FRTC Modernization EIS

Supporting Study
Livestock Grazing Allotment Study

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Technical Memo

Livestock Grazing Allotment Study for Fallon Range Training Complex Modernization

Final

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TABLE OF CONTENTS

APPENDICES

ACRONYMS AND ABBREVIATIONS

AUM	Animal Unit Months	
B	Bravo	
BLM	Bureau of Land Management	
DoD	Department of Defense	
DVTA	Dixie Valley Training Area	
EIS	Environmental Impact Statement	
FRTC	Fallon Range Training Complex	
lb	pound(s)	
m	meters	
Navy	U. Department of the Navy	
NHD	National Hydrography Dataset	
RAS	Rangeland Administration System	
RIPS	range improvement points	
SMA	surface management agency	
U.S.	United States	

1 Introduction

The United States (U.S.) Department of Navy (Navy) is preparing a land withdrawal application and associated Environmental Impact Statement (EIS) for the proposed land withdrawal and airspace expansion at the Fallon Range Training Complex (FTRC). In addition to the No Action Alternative, the Navy's EIS is exploring the following three action alternatives:

Alternative 1: Modernization of the FRTC

Alternative 2: Managed Access

Alternative 3: Bravo (B) -17 Shift and Managed Access (Preferred Alternative)

All three of these alternatives would include closing off access to existing Bureau of Land Management (BLM) livestock grazing allotments. This memo summarizes the method that the Navy used to calculate the potential loss of animal unit months (AUMs) from each action alternative. Information provided herein will be summarized and incorporated into the EIS.

2 Method

The number of permitted or allowable livestock within an area is determined by how much forage the land can produce. AUM is defined as the amount of forage required to sustain one cow and her calf, one horse, or five sheep or goats for one month. Forage is defined as the "edible parts of plants, other than separate grain, that can provide feed for grazing animals or that can be harvested for feeding" (Natural Resources Conservation Service, 2003).

The BLM provided the Navy with guidance on how to estimate the potential change in AUMs to existing livestock grazing allotments. The Rangeland Administration System (RAS) is the BLM's system that provides publicly available information on grazing allotments and the Rangeland Improvement Project System (RIPS) is the active BLM internal repository of all physical projects that occur on BLM administered lands. RAS was used to collect data about each allotment and RIPS was utilized to identify water sources. Rangeland production data was sourced from BLM which utilizes the Soil Survey Geographic Database (SSURGO) developed by the National Cooperative Soil Survey (Natural Resources Conservation Service, 2017). The Navy then verified and updated this information with the support of the BLM Stillwater Field Office and the Humboldt Field Office. Acres were calculated from ArcGIS data provided by the BLM (UTMz11 NAD 83 projection).

The BLM identified the following restrictions for estimating a change in AUMs, which were used to provide a range of AUMs lost per allotment:

1) Percent of allotment closed from livestock grazing
2) Percent of allotment with a greater than 30 percent slope
3) Percent of allotment that is greater than four miles from water
4) Percent of allotment with an annual forage production per acre of less than 100 pounds
5) Percent of allotment with an annual forage production per acre between 100 pounds and 300 pounds
6) Percent of allotment with an annual forage production per acre greater than 300 pounds

A restrictive analysis was then performed using the following five scenarios:

1. No Restrictions Scenario

a. Description: The loss of AUMs is directly related to the loss of acres of land.

b. Example: Allotment A is a 100-acre allotment with 100 AUMs. 20 acres of this allotment would be closed. The loss of AUMs would be 20 AUMs under this scenario.

2. Less than 30 Percent Slope Scenario

a. Description: This scenario assumes that livestock only graze on land with a less than 30 percent slope. The loss of AUMs is directly related to the loss of those acres of land with a less than 30 percent slope.
b. Example: Allotment B is a 100-acre allotment with 100 AUMs. 50 acres of this allotment has a slope of less than 30 percent. All of these 50 acres would be closed. The loss of AUMs would be 100 AUMs under this scenario.

3. Less than 30 Percent Slope and Less than 4 Miles from Water Scenario

a. Description: This scenario assumes that livestock only graze on land with less than 30 percent slope and within four miles from water. The loss of AUMs is directly related to the loss of land with these characteristics.
b. Example: Allotment C is a 100-acres allotment with 100 AUMs. 50 acres of this allotment has slope of less than 30 percent and are less than four miles from water. 25 acres of these 50 acres would be closed. The loss of AUMs would be 50 AUMs under this scenario.

4. Less than 30 Percent Slope, Less than 4 Miles from Water, and Greater than 100 lb/acre of Forage per Year Scenario

a. Description: This scenario assumes that livestock only graze on land with less than 30 percent slope, and are within four miles from water, and produce greater than 100 lb/acres of forge per year. The loss of AUMs is directly related to the loss of lands with these characteristics.
b. Example: Allotment D is a 100-acres allotment with 100 AUMs. 40 acres of this allotment has slope of less than 30 percent and are less than four miles from water and have over 100 lb/acre per year of forage production. 10 acres of the 40 acres would be closed. The loss of AUMs would be 25 AUMs.

5. ***Less than 30 Percent Slope, Less than 4 Miles from Water, and Greater than 300 lb/acre of Forage per Year Scenario***

a. Description: This scenario assumes that livestock only graze on land with less than 30 percent slope, and are within four miles from water, and produce greater than 300 lb/acres of forge per year. The loss of AUMs is directly related to the loss of these lands.
b. Example: Allotment E is a 100-acres allotment with 100 AUMs. 20 acres of this allotment has slope of less than 30 percent and are less than four miles from water and have over 300 lb/acre per year of forage production. None of these 20 acres would be closed. The loss of AUMs would be 0 AUMs.

Each scenario was run to establish a range of potential AUMs lost per allotment for each of the Navy's action alternatives. Losses of AUMs were rounded up to the nearest whole number. The scenario that produced the lowest number of AUMs represented the lowest value of the range of AUMs (minimum) and the scenario that produced the highest number of AUMs represented the highest value (maximum). The result is a range of AUMs that could be lost from the implementation of each alternative.

2.1.1 Data Processing Steps and Data Sources

The following data pre-processing steps and data sources were used to calculate the loss of AUMs for each grazing allotments. The BLM provided these steps and sources, which have received minor edits for purposes of readability. Scenarios were run using these data sources on 1 February 2018.

1. Grazing Allotment Data
    a. Data source: T:\ReferenceState\NV\CorporateData\NV_EDT_USER.sde\ilmnvedt.ILMNVDBO.gra\ilmnvedt.ILMNVDBO.gra_allot_poly
    b. The grazing allotments were selected based on an intersection with the withdrawal area data. A feature layer was then created representing the project study area.
2. Surface management agency (SMA; BLM land ownership layer).
    a. Data source:[1] T:\NV\GIS_Work\CCDO\Project\Range\FNAS_AUM\FNAS_AUM.gdb\SMA_clip2exWithdrw
    b. The SMA data also has a definition query applied to it: 'ABBR' = 'BLM'
    c. The SMA data was clipped to project study area (a layer of allotments that intersect the withdrawal area).
3. Slope Data
    a. Data source: T:\ReferenceState\NV\RasterData\NED\NED.gdb\slope_per
    b. DEM has a cell size of 10 meters (m). The slope raster had already been created to show the raster values as percent slope. Data is projected to UTM Zone 11 NAD 1983 within the tool.
    c. Slope data is reclassified to show areas less than 30 percent and greater than 30 percent slope.
4. Range Production Data[2]
    a. Data source: T:\ReferenceState\NV\CorporateData\soils\Range Production (Normal Year) (weighted component).lyr
    b. Data is clipped to the project study area based on the Normal Production to Land Status. The relevant data field is called 'rsprod_r' – this is where the lb per acre information is pulled from. All null values are changed to -99 in order to be shown as "unknown" later in the analysis.
        i. The layer is then converted to a raster and reclassified to show less than or equal to 100 lb/acre per year, 100 – 300 lb/acre per year, and greater than 300 lb/acre per year.
5. Water Data

[1] This is a copy of the production SMA for BLM, with the Department of Defense (DoD) withdrawal data erased out using the Erase (Analysis) tool. The BLM SMA data had shown BLM owned areas overlapping the current DoD withdrawal areas. DoD data was treated as the authoritative source of the current DoD owned areas.

[2] "Total range production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation. In a normal year, growing conditions are about average. Yields are adjusted to a common percent of air-dry moisture content" (Natural Resources Conservation Service, 2017).

a. Data sources used are range improvement points (RIPS) data, 100K Perennial Streams data, 100K Perennial Springs data, National Hydrography Dataset (NHD) Point data, NHD Waterbody data, NHD Flowline data, and National Wetland Inventory wetlands data.
   Most of the water feature layers had a definition query applied to show only perennial sources of water. Each of the feature layers were selected by intersection against the project study area. Each feature layer was then buffered up to 4 miles, which means that an area was measured out 4 miles from the feature.
   The buffered water features then merged together into one water feature layer, which was then dissolved and a new field added to show that the feature layer represents water sources within 4 miles. This feature layer was then erased from the project study area, with the resulting feature layer representing the area greater than 4 miles from a water source on BLM land.
   Both water feature layers were then merged together and clipped to the project study area. The resulting layer was then converted to a raster file and projected to Zone 11 NAD 1983 and reclassified to show which values represent areas greater than 4 miles or less than 4 miles from a perennial water source.
b. RIPS:
   i. Data source: T:\ReferenceState\NV\CorporateData\NV_EDT_USER.sde\ilmnvedt.ILMNVDBO.RIPS\ilmnvedt.ILMNVDBO.RIPS_Points_all
   ii. Definition query: Proj_type = 1 AND (Proj_2type = 'pond' OR Proj_2type = 'reservoir' OR Proj_2type = 'spring' OR Proj_2type = 'spring/trough' OR Proj_2type = 'stock pond' OR Proj_2type = 'trough' OR Proj_2type = 'water drop')
c. 100K Perennial Streams:
   i. Data source: T:\ReferenceState\NV\CorporateData\hydrography\100K Perennial Stream.lyr
   ii. Definition query: none applied
d. 100K Perennial Springs:
   i. Data source: T:\ReferenceState\NV\CorporateData\hydrography\100k Springs.lyr
   ii. Definition query: none applied
e. NHD Points:
   i. Data source: T:\ReferenceState\NV\CorporateData\hydrography\NHD\NHD Point.lyr
   ii. Definition query: FType = 458 (spring/seep)
f. NHD Waterbodies:
   i. Data source: T:\ReferenceState\NV\CorporateData\hydrography\NHD\NHD Waterbody.lyr
   ii. Definition query: FCode = 39004 (Lake/Pond: Hydrographic Category = Perennial) OR FCode = 39009 (Lake/Pond: Hydrographic Category = Perennial; Stage = Average Water Elevation) OR FCode = 39010 (Lake/Pond: Hydrographic Category = Perennial; Stage = Normal Pool) OR FCode = 39011 (Lake/Pond: Hydrographic Category = Perennial; Stage = Date of Photography) OR FCode = 43621 (Reservoir: Reservoir Type = Water Storage; Hydrographic Category =

Perennial) OR FCode = 46602 (Swamp/Marsh: Hydrographic Category = Perennial)

g. NHD Flowlines:
    i. Data source: T:\ReferenceState\NV\CorporateData\hydrography\NHD\NHD Flowline.lyr
    ii. Definition query: FCode = 46006 (Stream/River: Hydrographic Category = Perennial)
h. NWI (wetlands) data:
    i. Data source: T:\ReferenceNational\inlandWaters\FWS_NWI\new\Download\NV_wetlands\NV_wetlands.gdb\NV_Wetlands
    ii. Definition query: ATTRIBUTE = 'L1UBH' OR ATTRIBUTE = 'L2ABF' OR ATTRIBUTE = 'PEM1F' OR ATTRIBUTE = 'PEM1Fh' OR ATTRIBUTE = 'PUBF' OR ATTRIBUTE = 'PUBH' OR ATTRIBUTE = 'PUBHx' OR ATTRIBUTE = 'R3UBH' OR ATTRIBUTE = 'R5UBFx' OR ATTRIBUTE = 'R5UBH'

3 Summary

All three of the Navy's alternatives include expanding B-16, B-17, and B-20. Expanding these ranges would close off access to thirteen livestock grazing allotments. Closing access to an allotment could require an adjustment of AUMs depending on the characteristics of the land being closed. The existing and proposed Dixie Valley Training Area (DVTA) would remain open for livestock grazing under all three alternatives. Therefore, for purposes of this analysis, there would be no change to the number of AUMs for those allotments within the proposed DVTA boundary under any of the Navy's alternatives.

The attached tables and figures show how the restrictions were applied in order to calculate a loss of AUMs for each alternative. The expansion of the Bravo ranges under Alternative 1 would be the same as that under Alternative 2. Using the restrictive analysis, it is estimated that implementing either Alternative 1 or Alternative 2 would result in a loss of between 7,896 and 10,459 AUMs.

Alternative 3 would have a similar land configuration as Alternatives 1 and 2. The primary difference is that B-17 would be shifted slightly farther south and east than Alternatives 1 and 2. Using the restrictive analysis described above, it is estimated that implementing Alternative 3 would result in a loss of between 6,952 and 11,003 AUMs.

4 References

Natural Resources Conservation Service. (2003). *National Range and Pasture Handbook*. Washington, DC: U.S. Department of Agriculture Retrieved from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=STELPRDB1043084.

Natural Resources Conservation Service. (2017). Web Soil Survey. Retrieved April 2017 https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Appendix A

Tables Estimating the Change in Animal Unit Months per Allotment

ALTERNATIVE 1			
Allotment Name	Total AUMs	Minimum AUMs Lost	Maximum AUMs Lost
Horse Mountain	3,000	67	137
Lahontan	1,155	456	619
Bell Flat	3,688	3,068	3,346
Eastgate	9,770	21	32
La Beau Flat	3,035	1,551	2,027
Philip Well	1,450	989	1,052
Pilot Table Mountain	7,900	36	317
Copper Kettle	2,333	857	1,165
Humboldt Sink	1,582	0	20
Scheckler Pasture	145	0	27
Rochester	3,963	312	674
White Cloud	1,884	539	1,043
TOTAL	39,905	7,896	10,459

ALTERNATIVE 3			
Allotment Name	Total AUMs	Minimum AUMs Lost	Maximum AUMs Lost
Horse Mountain	3,000	45	118
Lahontan	1,155	443	619
Bell Flat	3,688	1,986	2,667
Eastgate	9,770	1,517	1,777
La Beau Flat	3,035	547	640
Philip Well	1,450	548	1,371
Pilot Table Mountain	7,900	182	1,114
Copper Kettle	2,339	857	939
Humboldt Sink	1,582	0	19
Scheckler Pasture	145	0	27
Rochester	3,963	307	669
White Cloud	1,884	520	1,043
TOTAL	39,760	6,952	11,003

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