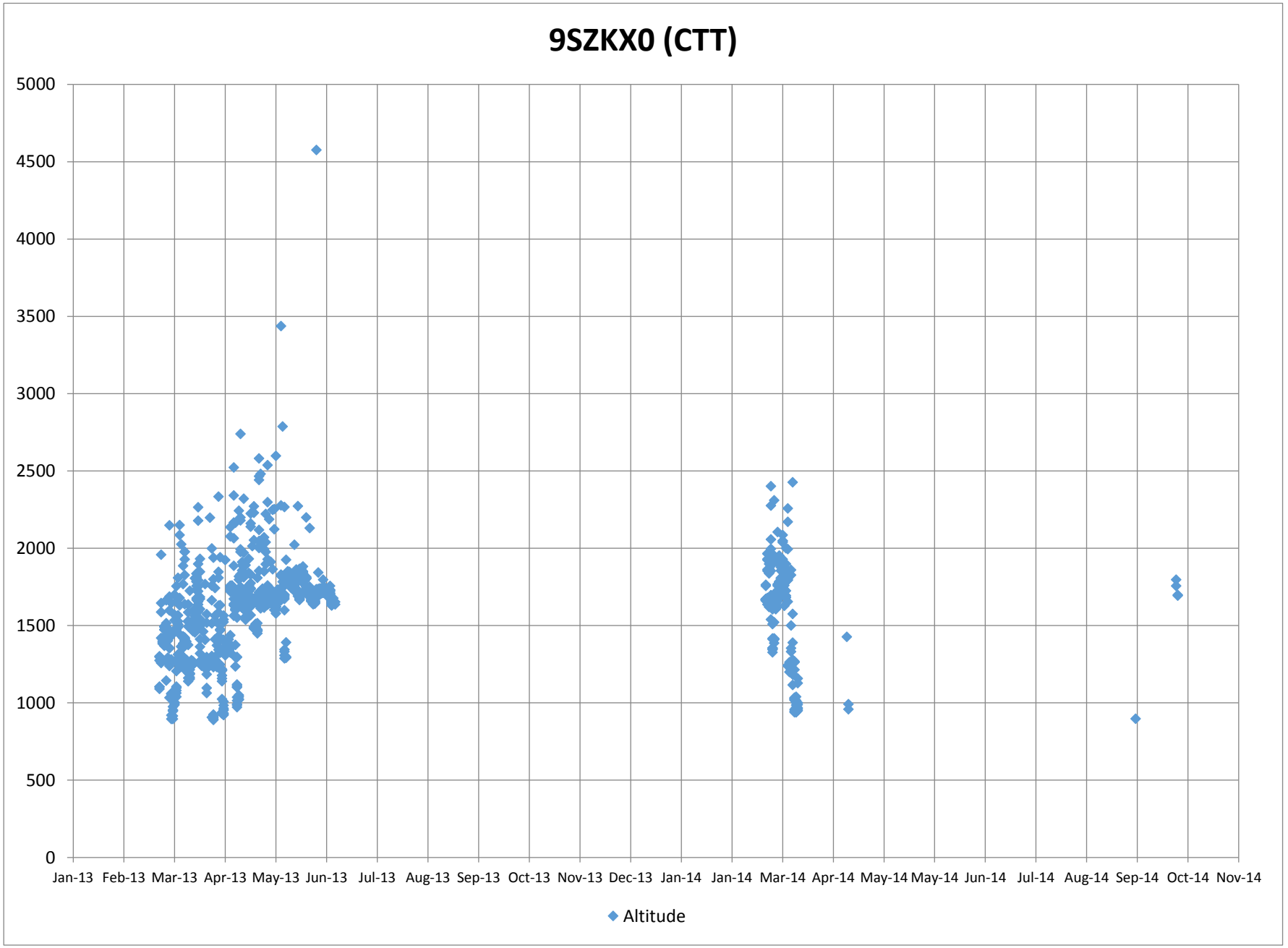

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Altitude

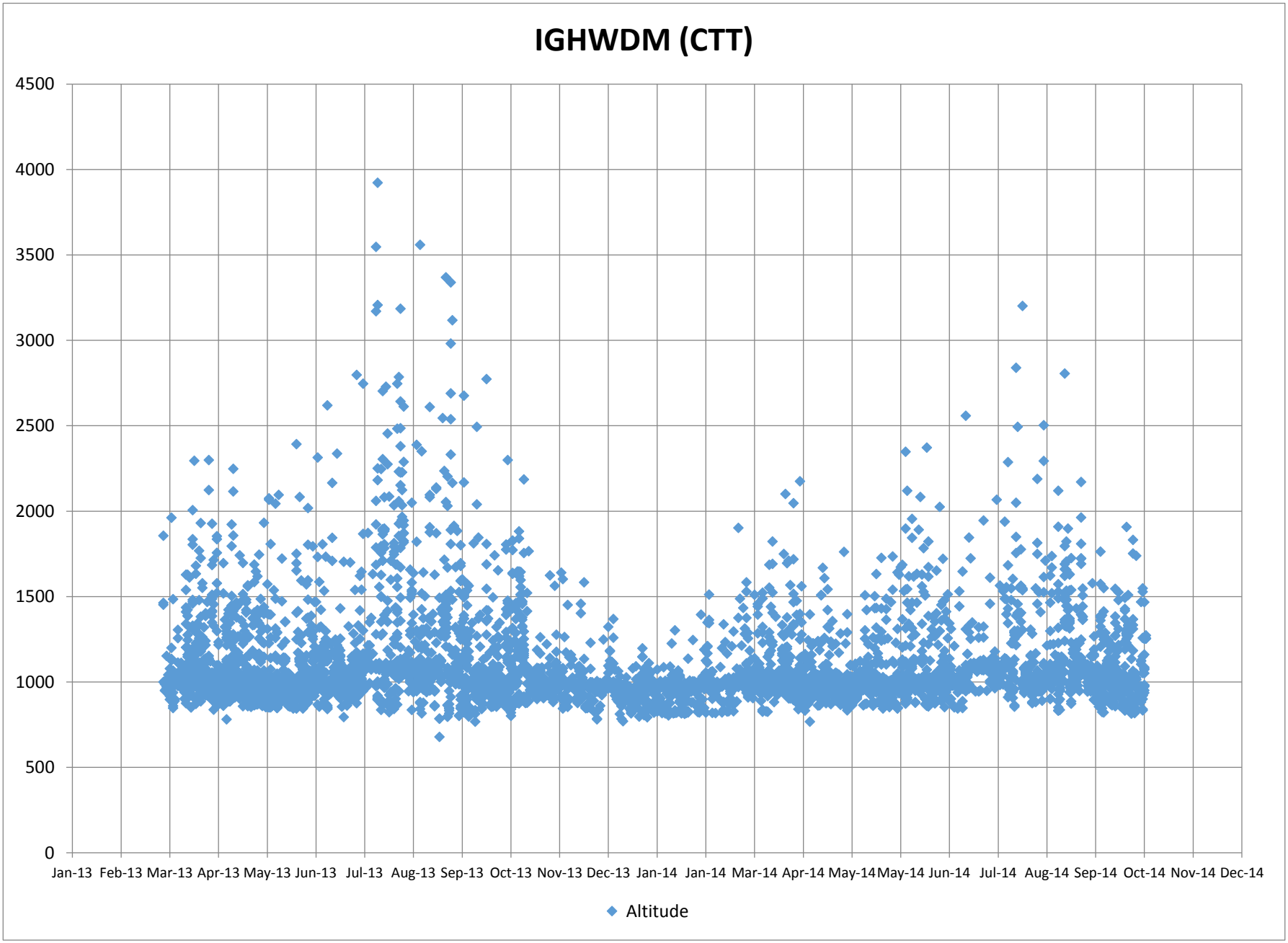

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Altitude

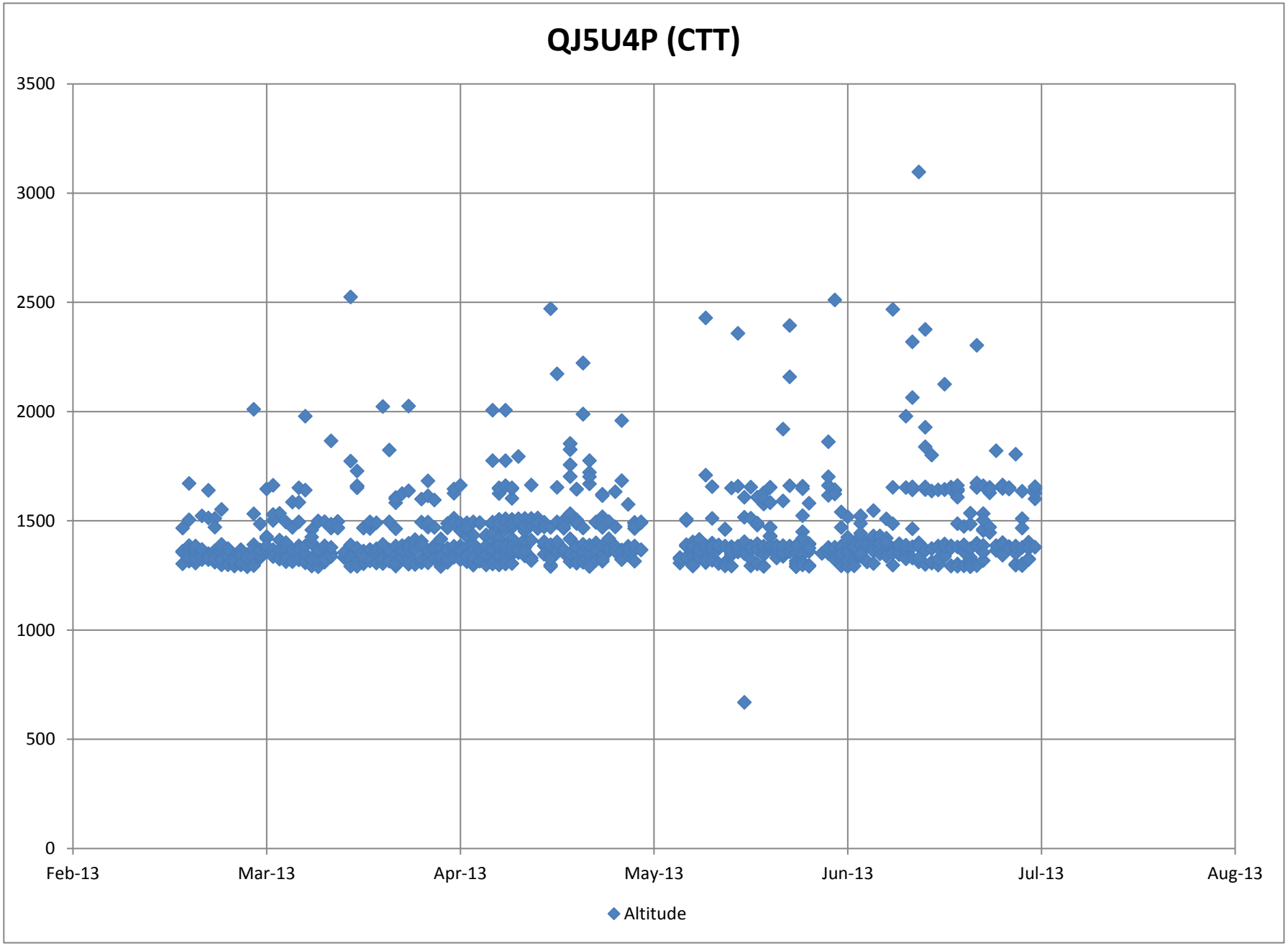

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Nov-14
Altitude

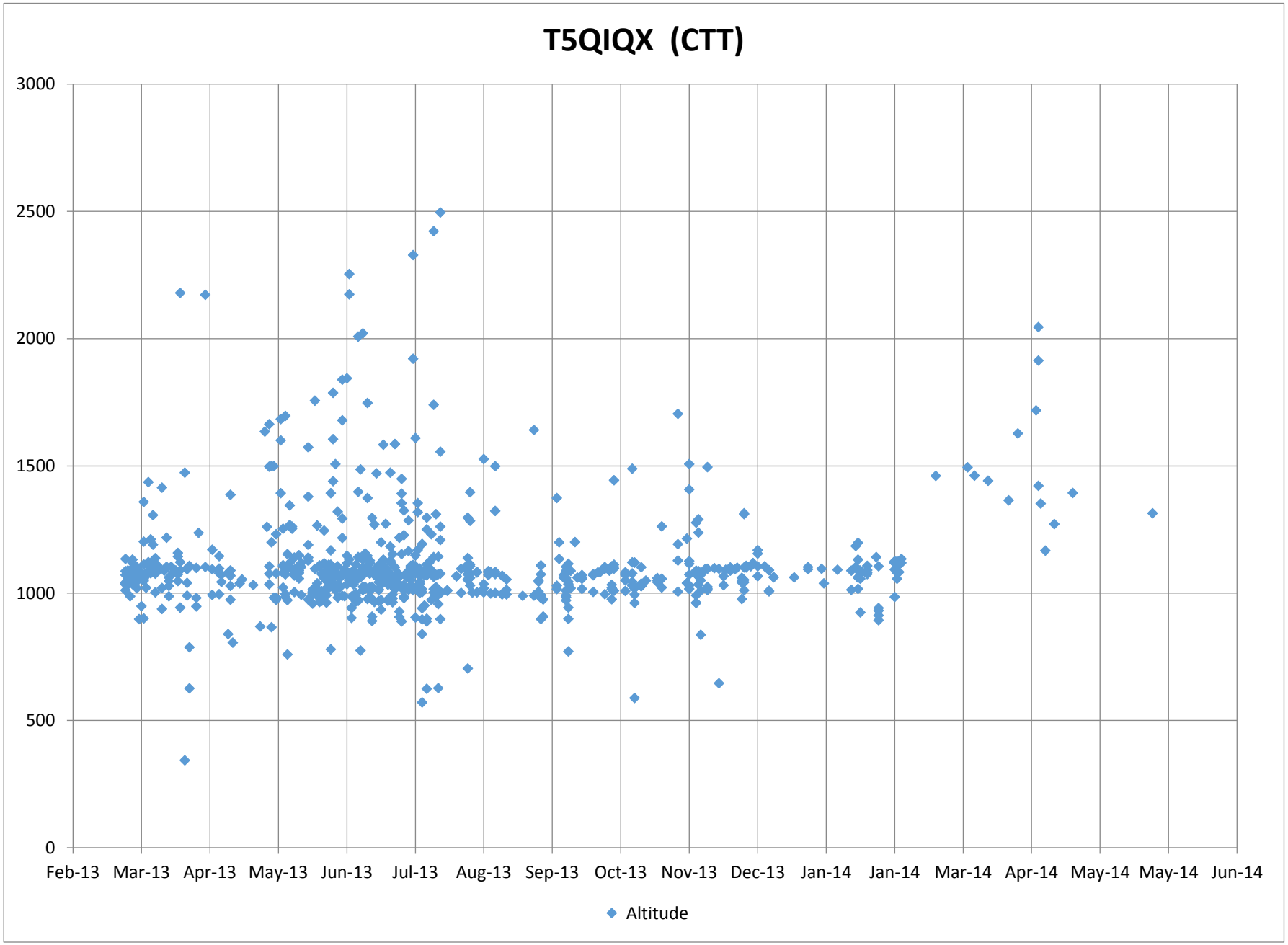

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Nov-14
Altitude


3BCEHC (CTT)
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3500
3000
2500
2000
1500
1000
500
0
Jan-14
Mar-14
Apr-14
May-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Altitude


9SZKX0 (CTT)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Jan-13
Feb-13
Mar-13
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Jan-14
Mar-14
Apr-14
May-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Altitude


IGHWDM (CTT)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Jan-13 Feb-13 Mar-13 Apr-13 May-13 Jun-13 Jul-13 Aug-13 Sep-13 Oct-13 Nov-13 Dec-13 Jan-14 Jan-14 Mar-14 Apr-14 May-14 May-14 Jun-14 Jul-14 Aug-14 Sep-14 Oct-14 Nov-14 Dec-14
Altitude


QJ5U4P (CTT)
3500
3000
2500
2000
1500
1000
500
0
Feb-13
Mar-13
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Altitude


T5QIQX (CTT)
3000
2500
2000
1500
1000
500
0
Feb-13
Mar-13
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Jan-14
Mar-14
Apr-14
May-14
May-14
Jun-14
Altitude

APPENDIX H

RECOVERY INFORMATION

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Michael Yates <myatesfalcon@gmail.com>

Fwd: mowed eagle recovery

3 messages

Jessi Brown <jessilbrown@gmail.com> Mon, Oct 20, 2014 at 2:38 PM
To: Michael Yates <myatesfalcon@gmail.com>, Carl Thelander <ct@biorc.com>, Brian Latta <blatta@biorc.com>

Hi, Carl, Mike, and Brian.

This is the sad end of your eagle 126227, found in a hay field north of Eureka, NV. NDOW currently has the remains of the transmitter and larger parts. I've already communicated with Mike Yates about it, and will be getting the transmitter remnants to him eventually (Joe Barnes with NDOW will be coming to Reno next month, he'll bring it then unless you are in a real hurry to have a chopped up transmitter in hand).

We are trying to figure out if there's anything useful we can do with the parts. Were there any blood or feather samples taken from this individual during banding? If so, we think it might be useful to screen them for lead (to compare with the levels in the later sample). Not sure what else might be useful to look at, but first we wanted to establish whether any samples might be available.

So, do let me know if there's any tissues archived and possibly available for screening.

Thanks, Jessi

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From: **Jessi Brown** <jessilbrown@gmail.com>
Date: Mon, Oct 20, 2014 at 2:20 PM
Subject: Fwd: mowed eagle recovery
To: Brian Woodbridge <brian_woodbridge@fws.gov>, "Millsap, Brian" <Brian_A_Millsap@fws.gov>

Hi, Brian and Brian. Here are photos of the mowed/baled eagle remnants. Any thoughts on whether it would be worth sending the large chunks to the forensics lab?

- Jessi

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From: **Jason Williams** <jasonw@ndow.org>
Date: Mon, Oct 20, 2014 at 1:45 PM
Subject: RE: mowed eagle recovery
To: Jessi Brown <jessilbrown@gmail.com>, Toni Wagner <toni_wagner@fws.gov>
Cc: Moira Kolada <mkolada@ndow.org>, Rory Lamp <rlamp@ndow.org>

Attached pics from the golden eagle remains collected on the mowed field just north of McGill last week.

The farmer told us that field was mowed around the 6th, and bailed around the 12th. In a separate email, Jessi wrote that the collar had been still since around the 7th, so I'd guess that in addition to going through a bailer, the bird was first mowed. We've seen mammals and birds that are JUST bailed, get bailed up whole. I didn't ask the farmer if they mowed/bailed at night. Often they'll bail at night to lock in moisture. I don't know about timing of cutting though. Regardless, I'd have a hard time believing a healthy eagle would allow itself to get mowed. The remains were so destroyed (and scavenged)…good luck in determining cause of

death.

Where would you like me to send the remains? Where would you like me to send the transmitter? If separate locations, do you want the leg band left on the bird, or shipped with the transmitter?

-Jason

Jason Williams

Nevada Dept. of Wildlife

1218 N. Alpha Street

Ely, Nevada 89301

775-289-1655 x23

From: Jessi Brown [mailto:jessilbrown@gmail.com]
Sent: Thursday, October 16, 2014 2:32 PM
To: Toni Wagner; Moira Kolada; Jason Williams; Joe Barnes
Subject: mowed eagle recovery

Hi, folks.

I just spoke with Toni Wagner, Special Agent for USFWS OLE about the apparently mowed and partially baled eagle outside of Ely. Toni might be contacting you folks just to get the story/scene description straight from you, in the off chance there was something weird going on (weirder than an eagle managing to get itself made into horse food). Maybe when Moira et al. are back in the office, you can take photos of the transmitter and harness so we can maybe figure out if it was only mowed, or if it had been removed or damaged before mowing? And please let Toni know a phone number that she can reach you on.

Regardless, thanks so much for taking the time to go out and do this recovery. It sure didn't end like I expected!

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10 attachments



PA160002.JPG
371K



PA160003.JPG
373K



PA160004.JPG
407K



PA160005.JPG
386K



PA160006.JPG
352K



PA160007.JPG
384K



PA160008.JPG
493K



PA160009.JPG
464K



PA160010.JPG
385K



PA160011.JPG
385K

Carl Thelander <ct@biorc.com> Mon, Oct 20, 2014 at 3:54 PM
To: Jessi Brown <jessilbrown@gmail.com>, Michael Yates <myatesfalcon@gmail.com>, Brian Latta <blatta@biorc.com>

Are there any risky 'features' nearby that may be involved but not readily visible where the carcass was discovered? How far is the bird from any power poles? Any rural roads? It may have been electrocuted (shot) or otherwise injured and managed to make it into the alfalfa field??? Maybe someone shot it and it managed to go some distance before landing in this field??? Just a few thoughts… CT

From: Jessi Brown [mailto:jessilbrown@gmail.com]
Sent: Monday, October 20, 2014 2:38 PM
To: Michael Yates; Carl Thelander; Brian Latta

Subject: Fwd: mowed eagle recovery

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Subject: RE: mowed eagle recovery

To: Jessi Brown <jessilbrown@gmail.com>, Toni Wagner <toni_wagner@fws.gov>
Cc: Moira Kolada <mkolada@ndow.org>, Rory Lamp <rlamp@ndow.org>

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Jason Williams

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Brian Latta <blatta@biorc.com> Tue, Oct 21, 2014 at 7:47 AM
Reply-To: Brian Latta <blatta@biorc.com>
To: Jessi Brown <jessilbrown@gmail.com>, Carl Thelander <ct@biorc.com>, Michael Yates <myatesfalcon@gmail.com>
Cc: Daniel Driscoll <eaglestudies@gmail.com>, Joe Barnes <jbarnes@ndow.org>

Hi Jessi,

Unfortunately, we took no samples from the two chicks in this nest as it was well over 100 degrees on the day of the banding with no shade available. We thought it best at the time to get the chicks back in the nest asap.

Brian

> On October 20, 2014 at 2:38 PM Jessi Brown <jessilbrown@gmail.com> wrote:
>
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>
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Brian C. Latta
Senior Raptor Biologist
BioResource Consultants
P.O. Box 1539
Ojai, CA 93024-1539
phone 805-390-5262
www.biorc.com

DIAGNOSTIC SERVICES SECTION

FINAL REPORT

SOUTHEASTERN COOPERATIVE WILDLIFE DISEASE STUDY (SCWDS)
COLLEGE OF VETERINARY MEDICINE
THE UNIVERSITY OF GEORGIA
ATHENS, GEORGIA 30602-7393
TELEPHONE: 706-542-1741; FAX: 706-542-5865

CASE NUMBER CC14-376
DATE RECEIVED November 21, 2014
DATE OF REPORT December 15, 2014

STATE UT **COUNTY** Tooele **AREA** Tooele Army Depot

SPECIES (NO.) Golden Eagle (1) **SEX** M **AGE** 15 years **WEIGHT** 2.165kg

CASE HISTORY: An adult, breeding golden eagle that was originally banded in the nest (0679-42959) was trapped by biologists with the group Bio Resource Consultants (BRC) and was outfitted with a GPS/PTT backpack. The signal was noticed to have stopped moving on January 4, 2014, and the animal was located on January 15, 2014, on the Tooele Army Depot at UTM 38461E, 4458578N with no obvious signs of trauma. The keel was readily palpable. The transmitter was removed, and the eagle was frozen until it was shipped to SCWDS on November 19, 2014, by Brian Proctor, a subcontractor for BRC on behalf of Brian Latta of BRC, under the direction of Brian Millsap of the United States Fish and Wildlife Service.

The carcass was received frozen on November 21, 2014, and a necropsy was performed on November 23, 2014.

FINAL DIAGNOSIS: Emaciation/starvation

COMMENTS: The final diagnosis is emaciation and starvation based on the extremely poor body condition at necropsy. Extensive toxicological testing did not detect any toxins at significant levels. Starvation is a commonly diagnosed cause of mortality in juvenile animals, but is less common in mature animals that are more experienced at foraging. In this case, an old wound was present on the leading edge of the right wing that may have impaired the bird's ability to fly and forage properly. There were also bony proliferations affecting the vertebrae that could also have impaired movement. These lesions are likely age-related. There was no evidence of underlying infectious disease in this animal. The liver lead concentration of 2.1 parts per million (ppm) wet weight is consistent with exposure to lead, but is below a range considered to be indicative of lead intoxication (6 to 10 ppm range or greater).

No arboviruses, including West Nile virus and Eastern equine encephalitis virus, were detected by virus isolation.

Mr. Proctor and Mr. Latta were notified of receipt of the carcass by phone on November 21, 2014. Mr. Proctor was given the final update including toxicology results on December 14, 2014.

WILDLIFE IMPLICATIONS: Starvation is a common cause of morality in raptors, particularly juveniles.

PUBLIC HEALTH IMPLICATIONS: None reported.

DOMESTIC ANIMAL IMPLICATIONS: None reported.

DIAGNOSTICIAN Heather Fenton, DVM, MVSc, DACVP

DISTRIBUTION: SCWDS File, Proctor, Latta, Millsap, Gibbs, Murphy

Laboratory Results Begin on Page 2

GROSS NECROPSY FINDINGS: A 15 year old, male golden eagle that weighs 2.165kg is submitted for necropsy. An approximately 2cm in maximum diameter open wound is present on the leading edge of the right wing. The edges of the wound are rounded and firm (interpreted as a previous injury). A silver band is present on the right leg 629-42959. The eagle is in extremely poor body condition with no visible subcutaneous or visceral fat stores, concave pectoral muscles, and a readily palpable keel. Black tarry material is present within the ventriculus. Bony proliferations are present on the ventral surface of the disk space between T3-T4 and T5-6 (spondylosis) and at the tailing edge of the rib T5.

HISTOLOGY

Skeletal muscle: Diffusely, myocytes have markedly shrunken cytoplasm (atrophy).

Thyroid: There is diffuse collapse of the majority of thyroid follicles with a basophilic appearance to the colloid when present in the center of the follicles.

Vertebra and rib: Significant artifact and autolysis are present in this section. Small foci of increased bone thickness composed primarily of layers of compact bone are present on the ventral surface of the vertebra and rib examined.

Proventriculus: Multiple cross sections of an adult nematode approximately 200 microns in diameter with a uterus filled with larvated eggs are present within multiple proventricular glands (possibly *Microtetrameres* sp.).

Skin: A piece of skin originating from the leading edge of the right wing has thickening of the dermis by mature fibrous connective tissue that is infiltrated by small numbers of lymphocytes, plasma cells, and macrophages.

No significant findings are present within sections of: lung, heart, brain, sciatic nerve, trachea, esophagus, crop, liver, oral cavity, intestine, kidney, and cloaca.

Marked autolysis and freezing artefact are present within all sections examined that may mask subtle changes.

MORPHOLOGIC DIAGNOSIS:

Emaciation and marked diffuse skeletal muscle atrophy

Vertebrae and rib: Multifocal, moderate, chronic spondylosis

Skin, leading edge of right wing: Previous laceration and fibrosis

Proventricular spirurid nematodiasis (possibly *Microtetrameres* sp.)

VIROLOGY: A sample of brain was submitted to the SCWDS laboratory for arbovirus testing. No arboviruses including West Nile virus and Eastern Equine encephalitis were detected.

TOXICOLOGY: Samples of liver, brain, and gastrointestinal content were sent to the California Animal Health and Food Safety laboratory in Davis, California. The detected liver lead concentration is consistent with exposure to lead, but is below a range considered to be indicative of lead intoxication (6 to 10 ppm range or greater). The measured brain cholinesterase is within an acceptable range for golden eagles (approximately 16 +/- 2.2 micromoles/gram/minute).

Note that none of the OC, OP, or carbamate insecticides included in our routine screens were detected in the tested samples at or above the indicated reporting limits.

Brain cholinesterase activity: 18uM/g/min (reporting limit 0.10 18uM/g/min)

Laboratory Results Continue on Page 3

Heavy metal panel (tissue: liver)

Analyte	Result (ppm)	Reporting Limit (ppm)
Lead	2.1	1.000
Manganese	4.5	0.040
Iron	990	0.200
Mercury	2.1	1.000
Arsenic	Not Detected	1.000
Molybdenum	0.67	0.400
Zinc	91	0.100
Copper	18	0.100
Cadmium	0.68	0.300

Organochlorine screen (brain tissue)

Analyte	Result	Rep Limit
Dieldrin	Not Detected	0.05 ppm
Endosulfan I	Not Detected	0.05 ppm
Endosulfan II	Not Detected	0.05 ppm
Endrin	Not Detected	0.05 ppm
HCB	Not Detected	0.05 ppm
Heptachlor	Not Detected	0.05 ppm
Heptachlor Epoxide	Not Detected	0.05 ppm
Lindane	Not Detected	0.05 ppm
Methoxychlor	Not Detected	0.05 ppm
Mirex	Not Detected	0.05 ppm
Aldrin	Not Detected	0.05 ppm
BHC alpha	Not Detected	0.05 ppm
Gamma Chlordane	Not Detected	0.05 ppm
DDE-p.p	Not Detected	0.2 ppm
DDD-p.p	Not Detected	0.1 ppm
DDT-p.p	Not Detected	0.1 ppm
Dicofol	Not Detected	0.1 ppm
DDE-o.p	Not Detected	0.1 ppm
DDD-o.p	Not Detected	0.1 ppm
DDT-o.p	Not Detected	0.1 ppm
Technical Chlordane	Not Detected	0.25 ppm
Toxaphene	Not Detected	0.2 ppm

Carbamate screen (gastrointestinal content)

Analyte	Result	Rep Limit
3-Hydroxycarbofuran	Not Detected	0.4ppm
Aldicarb	Not Detected	0.4ppm
Aldicarb Sulfone	Not Detected	0.4ppm
Bendiocarb	Not Detected	0.4ppm
Carbaryl	Not Detected	0.4ppm
Carbofuran	Not Detected	0.4ppm

Laboratory Results Continue on Page 4

Methiocarb	Not Detected	0.4ppm
Methomyl	Not Detected	0.4ppm
Mexacarbate	Not Detected	0.4ppm
Oxamyl	Not Detected	0.4ppm
Propoxur	Not Detected	0.4ppm

Organophosphate screen (gastrointestinal content)

Analyte	**Result**	**Rep Limit**
Diazinon	Not Detected	0.40ppm
Dicrotophos	Not Detected	0.40ppm
Dimethoate	Not Detected	0.40ppm
Dioxathion	Not Detected	1.6ppm
Disulfoton	Not Detected	0.40ppm
EPN	Not Detected	0.40ppm
Ethion	Not Detected	0.40ppm
Ethoprop	Not Detected	0.40ppm
Famphur	Not Detected	0.40ppm
Fenamiphos	Not Detected	0.40ppm
Fensulfothion	Not Detected	0.40ppm
Fenthion	Not Detected	0.40ppm
Fonofos	Not Detected	0.40ppm
Isofenphos	Not Detected	0.40ppm
Malathion	Not Detected	0.40ppm
Methamidophos	Not Detected	0.40ppm
Methidathion	Not Detected	0.40ppm
Methyl Parathion	Not Detected	0.40ppm
Mevinphos	Not Detected	0.40ppm
Monocrotophos	Not Detected	0.40ppm
Naled	Not Detected	0.40ppm
Parathion	Not Detected	0.40ppm
Phosalone	Not Detected	0.40ppm
Phosmet	Not Detected	0.40ppm
Phosphamidon	Not Detected	0.40ppm
Profenophos	Not Detected	0.40ppm
Propetamphos	Not Detected	0.40ppm
Ronnel	Not Detected	0.40ppm
Terbufos	Not Detected	0.40ppm
Tetrachlorvinphos	Not Detected	0.40ppm
Triazophos	Not Detected	0.40ppm
Acephate	Not Detected	0.40ppm
Azinphos methyl	Not Detected	0.80ppm
Carbophenothion	Not Detected	0.40ppm
Chlorfenvinphos	Not Detected	0.40ppm
Chlorpyrifos	Not Detected	0.40ppm
Coumaphos	Not Detected	0.40ppm
Crotoxyphos	Not Detected	0.40ppm
Crufomate	Not Detected	0.40ppm
DDVP	Not Detected	0.40ppm
DEF	Not Detected	0.40ppm
Demeton-O	Not Detected	0.40ppm
Demeton-S	Not Detected	0.40ppm