

Final

**Survey Report – Greater Sage-Grouse Lek Aerial Surveys
in Support of the Proposed Fallon Range Training Complex
Expansion, Nevada**



July 2019

Prepared for:

Naval Facilities Engineering Command, Southwest
San Diego, CA

Prepared by:

ManTech International Corporation
Environmental, Range, and Sustainability Services
Lompoc, CA and Solana Beach, CA

Contract N62742-14-D-1863: Task Orders FZNG and FZNG, Modification 4

Cover: (background) Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) interspersed with cheatgrass (*Bromus tectorum*) within the proposed B-17 expansion area; Photo: M. Ball, ManTech.
(foreground) Two male greater sage-grouse (*Centrocercus urophasianus*) on a lek; Photo: D. Anderson/Audubon Photography Awards.

TABLE OF CONTENTS

1.0	Introduction	3
2.0	Natural History Background.....	5
2.1	Great Basin	5
2.2	Greater Sage-Grouse.....	5
3.0	Methodology.....	8
3.1	Suitable Habitat and Survey Selection	8
3.2	Helicopter Surveys	8
4.0	Results and Discussion	10
5.0	References	18

Appendix A: Letter from Nevada Department of Wildlife re: Potential Occurrence of Wildlife Resources in Vicinity of Fallon NAS Withdrawal (January 4, 2017)

List of Figures

Figure 1-1.	Regional Location of Proposed FRTC Expansion Areas.....	4
Figure 2-1.	Occurrence of the Great Basin within the Western United States.....	6
Figure 2-2.	Male Greater sage-grouse in Typical Display with Inflated Gular Sacs (left) and Smaller, Female Bird (right) at a Lekking Site	7
Figure 3-1.	Greater Sage-grouse Habitat Management Areas within the Vicinity of Proposed FRTC Expansion Areas.....	9
Figure 4-1.	Greater Sage-grouse Aerial Survey Transects within the Proposed DVTA Expansion Area	12
Figure 4-2.	Greater Sage-grouse Aerial Survey Transects within the Proposed B-17 and Southern DVTA Expansion Areas.....	13
Figure 4-3.	2017 Transects 1 and 6 and 2019 Transects 1 and 2 were Characterized by Greasewood Habitats Adjacent to Sagebrush	14
Figure 4-4.	2017 Transects 8, 9, and 10 and 2019 Transect 3 were Characterized by Wyoming Big Sagebrush Interspersed with Cheatgrass	14
Figure 4-5.	2017 Transects 3 and 4 above the Foothills of the Stillwater Mountains	15
Figure 4-6.	2017 Transects 3 and 4 were Characterized by Sagebrush with Relatively Little Open Areas Suitable for Leks.....	15
Figure 4-7.	Old Winter Scat from a Greater Sage Grouse within the Proposed DVTA Expansion Area	16
Figure 4-8.	Greater Sage-grouse Habitat Management Areas, Historical Lek Locations, and Incidental Observations of Greater Sage-grouse and Scat during 2017 and 2019 Field Surveys.....	17

List of Tables

Table 4-1. Summary of 2017 and 2019 Greater Sage-grouse Survey Transects: Dates, Transect Lengths, Survey Times, Meteorological Conditions, and Personnel	10
Table 4-2. Incidental Observations of Greater Sage-grouse and Greater Sage-grouse Scat	16

Acronyms and Abbreviations

ac	acre(s)
BLM	Bureau of Land Management
DoN	U.S. Department of the Navy
DVTA	Dixie Valley Training Area
FRTC	Fallon Range Training Complex
ft	foot/feet
GRSG	greater sage-grouse
ha	hectare(s)
km	kilometer(s)
km ²	square kilometer(s)
m	meter(s)
mi	mile(s)
mi ²	square mile(s)
NAS	Naval Air Station
NDOW	Nevada Department of Wildlife
NNHP	Nevada Natural Heritage Program
NRCS	Natural Resources Conservation Service
U.S.	United States
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

Naval Air Station (NAS) Fallon currently manages the Fallon Range Training Complex (FRTC), which currently encompasses a combination of withdrawn and acquired lands totaling approximately over 223,600 acres (ac) (90,490 hectares [ha]) of military training land located southeast of Fallon, Nevada (Figure 1-1). The FRTC is the United States (U.S.) Department of the Navy's (DoN or Navy) premier integrated strike warfare training complex, supporting air units and special operations forces in a variety of mission areas. Since World War II, the Navy has extensively used the ranges and airspace of the FRTC to conduct military air warfare and ground training, including live-fire training activities. However, the current training areas are insufficient for implementation of realistic training scenarios and buffers required for public safety. In order to effectively meet these needs, the Navy proposes to modernize the land and airspace configurations of the FRTC. The Navy is currently proposing to expand the land administered by NAS Fallon by approximately 680,000 ac (275,200 ha). The proposed expansion areas are broken into four discontinuous areas associated with four of the current training ranges (ranges B-16, B-17, B-20, and Dixie Valley Training Area [DVTA]) (Figure 1-1):

- The area west of B-16 is the proposed B-16 Expansion Area.
- The area surrounding B-20 is the proposed B-20 Expansion Area.
- The areas west and east of B-17 and south of Highway 50, and areas north of Highway 50 surrounding the DVTA are the proposed DVTA Expansion Areas.
- The area south of B-17 and Highway 50 and east of B-17 is the proposed B-17 Expansion Area.

Currently, the Navy is preparing an Environmental Impact Statement (EIS) to assess the potential environmental effects of the proposed FRTC expansion. In support of the EIS, Naval Facilities Engineering Command, Southwest contracted ManTech International Corporation (ManTech) to perform a variety of ecological surveys to inventory the flora and fauna within the proposed FRTC expansion areas. This report details the results of aerial surveys for greater sage-grouse (GRSG; *Centrocercus urophasianus*) conducted in 2017 under contract N62742-14-D-1863, Task Order FZNG, and in 2019 under Task Order FZNG, Modification 4.

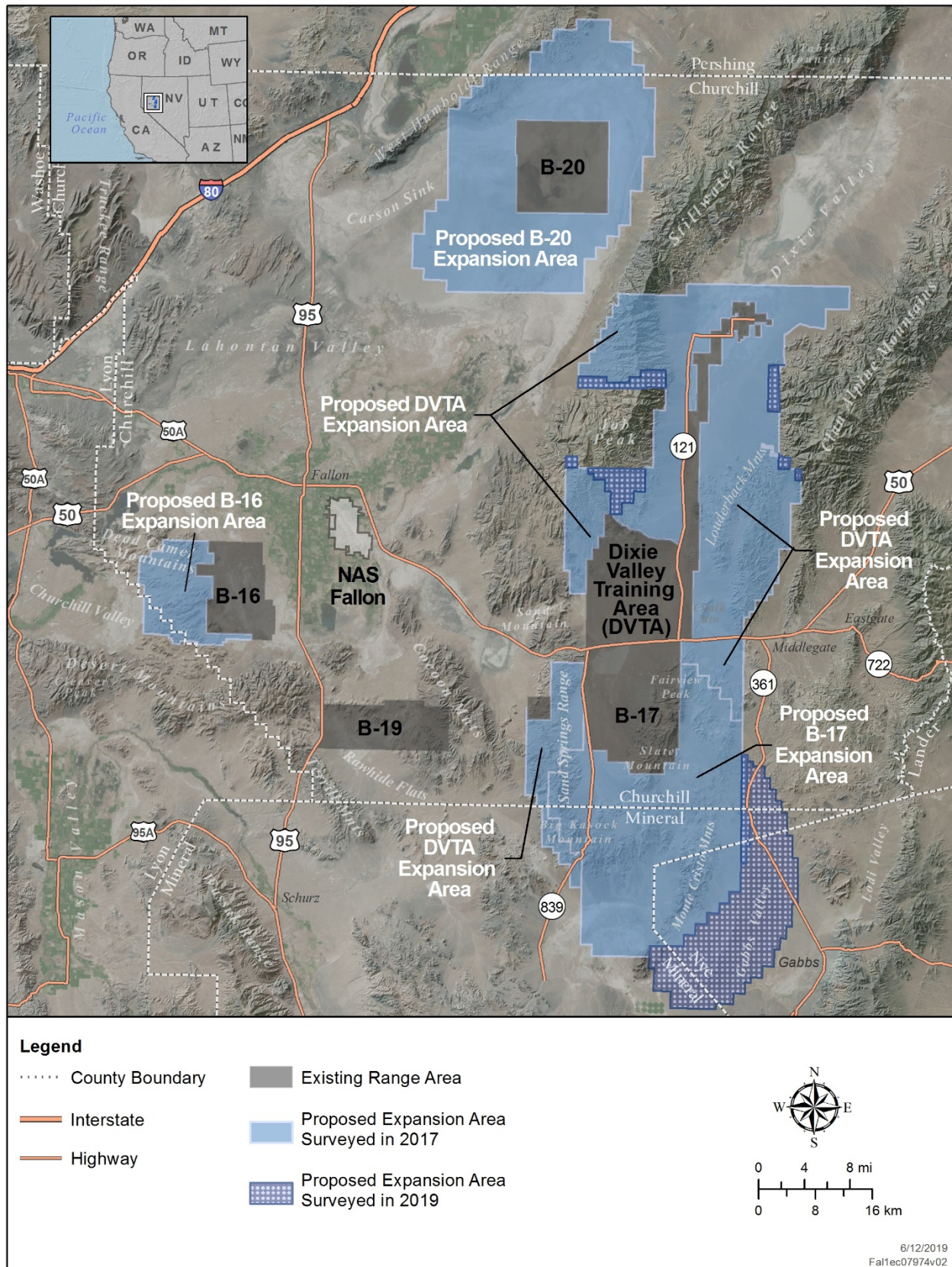


Figure 1-1. Regional Location of Proposed FRTC Expansion Areas

2.0 NATURAL HISTORY BACKGROUND

2.1 Great Basin

The project area lies within the geographic feature known as the Great Basin. The Great Basin Desert is the largest desert in the U.S., roughly bounded by the Sierra Nevada – Cascade mountains to the west and the Rocky Mountains to the east. Between these large mountain ranges are a series of basins interspersed by smaller, north-south running ranges. This desert covers 158,000 square miles (mi²) (409,218 square kilometers [km²]) of southern Idaho, southeastern Oregon, western Utah, eastern California, and nearly all of Nevada (MacMahon 1985) (Figure 2-1). The Great Basin is a high cold desert, with most of it over 4,000 feet (ft) (1,200 meters [m]). Precipitation is primarily in the form of snow, although rain showers can occur throughout the year (Sowell 2001).

The combination of hot, dry summers and cold winters results in a characteristic vegetation dominated by aromatic, perennial shrubs such as various species of sagebrush (*Artemisia* spp.), with nearly 40% of the Great Basin dominated by sagebrush. A long-lived species, many individual sagebrush plants have been documented as surviving at least 150 years. Healthy sagebrush habitats have plants of various age classes and a diverse understory of grasses and forbs that provide shelter and forage for a suite of wildlife species. Although sagebrush may comparatively lack the wildlife diversity of other ecoregions, species found in sagebrush, such as the GRSG, live nowhere else in the world. Sagebrush provides shelter, forage, and nesting cover for the GRSG (U.S. Fish and Wildlife Service [USFWS] 2014).

Although sagebrush is resistant to the environmental extremes of the Great Basin, changes in the fire regime, overgrazing, and/or agricultural conversion can affect sagebrush and take decades if not centuries to reestablish. Invasive species such as cheatgrass (*Bromus tectorum*) and encroaching Utah juniper (*Juniperus osteosperma*) can alter the density of sagebrush and otherwise negatively impact GRSG habitat. Native plants of the Great Basin, such as sagebrush, are not adapted to frequent fire and cannot recover quickly, particularly when fire frequency exceeds the pre-historical norm. Cheatgrass, in contrast, recovers from fire very rapidly and takes advantage of the low-competition, high-nutrient, and ample light in post-fire conditions to rebound in even greater numbers, thereby further increasing the likelihood of future fires (Young and Tipton 1990; USFWS 2014).

2.2 Greater Sage-Grouse

The GRSG is the largest North American grouse species and is one of two species in the genus *Centrocercus* within the Phasianidae family. It is a sagebrush obligate game bird and an umbrella species for the ecological integrity of sagebrush habitat (Knick et al. 2003). Though this species was removed from its candidate status in 2015 (USFWS 2015) and is subsequently not afforded protections under the Endangered Species Act, many state, federal, and non-governmental organizations consider the GRSG to be vulnerable or imperiled due to habitat fragmentation within the sagebrush steppe of western North America. It is widely distributed in association with sagebrush-shrub or sagebrush-grass habitats throughout the Great Basin. However, the encroachment of coniferous woodlands into sagebrush habitats excludes the GRSG (USFWS 2014).

It is currently listed as a Sensitive Species by the Bureau of Land Management (BLM) (BLM 2017), a protected game bird by the State of Nevada (Nevada Administrative Code 503.045), and a Species of Conservation Priority in Nevada's Wildlife Action Plan (Nevada Wildlife Action Team 2013). The GRSG is listed as vulnerable by the Nevada Natural Heritage Program (NNHP), is on their Watch List, and is also considered to be highly vulnerable to climate change as ranked by the NNHP Climate Change Vulnerability Index (NNHP 2018).



Figure 2-1. Occurrence of the Great Basin within the Western United States
(Source: Nevada Bureau of Mines and Geology 2012)

GRSG show strong sexual dimorphism; males are nearly twice the size of females, with a more varied and ornate plumage, while females are smaller and more cryptic (Figure 2-2).



Figure 2-2. Male Greater sage-grouse in Typical Display with Inflated Gular Sacs (left) and Smaller, Female Bird (right) at a Lekking Site

(Photo courtesy of Bill Schiess: <http://madisonbirds.blogspot.com/2011/03/greater-sage-grouse.html>)

Because this species of grouse lacks a functional gizzard, they are unable to grind and digest certain foods. Therefore, they forage for “softer food” and focus on insects and forbs in the spring and summer and switch to nearly a 100% sagebrush-diet in the fall and winter. However, in the first 3 weeks after hatching, chicks cannot digest sagebrush, and forbs and various insects (beetles, grasshoppers, and ants, especially) make up the bulk of the juvenile diet (Natural Resources Conservation Service [NRCS] 2010).

The extent to which GRSG migrate between winter and breeding grounds is highly variable both within and among populations, but average movements from winter to summer areas range from 4.3 to 18.0 mi (7-29 km) (Connelly et al. 1988; Fischer et al. 1993). Both winter and breeding habitats are dominated by sagebrush species. However, some populations winter and nest in a common area then move to higher elevations during the summer, while other populations winter, nest, and summer all in different areas (Schroeder et al. 1999). The timing and routes of bird movement can be driven by plant phenology (Fischer et al. 1996a), gender, and weather (Connelly et al. 1988). While GRSG can travel large distances in a relatively short time period (1 bird moved 15.5 mi [25 km] in <6 days), most GRSG locomotion is done by walking and most migratory movements are slow (i.e., <0.6 mi/day [<1 km/day]) (Connelly et al. 1988).

Once winter departs and/or snow recedes, male GRSG gather in areas called leks. A lek is a place where males traditionally gather to conduct a communal, competitive courtship display. The males use their specialized plumage and vocalizations to attract females for mating. This involves the elaborate gulping of up to a gallon of air in the male’s esophageal pouch, and once the bird squeezes it out, he begins his strutting display to attract a female for mating (Schroeder et al. 1999). Displays consist of posturing, strutting, and ritualistic combat with other males—leks are typically noisy places (Ryser 1985).

Leks are often located in openings or clearings of sagebrush or in areas where the sagebrush is low and scattered, so females can best evaluate the condition of prospective mates. Occasionally, other denuded areas such as grassy swales, natural and irrigated meadows, burned areas, cultivated fields adjacent to

sagebrush-grass rangelands, and cleared roadsides will also support leks. However, these areas must be in the vicinity of quality sagebrush for females to disperse to for nesting once inseminated (Klebenow 1973). Males commonly roost overnight near the lek and before sunrise will move to the lek to display. This continues for a couple of hours following sunrise, roughly from March through May (NRCS 2010).

The same males attend lekking grounds year after year and these leks can be active for decades. The quality, proximity, configuration, and abundance of sagebrush are key factors influencing lek selection and location. Leks are indicative of nesting habitat, underlying the close relationship with and importance of sagebrush habitats (NRCS 2010).

3.0 METHODOLOGY

Because GRSG display in open, sometimes denuded areas surrounded by short sagebrush steppe, the documentation of leks is relatively easy by ground or by air. Due to the size of the project area, ManTech opted to survey for potential lek sites by helicopter.

3.1 Suitable Habitat and Survey Selection

Per the statement of work and subsequent discussions with Naval Facilities Engineering Command, Southwest, ManTech was to survey up to approximately 12,000 ac (4,826 ha) of potential GRSG habitat as delineated in BLM Habitat Management Areas (HMAs) (Figure 3-1) (BLM 2019). These HMAs were derived from the intersection of habitat suitability categories and lek space use. Habitat suitability categories were derived from a composite, continuous surface of sage-grouse habitat suitability index (HSI) values for Nevada and northeastern California formed from the multiplicative product of the spring, summer, and winter HSI surfaces (BLM 2019). ManTech initially used the HMAs to provide a guide to plan the aerial survey effort. In the event that the HMAs were not helpful for identifying suitable lek habitat, ManTech would quickly shift efforts to identifying habitats adjacent to and within sagebrush containing open areas for potential leks within the proposed FRTC expansion areas. The identification of suitable habitat was assisted by other on-going ground surveys (e.g., vegetation mapping).

Although leks have not been documented within the proposed FRTC expansion areas (Appendix A; NDOW 2017), anecdotal observations have documented GRSG populations and leks in the vicinity of the proposed FRTC expansion areas (DoN 2014).

3.2 Helicopter Surveys

The aerial GRSG lek surveys adapted the methodology outlined in Connelly et al. (2003). Potential lek habitat was surveyed by either a Schweitzer 333 or Hughes 500 helicopter over the course of 5 days in 2017 and 4 days in 2019; 0.5 hour before sunrise to 1.5 hours after sunrise. Due to snow conditions in early April 2017, helicopter surveys were conducted following snow retreat and corresponded to suspected peak male attendance for northern Nevada. Suspected breeding habitat was mostly flown using north-south transects with lines about 0.5 mile apart except in cases of safety such as avoiding obstacles and staying within the proposed FRTC expansion areas. Transects were flown approximately 300-450 ft (90-137 m) above ground level (AGL) and at an approximate speed of 40 mi per hour (65 km per hour) to provide identification of GRSG and leks, while allowing the helicopter time to leave the area without disturbing potential leks and flushing birds. Due to restricted airspace, the helicopter did not transit or conduct aerial surveys greater than 500 ft (152 m) AGL. Special attention was paid to areas with access to water and other relatively open sites largely surrounded by sagebrush with 15-25% canopy cover.

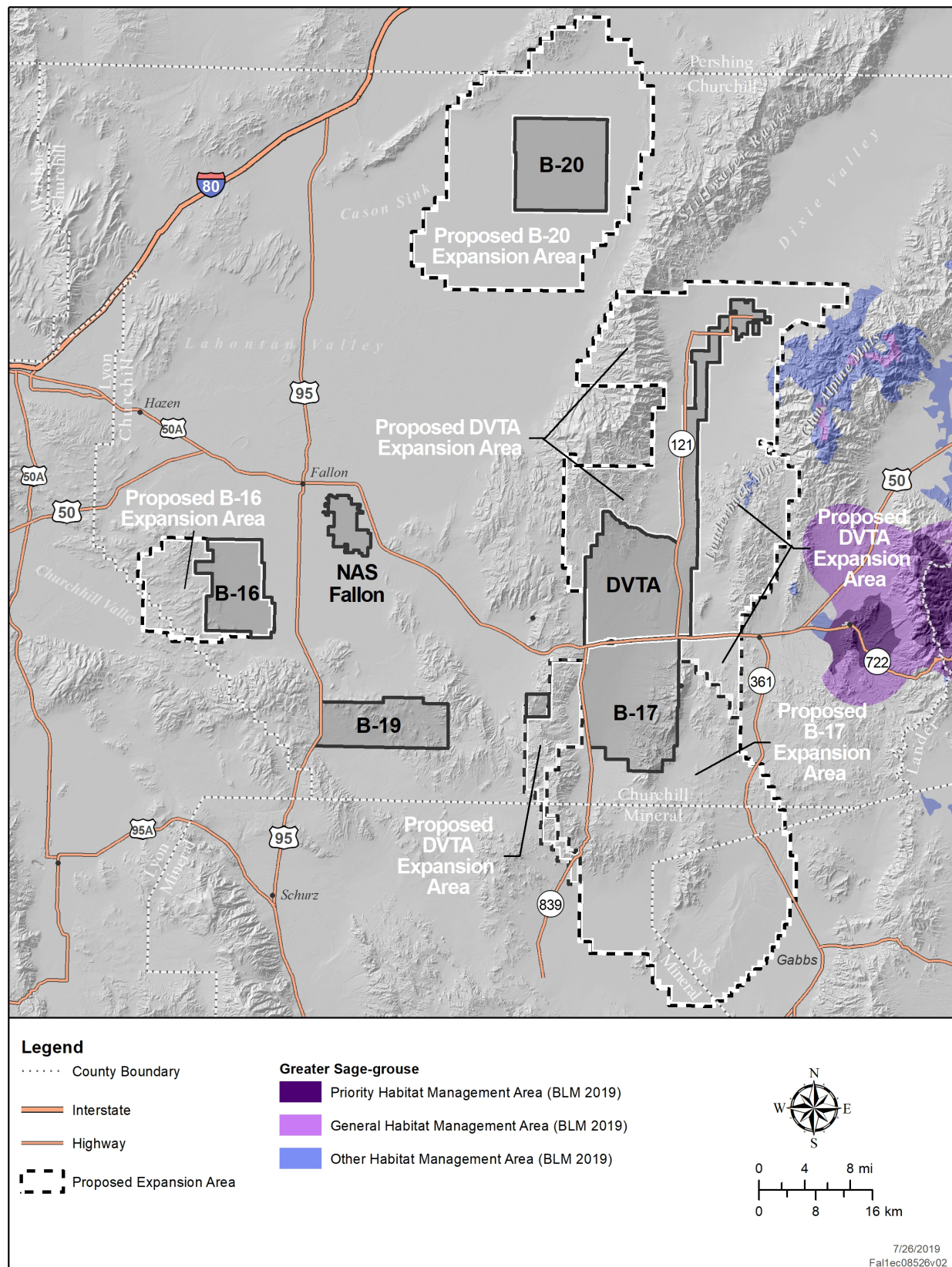


Figure 3-1. Greater Sage-grouse Habitat Management Areas within the Vicinity of Proposed FRTC Expansion Areas

Surveys were conducted only during periods of partly cloudy to clear skies with excellent visibility, and light to no wind. Data to be collected included: global positioning system (GPS) location and photos of individual GRSG and leks, number of individuals, sex, associated habitat, time, temperature, and elevation.

4.0 RESULTS AND DISCUSSION

As stated in Section 3 (Methodology), ManTech compared the habitat suitability model to on-the-ground field observations during the first day of aerial surveys. It was determined rather quickly that the habitat suitability model was not helpful for identifying suitable lek habitat. Therefore, during the initial helicopter reconnaissance of the survey area, ManTech identified habitats adjacent to and within sagebrush containing open areas for potential leks and conducted transects over these areas.

During the 5-day survey effort in 2017, 10 transects totaling 246 mi (396 km) and 52,228 ac (21,136 ha) were flown. During the 4-day survey effort in 2019, 4 transects totaling 261 mi (421 km) and 44,184 ac (17,881 ha) were flown (Table 4-1, Figures 4-1 and 4-2). No GRSG leks or individuals were detected during the aerial survey efforts. Additionally, concurrent aerial vegetation mapping surveys conducted April 13-21, 2017 and April 22-23, 2019 did not observe any GRSG. These results provide further evidence that there were no active GRSG leks within the proposed FRTC expansion areas during the 2017 and 2019 survey periods.

Table 4-1. Summary of 2017 and 2019 Greater Sage-grouse Survey Transects: Dates, Transect Lengths, Survey Times, Meteorological Conditions, and Personnel

Date	Transect	Transect Length (mi)	Sunrise	Start Time	End Time	Avg. Wind Speed (mph)	% Cloud Cover	Temp. (°F)	Survey Personnel
2017									
Apr 14	1	22	0549	0516	0710	1.7	0	35.0	K. Olthof M. Ball
	2	12				3	0	46.0	
Apr 16	3	36	0546	0518	0715	4	15	50.0	K. Olthof M. Ball
	4	53				4	10	51.8	
Apr 17	5	23	0544	0515	0715	5.8	10	51.8	K. Olthof M. Ball
	6	9				5.8	15	59.0	
Apr 19	7	12	0541	0513	0712	9.2	0	37.4	K. Olthof M. Ball
	8	11				9.2	0	39.2	
	9	23				2.9	0	41.0	
Apr 21	10	45	0538	0510	0710	4.6	0	39.2	K. Olthof M. Ball
2019									
Apr 24	1	94	0606	0536	0736	0	10	65	E. Rose M. Ball
Apr 25	2	73	0605	0535	0735	4.6	0	59	K. Olthof M. Ball
Apr 26	3	40	0603	0533	0733	0	5	60	K. Olthof M. Ball
Apr 27	4	54	0602	0532	0732	5.8	0	50	K. Olthof M. Ball

Notes: °F = degrees Fahrenheit; mph = miles per hour.

However, various upland bird species were observed on each transect, the most numerous being the chukar (*Alectoris chukar*)¹. Chukar are a pale colored, boldly patterned bird with a striking red bill and red legs contrasting strongly with their pale gray upperparts. Most birds were observed in breeding pairs. At altitudes below 350 ft (105 m), chukar would flush displaying rapid, deep wing-beats and black bars on pale flanks.

GRSG, on the other hand, are nearly double the size of chukar and display a chocolate-brown belly-band, a broad wingspan, and a long-pointed tail. When flushed, due to their large size, GRSG have slow wing-beats relative to chukar. A potential lek would contain many birds in relatively open spaces, therefore the surveyors have high confidence that no leks or birds were missed on the 14 transects.

Aerial survey transects were conducted in a variety of habitats but mostly sagebrush vegetation types. In 2017, transects 2, 3, and 10, and portions of 4, 5, 7, 8, and 9 were flown in nearly uniform sagebrush-type habitats (Figures 4-1 and 4-2). Transects 1 and 6, and portions of Transect 4, were flown in greasewood-type habitats at the foot of sagebrush uplands in the foothills of the Clan Alpine Mountains. These transects were characterized by large open areas adjacent to sagebrush within greasewood (*Sarcobatus baileyi*) at the base of upland sagebrush-scrub habitats (Figure 4-3). It was thought that due to the presence of large open areas, these areas could support leks. Transects 8, 9, and 10 were characterized by Wyoming big sagebrush interspersed with cheatgrass (Figure 4-4). Due to the uniformity of sagebrush and high cheatgrass incursion, these areas do not appear suitable for lekking. The best potential lekking locations appeared to be Transects 3 and 4 due to sagebrush density, the proximity to water, and lack of perches for aerial predators (Figures 4-5 and 4-6). However, chukar appeared especially well established in these areas.

In 2019, transects 1 and 2 predominantly fell within Bailey's Greasewood Shrubland. Transect 3 fell mostly in Wyoming Big Sagebrush Dry Steppe & Shrubland and Basin Big Sagebrush – Foothill Big Sagebrush Dry Steppe & Shrubland with small areas of Singleleaf Pinyon – Utah Juniper/Shrub Understory Woodland. Transect 3 was by far the best habitat available with its proximity to water and an abundance of *Artemisia* shrubs. However, there are few openings within the shrubland and this area also appears to have good, aerial predator perching with golden eagles (*Aquila chrysaetos*) common throughout the area. Transect 3 is also in the vicinity in which transient birds and scat were detected in 2017. Transect 4 occurred in the foothills of the Stillwater Mountains in Wyoming Big Sagebrush – Dry Steppe & Shrubland.

¹Non-target avian species observed during aerial surveys: chukar, California quail (*Callipepla californica*), mountain quail (*Oreortyx pictus*), and mourning dove (*Zenaida macroura*).

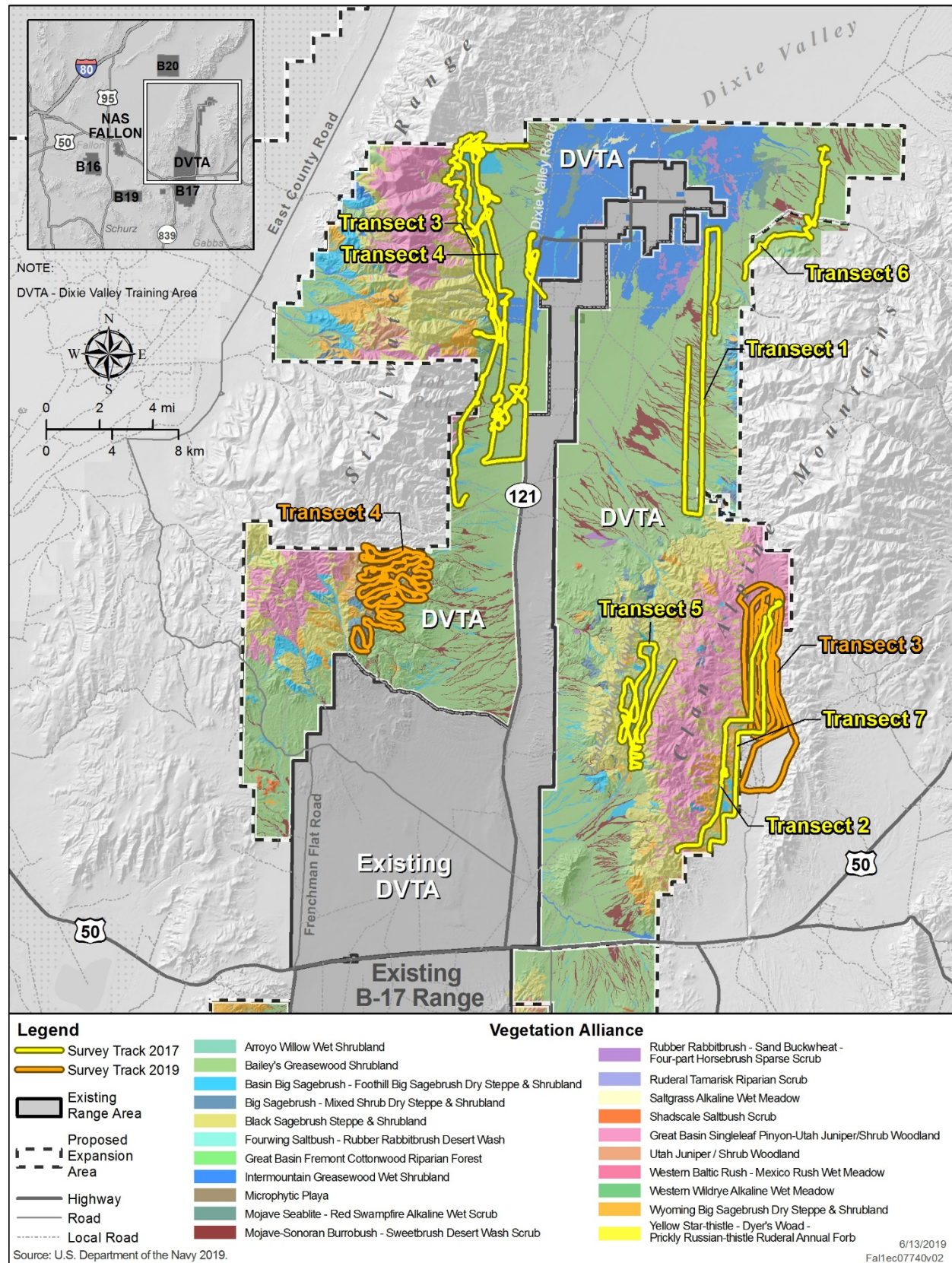


Figure 4-1. Greater Sage-grouse Aerial Survey Transects within the Proposed DVTA Expansion Area

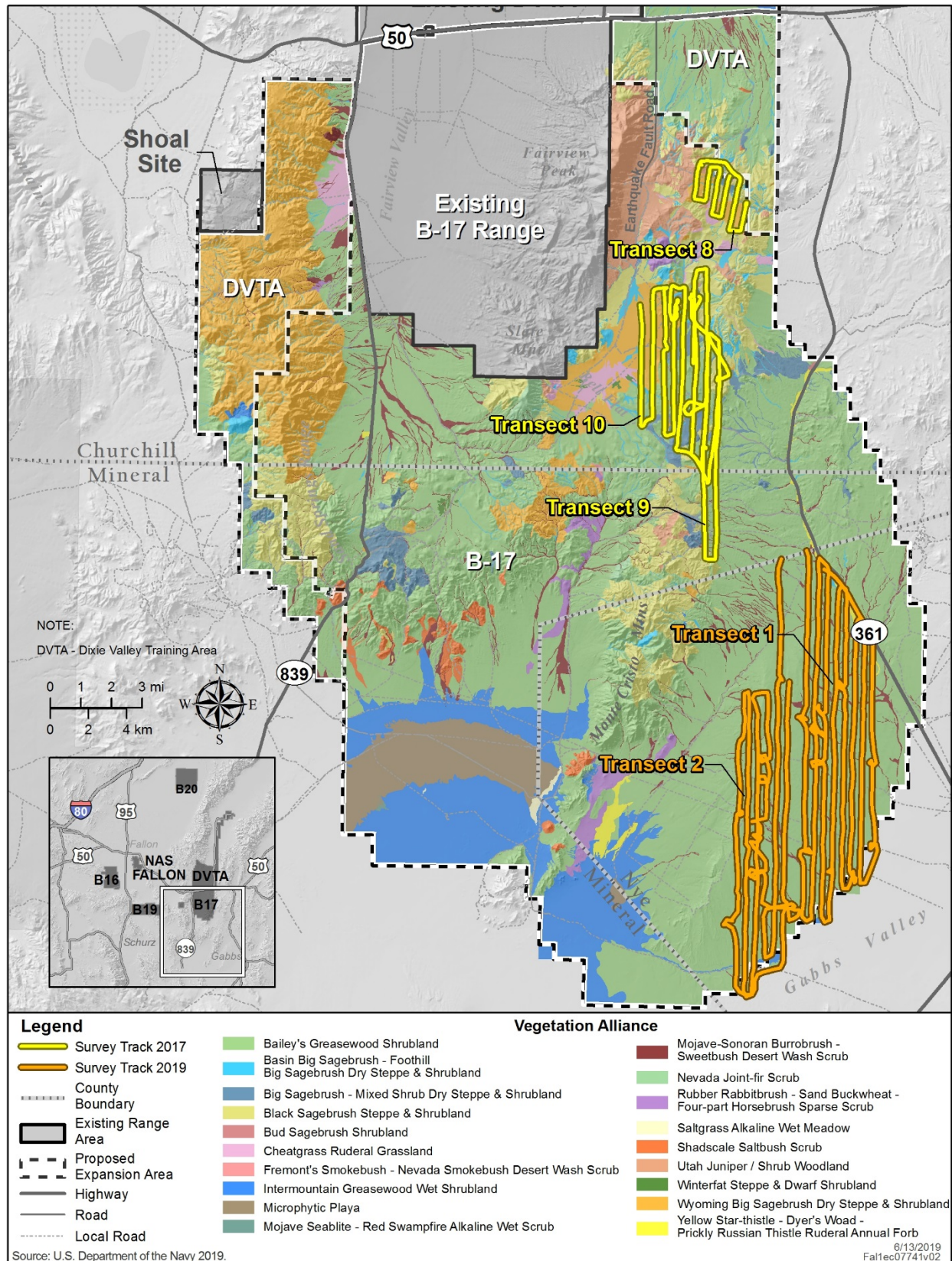


Figure 4-2. Greater Sage-grouse Aerial Survey Transects within the Proposed B-17 and Southern DVTa Expansion Areas



Figure 4-3. 2017 Transects 1 and 6 and 2019 Transects 1 and 2 were Characterized by Greasewood Habitats Adjacent to Sagebrush



Figure 4-4. 2017 Transects 8, 9, and 10 and 2019 Transect 3 were Characterized by Wyoming Big Sagebrush Interspersed with Cheatgrass

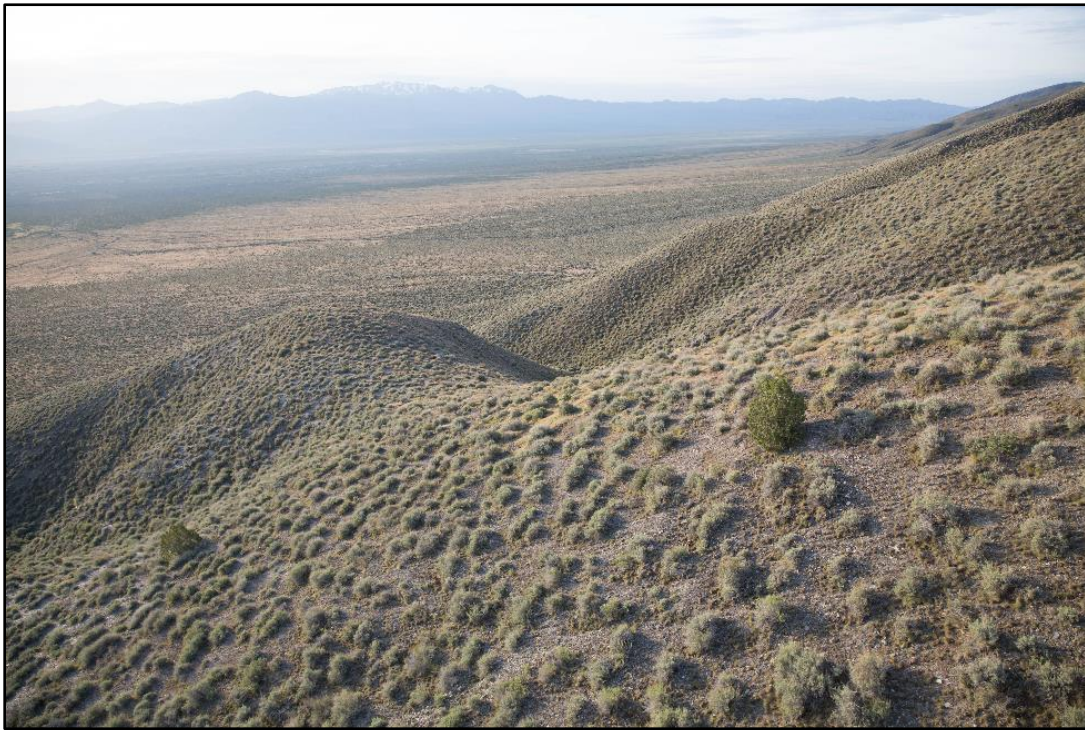


Figure 4-5. 2017 Transects 3 and 4 above the Foothills of the Stillwater Mountains
(Note: looking southeast above Transects 3 and 4.)



Figure 4-6. 2017 Transects 3 and 4 were Characterized by Sagebrush with Relatively Little Open Areas Suitable for Leks

Although GRSG were not encountered during aerial surveys, three individuals were observed on different occasions (in January and April 2017, and April 2019), and a GRSG scat was also found in April 2017 (Table 4-2; Figures 4-7 and 4-8). These incidental observations were made by ManTech personnel during field activities in support of other surveys.

Table 4-2. Incidental Observations of Greater Sage-grouse and Greater Sage-grouse Scat

Date	Observation Type*	Number of Individuals	Observer
Jan 27, 2017	Flushed bird – outside expansion area	1	C. Porterfield
Apr 4, 2017	Flushed bird – outside expansion area	1	
Apr 11, 2017	Scat	Not applicable	
Apr 26, 2019	Flushed bird (male) –western boundary of proposed DVTA Expansion Area	1	E. Howe, E. Rose

Note: *See Figure 4-8 for locations.



Figure 4-7. Old Winter Scat from a Greater Sage Grouse within the Proposed DVTA Expansion Area

Grouse feeding activity and seasonality is easily determined by the shape, color, and consistency of the scat. A single dropping indicates that GRSG are on the move as they forage. Winter scat is generally shaped like a Cheeto™ and consists of exclusively sagebrush leaves (NRCS 2010). Based on these parameters, the scat discovered on April 11, 2017 appeared to be fairly old and of a single bird on the move during winter months (Figure 4-7). GRSG are known to disperse miles away from lekking and nesting sites and many, if not most, populations of GRSG are migratory. For migratory populations, GRSG may use an area of (3,100 km²) (Fischer et al. 1996b) or more than (6,600 km²) (Tack et al. 2011) on an annual basis. Winter ranges may exceed 150 mi² (400 km²) (Leonard et al. 2000).

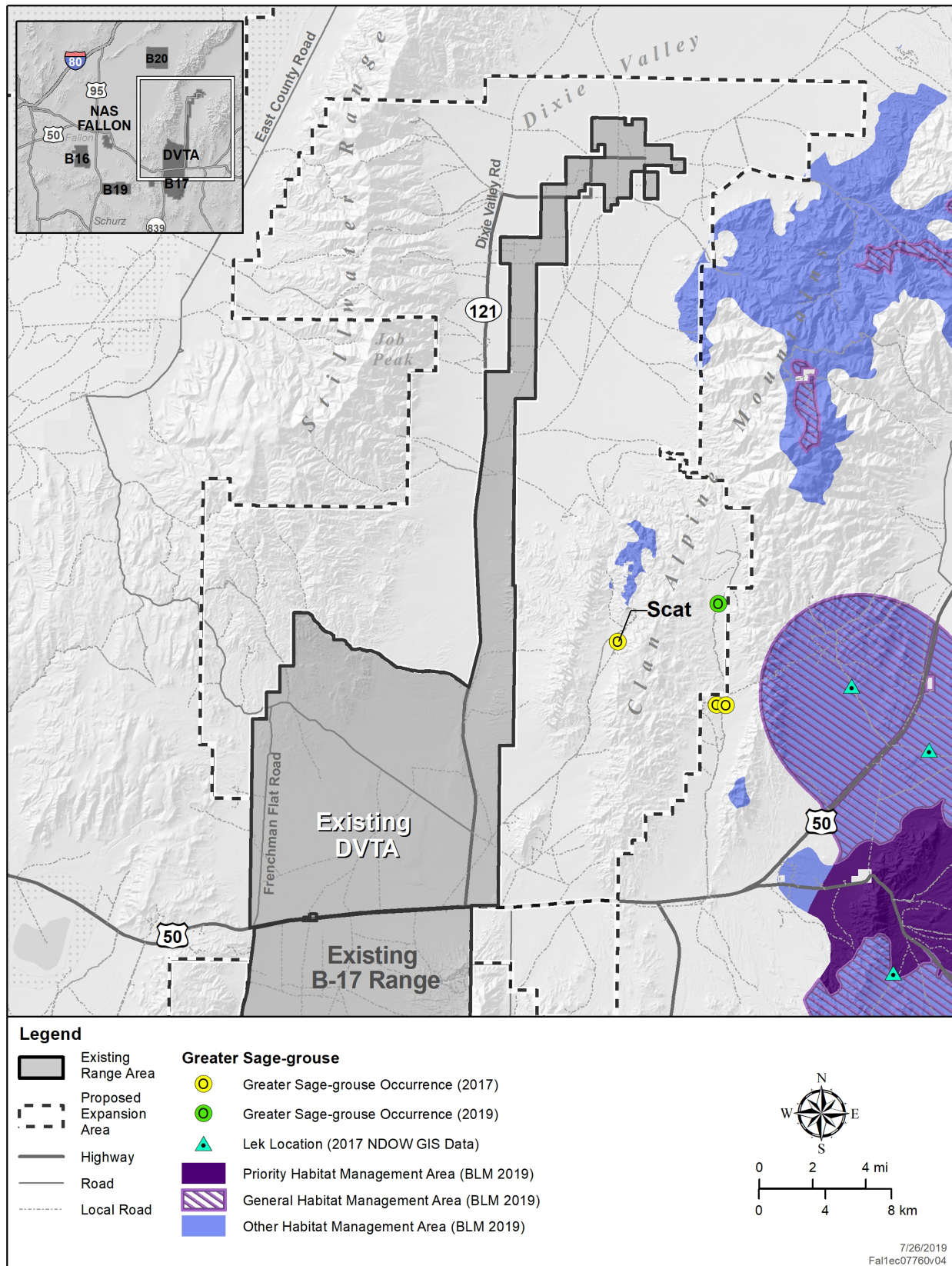


Figure 4-8. Greater Sage-grouse Habitat Management Areas, Historical Lek Locations, and Incidental Observations of Greater Sage-grouse and Scat during 2017 and 2019 Field Surveys

Although no GRSG leks were identified within the proposed FRTC expansion areas during this survey, the incidental GRSG observations and the presence of GRSG scat indicates that birds are present during portions of the year. Without evidence of a nearby lek, this suggests that these birds are using the proposed FRTC expansion area for wintering, or they are young, dispersing birds, that have not yet joined a lek. The presence of the single bird in April, the middle of the lekking season, suggests that birds are breeding in the region and that an active lek exists either outside the proposed FRTC expansion area or in portions that were not surveyed during this effort. In fact, based on lek data received from NDOW in 2017, three leks have been documented 5-10 mi (8-16 km) east of the proposed DVTA expansion area. In addition, BLM has identified areas to the east of the DVTA expansion area as GRSG management areas (BLM 2018) (Figure 4-8).

Overall, GRSG need intact landscapes of healthy, native sagebrush for their survival. Threats from invasive species such as cheatgrass, anthropogenic effects and noise, fire, and habitat conversion limit these birds' movement pathways—necessary for migration and gene flow. Grouse use pathways through intact habitats and rest and refuel at stopover sites during annual migrations. Though no lekking sites have been found to date within the proposed FRTC expansion areas, GRSG may be utilizing the area during migration or as a stop-over site, underscoring the need for the conservation of sagebrush habitats.

While GRSG population management has been approached through hunting legislation, predator control, food and water provision, and translocation, most management actions within the species range have been directed toward habitat maintenance and improvement. In general, maintaining and improving habitat for the species is most effective within 1.9 mi (3 km) of a lek, as most nests occur within that distance (Wallestad and Pyrah 1974). Habitat maintenance and improvement strategies include altering grazing pressures, using controlled burns, excluding invasive grasses, and reducing habitat loss (Braun et al. 1977). While it is possible that recent increases in common raven and other sage-grouse predator populations throughout the west have been putting pressure on GRSG within the region, predator removals have not been shown to be an effective long-term strategy for improving or maintaining GRSG populations (Sage-Grouse Conservation Partnership 2015; Conover and Roberts 2017).

5.0 REFERENCES

- BLM. 2017. Updated Bureau of Land Management (BLM) Sensitive Species List for Nevada. Instruction Memorandum No. NV-IM-2018-003. Nevada State Office, Reno, NV. November 22.
- BLM. 2019. 2019 Nevada and Northeastern California Greater Sage-Grouse Record of Decision and Approved Resource Management Plan Amendment. Nevada State Office, Reno. March.
<https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage¤tPageId=153090>. (GIS data: <https://navigator.blm.gov/data?keyword=2019%20armpa>). Accessed July 17.
- Braun, C.E., T. Britt, and R.O. Wallestad. 1977. Guidelines for maintenance of sage grouse habitats. *Wildlife Society Bulletin* 5: 99-106.
- Connelly, J.W., H.W. Browsers, and R.J. Gates. 1988. Seasonal movements of sage grouse in southeastern Idaho. *Journal of Wildlife Management* 52: 116-122.
- Connelly, J.W., K.P. Reese, and M.A. Schroeder. 2003. Monitoring of Greater Sage-grouse Habitats and Populations. Station Bulletin 80. College of Natural Resources Experiment Station, College of Natural Resources, University of Idaho, Moscow, ID. October.
- Conover, M.R. and A.J. Roberts. 2017. Predators, predator removal, and sage-grouse: A review. *Journal of Wildlife Management* 81: 7-15.

- DoN. 2014. Final Integrated Natural Resources Management Plan Naval Air Station Fallon, Fallon, Nevada. Prepared for Public Works Department, Environmental Division, NAS Fallon, NV. July.
- DoN. 2019. Draft Plant Community Surveys and Mapping Report in Support of the Proposed Fallon Range Training Complex Expansion, Nevada. Prepared for NAVFAC Southwest, San Diego, CA by ManTech International Corporation, Lompoc, CA and Solana Beach, CA. June.
- Fischer, R.A., A.D. Apa, W.L. Wakkinen, K.P. Reese, and J.W. Connelly. 1993. Nesting-area fidelity of sage grouse in southeastern Idaho. *Condor* 95: 1038-1041.
- Fischer, R.A., K. P. Reese, and J.W. Connelly. 1996a. Influence of vegetal moisture content and nest fate on timing of female Sage Grouse migration. *Condor*: 868-872.
- Fischer, R.A., K.P. Reese, and J.W. Connelly. 1996b. An investigation on fire effects within xeric sage-grouse habitat. *Journal of Range Management* 49: 194-198.
- Klebenow, D.A. 1973. The habitat requirements of sage grouse and the role of fire in management. Pages 305–315 *in* Proceedings, Annual Tall Timbers Fire Ecology Conference, Volume 12. Tall Timbers Research Station, Tallahassee, FL.
- Knick, S.T., D.S. Dobkin, J.T. Rotenberry, M.A. Schroeder, W.M. Vander Haegen, and C. Van Riper, III. 2003. Teetering on the edge or too late? Conservation and research issues for avifauna of sagebrush habitats. *Condor* 105: 611-634.
- Leonard, K.M., K.P. Reese, and J.W. Connelly. 2000. Distribution, movements, and habitats of sage grouse *Centrocercus urophasianus* on the Upper Snake River Plain of Idaho: changes from the 1950s to the 1990s. *Wildlife Biology* 6: 265-270.
- MacMahon, J. 1985. Deserts. Audubon Society Nature Guides. Alfred Knopf, Inc., New York, NY.
- NDOW. 2011. Greater Sage Grouse Habitat Categorization Map. Available at: https://www.fws.gov/nevada/nv_species/documents/sage_grouse/392012-Maps/Printable_Greater_Sage-Grouse_Habitat_Categorization_Map.pdf.
- NDOW. 2017. Known or Potential Occurrence of Wildlife Resources in the Vicinity of the Fallon NAS Withdrawal Located in Churchill, Lyon, Mineral, Nye, and Pershing Counties, Nevada. Personal communication via letter from B. Weller, GIS Specialist/Biologist III, NDOW, Reno, NV to K. Olthof, Project Lead/Wildlife Biologist, ManTech SRS Technologies, Inc., Lompoc, CA. January 4.
- Nevada Bureau of Mines and Geology. 2012. Great Basin Outline: GIS Data. Available at <http://www.nbmng.unr.edu/geothermal/Data.html>. Accessed February 26, 2018.
- Nevada Wildlife Action Plan Team. 2013. Nevada Wildlife Action Plan. Developed by the Wildlife Action Plan Team, Reno, NV. Submitted September 6, 2012, approved March 1, 2013.
- NNHP. 2018. Species Information: *Centrocercus urophasianus*. http://heritage.nv.gov/taxon_detail/19897. Accessed January 10.
- NRCS. 2010. Great Sage-Grouse Field Indicator Guide. Brochure produced in cooperation with the Bureau of Land Management; Montana Grazing Lands Conservation Initiative; Montana Fish, Wildlife and Parks; and Sage Grouse Working Groups. May.

- Peterson, E.B. 2008. A Synthesis of Vegetation Maps for Nevada (Initiating a 'Living' Vegetation Map). Nevada Natural Heritage Program, Department of Conservation and Natural Resources, Carson City, NV. March 12.
- Ryser, F.A., Jr. 1985. Birds of the Great Basin: A Natural History. University of Nevada Press, Reno.
- Sage-Grouse Conservation Partnership. 2015. The Oregon Sage-Grouse Action Plan. Governor's Natural Resources Office. Salem, OR.
- Schroeder, M.A., J.R. Young, and C.E. Braun. 1999. Greater Sage-Grouse (*Centrocercus urophasianus*), version 2.0. In The Birds of North America (P.G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, NY.
- Sowell, J. 2001. Desert Ecology: An Introduction to Life in the Arid Southwest. University of Utah Press, Salt Lake City.
- Tack, J.D., D.E. Naugle, J.C. Carlson, and P.J. Fargey. 2011. Greater sage-grouse *Centrocercus urophasianus* migration links the USA and Canada: a biological basis for international prairie conservation. *Oryx* 46: 64-68.
- USFWS. 2014. Why Care about America's Sagebrush? Region 6, Denver, CO. February.
- USFWS. 2015. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List Greater Sage-Grouse (*Centrocercus urophasianus*) as an Endangered or Threatened Species. Federal Register 80: 59858-59942.
- Wallestad, R.O. and D.B. Pyrah. 1974. Movement and nesting of sage grouse hens in central Montana. *Journal of Wildlife Management* 38: 630-633.
- Young, J.A. and F. Tipton. 1990. Invasion of cheatgrass into arid environments of the Lahontan Basin. Pages 37-40 in E.D. McArthur, E.M. Rummey, S.D. Smith, and P.T. Tueller, eds. Proceedings-Symposium on Cheatgrass Invasion, Shrub Dieoff, and Other Aspects of Shrub Biology and Management, Las Vegas, NV; April 5-7, 1989. USDA Forest Service General Technical Report INT-276. Intermountain Research Station, Ogden, UT. November.

APPENDIX A:
Letter from Nevada Department of Wildlife re: Potential Occurrence of Wildlife
Resources in Vicinity of Fallon NAS Withdrawal (January 4, 2017)

[This page intentionally left blank.]



BRIAN SANDOVAL
Governor

STATE OF NEVADA
DEPARTMENT OF WILDLIFE

6980 Sierra Center Parkway, Suite 120
Reno, Nevada 89511
(775) 688-1500 • Fax (775) 688-1495

TONY WASLEY
Director

ELIZABETH O'BRIEN
Deputy Director

JACK ROBB
Deputy Director

Katrina Olthof
Project Lead; Wildlife Biologist
ManTech SRS Technologies, Inc.
102 East Ocean Ave
Lompoc, California 93436

January 4, 2017

Re: Fallon NAS Withdrawal

Dear Katrina Olthof:

I am responding to your request for information from the Nevada Department of Wildlife (NDOW) on the known or potential occurrence of wildlife resources in the vicinity of the Fallon NAS Withdrawal located in Churchill, Lyon, Mineral, Nye, and Pershing Counties, Nevada. In order to fulfill your request an analysis was performed using the best available data from the NDOW's wildlife occurrences, raptor nest sites and ranges, greater sage-grouse leks and habitat, and big game distributions databases. No warranty is made by the NDOW as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data. These data should be considered **sensitive** and may contain information regarding the location of sensitive wildlife species or resources. All appropriate measures should be taken to ensure that the use of this data is strictly limited to serve the needs of the project described on your GIS Data Request Form. Abuse of this information has the potential to adversely affect the existing ecological status of Nevada's wildlife resources and could be cause for the denial of future data requests.

To adequately provide wildlife resource information in the vicinity of the proposed project the NDOW delineated an area of interest that included a four-mile buffer around the project area provided by you on Tuesday, January 03, 2017. Wildlife resource data was queried from the NDOW databases based on this area of interest. The results of this analysis are summarized below.

Big Game – Occupied bighorn sheep, mule deer, and pronghorn antelope distributions exist within portions of the project area and four-mile buffer area. No known occupied elk distribution exists in the vicinity of the project area. Please refer to the attached maps for details regarding big game distributions relative to the proposed project area.

Greater Sage-Grouse – Greater sage-grouse habitat in the vicinity of the project area has primarily been classified as Other habitat by the Nevada Sagebrush Ecosystem Program (<http://sagebrusheco.nv.gov>). General habitat also exists in the vicinity of the project area. Please refer to the attached maps for details regarding greater sage-grouse habitat relative to the proposed project area. There are no known radio-marked greater sage-grouse tracking locations in the vicinity of the project area. There are no known greater sage-grouse lek sites in the vicinity of the project area.

Raptors – Various species of raptors, which use diverse habitat types, may reside in the vicinity of the project area. American kestrel, bald eagle, barn owl, burrowing owl, Cooper's hawk, ferruginous hawk, golden eagle, great horned owl, long-eared owl, merlin, northern goshawk, northern harrier, northern saw-whet owl, osprey, peregrine falcon, red-tailed hawk, rough-legged hawk, sharp-shinned hawk, short-eared owl, Swainson's hawk, turkey vulture, and western screech owl have distribution ranges that include the project area and four-mile buffer area. Furthermore, the following raptor species have been directly observed in the vicinity of the project area:

American kestrel	ferruginous hawk	prairie falcon
bald eagle	golden eagle	red-tailed hawk
burrowing owl	great horned owl	rough-legged hawk
California condor	osprey	short-eared owl
Cooper's hawk	peregrine falcon	turkey vulture

Raptor species are protected by State and Federal laws. In addition, bald eagle, burrowing owl, California spotted owl, ferruginous hawk, flammulated owl, golden eagle, northern goshawk, peregrine falcon, prairie falcon, and short-eared owl are NDOW species of special concern and are target species for conservation as outlined by the Nevada Wildlife Action Plan. Per the *Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance* (United States Fish and Wildlife Service 2010) we have queried our raptor nest database to include raptor nest sites within ten miles of the proposed project area. There are 162 known raptor nest sites within ten miles of the project area. Please refer to the appendix for details regarding these raptor nest sites.

Other Wildlife Resources

There are 18 big game and 79 small game water developments in the vicinity of the project area. Additional species have also been observed in the vicinity of the project area. Please refer to the appendix for details regarding these species.

The proposed project area may also be in the vicinity of abandoned mine workings, which often provide habitat for state and federally protected wildlife, especially bat species, many of which are protected under NAC 503.030. To request data regarding known abandoned mine workings in the vicinity of the project area please contact the Nevada Division of Minerals (<http://minerals.state.nv.us/>).

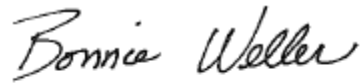
The above information is based on data stored at our Reno Headquarters Office, and does not necessarily incorporate the most up to date wildlife resource information collected in the field. Please contact the Habitat Division Supervising Biologists at our Southern Region Las Vegas Office (702.486.5127) and Western Region Reno Office (775.688.1500) to discuss the current environmental conditions for your project area and the interpretation of our analysis. Furthermore, it should be noted that the information detailed above is preliminary in nature and not necessarily an identification of every wildlife resource concern associated with the proposed project. Consultation with the Supervising Habitat biologist will facilitate the development of appropriate survey protocols and avoidance or mitigation measures that may be required to address potential impacts to wildlife resources.

Mark Freese - Western Region Supervising Habitat Biologist (775.688.1145) Brad Hardenbrook - Southern Region Supervising Habitat Biologist (ext. 3600)

Federally listed Threatened and Endangered species are also under the jurisdiction of the United States Fish and Wildlife Service. Please contact them for more information regarding these species.

If you have any questions regarding the results or methodology of this analysis please do not hesitate to contact our GIS office at (775) 688-1439.

Sincerely,

A handwritten signature in black ink that reads "Bonnie Ueller". The script is cursive and fluid, with the first name "Bonnie" and last name "Ueller" clearly distinguishable.

GIS Specialist/Biologist III
Nevada Department of Wildlife
GIS Section
(775) 688-1439
bweller@ndow.org

Appendix A: Raptor Nest Sites Table

Probable Use	Last Check	Last Active	Township/Range/Section
Burrowing Owl	4/29/1987		21 0170N 0340E 018
Buteo	3/31/1975		21 0260N 0310E 015
Buteo	5/18/1975		21 0260N 0310E 010
Buteo	4/27/1982	4/27/1982	21 0200N 0360E 015
Buteo	6/16/1982	6/16/1982	21 0170N 0280E 035
Buteo	1/1/1986	1/1/1986	21 0170N 0290E 007
Buteo	3/1/1986		21 0170N 0290E 008
Buteo	5/2/1986		21 0200N 0300E 011
Buteo	5/2/1986		21 0200N 0300E 011
Buteo	7/1/1986	7/1/1986	21 0210N 0300E 031
Buteo	7/1/1986		21 0210N 0300E 030
Buteo	7/1/1986		21 0210N 0300E 031
Buteo	5/7/1987		21 0180N 0280E 023
Buteo	5/14/1987		21 0180N 0280E 024
Buteo	5/18/1987		21 0180N 0280E 011
Buteo	6/12/1987		21 0250N 0310E 002
Buteo	6/12/1987		21 0250N 0310E 004
Buteo	6/12/1987		21 0250N 0310E 004
Buteo	6/12/1987		21 0260N 0310E 010
Buteo	6/12/1987		21 0260N 0310E 014
Buteo	6/12/1987		21 0260N 0310E 015
Buteo	6/12/1987		21 0260N 0310E 015
Buteo	6/12/1987		21 0260N 0310E 029
Buteo	6/7/2007	6/7/2007	21 0140N 0340E 034
Buteo	5/23/2014		
Buteo	5/23/2014		
Buteo	5/23/2014		
Buteo	5/23/2014		
Buteo	5/23/2014		
Buteo	5/23/2014		
Buteo	5/24/2014	5/24/2014	
Buteo	5/24/2014	5/24/2014	
Buteo	5/24/2014		
Buteo	6/26/2014	6/26/2014	
Buteo	7/14/2014	7/14/2014	
Buteo/Corvid	5/23/2014	5/23/2014	
Buteo/Corvid	5/23/2014	5/23/2014	
Buteo/Corvid	5/23/2014	5/23/2014	
Buteo/Corvid	5/23/2014	5/23/2014	
Buteo/Corvid	5/23/2014	5/23/2014	
Buteo/Corvid	5/23/2014	5/23/2014	
Buteo/Corvid	5/23/2014	5/23/2014	
Buteo/Corvid	5/23/2014		
Buteo/Corvid	5/23/2014		

Buteo/Corvid	5/23/2014		
Buteo/Corvid	5/23/2014		
Buteo/Corvid	5/23/2014		
Buteo/Corvid	5/23/2014		
Buteo/Corvid	5/23/2014		
Buteo/Corvid	5/23/2014		
Buteo/Corvid	5/23/2014		
Buteo/Corvid	5/23/2014		
Buteo/Corvid	5/24/2014	5/24/2014	
Buteo/Corvid	5/24/2014	5/24/2014	
Buteo/Corvid	5/24/2014	5/24/2014	
Buteo/Corvid	5/24/2014	5/24/2014	
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Buteo/Corvid	5/24/2014		
Corvid	5/23/2014		
Corvid	5/23/2014		
Corvid	5/23/2014		
Corvid	5/24/2014		
Corvid	5/24/2014		
Corvid	5/24/2014		
Eagle	4/15/1975		21 0240N 0300E 013
Eagle	4/15/1975		21 0240N 0310E 008
Eagle	4/15/1975		21 0250N 0310E 013
Eagle	4/15/1975		21 0250N 0310E 027
Eagle	4/22/1975	4/22/1975	21 0230N 0290E 003
Eagle	5/15/1975	5/15/1975	21 0190N 0320E 033

Eagle	5/15/1975		21 0210N 0330E 016
Eagle	1/1/1976		21 0100N 0330E 001
Eagle	1/1/1976		21 0160N 0290E 001
Eagle	1/1/1977		21 0230N 0340E 011
Eagle	1/1/1977		21 0230N 0340E 019
Eagle	1/1/1977		21 0240N 0350E 009
Eagle	3/24/1977	3/24/1977	21 0160N 0280E 023
Eagle	5/15/1986	3/13/1986	21 0210N 0300E 030
Eagle	5/21/1987		21 0170N 0360E 025
Eagle	6/7/2007	6/7/2007	21 0130N 0340E 023
Eagle	6/7/2007	6/7/2007	21 0140N 0350E 023
Eagle	6/7/2007	6/7/2007	21 0140N 0360E 017
Eagle	6/7/2007	6/7/2007	21 0160N 0350E 036
Eagle	6/26/2013	6/26/2013	21 0180N 0340E 003
Eagle	5/23/2014	5/23/2014	
Eagle	5/24/2014	5/24/2014	
Eagle	5/24/2014	5/24/2014	
Eagle	5/24/2014		
Eagle	5/24/2014		
Eagle			21 0130N 0340E 011
Eagle			21 0160N 0290E 016
Eagle/Buteo	5/23/2014		
Eagle/Buteo	5/23/2014		
Eagle/Buteo	5/23/2014		
Eagle/Buteo	5/23/2014		
Eagle/Buteo	5/23/2014		
Eagle/Buteo	5/23/2014		
Eagle/Buteo	5/23/2014		
Eagle/Buteo	5/24/2014		
Eagle/Buteo	5/24/2014		
Eagle/Buteo	5/24/2014		
Eagle/Buteo	5/24/2014		
Falcon - Confirmed	1/1/1979	1/1/1979	21 0260N 0300E 027
Falcon - Confirmed	5/24/1979	5/24/1979	21 0180N 0260E 021
Falcon - Confirmed	6/1/1981	6/1/1981	21 0240N 0300E 022
Falcon - Confirmed	4/26/1983	4/26/1983	21 0240N 0310E 006
Falcon - Confirmed	7/8/2013	7/8/2013	21 0190N 0340E 027
Falcon - Confirmed	5/24/2014	5/24/2014	
Falcon - Confirmed	5/24/2014	5/24/2014	
Falcon - Confirmed	5/24/2014	5/24/2014	
Falcon - Confirmed	5/24/2014	5/24/2014	
Falcon - Confirmed	5/24/2014	5/24/2014	
Falcon - Probable	4/1/1974	4/1/1974	21 0160N 0280E 015
Falcon - Probable	5/6/1974		21 0170N 0360E 024
Falcon - Probable	1/1/1975	1/1/1975	21 0250N 0310E 022
Falcon - Probable	4/9/1976	4/9/1976	21 0160N 0290E 003
Falcon - Probable	3/24/1977	3/24/1977	21 0230N 0300E 005
Falcon - Probable	4/13/1981	4/13/1981	21 0250N 0310E 031

Falcon - Probable	4/27/1982	4/27/1982	21 0190N 0360E 009
Falcon - Probable	4/26/1983	4/26/1983	21 0240N 0300E 023
Falcon - Probable	6/22/2007		21 0180N 0260E 034
Ferruginous Hawk	4/15/1975	4/15/1975	21 0250N 0310E 010
Ferruginous Hawk	5/23/1981	5/23/1981	21 0230N 0290E 013
Ferruginous Hawk	4/28/1983	4/28/1983	21 0260N 0330E 003
Ferruginous Hawk	1/1/2005	1/1/2005	21 0260N 0300E 024
Ferruginous Hawk	1/1/2007	1/1/2007	21 0250N 0290E 012
Ferruginous Hawk	1/1/2007	1/1/2007	21 0260N 0330E 002
Ferruginous Hawk	1/1/2007		21 0250N 0320E 030
Ferruginous Hawk	1/1/2007		21 0260N 0300E 031
Ferruginous Hawk	1/1/2007		21 0270N 0320E 032
Ferruginous Hawk	1/16/2007	1/16/2007	21 0240N 0310E 022
Ferruginous Hawk	5/23/2014		
Ferruginous Hawk	5/23/2014		
Northern Goshawk	4/27/1982	4/27/1982	21 0200N 0360E 032
Owl	4/9/1976	4/9/1976	21 0160N 0290E 003
Owl	1/6/1987	1/6/1987	21 0170N 0290E 008
Owl	6/12/1987		21 0250N 0310E 010
Owl	6/12/1987		21 0260N 0310E 010
Turkey Vulture	6/7/2007	6/7/2007	21 0150N 0360E 033

Appendix B: Other Wildlife Species Table

Common Name	ESA	State	SWAP SoCP
American avocet		Protected	Yes
American coot			
Arizona myotis			
bass (unknown)			
bat (unknown)			
black-crowned night-heron		Protected	
black-necked stilt		Protected	
blue-headed vireo		Protected	
bluegill			
bobcat		Furbearer	
Brazilian (Mexican) free-tailed bat		Protected	Yes
brook trout			
bullfrog			
bullsnake			
bushtit		Protected	
California myotis			
California toad			Yes
canyon deer mouse			
chisel-toothed kangaroo rat			
coachwhip			
common carp			
common kingsnake			
common loon		Protected	Yes
common nighthawk		Protected	Yes
common sagebrush lizard			
common side-blotched lizard			
coyote		Unprotected	
crestless column			
desert banded gecko			Yes
desert horned lizard			Yes
desert kangaroo rat			Yes
desert spiny lizard			
desert striped whipsnake			
desert woodrat			
Dixie Valley tui chub			Yes
double-crested cormorant		Protected	
eared grebe		Protected	
golden-crowned kinglet		Protected	
gophersnake			
gray fox		Furbearer	
Great Basin collared lizard			Yes
Great Basin fence lizard			
Great Basin gophersnake			
Great Basin pocket mouse			
Great Basin rattlesnake			

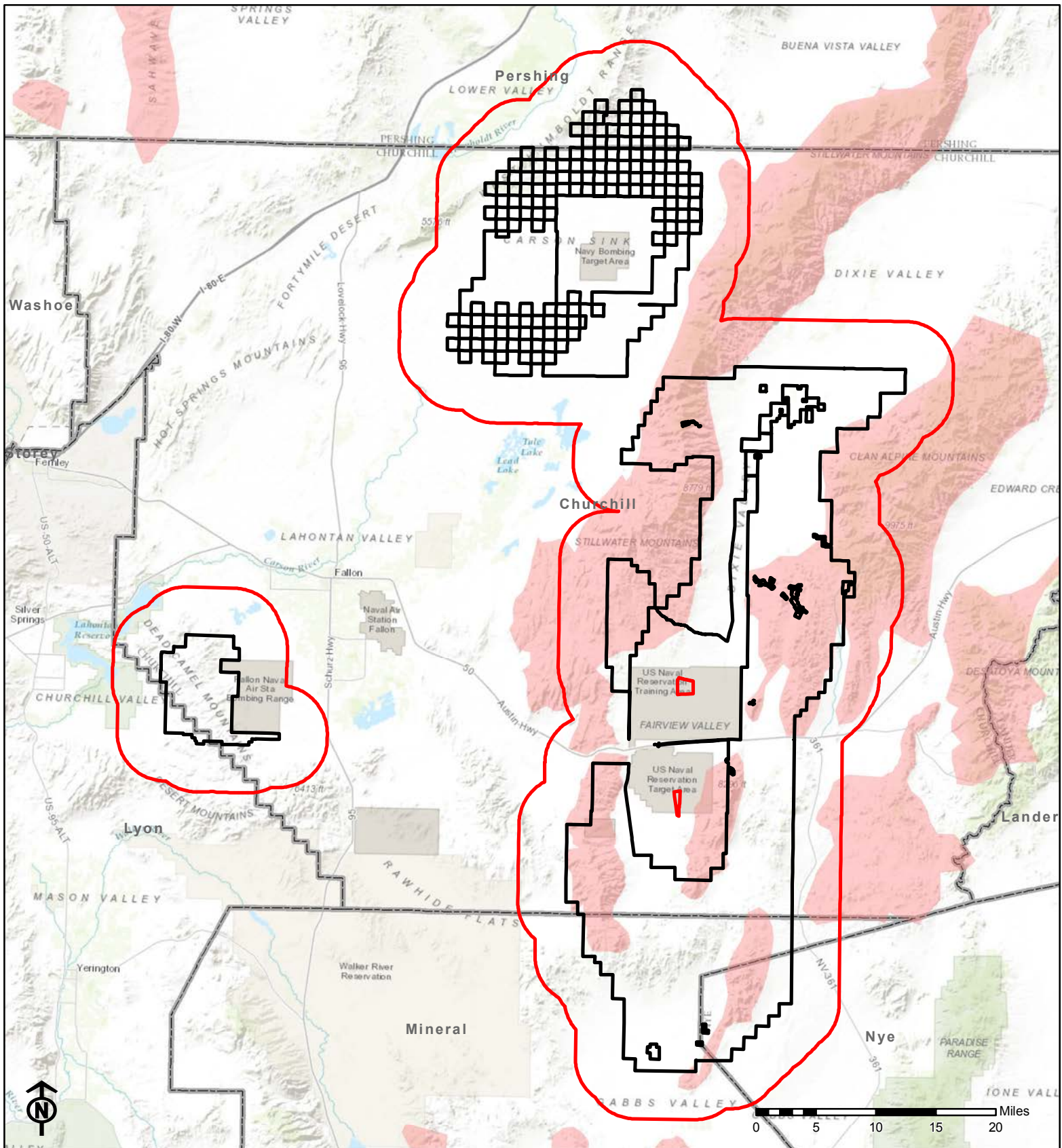
Great Basin spadefoot		Yes
Great Basin whiptail		
greater roadrunner	Protected	
greater short-horned lizard		Yes
green sunfish		
horned lark	Protected	
house mouse		
juniper titmouse	Protected	
kit fox	Furbearer	
little pocket mouse		
long-billed curlew		Yes
long-eared myotis		Yes
long-legged myotis		
long-nosed leopard lizard		Yes
long-nosed snake		
long-tailed pocket mouse		
Mediterranean gecko		
Merriam's kangaroo rat		
Mojave patch-nosed snake		
mountain lion		
mountain quail		Yes
myotis (unknown)		
Nevada side-blotched lizard		
North American deer mouse		
northern desert horned lizard		Yes
northern desert nightsnake		
northern sagebrush lizard		
northern Steptoe pyrg		Yes
Ord's kangaroo rat		
pale kangaroo mouse	Protected	Yes
pallid bat	Protected	
Panamint kangaroo rat		
physa (unknown)		
pinyon deer mouse		
Railroad Valley tui chub	Sensitive	Yes
red racer		
rufous hummingbird	Protected	Yes
sage sparrow	Protected	Yes
Say's phoebe	Protected	
scud (freshwater shrimp)		
Sierra gartersnake		
silky vallyonia		
snowy egret	Protected	
southern grasshopper mouse		
spotted towhee	Protected	
striped whipsnake		
tiger whiptail		
Townsend's big-eared bat	Sensitive	Yes




tree swallow	Protected	
variable groundsnake		
varied thrush	Protected	
western banded gecko		Yes
western fence lizard		
western glass-snail		
western harvest mouse		
western long-tailed brush lizard		Yes
western mosquitofish		
western patch-nosed snake		
western pipistrelle		
western rattlesnake		
western small-footed myotis		Yes
western toad		Yes
whimbrel		
white-faced ibis	Protected	Yes
white-tailed antelope squirrel		
white-winged dove		
whooping crane	Protected	
yellow-backed spiny lizard		
Yuma myotis		
zebra-tailed lizard		

ESA: Endangered Species Act Status

State: State of Nevada Special Status

SWAP SoCP: Nevada State Wildlife Action Plan (2012) Species of Conservation Priority



-  Project Area
-  Four Mile Buffer Area Boundary
-  Bighorn Sheep Distribution

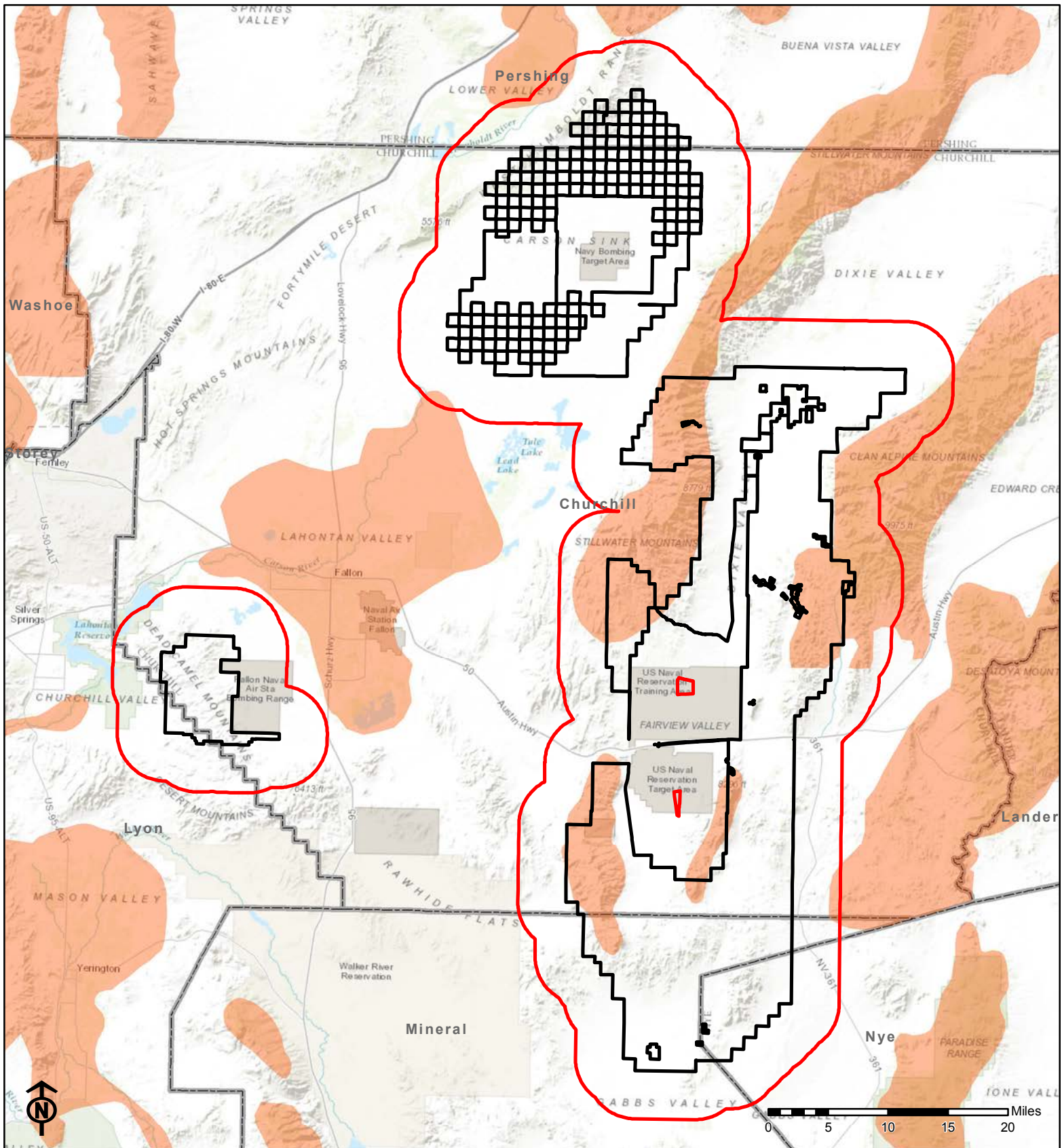
Fallon NAS Withdrawal Bighorn Sheep Distribution




January 04, 2017

Projection: UTM Zone 11 North, NAD83

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data.





-  Project Area
-  Four Mile Buffer Area Boundary
-  Mule Deer Distribution

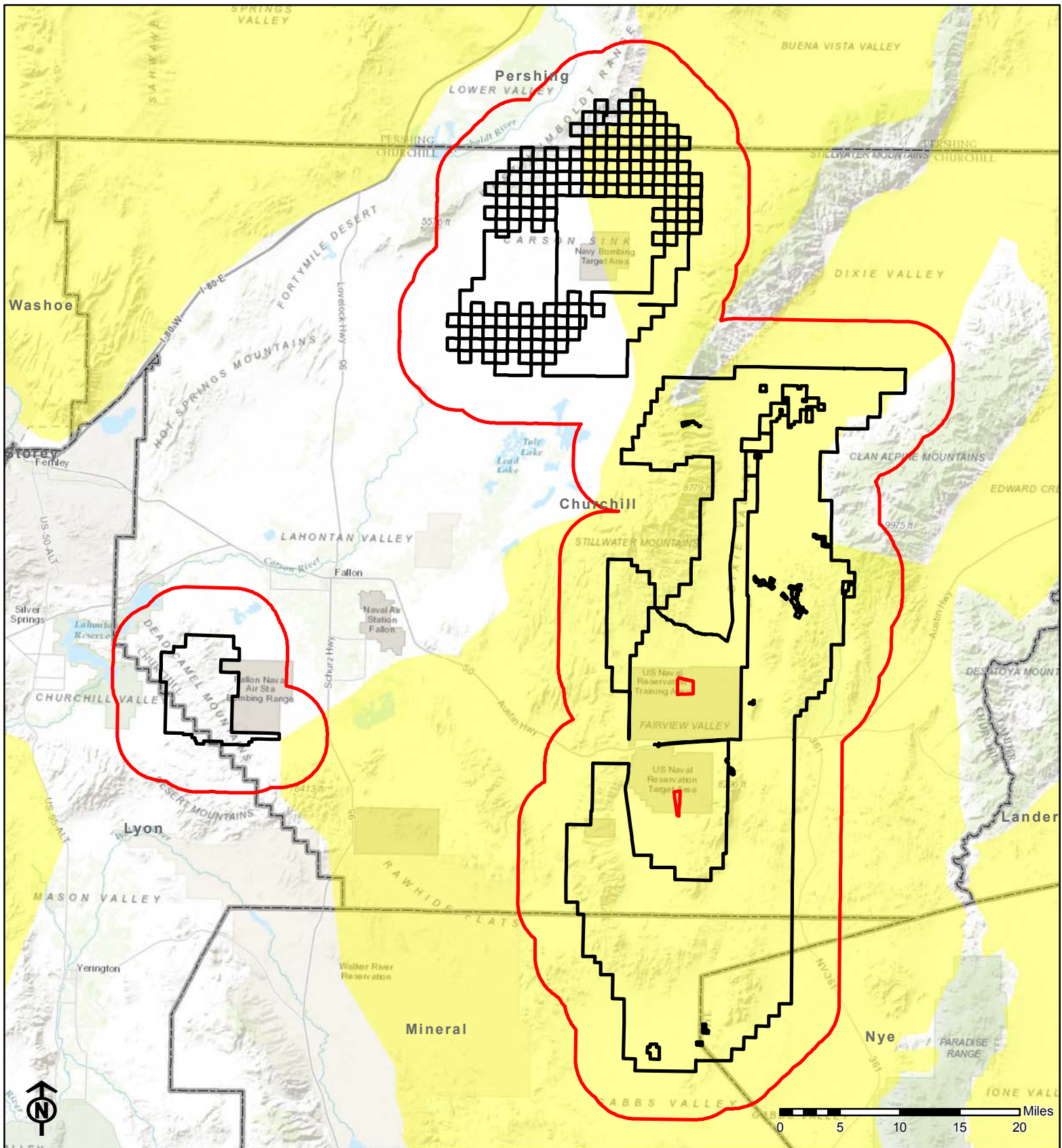
Fallon NAS Withdrawal Mule Deer Distribution




January 04, 2017

Projection: UTM Zone 11 North, NAD83

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data.





-  Project Area
-  Four Mile Buffer Area Boundary
-  Pronghorn Antelope Distribution

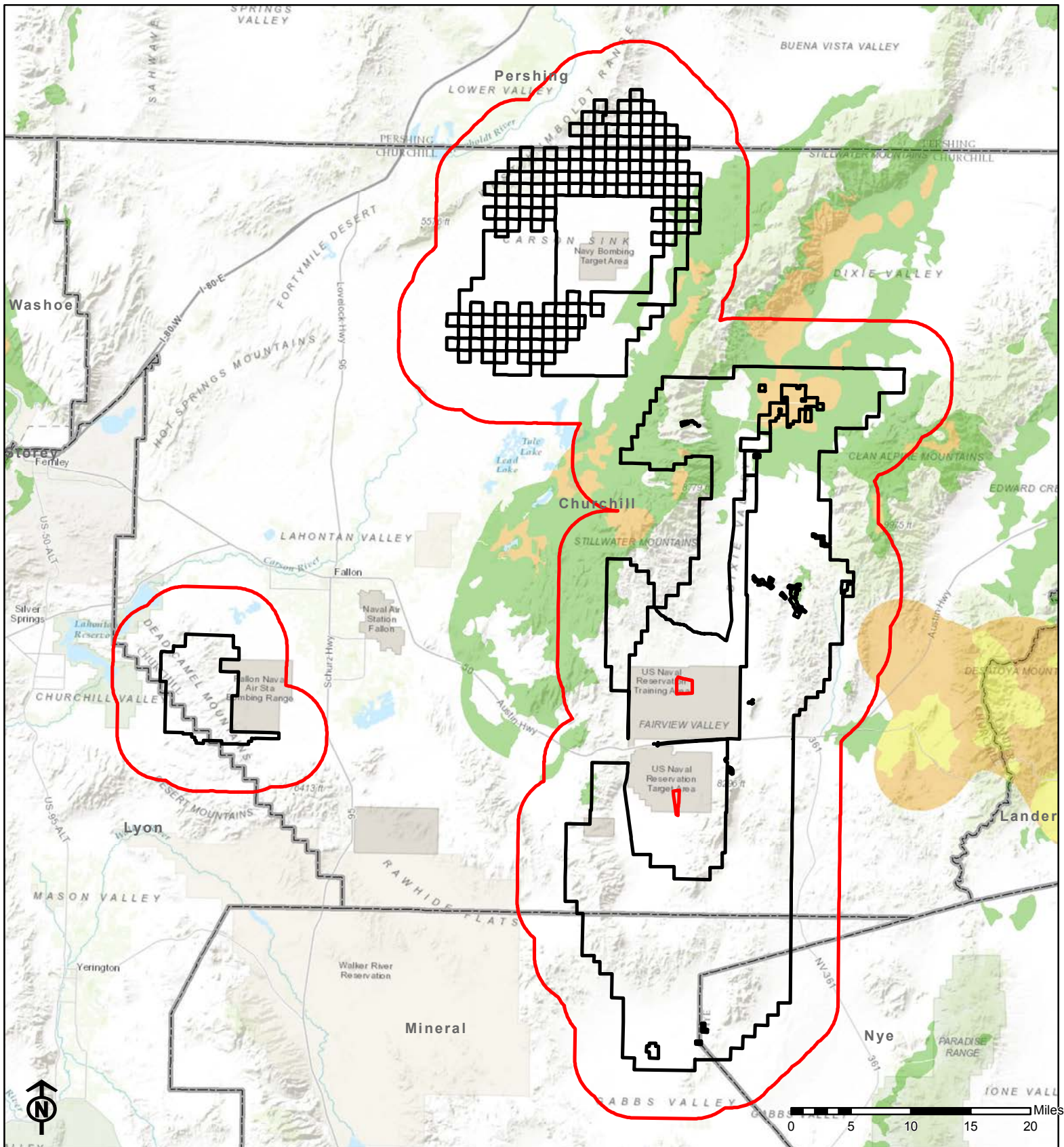
Fallon NAS Withdrawal Pronghorn Antelope Distribution

January 04, 2017

Projection: UTM Zone 11 North, NAD83

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data.





- Project Area
- Four Mile Buffer Area Boundary

Management

- Priority Habitat
- General Habitat
- Other Habitat

Fallon NAS Withdrawal Greater Sage-Grouse Habitat

January 04, 2017

Projection: UTM Zone 11 North, NAD83

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data.

