NEVADA TEST AND TRAINING RANGE (NTTR)

Land Withdrawal Application Packages/
Case File and Legislative EIS

ROADLESS AREAS ON THE NEVADA TEST AND TRAINING RANGE AND PROPOSED EXPANSION ALTERNATIVES

FINAL
August 2017

ROADLESS AREAS ON THE NEVADA TEST AND TRAINING RANGE AND PROPOSED EXPANSION ALTERNATIVES
Final Report

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Table of Contents

List of Figures

List of Tables

Abbreviations and Acronyms

99 CES/CEIEA	99th Civil Engineering Squadron/Installation Management Environmental Assessments Section
ACC	Air Combat Command
ACEC	Area of Critical Environmental Concern
AFI	Air Force Instruction
BLM	Bureau of Land Management
CAFB	Creech Air Force Base
CWA	Clean Water Act
DNWR	Desert National Wildlife Range
DOD	U.S. Department of Defense
DOI	U.S. Department of the Interior
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
GIS	Geographic Information Systems
GPS	Global Positioning System
INRMP	Integrated Natural Resources Management Plan
MSL	Mean Sea Level
NAFB	Nellis Air Force Base
NDCNR	Nevada Department of Conservation and natural Resources
NDF	Nevada Division of Forestry
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNRP	Nellis Natural Resources Program
NRCS	Natural Resources Conservation Service
NTTR	Nevada Test and Training Range. Also the new name for 98th Range Wing
NWAP	Nevada's Wildlife Action Plan
NWHR	Nevada Wild Horse Range
SAR	Small Arms Range
STATSGO2	U.S. General Soil Map
TNC	The Nature Conservancy
USACE	U.S. Army Corps of Engineers
USAF	United States Air Force
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Introduction

The U.S. Air Force (USAF) is in the process of extending the withdrawal of land for military operations and training on the Nevada Test and Training Range (NTTR). In addition to extending the current withdrawal, the USAF is evaluating several potential expansion alternatives. The current withdrawal will expire November 6, 2021, unless Congress enacts legislation to extend it. In accordance with Section 3016 of the Military Land Withdrawal Act (MLWA), the USAF, in coordination with the Department of Defense (DOD), has notified Congress of a continuing military need for the NTTR withdrawal. Furthermore, the USAF plans to submit a Legislative Environmental Impact Statement (LEIS) that supports a legislative withdrawal proposal which will be submitted through the Department of the Interior (DOI) to extend the withdrawal and provide recommendations for proposed expansion alternatives as analyzed in the LEIS.

The USAF is in the process of developing documentation required to support the Application Package, Case File, and legislative language to successfully accomplish the NTTR land withdrawal by November 2021. To maintain critical test and training capabilities at the NTTR, the USAF must complete all required studies in compliance with National Environmental Policy Act (NEPA), the *Engle Act*, *Federal Land Policy and Management Act*, the MLWA, and Land Withdrawals regulations set forth in Title 43 Code of Federal Regulations (CFR) Part 2300. The analysis and results of the roadless area study are required to comply with NEPA and Land Withdrawals regulations, support submittal of an application to the Bureau of Land Management (BLM), provision of a Case File to the DOI, and development of draft legislation for Congressional approval of the withdrawal in accordance with applicable rules and regulations.

The scope of this study is to identify roadless areas or roadless islands found on the NTTR or on the potential new expansion alternatives that have wilderness characteristics consistent with the provisions of the *Wilderness Act of 1964* (U.S. Congress, 1964). The land withdrawal renewal includes actions that present potential impacts to roadless areas that could be designated as wilderness. This report summarizes the delineation of roadless areas on the NTTR and potential expansion alternatives.

Description of the Study Area

The study area for this report includes the NTTR and potential expansion areas designated as Alternatives 3A, 3B, and 3C. The NTTR consists of 2,949,603 acres, in rural portions of Nye, Lincoln, and Clark Counties, Nevada (Figure 1). The potential expansion areas are shown in Figure 1 and consist of about 302,000 acres. These potential expansion areas are pre-decisional in nature from a National Environmental Policy Act (NEPA) perspective. Alternative 3A is 18,000 acres lying along the southwest boundary of the North Range of the NTTR. Alternative 3B is 57,000 acres located immediately south of the South Range of the NTTR. Alternative 3C is 227,000 acres immediately east of the South Range of NTTR in the Desert National Wildlife Refuge (DNWR). Geology varies from limestone/dolomite in the south to volcanic fields in the north. The South Range Study Area lies in the eastern Mojave Desert, and the North Range Study Area lies in the southern Great Basin (Figure 2).

Natural sources of water are scarce across most of the study area. Annual precipitation ranges from 3 to 5 inches in the basins to 16 inches in upper elevations of mountains. Vegetation composition is strongly influenced by the levels of precipitation. Most of the active springs are found in the North Range Study Area, especially in the Kawich, Belted, and Cactus mountain ranges and Stonewall Mountain. Only five springs are found in the South Range Study Area. Most water sources for wildlife in the South Range Study Area are provided by wildlife water developments, which collect water from storm events and store it in water tanks.

The South Range Study Area is typical of the Mojave Desert. Except for the higher elevations, most of the mountains are covered by scattered populations of various desert brush and cactus species. Typical physiography of the area consists of mountain ranges which drain into bajadas (collections of alluvial fans) which eventually drain into playas. Most of the state of Nevada drains internally to playas with the exception of some areas draining into the Colorado river, Amargosa River and Marys River. Playas tend to have little or no vegetation while bajadas are often dominated by creosote bush (*Larrea tridentata*) and bursage (*Ambrosia dumosa*) in the lower bajadas and blackbrush (*Coleogyne ramosissima*) and Joshua tree (*Yucca brevifolia*) in the upper bajadas. Mountain ranges support scattered populations of bitterbrush (*Purshia spp.*), matchweed (*Gutierrezia spp.)*, and shadscale (*Atriplex confertifolia*). At higher elevations, plant communities may be dominated by Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus monophylla*).

The North Range Study Area is typical of the southern portions of the Great Basin Desert. Again, the physiography of the area is comprised of mountains and closed basins similar to the South Range Study Area. However, rainfall is slightly higher in the North Range Study Area resulting in denser plant communities. Like the South Range Study Area, playas in the North Range Study Area contain little or no vegetation. From the boundaries of the playas to the base of mountains, plant communities are typically dominated by greasewood (*Sarcobatus spp.*) and shadscale (*Atriplex spp.*) in lower elevations and sagebrush (*Artemisia spp.*) in higher elevations. The upper elevations in the mountains are dominated by Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus monophylla*).

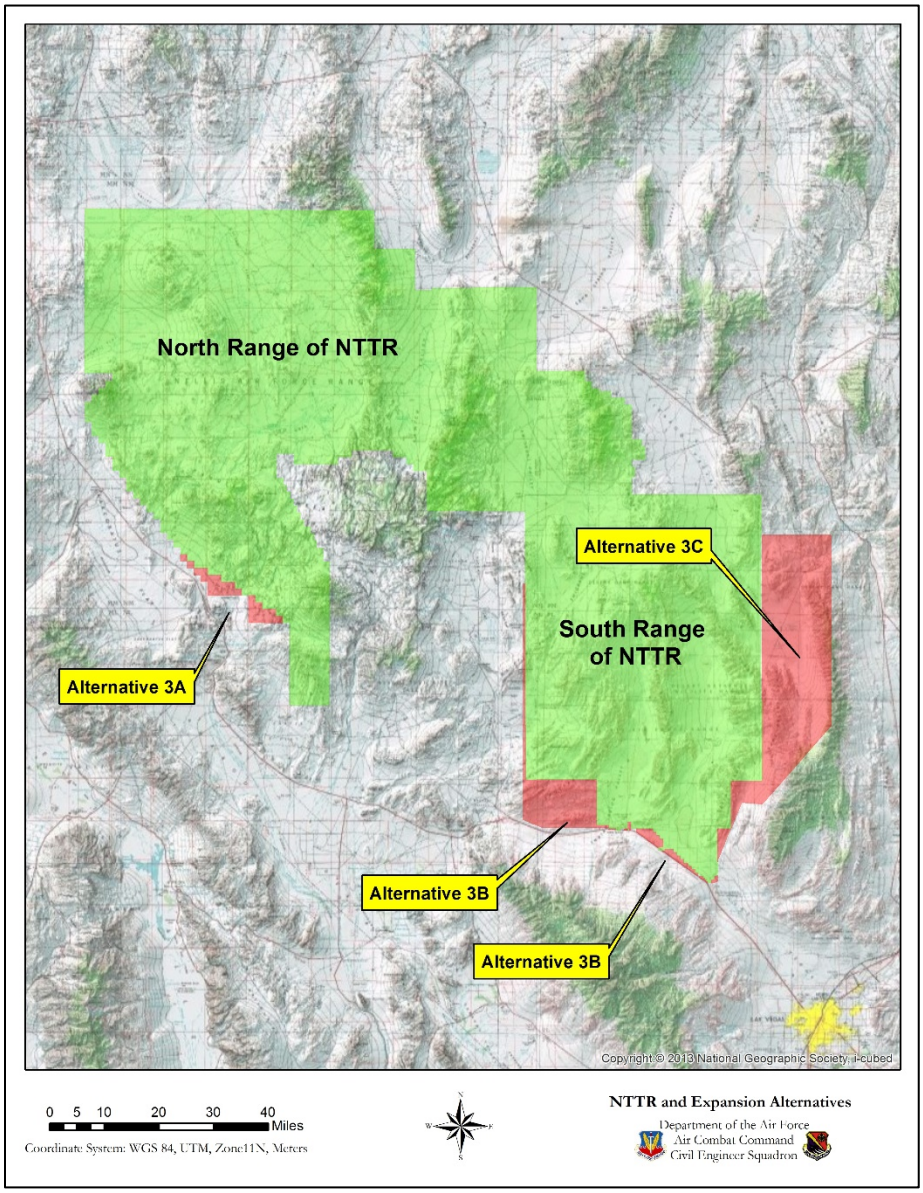

Figure 1. Location of the North and South Ranges of the NTTR as well as Alternatives 3A, 3B, and 3C.

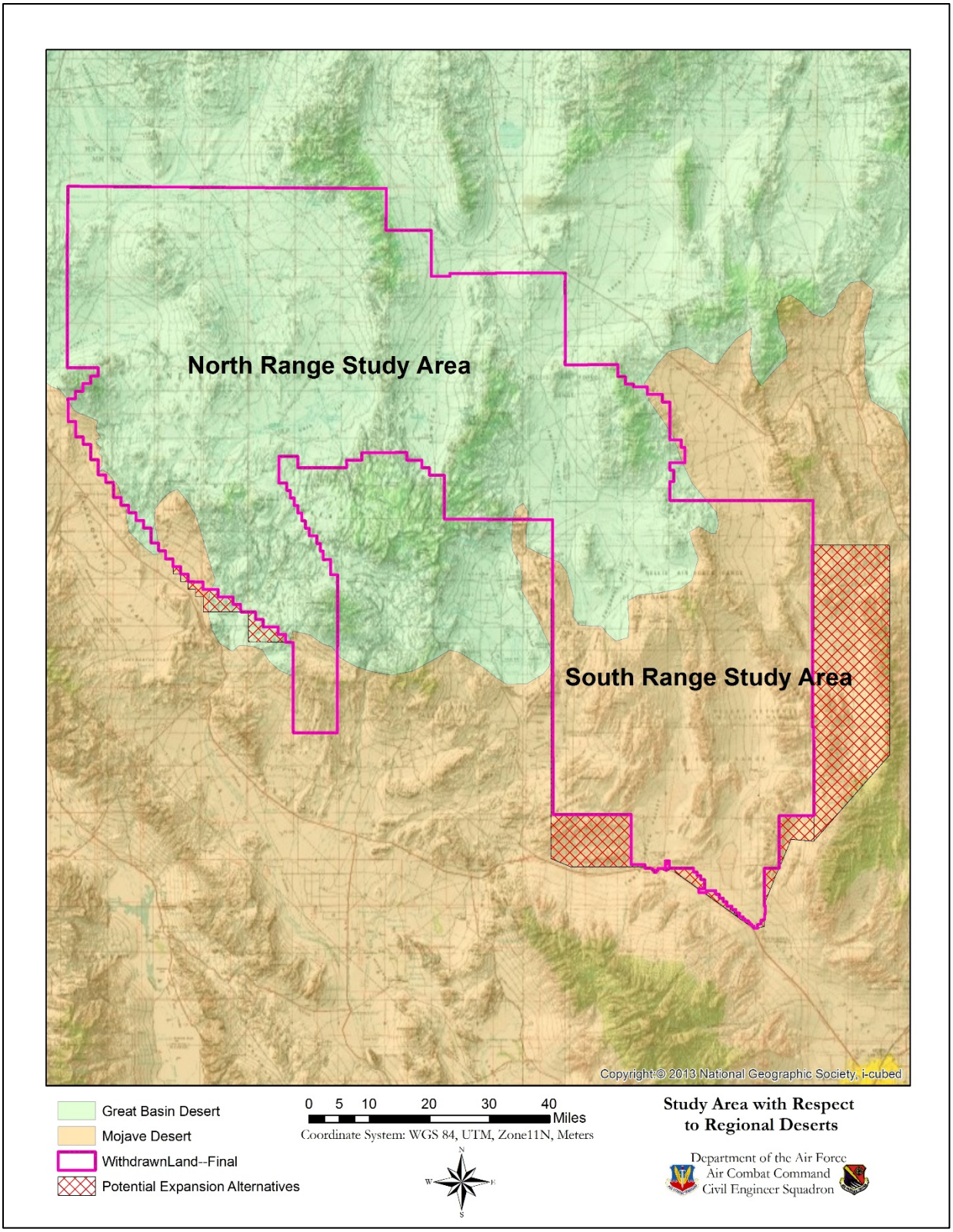

Figure 2. Location of the study area with respect to the Great Basin Desert and the Mojave Desert.

Regulatory Review

Much of the land surface of the study area, especially in the mountainous areas, lack access roads and would potentially qualify as roadless areas. However, on the North Range Study Area, specific areas in the basins are traversed by an elaborate road system to support military activities and infrastructure. Similarly, portions of the dry lake areas and lower alluvial fans of the South Range Study Area support a network of roads. These would not qualify as wilderness due to the intensity of impacts presented by anthropogenic activities. In parts of the South Range Study Area where the USFWS has primary jurisdiction, habitat is undisturbed and potentially qualifies as wilderness.

Various conservation areas have been established by different agencies on the study area. Approximately 90 percent of the South Range Study Area lies within the Desert National Wildlife Refuge (DNWR) and portions are currently proposed to be designated as wilderness, with the exception of some of the playas and dry lakes and lower alluvial fans. More specifically, the MOU between the U.S. Fish and Wildlife Service (USFWS) and USAF states that training activities are restricted to below 3,600 feet MSL in Indian Springs Valley and below 4,000 feet MSL in Three Lakes Valley (U.S. Fish and Widlife Service, 1997).

The BLM co-manages the North Range Study Area with the NTTR and provides oversight to a small portion of the South Range Study Area. Basically, this means that the BLM ensures that the NTTR Range Management Plan is properly implemented for those areas. One of the formal BLM management areas on the North Range Study Area is the Nevada Wild Horse Range Herd Management Area (1.3 million acres), which includes the Nevada Wild Horse Range Herd Management Area Core Area (484,000 acres). The core area lies mostly in the electronic ranges of the North Range Study Area of the NTTR and is where the BLM manages the horse population at a level of 300-500 horses (Figure 3).

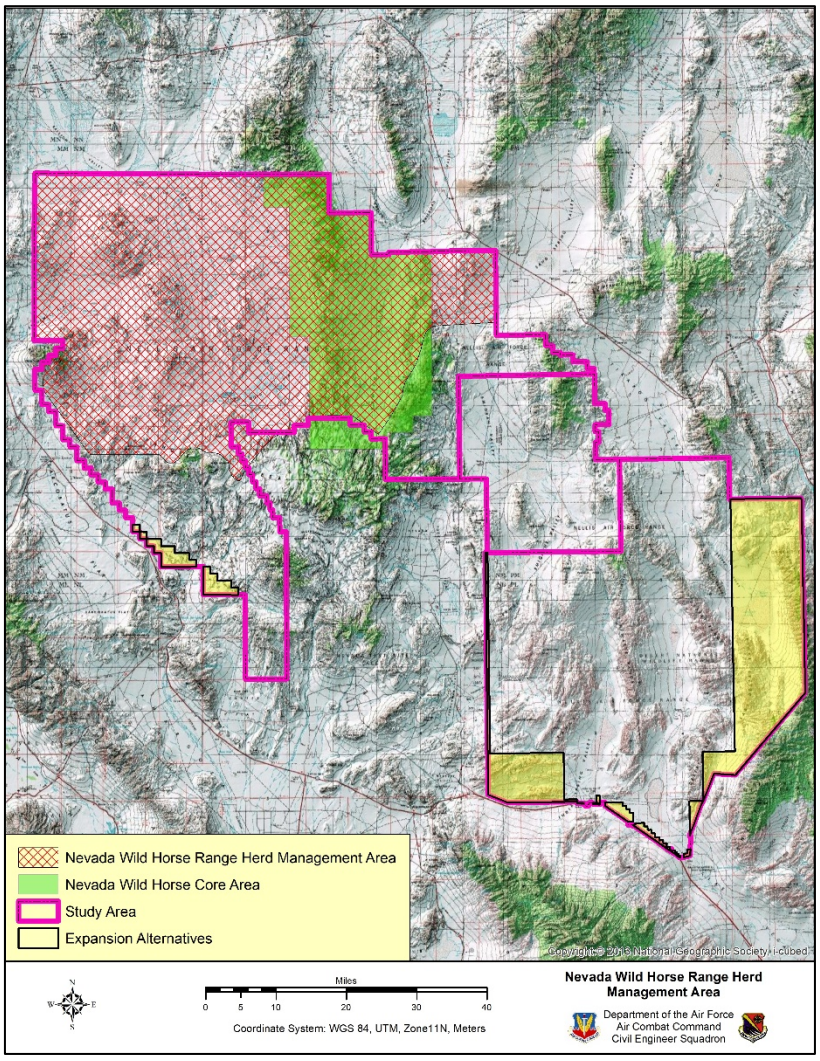

Figure 3. Nevada Wild Horse Range Herd Management Area on the Study Area

In addition to BLM's efforts, the Nature Conservancy (TNC) which is a non-profit organization that works with different public and private natural resources agencies to set potential conservation priorities for encouraging biodiversity, has delineated priority conservation areas that represent

the full distribution and diversity of native species, natural communities, and ecosystems within stated ecoregions as part of ecological planning. In Nevada, the TNC established several priority conservation areas in the NTTR study areas. These priority conservation areas were not necessarily targeted by TNC for land acquisition or management, but represent areas where native plants, animals, and natural communities of eco-regions can be efficiently and effectively conserved. These areas were prioritized according to the number of terrestrial and aquatic species that may face critical threats or maybe imperiled. The greater the threat, the higher the priority (Groves, 2010). Figure 4 shows the TNC priority conservation areas that have been established on the study area (The Nature Conservancy, 2015).

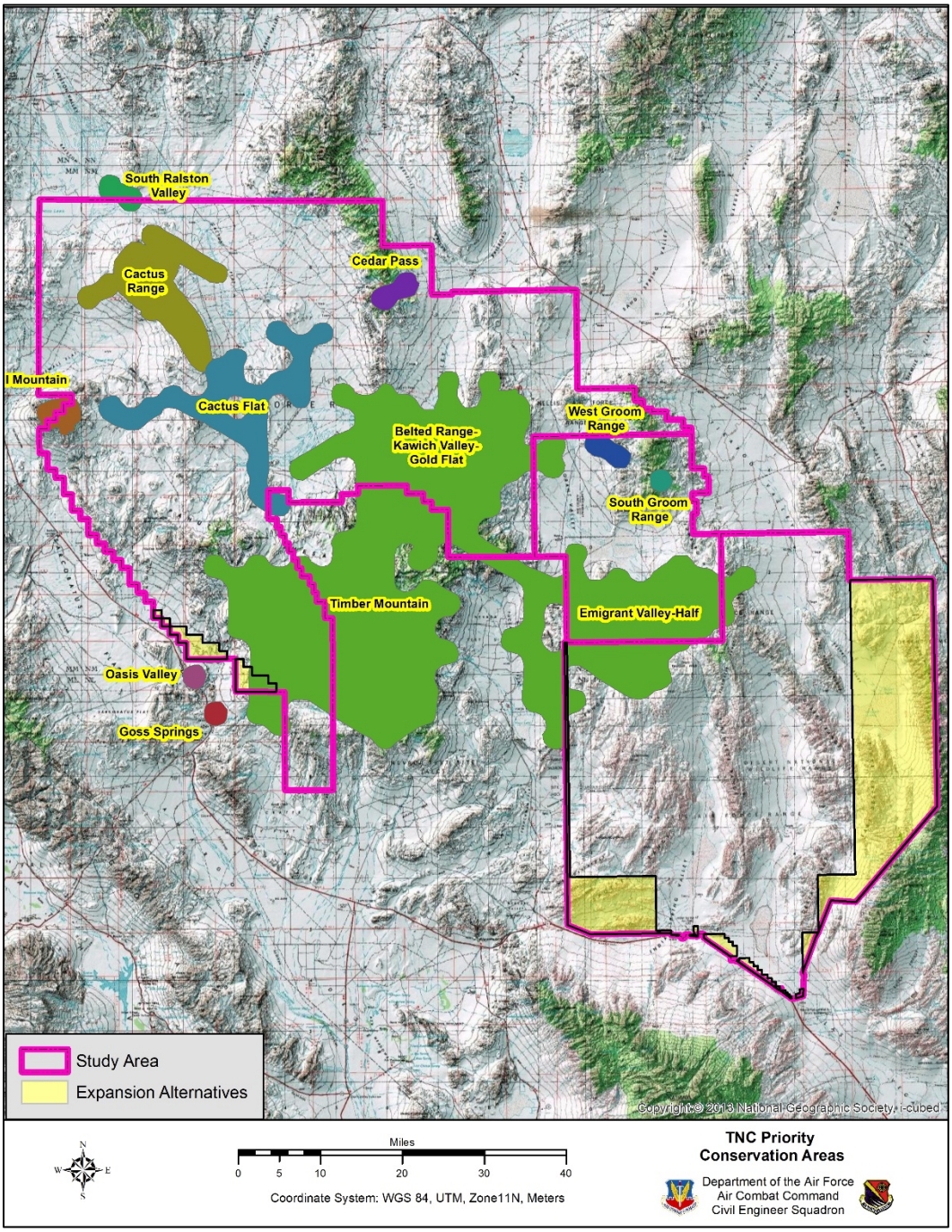

Figure 4. TNC Priority Conservation Areas on the Study Area

Two conservation areas have been established within the boundaries of the study area. The Timber Mountain Caldera Area of Critical Environmental Concern (ACEC) was established by Nellis Air Force Base (NAFB) and the BLM to conserve the geologic features in the area. The second area is part of the DNWR and was established for conservation of waterfowl and other migratory birds and for protection of the Nelson Bighorn Sheep herd found in that area. Figure 5 shows the location of these two conservation areas.

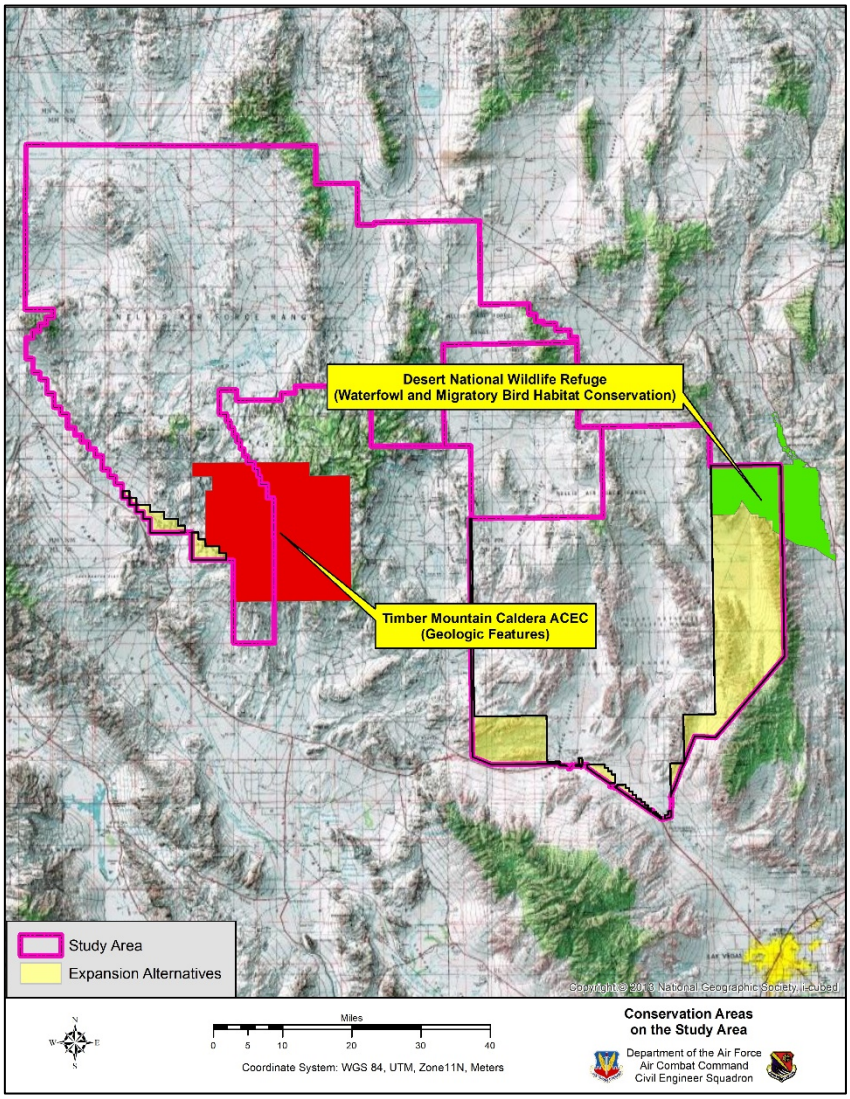

Figure 5. Conservation Areas found on the Study Area

The previously listed conservation areas have been established in the past and will be considered in the LEIS. However, areas meeting the wilderness area criteria established by the Department of Interior could be potentially designated as "Wilderness Areas" within the study area, and these are the focus of this report. According to land withdrawal regulations, the LEIS required for this land withdrawal must include identification of roadless areas or roadless islands having wilderness characteristics, as described in the Wilderness Act of 1964 (16 USC 1131, et seq.) (U.S. Congress, 1964). According to the Wilderness Act of 1964, "wilderness" is defined as the following:

> *A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.*

The act continues to list activities that are not allowed on areas designated as wilderness. This includes "no commercial enterprise and no permanent road… except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area)". Additionally, "there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area (U.S. Congress, 1964)."

It is important to note that any area that is considered suitable to be designated as wilderness can only be designated as such through recommendation by the President and provided by an Act of Congress. In the case of the study area, the Secretary of the Interior would determine if the land was suitable and, if so, would have to publish the proposed action in the Federal Register and conduct public hearings prior to recommendation to the President.

In development of the inventory of roadless areas on the study area, BLM Manual 6310 (Conducting Wilderness Characteristics Inventory on BLM Lands) was used (Bureau of Land Management, 2012). This manual requires that for an area to be considered wilderness, it must meet the following criteria:

- It must possess sufficient size (Roadless areas with over 5,000 acres of contiguous BLM lands).
- It must meet the criteria of "Naturalness", which means that the area must appear to have been affected primarily by the forces of nature, and any work of human beings must be substantially unnoticeable.
- It must have outstanding opportunities for solitude or a primitive and unconfined type of recreation. Here "solitude" means the ability to avoid the sights, sounds, and evidence of other people in the area. Some examples of primitive and unconfined types of recreation include hiking; backpacking; fishing; hunting; spelunking; horseback riding; climbing; river running; cross-country skiing; snowshoeing; dog sledding; photography; bird watching; canoeing; kayaking; sailing; and sightseeing for botanical, zoological, or geological features (Bureau of Land Management, 2012).

Within the study area, the only criteria valid for wilderness designation is "roadless area meeting the "Naturalness" criteria". The BLM manual defines roadless areas as "the absence of roads that have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A way maintained solely by the passage of vehicles does not constitute a road."

To further clarify the definition, the manual continues:

- *Improved and maintained – Actions taken physically by people to keep the road open to vehicle traffic. "Improved" does not necessarily mean formal construction. "Maintained" does not necessarily mean annual maintenance.*
- *Mechanical means – Use of hand or power machinery or tools.*
- *Relatively regular and continuous use – Vehicular use that has occurred and will continue to occur on a relatively regular basis. Examples are: access roads for equipment to maintain a stock water tank or other established water sources; access roads to maintained recreation sites or facilities; or access roads to mining claims.*

Additionally, the manual provides more detail on route criteria:

- *A route that was established or has been maintained solely by the passage of vehicles would not be considered a road for the purposes of wilderness inventory, even if it is used on a relatively regular and continuous basis. Vehicle routes constructed by mechanical means but that are no*

longer being maintained by mechanical methods are not wilderness inventory roads. Sole use of hands and feet to move rocks or dirt without the use of tools or machinery does not meet the definition of "mechanical means." Wilderness inventory roads need not be "maintained" on a regular basis but rather "maintained" when road conditions warrant actions to keep it in a usable condition. A dead-end (cherry-stem) road can form the boundary of an inventory area and does not by itself disqualify an area from being considered "roadless."

- *A route, or a segment of a route, which was mechanically improved to permit the passage of vehicles, but which to date has not needed any further mechanical improvement or maintenance to facilitate the relatively regular and continuous passage of vehicles, can be a road in those circumstances where the road would be maintained if the need were to arise.*
- *While the purpose of a route is not a deciding factor to consider in determining whether a route is a road for wilderness inventory purposes, it does provide context in which to consider the criteria for a road determination. For example, the purpose of the route provides context when the BLM considers whether maintenance of the route ensures relatively regular and continuous use and whether maintenance, that may so far have been unnecessary to ensure the use, would occur when the need arises.*

Withdrawing land from the BLM or USFWS would remove that land from being suitable as wilderness based on the premise that the general public would not be allowed to access or use the land since it will be a secured USAF range. Public use is required for wilderness area designation if the third criterion is to be met. Therefore, a preliminary determination of potential "roadless areas" was warranted to identify areas that could be designated as wilderness if not under USAF jurisdiction and public access was allowed. This report is a summary of the findings of this task.

Methodology

Most of the work associated with this special study entailed careful examination of high-resolution satellite imagery. Because the findings of this study were to locate roadless areas that could be identified as potentially meeting the wilderness criteria if the land was not withdrawn, ground surveys were determined to not be required. These would only be necessary if a roadless area was determined to be suitable as a wilderness area and the information would be submitted to the Secretary of Interior for approval. These surveys could only be conducted by the BLM/USFWS if the land was not withdrawn. If the land was withdrawn for the USAF, it could not meet the third criterion, which requires open access to the public, and would not be suitable as wilderness. Thus, the results of this roadless area study can be used to determine areas potentially suitable for wilderness that would be impacted by land withdrawal actions and alternatives.

Initially, GIS layers were obtained from the NTTR and the DNWR that delineated roads and areas of disturbances. These were evaluated for accuracy and possible use for determining potential wilderness areas. It was found that most of these layers were either out of date or insufficiently accurate for use in this task. It was therefore determined that all roads and disturbed areas would be re-drawn using high resolution satellite imagery. For the NTTR, satellite imagery obtained from Geo-Eye in 2009 and more current 2015 satellite imagery, obtained through ArcGIS Online, was used to map roads and disturbed areas. For Alternatives 3A-C, high resolution satellite imagery taken April 2-3, 2016, was obtained through Airbus Defense and Space. All of the satellite imagery was at least 60 cm resolution and colors were adjusted to mimic true, natural colors of the landscape.

Roads were digitized from the satellite imagery and classed as one of the following:

- Improved Road: A road that appeared to have regular maintenance or was paved or gravel.
- Graded Area: An area approximately the width of the road or wider that appeared to be graded, but most likely not used as a road. These were often temporary landing strips or targets and often appeared to be segments not connected to roads.
- Well Used Two Track Road: A road with well-defined tracks that appeared to be used fairly often. These roads did not appear to have regular maintenance or grading, but were regularly used.
- Intermittently Used Two Track Road: A road with tracks that may or may not be well defined and appeared to not be used on a regular basis.
- Trail: These were poorly defined roads or rights-of-way that were obviously impacted by a vehicle or excavation but apparently very rarely used and often difficult to map because of intermittent appearance on the satellite imagery.

Areas of disturbance were also mapped as polygons. These areas often included roads and graded areas associated with infrastructure, targets, and other construction areas.

Following the initial digitizing of these areas, the GIS layer was subjected to an intensive QA/QC process to ensure that roads were mapped and classed accurately. Following this process, the maps were again subjected to a QA/QC process by staff not involved with original mapping to ensure proper classification of roads and to identify any roads that may have been overlooked and not mapped.

The combination of the roads and disturbance layers were then used to identify potential roadless areas. Areas that were obviously impacted by human disturbance and activities were delineated into polygons that would be considered not eligible as roadless areas. Many of these areas were selected because none of the open areas between roads would meet the size criteria of 5,000 acres set by the BLM manual. The remaining open areas were delineated into polygons. Exact acreages of the different road types were determined by buffering polylines for roads a specific distance (using ArcGIS geoprocessing tools) and using that as the boundary of the polygon. The total width for each road type created by buffers was as follows:

- Trails—10 ft.
- Two-track Roads—15 ft.
- Gravel Roads—20 ft.
- Paved Roads—100 ft.

All roads, including trails, were considered roads that met the definition of roads according to the BLM manual (Bureau of Land Management, 2012) for the first determination of roadless areas. A second determination of roadless areas was calculated with trails not considered roads. The final determination of the classification of the roads would be made by the USAF and BLM or USFWS based on current and potential road usage/destination, and only in cases where a wilderness area is being established. This can only be done on a case-by-case basis and with a full inventory as dictated by the BLM manual (Bureau of Land Management, 2012).

Once roadless area polygons were created with and without trails being considered roads, boundaries were dissolved between polygons having the same wilderness classification (Roadless Areas; Human Disturbance). This removed boundaries between polygons that may have been established during the drawing process, making the polygons contiguous within each classification. Roadless areas that were less than 5,000 acres were removed from the total areas identified as roadless because they did not meet the size criterion. A second set of roadless areas was also developed. This set dissolved all trails, designating them as roadless areas. Thus, any roadless areas that were divided by a trail, were combined in this set. Maps were created and statistics were determined using these GIS layers.

Results

Delineation of roads was a relatively simple process for improved roads, graded areas, and well used two track roads. Trails and intermittently used two track roads were somewhat difficult to delineate, because they often disappeared for short distances, especially under trees and dense vegetation, and completely disappeared if they followed washes. Disturbed areas were only delineated if obvious soil disturbance or excavation had occurred. Areas of intensive roadwork or infrastructure were considered disturbed areas. On the DNWR, many of the roads and trails were not authorized for use by the public, but examination of the satellite imagery and field observations indicated that many of these roads were still being used on a limited basis and showed significant wear and tear. Thus, these roads were mapped as roads for the purposes of this report. Final determination of wilderness is determined on a case by case basis by formal ground surveys and removal of roads from use by gates, blockades, and restoration of vegetation. This was not a consideration for this report.

Final analysis indicated that only 29,785 acres of disturbed areas were identified and delineated on the study area (Table 1, Figures 6 and 7) representing 1.07% of the study area that was mapped. Final results indicated that the study area supports approximately 4,484 miles or 16,277 acres of roads, based on the average widths listed for each road type in the methodology section of this report. Thus, approximately 0.58% of the surface area of the study area that was mapped for roads and disturbances (2,792,681 acres) was impacted by roads (Table 1). The total area impacted by roads and disturbance as delineated with satellite imagery was 46,062 acres or 1.65% of the mapped area.

Table 1. Length and area of the different types of roads found on the study area.

Road Type	Length (miles)	Area (Acres)	Percent of Study Area*
Graded Areas	144	349	0.01%
Improved Roads	816	9,815	0.35%
Well-Used Two Track Roads	900	1,637	0.06%
Intermittently Used Two Track Roads	1182	2,147	0.08%**
Trails	1440	2,329	0.08%**
TOTAL ROADS	**4484**	**16,277**	**0.58%**
Disturbed Areas	N/A	29,785	1.07%
GRAND TOTAL		**46,062**	**1.65%**

*Total area of the study area includes only the area mapped for roads (2,792,681 acres)

**Please note that percentages are rounded to two decimal places, which resulted in two areas with slightly different acres have the same percentage.

The initial delineation of roadless areas included trails as meeting the road criteria to provide an estimate of wilderness assuming that all roads meet the "road" criteria for roadless area determination. Under this scenario, the total area contributed by roads was 16,277 acres or 0.58% of the land area as discussed in the preceding paragraph. For the purposes of this report, three different areas were designated based on roads and development:

- Human Impacts: Areas where roads, infrastructure, and military activities divided land into areas less than 5000 acres. Much of the area between roads was impacted by human activity and would not be considered "natural".
- Roadless Areas less than 5000 acres: Areas where roads dissected the land into parcels less than 5000 acres. These parcels were not impacted by human activities and would be considered "Natural".
- Roadless Areas greater than 5000 acres: Areas where roads dissected land into areas greater than 5000 acres. These areas were natural and unaffected by human activity.

For the scenario where trails were considered roads, areas impacted by humans comprised about 17.71% of the study area (Table 2). Roadless areas that meet the area requirement for wilderness (greater than 5,000 acres) comprised about 77.16% of the study area that was mapped for roads (Figures 8 and 9). Roadless areas less than 5,000 acres represented less than 5% of the land area (Table 2). In summary, a total of 2,154,952 acres would meet the roadless criteria with 126,828 acres not meeting the size criteria of 5,000 acres in the scenario where trails are considered roads (Figures 8 and 9).

Table 2. Area of the different categories of land found on the study area if trails are considered roads.

Category	Area (Acres)	Percent of Study Area
Roadless Areas Greater than 5000 acres	2,154,952	77.16%
Roadless Areas Less than 5000 acres	126,828	4.54%
Areas Impacted by Humans	494,624	17.71%
Roads	16,277	0.58%

*Total area of the study area includes only the area mapped for roads (2,792,681 acres)

In the scenario where trails were not considered roads, the roadless area meeting the greater than 5,000 acre criterion increased slightly to 2,230,191 acres with 59,679 acres not meeting the size criteria (Table 3) (Figures 10 and 11). In this scenario, potential roadless area (wilderness) comprised 79.86% of the area mapped.

Table 3. Area of the different categories of land found on the study area if trails are not considered roads.

Category	Area (Acres)	Percent of Study Area
Roadless Areas Greater than 5000 acres	2,230,191	79.86%
Roadless Areas Less than 5000 acres	59,679	2.14%
Areas Impacted by Humans	491,475	17.60%
Roads	13,895	0.50%

*Total area of the study area includes only the area mapped for roads (2,792,681 acres)

In conclusion, roadless area mapping indicates that a large portion of the study area being considered for the land withdrawal extension and proposed expansion areas would meet the roadless area criteria for wilderness. However, if the area was withdrawn, none of the roadless areas would be eligible for designation as wilderness because they would not meet the third criterion for suitability as wilderness as set by the Wilderness Act and the BLM manual, which require open access to the general public to use for solitude or primitive and unconfined types of recreation. The roadless areas could still be managed to conserve the natural character of the areas without public use, which is the basic policy of the USAF at this time for the NTTR. The lack of designation of areas as wilderness on the current NTTR have not resulted in impacts to those areas. On the contrary, most of the areas listed in this report as potential wilderness that are currently on the NTTR have enjoyed excellent protection and conservation in spite of the fact that they are not designated wilderness areas.

If parts of the study area are not included in the land withdrawal, the maps included in this report could be used to identify areas that could potentially be suitable as wilderness. In that event, the exact area of the wilderness could be calculated and detailed ground surveys inventorying all roads in the area would be required. Roads not obviously meeting the road criterion could be subjected to formal inventory surveys as described in the BLM Manual 6310. Once inventory and mapping is completed, each roadless area could be entered into the formal approval process involving the President and Congress.

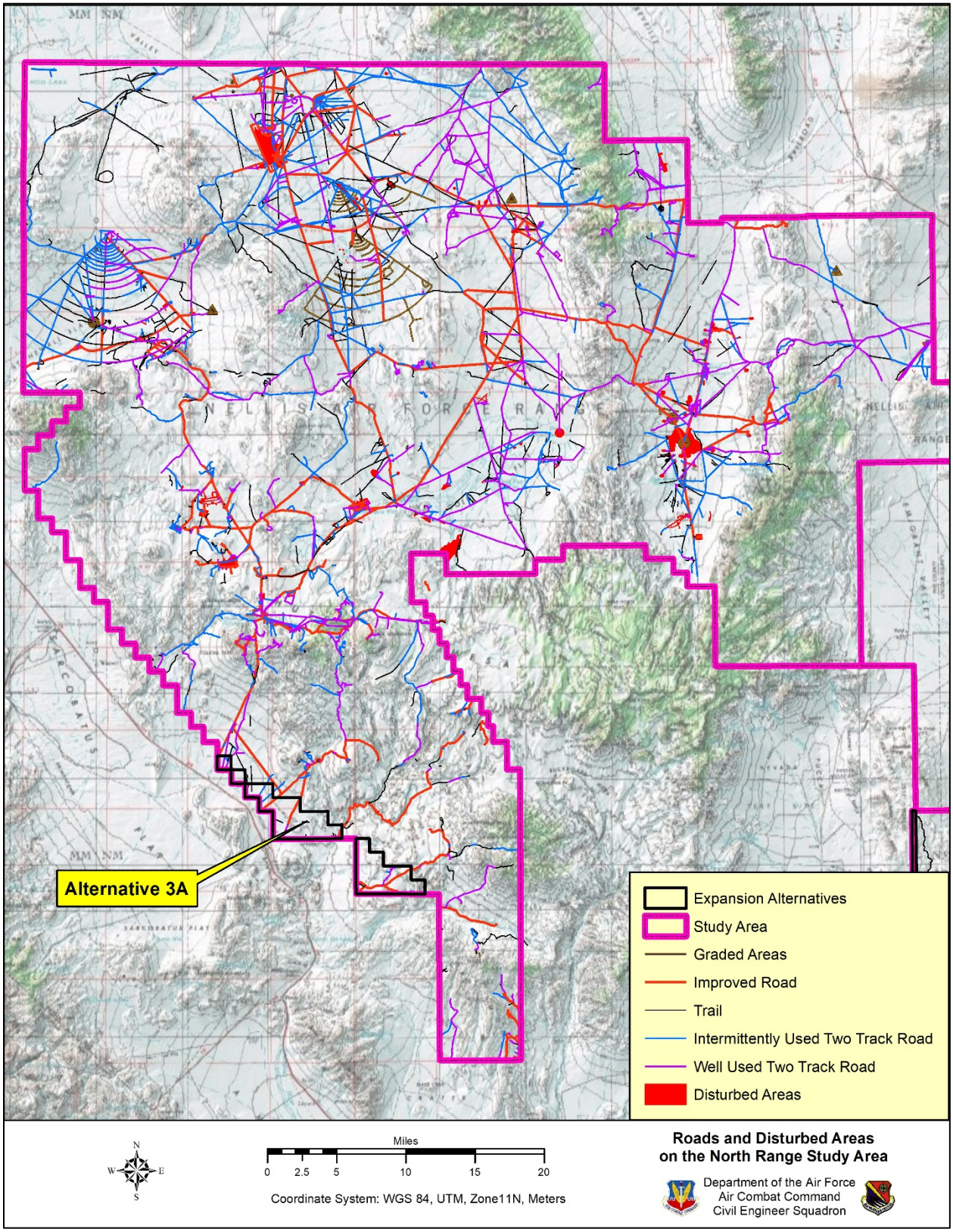

Figure 6. Roads, trails, and disturbed areas on the North Range Study Area

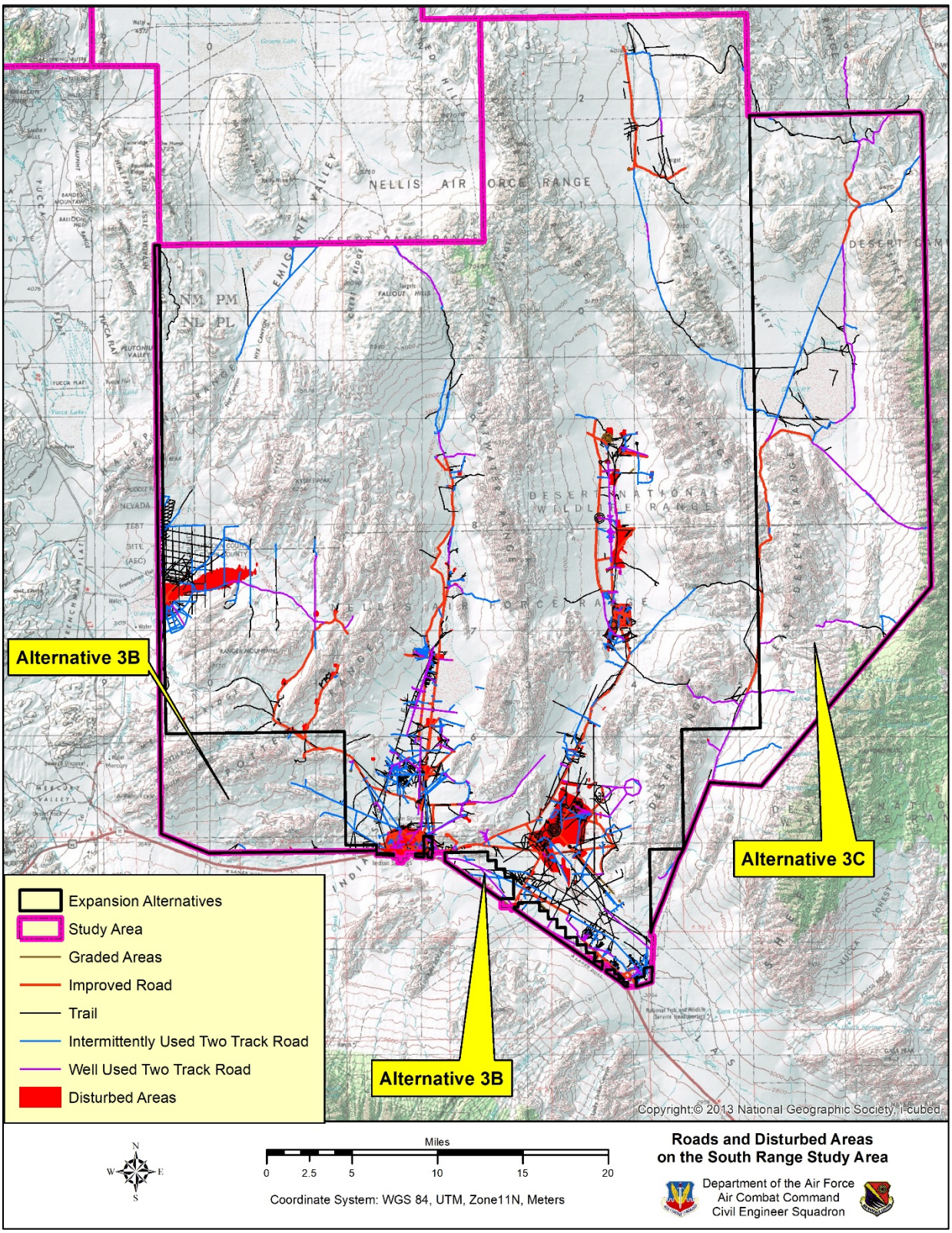

Figure 7. Roads, trails, and disturbed areas on the South Range Study Area

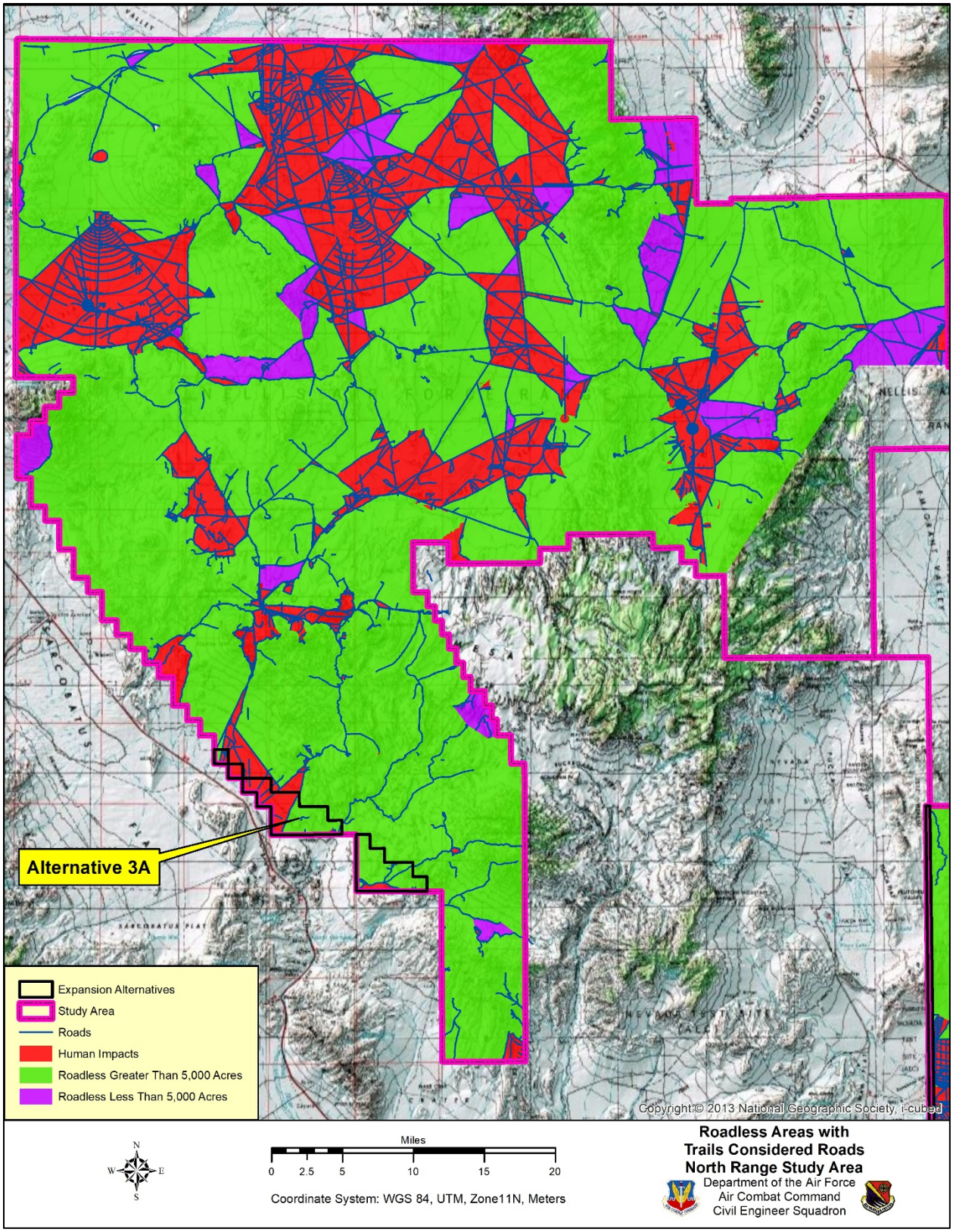

Figure 8. Roadless areas on the North Range Study Area when trails are considered roads.

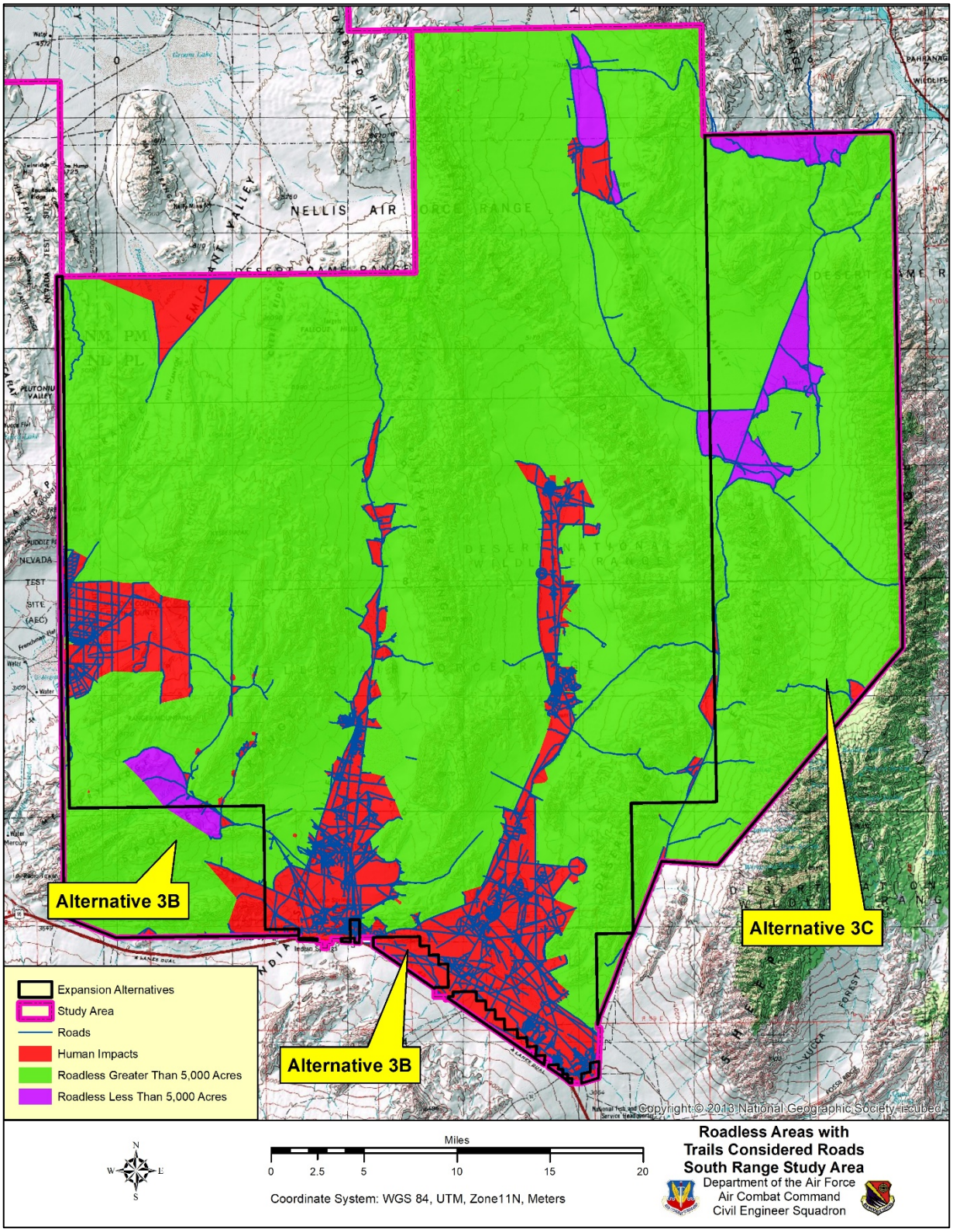

Figure 9. Roadless areas on the South Range Study Area when trails are considered roads.

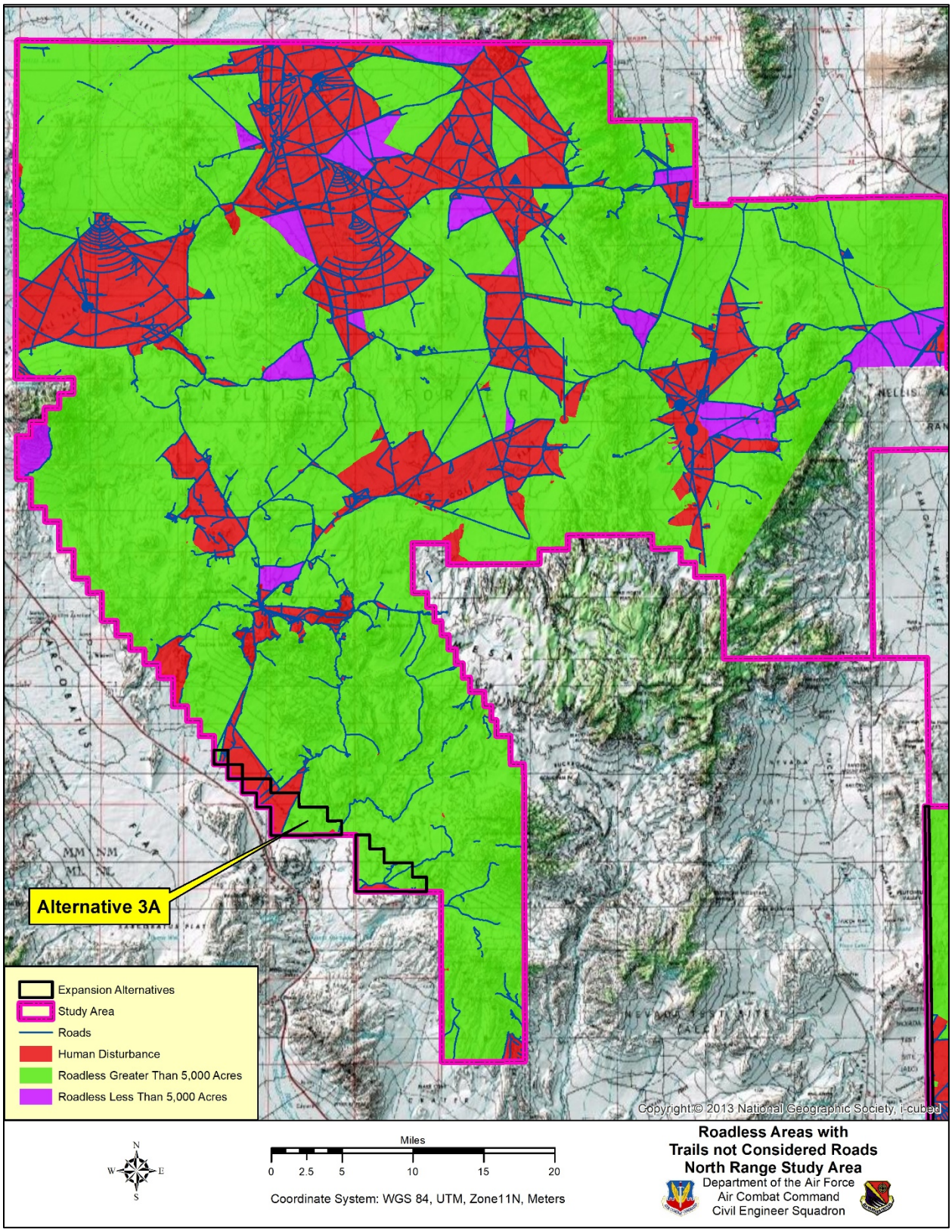

Figure 10. Roadless areas on the North Range Study Area when trails are not considered roads.

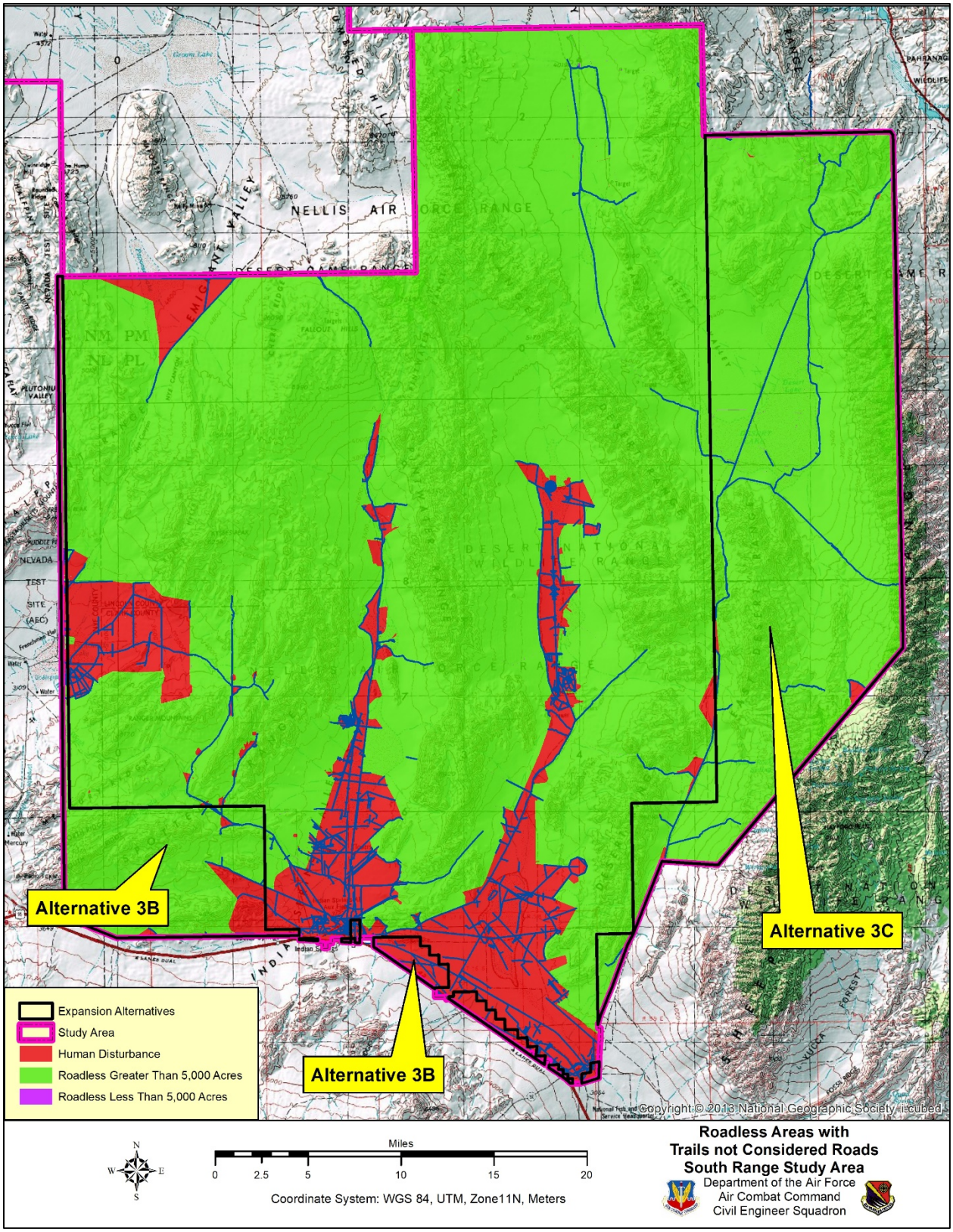

Figure 11. Roadless areas on the South Range Study Area when trails are not considered roads.

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