U.S. Sheep Experiment Station Grazing and Associated Activities Project 2009

Draft Rangeland Resource Report

Prepared by:

Troy Grooms, Range Specialist

Charles J. Jankiewicz, Range Specialist

Lucretia Smith, Range Specialist

and

Francis J. Yurczyk, Forester

TEAMS Planning Enterprise Unit

for:

United States Sheep Experiment Station

Dubois, Clark County, Idaho Date

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Table of Contents

Abstract 5
General Summary of Range Conditions 5
Introduction, Background and Regulatory Framework 6
History 7
Proposed Action 9
Operations 10
Sheep Grazing 13
Sheep Transportation by Truck 13
Sheep Trail and Driveway Use and Maintenance 13
Trails 14
Driveways 14
Stock Water Operations 15
Water Developments 16
Camp Tending 17
Sheep Herding Camps 17
Maintenance and repair of existing permanent fence 18
Fences 18
Maintenance and repair of existing roads and fire breaks 20
Roads (Figure 6) 20
Firebreaks 20
Range Improvement 21
Prescribed Burning 21
Seeding 22
Cattle and Horse Grazing 22
Predator Avoidance and Abatement 23
Integrated Pest Management 23
Noxious Weeds 23
Mitigation Measures 24
Grizzly Bear 24
Sheep Driveway 24
Herbicide Application 25
Heritage 25
Affected Environment 25
Spatial and Temporal Context for the Effects Analysis 26
Existing Condition 26
Methodology for Analysis 31
Environmental Consequences 32
Alternative 1 - Proposed Action (No New Federal Action) 33
Direct and Indirect Effects 36
Direct and Indirect Effects 40
Range Cumulative Effects 41
Monitoring 48
Literature Cited 49
Appendix A: Maps 51

List of Tables

Table 1. Summary of grazing areas 10
Table 2. Proposed Action general sheep movement schedule 11
Table 3. Proposed Action: Annual AUM[a] utilized per property within the approximate[b] dates that are specified. The calculations are based on 3,331 sheep[c] 13
Table 4. The number of sheep from Headquarters trucked in and out each year for each range area and allotment 13
Table 5. Annual sheep trails 14
Table 6. Sheep numbers trailed on pastures as an average of last five years 15
Table 7. Camps per pasture and season used 18
Table 8. Utilization 32
Table 9. Grazing Properties by Alternative 33
Table 10. Alternative 1 – percent of forage used, grazing period and grazing days by property[c] 35
Table 11. Alternative 2 - projected annual AUM utilization per property within the approximate dates that are specified. The calculations are based on 1,166 sheep; a 65% reduction in Alternative 1 sheep inventory. 36
Table 12. Alternative 2 – percent of forage used, grazing period and grazing days by property 37
Table 13. Alternative 3 - projected annual AUM utilization per property within the approximate dates that are specified. The calculations are based on 2,665 sheep, a 20% reduction in Alternative 1 sheep inventory. 38
Table 14. Alternative 3 – percent of forage used, grazing period and grazing days by property 39
Table 15. Alternative 4 - Projected annual AUM utilization per property within the approximate dates specified. Calculations are based on 3,331 sheep; 0% reduction in Alternative 1 sheep inventory. 39
Table 16. Alternative 4 – percent of forage used, grazing period and grazing days by property 40
Table 17. Alternative 5 - Projected annual AUM utilization per property within the approximate dates that are specified. The calculations are based on 2,332 sheep; a 30% reduction in Alternative 1 sheep inventory. 41
Table 18. Alternative 5 – percent of forage used, grazing period and grazing days by property 41
Table 19. Alternative 1 – percent of forage used, grazing period and grazing days by allotment 43
Table 20. Alternative 2 – percent of forage used, grazing period and grazing days by allotment 45
Table 21. Alternative 3 – percent of forage used, grazing period and grazing days by allotment 45
Table 22. Alternative 4 – percent of forage used, grazing period and grazing days by allotment 46
Table 23. Alternative 5 – percent of forage used, grazing period and grazing days by allotment 47
Table 24. Available AUMs and percent AUMs used by alternative 47
Table 25. Range monitoring plan 48

List of Figures

Figure 1. Sheep Driveway, Odell Creek (point OD5 on field map – jf 08/07/08) 14
Figure 2. Henninger ditch maintenance (jf) 15
Figure 3. Upland water trough (jf – 07/160/8) 16
Figure 4.Camp herder trailer (sw 05/08) 17
Figure 5. Example of coyote-proof fencing on Headquarters. (sw 05/08) 18
Figure 6 Example of road on Headquarters (sw 05/08) 20
Figure 7. Cleared firebreak –fy 2008 20
Figure 8. Blackline – fy 2008 21
Figure 9. Headquarters pasture (tg 08/09) 26
Figure 10. Henninger Ranch pasture (tg 08/09) 27
Figure 11. Humphrey Ranch pasture (tg 08/09) 27
Figure 12. East Summer and West Summer range (cj 08/09) 28
Figure 13. Fence-line along sheep exclosure 28
Figure 14. Same location away from exclosure 28
Figure 15. Same location inside exclosure - West Summer Odell Unit (grazed area) (cj 08/09) 29
Figure 16. Driveway bottleneck West Summer (cj 08/09) 29
Figure 17. West Summer Range, Odell. Upslope -Left side is ungrazed while right demonstrates herd grazing 30
Figure 18. West Summer Range, Odell. Down-slope – Note ungrazed areas bordering grazed/herded area 30
Figure 19. Grazed area exhibits minimal exposed soil and excellent residual litter. (cj 08/09) 30
Figure 20. Below area of concern Tom's Creek. – 8/09 31
Figure 21. Area of Concern Tom's Creek – 8/09 31

List of Maps

Map 1. Vicinity map 52
Map 2. Overview with allotments 53
Map 3. Overview with sheep trails 54
Map 4. Headquarters Pasture overview 55
Map 5. Headquarters Pasture roads & fire breaks 56
Map 6. Headquarters wild fire history 57
Map 7. Headquarters Pasture fence 58
Map 8. Headquarters prescribed fire history 59
Map 9. Headquarters proposed pasture fence 60
Map 10. Headquarters seeding 61
Map 11. Henninger Pasture irrigation 62
Map 12. Humphrey Pasture irrigation 63
Map 13. Humphrey proposed seeding & burn Map 64
Map 14. Summer Pasture East sheep driveways 65
Map 15. Summer Pasture West fence map 66
Map 16. Summer Pasture West sheep driveways 67
Map 17. Mud Lake Feedlot 68
Map 18. Alternative 2 69
Map 19. Alternative 3 70
Map 20. Alternative 4 71
Map 21. Alternative 5 72

Abstract

This rangeland report details the rangeland resource and sheep grazing management for the United States Sheep Experimental Station (USSES) outside of Dubois Idaho. The rangelands were assessed for the Headquarters Property, Henninger and Humphrey Ranches and, East and West Summer ranges by a U.S. Forest Service Enterprise Team interdisciplinary team consisting of rangeland management specialists, wildlife biologist, soil scientist, and hydrologist. Field surveys were conducted while assisting in data collection for Rangeland Assessment (Grooms 2009). The interdisciplinary team used field surveys, literature reviews, and rangeland monitoring, ocular observations, personal communications with USSES scientists and professional observations, and photographs to assess rangeland.

Results of this study indicated soils are stable across the vast majority of USSES rangelands. Utilization is None/Slight to Light (Table 3) only small areas (sheep driveway, trailing, watering, and bedding) less than 50 total acres per pasture showed heavy use. There is an appropriate diversity of forbs, shrubs, and grasses across these rangelands. Exclosures not grazed in 30 years compared (visually) to areas outside exclosures showed no differences in composition. Rotational, deferred and rest from grazing with light to moderate stocking rates have allowed for fair to good range conditions with static to upward trend across vast majority of rangelands. Only Henninger, where soils are stable with appropriate forbs, shrubs and grasses and Light utilization were concerns noted. There Moderate to Heavy browse species use was observed and may be from deer and elk grazing.

General Summary of Range Conditions

Headquarters soils are stable with desirable forb, shrub, and grass diversity. Utilization is None to Slight (Table 3). Rotational and deferred grazing, rest during the primary growing season with light stocking rates have allowed for fair range conditions with static trend. Only small (less than 50 acres) areas representing less than 2 percent of the area grazed (sheep trailing/watering/bedding) showed heavy use. Headquarters property is grazed April 23 to June 25 and September 1 –to November 1.

Humphrey soils are very stable with desirable forb, shrub, and grass diversity. Utilization is light (Table 3) with rams and small groups of sheep grazed here. Rotational and deferred grazing with light stocking rates have allowed for good range conditions with a static or slight upward trend. Only small (less than 50 acres) areas representing less than two percent of the area grazed (sheep trailing/watering/bedding) showed heavy use. Humphrey ranch is grazed June 1 to October 20.

Henninger soils are stable with desirable forb, shrub, and grass diversity. Range condition is fair and appears in static trend. Utilization is light on forbs and grasses (Table 3). Field survey 2009 (visual) found Moderate to Heavy use on browse. This may be from early and late season deer and elk grazing. Historically, the ranch primarily grazed cattle up until purchased by the U.S. Sheep Experiment Station in the early 1940s. The presence of smooth brome (*Bromus inermis)* in pastures indicates that it was planted for cattle feed. Smooth brome is not preferred by sheep and is spreading into native vegetation areas and increasing in density. Only small (less than 10 acres) areas representing less than two percent of the area grazed (sheep trailing/watering/bedding) showed heavy use. Henninger ranch is grazed June 25 to July 9 and August 31 to September 15.

East Summer (Tom's Creek) soils are stable with a desirable diversity of forbs, shrubs, and grasses. Utilization is None to Slight (Table 3). A rotational/deferred grazing system with rest one year in three and light stocking have developed good range conditions with a stable or upward trend. Exclosures not grazed in 30 years compared to outside exclosures showed no differences in composition. Only small (less than 50 acres) areas representing less than two percent of the area grazed (sheep

driveways/trailing/watering/bedding) showed heavy use. East Summer range is grazed July 23 to August 31.

West Summer (Odell/Big Mountain) soils are stable, appropriate diversity of forbs, shrubs, and grasses. Utilization is None to Slight (Table 3). A rotational/deferred grazing system and rest one year in three with light stocking have developed good range conditions with a stable or upward trend. Exclosures not grazed in 30 years compared to outside exclosures showed no differences in composition. Only small (less than 50 acres) areas representing less than two percent of the area grazed (sheep driveway/trailing/watering/bedding) showed heavy use. West Summer range is grazed July 9 to August 31.

Introduction, Background and Regulatory Framework

The purpose of the rangeland resource report is to provide an analysis of the rangeland resource and respond to the Settlement Agreement (12-21-07) reached in the lawsuit the Center for Biological Diversity, and Western Watersheds Project v. U.S. Sheep Experiment Station; U.S. Department of Agriculture; Agricultural Research Service; and U.S. Forest Service. The rangeland resource report will become part of the resource record and information contained within will support the National Environmental Policy Act (NEPA) documentation described in the settlement agreement.

The settlement agreement requires that:

1. The U.S. Agricultural Research Service shall prepare an “environmental assessment” (“EA”) or “environmental impact statement” (“EIS”), pursuant to the National Environmental Policy Act (“NEPA”), regarding sheep grazing and related activities on U.S. Sheep Experiment Station lands. The associated Decision Notice or Record of Decision shall be completed and signed on or before November 28, 2008.

2. The U.S. Agricultural Research Service shall consult with the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act regarding sheep grazing and related activities on U.S. Sheep Experiment Station lands. The U.S. Agricultural Research Service agrees to work with the U.S. Fish and Wildlife Service in a good faith effort to complete the consultation by the date that the associated Decision Notice or Record of Decision is completed.

To meet the intent of the settlement agreement, the USSES used a two-phased approach.

The first phase included an environmental assessment (Interim USSES Grazing and Association Activities Project (http://www.ars.usda.gov/SP2UserFiles/Place/53640000/20081126-ARS-USSES-EA.pdf)) and was limited to:

- The sheep grazing and associated activities on the USSES lands that have historically occurred and are ongoing in support of research projects currently being conducted.
- The time necessary (through March 2010) to complete an environmental analysis (Phase 2) to consider the long-term effects of sheep grazing and associated activities needed to facilitate research at the USSES

On August 12, 2008, a Scoping package explaining the purpose and need for action, as well as the location and types of proposed activities, was mailed to approximately 100 interested parties. These included individuals and organizations who expressed interest in the project, adjacent landowners, public legislators (federal, state), township supervisors, and plaintiffs in Center for Biological Diversity, and Western Watersheds Project v. U.S. Sheep Experiment Station; U.S. Department of Agriculture; Agricultural Research Service; and U.S. Forest Service. Nineteen (19) responses to Scoping were

received. Comments received during the public Scoping period were used to develop issues. Of the issues identified during Scoping none were unresolved. Therefore, no additional alternatives to the proposed action were analyzed in detail. Four additional alternatives were considered for that project but were eliminated from detailed analysis.

The Decision Notice, Finding of No Significant Impact, and Environmental Assessment for the Interim U.S. Sheep Experiment Station Grazing and Associated Activities Project were signed on November 28, 2008.

The Phase 1 Interim USSES Grazing and Association Activities Project EA and associated project file are incorporated by reference for this analysis.

This rangeland resource report is incorporated as a portion of the Phase 2, environmental analysis that looks at the long-term effects of sheep grazing and associated activities on the USSES lands that have historically occurred and are ongoing in support of the USSES research projects in Dubois, Idaho.

History

Establishment of the Station at Dubois

In the fall of 1915, the Bureau of Animal Industry secured authorization to search for a tract of land in the west that could be used as a range for a western sheep breeding experiment station. Two exacting conditions governed the selection of the site:

3. The area must be unappropriated public domain land and not intermingled with homesteads or other property.
4. The location must be accessible by railroad.

The location at Dubois, an area of approximately 28,000 acres, was decided upon, because it was the only location found containing a solid block of public domain land of sufficient acreage and adjacent to a railroad. (McWhorter, V. The Pacific Wool Grower, Vol. 4. Nos.10 & 11, 1952)

The U.S. Sheep Experiment Station (USSES) was established as a sheep breeding and rangeland grazing research facility. To provide the natural resource base for sheep and grazing research, lands were withdrawn from the public domain in 1915, 1916, 1919, and 1922. Presidents Woodrow Wilson and Warren G. Harding withdrew the lands with Executive Orders 2268, 2491, 3141, 3165, and 3767. Public Law 97-98-Dec. 22, 1981, clarified administrative jurisdiction of USSES lands, which rests solely with the Secretary of Agriculture, and the purpose of USSES lands, which are designated for "agricultural experiment purposes." There are no detailed records of land use prior to the USSES establishment. Livestock grazing research under the ARS ownership, which dates from circa 1918, predates the county. High elevation summer ranges were probably used for sheep grazing that was a common practice at that time (possibly cattle but more likely sheep).

Addition of Summer Range

Between 1940 and 1942, the USSES purchased the Humphrey and Henninger Ranches from the private sector. Prior to purchase, the Humphrey and Henninger Ranches were used for farming, some crop land, hay, mainly livestock production. Before transfer to the ARS, Henninger was grazed at much heavier rates than currently used by the USSES.

Research at the USSES, Dubois, Idaho

Since its research began, circa 1918, the USSES is credited with developing three breeds of sheep (i.e., Columbia, Targhee, and Polypay) and has been making germplasm (i.e., breeding stock) available to sheep breeders in North America since the 1920s. Based on numbers of registrations, Columbia has been one of the 10 most popular breeds of sheep in the United States since 1965. Grazing and rangeland research at the USSES has been ongoing since the 1930s, and the research has produced unmatched information on managing grazing on sagebrush steppe to preserve native ecosystems.

Current USSES research is aimed at developing new or improving existing genetic lines of sheep that specialize in paternal and maternal traits that enhance lamb production (i.e., number of lambs born and weaned per ewe), lamb growth, lamb carcass merit, and yield of marketable product; improving nutrient management throughout the sheep production cycle; developing monitoring technologies for landscape-scale assessment of plant communities and for determining the effects of rangeland management activities, including grazing and fire, on vegetation, ground cover, and herbivore selectivity; and developing science-based grazing and prescribed burn management strategies and decision support systems that can be used to guide managers to maintain or improve the ecological function of western rangelands.

USSES research involves at least 34 scientists at nine ARS locations in seven states and 10 universities in seven states, in addition to the scientists at the USSES. Most of the research spans multiple years, and some of the long-term sheep genetics and rangeland research spans more than seven decades. In many cases, the USSES has been the only location in North America with the land and animal resources to conduct the research, and the only location in North America able to establish direct linkages between new research and research conducted during the last 90 years to provide a clear understanding of the long-term consequences of various management strategies. USSES research is published in peer-reviewed scientific journals, which are becoming more readily available to the general public as publishing companies develop open-access electronic archives, and is often rewritten for various trade magazines.

USSES research has been used to:

- Train new scientists;
- Write textbooks to educate university students in animal and rangeland sciences;
- Develop outreach programs that benefit farmers, ranchers, small business owners, agribusiness corporations, and land managers;
- Develop or improve sheep breeds that increase the efficiency of food and fiber production;
- Preserve or improve rangeland ecosystems; and
- Preserve or improve wildlife habitat.

The USSES is known worldwide for its research and sheep breeds. Scientists, sheep producers, students, and industry personnel from throughout the United States and other countries visit, and many more contact, the U.S. Sheep Experiment Station each year to learn more about the research or ask for comments on various issues associated with sheep production and rangeland management.

The Dubois United States Sheep Experiment Station (USSES) is the only station in the USA conducting research with sheep in open range, high elevation extensive management systems. Research is done to

develop animals with fitness traits or genetics suited to these extensive range conditions. The purposed of this research is to develop animals with genetics adapted to the high elevation environment.

Headquarters

The Dubois Sheep Station was established in 1915. The Bureau of Animal Industry secured authorization to search for a tract of land in the west that could be used as range for a western sheep breeding experiment station. The Dubois location, approximately 28,000 acres, was selected, because it was the only location found containing a solid block of public domain land of sufficient acreage adjacent to a railroad (McWhorter 1952). The U.S. Sheep Experiment Station (USSES) was established as a sheep breeding and rangeland grazing research facility. To provide the natural resource base for sheep and grazing research, lands were withdrawn from the public domain in 1915, 1916, 1919, and 1922. Presidents Woodrow Wilson and Warren G. Harding withdrew the lands with Executive Orders 2268, 2491, 3141, 3165, and 3767. Public Law 97-98-Dec. 22, 1981, clarified administrative jurisdiction of USSES lands, which rests solely with the Secretary of Agriculture and the purpose of USSES lands, which are designated for "agricultural experiment purposes." There are no detailed records of land use prior to the USSES establishment. Livestock grazing research under the ARS ownership, which dates from the 1900s, predates the county.

Humphrey and Henninger

Humphrey and Henninger Ranches were purchased in 1940 and 1942, and added to the USSES Dubois operations. Prior to the purchase from private holdings, Humphrey and Henninger Ranches were mainly used for farming: livestock production, with some crop land and, hay, production. Before transfer to the ARS, Henninger was grazed at heavier rates than currently used by the USSES. There are seven pastures at the Humphrey ranch with pasture size varying from 320 to 485 acres.

Summer Range

Prior to USSES ownership, high elevation summer pastures were probably used for sheep grazing, which was a common practice in the area at that time. There is a possibility of cattle grazing, but more likely sheep were grazed. Historical hindsight would suggest sheep/cattle numbers were higher during this earlier grazing period.

Proposed Action

The United States Department of Agriculture (USDA), Agricultural Research Service (ARS) United States Sheep Experiment Station (USSES) is made up of four major areas; Headquarters, Humphrey, Henninger, and Summer Range. In addition to the ARS USSES owned lands that are grazed, USSES has Memoranda of Understanding (MOU) with other agencies to graze specific allotment. These grazing allotments cover lands managed by the Bureau of Land Management (BLM), Forest Service (USFS), and the Department of Energy (DOE). Grazing activities on the BLM, and USFS grazing allotments, and DOE Feedlot are covered under separate agreements (MOU) with each respective agency. The grazing allotments by agency include; USFS: Snakey – Kelly, East Beaver, and Meyers Creek Allotments, BLM: Bernice Allotment. The DOE land is used as a feedlot; it is called Mud Lake Feedlot. Mud Lake Feedlot facilities are used when sheep are not on grazing lands. Table 1 displays acres for each property.

Table 1. Summary of grazing areas

Property	Acres
Agricultural Research Service (ARS)	
Headquarters	27,930
Humphrey	2,600
Henninger	1,200
West Summer	11,874
East Summer	3,976
Leased (USDA-FS, DOI-BLM, DOE)	
Snakey-Kelly (FS)	5,819
East Beaver (FS)	20,786
Meyers Creek (FS)	3,503
Bernice (BLM)	22,181
Mud Lake Feedlot (DOE)	766

Operations

USSES currently has approximately 3,000 mature sheep, plus attendant young sheep. Including mature ewes and lambs, lambing rates are approximately 170 percent, and weaning rates are approximately 145 percent. The total number of sheep soon after the end of the lambing period is approximately 6,500. The numbers of mature and young sheep retained vary according to research needs. Sheep in excess of those needed for hypothesis-driven research are not retained. USSES sheep harvest most of their feed through grazing. Sheep numbers are kept below range carrying capacity to maintain favorable range conditions.

Operations include traditional and on-going activities associated with sheep grazing research. In addition to ARS lands, National Forest (Snakey, Kelly, East Beaver, and Meyers Creek Allotments), Bureau of Land Management (Bernice Allotment), and Department of Energy (Mud Lake Feedlot) are also used for sheep research and grazing operations. When not being grazed, the sheep are maintained at the Mud Lake feedlot facility and in the feedlot facilities at USSES Headquarters (where lambs are born). Mud Lake facilities include sheep pens, water stations, feed storage facilities, feed mixing and delivery equipment, tractors to power feed mixing and delivery equipment, and pen cleaning equipment. Harvested feeds (e.g., alfalfa hay, barley straw, small grains, corn, and various co products) are used to formulate balanced diets for sheep when they are in the Mud Lake feedlot (Moffet, 2008)

Sheep graze across the landscape on a seasonal basis. Sheep numbers used to determine AUMs are based on a 10-year sheep inventory high of 3,331 head. Table 2 displays grazing areas utilized by sheep throughout a typical season. Sheep numbers in Table 2 are rounded to 3300, dates on and off each grazing area are average dates to display possible variations from year to year depending on weather and forage conditions.

Table 2. Proposed Action general sheep movement schedule

Dates	Activity (Grazing dates are approximate depending on range readiness)	ARS Lands
Mid-Late January - Late April to Early May	3300 sheep are maintained at Mud Lake feedlot facility leased from DOE and in the feedlot facilities at USSES headquarters (lambs are born at this time of year)	Yes / No
Late April to Early May	3300 sheep are turned out to graze on USSES headquarters lands in Idaho	Yes
Late April/Early May - Late June	3300 sheep Grazing on USSES headquarters lands in Idaho	Yes
Early June - Early Sept	2000 sheep are moved from USSES headquarters lands in Idaho to USSES lands at the Henninger Ranch property in Idaho (this move is a transition between the spring and summer feeding grounds) [a]	Yes
	650 sheep are moved from USSES headquarters lands to graze on USSES lands at the Humphrey Ranch property in Idaho (this move is a transition between the spring and summer feeding grounds; 250 ewes with lambs and 400 rams)	
Early July to Early Sept	650 sheep are moved from USSES headquarters lands in Idaho to East Beaver FS allotment	
Late June – Early July	2000 sheep moved to graze on Henninger	Yes
Early July - Early Sept	600 sheep herded across the Forest Service Meyers Creek allotment to summer grazing on East Summer Range, USSES lands in Montana -	Yes / No
	600 sheep (average number/year) moved from Henninger Ranch to Meyers and East Summer Range, (900 sheep two out of three years)	
	1400 sheep herded from the Henninger Ranch to summer grazing in the Odell Creek and Big Mountain areas of USSES lands in Montana. Each year two of the three following scenarios are followed: 1) two out of three years one group of sheep herded across FS Meyers Creek Allotment to summer graze in Toms Creek, USSES lands in Montana. 2) one group of sheep herded from Henninger Ranch to summer graze in Odell Creek area. 3) A group of sheep herded from Henninger Ranch are summer grazed in Big Mountain area of the West Summer Range. -	
	1,400 (average sheep numbers/year or 1100 two out of three years) sheep either at Odell or Big Mt, two out of three years, third year all 2,000 sheep are trailed to Odell and W Summer; no sheep to Meyers and E Summer	
	650 Sheep are moved from HDQ to East Beaver	
Early Sept – Mid Sept	2000 sheep from E and W Summer Range/Meyers move to Henninger	Yes/No
Mid Sept	2000 sheep move from Henninger to HDQ	Yes
	650 sheep from E. Beaver; 250 from Humphrey, (400 rams remain at Humphrey) move to HDQ	Yes
Mid Oct – Mid Nov	400 rams moved from Humphrey to HDQ	
Mid Oct	3300 sheep at HDQ	
Mid-October - Mid Nov	3300 Sheep are moved and maintained at the Mud Lake feedlot facility leased from DOE (this is when the ewes are mated)	
Mid Nov	2100 sheep are moved from Mud Lake to Snakey and Kelly, FS allotments. 400 Rams and 800 ewe lambs are retained at Mud Lake. [e]	No
Early November - Mid-Dec (based on allotment dates and or weather conditions)	2100 Sheep graze on Snakey and Kelly FS allotments	No
	1100 sheep graze on Snakey [b] 1000 sheep graze on Kelly [c]	

Dates	Activity (Grazing dates are approximate depending on range readiness)	ARS Lands
Late Nov - Mid Dec (based on allotment dates and weather conditions)	2100 Sheep are moved from Snakey and Kelly allotments to graze on BLM Bernice allotment [d]	No
Late Nov / Early February -	2100 sheep graze on Bernice allotment	No
Late Jan – Early Feb [f]	2100 sheep are moved to Mud Lake from Bernice allotment	No

[a] - Rams are not with ewes and lambs (2900 ewes and about 400 rams, this number is not exact and varies from year to year)

[b] - Snakey has 1200 sheep permitted for the allotment, Nov 6 to Jan 2, dates sheep are moved out of Snakey/Kelly is based on weather conditions, if there is early snow accumulation move out dates are earlier than permitted dates. Sheep would always be moved out of Snakey on or before January 12 and always moved out of Kelly on or before January 13. From Snakey and Kelly sheep are moved to BLM Bernice allotment.

[c] - Kelly has 1000 sheep permitted for the allotment, Nov 20 to Jan 3. From Kelly sheep are moved to BLM Bernice allotment.

[d] - Bernice has 1050 sheep permitted for the allotment, Nov 23 to Feb 1, and 1050 sheep permitted for the allotment, Dec 06 to Feb 5, from Bernice sheep are moved back to Mud Lake, then back to HDQ.

[e] – 400 Rams and 800 ewe lambs are retained at Mud Lake when 2100 sheep are moved in mid November to graze at FS and BLM allotments

[f] – Move date from Bernice to Mud Lake depends on snow conditions; early snow requires moving earlier than early Feb.

Sheep Grazing

Sheep graze across the landscape on a seasonal basis. Table 3 forage use and grazing dates are based on calculations using the best available plant productivity estimates and the high from the last 10 years of sheep inventory data (Moffet, personal communication) and demonstrates the expected distribution of AUM utilization (sheep only) for the past 10 years, present, and future. AUMs used are based on days shown in Table 2. Actual days when sheep would be on the range vary from year to year depending on weather and plant conditions. Average days and rounded sheep numbers, for a typical year, when sheep are moved on and off each range are shown in Table 2.

Table 3. Proposed Action: Annual AUM[a] utilized per property within the approximate[b] dates that are specified. The calculations are based on 3,331 sheep[c1].

Properties	AUM Available	AUM Utilized	Utilization Percent	Approximate Grazing Dates
Agricultural Research Service (ARS)	**48,667**	**3,311**	**6.8 %**	
Headquarters	28,353	1,598	5.6 %	April 23 – June 25; September 1 – November 1
Humphrey	4,476	603	13.5 %	June 1 – October 20
Henninger	1,914	455	23.8 %	June 25 – July 9; August 31 – September 15
Summer East (Tom's Creek	4,043	155	3.8 %	July 23 – August 31
Summer West (Odell Creek/ Big Mountain	9,881	500	5.1 %	July 9 – August 31
Leased (DOE, USDA-FS, DOI-BLM)	**26,087**	**1,516**	**5.8 %**	
Mud Lake	560	160	28.6 %	April 1 – June 1
Snakey-Kelly	1,756	421	24.0 %	November 8 – December 15
East Beaver	17,877	213	1.2 %	July 3 – September 1
Meyers Creek	3,076	71	2.3 %	July 5 – July 23
Bernice	2,808	650	23.2 %	December 15 – February 5

a - Animal Unit Month. By definition, one (1) AUM represents 790 lbs of dry forage consumed over 30.44 days by a 1,000-lb cow that is nursing a calf. For the purposes of this table, five (5) sheep[c] are equivalent to one (1) AUM.
b - Depending on weather conditions and day of the work week these dates may shift ± 7 days.
c - A sheep is considered a lamb that is weaned, a yearling ram or ewe, a mature ram or ewe, or a pregnant or lactating ewe with a lamb(s). Sheep numbers are rounded, for more specific sheep numbers see flow charts and spreadsheets in Project File.

Sheep Transportation by Truck

Sheep are trucked between grazing locations that are not contiguous or are not within trailing distance. Sheep are trucked from Headquarters to the Mud Lake Feedlot, Humphrey Ranch, and to Forest Service and Bureau of Land Management allotments.

Table 4. The number of sheep from Headquarters trucked in and out each year for each range area and allotment

Property	Sheep
Humphrey	1300
Winter Range (FS & BLM Allotments)	2100 (± 100 depending on year)
Mud Lake (DOE)	3,300 (± at shearing and breeding time)

Sheep Trail and Driveway Use and Maintenance

Trails and driveways are used to move sheep between grazing areas.

[1] Taylor. personal communication. USSES. 8/29/09

Trails

Sheep are trailed along existing roads to move sheep from Headquarters and Henninger properties to other grazing areas. Table 5 displays the sheep trails used by the USSES annually (Appendix A, ARS Overview with Sheep Trails, Map 3).

Table 5. Annual sheep trails

Trail	Description
Headquarters to Henninger	Trailing from Headquarters to Henninger follows a private unnamed two-track road part way with 90 percent of trailing on county roads (Spencer-Idmon and County Road A2)
From Henninger to Meyers	Sheep are trailed on County Road A2, sheep are moved or trailed while grazing through, Meyers Allotment to the East Summer Range
From Henninger to West Summer Range	Sheep are trailed on County road A2, and National Forest East Dry Road 327
When returning from East Range to Henninger:	Sheep are trailed on Keg Springs National Forest Road 042 and County Road A2
When returning from West Summer Range to Henninger	Sheep follow National Forest Road 327 and County Road A2
When returning from Henninger to Headquarters	Sheep are trailed on County Road A2, Spencer-Idmon Road, and the unnamed two-track road on private land
Sheep are trucked to Humphrey and East Beaver Forest Service Allotment	At Humphrey, sheep are trailed through a gate to the adjacent National Forest East Beaver allotment.
Sheep are trucked to Fs and BLM allotments and unloaded on National Forest Road 202.	Depending on snow depth, sheep are trailed along National Forest Roads 184, 279 and 202 to Snakey-Kelly National Forest Allotment. A temporary corral and mobile loading chute are set up on Road 202 for loading when sheep are moved off the Snakey-Kelly Allotment.

Driveways[2]

Sheep are moved along driveways, through timbered areas on East and West Summer ranges. Herders on horseback use working dogs to herd sheep from one grazing location to another. There are about four miles of maintained sheep driveways through timbered areas on the West and East Summer Ranges. Sheep driveway locations are shown on Appendix A, Sheep Drive Map 14 for East and Map 16 for West Summer Range.

Figure 1. Sheep Driveway, Odell Creek (point OD5 on field map – jf 08/07/08)

There are no sheep driveways on low elevation pastures, the only maintained driveways are through timbered areas in West Summer Range (Odell/Big Mountain) and East Summer Range (Tom's Creek). Annual driveway maintenance is done through the timbered areas. Small diameter downed wood across driveways is

[2] Driveway: Travel route used to herd sheep from one grazing location to another; sheep spread out over larger areas in open terrain, move slowly while grazing

retained on site; some limbing may be done on retained downed trees. New or recently fallen trees (greater than 10 or 12 inches in diameter) are cut out and removed (pulled back into adjacent timber stands) from the driveways each year. Occasionally sheep driveway trails are rerouted, closed, and rehabilitated. Driveways may be rerouted when a better route is located or an alternate route is needed for research. Driveways through timber patches and across meadows are short, generally less than ½ mile long. If adverse effects to soil or water occur, mitigation measures (cross drains with woody debris to divert overland flow) are implemented or a driveway segment maybe rerouted to avoid sensitive areas. Old driveways, no longer needed or used, are closed and rehabilitated; seeded with native species, brush or woody debris if available returned to the site, and animals are kept off to restore the area.

Table 6. Sheep numbers trailed on pastures as an average of last five years

Driveway	Length	Use Time	Horse	Ewes	Lambs
Summer West Pasture					
Skyline Unit - used twice a year	~1 mile	~2 hours	2	785	1,165
Odell Unit 6 - usually used once a year	~1/8 mile	~1 hour	2	785	1,165
Odell Unit 4 - usually used twice a year	~1/8 mile	~½ hour	1	785	1,165
Little Odell - used once a year	~¼ mile	~1 hour	1	785	1,165
Big Odell -- used once a year	~¼ mile	~1 hour	1	785	1,165
Big Mountain - generally used only once a year	~½ mile	~1 ½ hours	2	782	1,157
Corrals to Top - usually used 4 times a year	~½ mile	~1 ½ hours	2	782	1,157
Canyon Unit – used once or twice a year	~¼ mile	~45 minutes	2	782	1,157
Summer East Pasture					
Tom's Units 5 & 6 – used once or twice a year	~½ mile	~1 ½ hours	1	838	1,273
Tom's Units 6 & 7 - used once or less a year	~½ mile	~2 hours	1	838	1,273

At three to four week intervals, sheep are moved from grazing areas to staging areas for data collection. On these drives, sheep are spread out over larger areas in open terrain and moved slowly while grazing to reduce adverse effects on the travel routes.

Driveways are used only on years the pastures in the area are grazed, two out of three years. Each pasture is rested one year in three.

Stock Water Operations

In areas where water is not readily accessible at the USSES Headquarters, water is trucked to the sheep and unloaded into water troughs 12 feet long, 12 inches high, and 12 inches wide. Troughs are moved as grazing progresses across the pastures. The number of troughs used at each grazing area depends on the number of sheep to water; up to 25 troughs may be used for large bands, two troughs are adequate where small quantity (50 to 60 head) of sheep are grazed. There are 70 pastures at low elevation where water is trucked; about 80 watering sites are used. Each band has one watering site. Six to eight groups graze at the same time so that six to eight sites could be used at any given time. Watering sites are used for three to seven days and then moved. Areas up to ¼

Figure 2. Henninger ditch maintenance (jf)

acre in size are disturbed from sheep use around water troughs, and tend to have crested wheatgrass cover. Henninger and Humphrey pastures have surface water available for watering sheep. Summer pastures have surface water available for sheep and horses with developed sites on Big Mountain pasture described below.

Water Developments

Humphrey and Henninger

Humphrey and Henninger Ranches have developed ditches (Figure 2) to divert water onto grazing pastures while sheep are grazing the areas. Flood irrigation water is used to water sheep. Irrigation ditch

locations and flood irrigated areas located on Humphrey and Henninger pastures are shown on Appendix A, Map 11 and Map 12. Humphrey and Henninger Ranches were working ranches, purchased from the private sector in the 1940s. Irrigation practices were ongoing before ARS purchased the properties. Water is diverted, from Modoc Creek at Humphrey and from West Dry Creek at Henninger, with canvas dams, into diversion ditches to flood pastures at the time sheep graze in the area. Diverted irrigation water may be used annually, acres watered for each ranch varies, depending on stream flow at time of use. In dry years, very little water is used. Diverted water is used for watering sheep and irrigation provides more green forage longer during the dry season. Number of days water is applied varies from one year to next depending on needs and water availability. When sheep are moved out of the pasture water diversion canvas dams are removed, diversion is shut off. There are about two miles of irrigation ditch at each ranch. Humphrey ranch has rights for from May 1 to October 15. The Humphrey pastures are grazed from May to October. Henninger ranch has water use rights from May 1 to October 31, spring water use is not allowed until the water flow in Dry Creek no longer reaches Spring Creek in mid to late June. Diversion ditches are inspected and maintained annually.

West Summer Range

Water developments (Figure 3) sites located on the West Summer Range are shown on Appendix A, Map 16. There are five water developments, in the West Summer Range, in Montana on the Big Mountain area. Springs are developed with permanent troughs to collect water in low-flow areas needed to water 350 to 900 ewes and 1,250 to 1,400 lambs at one time. Water developments are also used by wildlife.

Figure 3. Upland water trough (jf – 07/160/8)

The five water development sites on the West Summer Range include four metal and one rubber trough. Four of the developments are flume type with metal troughs and metal or wood support structures. Flumes are 80 to 90 feet in length, approximately 20 to 24 inches in width, and 14 to 16 inches deep. The fifth development is a series of round rubber troughs, with about 10 gallons capacity each, installed at springs.

Developed water site locations shown on Map 16 include:

- Short Canyon = SENE 1/4 Section 6, T15S, T1W (Round rubber troughs).

- Lower Unit 3 = SENE Section 5, T15S, R1W (Flume trough).
- Unit 2 = SWNWNW Section 5, T15S, R1W (Flume trough).
- Upper Unit 3 = SESW Section 33, T14S, R1W (Flume trough).
- Unit 4 = NENESE Section 4, T15S, R1W (Flume trough).

Schedule of proposed water development activities though 2014

Humphrey

- Continue cleaning existing ditches with the ditching tool.
- Install two new Weir Boxes on Modoc Creek on National Forest lands to improve water measurement.

Henninger

- Continue cleaning existing ditches with the ditching tool.
- Install new concrete diversion head gate on National Forest lands (after approval by USFS. USFS will do NEPA analysis on this head gate project) . The new head gate will allow better measurement of the water usage and less erosion problems with the ditch.

Summer Range

- Replace two existing wooden water developments with metal structures.
- Continue annual spring cleanings for water sources.

Camp Tending

Sheep Herding Camps

Headquarters, Humphrey and Henninger Camps

Figure 4.Camp herder trailer (sw 05/08)

Low elevation pastures are administered from existing roads. Herder camps on low elevation spring, fall and winter pastures are equipped with a 12-foot long by 7-foot wide, four-wheel living quarters trailer (Figure 4) and a tow-behind camp commissary to transport dog food, oats, saddles, and other gear. These camps are located near existing roads and are moved with pickups as sheep graze through the pastures. Camp activities affect ¼ acre or less at each site. Camp site equipment and activities include a horse trough, a horse picketed on a 20 to 30 foot chain, and dog feeding area. Camps at low elevation pastures are visited by a camp tender at two-day intervals. Crested wheatgrass provides the primary ground cover at the ¼ acre or less campsites where camp activities

remove or trample sagebrush and other vegetation. Total area affected by campsites is a very small or is a negligible percent of the total pasture area.

Summer Range Camps

Summer camps include a seven foot by seven-foot teepee tent, no trough, horses are watered at natural water sites, one horse is picketed, and one horse is loose. Camp areas affect about a 50-foot radius, less than ¼ acre. Camps are moved every three to four days to progress with sheep grazing. Camps follow the sheep closely and with frequent moves have little effect on vegetation at the sites. Trash from herders' camps is transported back to USSES Headquarters for proper disposal in a dumpster that is emptied at a legal landfill. Table 7 shows the number of camps in each summer pasture and season used.

Table 7. Camps per pasture and season used

Range	Pasture	Camps per Pasture	Season Used
West Summer Range	Odell	9	July 10 – August 29
	Big Mountain	7	
East Summer Range	Tom's Creek	6	

Maintenance and repair of existing permanent fence

Fences

There are about 180 miles of permanent sheep fence on Headquarters, Humphrey, and Henninger ranches. All fences are inspected and repaired annually. Fence locations, including exclosures, are shown on each ARS pasture area maps in Appendix A. Fence types are shown in the map legend.

Pasture Fences

Sheep proof fences at Headquarters, Humphrey, and Henninger are maintained to confine sheep. An eight-foot high coyote proof fence is maintained at Headquarters (around, and subdividing, section 2, T10N, R36E. The eight-foot-high fence was constructed circa 1976 for coyote-sheep interaction research; the research project ended circa 1987, and the fence is maintained to provide a safe location for certain ewe-lamb studies

Figure 5. Example of coyote-proof fencing on Headquarters. (sw 05/08)

Horse Corral

The horse corral fence on West Summer Range, (Odell) pasture was constructed and is maintained to confine horses used for sheep trailing, camp tending and other sheep grazing management and research activities (Appendix A, Map 15). The north and west part of the horse corral is sheep proof net-wire with two strands of barbed wire above the net-wire. The south and east

portion of the corral is two strand barbed wire. All of the corral fencing on Odell pasture is let-down type. The drop fence is let down each year after grazing operations are complete.

Exclosures

Exclosures at Headquarters are sheep proof, maintained to exclude sheep from grazing excluded areas. The West Summer Range exclosures are drop fences, put up to exclude sheep when pastures in the exclosure areas are grazed. These drop fences are let down after sheep are removed from the pasture.

An eight feet high wildlife exclosure fence in section 7, T15N, R15S, Odell pasture, is maintained to exclude wild ungulates and sheep. An adjacent four foot-high sheep proof exclosure is maintained to compare grazing effects. This wildlife and sheep exclosure includes a riparian area. These exclosures are located and designed to compare and evaluate domestic and wild ungulate grazing effects on willow and other riparian vegetation. The entire fenced area is less than one-half acre.

Schedule of proposed fence maintenance activities though 2014

Headquarters

- Replace four miles of existing fence with new fence materials
- Clean-up nonfunctional research pens

Humphrey

- Replace three miles of existing fence with new fence at same location
- Continue clean-up of old nonfunctional fence lines and equipment

Henninger

- Replace two miles of existing border fence with new fence, metal braces, etc.

Summer Range

- Replace two miles of old horse pasture fence with new fence, metal braces, etc.
- Remove old range exclosures
- Continue repairs on existing exclosures with new posts and wire)

Maintenance and repair of existing roads and fire breaks

Roads *(Figure 6)*

Annual road maintenance is done on main roads as needed. Road segments with ruts or other maintenance needs are bladed or improved for efficient motorized travel. Each year approximately 20 miles of road need maintenance improvements. Road maintenance is contained within the road right-of-way.

Figure 6 Example of road on Headquarters (sw 05/08)

Schedule of proposed road work activities though 2014

Headquarters

- Annual road maintenance (pulling up the shoulders and smoothing out potholes). Any replacement gravel is hauled in from the State of Idaho gravel pits.
- Remove, clean, repair and reinstall six existing cattle guards
- Replace two existing culverts in the feedlot. Culverts are for spring runoff water

Henninger

- Continue to lightly grade the existing roads no new road construction is planned

Firebreaks

The firebreak around the headquarters area is maintained annually with a motor grader to provide a mineral soil break about 20 feet wide. Chemicals may be used to control noxious weeds on the Headquarters firebreak. Weed management is described in the pest control section below. Firebreaks 15 to 20 feet wide down to mineral soil are constructed around prescribed burn areas including blackline burn areas.

Figure 7. Cleared firebreak –fy 2008

Prescribed burn firebreaks are constructed with a dozer and motor grader. Burn unit firebreak lines (Figure 7) and blackline firebreaks (Figure 8) are generally within 50 to 200 feet of each other. Cleared firebreaks around burn units are also used for vehicle and equipment access during burn operations and for research during and after the areas are burned. Fire breaks not needed for motorized access for research are rehabilitated. Shrub and grass debris removed from firebreaks is pulled back and spread over the cleared area on firebreaks not needed for research access after the burn, generally within the same season.

Figure 8. Blackline – fy 2008

Firebreaks around prescribed burn areas are not maintained. They are not seeded and are left to revegetate with native species. Windrowed shrubs, grass, litter, and top soil are pulled back and spread over the firebreak with a motor grader. Invasive, noxious weeds have not been a problem on the cleared firebreaks. *Bromus tectorum L.* (cheatgrass), present since 1930s, shows up on some cleared areas but is not persistent at this elevation or environment. A study of cheatgrass encroachment is continuing on the 2005 Hitching-Post Burn at Headquarters Range in parts of sections 5, 6, 7, and 8 T11N, R37E (Taylor 2008).

Range Improvement

Prescribed Burning

Prescribed burning, to improve range land, has been conducted on ARS land since 1936. ARS plans to burn Headquarters pasture areas on a 30 year rotation, this would equal about 900 acres each year, actual burn area has been less than the planned 30 year average acres. Burn records show the following acres burned:

- Past 30 years, 1978 to 2007; 5,400 acre prescribed burn and 13,867 acres wildfire
- Past 10 years, 1998 to 2007; 2,672 acres prescribed burn and 1,208 acres wildfire

Total area burned with wildfire and prescribed fire in past 40 years is 23,147; 580 acres/year. The Headquarters Prescribed Burn Map 8 displays prescribed burn areas and years burned. (Appendix A) Headquarters Wildfire History Map 6 displays wildfires and year burned (Appendix A). In the past 30 years, burns have been done primarily in fall, with minor amounts of spring and late summer burning. Wildfire burn areas are evaluated and included when planning prescribed burns. Burning is conducted, on about 200 acre average size units, primarily in spring and fall. Burning, for research to improve forage production benefits wildlife habitat by providing a mosaic of burned and unburned sites. Burn effects research has been the main objective of prescribed burns after 1990. Prior to 1990 burning was done to increase forage production and improve range conditions. Burn research, to determine species composition, range health and productivity, dates back to 1936. Research with statistically valid replicated plots of unburned areas is done within the larger fire area. Burning is done is to simulate wildfire frequency and approximate natural fire cycles with a burned-unburned mosaic. Prescribe burn research includes effects on vegetation recovery with sheep grazing, before and after the burn, on rangeland ecosystems.

Burns are designed to consume 95 percent of the vegetation. Remote sensing is used to evaluate fire intensity and to determine if objectives have been met. The main adverse effect of burning is temporary loss of vegetation and ground cover litter for soil protection. Within two years, after burning, forb and grass cover returns to replace pre-burn shrubs. Shrub cover returns and again replaces grass and forbs after several decades. Current burn effects monitoring is being done to determine wind caused soil transport on burn areas (Moffet 2008).

All burning completed in 2008 and spring 2009, was located on areas that had been previously prescribe burned. Total burn area for fall 2008 and spring 2009 is 474 acres, plus 29 acres of black line burn. . Burn unit locations are shown on ARS-Headquarters Prescribed Fire History Map 8, Appendix A.

An 11,803 acre landscape area has been identified for future burn opportunities. About 2000 acres within the identified area would be burned in the next five years (2015), an average 400 acres/year. ARS-Headquarters Prescribed Fire History Map 8, Appendix A identifies the area where burning would be done. Specific locations for each burn unit would depend on research needs. Burn units are unlikely to have complete combustion; therefore there would be unburned areas within the burn unit perimeter. Prior to burning an individual burn plan would be prepared (see example in Interim U.S. Sheep Experiment Station Grazing and Associated Activities Project Environmental Assessment, Appendix 4: Statement of Work – Prescribed Burns – Dubois, Idaho 2008).

Seeding

Crested wheatgrass was planted on Dubois ARS lands about 1940 (National Wool Growers, 1947 and 1948, photo of planting results is dated 8-22-1941). Plantings were at 5,800 feet elevation with 12 inch precipitation. Plantings produced forage for eight sheep months/acre. Large areas were planted with wheatgrass on Headquarters property in 1960s (Jacobson 09-2009 personal communication).

Recent plantings include fifty-two acres of the 2001 burn area at Headquarters with a mixture of native and introduced species in April 2002. Fifty-two acres of forage Kochia, Bitterbrush, and crested wheatgrass planting are planned for 2011. Various forage Kochia varieties are planned for planting on 240 acres in 2014.

A successful seeding at Henninger was first done on about 30 acres in the West Meadow on October 22 and 23, 1981. The second seeding on 35 acres, a no-till effort, at Henninger East Meadow in 1986 failed. The same area was plowed in the fall of 1989 and successfully seeded in the spring of 1990.

Occasional reseeding has been done on Humphrey Ranch, 11 acres were reseeded in 2005, and 20 acres were seeded about 1988. Forty-eight acres of the 2000 wildfire burn area were seeded in spring 2001. A native seed mix, an introduced mix, and a mix with natives and introduced species were applied to test results.

Eleven and one half acres were planted to spring wheat at Humphrey in 2008, in 2009, 11.5 acres were planted to Triticale. Eight acres are planned for seeding at Humphrey in 2010 and nine acres are planned for 2011. Specific acres and planned species to be planted are included in Project File.

Eighteen acres on the Big Mountain grazing Area, (West Summer Range mine disturbed site), were seeded with a mix of Luna pubescent wheatgrass, Tekmar/Rush intermediate wheatgrass, Covar sheep fescue, and yellow sweet clover in 2002, this planting failed.

Complete seeding records are available at the Dubois Headquarters range office.

Cattle and Horse Grazing

Cattle and horse grazing with cooperative research is used periodically to improve sheep range conditions. Cattle and horses consume vegetation that sheep typically do not harvest, create more uniform pastures for grazing research, reduce residual on-site forage for other rangeland research, and reduce fuel loads and fire risk. Cattle and horse grazing is used mainly on the Headquarters range, with occasional cattle grazing on Humphrey and Henninger ranches. The number of animals used varies from year to year depending on research needs and vegetation conditions. Cattle or horse numbers used are based on the

area and amount of vegetation needed to be removed. No cattle were grazed in 2006 due to drought conditions. Cattle are primarily used with limited horse grazing in past. Pastures are evaluated for forage removal needs and mapped to determine livestock stocking. Grazing bids are solicited and awarded to private livestock owners. Number of animals, number of days, and areas grazed are tracked with detailed yearly records included in the Dubois Station records.

Cattle grazing from November 1 to January 1 started in 1998. Six headquarters pastures are grazed with cattle or horses. The Headquarters range grazing pasture units vary from 160 to 900 acres, cattle grazed 500 acres in 1998 (Williams 2008).

Predator Avoidance and Abatement

Large predators have not been a problem with sheep grazing on ARS lands. Sheep are moved, when large carnivores enter the current grazing area, to avoid conflict. USDA, Animal and Plant Health Inspection Service (APHIS), Wildlife Services and US Fish and Wildlife Service is contacted and used to manage wolf, bear, or mountain lion encounters. USSES staff or Wildlife Services are used to remove problem coyotes. Records indicate few large carnivore encounters in the past.

Integrated Pest Management

Noxious Weeds

There are few weed problems on ARS pasture lands. The minimal weed infestations that are present are located in sheep pens and along roads. Some weed species are present on adjacent lands where cattle graze, and, over time, the adjacent weeds invade ARS lands. Invasive plant species infestations on ARS lands are GPS (Global Positioning System) mapped. Area or patch infestations are mapped as polygons and included in the USSES records. Roadside noxious weed locations are identified on hard copy maps and recorded for treatment, as they are found.

Precautions are taken by ARS to minimize weed spread from sheep. To accomplish this, areas with weeds are grazed in spring when there is little or no risk of spreading weed seeds. ARS also quarantines animals for six days before moving sheep from weed infested areas or from feed with potential weed seeds to other grazing units. ARS does not graze areas when weed seeds are developed and there is risk of spreading seeds to another area.

ARS uses an adaptive management/integrated pest management approach for control and eradication of exotic, invasive weeds. This integrated approach is coupled with research on ecosystem functions and native plant communities and with research on weed seed production and spread with sheep grazing. As primary weed control, this integrated approach includes the use of strategic sheep grazing as a biocontrol method to reduce the production of weed seed and the spread of weeds. Other biocontrol methods, such as specific species of beetles, alone or in combination with other biocontrol methods, are also used.

Herbicide application is used minimally on invasive weed species that are not consumed by sheep. Herbicides have been used annually to control weeds along roadsides, in feedlots and corrals, small pastures (< 10 ha), and near building structures for about 30 years. Vegetation monitoring is conducted before and after grazing, which includes annual measurements of invasive weeds, native plant density, occurrence frequency, along with collecting annual or biannual aerial (100 to 200 m above-ground-level) and on-the-ground (1 to 2 m) digital imagery of grazed and non-grazed areas. Post treatment monitoring is conducted with site visits at five year intervals. A description, target species and example of USSES noxious weed strategy is included in Appendix 2 of the Interim U.S. Sheep Experiment Station Grazing and Associated Activities Project EA.

Mitigation Measures

Grizzly Bear

The Wildlife Report is hereby incorporate by reference. Mitigation measures include:

- Minimize the availability of all unnatural attractants to bears. These include livestock carcasses, human foods, garbage, and dog food.
- Consider potential livestock-bear conflicts when creating research plans that include a sheep grazing component, and avoid areas with anticipated problems.
- Use good husbandry practices so that sheep are healthy and suitable for research. ARS Institutional Animal Care and Use Committee evaluates all research protocols that include animals and all standard livestock management practices to assure compliance with Federal laws that govern use of agricultural animals in agricultural research. Assure standard management practices are consistent with good animal husbandry. Protocols and practices that do not comply are not approved, and animals cannot be used unless protocols and practices are in compliance.
- Based on arrangements between USDA, Agricultural Research Service and USDA, APHIS, Wildlife Services, when on Agricultural Research Service land report potential and existing bear activity and(or) conflicts to Wildlife Services. Wildlife Services then contacts whatever agencies should be contacted.
- When on USDA, Forest Service or on DOI, Bureau of Land Management land, ARS contact the Forest Service or Bureau of Land Management, respectively, and Wildlife Services. Wildlife Services handles wildlife issues on behalf of the Agricultural Research Service.
- When on Agricultural Research Service, Forest Service, and Bureau of Land Management land, use approved, “bear-proof” containers. Damaged containers are repaired or replaced so that they work as designed.
- Conduct at least two formal training-orientation meetings annually with USSES employees to make sure they can identify black bear, grizzly bear, bighorn sheep, mountain lions, etc., understand USSES sanitation and garbage removal practices, know how to use nonlethal methods to minimize livestock-wildlife interactions, who to contact and how to do it if they anticipate or experience a problem, and a variety of related issues.
- Training and education are ongoing and not limited to formal meetings.
- Keep herders, working dogs, and guard dogs with ARS sheep when they are on rangelands, and basically follow the “best management practices” that are listed in the file, entitled Bernice Snakey Kelly Allotment BMPs 7-14-2009.doc

Sheep Driveway

At the sheep driveway crossing on Odell Creek in section 11, T15S, R2W there is bare soil, 10 feet wide for about 150 feet on the south side of the crossing, on 15 to 20 percent slope. To divert overland flow and prevent soil transport into Odell Creek, cross drains would be constructed on the driveway trail. Place three 10 to 12 inch diameter logs (available in the adjacent timber stand) angle imbedded three inches deep across the trail to divert runoff into undisturbed areas with existing vegetation ground cover and down woody debris. The three cross drains would be placed 40 to 50 feet apart, at sites where the trail

grade is less than 10 percent, for efficient cross drain function and to minimize maintenance needs. Cross drains would also be constructed on the narrow trail further to the west. This trail segment is eroding into a washed out trench, cross drains would divert water off the trail and eliminate further down cutting. Cross drains would be monitored and maintained annually. The sheep driveway crossing on the south fork of Odell Creek near the south line, section 14, T15S, R2W, is low impact, with grass and forb cover and little adverse effect.

Herbicide Application

- Follow all label directions for application
- Any herbicide application is limited to the minimum amount of active ingredient (pounds of active ingredient/acre) as analyzed in the current SERA. All guidelines and safety precautions would be followed in any application of chemical materials. By following all guidelines and safety procedures.

Heritage

To ensure protection for cultural resources (Heritage Report is hereby incorporated by reference).

- Review proposed undertakings with the State Historic Preservation Officers prior to implementation.
- If unanticipated discoveries are found during project activities, cease all operations in the vicinity of the discovery until assessed by a professional archaeologist or historian.
- Develop a survey strategy and facilities management plan and schedule during the second stage of the NEPA analysis.

Affected Environment

The U.S. Department of Agriculture (USDA), Agricultural Research Service, U.S. Sheep Experiment Station Headquarters is located in the upper Snake River plain at the foothills of the Centennial Mountains, in Clark County, about six miles north of Dubois, Idaho. Agricultural Research Service, USSES, Dubois station manages and grazes lands for research in Montana and Idaho. An overview of the grazing areas is described below (also see Appendix A Maps).

Headquarters Range, 27,930 acres of ARS land, includes office, laboratory, animal, equipment, and residential buildings, dry-lot facilities for research throughout the year, lambing facilities, and lands used for spring and autumn grazing and rangeland research. Headquarters pastures are located in T11N, R36E, sections: 1, 11, 12, 13, 14, 16, 22, 23, 24, 25, 26, 27, 34, 35, 36; Part of sections: 2, 9, 10, 15, 17, 20, 21, 28, 33. T11N, R37E sections: 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 19; Part of sections: 2, 3, 4, 11, 14, 20, 22, 23, 29, 30, 31. T10N, R36E, sections: 1, 2, 11, 12. T10N, R37E part of sections: 6, and 7.

West and East Summer pastures, 16,600 acres of ARS land, in the Centennial Mountains of Montana, are used for summer grazing and rangeland research. West Summer Range is located in: T15S, R2W, unsurveyed Sections: 1, 2, 3, 4; Part of sections: 5, 9, 10, 11, 12, 13, 14, 15, 16, 22, 23 T15SR1W sections: 4, 5, 6, 7; Part of sections 8, 9, 10, 18, 19. T14S, R1W Sections: Part of sections 31, 32, 33, 34. East Summer range is located in T14S, R1E: 34; Part of unsurveyed sections 25, 26, 27, 28, 32, 33, 35. T15S, R1E sections: Part of sections 1, 2, 3, 4, 5, 6.

Humphrey Ranch, 2,600 acres of ARS land north of Headquarters in Idaho, has animal facilities and equipment buildings, and is used for spring, summer, and autumn grazing and rangeland research, located in T14N, R36E: Part of sections 19, 20, 21, 22, 27, 28, 29

Henninger Ranch, 1,200 acres of ARS land near Kilgore, Idaho, has animal facilities and is used for summer, spring and fall grazing and rangeland research, located in T13N, R39E Section: 25 and Part of sections: 24, 36. T13N, R40E Sections: 19, 30.

Throughout the year, sheep utilize Bureau of Land Management, Forest Service, and Department of Energy (Appendix A, Map 2) lands. These lands will be included in this analysis as appropriate. However, use of these lands is covered under separate agreements with those agencies and will not be part of this decision.

The basis for the following summary of the existing range conditions of the Agricultural Research Station is the U.S. Sheep Experiment Station Grazing and Associated Activities Project 2009, Rangeland Assessment Report.

AUMs, grazing dates and percent forage utilization by property are shown in Table 3.

Spatial and Temporal Context for the Effects Analysis

The spatial boundary for range cumulative effects analysis is ARS, USSES lands and leased lands used for grazing throughout each year. The temporal boundary will represent resource impacts that occur across timeframes of five years. The five-year timeframe allows for yearly fluctuations while being an appropriate timeframe to identify range condition and trend.

Existing Condition

Headquarters Pastures (Figure 9)

The Headquarters rangelands are currently in a state of transition with sagebrush range sites converting to woody dominated sites with a diminishing herbaceous understory; which is a natural seral condition. The current seral state overall for the Headquarters pastures is late mid seral. The historical plant community for a majority of the Headquarters rangeland sites would have a higher percent of grasses than sagebrush.

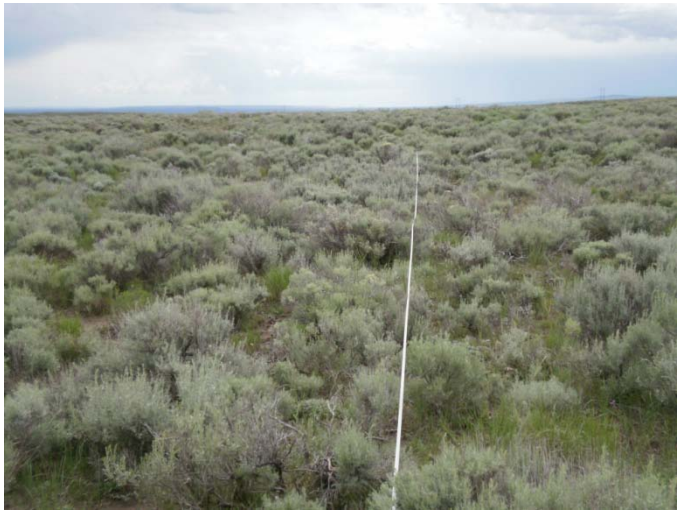


Figure 9. Headquarters pasture (tg 08/09)

Headquarters soils are stable, with an appropriate diversity of forbs, shrubs, and grasses. With rotational and deferred grazing and light stocking, utilization is none to slight (Table 3). Only small areas (sheep driveway, trailing, watering, bedding) less than 50 total acres, showed heavy use.

Yearly growing season rest across a majority of Headquarter and the use of summer ranges is benefitting Headquarters, Humphrey and Henninger range resources by reducing amount of vegetation grazed during the growing season. Continued use of prescribed fire in Headquarters improves forage by reducing amount of sagebrush cover and increasing forbs and grasses.

The Natural Resource Conservation Service conducted a range survey on Headquarters property in 1994. Survey findings by percent of property area were: excellent condition one percent, good condition 63 percent, fair condition 31 percent (NRCS 1995). The2009 visual survey results agree with the 1995 NRCS survey.

Henninger Ranch Pastures (Figure 10)

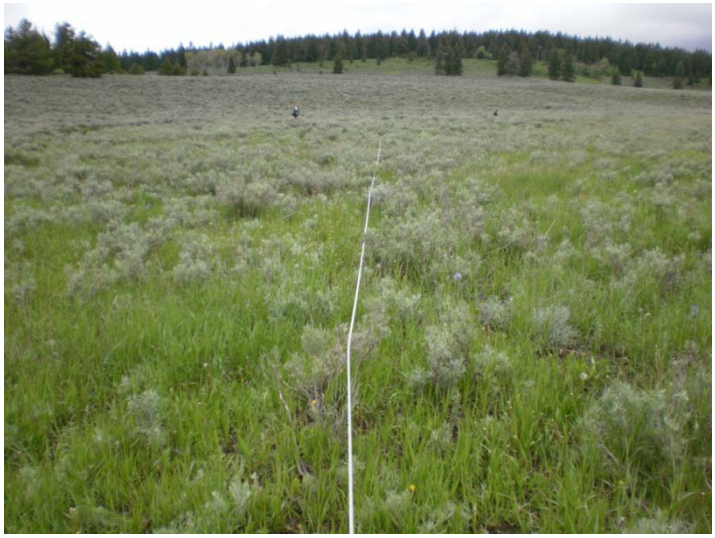


Figure 10. Henninger Ranch pasture (tg 08/09)

The Fair range condition appears to be static; recovering from past cattle grazing and early agricultural practices. Current grazing from June 25 through July 29 and again August 31 through September 15 are assisting with recovery.

Field surveys, 2009, indicated Moderate to Heavy browse species use was observed and may be from deer and elk grazing.

Historically, the ranch primarily grazed cattle up until purchased by the U.S. Sheep Experiment Station in the early 1940s. The presence of smooth brome (*Bromus inermis)* in pastures indicates that it was planted for cattle feed. Smooth brome is not preferred by sheep and is spreading into native vegetation areas and increasing in density.

Seeding

A successful seeding at Henninger was first done on about 30 acres in the West Meadow on October 22 and 23, 1981. The second seeding was on 35 acres, a no-till effort, in the East Meadow in 1986 failed. The same area was plowed in the fall of 1989 and seeded in the spring of 1990. The 1990 effort was very successful.

Humphrey Ranch Pastures (Figure 11)

The Humphrey Rangeland site is thriving in an early mid seral state. This site is very stable and has an appropriate diversity of forbs, shrubs, and grasses. Fire has historically occurred on this site at 20 to 50 year intervals. Fire has occurred on the site within the last 20 years.

Figure 11. Humphrey Ranch pasture (tg 08/09)

Utilization is Light with rams and small groups of sheep grazed here. Rotational and deferred grazing with light stocking rates have allowed for good range conditions with a static or slight upward trend. Only small areas, less than 50 total acres, where sheep are trailed, watered and/bedded showed heavy use.

East Summer and West Summer Ranges (Figure 12)

In 2009, the Summer Ranges had a high diversity of forbs, grasses, and shrubs due to the high precipitation received in the form of snow and rain.

Figure 12. East Summer and West Summer range (cj 08/09)

Sheep grazing takes place during the summer only and is rotated between East Summer (Tom's Creek) and West Range (Big Mountain and Odell) grazing units which results in a pasture receiving rest one year in three. Recent fires on Agricultural Research Service lands that occurred during the fall favor forb growth. Above average precipitation, and below average temperatures in 2009, gave forbs a boost in production. Exclosures in East and West Summer Ranges showed no visual difference in composition, vigor, or production over areas grazed. This is consistent with Klement's 1997 findings. All sampled components were similar both inside and outside of exclosures. Figure 13 - Figure 15 display grazing effects at fence-line sheep exclosure in West Summer Range (Odell).

Figure 13. Fence-line along sheep exclosure

Figure 14. Same location away from exclosure

Figure 15. Same location inside exclosure - West Summer Odell Unit (grazed area) (cj 08/09)

Figure 16. Driveway bottleneck West Summer (cj 08/09)

Figure 16, West Summer – Big Mountain, shows the sheep driveway where some exposed soil is evident. Impacts to areas subject to concentrated localized activity such as the driveways, are mitigated by rest one in three years, and are considered short-term impacts. Note willows (brush) are vigorous and are protecting intermittent stream course at toe of slope (Figure 16). Driveway impacts are not characteristic of the Summer Ranges or grazing units within them, where light stocking grazing activities are spread across the large landscape with minimal effects. Rotational and deferred grazing (rest one in three years), None to Slight utilization and light stocking (Table 3), commitment to adaptive management and best management practices have resulted in good range condition and slightly upward trend.

Visual review of the grazed pastures during 2009 field surveys supports U.S. Sheep Experiment Station records (Table 3) of grazing well below accepted utilization standards.

Sheep grazing impacts visually contrast with cattle use. As sheep are continually herded they graze in tight patterns across the landscape. This, coupled with herd size, (approximately 900) can result in as much tramping of vegetation as grazing (Figure 17 - Figure 19).

Figure 17. West Summer Range, Odell. Upslope -Left side is ungrazed while right demonstrates herd grazing

Figure 18. West Summer Range, Odell. Down-slope – Note ungrazed areas bordering grazed/herded area

Figure 19. Grazed area exhibits minimal exposed soil and excellent residual litter. (cj 08/09)

A comment received during Scoping indicated that the head of Tom's Creek is a concern. Current condition is related to past grazing, wildfire less than 50 years ago, and harsh site location (aspect/slope/elevation), all of which combine for a slow site recovery. Bare soil and lack of plants is not tied to current grazing. Figure 20 and Figure 21 display the existing conditions for the area of concern in Tom's Creek that was noted in Scoping comments. A diversity of plants and good production indicate that this area is recovering.

Figure 20. Below area of concern Tom's Creek. – 8/09

Figure 21. Area of Concern Tom's Creek – 8/09

Methodology for Analysis

Short-term effects represent impacts that occur year to year, or for this analysis, across a time-span of up to five years (short-term monitoring should generally occur on an annual basis or at least once in every three years. Long-term effects for this analysis represent resource impacts that occur across timeframes for five years or more (generally, long-term monitoring occurs every five to ten years). For this analysis, sheep grazing effects are discussed for Agricultural Research Service rangelands.

This effects analysis is based on current scientific literature, professional judgment, and experience in the field of rangeland management.

The Rangeland Assessment (Grooms, 2009) evaluated and assessed the Headquarters, Henninger, Humphrey, and East and West Summer Ranges using an interdisciplinary team consisting of rangeland management specialists, a wildlife biologist, a soil scientist, and a hydrologist. Documents and publications used in the assessment process include the Soil Survey of Grant and Freemont County, Idaho (NRCS 1999), Ecological Site Descriptions for Major Land Resource Area Bllb, Blla, B13 (NRCS 1982) Interpreting Indicators of Rangeland Health (USDI-BLM et al. 2000), Sampling Vegetation Attributes (USDI-BLM et al. 1996), and the National Range and Pasture Handbook (USDA-NRCS 1997). A complete list of references is included at the end of this Range Specialist Report (2009) The method used to obtain the data is the line intercept method that consists of a horizontal, linear measurement of plant

intercepts along the course of a line (tape). It is designed for measuring grass or grass-like plants, forbs, shrubs, and trees. The line point intercept method measures vegetation along a given distance and from those measurements plant composition is extrapolated.

The Rangeland Assessment and associated project file are incorporated by reference for this analysis.

Potential effects of the proposed management activities by alternative are evaluated using the following criteria:

There are no federal laws and regulations applicable to grazing ARS rangelands. The existing condition is considered the baseline for comparison of alternatives.

Proposed management activities have been evaluated using vegetation condition, forage utilization, and management or operations flexibility.

Vegetation condition can be: Excellent Up, Down, or Static, Good Up, Down, or Static, Fair Up or Static, Fair Down, Poor Up, Down, or Static, Very Poor Up, Down, or Static.

Forage Utilization (Table 8) is defined as amount of vegetation grazed at the end of the grazing season. Percentage figures apply to current year's growth of key forage species on a site.

Table 8. Utilization

Level of Use	Percentage of grazed
None to Slight	0 to 10%
Light	10 to 30%
Moderate	30 to 50%
Heavy	Greater than 50 %

Flexibility and adaptive management is defined as flexibility in management options for where, when, and how long sheep graze a range. Increased options (where/when/duration) increase ability to practice adaptive management. Flexibility could be: no flexibility poorly adaptive; some flexibility moderately adaptive; or maximum flexibility highly adaptive.

Rangeland condition is a function of rangeland forage: condition, trend and utilization. The focus of the analysis of effects to the rangeland resource is on browse and forbs, which are the primary forage types used by sheep. Effects to these forage types determine long-term sustainability of the rangeland resource. Therefore, they are a key factor to take into consideration for this analysis of effects.

Environmental Consequences

Alternative descriptions below display the differences between Alternatives 2-5 and the Proposed Action (Alternative 1). Table 9 displays the ARS properties or allotments where grazing would or would not occur under Alternatives 1-5. When not being grazed, sheep are maintained at the Mud Lake feedlot.

Table 9. Grazing Properties by Alternative

Properties	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	Proposed Action / No New Federal Action	No grazing would occur on the Headquarters, Summer East, Summer West, Henninger, and Humphrey pastures as well as on the following allotments: Snakey Kelly, East Beaver, Bernice, and Meyers Creek allotment	No grazing would occur on the Summer East, Summer West, and Humphrey pastures as well as on the following allotments: East Beaver and Meyers Creek allotments.	No grazing would occur on the Summer East range as well as on the Meyers Creek allotment	No grazing would occur on Snakey Kelly and Bernice Allotments
Agricultural Research Service (ARS)					
Headquarters	Grazing	*No Grazing*	Grazing	Grazing	Grazing
Humphrey	Grazing	*No Grazing*	*No Grazing*	Grazing	Grazing
Henninger	Grazing	*No Grazing*	Grazing	Grazing	Grazing
Summer East	Grazing	*No Grazing*	*No Grazing*	*No Grazing*	Grazing
Summer West	Grazing	*No Grazing*	No Grazing	Grazing	Grazing
Leased (DOE, USDA-FS, DOI-BLM)					
Mud Lake Feed Lot	Grazing	Grazing	Grazing	Grazing	Grazing
Snakey-Kelly	Grazing	*No Grazing*	Grazing	Grazing	*No Grazing*
East Beaver	Grazing	*No Grazing*	*No Grazing*	Grazing	Grazing
Meyers Creek	Grazing	*No Grazing*	*No Grazing*	*No Grazing*	Grazing
Bernice	Grazing	*No Grazing*	Grazing	Grazing	*No Grazing*

Alternative 1 - Proposed Action (No New Federal Action)

Direct and Indirect Effects

Alternative 1, the Proposed Action would continue ongoing sheep grazing and associated activities that have been historically occurring in conjunction with ARS, USSES research to develop integrated methods for increasing production efficiency of sheep and to simultaneously improve the sustainability of rangeland ecosystems. These activities enable the USSES to carry out the mission for which the USSES was established by executive order and public law.

The Proposed Action is also considered the No Action alternative, because no new federal actions are proposed, merely a continuation of the historic and existing activities already occurring on the USSES, Dubois, Idaho.

Headquarters

Continuation of current grazing would have little effect on this range. Based on available data, there is little or no difference between the grazed and ungrazed areas now and little room for improvement. Rotational and deferred grazing with light stocking rates would continue to maintain Fair range conditions

with a Static trend. Current season of use would continue to provide growing season deferment across the majority of this unit each year. This range would continue to perform its natural ecological function. Soils would continue to be stable, and there would be an appropriate diversity of forbs, shrubs, and grasses. Only small (less than 10 acres) areas representing less than three percent of Headquarters (trailing/watering/bedding) would continue to show Heavy use.

Associated activities (prescribed burning, seeding, noxious weed control, fence maintenance, cattle and horse grazing, stock watering) would continue. These activities would contribute to good range condition. Prescribed burning would continue to reduce shrub (sagebrush, *Artemesia ssp*) density. Weeds are not a problem and continued weed control (grazing/herbicide application) would help keep weeds in check. Cattle and horse grazing during the non-growing season would continue removing last-season grass growth. Forage removal with infrequent light stocking of cattle and horse grazing would contribute to grass growth. Fence maintenance would continue to control sheep grazing within units and prevent livestock trespass. Stock watering would continue to move sheep by varying water sites to little-used areas.

Humphrey

Continuing current grazing would have little effect on this range. Based on 2009 range surveys there is little or no difference between grazed and ungrazed areas now, with little room for improvement. Rotational and deferred grazing with light stocking rates would continue to maintain fair range conditions with a static trend. Humphrey soils would continue to be very stable, and there would be an appropriate diversity of forbs, shrubs, and grasses. Light stocking with less than 400 rams and 200 ewes would continue. Only small (less than 10 acres) areas representing less than three percent of Humphrey property (trailing, watering, bedding) would continue to show heavy use.

Continued associated activities, seeding, noxious weed control, fence maintenance, cattle and horse grazing, would contribute to good range condition. Weeds are not a problem and weed control with sheep grazing and spot herbicide application would continue to keep weeds in check. Cattle and horse grazing during the non-growing season would continue to contribute by removing last-season grass growth. Dormant vegetation removal by infrequent light stocking of cattle and horse grazing would continue to enhance forage production. Fence maintenance would continue to control sheep grazing within units and prevent livestock trespass use from surrounding private lands.

Henninger

Soils are stable and diversity of forbs, shrubs, and grasses is appropriate although there is a concern. Range condition is Fair and appears in Static trend. Utilization is light on forbs/grasses (Table 3). Field survey 2009 (visual) found Moderate to Heavy use on browse. This may be from early and late deer and elk grazing. Historically, the ranch primarily grazed cattle up until purchased by the U.S. Sheep Experiment Station in the early 1940s. The presence of smooth brome (*Bromus inermis)* in pastures indicates that it was planted for cattle feed. Smooth brome is not preferred by sheep and is spreading into native vegetation areas and increasing in density.

Only small (less than 10 acres) areas representing less than two percent of the area grazed (trailing/watering/bedding) showed heavy use. Season of use is June 25 - July 9 and August 31 - September 15.

Associated activities (noxious weed control, fence maintenance, predator mitigation measures) would continue. Effects would be the same as for Humphrey Ranch noted above.

East Summer Range (Tom's Creek)

Continuation of current grazing would have little effect on this range. Based on available data, there is little or no difference between the grazed and ungrazed areas now and little room for improvement. Light forage utilization and good range conditions with static or slight upward trend would continue. Soils would continue to be stable with an appropriate diversity of forbs, shrubs, and grasses. Rotation and rest one year in three with light stocking have developed good range conditions with a continued stable or upward trend. A comparison of exclosures that have not been grazed in 30 years to areas outside exclosures, showed no differences in composition. Forb production in 2009 was high and would be expected to continue with current stocking. Only small (less than 50 total acres) areas (sheep driveways, trailing, watering, bedding), representing less than two percent of East Summer Range, showed heavy use and this would be expected to continue.

Driveway maintenance would continue to facilitate moving sheep to graze underutilized areas.

West Summer Range (Odell/Big Mountain)

Continuation of current grazing would have little effect on this range. Based on available data, there is little or no difference between the grazed and ungrazed areas now and little room for improvement. Light forage utilization and good range conditions with static or slight upward trend would continue. Soils would continue to be stable with an appropriate diversity of forbs, shrubs, and grasses. Rotational and rest one year in three with light stocking have developed good range conditions with a stable or upward trend and would continue. Only small (less than 50 acres) areas (sheep driveways, trailing, watering, bedding), representing less than two percent of West Summer, showed heavy use, and this would be expected to continue.

Alternative 1 - Summary Range Direct/Indirect Effects

Table 10 displays available forage in AUMs, AUMs used, percent of available forage used, grazing period used during the year and number of days grazed by property.

Table 10. Alternative 1 – percent of forage used, grazing period and grazing days by property[c]

Property	Available Forage AUMs[a]	AUMs Used[a]	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing Days[b]
Headquarters	28,353	1598	5.6	April 23 – June 25	86
				Sept 1 – Nov 1	61
Humphrey	4,476	603	13.5	June 1 – Oct 20	142
Henninger	1,914	455	23.8	June 25 – July 9	15
				Aug 31 – Sept 15	16
East Summer[d]	4,043	155	3.8	July 3 – Aug 31	60
West Summer[d]	9,881	500	5.1	July 9 – Aug 31	54

[a] - Animal Unit Month. By definition, one (1) AUM represents 790 lbs of dry forage consumed over 30.44 days by a 1,000-lb cow that is nursing a calf. For the purposes of this table, five (5) sheep are equivalent to one (1) AUM.
[b] - Depending on weather conditions and day of the work week, these dates may shift ± 7 days.
[c] - A sheep is considered a lamb that is weaned, a yearling ram or ewe, a mature ram or ewe, or a pregnant or lactating ewe with a lamb(s).
[d] - East and West Summer Ranges would be rest rotation grazed two years out of three.

Alternative 1 would continue to provide range conditions necessary for the U. S. Sheep Experiment Station to continue its mission of current and ongoing research.

Alternative 2 (No grazing U.S. Sheep Experiment Station Properties and Bureau of Land Management/ Forest Service Allotments)

Direct and Indirect Effects

Alternative 2 was developed in response to the public suggestion that sheep grazing be eliminated completely from the USSES lands and BLM and FS allotments. This would result in a 65 percent reduction of sheep inventory from Alternative 1 with 1,166 head retained for research purposes. Remained sheep would be maintained at the Mud Lake Feedlot where harvested feeds would be fed daily to meet the nutrient needs. A small contingent of sheep (~130 head) would graze the lands surrounding Mud Lake Feedlot from April to September.

Table 11. Alternative 2 - projected annual AUM utilization per property within the approximate dates that are specified. The calculations are based on 1,166 sheep; a 65% reduction in Alternative 1 sheep inventory.

Properties	AUM Available	AUM Utilized	Utilization, %	Approximate grazing dates
Agricultural Research Service	**48,667**	**0**	**-**	**NA**
Headquarters	28,353	0	-	NA
Humphrey	4,476	0	-	NA
Henninger	1,914	0	-	NA
East Summer (Toms Cr.)	4,043	0	-	NA
West Summer (Odell Cr./Big Mt.)	9,881	0	-	NA
Leased (DOE, USDA-FS, DOI-BLM)	**26,087**	**158**	**0.6**	
Mud Lake	560	158	28.2	April 1 – September 20
Snakey-Kelly	1,756	0	-	NA
East Beaver	17,887	0	-	NA
Meyers Creek	3,076	0	-	NA
Bernice	2,808	0	-	NA

Calculations indicate percent utilization is well within accepted standards.

Headquarters/Humphrey East Summer /West Summer

Cessation of grazing would have little effect on these range properties. Based on available data, there is little or no difference between the grazed and ungrazed areas now and little room for improvement. Alternative 2 would likely lead to the maintenance of satisfactory range. The small disturbed areas of past grazing effects would recover at natural rates. This would include those areas of heavy use identified under alternative 1. Progress toward range vegetation condition of “fair up” or static would be met. Existing infrastructure (troughs, fences, springs, etc.) would not be maintained. Efforts to reintroduce fire to the landscape (Headquarters) and addressing invasive plants on these lands would not continue.

Favorable vegetation condition and utilization would be met on all lands eliminated from grazing. Absence of sheep grazing across all Agricultural Research Service lands would eliminate localized and short-term grazing effects on sheep driveways, watering sites, and bedding grounds. Absence of grazing is likely to allow late-seral species to increase and maintain dominance in herbaceous vegetation types, because preferred forage species would not be harvested by sheep.

Noxious weeds in small patches do exist on these lands. With current sheep grazing, invasive weeds are not a problem. Neighboring rangelands have more extensive weed infestations. Weed control (grazing and spot herbicide application) would not continue, and this could result in increasing weed populations. Fence maintenance on Headquarters and Humphrey properties would not continue which could result in cattle trespass use.

Henninger

Residual effects from sheep grazing would recover at natural rates. This would include those areas of heavy use identified under alternative 1. Range vegetation condition would probably move to Fair trend Upward. Invasive weed control on these lands would not continue. Fence maintenance would not continue which could result in cattle trespass grazing. Smooth brome (non-native grass) would continue spreading and increasing in density.

Alternative 2 - Summary Range Direct/Indirect Effects

Table 12 displays available forage in AUMs, AUMs used, percent of available forage used, grazing period used during the year and number of days grazed by property.

Table 12. Alternative 2 – percent of forage used, grazing period and grazing days by property

Property	Available Forage AUMs	AUMs Used	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing Days
Headquarters	28,353	0	0.0	NA	NA
Humphrey	4,476	0	0.0	NA	NA
Henninger	1,914	0	0.0	NA	NA
East Summer	4,043	0	0.0	NA	NA
West Summer	9,881	0	0.0	NA	NA

While cessation of grazing and associated activities the Agricultural Research properties would have some changes to the various properties, the overall unavailability of Headquarters, Henninger and Humphrey Ranches, and the East and West Summer Ranges for grazing would not provide range conditions necessary for the U. S. Sheep Experiment Station to continue its current and ongoing research mission.

Alternative 3 (No grazing U.S. Sheep Experiment Station Humphrey Ranch, East and West Summer Ranges)

Direct /Indirect Effects

Alternative 3 was developed in response to the public scoping suggestion that grazing be eliminated in the Centennial Mountains. According to Alternative 3, ARS-USSES properties Humphrey, Summer East, and Summer West, and USDA-FS properties Meyers Creek and East Beaver would not be grazed. Remaining Animal units are based on a 20 percent reduction from Alternative 1 sheep inventory, which resulted in 2,665 head retained for research purposes. The majority of AUMs needed with elimination of Centennial Mountains would be taken from ARS-USSES Headquarters property. Reduced sheep numbers is in response to lower water availably and reduced forage quality on Headquarters.

Table 13. Alternative 3 - projected annual AUM utilization per property within the approximate dates that are specified. The calculations are based on 2,665 sheep, a 20% reduction in Alternative 1 sheep inventory.

Properties	AUM Available	AUM Utilized	Utilization, %	Approximate grazing dates
Agricultural Research Service	48,667	2,873	5.9	
Headquarters	28,353	2,577	9.1	April 23 – November 1
Humphrey	4,476	0	-	NA
Henninger	1,914	296	15.5	June 1 – October 20
Summer East (Toms Cr.)	4,043	0	-	NA
Summer West (Odell Cr./Big Mt.)	9,881	0	-	NA
Leased (DOE, USDA-FS, DOI-BLM)	26,087	1,015	3.9	
Mud Lake	560	158	28.2	April 1 – June 15
Snakey-Kelly	1,756	337	19.2	November 8 – December 15
East Beaver	17,887	0	-	NA
Meyers Creek	3,076	0	-	NA
Bernice	2,808	520	18.5	December 15 – February 5

Calculations indicate percent utilization is well within accepted standards.

Headquarters

Light stocking increases to moderate with an estimated utilization almost doubling Alternative 1. Utilization would remain light. Growing season deferment provided under Alternative 1 (June 25 – September 1) would be lost. Grazing would affectively move from before and after the growing season to during the growing season. Continued growing season use could affect plant composition and vigor, less desirable plants may increase. Use of sheep-preferred browse species and forbs would increase from 6.8 percent to 9.1 percent. Light stocking and predicted 9.1 percent utilization would not compensate for continued growing season use.

Associated activities (prescribed burning, seeding, noxious weed control, fence maintenance, cattle and horse grazing, predator avoidance and abatement) would continue but may be less effective than in alternative 1. Prescribed burning that currently contributes to keeping shrub densities from increasing could be implemented with adjustment in pasture grazing schedules. Grasses and forbs would decrease as shrub (sagebrush) densities increase. Noxious weeds in small patches do exist on these lands. Removal of additional vegetation by sheep would occur and plant and litter production would decrease. Cattle and horse grazing during the non-growing season could be done for a shorter period with less available forage. Fence maintenance would continue to facilitate sheep grazing within units.

Henninger

Forage utilization would be reduced from 23.8 percent in Alternative 1 to 15.5 in Alternative 3. Deferred grazing during the growing season provided under Alternative 1 (July 9 – August 31) would be lost. Range condition is currently Fair and trend Static. Smooth brome would probably continue spreading and increasing in density. Noxious weeds in small patches and at sheep handling facilities do exist. Noxious weed control measures and fence maintenance would continue.

Humphrey /East Summer/West Summer

Same as Alternative 2.

Alternative 3 - Summary Range Direct/Indirect Effects

Table 14 displays available forage in AUMs, AUMs used, percent of available forage used, grazing period used during the year and number of days grazed by property.

Table 14. Alternative 3 – percent of forage used, grazing period and grazing days by property

Property	Available forage AUMs[a]	AUMs Used	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing Days[b]
Headquarters	28,353	2577	9.1	April 23 – Nov 1	193
Humphrey	4,476	0	0.0	NA	NA
Henninger	1,914	296	15.5	June 1 – Oct 20	142
East Summer	4,043	0	0.0	NA	NA
West Summer	9,881	0	0.0	NA	NA

Cessation of grazing and associated activities on Humphrey Ranch and the East and West Summer Ranges would have some changes to range conditions on the Agricultural Research properties. However, the overall unavailability of Humphrey Ranch and the East and West Summer Ranges for grazing would not provide range conditions necessary for the U. S. Sheep Experiment Station to continue its current and ongoing research mission.

Alternative 4 (No Grazing East Summer Range, Meyers Creek Allotment)

Direct /Indirect Effects

Alternative 4 was developed in response to the public scoping suggestion that grazing be eliminated adjacent and within in the grizzly bear primary conservation area (PCA). According to Alternative 4, ARS-USSES property Summer East and USDA-FS allotment Meyers Creek would not be grazed. Animal units are based on a 10-year sheep inventory with a high of 3,331head retained for research purposes. The majority of AUMs needed with elimination of East Summer would be taken from ARS-USSES West Summer.

Table 15. Alternative 4 - Projected annual AUM utilization per property within the approximate dates specified. Calculations are based on 3,331 sheep; 0% reduction in Alternative 1 sheep inventory.

Properties	AUM Available	AUM utilized	Utilization, %	Approximate grazing dates
Agricultural Research Service	**48,667**	**3,382**	**7.0**	
Headquarters	28,353	1,598	5.6	April 23 – June 25; September 1 – November 1
Humphrey	4,476	603	13.5	June 1 – October 20
Henninger	1,914	470	24.6	June 25 – July 9; August 31 – September 15
East Summer (Toms Cr.)	4,043	0	-	NA
West Summer (Odell Cr./Big Mt.)	9,881	711	7.2	July 9 – August 31
Leased (DOE, USDA-FS, DOI-BLM)	**26,087**	**1,445**	**5.5**	
Mud Lake	560	160	28.6	April 1 – June 1
Snakey-Kelly	1,756	421	24.0	November 8 – December 15
East Beaver	17,887	213	1.2	July 3 – September 1
Meyers Creek	3,076	0	-	NA
Bernice	2,808	650	23.2	December 15 – February 5

Calculations indicate percent utilization is well within accepted standards.

Headquarters/Humphrey/Henninger

Same as Alternative 1

East Summer

Same as Alternative 2.

West Summer (Odell/Big Mountain)

Forage utilization on West Summer Range would increase from 5.1 percent in alternative 1 to 7.2 percent in alternative 4. With increased forage use, stocking and utilization would remain light. Cessation of grazing on East Summer would result in grazing West Summer (Odell/Big Mountain) each year. Although rest rotation could be done on some grazing units, good range conditions with a static or slight upward trend would continue. Small (less than 50 acres) areas of heavy use on sheep driveways, watering sites, bedding and herder camps would increase with higher use.

Alternative 4 - Summary Range Direct/Indirect Effects

Table 16 displays available forage in AUMs, AUMs used, percent of available forage used, grazing period used during the year and number of days grazed by property.

Table 16. Alternative 4 – percent of forage used, grazing period and grazing days by property

Property	Available Forage AUMs[a]	AUMs Used	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing days[b]
Headquarters	28,353	1598	5.6	April 23 – June 25	86
				Sept 1 – Nov 1	61
Humphrey	4,476	603	13.5	June 1 – Oct 20	142
Henninger	1,914	470	24.6	June 25 – July 9	15
				Aug 31 – Sept 15	16
East Summer	4,043	0	NA	July 3 – Aug 31	60
West Summer	9,881	711	7.2	July 9 – Aug 31	54

Cessation of grazing and associated activities on the East Summer Range would have some changes to range conditions on the Agricultural Research properties. However, the overall unavailability of the East Summer Range for grazing would not provide range conditions necessary for the U. S. Sheep Experiment Station to continue its current and ongoing research mission.

Alternative 5 (No Grazing – Snakey, Kelly, Bernice Allotments)

Direct and Indirect Effects

Alternative 5 was developed in response to the public suggestion that grazing be eliminated to protect big horned sheep populations. Animal units are based on a 30 percent reduction from Alternative 1 sheep inventory, which resulted in 2,332 head retained for research purposes. Under Alternative 5, USDA-FS East Beaver and DOI-BLM Bernice allotments would not be grazed. Remaining sheep would be maintained at the Mud Lake Feedlot where harvested feeds would be fed daily to meet the nutrient needs of the sheep. A small number of sheep would be grazed on lands surrounding Mud Lake Feedlot. The

reduction in sheep inventory was necessary to remain within available funds for purchasing harvested feeds and maintaining a feedlot facility.

Table 17. Alternative 5 - Projected annual AUM utilization per property within the approximate dates that are specified. The calculations are based on 2,332 sheep; a 30% reduction in Alternative 1 sheep inventory.

Properties	AUM available	AUM Utilized	Utilization, %	Approximate grazing dates
Agricultural Research Service	**48,667**	**1,967**	**4.0**	
Headquarters	28,353	1,119	3.9	April 23 – June 25; September 1 – November 1
Humphrey	4,476	422	9.4	June 1 – October 20
Henninger	1,914	318	16.6	June 25 – July 9; August 31 – September 15
East Summer (Toms Cr.)	4,043	108	2.7	July 23 – August 31
West Summer (Odell Cr./Big Mt.)	9,881	350	3.5	July 9 – August 31
Leased (DOE, USDA-FS, DOI-BLM)	**26,087**	**365**	**1.4**	
Mud Lake	560	166	29.6	April 1 – June 15
Snakey-Kelly	1,756	0	-	NA
East Beaver	17,887	149	0.8	July 3 – September 1
Meyers Creek	3,076	50	1.6	July 5 – July 24
Bernice	2,808	0	-	NA

Calculations indicate percent utilization is well within accepted standards.

Alternative 5 (No Grazing – Snakey, Kelly, Bernice Allotments)

Headquarters/Humphrey/Henninger/East Summer/West Summer

There would be no change from Alternative 1.

Alternative 5 - Summary Range Direct/Indirect Effects

Table 18 displays available forage in AUMs, AUMs used, percent of available forage used, grazing period used during the year and number of days grazed by property.

Table 18. Alternative 5 – percent of forage used, grazing period and grazing days by property

Property	Available Forage AUMs[a]	AUMs Used	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing days[b]
Headquarters	28,353	1119	3.9	April 23 – June 25	86
				Sept 1 – Nov 1	61
Humphrey	4,476	422	9.4	June 1 – Oct 20	142
Henninger	1,914	318	16.6	June 25 – July 9	15
				Aug 31 – Sept 15	16
East Summer [c]	4,043	108	2.7	July 3 – Aug 31	60
West Summer [d]	9,881	350	3.5	July 9 – Aug 31	54

Range Cumulative Effects

The spatial boundary for range cumulative effects for this analysis includes the U.S. Sheep Experiment Station properties (Headquarters, Humphrey, Henninger, East and West Summer Ranges) and the leased

lands (Mud lake Feedlot, Snakey, Kelly, East Beaver, Meyers, Bernice), use of these lands is part of the overall grazing strategy for the U.S. Sheep Experiment Station. The temporal boundary represents resource impacts that occur across timeframes of five years. The five-year timeframe allows for yearly fluctuations while being an appropriate timeframe to identify range condition and trend.

Within the cumulative effects area, none of the properties is adjacent to another. Sheep are trucked or trailed between properties and allotments. Therefore, effects to range are not interdependent. An increase or decrease in range condition on one property or allotment does not affect range condition on any other property.

Alternative 1 – Proposed Action

Mud Lake Feedlot

Mud Lake property is primarily used as a feedlot operation. Harvested feeds provide the daily nutrient needs of sheep located there. A small number of sheep are grazed on lands surrounding the feedlot with 560 useable AUMs. Stocking is light and utilization is also light at 160 AUMs used. The use period (April 1-June 1) on feedlot grazing lands provides ample opportunity for regrowth during the area's prime growing season (June – August). No change is expected from the continuation of current management.

Snakey, Kelly and Bernice

Currently these allotments are lightly stocked with resulting light utilization. The grazing period is during the non-growing season (November – February). Plants are annually rested from growing season use, which allows for recovery. Rotational grazing within these unit assists in keeping utilization light. These allotments currently are the only grazing lands available for winter use. All other properties are unavailable to sheep due to snow cover and extreme winter conditions. Only Mud Lake feedlot using a daily feeding program could be used as alternative to grazing these allotments.

Grazing during the non-growing season with light stocking and utilization helps maintain the range condition. Only small (less than 50 acres) areas (sheep trailing/watering/bedding) would continue to display sheep impacts. A satisfactory range vegetation condition of "fair up" or static would continue to be met. Existing infrastructure would be maintained. Snakey and Kelly are operated under permits with the Caribou-Targhee National Forest; grazing standards would continue. Bernice operates under a Bureau of Land Management permit, Upper Snake Field Office, grazing standards (permitted AUMs used and grazing period) would continue to be met.

Meyers Creek Allotment

Currently this allotment is lightly stocked with an estimated 2.3 percent utilization. This is a transition unit between low- and high-elevation grazing/growing seasons. The grazing period is during two weeks in July. This removes grazing pressure from Henninger and allows East Summer vegetation to achieve range readiness. The flexibility provided by Meyers Creek addresses condition and utilization on Henninger and East Summer. Plants are annually deferred, allowing for recovery and regrowth after grazing. Meyers Creek is rested when East Summer is rested (1 in 3 years).

Short duration grazing with light stocking and utilization would maintain range condition. Only small (less than 50 acres) areas (sheep trailing/watering/bedding) would continue to display grazing use impacts. A satisfactory range vegetation condition of "fair up" or static would continue. Meyers Creek operates under a permit with the Caribou-Targhee National Forest; grazing standards would continue to be met.

East Beaver Allotment

Currently this allotment is lightly stocked with an estimated 1.2 percent utilization. Rotational grazing is practiced within the unit to provide plant deferment. Only small (less than 50 acres) areas (sheep watering/bedding) would display sheep impacts. Satisfactory range vegetation condition of "fair up" or static would continue. East Beaver operates under a permit with the Caribou-Targhee National Forest; grazing standards would continue to be met.

Alternative 1 – Summary Cumulative Effects

Cumulative effects from continued grazing and related activities including past, present, and foreseeable future grazing and related actions would not adversely affect the current range resource.

Table 19 displays available forage in AUMs, AUMs used, percent of available forage used, grazing period used during the year and number of days available for grazing by allotment.

Table 19. Alternative 1 – percent of forage used, grazing period and grazing days by allotment

Allotment [a]	Available Forage AUMs[g]	AUMs Used	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing days Available
Mud Lake [e]	560	160	28.6	April 1 – June 1	62
Snakey-Kelly [b], [c]	1756	421	24.0	Nov 1 – Dec 15	45
East Beaver	17887	213	1.2	July 3 – Sept 1	61
Meyers Creek	3076	71	2.3	July 5 – July 25	20
Bernice [d], [f]	2808	650	23.2	Dec 15 – Feb 5	53

a - Grazing units within allotments are rest rotation grazed.
b - Snakey has 1200 sheep permitted for the allotment, Nov 6 to Jan 2, date move out of Snakey/Kelly is based on weather conditions, early snow accumulation would require move out dates earlier than permitted dates. Sheep would always be moved out of Snakey on or before January 12 and always moved out of Kelly on or before January 13.
c - Kelly has 1000 sheep permitted for the allotment, Nov 20 to Jan 3.
d - Bernice has 1050 sheep permitted for the allotment, Nov 23 to Feb 1, and 1050 sheep permitted for the allotment, Dec 06 to Feb 5,
e – 400 Rams and 700 ewe lambs are retained at Mud Lake when 2230 sheep are moved in mid November to graze at FS and BLM allotments
f- Grazing dates at Bernice depends on snow conditions, early snow requires moving earlier than February 5 with less days grazed.
g - Animal Unit Month. By definition, one (1) AUM represents 790 lbs of dry forage consumed over 30.44 days by a 1,000-lb cow that is nursing a calf. For the purposes of this table, five (5) sheep3 are equivalent to one (1) AUM.

Alternative 1 would continue to provide range conditions necessary for the U. S. Sheep Experiment Station to continue its mission of current and ongoing research.

Alternative 2 (No grazing U.S. Sheep Experiment Station Properties and Bureau of Land Management/ Forest Service Allotments)

Mud Lake Feedlot

Grazing of 158 AUM during the growing season (April thru September) on lands surrounding Mud Lake Feedlot would affect range condition and utilization. Progress toward range vegetation condition of "fair up" or static would not be met. Continued growing season use would affect composition resulting in less desirable plants and an increase of existing noxious weeds. The light stocking and predicted 28.2 percent utilization would not compensate for continued growing season use.

Snakey, Kelly, and Bernice

Cessation of grazing would have little effect on this range. Currently these allotments are grazed only during the non-growing season. If sheep grazing on this land were terminated, slightly more forage could be available for wildlife. Additional litter would be available for soil protection.

The residual effects from past disturbances would recover at natural rates. This would include those areas of heavy use under alternative 1. Progress toward range vegetation condition of “fair up” or static would be met. Efforts to address invasive plants on these lands would stop.

Meyers Creek Allotment

Cessation of grazing would have little effect on this range. Currently this allotment is lightly stocked with an estimated 2.3 percent utilization. The grazing period is during two weeks in July. This is a transition unit between low- and high-elevation grazing. Flexibility to graze Meyers Creek addresses condition and utilization on Henninger and East Summer. Meyers Creek is now rested when East Summer is rested (1 in 3 years) under alternative 1.

The residual effects from past disturbances would recover at natural rates. This would include those areas of heavy use under alternative 1. Range vegetation condition of “fair up” or static would be met. Weeds could be expected to increase on these lands without control efforts implemented by U.S. Sheep Experiment Station.

East Beaver Allotment

Sheep grazing cessation would have little effect on this range. Currently (alternative 1) this allotment is lightly stocked with an estimated 1.2 percent utilization. Rotational grazing is practiced to provide plant deferment. No sheep grazing could result in slightly more forage additional litter would be available for soil protection.

The residual effects from past disturbances would recover at natural rates. This would include those areas of heavy use. Range vegetation condition of “fair up” or static would be met.

East Beaver allotment was originally planned as a common use allotment, for cattle and sheep grazing, to provide some forb use so that cattle grazing would not result in a shift from grass dominated to forb dominated. With no sheep grazing under alternative 2, cattle grazing which is the bulk of the utilization for this allotment, would continue and this may cause forbs to increase.

Alternative 2 – Summary Cumulative Effects

All properties are eliminated from grazing. Mud Lake would be unsatisfactory based on effect on range condition trend and heavy utilization. All leased properties would be unsatisfactory based on loss of flexibility.

Cumulative effects from continued grazing and related activities including past, present, and foreseeable future grazing and related actions would not adversely affect the current range resource.

Table 20 displays available forage in AUMs, AUMs used, percent of available forage used, grazing period used during the year and number of days available for grazing by allotment.

Table 20. Alternative 2 – percent of forage used, grazing period and grazing days by allotment

Allotment	Available Forage AUMs	AUMs Used	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing days Available
Mud Lake	560	158	NA	April 1 – Sept 20	173
Snakey-Kelly	1756	0	NA	NA	NA
East Beaver	17887	0	NA	NA	NA
Meyers Creek	3076	0	NA	NA	NA
Bernice	2808	0	NA	NA	NA

Elimination of grazing on Agricultural Research properties as well as Bureau of Land Management/ Forest Service allotments would not provide range conditions necessary for the U. S. Sheep Experiment Station to continue its current and ongoing research mission.

Alternative 3 (No grazing U.S. Sheep Experiment Station Humphrey Ranch, East and West Summer Ranges)

East Beaver and Meyers Creek Allotments

Same as Alternative 2.

Mud Lake/Snakey Kelly/Bernice

Same as Alternative 1.

Alternative 3 – Summary of Cumulative Effects

East Beaver and Meyers Creek would be unsatisfactory based on units that are eliminated from grazing/flexibility.

Cumulative effects from continued grazing and related activities including past, present and foreseeable future grazing and related actions would not adversely affect the current range resource.

Table 21 displays available forage in AUMs, AUMs used, percent of available forage used, available grazing period during the year and approximate number of days available for grazing by allotment.

Table 21. Alternative 3 – percent of forage used, grazing period and grazing days by allotment

Allotment	Available Forage AUMs	AUMs Used	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing days Available
Mud Lake	560	158	28.2	April 1 – June 15	76
Snakey-Kelly	1756	337	19.2	Nov 8 – Dec 15	38
East Beaver	17887	0	NA	NA	NA
Meyers Creek	3076	0	NA	NA	NA
Bernice	2808	520	18.5	Dec 15 – Feb 5	53

Cessation of grazing and associated activities on Humphrey Ranch and the East and West Summer Ranges and East Beaver and Meyers Creek allotments would have some changes to range conditions. However, the overall unavailability of Humphrey Ranch and the East and West Summer Ranges and East Beaver and Meyers Creek allotments for grazing would not provide range conditions necessary for the U.S. Sheep Experiment Station to continue its current and ongoing research mission.

Alternative 4 (No Grazing East Summer Range, Meyers Creek Allotment)

Mud Lake Feedlot, Snakey, Kelly, Bernice, and East Beaver Allotments

Same as Alternative 1.

Meyers Creek Allotment

No grazing on Meyers Creek allotment eliminates grazing of the transition unit between low- and high-elevation grazing. Loss of this unit affects flexibility and increases utilization on Henninger. All other affects are the same as alternative 2.

Cumulative effects from continued grazing and related activities including past, present, and foreseeable future grazing and related actions would not adversely affect the current range resource.

Alternative 4 – Summary of Cumulative Effects

Cumulative effects from continued grazing and related activities including past, present and foreseeable future grazing and related actions would not adversely affect the current range resource.

Table 22 displays available forage in AUMs, AUMs used, percent of available forage used, grazing period used during the year and number of days available for grazing by allotment.

Table 22. Alternative 4 – percent of forage used, grazing period and grazing days by allotment

Allotment	Available Forage AUMs	AUMs Used	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing days Available
Mud Lake	560	160	28.6	April 1 – June 1	62
Snakey-Kelly	1756	421	24.0	Nov 1 – Dec 15	45
East Beaver	17887	213	1.2	July 3 – Sept 1	61
Meyers Creek	3076	0	NA	NA	NA
Bernice	2808	650	23.2	Dec 15 – Feb 5	53

Cessation of grazing and associated activities on the East Summer Ranges and Meyers Creek allotment would have some changes to range conditions. However, the overall unavailability of the East Summer Range and Meyers Creek allotment for grazing would not provide range conditions necessary for the U.S. Sheep Experiment Station to continue its current and ongoing research mission.

Alternative 5 (No Grazing – Snakey, Kelly, Bernice Allotments)

Meyers Creek/Snakey/Kelly

Same as Alternative 1

East Beaver/Bernice/Mud Lake Feedlot

Same as Alternative 2

Alternative 5 – Summary of Cumulative Effects

Cumulative effects from continued grazing and related activities including past, present, and foreseeable future grazing and related actions would not adversely affect the current range resource.

Table 23 displays available forage in AUMs, AUMs used, percent of available forage used, grazing period used during the year and number of days available for grazing by allotment.

Table 23. Alternative 5 – percent of forage used, grazing period and grazing days by allotment

Allotment	Available Forage AUMs	AUMs Used	Percent of Available Forage Used	Inclusive Grazing Period	Approximate Grazing days Available
Mud Lake	560	166	29.6	April 1 – June 15	76
Snakey-Kelly	1756	0	0	NA	NA
East Beaver	17887	149	0.8	July 3 – Sept 1	61
Meyers Creek	3076	50	1.6	July 5 – July 24	19
Bernice	2808	0	0	NA	NA

Cessation of grazing and associated activities on the Snakey-Kelly and Bernice allotments would have some changes to range conditions. However, the overall unavailability of Snakey-Kelly and Bernice allotments for grazing would not provide range conditions necessary for the U. S. Sheep Experiment Station to continue its current and ongoing research mission.

Range Effects Summary

Table 24 displays available AUMs for each property and allotment and percent used under each alternative.

Table 24. Available AUMs and percent AUMs used by alternative.

Percent utilization	AUM	Existing	Alternatives with varying degrees of no grazing			
Properties	**Available**	**Alt1**	**Alt2**	**Alt3**	**Alt4**	**Alt5**
All Agricultural Research Service	48,667	6.8	-	5.9	7	4
Headquarters	28,353	5.6	-	9.1	5.6	3.9
Humphrey	4,476	13.5	-	-	13.5	9.4
Henninger	1,914	23.8	-	15.5	24.6	16.6
Summer East (Toms Cr.)	4,043	3.8	-	-	-	2.7
Summer West (Odell Cr./Big Mt.)	9,881	5.1	-	-	7.2	3.5
All Leased (DOE, USDA-FS, DOI-BLM)	26,087	5.8	0.6	3.9	5.5	1.4
Mud Lake	560	28.6	28.2	28.2	28.6	29.6
Snakey-Kelly	1,756	24	-	19.2	24	-
East Beaver	17,887	1.2	-	-	1.2	0.8
Meyers Creek	3,076	2.3	-	-	-	1.6
Bernice	2,808	23.2	-	18.5	23.2	-

Alternative 1 would continue to provide range conditions necessary for the U. S. Sheep Experiment Station to continue its mission of current and ongoing research. While cessation of grazing on various Agricultural Research properties and U.S. Forest Service and Bureau of Land Management allotments would have some changes in range conditions, the unavailability of those various parcels in Alternatives 2-5 would not provide range conditions necessary for the U. S. Sheep Experiment Station to continue its current and ongoing research mission availability.

Monitoring

To ensure the continuation of the current range condition and to determine any change in condition it is recommended monitoring contained in Table 25 be incorporated in the Proposed Action

Table 25 displays the monitoring plan to be implemented as part of the Proposed Action. This plan includes both implementation and effectiveness monitoring. Implementation monitoring to determine whether the grazing is implemented as planned. Effectiveness monitoring conducted to determine if grazing management practices applied have been effective in maintaining range condition.

Table 25. Range monitoring plan

ARS Lands	Key Species/Area	Standard	When	Frequency
Headquarters	Species and area selected by USSES	40 -50%[a]	During grazing season and post grazing	Annually[b]
Humphrey	Species and area selected by USSES	40-50%[a]	During grazing season and post grazing	Annually[b]
Henninger	Species and area selected by USSES	40-50%[a]	During grazing season and post grazing	Annually[b]
West Summer	Species and area selected by USSES	40-50%[a]	During grazing season and post grazing	Annually[b]
East Summer	Species and area selected by USSES	40-50%[a]	During grazing season and post grazing	Annually[b]
Headquarters	Area selected by USSES	Install (6) line intercepts for condition and trend monitoring	2010	Read every 5 to 10 years
Humphrey	Area selected by USSES	Install (2) line intercepts for condition and trend monitoring	2010	Read every 5 to 10 years
Henninger	Area selected by USSES	Install (2) line intercepts for condition and trend monitoring	2010	Read every 5 to 10 years
West Summer	Area selected by USSES	Install (4) line intercepts for condition and trend monitoring	2010	Read every 5 to 10 years
East Summer	Area selected by USSES	Install (4) line intercepts for condition and trend monitoring	2010	Read every 5 to 10 years

a- Percent grazed at the end of the grazing season
b - After 2 consecutive years of meeting or exceeding the standards monitoring would be placed on a 3-year rotation for inspections. During the 2 years of not being inspected, standard would be field reviewed by ARS sheep manager.

Monitoring is conducted to ensure adaptive management can be applied so standards are being accomplished. Achieving applicable standards ensures attaining desired rangeland resource conditions.

Literature Cited

Ellison, L., A. R. Croft, and R. W. Bailey. 1951. Indicators of condition and trend on high range-watersheds of the Intermountain Region. Agr. Handbook No. 19, U. S. Dept. Agr. 66pp.

Grooms ,Troy, Rangeland Specialist, USDA Forest Service 2009. US Sheep Experiment Station Grazing and Associated Activities Rangeland Assessment Report

Jacobson, Quinn. 2008. Personal Communications with Quinn Jacobson, Rangeland Scientist, University of Idaho, Dubois, Idaho, Personal Communication October - November 2008

Klement, Keith D. 1997. Condition and Trend Analysis on Subalpine Rangeland Grazed by Sheep in the Centennial Mountains, Montana, University of Wyoming

Lewis, Gregory S., Moffet, Corey A., Mousel, Michelle R., and Taylor, Bret J. 2007. Project Plan, NP 205, Rangeland, Pasture, and Forages, Panel Review, September – November 2007

Lewis, Greg. 2008. Personal Communications with Greg Lewis, Rangeland Scientist, ARS, USSES Dubois, Idaho, Personal Communication October - November 2008

McWhorter, V. 1952. The Pacific Wool Grower, Vol.4. Nos.10 & 11

Moffet, Corey. 2008. Personal Communications with Corey Moffet, Rangeland Scientist, ARS, USSES Dubois, Idaho, Personal Communication October - November 2008

Nelson, D. 1964. A comparison of forb-grass site with sagebrush sites in the Centennial Mountains of southern Montana. M.S. Thesis, Univ. of Idaho, Moscow, Ida.

Nelson, Ruth Ashton, (revised by Williams, Roger L.). 1992. Handbook of Rocky Mountain Plants, Published by Robert Rinehart Publishers, Post Office Box 666, Niwot, Colorado 80544

Parker, Robert, Lee, Richard D., Nelson, Burrell E., Cudney, David W., Burrill, Larry C., Whitson, Tom D., Dewey, Steven A.. 2006. Weeds of the West, 9th Edition, Published by Western Society of Weed Science, in cooperation with the Western United States Land Grant Universities Cooperative Extension Services, Printed by Grand Teton Lithography, Jackson Hole Wyoming

Smith, Casey. 2008. Personal Communications with Casey Smith, Wrangler, Centennial Outfitters, Lakeview, Montana, Personal Communication September 2008

Taylor, Bret. 2008. Personal Communications with Bret Taylor, Rangeland Scientist, ARS, USSES Dubois, Idaho, Personal Communication October 2008

USDA. 1937. Range Plant Handbook, United States Government Printing Office

USDA Forest Service. 1969. Range Environmental Analysis Handbook. Forest Service Handbook, R-4. 41.4--20.

USDA Natural Resource Conservation Service. 1991. U.S. Sheep Exp. Sta. summer range soil survey, Beaverhead County, Mont.

USDA Natural Resources and Conservation Service, ARS, US Sheep Experiment Station, Station Headquarters, Soil/Vegetative Inventory, 1995

VanHorn-Ecret, R. L. 1986. An ecological analysis of the tall forb community of the Centennial Mountains, Mont. M.S. Thesis. University of Idaho.

Willard E., and J. Nimlos. 1977. Soil and vegetation conditions on the Sheep Exp. Sta. Summer Range, Centennial Mountains, Montana. Mont. Forest and Conserv. Exp. Sta. Univ. of Mont.

Williams, Mark. 2008. Personal Communications with Mark Williams, Rangeland Scientist, ARS, USSES Dubois, Idaho, Personal Communication October 2008

Appendix A: Maps

Map 1. Vicinity map

Map 2. Overview with allotments

Map 3. Overview with sheep trails

Map 4. Headquarters Pasture overview

Map 5. Headquarters Pasture roads & fire breaks

Map 6. Headquarters wild fire history

Map 7. Headquarters Pasture fence

Map 8. Headquarters prescribed fire history

Map 9. Headquarters proposed pasture fence

Map 10. Headquarters seeding

Map 11. Henninger Pasture irrigation

Map 12. Humphrey Pasture irrigation

Map 13. Humphrey proposed seeding & burn Map

Map 14. Summer Pasture East sheep driveways

Map 15. Summer Pasture West fence map

Map 16. Summer Pasture West sheep driveways

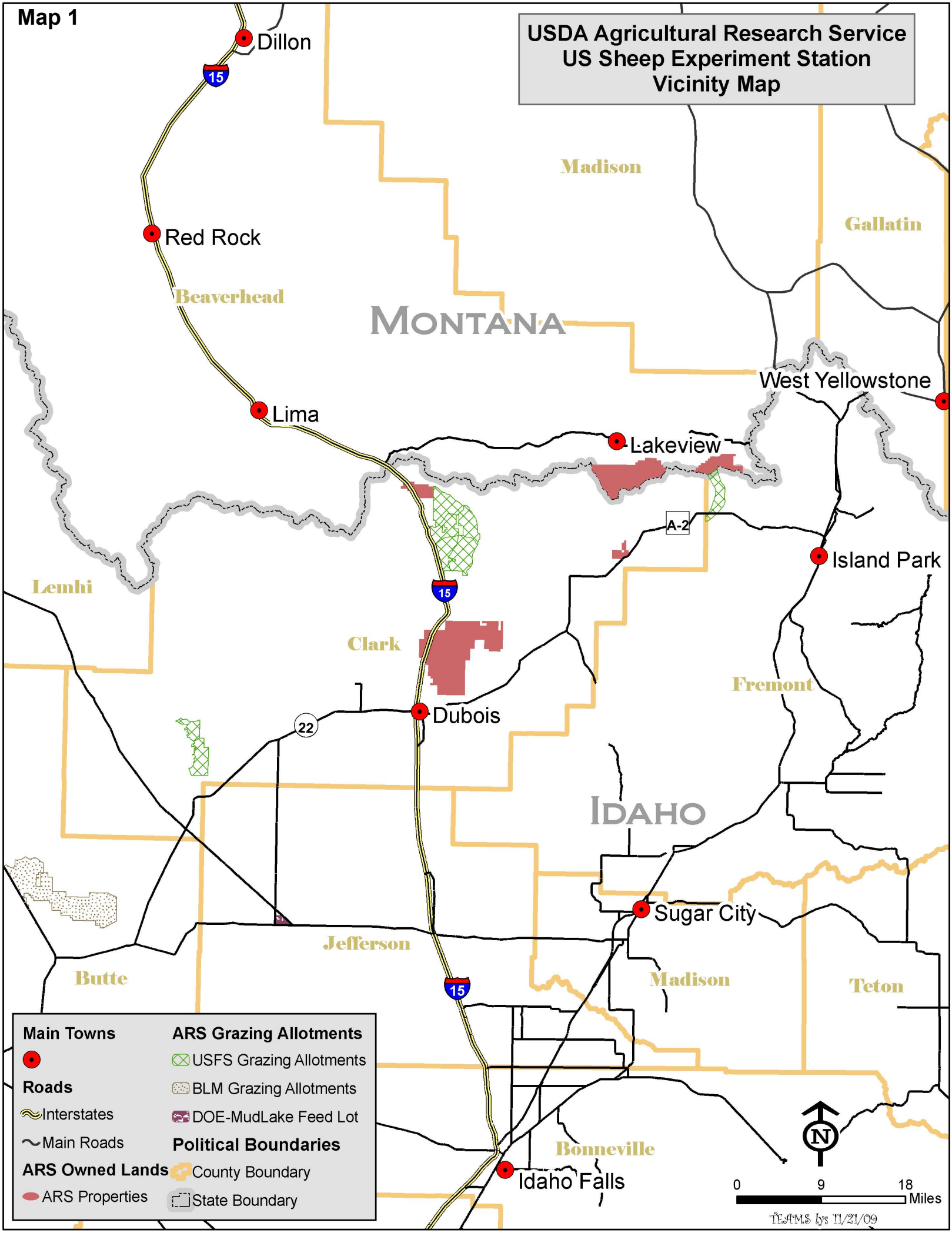
Map 17. Mud Lake Feedlot

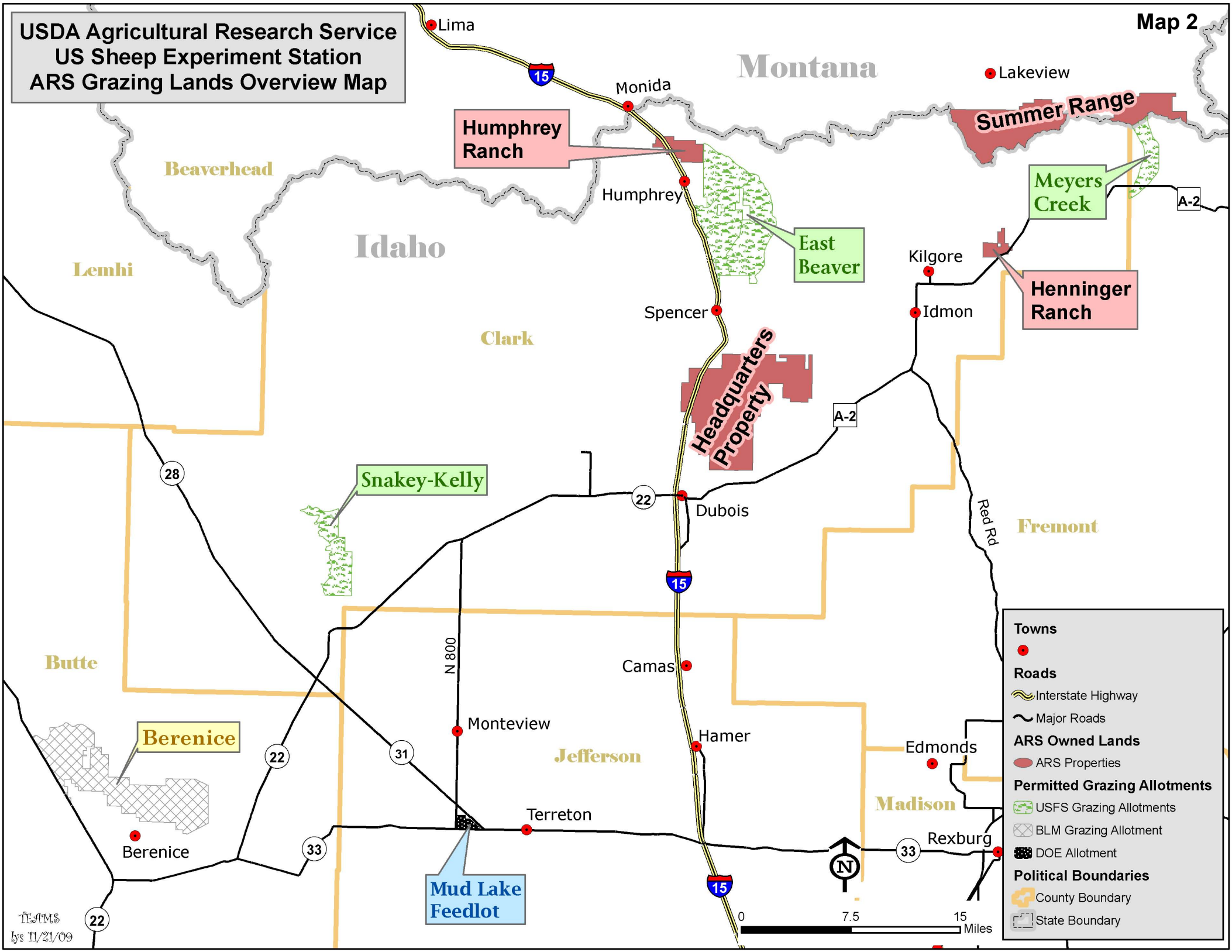
Map 18. Alternative 2

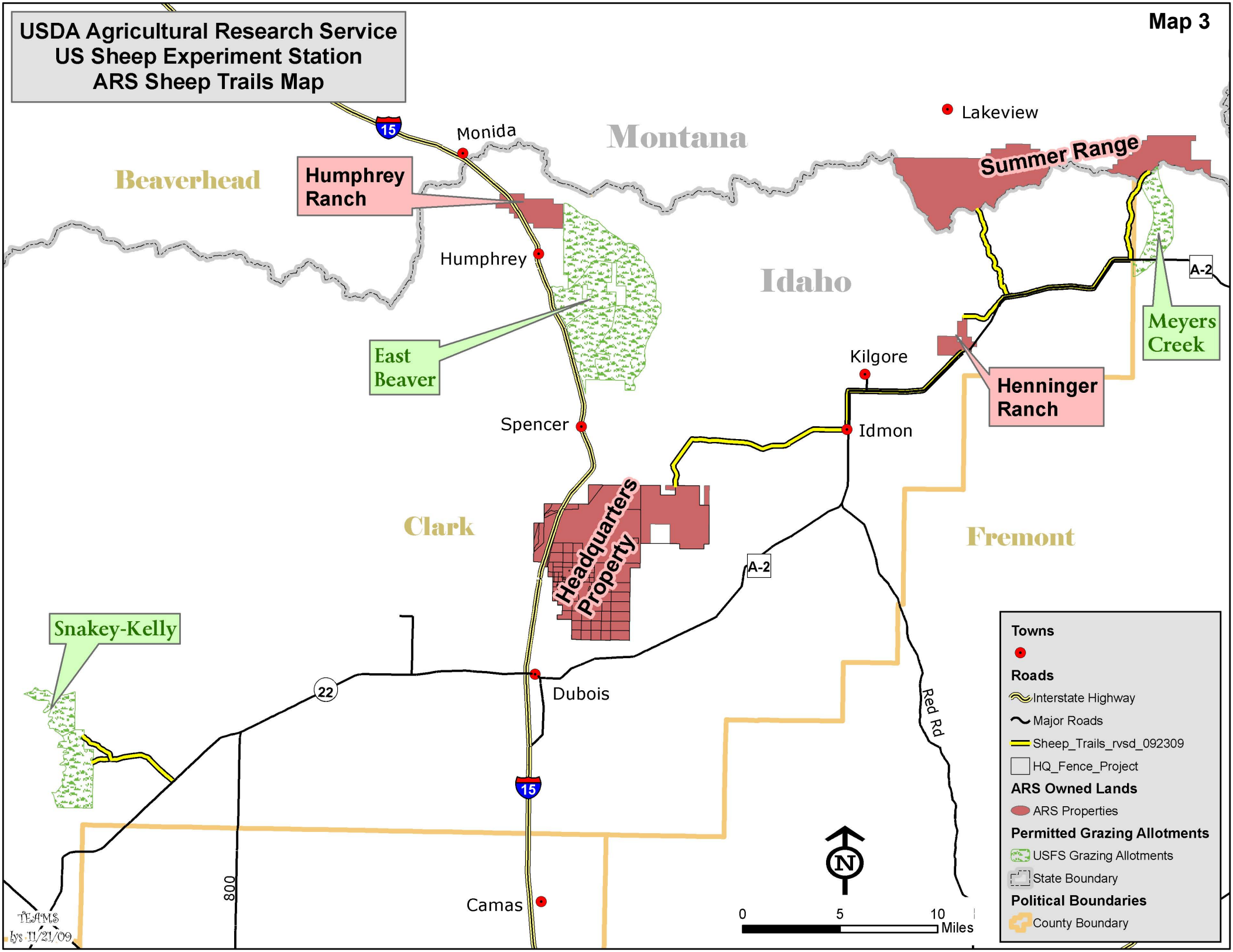
Map 19. Alternative 3

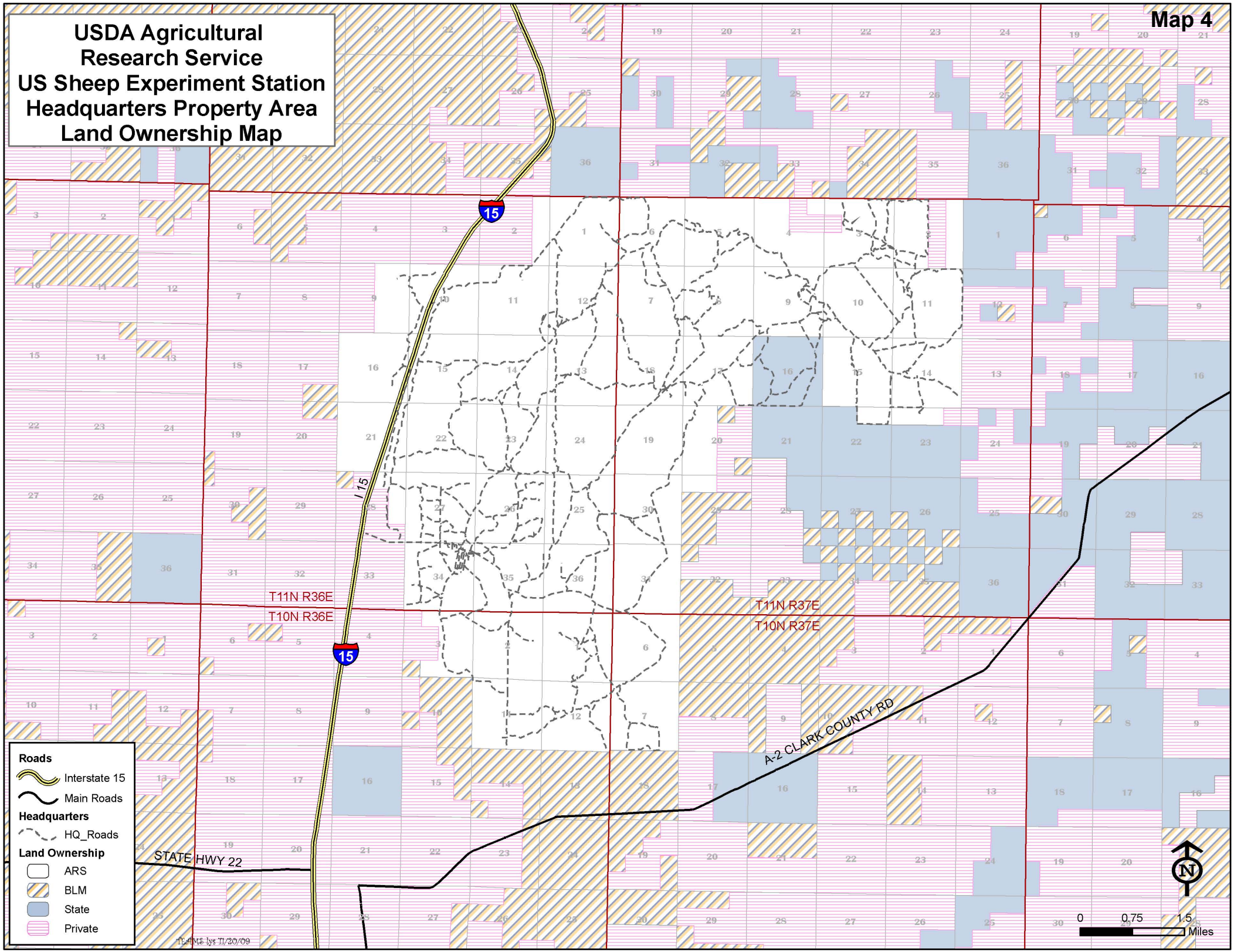
Map 20. Alternative 4

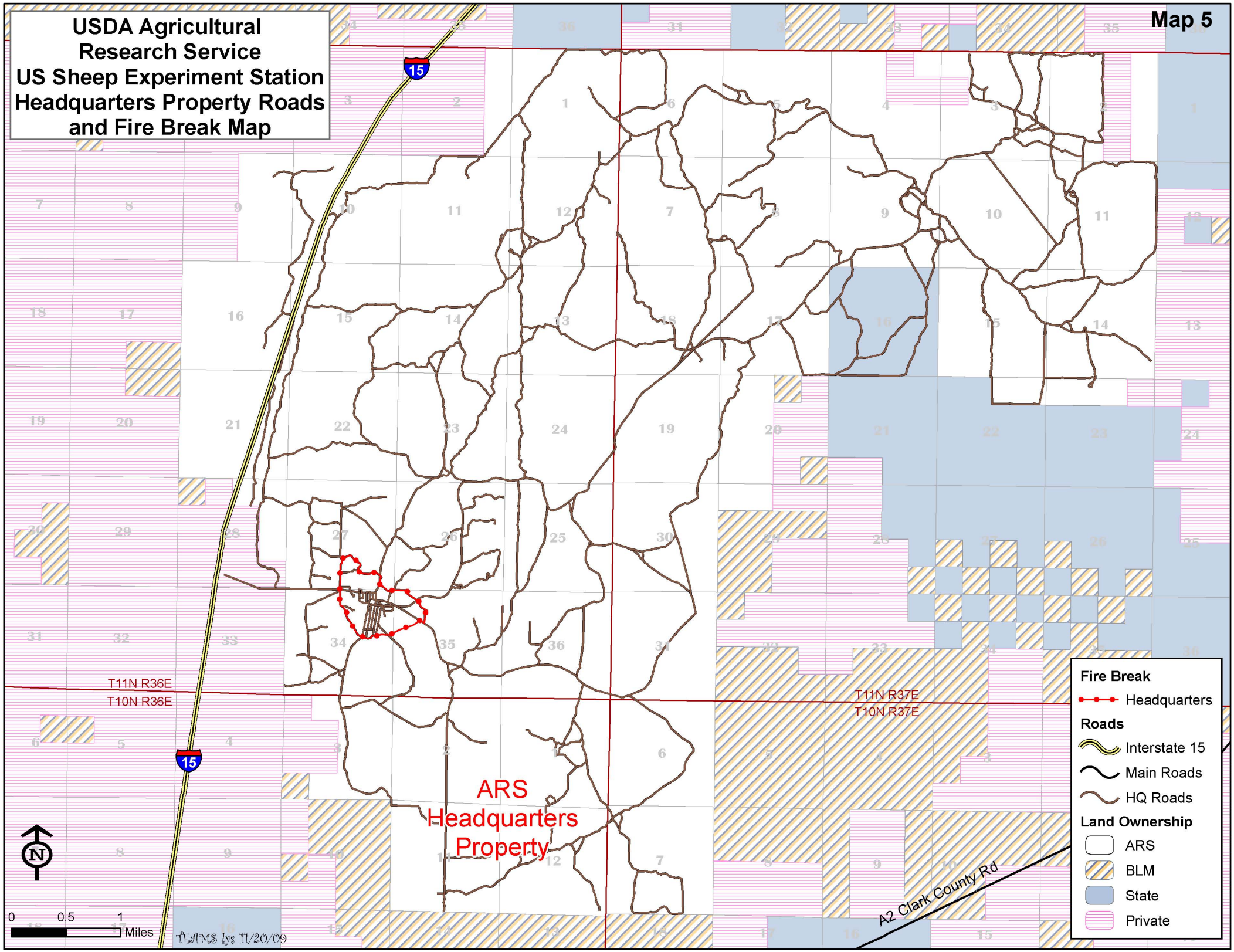
Map 21. Alternative 5

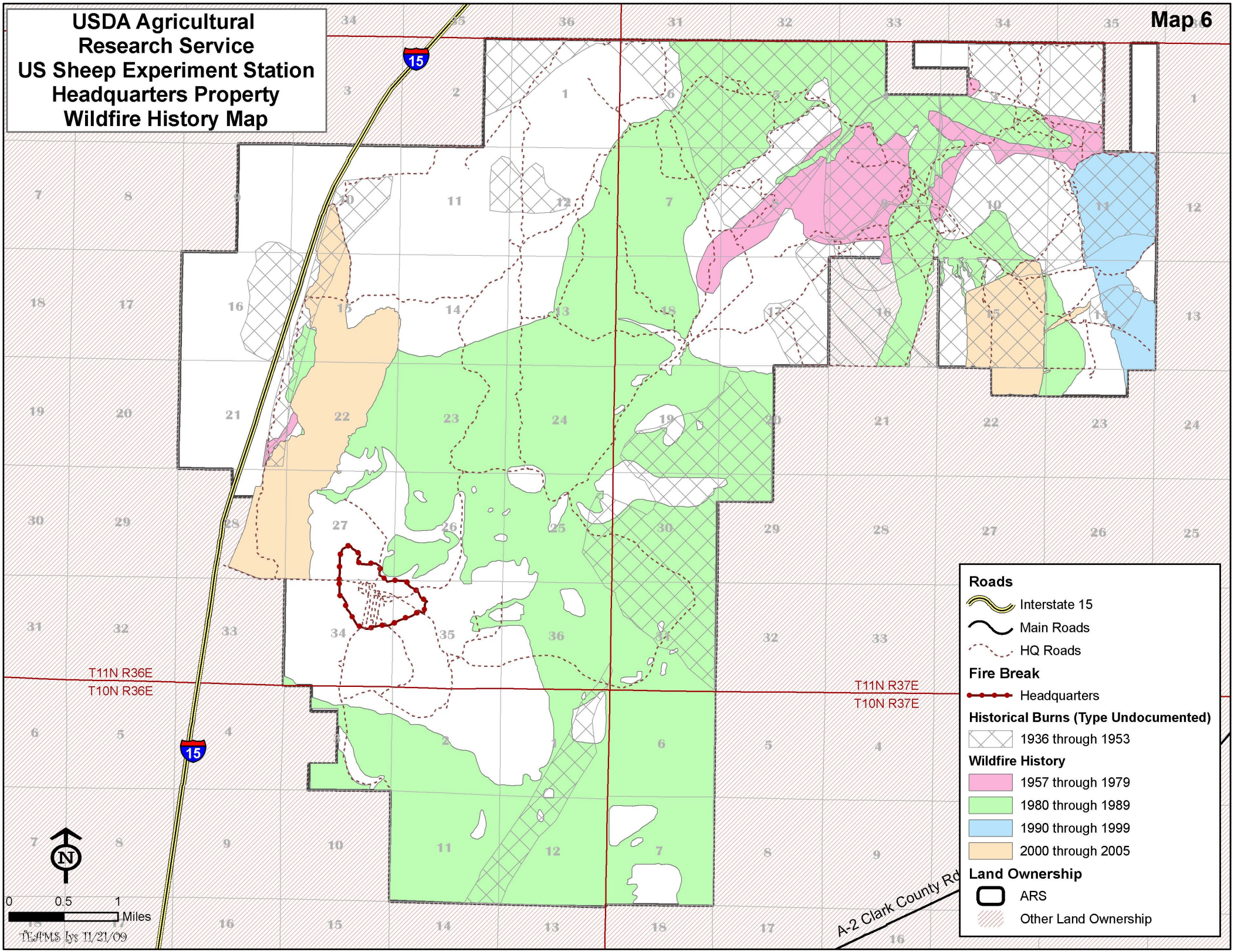

Map 1
USDA Agricultural Research Service
US Sheep Experiment Station
Vicinity Map
Dillon
15
Red Rock
Beaverhead
Madison
Gallatin
MONTANA
West Yellowstone
Lima
Lakeview
A-2
Island Park
Lemhi
15
Clark
Fremont
Dubois
22
IDAHO
Sugar City
Jefferson
Butte
15
Madison
Teton
Bonneville
Idaho Falls
Main Towns
Roads
Interstates
Main Roads
ARS Owned Lands
ARS Properties
ARS Grazing Allotments
USFS Grazing Allotments
BLM Grazing Allotments
DOE-MudLake Feed Lot
Political Boundaries
County Boundary
State Boundary
N
0
9
18
Miles
TEAMS lys 11/21/09

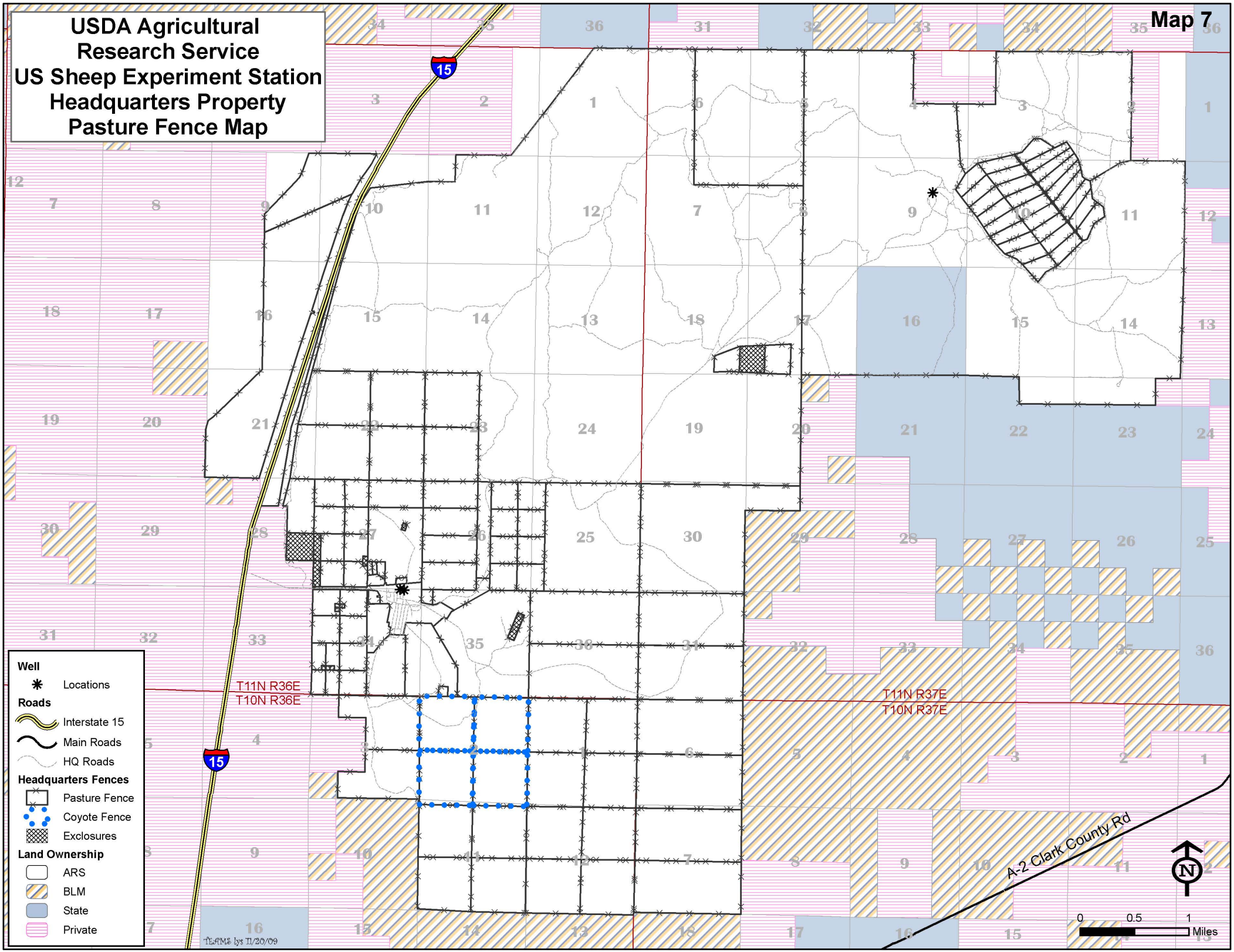

USDA Agricultural Research Service
US Sheep Experiment Station
ARS Grazing Lands Overview Map
Map 2
Montana
Idaho
Lima
Monida
Lakeview
Humphrey
Spencer
Kilgore
Idmon
Dubois
Camas
Hamer
Monteview
Terreton
Edmonds
Rexburg
Berenice
Beaverhead
Lemhi
Clark
Butte
Jefferson
Madison
Fremont
Red Rd
N 800
A-2
15
28
22
31
33
Humphrey Ranch
Summer Range
Meyers Creek
East Beaver
Henninger Ranch
Headquarters Property
Snakey-Kelly
Berenice
Mud Lake Feedlot
Towns
Roads
Interstate Highway
Major Roads
ARS Owned Lands
ARS Properties
Permitted Grazing Allotments
USFS Grazing Allotments
BLM Grazing Allotment
DOE Allotment
Political Boundaries
County Boundary
State Boundary
0
7.5
15
Miles
N
TEAMS
lys 11/21/09

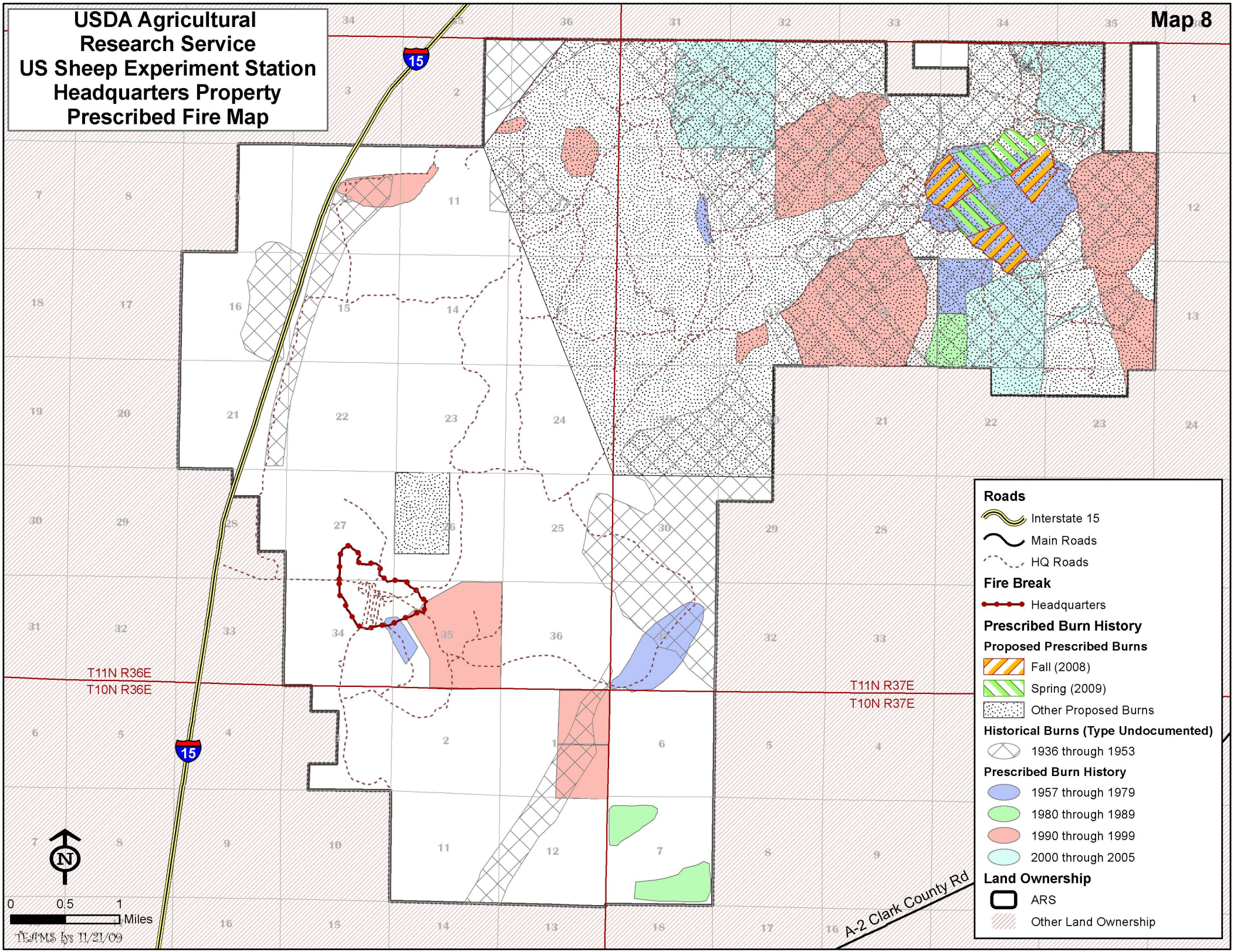

USDA Agricultural Research Service
US Sheep Experiment Station
ARS Sheep Trails Map
Map 3
Montana
Idaho
Beaverhead
Clark
Fremont
Monida
Humphrey
Spencer
Dubois
Camas
Kilgore
Idmon
Lakeview
Humphrey Ranch
East Beaver
Snakey-Kelly
Headquarters Property
Summer Range
Meyers Creek
Henninger Ranch
15
22
A-2
800
Red Rd
N
0
5
10
Miles
Towns
Roads
Interstate Highway
Major Roads
Sheep_Trails_rvsd_092309
HQ_Fence_Project
ARS Owned Lands
ARS Properties
Permitted Grazing Allotments
USFS Grazing Allotments
State Boundary
Political Boundaries
County Boundary
TEAMS
lys 11/21/09


USDA Agricultural
Research Service
US Sheep Experiment Station
Headquarters Property Area
Land Ownership Map
Map 4
I 15
15
T11N R36E
T10N R36E
T11N R37E
T10N R37E
A-2 CLARK COUNTY RD
STATE HWY 22
Roads
Interstate 15
Main Roads
Headquarters
HQ_Roads
Land Ownership
ARS
BLM
State
Private
0
0.75
1.5
Miles
N


USDA Agricultural
Research Service
US Sheep Experiment Station
Headquarters Property Roads
and Fire Break Map
Map 5
15
T11N R36E
T10N R36E
T11N R37E
T10N R37E
ARS
Headquarters
Property
A2 Clark County Rd
Fire Break
Headquarters
Roads
Interstate 15
Main Roads
HQ Roads
Land Ownership
ARS
BLM
State
Private
N
0
0.5
1
Miles
TEAMS by 11/20/09

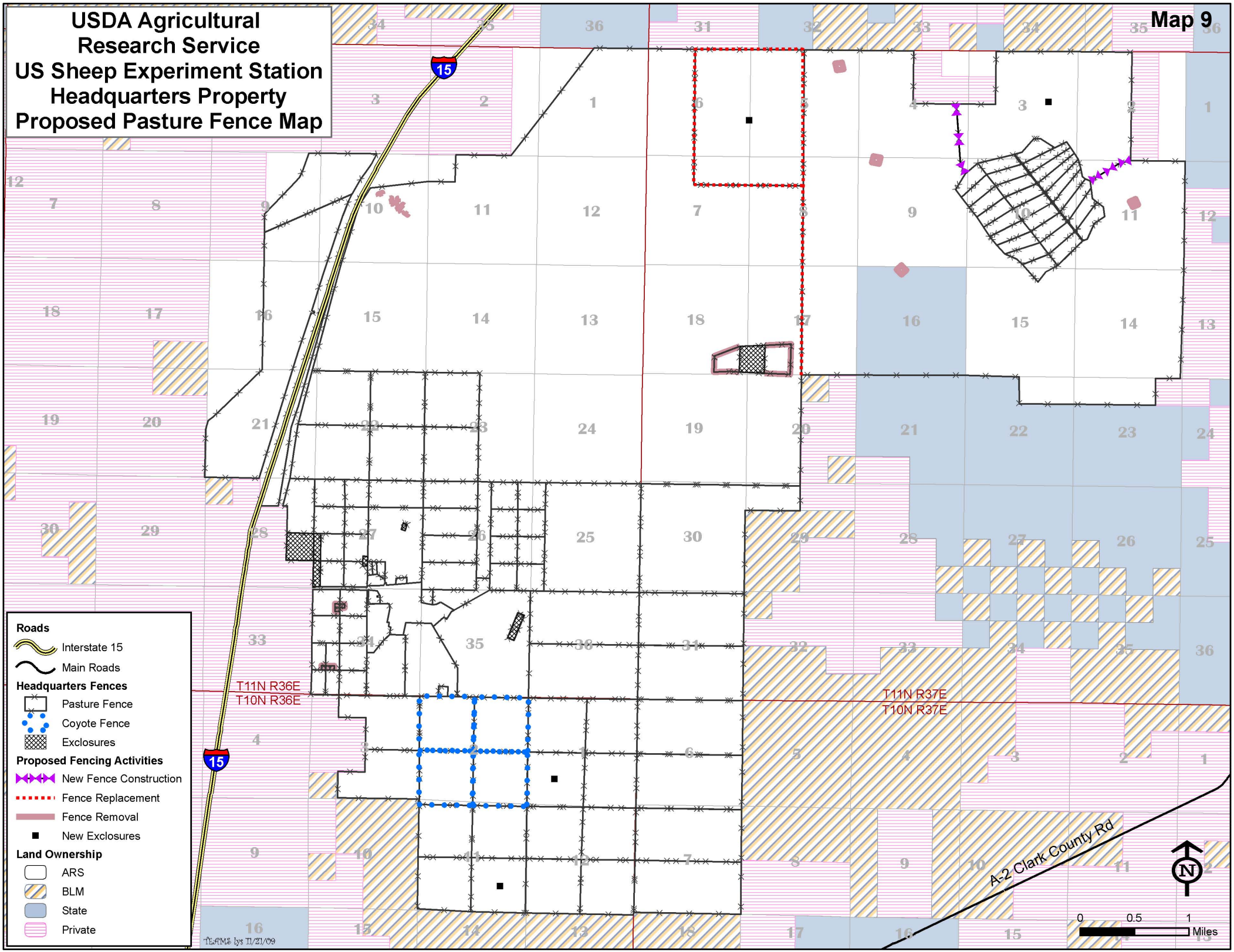

USDA Agricultural
Research Service
US Sheep Experiment Station
Headquarters Property
Wildfire History Map
Map 6
15
T11N R36E
T10N R36E
T11N R37E
T10N R37E
A-2 Clark County Rd
Roads
Interstate 15
Main Roads
HQ Roads
Fire Break
Headquarters
Historical Burns (Type Undocumented)
1936 through 1953
Wildfire History
1957 through 1979
1980 through 1989
1990 through 1999
2000 through 2005
Land Ownership
ARS
Other Land Ownership
N
0
0.5
1
Miles
TSMS by 11/21/09

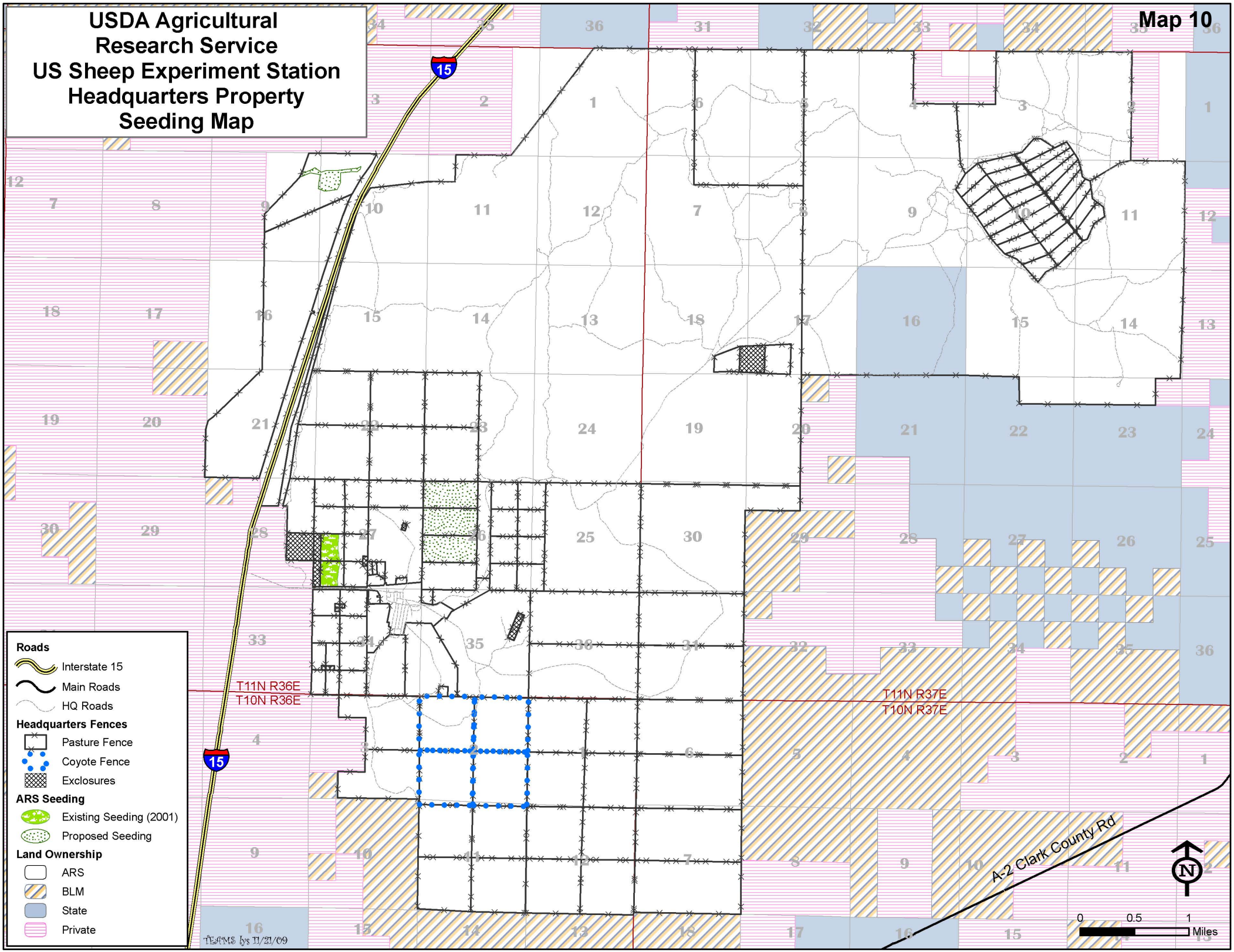

USDA Agricultural
Research Service
US Sheep Experiment Station
Headquarters Property
Pasture Fence Map
Map 7
Well
Locations
Roads
Interstate 15
Main Roads
HQ Roads
Headquarters Fences
Pasture Fence
Coyote Fence
Exclosures
Land Ownership
ARS
BLM
State
Private
T11N R36E
T10N R36E
T11N R37E
T10N R37E
A-2 Clark County Rd
15
N
0
0.5
1
Miles
TLAMS lys 11/20/09

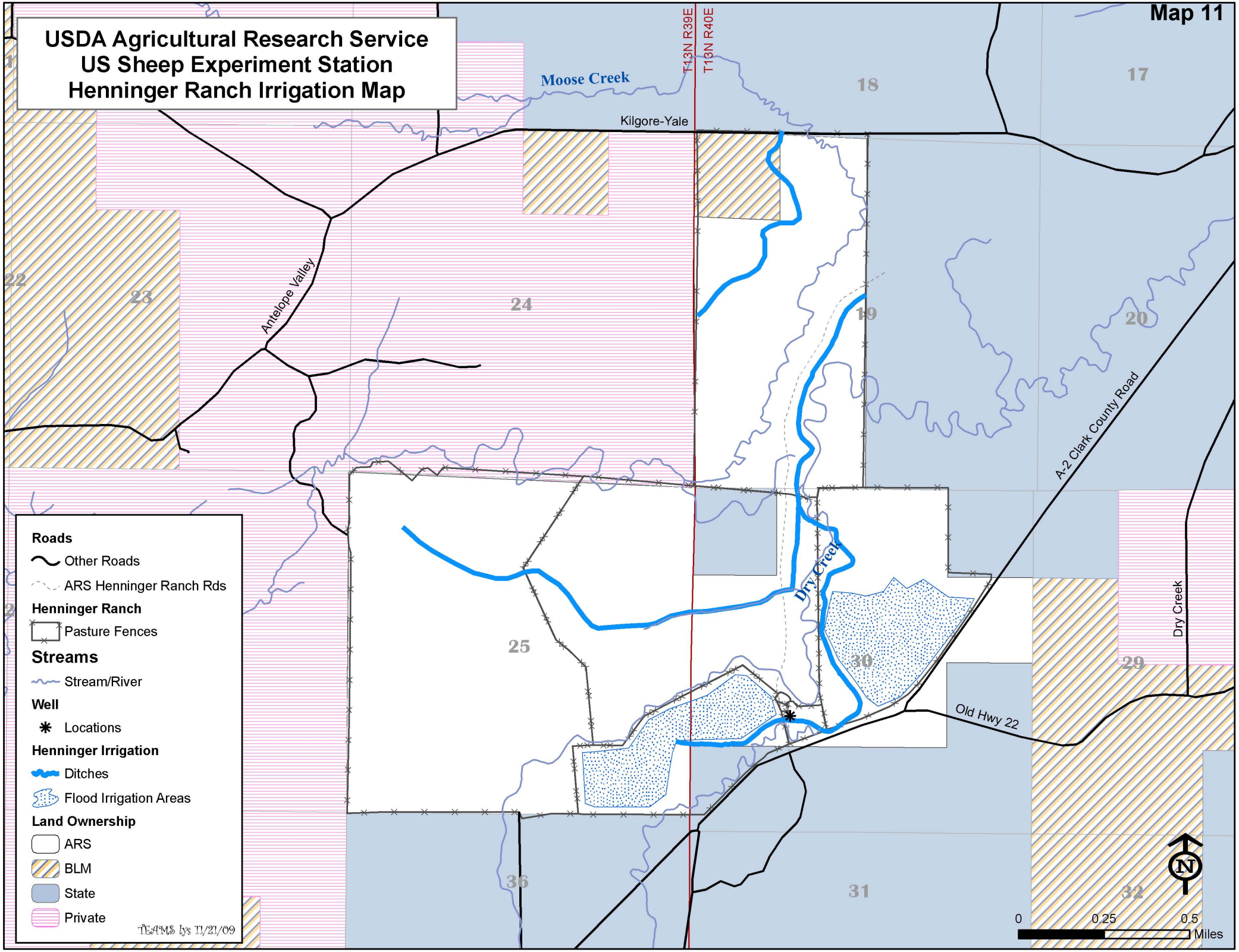

USDA Agricultural Research Service
US Sheep Experiment Station
Headquarters Property
Prescribed Fire Map
Map 8
15
T11N R36E
T10N R36E
T11N R37E
T10N R37E
A-2 Clark County Rd
Roads
Interstate 15
Main Roads
HQ Roads
Fire Break
Headquarters
Prescribed Burn History
Proposed Prescribed Burns
Fall (2008)
Spring (2009)
Other Proposed Burns
Historical Burns (Type Undocumented)
1936 through 1953
Prescribed Burn History
1957 through 1979
1980 through 1989
1990 through 1999
2000 through 2005
Land Ownership
ARS
Other Land Ownership
N
0 0.5 1 Miles
TLAMS Lys 11/21/09

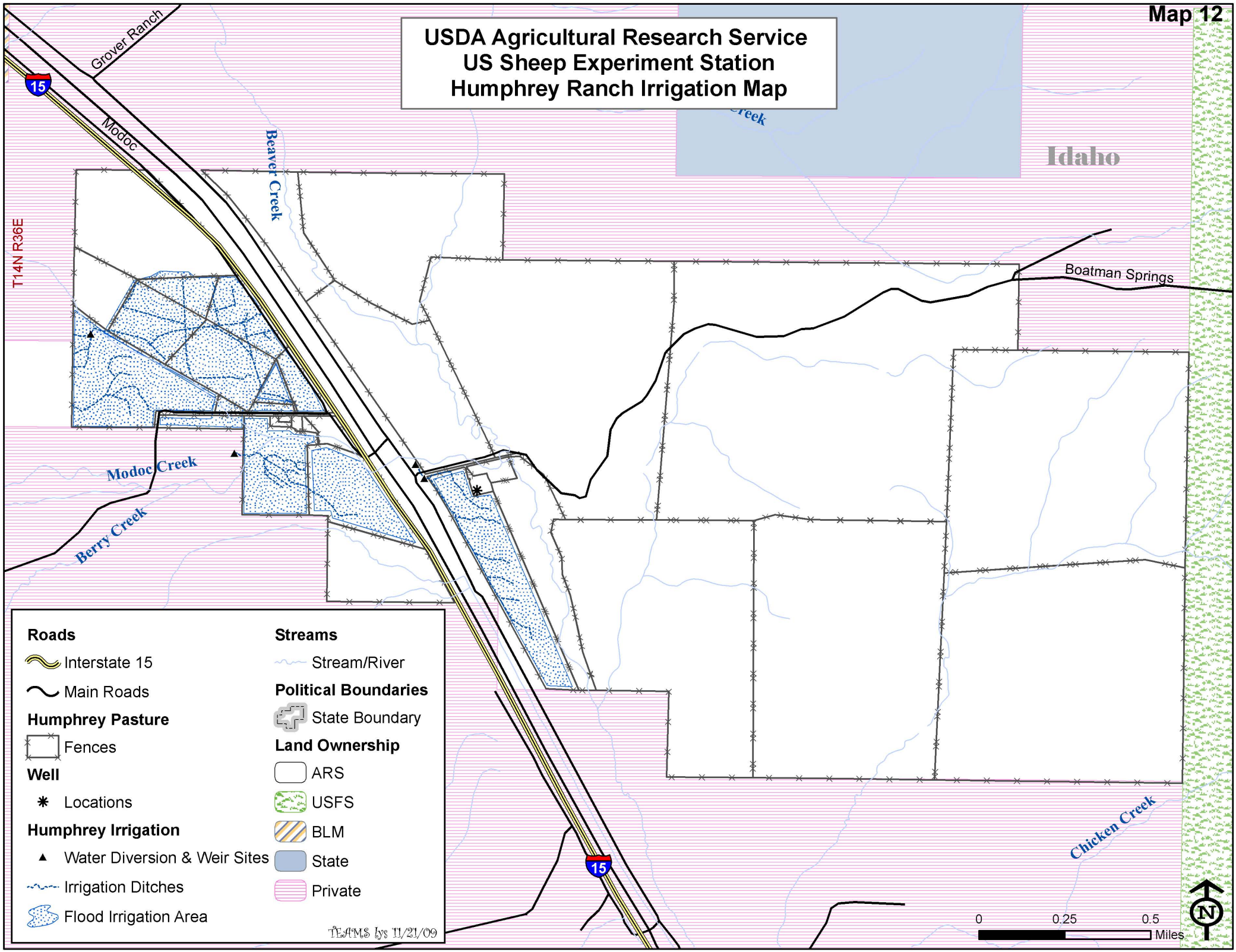
USDA Agricultural Research Service US Sheep Experiment Station Headquarters Property Proposed Pasture Fence Map

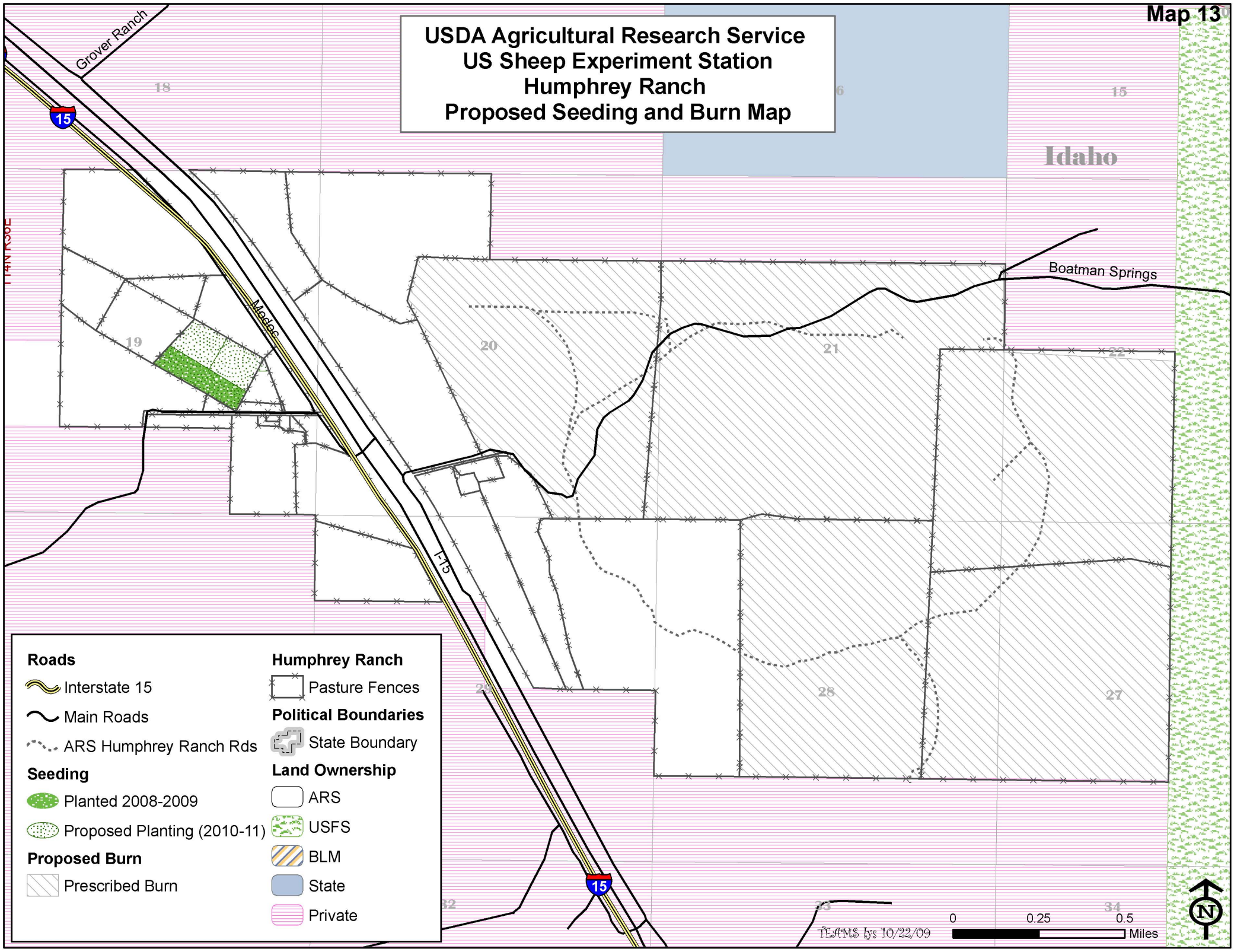
Map 9

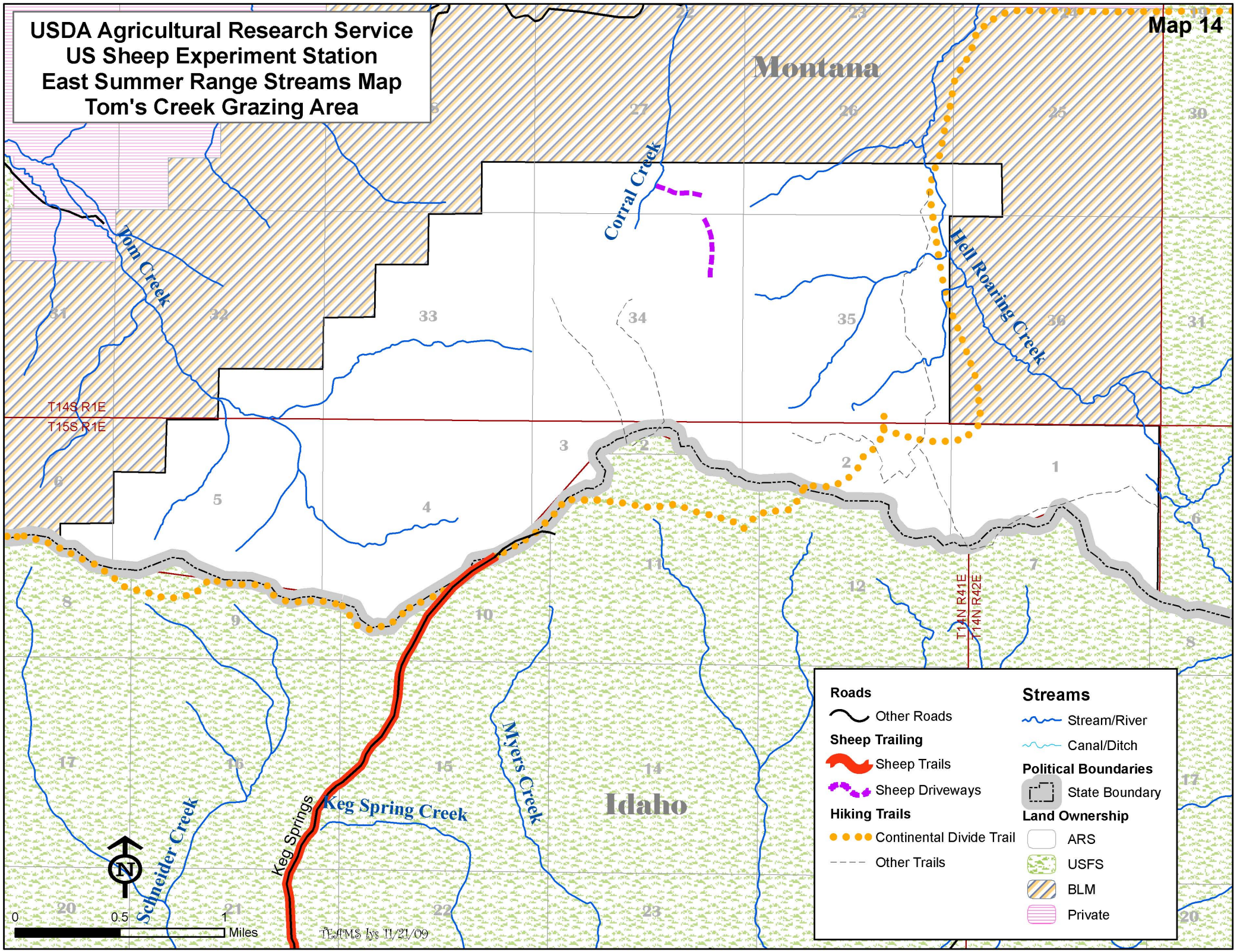


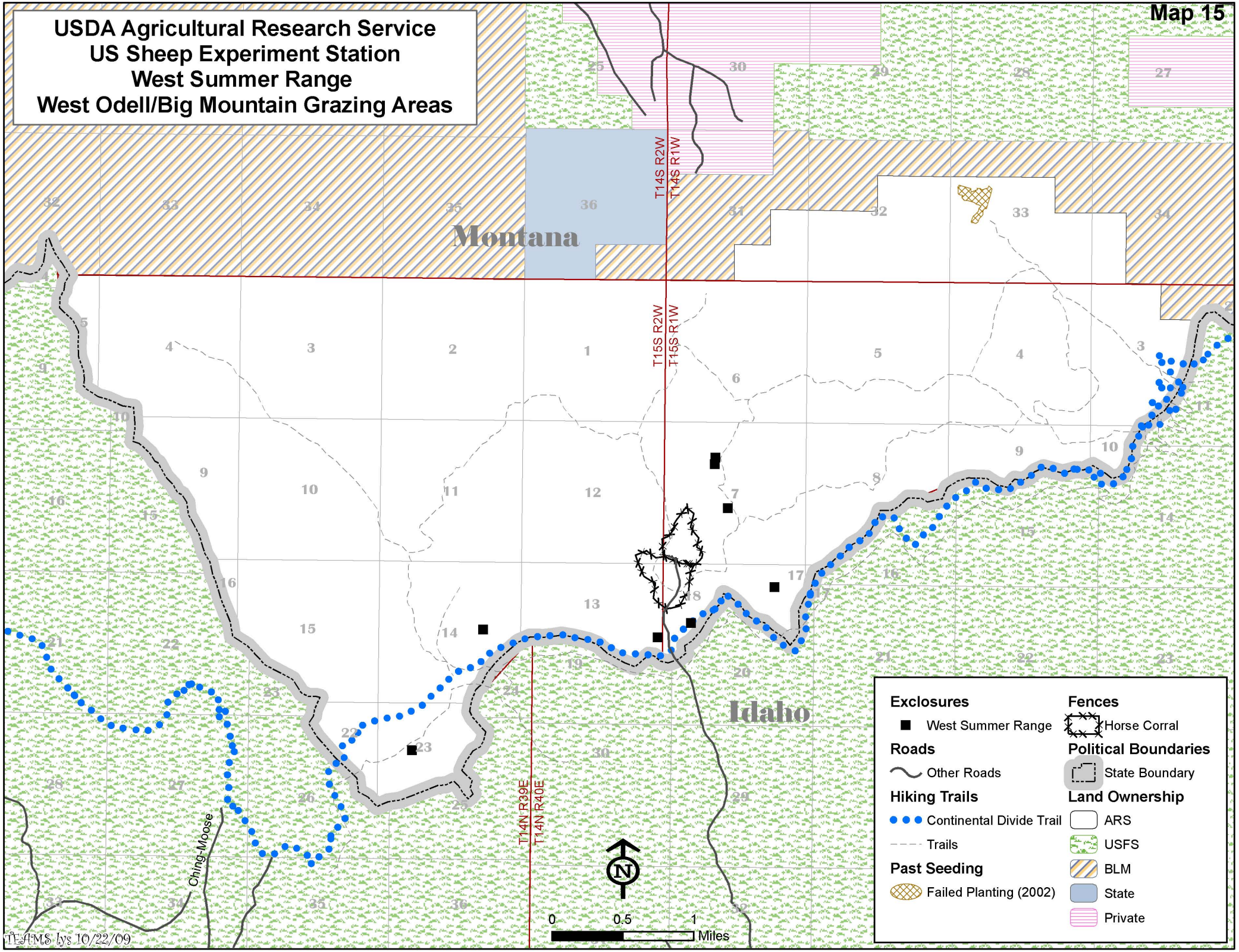

USDA Agricultural
Research Service
US Sheep Experiment Station
Headquarters Property
Seeding Map
Map 10
15
T11N R36E
T10N R36E
T11N R37E
T10N R37E
A-2 Clark County Rd
N
0
0.5
1
Miles
Roads
Interstate 15
Main Roads
HQ Roads
Headquarters Fences
Pasture Fence
Coyote Fence
Exclosures
ARS Seeding
Existing Seeding (2001)
Proposed Seeding
Land Ownership
ARS
BLM
State
Private
TEAMS lys 11/21/09

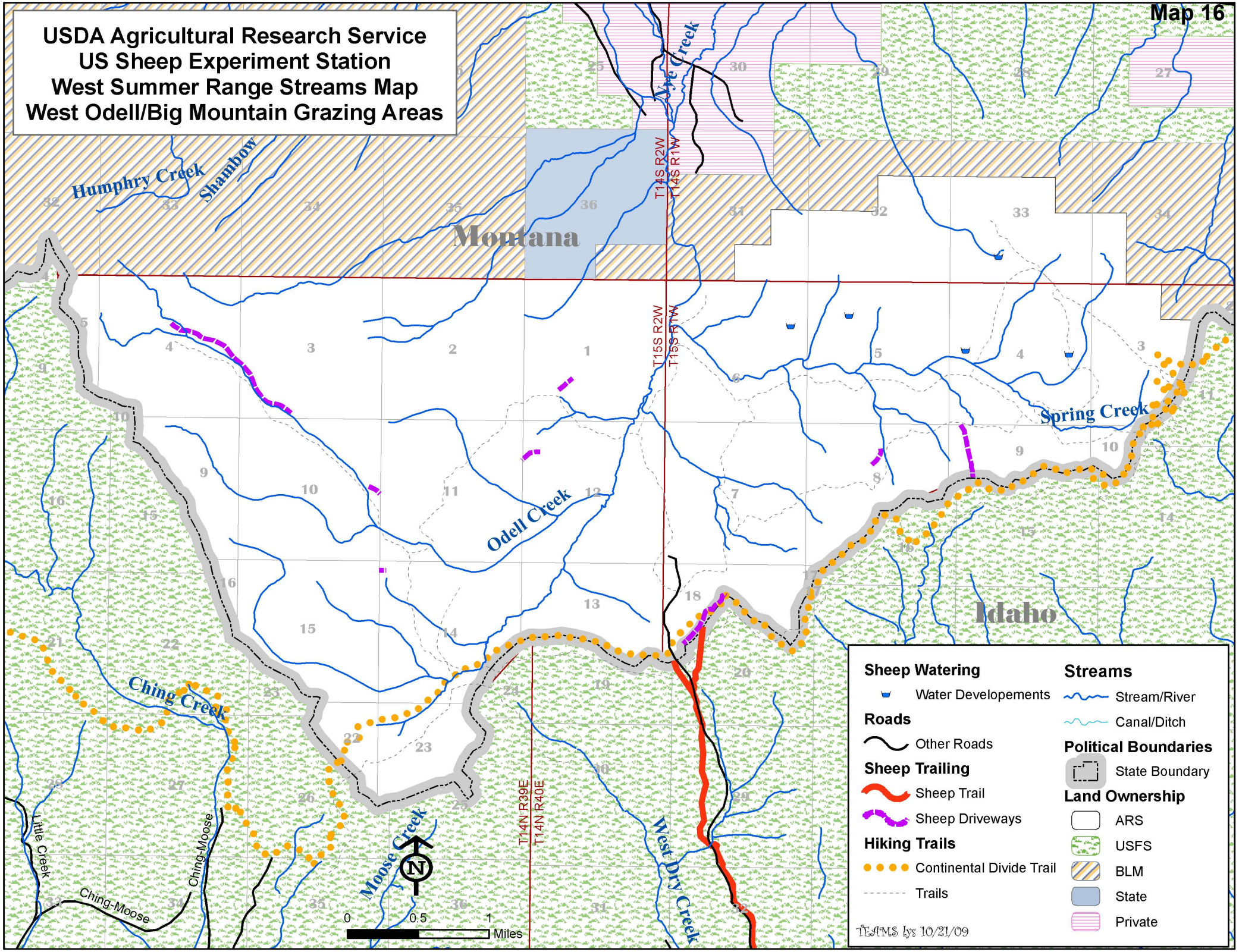

Map 11
USDA Agricultural Research Service
US Sheep Experiment Station
Henninger Ranch Irrigation Map
Moose Creek
T13N R39E
T13N R40E
Kilgore-Yale
Antelope Valley
A-2 Clark County Road
Dry Creek
Old Hwy 22
17
18
19
20
22
23
24
25
29
30
31
32
36
Roads
Other Roads
ARS Henninger Ranch Rds
Henninger Ranch
Pasture Fences
Streams
Stream/River
Well
Locations
Henninger Irrigation
Ditches
Flood Irrigation Areas
Land Ownership
ARS
BLM
State
Private
TEAMS by 11/21/09
N
0
0.25
0.5
Miles

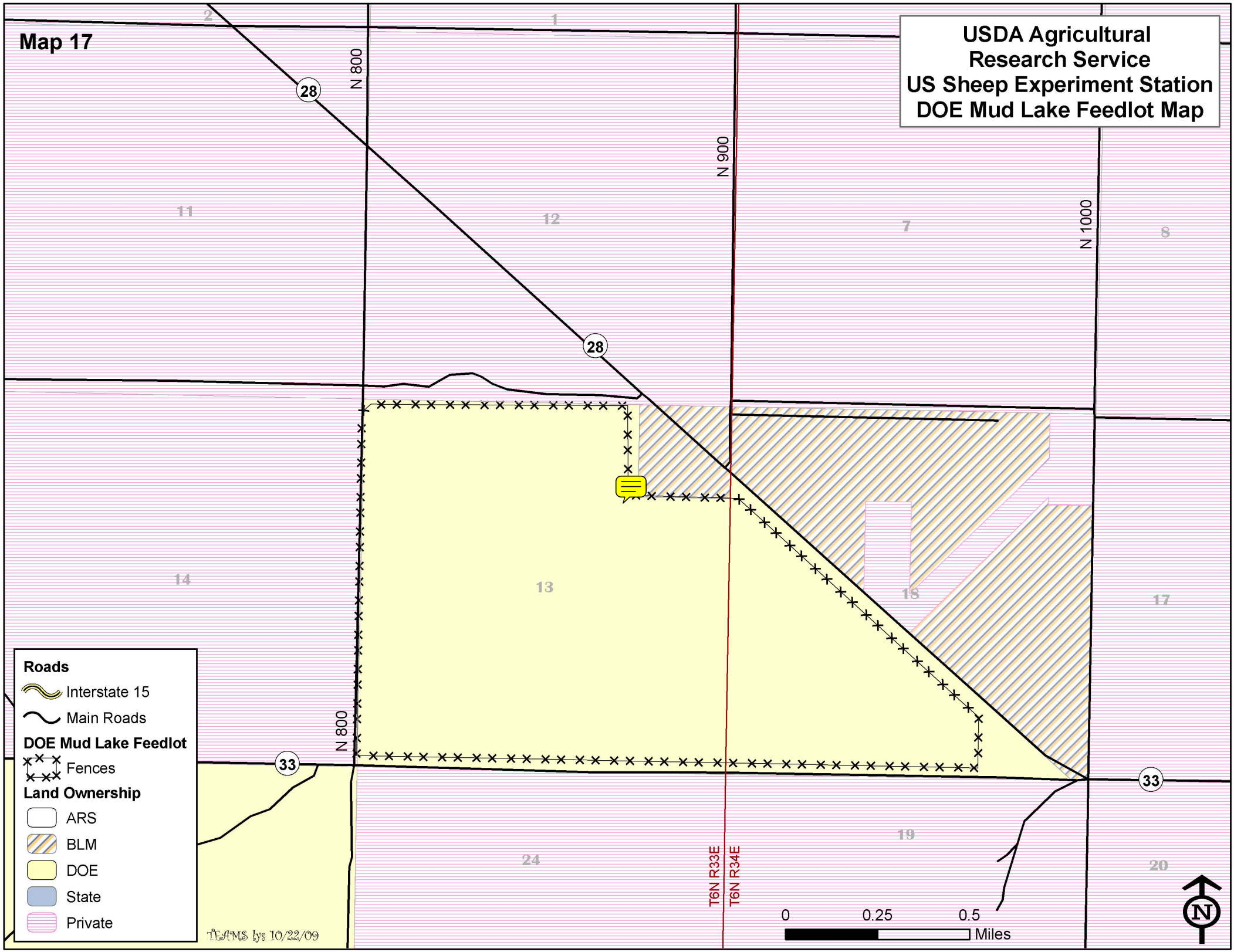

Map 12
USDA Agricultural Research Service
US Sheep Experiment Station
Humphrey Ranch Irrigation Map
Grover Ranch
Modoc
Beaver Creek
Idaho
T14N R36E
Boatman Springs
Modoc Creek
Berry Creek
Chicken Creek
15
Roads
Interstate 15
Main Roads
Humphrey Pasture
Fences
Well
Locations
Humphrey Irrigation
Water Diversion & Weir Sites
Irrigation Ditches
Flood Irrigation Area
Streams
Stream/River
Political Boundaries
State Boundary
Land Ownership
ARS
USFS
BLM
State
Private
TEAMS lys 11/21/09
0
0.25
0.5
Miles
N

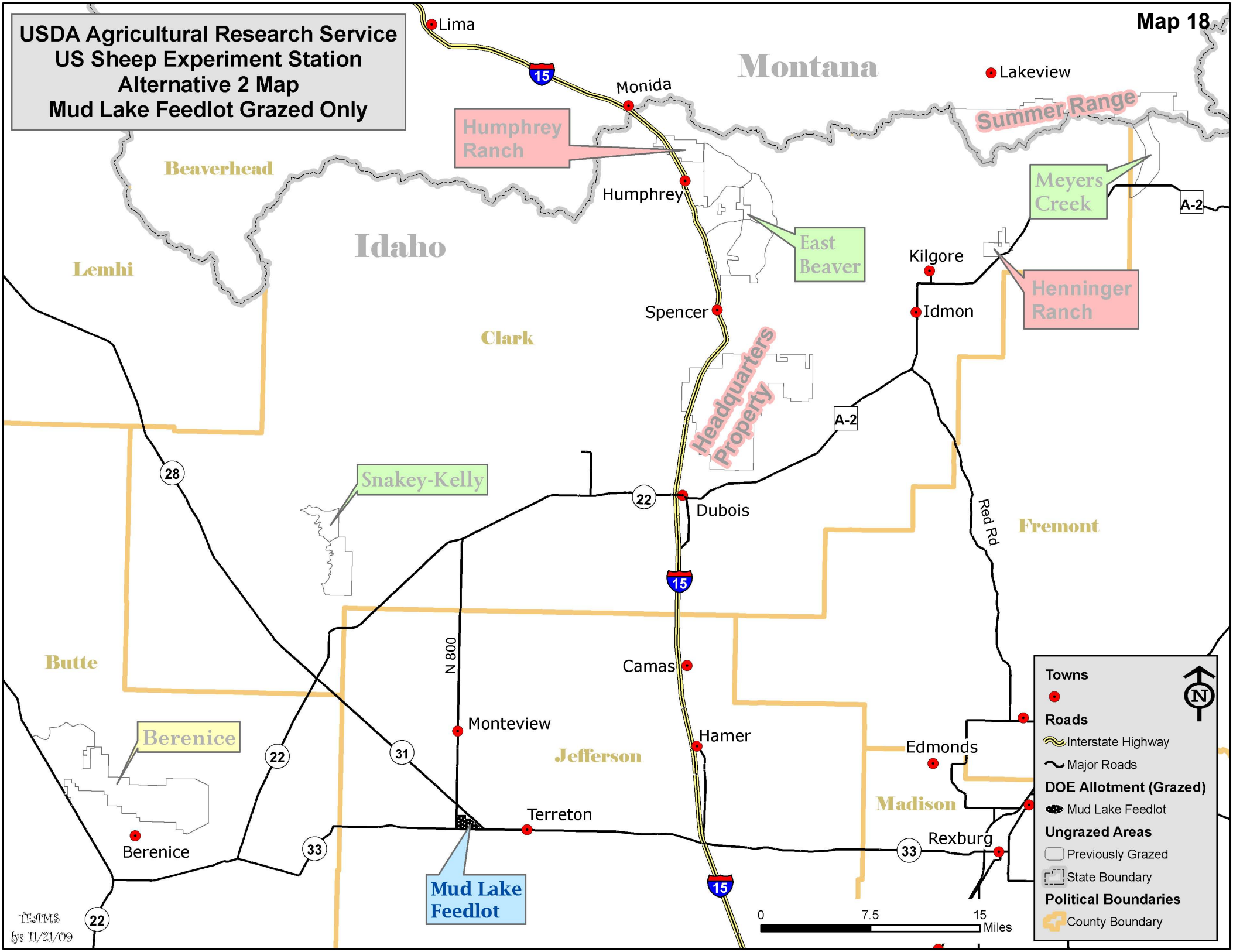

Map 13
USDA Agricultural Research Service
US Sheep Experiment Station
Humphrey Ranch
Proposed Seeding and Burn Map
Grover Ranch
Idaho
Boatman Springs
Modoc
I-15
15
18
19
20
21
22
27
28
29
32
33
34
Roads
Interstate 15
Main Roads
ARS Humphrey Ranch Rds
Seeding
Planted 2008-2009
Proposed Planting (2010-11)
Proposed Burn
Prescribed Burn
Humphrey Ranch
Pasture Fences
Political Boundaries
State Boundary
Land Ownership
ARS
USFS
BLM
State
Private
0
0.25
0.5
Miles
N
TLAMS lys 10/22/09

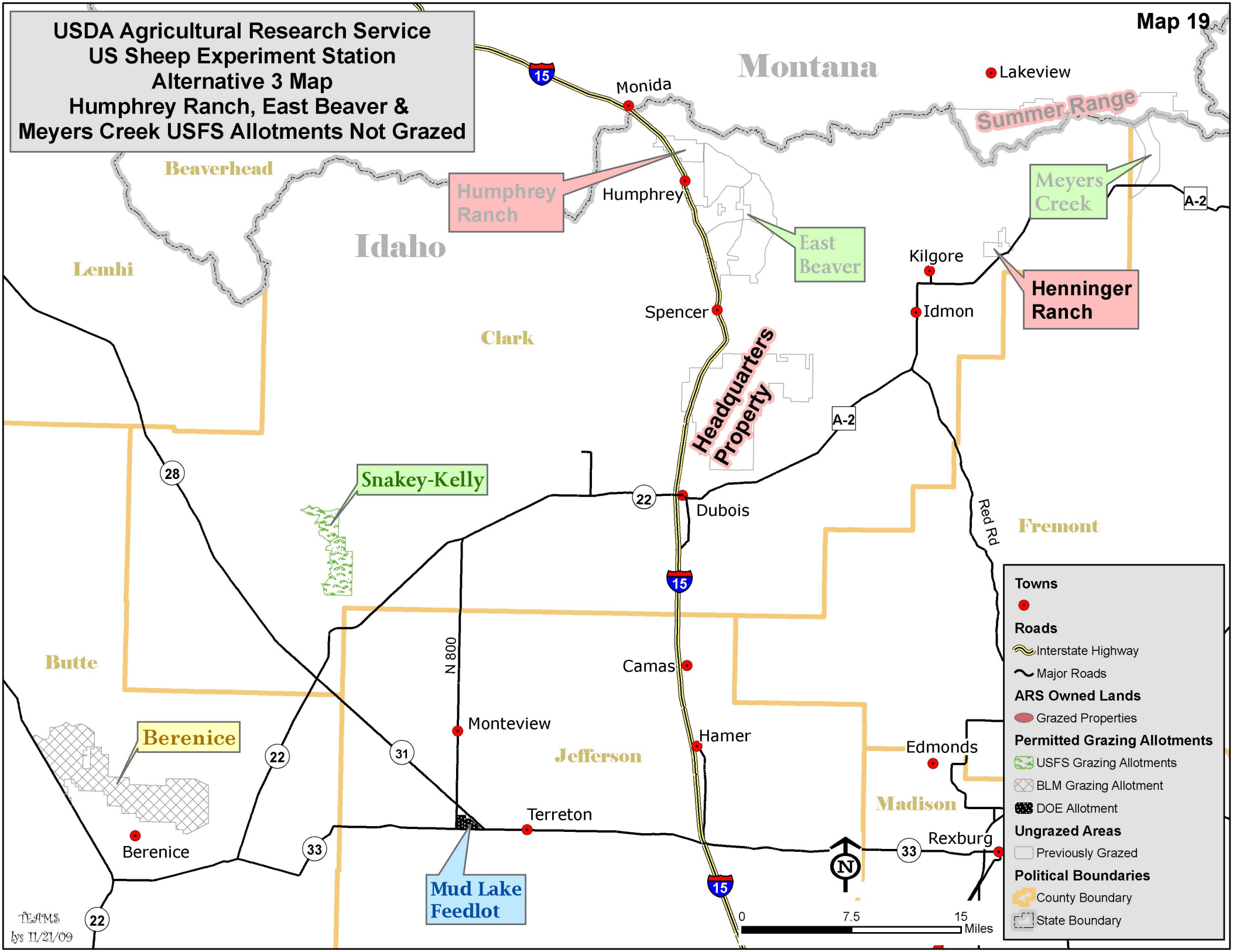

USDA Agricultural Research Service
US Sheep Experiment Station
East Summer Range Streams Map
Tom's Creek Grazing Area
Map 14
Montana
Idaho
Corral Creek
Tom Creek
Hell Roaring Creek
Keg Spring Creek
Keg Springs
Myers Creek
Schneider Creek
T14S R1E
T15S R1E
T14N R41E
T14N R42E
Roads
Other Roads
Sheep Trailing
Sheep Trails
Sheep Driveways
Hiking Trails
Continental Divide Trail
Other Trails
Streams
Stream/River
Canal/Ditch
Political Boundaries
State Boundary
Land Ownership
ARS
USFS
BLM
Private
N
0
0.5
1
Miles
TLMS lys 11/21/09

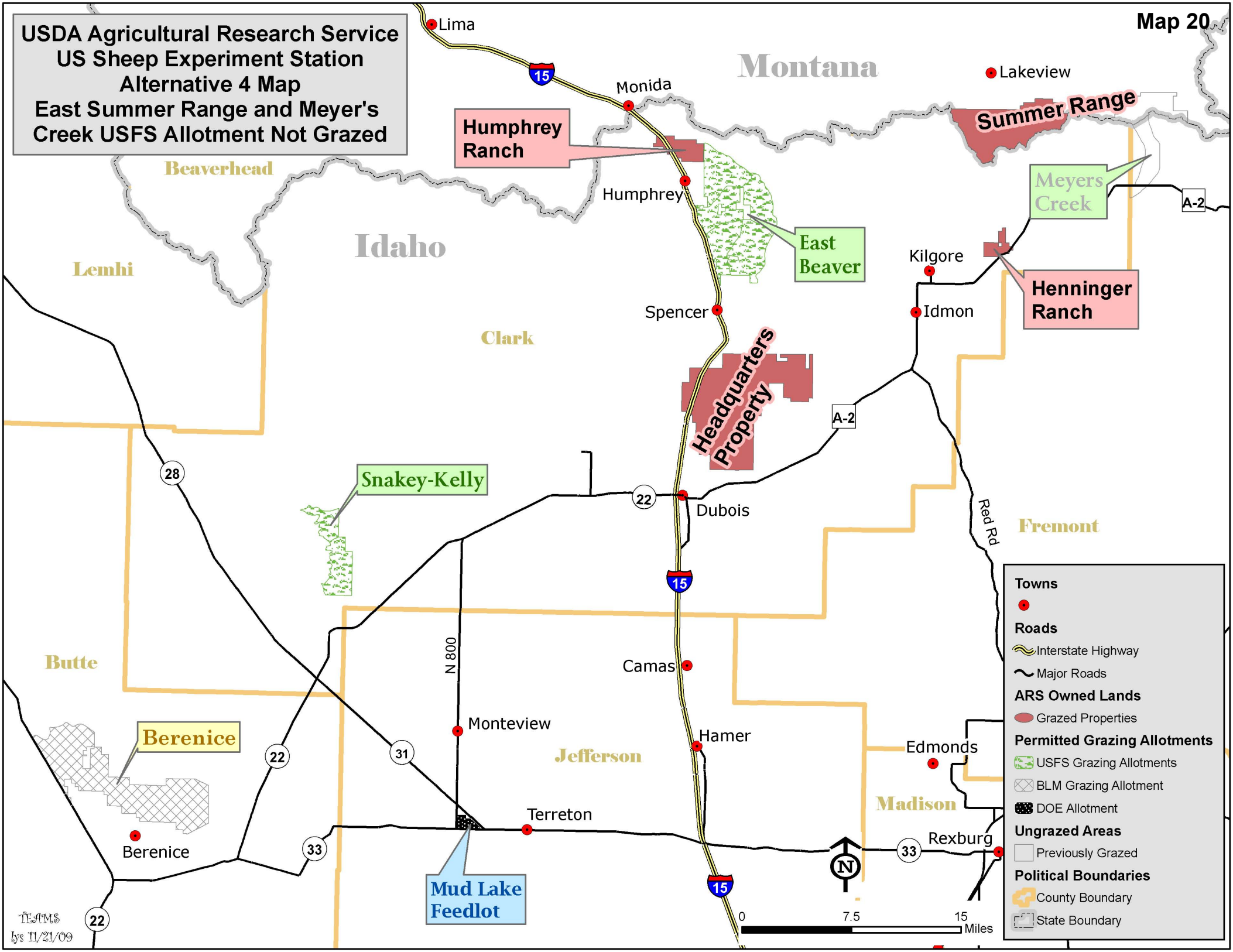

Map 15
USDA Agricultural Research Service
US Sheep Experiment Station
West Summer Range
West Odell/Big Mountain Grazing Areas
Montana
Idaho
T14S R2W
T14S R1W
T15S R2W
T15S R1W
T14N R39E
T14N R40E
Ching-Moose
Exclosures
West Summer Range
Fences
Horse Corral
Roads
Other Roads
Political Boundaries
State Boundary
Hiking Trails
Continental Divide Trail
Trails
Land Ownership
ARS
USFS
BLM
State
Private
Past Seeding
Failed Planting (2002)
0
0.5
1
Miles
N
TEAMS lys 10/22/09

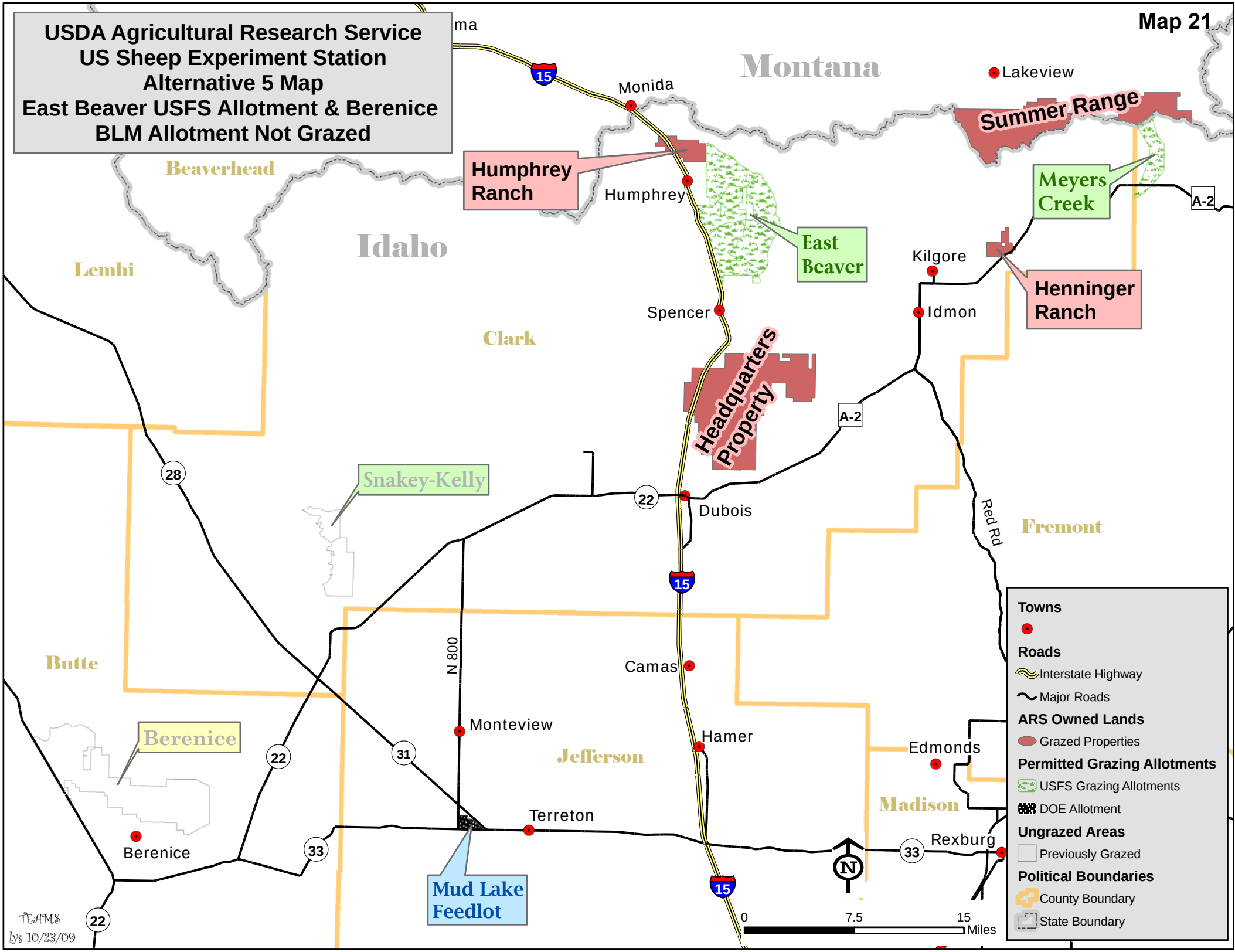

Map 16
USDA Agricultural Research Service
US Sheep Experiment Station
West Summer Range Streams Map
West Odell/Big Mountain Grazing Areas
Humphry Creek
Shambow
Montana
Idaho
Spring Creek
Odell Creek
Ching Creek
Moose Creek
West Dry Creek
Little Creek
Ching-Moose
T14S R2W
T14S R1W
T15S R2W
T15S R1W
T14N R39E
T14N R40E
0
0.5
1
Miles
Sheep Watering
Water Developements
Roads
Other Roads
Sheep Trailing
Sheep Trail
Sheep Driveways
Hiking Trails
Continental Divide Trail
Trails
Streams
Stream/River
Canal/Ditch
Political Boundaries
State Boundary
Land Ownership
ARS
USFS
BLM
State
Private
TEAMS lys 10/21/09


Map 17
USDA Agricultural
Research Service
US Sheep Experiment Station
DOE Mud Lake Feedlot Map
N 800
N 900
N 1000
28
33
2
1
11
12
7
8
14
13
18
17
24
19
20
T6N R33E
T6N R34E
Roads
Interstate 15
Main Roads
DOE Mud Lake Feedlot
Fences
Land Ownership
ARS
BLM
DOE
State
Private
0
0.25
0.5
Miles
N
TEAMS lys 10/22/09


USDA Agricultural Research Service
US Sheep Experiment Station
Alternative 2 Map
Mud Lake Feedlot Grazed Only
Map 18
Montana
Idaho
Lima
Monida
Lakeview
Summer Range
Humphrey Ranch
Humphrey
East Beaver
Meyers Creek
Henninger Ranch
Kilgore
Idmon
Spencer
Headquarters Property
Beaverhead
Lemhi
Clark
Snakey-Kelly
Dubois
Fremont
Red Rd
Butte
N 800
Camas
Monteview
Hamer
Jefferson
Edmonds
Madison
Berenice
Terreton
Rexburg
Mud Lake Feedlot
A-2
15
28
22
31
33
Towns
Roads
Interstate Highway
Major Roads
DOE Allotment (Grazed)
Mud Lake Feedlot
Ungrazed Areas
Previously Grazed
State Boundary
Political Boundaries
County Boundary
N
0
7.5
15
Miles
TEAMS
lys 11/21/09


USDA Agricultural Research Service
US Sheep Experiment Station
Alternative 3 Map
Humphrey Ranch, East Beaver &
Meyers Creek USFS Allotments Not Grazed
Map 19
Montana
Idaho
Lakeview
Summer Range
Monida
Humphrey
Humphrey Ranch
East Beaver
Meyers Creek
Henninger Ranch
Kilgore
Idmon
Spencer
Headquarters Property
Dubois
Snakey-Kelly
Beaverhead
Lemhi
Clark
Fremont
Butte
Jefferson
Madison
Camas
Hamer
Monteview
Terreton
Edmonds
Rexburg
Berenice
Mud Lake Feedlot
N 800
Red Rd
A-2
15
28
22
31
33
Towns
Roads
Interstate Highway
Major Roads
ARS Owned Lands
Grazed Properties
Permitted Grazing Allotments
USFS Grazing Allotments
BLM Grazing Allotment
DOE Allotment
Ungrazed Areas
Previously Grazed
Political Boundaries
County Boundary
State Boundary
0
7.5
15
Miles
N
TEAMS
lys 11/21/09


USDA Agricultural Research Service
US Sheep Experiment Station
Alternative 4 Map
East Summer Range and Meyer's Creek USFS Allotment Not Grazed
Map 20
Montana
Idaho
Lima
Monida
Lakeview
Summer Range
Humphrey Ranch
Humphrey
East Beaver
Meyers Creek
A-2
Kilgore
Idmon
Henninger Ranch
Spencer
Headquarters Property
Beaverhead
Lemhi
Clark
Snakey-Kelly
Dubois
Red Rd
Fremont
Butte
N 800
Camas
Monteview
Hamer
Jefferson
Edmonds
Madison
Berenice
Terreton
Rexburg
Mud Lake Feedlot
Towns
Roads
Interstate Highway
Major Roads
ARS Owned Lands
Grazed Properties
Permitted Grazing Allotments
USFS Grazing Allotments
BLM Grazing Allotment
DOE Allotment
Ungrazed Areas
Previously Grazed
Political Boundaries
County Boundary
State Boundary
0
7.5
15
Miles
TEAMS
lys 11/21/09


USDA Agricultural Research Service
US Sheep Experiment Station
Alternative 5 Map
East Beaver USFS Allotment & Berenice
BLM Allotment Not Grazed
Map 21
Montana
Idaho
Beaverhead
Lemhi
Clark
Butte
Jefferson
Madison
Fremont
Monida
Lakeview
Summer Range
Humphrey Ranch
Humphrey
East Beaver
Meyers Creek
Kilgore
Idmon
Henninger Ranch
Spencer
Headquarters Property
Snakey-Kelly
Dubois
Red Rd
Camas
N 800
Monteview
Hamer
Edmonds
Berenice
Terreton
Rexburg
Mud Lake Feedlot
15
28
22
31
33
A-2
N
0
7.5
15
Miles
Towns
Roads
Interstate Highway
Major Roads
ARS Owned Lands
Grazed Properties
Permitted Grazing Allotments
USFS Grazing Allotments
DOE Allotment
Ungrazed Areas
Previously Grazed
Political Boundaries
County Boundary
State Boundary
TEAMS
lys 10/23/09