FINDING OF NO SIGNIFICANT IMPACT

GRAZING PERMIT RENEWALS FOR WARD LAKE (00704) AND SQUAW BUTTE (00915) ALLOTMENTS

DOI-BLM-OR-L050-2014-0029-EA

The Lakeview District, Bureau of Land Management (BLM), has analyzed several alternative proposals related to renewing 2, 10-year term grazing permits (#3601216 and #3601444) for the Ward Lake (#00704) and Squaw Butte (00915) Allotments. The allotments are located in the northwestern corner of Lake County, Oregon.

An environmental assessment (EA) was prepared that analyzed the potential direct, indirect, and cumulative environmental impacts of three alternatives. The alternatives included No Action (renew existing grazing permits), Grazing Management Changes, and No Permits Issued (no grazing) (see Chapter 2 of attached EA).

The Council on Environmental Quality (CEQ) regulations state that the significance of impacts must be determined in terms of both context and intensity (40 CFR 1508.27). The context of the proposed action is the spatial extent of the Ward Lake and Squaw Butte Allotments. For this reason, the analysis of impacts in the attached Environmental Assessment (EA) is focused appropriately at this scale. The CEQ regulations also include the following ten considerations for evaluating the intensity of impacts:

1) Would any of the alternatives have significant beneficial or adverse impacts (40 CFR 1508.27(b)(1)?
( ) Yes (X) No

Rationale: Based on the analysis contained in the attached EA, none of the alternatives would have either significant beneficial or adverse impacts on the human environment. There are no prime or unique farmlands, forest habitat, wild horse management areas, wild and scenic rivers, significant caves, designated wilderness areas, lands with wilderness characteristics, special status plants, hazardous waste sites, ACEC/RNAs, paleontological resources, or low income or minority populations located in the project area. No measureable impacts would occur to climate, air quality, floodplains, land status, or mineral and energy resources (see Table 7 of attached EA).

The potential impacts to existing soils, biological soil crusts, water quality, wetland and riparian areas, upland vegetation, noxious weeds and invasive plants, aquatic species, wildlife, special status wildlife species, livestock grazing management, native American traditional practices, cultural resources, recreation, visual resources, and social and economic values anticipated by the various alternatives have been analyzed in detail within Chapter 3 of the attached EA and found not to be significant.

2) Would any of the alternatives have significant adverse impacts on public health and safety (40 CFR 1508.27(b)(2)? ( ) Yes (X) No

Rationale: None of the alternatives analyzed in the attached EA would have significant impacts on public health or safety because the project area is not located within or adjacent to any populated rural or urban area. For this reason, there would also be no impacts to low income or minority populations. Further, there are no known hazardous waste sites in the project area. There are no surface drinking water sources located in the project area. There would be no measureable impacts to air quality within and surrounding the project area (see Table 7). Impacts to water quality were assessed in Chapter 3 of the attached EA and found not to be significant.

3) Would any of the alternatives have significant adverse impacts on unique geographic characteristics (cultural or historic resources, park lands, prime and unique farmlands, wetlands, wild and scenic rivers, designated wilderness or wilderness study areas, or ecologically critical areas (*ACECs, RNAs, significant caves*)) (40 CFR 1508.27(b)(3)? ( ) Yes (X) No

Rationale: There are no park lands, prime or unique farmlands, wild and scenic rivers, significant caves, designated wilderness areas, ACEC/RNAs, or lands with wilderness characteristics located in the area (Table 7). Potential impacts to wetlands and riparian areas, wilderness study areas, and cultural resources have been analyzed in Chapter

3 of the attached EA and found not to be significant.

4) Would any of the alternatives have highly controversial effects (40 CFR 1508.27(b)(4)? ( ) Yes (X) No

Rationale: The BLM has extensive expertise planning, analyzing impacts, and implementing range management actions such as those proposed by the alternatives addressed in the attached EA. The potential impacts of these range management actions on soils, biological soil crusts, water quality, wetland and riparian areas, upland vegetation, noxious weeds and invasive plants, aquatic species, wildlife, special status wildlife species, livestock grazing management, native American traditional practices, cultural resources, recreation, visual resources, and social and economic values can be reasonably predicted based on existing science and professional expertise. The attached EA analyzed these impacts and did not find the nature of these impacts to be highly controversial, nor was there substantial dispute within the scientific community regarding the nature of these potential effects (see Chapter 3). The public has been given an opportunity to review and comment on the analysis of effects. The analysis contained in the EA did not identify any potential highly controversial effects, as defined under 40 CFR 1508.27(b)(4). During the 30-day review period, one comment letter was received but it did not identify any highly controversial effects associated with any of the alternatives.

5) Would any of the alternatives have highly uncertain effects or involve unique or unknown risks (40 CFR 1508.27(b)(5)? ( ) Yes (X) No

Rationale: The BLM has extensive expertise planning, analyzing impacts, and implementing range management actions such as those proposed by the alternatives addressed in the attached EA. The potential impacts of these range management actions on soils, biological soil crusts, water quality, wetland and riparian areas, upland vegetation, noxious weeds and invasive plants, aquatic species, wildlife, special status wildlife species, livestock grazing management, native American traditional practices, cultural resources, recreation, visual resources, and social and economic values can be reasonably predicted based on existing science and professional expertise. The attached EA analyzed these impacts. The nature of these impacts is not highly uncertain, nor does it involve unique or unknown risks (see Chapter 3).

6) Would any of the alternatives establish a precedent for future actions with significant impacts (40 CFR 1508.27(b)(6)? ( ) Yes (X) No

Rationale: The BLM has extensive expertise planning, analyzing impacts, and implementing range management actions such as those proposed by the alternatives addressed in the attached EA. None of the alternative actions represents a new, precedent-setting range management technique or would establish a precedent for future similar actions with potentially significant effects.

7) Are any of the alternatives related to other actions with potentially significant cumulative impacts (40 CFR 1508.27(b)(7)? ( ) Yes (X) No

Rationale: Based on the analysis contained within the Cumulative Effects section of Chapter 3 of the attached EA, none of the alternatives would have significant cumulative effects within the project area, even when added to the effects of other past, present, and reasonably foreseeable future actions.

8) Would any of the alternatives have significant adverse impacts on scientific, cultural, or historic resources, including those listed or eligible for listing on the National Register of Historic Resources (40 CFR 1508.27(b)(8)? ( ) Yes (X) No

Rationale: The allotment is located within a broad area which was used historically by native Americans. However, there are no known native American religious or sacred sites, designated Traditional Cultural Properties, or important plant collecting sites known within the allotments. Potential impacts to cultural resources have been analyzed in Chapter 3 of the attached EA and found not to be significant.

9) Would any of the alternatives have significant adverse impacts on threatened or endangered species or their critical habitat (40 CFR 1508.27(b)(9)? ( ) Yes (X) No

Rationale: There are no threatened or endangered species or designated critical habitat within the project area (see Tables 7 and 17). Potential impacts to special status wildlife species and their associated habitat were addressed in Chapter 3 and were not significant.

10) Would any of the alternatives have effects that threaten to violate Federal, State, or local law or requirements imposed for the protection of the environment (40 CFR 1508.27(b)(10)? ( ) Yes (X) No

Rationale: All of the alternatives analyzed in the attached EA comply with all Federal, State, and local environmental laws or other environmental requirements, including the requirements of the National Environmental Policy Act, Clean Water Act, Clean Air Act, and Endangered Species Act.

The Federal Land Policy and Management Act requires that any action that BLM implements must also conform with the current land use plan and other applicable plans and policies. The purpose and need for the proposed action conforms with the goals and management direction contained in the *Lakeview Resource Management Plan/Record of Decision* (BLM 2003b). The alternatives analyzed in the EA conform to the management direction of this plan and the *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington* (BLM 1997), and the grazing regulations (43 CFR Part 4100) in varying degrees (see EA page 3 and Chapter 3). Conformance with this direction is addressed in more detail within the proposed decision.

Finding

On the basis of the analysis contained in the attached EA, the consideration of intensity factors described above, and all other available information, my determination is that none of the alternatives analyzed would constitute a major federal action which would have significant adverse or beneficial impacts on the quality of the human environment. Therefore, an Environmental Impact Statement (EIS) is unnecessary and will not be prepared.

J. Todd Forbes, Field Manager
Lakeview Resource Area

12-10-14
Date

Grazing Permit Renewals for Ward Lake (00704) and Squaw Butte (00915) Allotments

Environmental Assessment

DOI-BLM-L050-2014-0029-EA

Lakeview Resource Area
Lakeview District
Bureau of Land Management
1301 South G Street
Lakeview, Oregon 97630

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Revised text is shown as underlined text

CHAPTER 1—PURPOSE AND NEED FOR ACTION

Introduction

The Lakeview District, Bureau of Land Management (BLM) has prepared this Environmental Assessment (EA) to analyze the potential effects of renewing term grazing Permits #3601216 and #3601444 for a ten-year period. These permits guide livestock grazing management for the Ward Lake (00704), and Squaw Butte (00915) Allotments. The Ward Lake Allotment is located approximately 3 miles northwest of Silver Lake, Oregon, and contains about 13,105 acres of public land and 3,143 acres of private land. Squaw Butte Allotment is located about 16 miles north of Christmas Valley, Oregon, and contains about 8,154 acres public land and 395 acres of private land (Maps 1 and 2).

This EA analyzes the potential direct, indirect, and cumulative impacts that may result with the implementation of the proposed alternatives. This EA also serves as the analytical basis for compliance with the National Environmental Policy Act of 1969 (NEPA), as well as making the determination as to whether any significant impacts to the human environment would result from the proposal.

Purpose and Need for Action

The grazing permit for Brown Ranch (Ward Lake Allotment) expired in 2004, at which time the permit renewal application was submitted to the BLM for consideration by the permittee. At that time the BLM was unable to fully process the permit renewal; therefore, the permit was renewed with the same terms and conditions as the expiring permit under the authority of Section 325, Public Law 108-108, until such time as the permit could be fully processed. The permit is up for renewal once again.

The grazing permit for the Iverson Partnership, which includes both Ward Lake and Squaw Butte Allotments, was last renewed by grazing decision in 2008.

The primary purpose of this analysis is to respond to the permittees' permit renewal applications and consider whether to reissue or modify the 10-year term livestock grazing permits #3601216 and #3601444 in accordance with 43 CFR Part 4130. When issued, grazing permits must also address appropriate terms and conditions designed to "achieve management and resource condition objectives for the public lands… and to ensure conformance with part 4180" (43 CFR Part 4130.3).

Decisions to Be Made

The authorized officer will decide whether to renew or modify the 10-year Term Grazing Permits, and if so, under what terms and conditions.

Decision Factors

Decision factors represent criteria used by the decision maker to choose the alternative that best meet the purpose and need for the proposal. These include, but are not limited to:

a) How well does the decision conform to laws, regulations, and policies related to grazing use and protecting other resource values?
b) How well does the decision conform to the resource management and allotment management plans?
c) How well does the decision promote maintenance of rangeland health standards?
d) How well does the decision conform with ODFW 2005 sage-grouse guidelines?

e) How well does the decision conform with IM 2012-043 regarding interim sage-grouse management?

Conformance with Laws and Regulations

Grazing permits are issued or renewed in accordance with the provisions of the Taylor Grazing Act (1934), Federal Land Policy and Management Act (FLPMA; 1976), Public Rangelands Improvement Act (1978), and applicable grazing regulations at 43 Code of Federal Regulations (CFR) Part 4100.

In order for an applicant to lawfully graze livestock on public land, the party must obtain a valid grazing permit or lease. The grazing regulations, 43 CFR 4130.2(a), state "grazing permits or leases shall be issued to qualified applicants to authorize use on the public lands and other lands under the administration of the Bureau of Land Management that are designated as available for livestock grazing through land use plans." As noted above, the *Lakeview RMP/ROD* has designated these allotments as available for livestock grazing (BLM 2003b). The permit renewal applicants (current permittees) control the base property associated with the grazing preference on the allotment and have been determined to be qualified applicants.

A performance review of each permittee's past use has been completed. BLM found both permittees to have a satisfactory record of performance pursuant to 43 CFR 4110.1(b). This conclusion was based on: grazing utilization at acceptable levels; bills paid on time; actual use turned in annually; permit terms and conditions were adhered to, base property requirements met, and no history of livestock trespass or unauthorized use. The record of performance review is hereby incorporated by reference.

This EA has been prepared in accordance with National Environmental Policy Act (1969).

Conformance with Land Use Plan

Approved management actions must conform to the appropriate land use plan. The *Lakeview Resource Management Plan/Record of Decision* (BLM 2003b, as maintained) is the governing land use plan for the area. Conformance with this plan will be discussed further within the proposed decision.

Conformance with Other Plans and Policies

The final decision must also comply with a number of other plans and policies. Conformance with the following plans/policies will be discussed further within the proposed decision:

Standards for Rangeland Health and Guidelines for Livestock Management for Public Lands Administered by the BLM in the States of Oregon and Washington (BLM 1997a)

Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (ODFW 2005)

Greater Sage-Grouse Interim Management Policies and Procedures (BLM 2011a)

CHAPTER 2—ALTERNATIVES

A total of three alternatives were analyzed within this EA. Table 1 includes a summary of these alternatives for each allotment. The alternatives are described in more detail in the following section.

Table 1. Grazing Management Alternative Summary for each Allotment

Allotment	Alternative 1 (No Action)	Alternative 2 (Grazing Management Changes)	Alternative 3 (No Permits Issued)
Ward Lake (00704) Brown Permit	50 cows 5/1-7/30 150 AUMs	Brown Permit - Add Stratton FRF Pasture to permit and add 19 AUMs to permit	No Grazing Permit Issued
Iverson Permit	221 cows 4/28-5/31 247 AUMs	Restore 101 AUMs suspended nonuse to active use in the Iverson permit	No Grazing Permit Issued
Squaw Butte (00915) Iverson Permit	181 cows 5/1-10/15* 1,000 AUMs	181 cows 5/1-10/15* 1,000 AUMs	No Grazing Permit Issued

*Grazing use after 8/30 is authorized on a temporary basis in the Squaw Butte Allotment Management Plan.

Alternative 1 (No Action)

The No Action Alternative would renew the existing livestock grazing permits (#3601216 and (#3601444) in the Ward Lake (00704), and Squaw Butte (00915) Allotments for the current grazing permittees with the same terms and conditions. The two 10-year term livestock grazing permits would be issued that continues current grazing management during the permitted season with the current specified grazing use (Table 1). This definition for the No Action Alternative is consistent with BLM (2000, 2008d) guidance.

Grazing Management System for Ward Lake Allotment (00704)

The current rest rotation grazing system would continue. There are 4 pastures in the Ward Lake Allotment. Two of the four pastures would be grazed each year and two pastures rested. Grazing in May thru July by the Brown Ranch is rotated between the East and North Pastures every other year. The grazing by the Iverson Ranch in the Middle and South Pastures occurs in May and is rotated every other year (Table 2). This system allows each pasture to be completely rested every other year and fits the natural rotation of the livestock as they travel from BLM land to other Forest Service pastures in the summer.

Table 2. Rest Rotation Grazing System for Ward Lake Allotment (00704)

Pasture	Year 1 in Rotation	Year 2 in Rotation
Brown Permit East	Graze 5/1-7/30	REST
North	REST	Graze 5/1-7/30
Iverson Permit Middle	Graze 4/28-5/31	REST
South	REST	Graze 4/28-5/31

Grazing management System for Squaw Butte Allotment (00915)

The current grazing system for the Squaw Butte Allotment is a rest rotation system that uses two of three pastures each year (Table 3). Each Pasture is grazed early (5/1-7/15) one year, grazed late one year (7/16-10/15) and completely rested one year. This system provides growing season rest for one pasture and complete rest for another pasture every year.

Table 3. Deferred Grazing System Squaw Butte Allotment (00915)

Pasture	Year 1 in Rotation	Year 2 in Rotation	Year 3 in Rotation
Rogers	5/1-7/15	7/16-10/15*	REST
West	7/16-10/15*	REST	5/1-7/15
Lava	REST	5/1-7/15	7/16-10/15*

*This extended grazing season (beyond 8/30) is temporary use authorized as part of the Squaw Butte Allotment Management Plan.

Alternative 2 (Grazing Management Changes)

A 10-year term livestock grazing permit would be issued that changes the current 10-year permit for the Brown portion of the Ward Lake Allotment. The changed permit would add an FRF Stratton Pasture and 19 AUMs to the grazing schedule (Table 4).

Table 4. Specified Grazing Use for Alternative 2 for each Allotment

	Livestock		Grazing Period		Type of Use	% Public Land	AUMs
Allotment	Number	Kind	Begin Date	End Date			
Ward Lake (00704) Brown Permit	50	CATTLE	5/1	7/30	Active	100	150
Stratton FRF Pasture	75	CATTLE	7/1	8/24	Active	14	19
Iverson Permit	311	CATTLE	4/28	5/31	Active	100	348
Squaw Butte (00915)	181	CATTLE	5/1	10/15*	Active	100	1000

*Grazing use after 8/30 is authorized on a temporary basis in the Squaw Butte Allotment Management Plan.

The Iverson portion of the 10-year permit for the Ward Lake Allotment would restore 101 AUMs of suspended use and increase the number of authorized AUMs for Iverson to 348 AUMs (Table 2).

Actions Common to Grazing Alternatives 1 and 2

Monitoring

Monitoring would continue, as specified in the *Lakeview RMP/ROD*, incorporated herein by reference, (BLM 2003b, pages 53-55). In summary, trend monitoring studies include nested frequency, 180° step-toe, photo station and observed apparent trend methodologies. These methodologies are used to measure cover, species composition and frequency. Utilization studies would be conducted using the key forage plant method. Utilization is a measure of the amount of the current year's forage that is consumed by livestock. Monitoring methodology would follow the latest protocol, such as Technical Reference 1734-3 and 1734-4 (BLM 1996a, 1996b) incorporated by reference. Tables 5-6 describe the key species and utilization targets identified for each allotment.

Table 5. Key Species and Target Utilization Levels for the Ward Lake Allotment (00704)

Pasture	Total Acres	Trend Plot	Key Species	Utilization Target %
East	3650	WL-08	Thurbers Needlegrass (*Achnatherum thurberianum*) Squirreltail (*Elymus elymoides*) Sandberg's bluegrass (*Poa sandbergii)*	50
North	3526	WL-07	Idaho Fescue (*Festuca idahoensis*) Squirreltail (*Elymus elymoides*) Sandberg's bluegrass (*Poa sandbergii)*	50
Middle	3587	WL-01 WL-04 WL-05 WL-06	Idaho Fescue (*Festuca idahoensis*) Thurbers Needlegrass (*Achnatherum thurberianum*) Squirreltail (*Elymus elymoides*) Sandberg's bluegrass (*Poa sandbergii)*	50
South	4743	WL-02 WL-03 WL-09	Thurbers Needlegrass (*Achnatherum thurberianum*) Squirreltail (*Elymus elymoides*) Sandberg's bluegrass (*Poa sandbergii)*	50%
Ward Lake Exclosure	351			Excluded; Private land
Buck Creek Exclosure	391			Excluded

Table 6. Key Species and Target Utilization Levels for the Squaw Butte Allotment (00915)

Pasture	Total Acres	Trend Plot	Key Species	Utilization Target %
Rogers	2,970	SB-01	Thurbers Needlegrass (*Achnatherum thurberianum*) Idaho Fescue (*Festuca idahoensis*) Squirreltail (*Elymus elymoides*) Sandberg's bluegrass (*Poa sandbergii)*	50
West	2,215	SB-02	Idaho Fescue (*Festuca idahoensis*) Squirreltail (*Elymus elymoides*) Sandberg's bluegrass (*Poa sandbergii)*	50
Lava	3,364	SB-03	Idaho Fescue (*Festuca idahoensis*) Thurbers Needlegrass (*Achnatherum thurberianum*) Squirreltail (*Elymus elymoides*)	50

Terms and Conditions Applicable to Grazing Alternatives 1 and 2 for Both Allotments

Terms and conditions that comply with Federal and State policies will be included within any grazing permit issued under any grazing alternative. This includes requirements such as: timely payment of fees, submission of actual use reports, providing administrative access across private land, continued compliance with Rangeland Health Standards, and maintenance of range improvements.

Management Flexibility Applicable to Grazing Alternatives 1 and 2 for Both Allotments

Knowing that uncertainties exist in managing for sustainable ecosystems, changes to the annual grazing use may be authorized within the limits of the grazing permit for reasons such as, but not limited to:

- Adjust the rotation/timing of grazing based on previous year's monitoring and current year's climatic conditions. An example of this would be; to turn livestock out later in the season on a year with a wet cold spring; or to bring livestock off the allotment early, as conditions warrant.

- Dry years with limited water availability; An example would be resting a pasture that had insufficient water to support livestock and shifting livestock use to the pasture that had water. Conversely on wet years, when water sources are abundant, more emphasis would be placed on putting livestock into under-utilized areas where water is typically less reliable.

- Change in use periods to balance utilization levels in each pasture. An example of this would be to shorten the time period or number of livestock in a pasture that had 65% average utilization and/or increase the time period and number of livestock in another pasture that had 30% average utilization, if the target utilization in both pastures is 50%.

Flexibility in grazing management would be authorized within the active permitted AUMs and permit dates, some of the more common adjustments are:

- Increasing livestock numbers while shortening the season of grazing use

- Adjustments to the length of time and AUMs of grazing use to meet resource objectives including, but not limited to, utilization targets.

- Temporary (1 year) adjustments to pasture use usually dependent on water availability or climate related issues. Sometimes adjustments would be made to reduce conflicts with other resources; such as one time recreational or other activities where livestock or the other resource would benefit from adjusting the livestock use.

Maintenance of Existing Range Improvements (Alternatives 1 and 2)

Maintenance of existing water troughs, wells, pipelines, waterholes, and fences would be included under Alternatives 1 and 2. Maintenance may not be needed on all existing developments; however, it would likely be needed sometime in the next 10 years. Waterhole maintenance would include the cleaning (within the original area of disturbance) of the waterhole to ensure continued function. Trough maintenance would include fixing and/or replacing leaking troughs, or fixing and/or replacing fittings, etc. Pipeline maintenance would include replacing and/or repairing broken, damaged, or leaking sections of pipe, and replacing fittings, etc.

Alternative 3 (No Permits Issued)

Under this alternative, the current grazing permits would not be renewed and livestock grazing under these permits would not be authorized on public lands within the two allotments. This alternative is being considered to provide a full range of alternatives and comply with current grazing management permit renewal guidance (BLM 2000, 2008b).

Range improvements within the allotment boundaries would not be maintained. However, allotment boundary fences would still be maintained to prevent unauthorized livestock use (trespass) from adjacent allotments that continue to be grazed under other permits.

CHAPTER 3— AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Introduction

This section presents a description of the current environment within the allotments and a discussion of the potential changes resulting from implementation of the alternative management actions. An inter-disciplinary (ID) team has reviewed and identified the resources values and uses that could potentially be affected by the alternative actions. Those resources or resource uses identified as "not affected" or "not present" are listed in Table 7 and will not be discussed or further analyzed in this EA. The remainder of this chapter describes the potential direct, indirect, and cumulative effects on resources and resource uses that may result from each alternative.

Table 7. Resources or Resource Uses that Would not be Affected

Critical Elements of Human Environment		Rationale
Air Quality (Clean Air Act)	Not Affected	None of the alternatives would have measureable impacts to air quality or discharges of regulated air pollutants.
Environmental Justice (Executive Order 12898)	Not Affected	No minority or low-income populations are located within or adjacent to the allotments. For this reason, none of alternatives would have effects on such populations.
Prime or Unique Farmlands	Not Present	No such lands have been identified in the allotments.
Flood Plains (Executive Order 13112)	Not Affected	No proposed construction within or other modification of flood plains would occur. Therefore, there would be no floodplain impacts.
Paleontology	Not Present	There are no known paleontological resources within the allotments.
Lands	Not Affected	None of the alternatives analyzed would have any effects on land status or land tenure.
Minerals and Energy	Not Affected	None of the alternatives analyzed would have any effects on mineral or energy resources or uses.
Hazardous or Solid Waste	Not Present	No such sites or issues are known within the allotments.
Significant Caves	Not Present	No caves are known within the allotments.
Wild Horses (Wild Horse and Burro Act)	Not Present	The allotments are located outside of designated wild horse herd management areas.
Special Status Plants	Not Present	There are no known special status plants, including federally-listed species, located within the allotment.
Lands with Wilderness Characteristics	Not Present	BLM's original wilderness inventory did not find wilderness characteristics to be present within these allotments (BLM 1979a, 1979b, 1979c, 1980a, 1980b, 1989, 1991). Since 2007, the BLM has been conducting wilderness inventory updates following current inventory guidance (BLM 2007a, 2008a, 2012a). In this process, an inter-disciplinary team reviewed the existing wilderness inventory information contained in the BLM's wilderness inventory files, previously published inventory findings (BLM 1979a, 1979b, 1979c, 1980a, and 1980b), and citizen-provided wilderness information (ONDA 2005). BLM conducted field inventory, completed route analysis forms, made unit boundary determinations, and subsequently evaluated wilderness character within each inventory unit. BLM has completed wilderness character inventory updates for all lands within the allotments (BLM 2010c and 2011c). BLM hereby incorporates these findings and all other inventory information by reference in its entirety. Based upon the results of these inventory updates, there are no lands with wilderness characteristics in any of the allotments. Therefore, there would be no impacts to such values.
Wild and Scenic Rivers	Not Present	There are no Wild or Scenic Rivers within the allotments.
Wilderness	Not Present	There are no designated wilderness areas are located in the allotments.
Areas of Critical Environmental Concern/Research Natural Areas	Not Present	There are no ACEC/RNAs within the allotments.

Analytical Assumptions

For purposes of the analysis in this EA, the Inter-Disciplinary (ID) team assumed that the permittees would use their full preference (full authorized level of AUMs) each year of the 10-year permit and the 50% utilization standard would not be exceeded. However, the livestock grazing section also acknowledges that the permittee may actually use less AUMs in a given year than the full permitted number for a variety of reasons and, for this reason, the actual utilization levels may be less than 50%.

It is important to understand that, in order to use the full permitted forage allocation, the permittee must also be able to utilize all of the existing water sources on each allotment. For this reason, the ID team assumed that under full permitted use levels, most livestock forage use would be concentrated around water sources. For the purposes of quantifying many resource impacts, the total acres of ground disturbance were used as an indicator of potential impacts. Total acres impacted by concentrated grazing use can be estimated by multiplying the impacted acres around a water source by the total number of water sources. It was assumed, based on professional experience, that the average disturbed area around a given point water source (well, spring, trough, waterhole, small reservoir) occurs within about 0.25 miles around the water source and this equals about 125 acres per water source. It is assumed the disturbed area around small or minor water sources (small waterholes or low producing springs) that the average disturbed area would be within 0.1 mile around the water source and equals about 25 acres. Total acres of heavy, concentrated livestock use are presented in Table 10. Cattle trails tend to be located along fence lines and near water sources. These trails are typically less than 5 feet wide. The miles of fence located within an allotment where cattle are known to trail were estimated and using the formula (# mi. x 5 ft. x 5,280 ft. per mi./ 43,560 $ft.^2$ per acre) the area of potential disturbance associated with past fence construction and livestock trailing was calculated. BLM does not have a quantifiable means of estimating disturbed acres associated with cross-country livestock trailing to water sources, but based on estimates associated with fencing, believes that it represents a very small percentage of the allotment. It is assumed that the acres impacted by trailing along fences will be similar in alternatives where grazing is occurring.

Climate

***Affected Environment*:**

Climate patterns of this region are typical of the Intermountain West precipitation zone, with winters and early springs being cold and snow constituting the majority of the precipitation, while summers are typically warm and dry. Average precipitation for Ward Lake (00704) and Squaw Butte (00915) Allotments are based upon the Parameter-elevation Regressions on Independent Slopes Model (PRISM system, and is estimated to average 7-12 in./year, with extreme lows (<6 in.) and highs (>13 in.) occasionally occurring. Average yearly temperatures range from 30-59º F, with average lows in December ~18º F, and average highs in July ~82º F; the coldest and warmest months, respectively (PRISM Climate Group, 2012). The soil regime within the allotments is frigid, with the frost-free time period ranging from 50 to 80 days (NRCS 2010). Peak plant growth typically occurs from April through June.

Changes in greenhouse gas levels may affect global climate (Forster *et al*. 2007). However, the U.S. Geological Survey (USGS) has summarized the latest science on greenhouse gas emissions and concluded it is currently beyond the scope of existing science to identify a specific source of greenhouse gas emissions and designate it as the cause of specific climate impacts at a specific location (USGS 2008).

***Environmental Consequences*:**

Livestock grazing results in methane emissions as a result of ruminant digestion. Methane is recognized as one source of carbon emissions. Emission rates from cattle vary widely and depend on many variables (Johnson and Johnson 1995; DeRamus *et al*. 2003). Livestock grazing can also affect rangeland carbon storage levels, through changes in plant community and changes in ecosystem processes, but the effects have been variable and inconsistent among the ecosystems studied (Schuman *et al*. 2009). Some studies have found that grazing can result in increased carbon storage compared to no grazing, because of increased plant turnover and changes in plant species composition (Follett *et al*. 2001). Many changes in rangeland carbon from different grazing practices do not result in substantial changes in total ecosystem carbon, but rather simply redistribute carbon, for example, from aboveground vegetation to root biomass (Derner and Schuman 2007).

Based on the analyses contained in several recent permit renewal EAs (which analyzed between 0 and 4,633 AUMs of forage consumption annually and are incorporated herein by reference in their entirety (BLM 2012d, 2012e, 2012f, 2013), the continued utilization of up to 1,498 AUMs of forage would result in extremely small levels of greenhouse gas emissions and net carbon storage/loss, and would be similar to the extremely small levels previously analyzed (BLM 2012d, 2012e, 2012f, 2013c). These levels would have no scientifically verifiable effects on regional or global climate change, nor would they have any significant effects on either greenhouse gas emissions or carbon sequestration processes. For this reason, this issue will not be analyzed further.

Soils and Biological Soil Crusts

Affected Environment:

Soils

Soil information was collected from the Soil Survey of Lake County, Northern Part, Natural Resource Conservation Service (NRCS; 2010) as well as soil data on file at the Lakeview District BLM Office. This data is herein incorporated by reference in its entirety and is summarized in the following section.

The Rangeland Health Assessments found that soils in the two allotments exhibited infiltration and permeability rates, moisture storage, and stability appropriate for soil, climate, and land form. Root occupancy for the soil was appropriate, and therefore, Standard 1 was being met (BLM 2004c and BLM 2007d). These assessments examined soil surface factor (SSF) data for the two allotments collected during the ecological site inventory (ESI) effort in 2000. SSF ratings are used to assign an erosion class rating and the potential susceptibility of soil to accelerated erosion. Observed apparent trend (OAT) data was used to determine trend indicators correlated to soil stability. These indicators are: surface litter, pedestals, and gullies. The summary of that data including SSF and OAT ratings are included in Tables 8 and 9.

There are 13 soil map units in the Ward Lake Allotment (Map 3). They vary in soil texture from loam to cobbly ashy fine sandy loam. The most common soils types are cobbly ashy fine sandy loams and gravelly ashy fine sandy loams found in the Moonbeam-Goodtack Complex,1-8% slopes and the Norcross Complex, 1-4% slopes, comprising about 61% of the Ward Lake Allotment (Table 8) These soils are all located on Lava plateaus and are volcanic ash and pumice over residium derived from volcanic rock. These soils are all well drained and have low to very low water holding capacity. These soils have an indurated duripan layer beginning at 13-20 inches. About 16% of the Ward Lake Allotment is unknown and most of the remaining 23% is an ashy fine sandy loam with either gravelly or cobbles as a component.

In the Ward Lake Allotment the SSF rating was slight on about 46% percent of the acreage. About 24% percent was rated in the Moderate erosion condition class along with 29% percent in the unknown class. The breakdown of the SSF rating by soil type is seen in Table 8.

Table 8. Soil Type and SSF and OAT Ratings for the Ward Lake Allotment (00704)

Soil Map Units	Total Acres	% of Allot-ment	SSF Acres			OAT Acres			Unmapped Acres
			Slight	Moderate	Critical	Down	Static	Up	
Dunries-Henkle Complex, 2-20% slopes	166	1%	149					149	17
Swalesilver, A-FSL, 0-1% Slopes	15	T		5	9	9	5		1
Norcross Complex, 1-4% slopes	4,076	25%	**2,289**	1,175			3,464		612
Moonbeam-Goodtack Complex,1-8% slopes	5,815	36%	2,231	2713		2,231	2713		871
Glencabin GR-A-L's Dry, 15-35% Slopes	213	1%	132	58			58	132	23
Embal SL, 0-3% Slopes	2	T							2
Wanoga-Henkle Complex, Moist,1-15% Slopes	1,366	8%	1,105				216	889	261
Bridgewell A-L. 0-1%Slopes	15	T							15
Wegert-Kunceider Complex, 0-3% Slopes	5	T							5
Connleyhills A-COSL, 1-6% Slopes	704	4%	598			383	215		106
Morehouse A-S, 2-20% Slopes	4	T							4
Murlose GR-A-Ls, Dry, 15-35% Slopes	1116	7%	949				949		167
Water	184	1%							
Total Mapped Soils	**13,681**		**7,453**	**3,951**	**9**	**2,623**	**7,620**	**1170**	**2,084**
Percent of Allotment	84%		46%	24%	0.05%	16%	47%	7%	13%
Unknown inclusions, transition zones, or rock outcrops	2,567	16%							
Total	16,248								

OAT data collected indicates stable soils are found on about 47% of the Ward Lake Allotment; i.e. the majority of litter is collecting in place, there is little evidence of pedestaling, and gullies are absent from the slopes. About 45% of the acres in the Ward Lake Allotment are rated as unknown (Table 8).

There are 17 soil map units in Squaw Butte Allotment (Map 4). They vary in soil texture from Lava Rock to loam to cobbly ashy fine sandy loam. The most common soils types are Wegert ashy loamy sand, cool, 0-1 percent (29% of allotment), Hayspring-Dunries-Complex, 1-15% (20% of allotment) and Dunries cobbly ashy sandy loam, 1-15 percent (22% of allotment) (Table 9). These soils are all located on lava plateaus and are volcanic ash and pumice over residium derived from volcanic rock. These soils are all well drained and have low to very low

water holding capacity. The Wegert soil is 20-40 inches deep to lithic bedrock, while the Hayspring and Dunries soils have a duripan layer beginning at 14-20 inches.

In the Squaw Butte Allotment the SSF rating was slight on about 63% percent of the acreage, about 12% percent was rated in the Moderate erosion condition class and 2% in the Stable class with 23% percent in the unknown class (Table 9).

Table 9. Soil Type and SSF and OAT rating for the Squaw Butte Allotment (00915)

Soil Map Units	Total Acres	% of Allot-ment	SSF Acres			OAT Acres		Unmapped Acres
			Stable	Slight	Moderate	Static	Up	
Wegert-A-LS, Cool, 01-% Slope	2,514	29%		1,903		1,903		611
Hayspring-Senra complex,1-6% Slope	157	2%			71	71		86
Dunries-Moonbeam Complex, 1-8% Slope	108	1%		56		56		52
Moonbeam-Connleyhills Complex,1-8% slope	12	0.1%						12
Hayspring-Dunries- Complex, 1-8% Slope	1,726	20%		901	289	1,190		536
Glencabin GR-A-L's, -30-65% Slope	181	2%		154		154		27
Henkle-Wanoga- Complex, 1-15% Slope	193	2%	146				146	47
Glencabin Wanoga- Complex, 15-35% Slope	535	7%		310	176	486		49
Glencabin Rock Outcrop Complex, 15-40% Slope	199	2%		129			129	70
Laidlaw A-LCS, 5-15% Slope	40	0.5%		34		34		6
Oatmanflat A-VFSL, 0-2% Slope	97	1%		82		82		15
Dunries CB-A-SL, 1-15% Slopes	1,861	22%		1,073	509	509	1,073	279
Greenmountain Gravelly Ashy Sandy Loam, 1-8% Slope	8	0.1%		7		7		1
Henkle-Ludi- Complex, 20-40% Slope	116	1%		98		98		18
Greenmountain-Jacksplace Complex, 2-15% Slope	665	8%		565		565		100
Moonbeam- CB-A-L, 2-15% Slope	19	0.2%		16		16		3
Lithic Haploxerolls-Lava Flows Complex, 2-15% Slope	99	1%		70			70	29
Total Mapped Soils	**8530**	**99%**	**146**	**5398**	**1045**	**5171**	**1418**	**1941**
Percent of Allotment			2%	63%	12%	60%	17%	23%
Unknown inclusions, transition zones, rock outcrops	17	0.2%						
Total	8,547							

OAT data indicates upward soil conditions on about 17% of the allotment and static soil conditions on about 60% of the Squaw Butte Allotment; i.e. the majority of litter is collecting in place, there is little evidence of pedestaling, and gullies are absent from the slopes. About 23% of the acres in the Squaw Butte Allotment are rated as unknown (Table 9).

The Rangeland Health Assessment Updates of the two allotments (BLM 2014a, 2014b), also examined the recent trend photos and the vegetation transect data and concluded that the soil indicators in those locations are either stable or in an upward trend in the two allotments.

Biological Soil Crusts (BSCs)

BSCs such as mosses, lichens, micro fungi, cyanobacteria and algae play a role in a functioning ecosystem. In addition to providing biological diversity, BSCs contribute to soil stability through increased resistance to erosion and nutrient cycling (Belnap *et al.* 2001). Lichen species diversity is poorly known in the Pacific Northwest (Root *et al*. 2011). Further, identification of BSCs at the species level is not practical for fieldwork, as it is very difficult and may require laboratory culturing (Belnap *et al.* 2001).

The 3 long-term transects in the Squaw Butte Allotment recorded less than 1% cryptogram cover. Moss was recorded on two of three transects at less than 0.5 % in 2012. The 3 long-term transects established in the Ward Lake Allotment recorded cryptogram cover (moss) at 1% on one transect in 2012.

Though comprehensive data is lacking, BLM staff note (based on professional field knowledge) that BSCs are present in the allotments, but occupy a very small percentage of the total ground cover. BLM assumes the condition of existing BSCs would be similar to the condition of the soils, litter, and vegetation with which they co-exist. The conditions of the perennial vegetation, litter, and soils seen in the trend photos and recorded on the vegetation transects appear to be stable or improving.

Environmental Consequences:

Alternatives 1 and 2

The impacts of livestock grazing on soils within the Lakeview Resource Area were analyzed in the *Lakeview Proposed RMP/Final EIS* (BLM 2003a) and that analysis is incorporated herein by reference. In summary, livestock use would continue to negatively impact area soils due to compaction at waterholes and along trails (pages 4-35 to 4-36). However, the rest rotation grazing system in the 2 Allotments (Tables 2 and 3) allows for periodic rest and time for plant growth and micro biological activity in the soil to mitigate the impacts of trampling to some degree.

Soils and BSCs would continue to be negatively impacted in livestock concentration areas near water sources and cattle trails under Alternatives 1 and 2. Using the use pattern maps, size and volume of the water sources (developed springs, waterholes, and reservoirs) and the calculations from the analytical assumptions section described in the beginning of Chapter 3, the acres impacted by concentrated use can be estimated. The breakdown of the estimated acreage impacted by concentrated livestock use in each allotment by alternative is summarized in Table 9. (Note: The Stratton FRF Pasture within the Ward Lake Allotment is not included in these calculations because the pasture is only about 14% public land accounting for 19 AUMs).

Ward Lake Allotment (00704)

Alternative 1 (No Action)

There are about 896 acres (6%) in the Ward Lake Allotment that would be impacted by concentrated livestock use (Table 10). However, with the rest rotation grazing system approximately one half of this area is rested every year so only about 3% of the allotment would be impacted by livestock concentration in any given year. Most of this use would occur around the 5 major water sources, which includes 4 major constructed waterholes and Lily Lake (Map 5). There are 10 additional water sources that receive less grazing pressure and cattle concentration impacts (approximately 250 acres) around minor water sources would be impacted by concentrated grazing (Table 10). Though Buck Creek is within the allotment boundary, it is excluded from

Table 10. Estimated Acreage Disturbed by Concentrated Livestock Use by Alternative

	Alternative 1 (No Action)		**Alternative 2** (Grazing Management Changes)		**Alternative 3** (No Permits Issued)	
	Acres	**% Allot**	**Acres**	**% Allot**	**Acres**	**% Allot**
Ward Lake Allotment						
Water Developments						
Major Waterholes (5)	625 acres	4%	775	6%	0 acres	%
Minor Waterholes (10)	250 acres	2%	322	2%	0 acres	0.2%
Total for Water Developments	**875 acres**	**6%**	**1097**	**8%**	**0 acres**	**3%**
Trails along fences (35 mi.)(5 Feet)	21 acres	0.1%	21	0.1%	0 acres	0.04%
Gross Total	896 acres	6%	1271	8%	0 acres	0%
Annual Total (note only 1/2 of allotment is grazed each year)	**448 acres**	**3%**	**636**	**4%**	**0 acres**	**0%**
Squaw Butte Allotment						
Water Developments						
Major Wells (4)	500 acres	6%	Same as Alternative 1		0	
Minor Waterholes (3)	75 acres	1%			0	
Total for Water Developments	**575 acres**	**7%**			**0**	
Trails along fences and lava flows (18 mi.)(5 Feet)	11 acres	0.1%	Same as Alternative 1		0	
Gross Total	586 acres	7%			0	
Grand Total Used Annually (note: only 2/3 of allotment is grazed each year)	**393 acres**	**5%**			**0**	

grazing.

About 35 miles of fence are located within the allotment and account for about 21 acres of ground disturbance associated with past fence construction and livestock trailing.

The average utilization levels across the allotment since 2000 were about 41% with the Middle Pasture being the highest at 43% and East Pasture being the lowest at 39%. The North and South Pastures averaged 42% and 40% respectively. This moderate to light level of utilization across the allotment continues to provide for some BSC retention and litter accumulation, resulting in the maintenance of existing organic matter, soil structure and productivity. In addition each pasture is completely rested every other year further providing time necessary for plants to maximize production and complete their life cycle. This results in increased root production, seed production and litter accumulation which further protects BCSs and maintains organic matter and soil productivity.

The use pattern mapping of the allotment over the last 10 years showed even lower percentages of the allotment were heavily used. The percent of heavy use was between 2% in the North Pasture (2008) and 8% in the West Pasture (2009). The 10-year average of acres mapped as heavy use for the East Pasture was 5%, the North Pasture, 5% and the West Pasture, 6%. This average percentage was only for years the pastures were grazed and does not include the rest years. Therefore, with a third of the allotment being rested every year, the percentage of the allotment mapped as heavy use would be about 3-5%. (This data and maps are on file in the Lakeview Resource Area Office).

While wind and water erosion and wildlife use would also have an on-going negative impact on soils and BSCs, based on professional judgment, the allotment would be expected to continue to meet rangeland health Standard 1 into the foreseeable future.

Alternative 2 (Grazing Management Changes)

Under Alternative 2, the impacts of grazing use on soils and BSCs would be increased compared to Alternative 1. The increase of 19 AUMs to the Brown permit would be completely within the Stratton FRF Pasture and that only accounts for 14% of the available forage in the Stratton Pasture. Most of the livestock use in the Stratton Pasture is on private land meadow. Therefore, authorizing 19 additional AUMs would not impact the soils in the Stratton Pasture beyond what is already occurring in Alternative 1.

The activation of the 101 suspended AUMs in the Iverson permit would negatively impact the soils in two pastures (Middle and South) more than Alternative 1. There would be a 41% increase in the number of AUMs and therefore, a corresponding increase in the concentration use areas and the average utilization in the Middle and South Pastures is expected. The concentrated use areas would be estimated to increase from about 875 acres to about 1,097 acres and this increase would be focused around waterholes in the Middle and South Pastures. The percentage of the two pastures that would receive concentrated use would increase from 6% of the two pastures to 9%. The average utilization across the pastures is estimated to increase from about 41% to about 57%. This increase in the concentration areas and the average utilization levels would increase the level of impacts on the soils across these two pastures.

Alternative 3 (No Permits Issued)

Under this alternative little change to soils would occur on public lands in the allotment in the short-term (up to 5 years). Most of the concentrated livestock use areas on public land associated with water sources

and the cattle trails (about 896 acres) would begin to reclaim naturally with vegetation and BSCs over the long-term (5-10 years). However, plant community changes typically occur very slowly in the high desert climate. While wind and water erosion and wildlife use would still have an on-going negative impact on soils and BSCs, the public lands in the area would be expected to continue to meet rangeland health Standard 1 into the foreseeable future.

Squaw Butte Allotment (00915)

Alternatives 1 and 2

There are 586 acres (7%) in the Squaw Butte Allotment estimated to be impacted by concentrated livestock use (Table 10). However, with the rest rotation grazing system approximately one third of this area is rested every year so only about 393 acres (5%) of the allotment is impacted by livestock concentration in a given year. Most of this use is around the 4 major water sources (wells) with one in the Lava Pasture, one in the East Pasture, one accessing two pastures and one accessing all three pastures. The additional 3 minor water sources include one in the Lava Pasture, one that serves both the Lava Pasture and the East Pasture and one in the West Pasture (Map 6). The concentrated use area around the four major water sources totals about 500 acres (Table 10). The total concentrated use area around the 3 minor waterholes would be about 75 acres. The total concentrated use area around water sources would be about 575 acres.

Cattle trail along about 18 miles of fence and lava flows within the allotment. This would account for about another 11 acres of concentrated ground disturbance.

Average utilization levels across the allotment since 2005 were about 43% with the Rogers Pasture being the highest at 52%, the Lava Pasture at 35% and West Pasture at 43%. This moderate to light level of utilization continues to provide for some BSC retention and litter accumulation, resulting in the maintenance of organic matter, soil structure, and productivity. In addition, each pasture receives growing season rest two out of three years and is completely rested every third year. This rest provides the time necessary for plants to complete their life-cycle, thus resulting in increased root production, seed production, and litter accumulation which protects BCSs and thereby maintain organic matter and soil productivity. While wind and water erosion and wildlife use would also have on-going negative impacts on soils and BSCs, based on professional judgment, the allotment would be expected to continue to meet rangeland health Standard 1 into the foreseeable future.

Alternative 3 (No Permits Issued)

Under this alternative, little change to soils would occur on public lands in the allotment in the short-term (up to 5 years). Most of the concentrated livestock use areas on public land associated with water sources and the cattle trails (about 586 acres) would reclaim naturally with vegetation and BSCs over the long-term (5-10 years). However, plant community changes typically occur very slowly in the high desert climate. While wind and water erosion and wildlife use would still have on-going negative impacts on soils and BSCs, most of the public lands in the allotment would be expected to continue to meet rangeland health Standard 1 into the foreseeable future.

Water Quality, Wetlands, Riparian and Aquatic Habitat

Affected Environment:

In 2014, an interdisciplinary (ID) team identified 26 acres of palustrine wetlands in the Ward Lake Allotment and, based on field inventory all were found to be in Proper Functioning Condition (Table 15).

Buck Creek, a perennial fish-bearing stream, falls within the allotment, but has been excluded from grazing since 1989. In 1996, an ID team determined the portion of Buck Creek in the Ward Lake Allotment was in PFC. As of 2014, Buck Creek is still excluded from grazing and is still in PFC. Monitoring indicates the condition of this creek continues to improve.

No water quality data exists for water bodies in the Ward Lake Allotment. No surface water or groundwater within the allotment has been listed for exceeding State Water Quality standards. Because all 26 acres of wetlands, as well as that portion of Buck Creek located in the allotment are at PFC, it is believed that water quality conditions are adequate.

There are no wetlands, perennial or major intermittent streams, or associated riparian areas in the Squaw Butte Allotment (Table 16), so there would be no potential for impacts to such resources in this allotment and it will not be discussed further.

Environmental Consequences: Ward Lake Allotment (00704)

<u>Alternative 1 (No Action)</u>

Under Alternative 1, no changes would be made to the current grazing strategy. The current strategy has led to adequate or improving riparian and water quality conditions, as described above (see also Table 15). For this reason, these resource conditions would be maintained or continue to improve under implementation of this alternative and rangeland health standards 2 and 4 would continue to be met.

<u>Alternative 2 (Grazing Management Changes)</u>

Under Alternative 2 the impacts of grazing use on wetlands, riparian and aquatic habitat, and water quality would be increased compared to Alternative 1. The increase of 19 AUMs to the Brown permit would be within the Stratton FRF Pasture and the limited amount of public lands accounts for only 14% of the available forage in the pasture. However, most of the livestock use in the Stratton Pasture occurs on private land meadows. For this reason, adding 19 AUMs of use to the permit would not impact aquatic, riparian, or water quality resources in the Stratton Pasture significantly more than what is occurring in Alternative 1.

The re-activation of the 101 suspended AUMs in the Iverson permit would impact the aquatic, riparian, and water quality resources in the Middle and South Pastures. There would be a 41% increase in the number of AUMs and an increase in the average utilization in the Middle and South Pastures. There would also be a corresponding increase in the high concentration use areas around water sources (which generally contain aquatic or riparian resources). The concentrated use areas would increase from about 875 acres to about 1,097 acres in the Middle and South Pastures. The percentage of the two pastures that would receive concentrated use would increase from about 6% to about 9%. The average utilization across the pastures would increase from the current 41% average and possibly exceed the standard of 50%. This increase in the concentration areas and the average utilization levels would have additional negative impacts on the

aquatic, riparian, and water quality resources across the Middle and South Pastures compared to Alternative 1. For these reasons, it is likely that rangeland health standards 2 and 4 would not be met across this allotment under this allotment over the long-term.

Alternative 3 (No Permits Issued)

Under Alternative 3, all grazing related impacts would be removed from the allotment and high concentration areas around water sources would recover over time. This alternative would provide the most rapid rate of recovery or improvement in aquatic, riparian, and water quality conditions compared to Alternatives 1 and 2. For these reasons, rangeland health standards 2 and 4 would continue to be met.

Upland Vegetation

Affected Environment: Ward Lake Allotment (00704)

The Ward Lake Allotment is a transitional area between Paulina Marsh to the east and National Forest lands to the west and north. The allotment is bordered on the south by Buck Creek and generally slopes down from west to east. Most of the allotment lies between 5,200 feet elevation on the west edge to 4,500 feet in the East Pasture.

Table 11 and Map 7 summarize the dominant plant communities within the allotment, as summarized from the North Lake Ecological Site Inventory (ESI) which is hereby incorporated by reference in its entirety. The western juniper/shrub communities are the dominant types occupying about 63% of the allotment. The ponderosa pine/shrub community occupies 7% of the allotment and 30% of the allotment is either unknown or unvegetated rock outcrops. The western juniper with a low sagebrush understory and either Danthonia or bluebunch wheatgrass vegetation complex make up about 31% of the allotment (Table 11). The 30% unknown area represents National Forest Service and private lands within the allotment that were not surveyed as part of the ESI effort. Vegetation data is not available for much of the North Pasture. However, based on monitoring studies and professional field knowledge, the Forest Service lands consist of a forest-sagebrush transitional zone with a ponderosa pine and western juniper overstory and a mountain mahogany, low sagebrush, and Danthonia or Idaho fescue understory.

Several indicators of plant community health are described. These include Soil Surface Factor (SSF), current dominant vegetation, Observed Apparent Trend (OAT), condition rating, and seral stage. Soil Surface Factor (SSF) is an indicator of accelerated erosion and is a method of documenting observations regarding erosion. With 46% (Table 11) of the allotment being in the slight category and 24% in the moderate, there is little or no active soil erosion or evidence of past erosion on these areas. This indicates the vegetation cover and litter are sufficient to limit soil movement, pedestalling, rills and gullies.

The Observed Apparent Trend (OAT) for the vegetation communities recorded that 9% of the allotment was in upward condition, 45% had a static trend and about 17% of the allotment was in a downward trend (Table 11). The majority of downward trend can be attributed to high levels of cheatgrass and western juniper. The downward trend was a reflection of historical grazing, fire suppression, and weed species invasion and was not attributed to current livestock management.

The ESI compares the current plant composition to a defined Potential Natural Plant Community for the identified soil type and precipitation zone. Based on the ESI data, the percent of the allotment in each seral stage or ecological condition is summarized in Table 11. Less than 0.1% of the

Table 11. Summary of ESI Data for Ward Lake Allotment

Vegetation Community	Total Acres	% of Veg Comp	SSF Acres			OAT Acres			Seral Stage Acres			
			Slight	Mode-rate	Critical	Down	Static	Up	PNC	Late	Mid	Early
ARCA/MUWR Silver sagebrush/Mat muhly	13	0.1%			13	13						13
ARTRV/FEID Mountain Big sagebrush/Idaho fescue	34	0.2%	34					34		34		
ARTRV/STCO Mountain Big sagebrush/Thurbers needlegrass	54	0.3%	**54**			54					54	
Total Mountain big sagebrush	**88**	**0.6%**	**88**	**0**	**13**	**54**	**0**	**34**	**0**	**34**	54	0
JUOC/ARAR/DAUN Western juniper/Low sagerbrush/	2,241	14%	2,241				2,241			2,241		
JUOC/ARAR/PSSPS Western juniper/Low sagerbrush/	2,709	17%		2,709			2,709			2,709		
JUOC/CHNA/BRTE Western juniper/Rubber rabbitbrush/cheatgrass	2,231	14%	2,231			2,231					2,231	
JUOC/ARTRV/BRTE Western juniper/mountain big sagebrush/cheatgrass	47	0.3%		47			47			47		
JUOC/ARTRV/PSSPS Western juniper/mountain big sagebrush/bluebunch wheatgrass	109	0.7%	109					109	109			
JUOC/ARTRV/STCO Western juniper /Mountain Big sagebrush/needle and thread	383	2%	383			383					383	
JUOC/ARTRV/STTH Western juniper /Mountain Big sagebrush/Thurbers needlegrass	366	2%	366					366			366	
JUOC/PUTR/FEID Western juniper/antelope bitterbrush/Idaho fescue	1,224	8%		1,224			1,224			1,224		
JUOC/PUTR/STTH Western juniper/antelope bitterbrush/Thurbers needlegrass	949	6%	949				949			949		
Total Western juniper	**10,259**	**63%**	**6,279**	**3,980**	**0**	**2,614**	**7,170**	**475**	**109**	**7,170**	**2,980**	**0**
PIPO/FEID Ponderosa pine/Greenleaf Manzanita	216	1%	216				216			216		
PIPO/CELE/FEID Ponderosa pine/mount mahogany/Idaho fescue	889	6%	889					889		889		
Total ponderosa pine	**1105**	**7%**	**1,105**	0	**0**	**0**	**216**	**889**	0	**1,105**	0	0
Total Mapped Vegetation	**11,465**	**70%**	**7,472**	**3,980**	**13**	**2,81**	**7,386**	**1,398**	**109**	**8,309**	**3,034**	**13**
Percent of Allotment			46%	24%	0.1%	17%	45%	9%	0.1%	51%	19%	0.1%
Unmapped areas, unknown inclusions ,transition zones, rock outcrops, playas, and water	4,763	30%										
Total	16,248											

allotment in the early seral stage while 51% of the allotment is in late seral condition, 19% is in mid seral and 0.1% is in PNC.

There are 8 long-term trend plots in the allotment and the type of plot and the trend is summarized in Table 12. There are four trend plots in Middle Pasture, one in the East Pasture, and three in the South Pasture. One trend plot in the South Pasture (WL-02) is a long term photo plot and the other seven trend plots are long term photo plots with associated vegetation frequency transects. In the analysis of the trend photos and data it was determined that 5 trend plots were static and three plots had upward trend (Table 12).

Table 12. Ecological Trend in Ward Lake Allotment Based on Long-term Monitoring Photos and Plots

Pasture	Monitoring plot#	Photo Trend Years Taken	Transect Method Years	Trend
Middle	WL-01	Photo 12 Years 1975-2012	Nested Frequency & Canopy Cover Established 2012	Trend Upward 1975-2012 Sagebrush, Bitterbrush and Juniper density increasing
Middle	WL-04	Photo 11 Years 1975-2012	Nested Frequency & Canopy Cover Established 2012	Upward Trend 1975-2003 Static Trend 2003-2012 Sagebrush and Juniper density has increased
Middle	WL-05	Photo 9 Years 1975-2012	Nested Frequency & Canopy Cover Established in 2012	Static Trend
Middle	WL-06	Photo 5 Years 1987-2011	Nested Frequency Transect 3 years 1987, 1991, and 2011	Trend Static
East	WL-08	Photo 5 Years 1987-2012	Frequency Transect 3 years 1987, 1991, and2012	Trend Static
South	WL-02	Photo 10 Years 1975-2011	Photo	Trend Upward
South	WL-03	Photo 11 Years 1975-2012	Nested Frequency & Canopy Cover Established in 2012	Trend Static 1975-81 Trend Upward 1987-2012 Recent Juniper cut has Trend Improving
South	WL-09	Photo 3 Years 1993, 1997, 2011	Nested Frequency Transect 2 years , 1993 and 2011	Trend Static

Environmental Consequences: Ward Lake Allotment (00704)

Effects Common to Alternatives 1 and 2

The impacts of continuing grazing under a rest-rotation grazing system on the upland plant communities within the Lakeview Resource Area have previously been analyzed in the *Draft Lakeview RMP/EIS* and *Lakeview Proposed RMP/Final EIS* (BLM 2001, 2003a) and these analyses are incorporated herein by reference. In summary, the vegetation composition of key species is expected to improve over time under this type of grazing system (BLM 2003a; pages 4-5 and 4-9). In addition, a rest rotation system would significantly improve the composition of the key perennial herbaceous species within both the big sagebrush/grassland and low sagebrush/grassland communities (BLM 2001; page A-162). Absent a wildfire,

juniper expansion is expected to continue in the allotment regardless of grazing strategies, as it out-competes understory grasses and shrubs for available moisture and soil nutrients.

Alternative 1 (No Action)

There are 896 acres (6%) in the Ward Lake Allotment estimated to be impacted by concentrated livestock use (Table 9). However, with the rest rotation grazing system approximately one half of this area is rested every year so only about 3% of the allotment is impacted by livestock concentration in any given year.

The estimated use around the 5 major water sources is 625 acres or 4% of the allotment (Table 9). The 5 major water sources include 4 major constructed waterholes and one natural lake. The natural lake (Lily Lake) serves three pastures (Middle, East and South) and there are 2 major constructed waterholes in the Middle Pasture and one each in the South and North Pastures (Map 5).

There are 10 additional water sources that receive less grazing pressure and the cattle concentration impact is estimated to be about 250 acres. Therefore, approximately 875 acres around major and minor water sources would be impacted by concentrated grazing (Table 9). However, since only half the allotment is used each year the annual average use is about 438 acres or31% of the allotment.

About 35 miles of fence within the allotment where cattle are known to trail account for about 21 acres of additional ground disturbance (Table 9).

The use pattern mapping of the allotment over the last 10 years is limited, but shows even lower percentages of the allotment were heavily used. The percent of heavy use was between 3% in the North Pasture (2010) and 0.5% in the East Pasture (2010). Therefore, with half of the allotment being rested every year, the percentage of the allotment being used heavily would likely be 1-2%. (This data and maps are on file in the Lakeview Resource Area Field Office).

The allotment is meeting rangeland health standards 1 and 3 (Table 15) and would continue to do so under this alternative.

Alternative 2 (Grazing Management Changes)

Under Alternative 2 the impacts of grazing use on vegetation would be increased compared to Alternative 1. The increase of 19 AUMs to the Brown permit would be within the Stratton FRF Pasture and that only accounts for 14% of the available forage in the Stratton Pasture. Most of the livestock use in the Stratton Pasture is on private land meadow. Therefore, adding the 19 AUMs would not impact the vegetation in the Stratton Pasture any more than what is already occurring in Alternative 1.

The re-activation of the 101 suspended AUMs in the Iverson permit would negatively impact the vegetation in Middle and South Pastures more than Alternative 1. There would be a 41% increase in the number of AUMs and therefore, a corresponding increase in the concentration use areas and the average utilization across the two pastures. The concentrated use areas would be estimated to increase from about 875 acres to about 1,097 acres. The percentage of the two pastures that would receive concentrated use would increase from about 6% to about 9%. The average utilization across the pastures would increase from about 41% to about 57%. This increase in the concentration areas and the average utilization levels would have higher negative impacts on the vegetation across the two pastures compared to Alternative 1. This could

result in these pastures not meeting rangeland health standards 1 or 3 over the long-term under this alternative.

Alternative 3 (No Permits Issued)

Under this alternative, the public land in the allotment would be excluded from grazing. Generally, plant community shifts occur very slowly in the high desert climate without the influence of a major disturbance (fire, weed invasion, or some catastrophic event). There would be little or no noticeable difference in plant communities in the short-term 5-10 years and only slight shifts in vegetation over the long-term (10-20 years) (Holechek *et al.* 2006). The majority of the allotment (94%) receives moderate to no use, so any changes in vegetation would be slow as long-term studies of areas excluded from grazing found no significant difference in vegetation composition between moderately grazed sagebrush communities and excluded ones (Rose *et.al*. 1994).

Daddy *et. al*. (1988) found removal of livestock grazing may be relatively ineffective in increasing herbaceous biomass because of the long life and competitive nature of sagebrush. Little or no change in vegetation would be expected within the 47% of the allotment that is currently in the late or climax seral state (see North Lake ESI, unpublished data and Table 11) which varies only slightly from the potential natural community for these vegetation types. The early seral stage has the most potential for change or improvement, but only comprises about 0.1% of the allotment (13 acres). About 46% of the allotment is either unvegetated rockland with little potential for improvement or is unknown. Therefore, long-term shifts in vegetation would be likely on only about 7% of the allotment that is in mid seral condition. These long-term changes may show a 5-10% shift of grass species toward an increase in those that had been favored by cattle and a decrease in those less utilized by cattle. The shrub component is likely to remain relatively stable over the 10-year analysis period.

Total rest from grazing would increase fine fuels and could increase the risk of wildfire. Not only does wildfire reduce sagebrush, but was found to be more detrimental to perennial native grasses in rested areas then in grazed areas (Davies *et al.* 2009). Their study speculated that the increased litter component around long-term rested grass plants increased the risk of these plants being killed by wildfire as they saw a decline in perennial grasses inside exclosures after fire. Absent a wildfire, rangeland health standards 1 and 3 would continue to be met under this alternative.

Affected Environment: Squaw Butte Allotment (00915)

The Squaw Butte Allotment is a transitional area between East Lava Flow to the south and the National Forest to the Northwest. The dominant feature is Squaw Butte in the Northwest corner at over 5,400 feet elevation and the terrain slopes gently downward to the east and southeast to 4,622 feet elevation along the eastern boundary.

Table 13 and Map 8 summarize the existing dominant plant communities within the allotment, as summarized from the North Lake Ecological Site Inventory (ESI) which is hereby incorporated by reference in its entirety. The mountain big sagebrush/Idaho Fescue is the dominant community occupying about 44% of the allotment. The Western juniper/Shrub communities occupy 25% of the allotment and the ponderosa pine/shrub community occupies about 5% of the allotment. The vegetation on about 19% of the allotment is either unknown inclusions or unvegetated rock outcrops.

Soil Surface Factor (SSF) is an indicator of accelerated erosion and is a method of documenting observations regarding erosion. With 69% (Table 13) of the allotment being in the slight class and 10% in the moderate class, there is little or no active soil erosion or evidence of past erosion on these areas. This indicates the vegetation cover and litter are sufficient to limit soil movement, pedestalling, rills and gullies.

Table 13. Summary of ESI Data for Squaw Butte Allotment

Vegetation Community	Total Acres	% of Veg Comp	SSF Acres			OAT Acres		Seral Stage Acres		
			Stable	Slight	Moderate	Static	Up	PNC	Late	Mid
ARAR/FEID Low sagebrush/Idaho fescue	49	1%		44	5	49			49	
ARTRV/FEID Mountain Big sagebrush/Idaho fescue	3787	44%		3787		3787		740	1,715	1332
ARTRV/PSSPS Mountain Big sagebrush/bluebunch wheatgrass	154	2%		154		154				154
Total Mountain big sagebrush	**3,941**	**46%**	**0**	**3,941**	**0**	**3941**	**0**	**740**	**1,715**	**1,486**
PUTR/FEID antelope bitterbrush/ Idaho fescue	134	2%		134		134				134
CHVIS2/FEID Green rabbitbrush/Idaho fescue	289	3%			289	289			289	
JUOC/ARTRV/FEID Western juniper/mountain big sagebrush/Idaho fescue	1802	21%		1222	580	587	1215	133	1669	
JUOC/ARTRV/PSSPS Western juniper/mountain big sagebrush/bluebunch wheatgrass	272	3%		272		207	65		111	161
JUOC/ARAR/FEID Western juniper/mountain low sagebrush/Idaho fescue	63	1%		63			63		63	
Total Western juniper	**2137**	**25%**	**0**	**1,557**	**580**	**794**	**1,341**	**133**	**1,843**	**161**
PIPO/ARPA6/FEID Ponderosa pine/Greenleaf Manzanita/Idaho fescue	161	2%		161			161			161
PIPO/ARTRV/FEID Ponderosa pine/mountain big sagebrush/Idaho fescue	232	3%	146	86		86	146		198	34
Total ponderosa pine	**393**	**5%**	**146**	**247**	0	**86**	**307**	0	**198**	**195**
Total Mapped Vegetation	**6,943**	**81%**	**146**	**5,923**	**874**	**5,293**	**1,650**	**873**	**4,094**	**1,976**
Percent of Allotment			2%	69%	10%	62%	19%	10%	48%	23%
Unknown inclusions, transition zones, rock outcrops, playas, and water	1,606	19%								
Total	8,549									

The Observed Apparent Trend (OAT) for the vegetation communities on public land was also determined during the ESI. In 2000, the OAT recorded that 19% of the allotment was in upward condition, 62% had a static trend (Table 13).

The ESI compares the current plant composition to a defined Potential Natural Plant Community for the identified soil type and precipitation zone. Based on the ESI data, about 48% of the allotment is in Late seral condition, 23% is in Midseral and 10% is in PNC (Table 13).

There are 3 long-term trend plots in the allotment with one in each pasture.. The type of plot and the trend is summarized in Table 14. Each trend plot consists of a photo plot and vegetation transect measuring frequency and cover. In the analysis of the trend photos and data it was determined that all three trend plots were stable. However, in SB-02 and SB-03 there is an increase in the size and density of juniper trees and this may result in a decrease in the density and cover of shrubs (Table 14).

Environmental Consequences: Squaw Butte Allotment (00915)

Alternatives 1 and 2

The impacts of grazing under a rest-rotation grazing system on the upland plant communities within the Lakeview Resource Area have previously been analyzed in the *Draft Lakeview RMP/EIS* and *Lakeview Proposed RMP/Final EIS* (BLM 2001, 2003a) and these analyses are incorporated herein by reference. In summary, the vegetation composition of key species is expected to improve over time under this type of grazing system (BLM 2003a; pages 4-5 and 4-9). In addition, a rest rotation system would significantly improve the composition of the key perennial herbaceous species within both the big sagebrush/ grassland and western juniper woodland communities (BLM 2001; pages A-162 and A-167). Absent a wildfire, juniper expansion is expected to continue in the allotment regardless of grazing strategies, as it out-competes understory grasses and shrubs for available moisture and soil nutrients.

Table 14. Ecological Trends in Squaw Butte Allotment Based on Long-term Monitoring Photos and Plots

Pasture	Monitoring plot#	Photo Trend Years Taken	Transect Method Years	Trend
Rogers	SB-01	Photo 11 Years 1967-2012	Nested Frequency and Canopy Cover Read in 1981, 1992, and 2012	The Photo Trend was Stable 1975-1986. Burned in 1986. Trend was Upward in 1986 as grass increased until rabbitbrush began to occupy the site. In 2012, there was increased shrub cover and trend appears stable. Analyzing the trend transects, vegetation cover increased following the burn in 1986. By 2012, the shrub cover has increased but, was still lower than before 1986 burn. The trend appears stable to upward, as grass species composition has remained stable since 1981.
West	SB--02	Photo 9 Years 1969-2012	Nested Frequency and Canopy Cover Read in 1981, 1994 and 2012	The photo trend was stable from 1969 thru 1994. In 2012, the photos show noticeable increase in the size and density of juniper and possible decrease in the size and density of sagebrush. The grass cover has appeared stable since 1969. Analyzing the trend transects, vegetation cover has increased since in 1987. However, the frequency of juniper has also increased and the frequency of sagebrush has declined since 1987.
Lava	SB-03	Photo 3 Years 1987,1992 and 2012	Nested Frequency and Canopy Cover Read in 1987, 1992 and 2012	Static in photo trend overall, but there was a noticeable increase in the size of juniper trees and a slight reduction in the density of sagebrush. Perennial grass appears to have increased. The vegetation transects appeared stable from 1987- 2012 with no reduction in sagebrush cover or frequency.

The vegetation would continue to be negatively impacted in livestock concentration areas near water sources and cattle trails under Alternatives 1 and 2.

Alternative 1 (No Action)

There are 586 acres (7%) in the Squaw Butte Allotment estimated to be impacted by concentrated livestock use (Table 10). However with the rest rotation grazing system approximately one third of this area is rested every year so only about 5% of the allotment is impacted by livestock concentration each year.

The estimated use around the 4 major water sources is 500 acres or about 6% of the allotment (Table 10). The major water sources are major wells (Map 6). Since only two thirds of the allotment is used each year, the annual use around these major water sources averages about 4% of the allotment. There are 3 additional water sources that receive less grazing pressure and cattle concentration impacts ~~a~~pproximately 75 acres around minor water sources (Table 10). Again with two thirds of the allotment used each year the annual average use is about 50 acres or 1% of the allotment. Cattle trails located along the 18 miles of fence and lava flow within the allotment account for about another 11 acres of disturbance (Table 10). While the total acres impacted by concentrated livestock use is estimated at about 586 acres, with the rest rotation system the average annual use is about 393 acres (5% of allotment). The vegetation use pattern mapping of the allotment over the last 10 years shows even lower percentages of the allotment were heavily used. The percent of heavy use was between 3% in the North Pasture (2010) and 0.5% in the East Pasture (2010). Therefore, with a third of the allotment being rested every year, the percent of the total allotment being heavily used would be about 1-2%. (This data and the maps are on file in the Lakeview Resource Area Field Office).

The vegetation trend data summarized in Table 14 indicates that current grazing levels are maintaining the herbaceous vegetation community. For this reason rangeland health standards 1 and 3 would continue to be met.

Alternative 2 (Grazing Management Changes)

Under Alternative 2, the impacts of grazing use on vegetation would be the same as Alternative 1.

Alternative 3 (No Permits Issued)

Under this alternative, the public land in the allotment would be excluded from grazing. Generally, plant community shifts occur very slowly in the high desert climate without the influence of a major disturbance (fire, weed invasion, or some catastrophic event). There would be little or no noticeable difference in plant communities in the short-term (5-10 years) and only slight shifts in vegetation over the long-term (10-20 years) (Holecheck *et al.* 2006). The majority of the allotment (93%) receives moderate to no use, so any changes in vegetation would be slow as long-term studies of areas excluded from grazing found no significant difference in vegetation composition between moderately grazed sagebrush communities and excluded ones (Rose *et.al*. 1994).

Daddy *et. al*. (1988) found removal of livestock grazing may be relatively ineffective in increasing herbaceous biomass because of the long life and competitive nature of sagebrush. Little or no change in vegetation would be expected in the 58% of the allotment that is in the late or climax seral state (North Lake ESI, unpublished data) which varies only slightly from the potential natural community for these vegetation types. About 19% of the allotment is either rockland or identified as unknown vegetation inclusions.

Therefore, only the 23% of the allotment that is in mid seral condition would likely undergo long-term shifts in vegetation. These long-term changes may show a 5-10% shift of grass species toward an increase in those that had been favored by cattle and a decrease in those less utilized by cattle.

Total rest from grazing would increase fine fuels and could increase the risk of wildfire. Not only does wildfire reduce sagebrush, but was found to be more detrimental to perennial native grasses in rested areas then in grazed areas (Davies *et al.* 2009). This study speculated that the increased litter component around long-term rested grass plants increased the risk of these plants being killed by wildfire, as they saw a decline in perennial grasses inside exclosures after fire. Absent a wildfire, rangeland health standards 1 and 3 would continue to be met over the long-term under this alternative.

Noxious Weeds and Invasive Species

Invasive plants (or weeds) are non-native, aggressive plants with the potential to cause significant damage to native ecosystems and/or cause significant economic losses. They successfully compete with native plants for light, water, soil nutrients, and space with the potential to dominate existing plant communities and displace native plants and the fauna that depends on them. Noxious weeds are a subset of invasive plants that are State or federally listed as injurious to public health, agriculture, recreation, wildlife, or any public or private property.

Affected Environment: Ward Lake

During the 2014 invasive plant survey, the noxious weeds musk thistle *(Carduus nutans L.)* and Canada thistle *(Cirsium arvense)* were both found within the Ward Lake Allotment. There is one historic site that consisted on a single plant of Scotch broom *(Cytisus soparius),* which is extremely rare east of the Cascades. The Scotch broom was found several years ago, was manually controlled, and has been found since. All of these invasive plants were found within the Buck Creek Exclosure, where no grazing is allowed.

Scotch Broom has been widely planted in western Oregon and is now the biggest nuisance forest species in Oregon, according to Oregon Department of Agriculture. Scotch broom is known to displace native plants and readily invades disturbed sites, natural areas, and forestlands. Scotch broom has a prolific seed produced of long-lived (10 year plus) seeds. This species was manually removed from the allotment before it had a chance to establish and set seed, but will continue to be monitored as part of BLM's on-going weed treatment program.

Canada thistle is a perennial broadleaved weed with creeping roots that can extend up to 17 feet horizontally and 20 feet deep. Flowers occur from June through October. Each flower head produces about fifty seeds and an average stem bears twelve to fourteen flowers. Seeds germinate from late spring through autumn. Germination studies show that seeds may be viable after twenty years in the soil. Many other exclosures across the Lakeview Resource Area also contain Canada thistle.

Musk thistle is an aggressive biennial weed, although it can act as an annual. Musk thistle spreads solely from seed. One plant can set up to 20,000 seeds, however only one-third of the seeds are typically viable. Most seed is dispersed within the immediate vicinity of the parent plant. This leads to a clumped pattern of seedling development and results in competition to other native plants. Wind and water are good dissemination methods and seeds can also be spread by animals and vehicles. Since the site was located within the exclosure where livestock are not present, the most likely animal transport vector would be big game or rodents.

Environmental Consequences: Ward Lake

Alternatives 1-3

Since all of the documented noxious weeds within the allotment are currently located within a grazing exclosure, the potential effects of livestock on weed spread/expansion would generally be low and similar under all alternatives. However, wildlife and humans (through recreation activities) would continue to act as seed transport vectors.

Alternatives 1 and 2

Even though there are no documented noxious weeds within the grazed portion of the allotment, grazing does cause areas of ground disturbance that is potentially at risk or susceptible to future weed invasion. The heaviest disturbances are located near water developments and cattle trails. There are 5 major waterholes and 10 minor waterholes and about 35 miles of cattle trails in the Ward Lake Allotment (Table 11).

Alternative 1 (No Action)

According to Table 11, the annual disturbance from grazing across the allotment would be approximately 3% (about half of the allotment is grazed each year). The cattle would continue to negatively impact these concentration areas, which could lead to invasive species. Some of the noxious weeds in the Buck Creek Exclosure have the potential to spread to grazed portions of the allotment by other transport vectors and could be further aided by livestock. However, the musk thistle spreads mostly through wind.

Alternative 2 (Grazing Management Changes)

Under Alternative 2, the increased grazing would cause additional ground disturbance that would potentially be at risk or susceptible to future weed invasion. The risk of invasion from the additional 14 AUMs of use in the Stratton FRF Pasture would be very low, especially since the majority of the livestock use would continue to occur on private land. However, the effects from the re-activation of the 101 suspended AUMs in the Iverson Permit would increase the amount of ground disturbance in the Middle and South Pastures. This increase of AUMs (41% more Alternative 1) would increase the amount of ground disturbance from livestock concentration compared to Alternative 1 (see soils section and Table 10). The additional disturbance would open up more areas that could be easily invaded by noxious or invasive plants. Livestock could further spread noxious weeds and invasive plants, should they actually become established in the grazed portion of the allotment.

Alternative 3 (No Permits Issued)

Alternative 3 would remove cattle from the allotment. The disturbance from livestock around the waterholes and trails would be eliminated and would allow for native plant communities to recover in these areas, making them more resistant to invasive plants over the long-term. However, plant community changes occur very slowly in the high desert climate. In addition, there would still be areas near water developments that would continue to be disturbed by local wildlife use, but this level of disturbance would be less than what would occur under Alternatives 1 or 2.

Affected Environment: Squaw Butte

Currently there are no noxious weeds present within the Squaw Butte Allotment. All of the roads, trails, fence rows and water developments were surveyed during 2014 field season and no noxious weeds were documented. There was a trace of cheatgrass (*Bromus tectorum)* found within the allotment. Cheatgass is a winter annual grass species that has a shorter life cycle than most grasses. This weedy grass species flowers in the spring and matures earlier in the season, making it a fire hazard. Cheatgrass is wide spread across the entire Resource Area; therefore it is not accurately mapped.

Other invasive plants/noxious weeds that could invade the allotment in the future would be spotted knapweed *(Centaurea stoebe)* as it has been found on many of the county roads near the allotment. Spotted knapweed is a short-lived perennial or biennial. This plant has a strong taproot, as well as lateral roots. Spotted knapweed prefers sunny, arid conditions in course soil, such as those within the Squaw Butte Allotment. Spotted knapweed is highly adaptable and can be found just about anywhere. Annual surveys need to take place to make sure this plant does not invade the allotment in the future.

Environmental Consequences: Squaw Butte Allotment

Alternatives 1-3

Since there are currently no noxious weed infestations located within the Squaw Butte Allotment, grazing is not a factor contributing to the invasion or expansion of invasive species. Spotted knapweed, located within the vicinity of the allotment, could possibly invade the allotment as there are several roads that pass through the allotment that are used for hunting, recreation, and access by permittees and BLM staff. These roads would be the most likely vectors to transport and spread weeds into the allotment.

Alternatives 1 and 2

Even though there are no documented noxious weeds within the allotment, grazing does cause areas of ground disturbance that is potentially at risk or susceptible to future weed invasion. The heaviest disturbances are located near water developments and cattle trails. This disturbance (about 7.1% of the allotment; Table 10) would be the same for both Alternatives 1 and 2. These disturbed areas would continue to be monitored for invasive plants.

There is some cheatgrass present within the allotment. The actual amount is not accurately documented. Late spring grazing would reduce the amount of cheatgrass that is able to produce seed annually. The effects of both Alternative 1-2 on cheatgrass would be similar.

Alternative 3 (No Permits Issued)

Alternative 3 would remove cattle from the allotment. The disturbance from livestock around the waterholes and trails would be eliminated and would allow for native plant communities to recover in these areas, making them more resistant to invasive plants over the long-term. However, plant community changes occur very slowly in the high desert climate. In addition, there would still be areas near water developments that would continue to be disturbed by local wildlife use, but this level of disturbance would be less than what would occur under Alternatives 1 or 2. In addition, with no grazing in the late spring there would likely be more cheatgrass seed production annually which could lead to expansion of this species and less diverse plant communities over the long-term.

Livestock Grazing Management

Affected Environment: Ward Lake Allotment (00704)

There are two ten-year term grazing permits authorizing 397 AUMs of cattle use in Ward Lake Allotment (00704). There are 247 AUMs authorized in this allotment in the Iverson permit and 150 AUMs authorized in the Brown permit. The season of use is from April 28th thru July 30th. Grazing is managed as a rest rotation grazing system with four pastures.
The rest rotation grazing system uses two pastures during April to July each year and rests the other pastures. The following year the rested pastures are grazed and the grazed pastures are rested (Table 2).

The allotment is categorized as an "I" or "improve" category and this category was determined by the following criteria:

- Present range condition unsatisfactory with most areas improving and some in static condition.
- Allotment has moderate to high resource production potential, and are producing low to moderate. Much potential for both native and artificial treatment.
- Limited resource-use conflicts may exist. There are values for deer, antelope and sage-grouse.
- Opportunities exist for positive economic return from public investments. Good opportunities for burning and seeding.
- Present management appears satisfactory. Grazing system has been effective.
- Other criteria appropriate to area. Permittees are very cooperative.

Rangeland Health

An interdisciplinary team conducted a Rangeland Health Assessment (RHA) in the allotment in 2004 to determine if grazing management was in conformance with the applicable standards. The RHA was reviewed again as part of this environmental analysis. A summary of the 2004 RHA and a summary of conditions in 2014 are contained in Table 15 and are incorporated herein by reference in their entirety (BLM 2004c, 2014a).

Environmental Consequences: Ward Lake Allotment (00704)

<u>Alternative 1 (No Action)</u>

Actual use, utilization, and climate data have been summarized in the allotment monitoring file and indicate that livestock grazing levels are sustainable at the current forage allocation for the allotment.

Trend photos indicate a stable trend in the key areas of the allotment, and the current rest rotation grazing system is meeting all Standards and Guidelines. Livestock grazing management is maintaining a vegetative community that supports other resources objectives and uses.

The average actual use over the last 11 years in the allotment is 355 AUMs for the 4 main pastures in which the authorized use is 397 AUMs. The average utilization measured in the pastures varied between an average of 44% for North Pasture, 43% in the Middle Pasture, 39% East Pasture and 40% in the South Pasture. Since each pasture is only used every other year, these utilization levels only occurred every other year. Therefore the average utilization was below the 50% utilization level needed to sustain root growth and maintain perennial native grass production.

Table 15. Rangeland Health Assessments for Ward Lake Allotment (BLM 2004c and 2014a)

Standard	2004	2014	Comments
1. **Watershed Function – Uplands** (Upland soils exhibit infiltration and permeability rates, moisture storage, and stability that are appropriate to soil, climate, and landform)	Met	Met	The 2004 RHA found soils in the Ward Lake Allotment exhibited infiltration and permeability rates, moisture storage, and stability appropriate for soil, climate, and land form. Root occupancy for the soil was appropriate. Based on 1997-2001 ESI data, the SSF rating showed 46% of the allotment was in slight, 24% in moderate, and only 0.1% in the critical erosion classes. There was little or no active soil erosion or evidence of past erosion in the area. In 2013, a summary of the vegetation trend plots indicated the vegetation cover was stable and there was still little or no active soil erosion. In 2013, the average actual use for the allotment over 11 years was 366 AUMs, compared to the average actual use of 402 AUMs in 12 years prior to 2002. The authorized use for the allotment is 397 AUMs. In 2013, the average utilization across the allotment on native species was between 39-45%. These utilization levels indicate that sufficient plant material was being left behind to protect the soil from erosion. The average utilization levels and the average actual use from 2002 to 2013, combined with season-long rest every other year, indicate there is sufficient plant material remaining on the soil to prevent soil erosion. For these reasons, this standard continues to be met.
2. **Watershed Function -Riparian/ Wetland Areas** (Riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform)	Met	Met	In 2004, there was 510 acres of palustrine wetlands identified within a much larger area (15 allotments in Silver Lake area) that included the Ward Lake Allotment. All were determined to be in PFC condition. In 2014, an interdisciplinary team identified 26 acres of palustrine wetlands in the allotment and, based on field inventory all were found to be in PFC. Buck Creek is within the allotment, but has been excluded from grazing since 1989. In 1996, an interdisciplinary team determined the portion of Buck Creek in the Ward Lake allotment was in PFC. In 2014, Buck Creek is still excluded from grazing and is still in PFC. Continued monitoring indicates the condition is continuing to improve.
3. **Ecological Processes** (Healthy, productive, and diverse plant and animal populations and communities appropriate to soil, climate, and landform are supported by ecological processes of nutrient cycling, energy flow, and the hydrologic cycle).	Met	Met	In 2004, a review of the range monitoring data (photos, trend transects, climate, field observations) ESI data, wildlife inventories, botany reports, weed surveys, and professional judgment indicated that overall the area was meeting this standard. Indicators used to evaluate this standard included animal populations, vegetative composition, presence of weed species, botanical reports, ecological status, Observed Apparent Trend (OAT), current plant composition as compared to a defined Potential Natural Community (PNC) for the soil type and precipitation zone. SSF, OAT, Range Site, Seral Stage and PNC are from the Lake County ESI survey (1997-2001). Based on ESI, 51% of the native plant communities were in Late Seral, 19% were in Mid Seral, and 0.1% were in Early Seral. OAT is a one-time trend for the area determined in the ESI. The allotment showed 7% had an upward trend, 45% had a static trend and 17% had a downward trend. The majority of downward trend can be attributed to high levels of cheatgrass, medusahead rye, and western juniper. The downward trend was a reflection of historical grazing, fire suppression, and weed species invasion and was not attributed to current livestock management. In the 2004 RHA, an ID team made the following observations about the current plant communities: overall plant diversity was high with shrubs and grasses in excellent condition. There are 9 trend photo plots scattered around the allotment which began in the 1970s or 1980s and continue today. These photos illustrated the plant communities are either stable or improving across the allotment. The vigor, condition, and composition of the vegetation in the photos were influenced by the amount of moisture, the grazing schedule, and juniper cutting. Even taking into account these factors, the ecological condition of these sites has either remained stable or improved over the last 30 years, except that there has been an increase in juniper density and size across the allotment. In 2014, an analysis of the photo trend plots since 2004 found the same conclusions apply. (Table 1). In Tables 3-5 is a summary of the vegetation transects on the three trend plots (WL-06, WL-08 and WL-09). The same species appear to be present and the three trend sites appear to have a static trend. Prior to 2014, only one noxious weed species was located within the Ward Lake allotment, Scotch broom *(cytisus scoparius) (L..) Link).* The infestation was located along Buck Creek in the Buck Creek Exclosure. This species is very uncommon to the Eastern portion of Oregon. The location of the Scotch broom site is along Buck Creek riparian area. The site was discovered by the Lakeview RA staff during a river survey. The site was controlled manually and will continue to be monitored. There were no plants present in 2014. During the 2014 invasive plant survey musk thistle *(Carduus nutans L.)* was found along Buck Creek

			within the Buck Creek Exclosure, the south pasture within the riparian area, and in the east pasture. All of the infestations are currently small and were manually controlled during the 2014 field season. These sites will continue to be monitored. Other species that could likely invade the allotment are Medusahead Rye *(Taeniatherum caput-medusae (L.),* Ventenata *(Ventenata dubia),* Mediterranean sage *(Salvia aethiopis L.), and* Canada thistle *(Cirsium arvense (L.) Scop)*. These species are all located adjacent to the allotment. The allotment will continue to be monitored for new populations. Standard 3 is being met for wildlife populations. The majority of habitats within the allotment are in functional condition and support natural ecological processes. Habitat quality and population levels fluctuate over time, and generally represent natural trends in the ecosystem; however, some species may show erratic or negative trends. These trends are determined through monitoring of habitat and animal composition and community structure. This area supports diverse wildlife populations that are appropriate for the types of habitats available within the allotment. This standard is currently being met from the aspect of natural wildlife populations, diversity, and sustainability with current environmental conditions.
4. **Water Quality** (Surface water and groundwater quality, influenced by agency actions, complies with State water quality standards).	Met	Met	No surface water or groundwater within the allotment has been listed for exceeding State Water Quality standards.
5. **Native, Threatened & Endangered, and Locally Important Species** (Habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate, and landform)	Met	Met	The 2004 RHA stated the allotment contained healthy, productive, and diverse plant and animal populations and communities that were appropriate to soil, climate, and landform. No Special Status Plant Species located within the allotment**.** The allotment contains an appropriate assemblage of wildlife species and wildlife habitat expected for the shrub-steppe ecosystem. Species diversity may be somewhat higher due to the juxtaposition with the wetland areas adjacent to the eastern boundary and the ponderosa pine forest transitional zone along the western edge of the allotment, providing additional habitat diversity. Special status wildlife species or their habitats that may be present within the allotment include the Bald Eagle (*Haliaeetus leucocephalus*), Ferruginous Hawk (*Buteo regalis*), Peregrine Falcon (*Falco peregrinus*), Burrowing Owl (*Speotyto cunicularia*), Kit Fox (*Vulpes macrotis*), Greater Sage-Grouse (*Centrocercus urophasianus*), Townsend's big-eared bat (*Coryorhinus townsendii*), fringed myotis (*Myotis thysanodes*), pallid bat (*Antrozous pallidus*), spotted bat (*Euderma maculatum*), and pygmy rabbit (*Brachylagus idahoensis*). There are 3 known Bald Eagle nests within the allotment. One nest occurs on Forest Service-administered lands and 2 on BLM-administered lands. There is also some foraging on scattered carrion within the allotment. There have not been any incidental sightings of Peregrine Falcons in the vicinity of the allotment; although, they may be occasional visitors to the allotment, no nesting habitat or actual nesting activity has been documented within the allotment. Foraging habitat does not exist within close proximity of the allotment. While foraging habitat for Ferruginous Hawk was identified in the 2004 assessment, this species has not actually been confirmed within the allotment to date. Burrowing Owls have been observed at a few locations within the allotment, however no nest burrows have been observed. Roosting and wintering (hibernacula) habitat for the 4 Bureau Sensitive Species of bats is limited or lacking throughout the allotment. Kit fox and pygmy rabbits, both BLM sensitive species, are also known to occur within the Lakeview Resource Area. The potential for the presence of kit foxes is very low as the allotment lies outside the northern range of the kit fox. Although, pygmy rabbits are suspected to occur in some isolated pockets within the allotment, there have been no inventories or incidental sightings. No Greater Sage-Grouse leks occur within or near the allotment based on the 4-mile proximity criterion, and the allotment does not contain preliminary priority or general habitat and ODFW core or low density habitat. There are several species with high public interest. These include Golden Eagle (*Aquila chrysaetos*) mule deer (*Odocoileus hemionus*), and Rocky Mountain elk (*Cervus elaphus*). In 2004 and 2013, the allotment supported the current and proposed number of mule deer identified by ODFW big game

			management plans. Elk and mule deer winter range occurs within this allotment. Migratory ungulates may be affected in winter months if grazing pressure negatively impacts availability of shrub (palatable and nutritious) vegetation. Elk are scattered throughout the allotment, but tend to use areas with higher densities of western juniper and timbered drainages. There is some overlap between cattle and elk foraging areas, but there is little competition between these species within the allotment. Moderate to high concentrations of wintering mule deer occur in the allotment. Wintering deer depend on bitterbrush and big sagebrush as winter forage. Both of these browse species are common within the allotment. There is no evidence showing impacts from grazing on mule deer foraging and winter range. Invasive juniper has decreased mule deer winter range conditions in portions of the allotment. Golden Eagles (BOC species) have been seen within the area foraging on small mammals. One Golden Eagle nest occurs within the allotment on private lands. In 2004, no conflicts were identified between livestock grazing and wildlife species. Currently, there are no known resource conflicts between the current livestock grazing management and habitat for Peregrine Falcons, Bald Eagles, Ferruginous Hawks, Burrowing Owls, Golden Eagles, bat species, kit foxes, pygmy rabbits, or elk. Meeting the mule deer browse utilization objective established in the RMP/ROD is sufficient to maintain adequate bitterbrush densities within the allotment and avoid a conflict with livestock management. For these reasons, this standard is being met for wildlife species (including special status species) and their habitat. However, the occurrence of invasive western juniper appears to be the limiting factor for sage-grouse, wintering mule deer, and most sagebrush obligates. Habitat management actions need to focus on control and reduction of western juniper to historic levels to insure meeting this standard in the future.

The grazing levels would remain at 397 AUMs under Alternative 1. This level of use, along with managed grazing, would provide a sustainable forage base under this alternative. There could potentially be a decline in forage production over the long-term as western juniper continues to expand into the area in the absence of wildfire. However, rangeland health standards would continue to be met in this allotment under this alternative.

Alternative 2 (Grazing Management Changes)

The administrative adjustment of adding 19 AUMs from the Stratton Pasture to the Brown permit would clarify where the AUMs are being used, but the impacts are the same as Alternative 1. The permittee would be required to pay for 19 more AUMs compared to Alternative 1.

Re-activating the 101 suspended AUMs to the Iverson permit would allow the permittee to graze more cattle in the allotment, but the increased utilization could exceed the allowable utilization levels of 50%. Therefore, over time the amount of forage could be reduced and negatively impact the production and condition of the range. This would result in a decline in livestock performance and eventually a decrease in the amount of AUMs available. In addition, rangeland health standards may not be met over the long-term in this allotment under this alternative.

Alternative 3 (No Permits Issued)

Under this alternative, livestock grazing within the allotment would not be authorized. The permittees would need to replace 397 AUMs of lost forage with private land forage or hay in the general vicinity. Under the Brown permit there would be an additional loss of 19 AUMs within the Stratton Pasture and the permittee would need to fence the private land separate to avoid trespass on the 80 acres of public land in the pasture. The additional cost to replace this forage would be at the permittee's expense. These costs are

discussed further in the social and economic section. In addition, rangeland health standards would continue to be met in this allotment under this alternative.

Affected Environment: Squaw Butte Allotment (00915)

The grazing permit in Squaw Butte Allotment (00915) authorizes 1,000 AUMs of cattle use to the Iverson Ranch. The season of use is from May 1st thru October 15th. Grazing is managed as a rest rotation grazing system utilizing three pastures. The rest rotation grazing system rotates between two pastures, May 1st to October 15 each year, and rests the third pasture (Table 2).

The allotment is categorized as an "M" or "maintain" category and this category was determined by the following criteria:

- Present range condition satisfactory
- Allotments have moderate to high resource production potential, and are producing near their potential (trend is moving in that direction)
- No serious resource-use conflicts exist
- Opportunities may exist for positive economic return from public investments
- Present management appears satisfactory
- Other criteria appropriate to area

Rangeland Health

An interdisciplinary team conducted a Rangeland Health Assessment (RHA) in the allotment in 2007 to determine if grazing management was in conformance with the applicable standards. The RHA was reviewed again as part of this environmental analysis. A summary of the 2007 RHA and a summary of conditions in 2014 are contained in Table 16 and are incorporated herein by reference in their entirety (BLM 2007d, 2014b).

Environmental Consequences: Squaw Butte Allotment (00915)

<u>Alternatives 1 and 2</u>

Actual use, utilization, and climate data have been summarized in the allotment monitoring file and indicate that livestock grazing levels are sustainable at the current forage allocation for the allotment. Trend photos indicate a stable trend in the key areas of the allotment. Livestock grazing management (rest rotation grazing system) is maintaining a vegetative community that supports other resources objectives and uses. For this reason, rangeland health standards would continue to be met in this allotment under both alternatives.

The average actual use over the last 11 years in the allotment is 752 AUMs for the 3 pastures in which the authorized use is 1,000 AUMs. The average utilization measured in the pastures varied between 35% for Lava Pasture, 51% in the Rogers Pasture, and 45% in the West Pasture. Since each pasture is only used 2 of three years, these utilization levels would be lower if the rest year was averaged in. Therefore the average utilization was below the 50% utilization level needed to sustain root growth and maintain perennial native grass production.

Table 16. Rangeland Health Assessments for Squaw Butte Allotment (BLM 2007d, 2014b)

Standard	2007	2014	Comments
1. **Watershed Function – Uplands** (Upland soils exhibit infiltration and permeability rates, moisture storage, and stability that are appropriate to soil, climate, and landform)	Met	Met	The 2007 RHA stated that soils within the Squaw Butte Allotment exhibited infiltration and permeability rates, moisture storage, and stability were appropriate for soil, climate, and land form. Root occupancy for the soil was appropriate. Based on 1997-2001 ESI data, the soil surface factor (SSF) rating showed 72% of the allotment was in slight, 11% in moderate, and 17% in unknown classes (Table 2). There is little or no active soil erosion or evidence of past erosion in the area. In 2014, a summary of the vegetation trend plots indicated the vegetation cover was stable and there was still little or no active soil erosion.
2. **Watershed Function -Riparian/ Wetland Areas** (Riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform)	Met	Met	There are no perennial or major intermittent streams nor associated riparian areas in these allotments, so this standard does not apply.
3. **Ecological Processes** (Healthy, productive, and diverse plant and animal populations and communities appropriate to soil, climate, and landform are supported by ecological processes of nutrient cycling, energy flow, and the hydrologic cycle)	Met	Met	In 2007, a review of the range monitoring data (photos, trend transects, climate, field observations) ESI data, wildlife inventories, botany reports, weed surveys, and professional judgment indicated that overall the assessment area was meeting this standard. Indicators used to evaluate this standard included animal populations, vegetative composition, presence of weed species, botanical reports, ecological status, OAT, current plant composition as compared to a defined Potential Natural Community (PNC) for the soil type and precipitation zone. SSF, OAT, Range Site, Seral Stage and PNC are from the Lake County ESI survey (1997-2001). The ESI survey compared the current plant composition to a defined PNC. The ESI survey determined that 11% of the native plant communities were in PNC, 51% were in Late Seral, 21% were in Mid Seral, and 0% were in Early Seral (see Table 3). Table 3 presents the summary of ESI data which shows the diversity of plant communities and indicators used to evaluate this standard. Observed Apparent Trend (OAT) is a one-time trend for the area determined in the 1997-2001 ESI survey. Totals for the acreage surveyed in the Squaw Butte Allotment showed 19% had an upward trend, 62% had a static trend and 0% had a downward trend. In the 2007 RHA, an ID team made the following observations about the current plant communities: Health, productivity and diversity of plant species were good throughout the assessment area. Small areas had inhibited productivity and diversity in which livestock grazing is not contributing towards these areas not meeting the standard. Long-term trend studies show substantial juniper expansion into sagebrush steppe communities in the allotment which, left untreated is expected to reduce the plant diversity and overall health of perennial grasses, forbs and shrubs in the area within the next 10-20 years. There are 3 trend photo plots scattered around the allotment which began in the 1960s or 1970s and continue today. In 2014, an analysis of the 3 photo trend plots in the allotment found the same observations made in 2007 still apply (Table 2). These photos illustrated the plant communities are either stable or improving across the allotment. The vigor, condition, and composition of the vegetation in the photos were influenced by the amount of moisture, the grazing schedule, and wildfire. But even taking into account these factors, the ecological condition of these sites has either remained stable or improved over the last 30 years, except that there has been an increase in juniper density and size across the allotment. In Tables 4-6 is a summary of the vegetation transects on the three trend plots (SB-01, SB-02 and SB-03). The vegetation data was collected three years between 1987 and 2012. The same species appear to be present and the three trend sites appear to have a static to upward trend. Currently there are no known noxious weeds located within the allotment. Surveys were completed

			in 2014. There are no known noxious weeds near this allotment currently. The most likely species to invade this area would be spotted knapweed due to the large populations of it on the Prineville district and Deschutes National Forest, which are located near the allotment. The allotment will continue to be monitored for noxious weeds and non-native invasive plant species. This standard is currently being met from the aspect of natural wildlife populations, diversity, and sustainability with current environmental conditions. The majority of habitats within the allotment are in functional condition and support natural ecological processes. Habitat quality and population levels fluctuate over time, and generally represent natural trends in the ecosystem; however, some species may show erratic or negative trends. These trends are determined through monitoring of habitat and animal composition and community structure. In 2004 and in 2013 the allotment is supporting the current and proposed number of mule deer and pronghorn antelope identified by ODFW big game management plans**.** This area supports diverse wildlife populations that are appropriate for the types of habitats available within the allotment.
4. **Water Quality** (Surface water and groundwater quality, influenced by agency actions, complies with State water quality standards)	Met	Met	No surface water or groundwater within the allotment has been listed for exceeding State Water Quality standards.
5. **Native, Threatened & Endangered, and Locally Important Species** (Habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate, and landform)	Met	Met	The 2007 RHA found the allotment contained healthy, productive, and diverse plant and animal populations and communities that were appropriate to soil, climate, and landform. No Special Status Plant Species located within the allotment. This standard is being met for healthy, productive and diverse populations of plant communities. There are no listed T&E or sensitive aquatic species known in the area. Special status wildlife species or their habitats that may be present within the allotment include the Bald Eagle *(Haliaeetus leucocephalus), F*erruginous Hawk *(Buteo regalis),*Peregrine Falcon *(Falco peregrinus),* Burrowing Owl *(Speotyto cunicullariai,* Townsend's big-eared bat *(Corynorhinus townsendii),* Greater Sage-Grouse *iCentrocercus urophasianus),* and pygmy rabbit *Brachylagus idahoensis).* No nesting habitat is available within the allotment for Bald Eagles. It is suspected that Bald Eagles are occasional visitors to the area. Bald Eagle foraging does occur within the allotment. No nesting habitat is available for Peregrine Falcons. No incidental sightings of peregrines exist within the allotment. There is some potential nesting habitat for Ferruginous Hawks on scattered junipers within the allotment and sightings have occurred in the area. No surveys have been conducted for Ferruginous Hawk. Ferruginous Hawk foraging habitat exists through portions of the allotment. There are no resource issues for Peregrine Falcons, Ferruginous Hawks, or Bald Eagles. No observations of Burrowing Owls exist within the vicinity of the allotment. It is assumed that they may occasionally occur within the allotment. There are no known resource conflicts for this species. There are no known roost sites within the allotment for Townsend's big-eared bats, but probably occur in or adjacent to the allotment. It is suspected that Townsend's forage across portions of the allotment. There are no known resource conflicts for this species. Habitat is present for pygmy rabbit, but no known locations exist within the allotment for these species. No inventories have been conducted for this species within the allotment. The nearest known populations of pygmy rabbits are over 15 miles to the south. It is suspected that pygmy rabbits could occur within portions of the allotment. There are no known resource conflicts for this species. There are also four species with high public interest: mule deer *(Odocoileus hemionus),* elk, *(Cervus elaphus),* California bighorn sheep *(Ovis canadensis)* and pronghorn antelope *(Antilocapra americana).* In 2004 and 2013 the allotment is supporting the current and proposed number of mule deer and pronghorn antelope identified by ODFW big game management plans**.** There is some overlap in range between bighorn sheep and cattle, however bighorn sheep use is light at this time and on the fringes of the lava flows in the area. Some impacts to bighorn sheep from expanding stands of young western juniper are expected within the next 10-20 years. Bighorn sheep would benefit from the removal of western juniper. No major conflicts exist between bighorn sheep and cattle grazing within the allotment. Moderate to high concentrations of wintering mule deer occur in the allotment. Wintering deer depend on bitterbrush and big sagebrush as winter forage. Both of these browse species are common

			within the allotment. There is no evidence showing impacts from grazing on mule deer foraging and winter range. Elk occur year round throughout portions of the allotment and on adjacent public and private lands. Historically elk were absent from the surrounding area. They have only increased in density over the last 15 -20 years. Some potential forage conflicts exist between livestock and elk. These conflicts are minimal however. Elk use on the adjacent private lands is most common during the alfalfa growing season and use on public land increases during fall and winter. Elk numbers within the allotment fluctuate greatly over the year and between years. No major conflicts exist between elk and livestock at this time There are no Greater Sage-Grouse lek sites within the allotment; however, BLM identified preliminary general and ODFW low density habitat does occur within the allotment. The nearest active lek sites are approximately 10 miles to the east and 9 miles to the west. No known issues exist between livestock grazing and sage-grouse use within this allotment. Current limiting factors and threats to sage-grouse habitat in the allotment are mostly from western juniper expansion in the south and western portions of the allotment. At this time, western juniper has not greatly altered sagebrush habitats, however, small juniper are established across much of the allotment and will greatly reduce habitats for sage-grouse and other sagebrush obligates over the next 20 years if left unchecked. Sage-grouse habitat would greatly benefit from juniper removal.

Alternative 3 (No Permits Issued)

Under this alternative, livestock grazing within the allotment would not be authorized. The permittees would need to replace 1,000 AUMs of lost forage with private land forage or hay in the general vicinity. The additional cost to replace this forage would be at the permittee's expense. These costs are discussed further in the social and economic section. In addition, rangeland health standards would continue to be met in this allotment under this alternative.

Wildlife and Special Status Wildlife Species

Affected Environment: Wildlife

Wildlife habitat is defined largely by the existing soils, topography, and vegetation communities within the allotments. The allotments contain various soils and vegetation communities which provide a variety of wildlife habitats (Tables 8, 9, 11, and 13). The Rangeland Health Assessments for the allotments determined that Rangeland Health Standards 3 and 5 (which relate to ecological processes and wildlife habitat) were met in 2004 for Ward Lake and 2007 for Squaw Butte (BLM 2004c, 2007d), and are still being met at the present time (BLM 2014a, 2014b) (see Tables 15 and 16). Water for wildlife within the allotments is available from a few natural sources and livestock water developments (waterholes, reservoirs, wells, and developed springs). Competition for water can occur between wildlife and livestock in areas where water is scarce.

Mule deer, pronghorn antelope, and elk habitat is present within the allotments (see Maps 9-14). The Ward Lake Allotment falls within the Oregon Department of Fish and Wildlife's (ODFW) Fort Rock Management Unit while the Squaw Butte Allotment falls within the Paulina Wildlife Management Unit. The mule deer, pronghorn antelope, and elk populations are relatively stable within these units (ODFW 2003a, 2003b). Habitat quantity and quality do not appear to be limiting big game population size or health within the unit. Deer and pronghorn populations continue to fluctuate at or slightly above ODFW's population management objectives for the units (ODFW 2012a, ODFW 2012b). The allotments comprise a small percentage of the units and provide habitat capable of supporting mule deer, pronghorn, and elk. The area within the allotments provides year round habitats for mule deer, including fawning habitat. There are currently 337

AUMs allocated for wildlife within the Ward Lake allotment: 170 AUMs for mule deer and pronghorn, 150 AUMs for elk, and 17 AUMs for other wildlife species. There are currently 605 AUMs allocated for wildlife within the Squaw Butte allotment; 500 AUMs for mule deer and pronghorn, 40 AUMs for elk, 30 AUMs for bighorn sheep, and 35 AUMs for other wildlife species (BLM 2003b, pages A-94 and A-119). Based on previous consultation with ODFW biologists, these forage allocations are adequate to support wildlife populations within the allotments.

Other mammals expected in the general area may include jackrabbits, cottontails, coyotes, ground squirrels, chipmunks, marmots, bobcats, mountain lions, badgers, and other common shrub-steppe mammal species. The allotments also provide habitat for numerous nongame birds common to the Great Basin. There are many amphibian and reptile species that likely occur within the allotments including fence lizards, sagebrush lizards, gopher snakes, rattlesnakes, horned-lizards, and other common shrub-steppe reptile/amphibian species.

Table 17 contains a list of wildlife species with special management designation(s) (excludes common migratory species except where otherwise designated) potentially occurring on the allotments. Common names for avian species have been standardized and are used for avian species throughout this document; taken from the ABA Checklist of birds (available at: http://wwwpersonal.umich.edu/~bbowman/birds/updates/abalist1.html (accessed 8/29/2013)).

The *Migratory Bird Treaty Act of 1918* identifies migratory birds regardless of their status as common or rare. Common migratory species observed or expected to occur based on species range and vegetation in the allotments include American robin, dark-eyed junco, mourning dove, Townsend's solitaire, and the mountain bluebird. Other bird species suspected to occur within the allotments include the great horned owl, barn owl, short-eared owl, American kestrel, chukar partridge, California quail, common raven, various waterfowl and shorebirds, and other common shrub-steppe bird species.

The 1988 amendment to the *Fish and Wildlife Conservation Act* mandates the U.S. Fish and Wildlife Service (USFWS) to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973." *Birds of Conservation Concern 2008* (USFWS 2008) is the most recent effort to carry out this mandate. While all of these bird species are priorities for conservation action, the list makes no finding with regard to whether they warrant consideration for ESA listing. The goal of this act is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions. In accordance with Executive Order 13186, "*Responsibilities of Federal Agencies to Protect Migratory Birds*" the appropriate Bird Conservation Plan and BCC species list for the project area was reviewed. Those species and habitats that are within the project area are incorporated and effects disclosed in this analysis. Game birds identified by the ODFW and USFWS that are below desired condition (GBBDC) represent species whose population is below long-term averages or management goals, or for which there is evidence of declining population trends. Table 17 displays a list of the Migratory BCC and GBBDC in the allotments that are known or likely to be present in the area.

Partners in Flight use the focal species approach to set biological objective and link priority species with specific conservation recommendations. It is a multi-species approach in which the ecological requirements of a suite of focal species are used to define an "ideal landscape" to maintain the range of habitat conditions and ecological processes required by land birds and many other species. Focal species are considered most sensitive to or limited by certain ecological processes (e.g. fire or nest predation) or habitat attributes (e.g.

Table 17. Wildlife Species with Special Designations

Species	Preferred Habitat	Special Status Species	Birds of Conservation Concern	Migratory Birds	Focal Species	Game Birds Below Desired Condition	Eagle Act	Allotments with Known or Potential Habitat	Potentially Affected
Avian Species									
American Peregrine Falcon	Wide range of habitats, nests on cliff ledges, bridges, quarries.	x (delisted)	x	x				704, 915	**no**
Bald Eagle	Associated with large bodies of water, forested areas near the ocean, along rivers, and at estuaries, lakes and reservoirs.	x (delisted)	x	x			x	704, 915	**no**
Brewer's Sparrow	Sagebrush obligate found in shrublands of contiguous big sagebrush, greasewood, rabbitbrush, and shad-scale habitats.		x	x	x			704, 915	**yes**
Burrowing Owl	Sagebrush steppe, grasslands, pastures, roadsides where vegetation is sparse and terrain is level			x	x			704, 915	**no**
Golden Eagle	Inhabits shrub-steppe, grassland, juniper and open ponderosa pine and mixed conifer/deciduous habitats preferring areas with open shrub component for foraging.		x	x			x	704, 915	**no**
Greater Sage-Grouse	Sagebrush obligate, found east of the Cascades. They require large expanses of sagebrush with healthy native understories of forbs.	x (FC) OR-SEN	x	x	x			704, 915	**yes**
Loggerheaded Shrike	Inhabits grasslands, pastures with fence rows, agricultural fields, sagebrush with scattered juniper and open woodlands. Requires elevated perches throughout for hunting and nesting.		x	x	x			704, 915	**yes**
Sage Sparrow	Found in southeast and central Oregon Associated with semi-open evenly spaced shrubs 1-2 m high in big sagebrush up to 6,800 ft.		x	x				704, 915	**yes**
Sage Thrasher	A sagebrush obligate dependent on large patches and expanses of sagebrush steppe and		x	x	x			704, 915	**yes**

	bitterbrush with shrub heights in the 30 -60 cm height. Prefers bare ground over grassy understories.								
Mammal Species									
Kit Fox	Desert scrub and grassland communities	x OR-SEN						704, 915	**no**
Pygmy Rabbit	Sagebrush with deep soils	x OR-SEN						704, 915	**no**
Fringed myotis	Trees, snags, buildings, caves, cliffs, and bridges.	x OR-SEN						704, 915	**no**
Pallid Bat	Arid regions/rocky outcroppings	x						704, 915	**no**
Spotted Bat	Cliff Habitat	x OR-SEN						704, 915	**no**
Townsend's Big-eared Bat	Lava fields/Rocky Cliffs /Abandoned Structures	x						704, 915	**no**

FC – Candidate for listing under the Endangered Species Act
FE – Federal Endangered Species
FT – Federal Threatened Species
OR-SEN – State of Oregon Sensitive Species
Delisted – formerly federally listed species

patch size or snags). The requirements of a suite of focal species are then used to help guide management activities. Golden and bald eagles are given special protection under the Bald Eagle Protection Act of 1940 (as amended).

Affected Environment: Special Status Wildlife Species

There are no wildlife species classified as federally-listed Threatened or Endangered or proposed or designated critical habitat within the project area. However, the Greater Sage-grouse is a Federal Candidate Species and is currently managed as a special status species. BLM policy on special status species (listed in Table 17) is to conserve those species and the ecosystems upon which they depend (BLM 2008c).

Raptors

Peregrine Falcons may be an occasional visitor to the area. However, no nesting habitat or actual nesting activity has been documented within the allotment. For this reason, none of the alternatives would likely have any measurable impacts on Peregrine Falcons or their habitat and are not carried forward for further analysis.

No Bald Eagle nesting habitat occurs within the 2 allotments. Bald Eagle foraging may occur within the allotment, however it is probably restricted to road killed deer adjacent to the major roadways or occasional carrion scattered through the allotment.

While potential habitat for Ferruginous Hawk and Burrowing Owl was identified in the RHA assessments, these species have not actually been confirmed within the allotments to date. There have been no inventories or incidental sightings indicating Ferruginous Hawks or Burrowing Owls. For this reason, none of the alternatives would likely have any measurable impacts on Ferruginous Hawk and Burrowing Owl or their habitat and are not carried forward for further analysis.

Golden Eagles (BOC species) have been observed within the allotments; however, no known nest sites occur within the boundary of the allotments, and areas surrounding the allotments. Suitable cliff habitat exists; however these eagles are likely only occasional visitors.

California Bighorn Sheep

California bighorn sheep range does occur within the southern half of Squaw Butte Allotment (Map 14). Bighorn sheep may be occasional visitors to the allotment. Bighorn sheep generally do not compete for forage with cattle due to differences in habitat use patterns (ODFW 2003a). For this reason, none of the alternatives would likely have any measurable impacts on bighorn sheep or their habitat and are not carried forward for further analysis.

Pygmy Rabbit

To date, neither pygmy rabbit (BLM sensitive species) or its habitat has been identified within the 2 allotments. No inventories for this species have been completed in these areas. Potential habitat could exist in portions of the allotments. However, juniper encroachment likely limits habitat potential in the Ward Lake Allotment.

Bats

Four Bureau Sensitive Species of bats are known to occur within the Lakeview Resource Area. These include the fringed myotis, pallid bat, spotted bat, and the Townsend's big-eared bat. However, spotted bats and fringed myotis rarely occur in the area and are not known to occur on the allotments. Intensive range use can lead to altered invertebrate densities and species abundance which could reduce availability of habitat for certain bat species, but causality is speculative and research would be required to draw conclusions (BCME 2008). Research on activities that may change landscapes to benefit or adversely affect different bat species are poorly represented in the literature (Chung-MacCoubrey 1996). Chapman *et al.* (1994) suggest that it is possible that grazing may physically enhance foraging opportunities, for pallid bats, by reducing vegetative cover. The effects of grazing, fire suppression, urbanization, etc. can only be speculated based on the effects of these activities on known resource requirements of bats.

Roosting and wintering (hibernacula) habitat for these species is limited or lacking throughout the allotments. There are no known caves, adits, shafts, or outbuildings on the BLM portions of the allotments capable of providing hibernacula for bats; however, lava flows do occur within the Squaw Butte allotment and may provide habitat for bats. Use of the area by these species of bats is likely limited primarily to foraging activities. Fringed myotis are rare across their distribution, but can be locally abundant. Fringed myotis are reported to use a variety of structures as day roosts including caves, mines, trees, and buildings. A telemetry study conducted in portions of Washington and Klamath and Lake counties of Oregon (Lacki and Baker 2007) showed 93% of day roosts were in rock substrates suggesting that tree roosts were of lesser importance to fringed myotis than are crevices in rocks. No fringed myotis were located in snags in Klamath or Lake County during the study. As noted with songbird abundance (Earnst *et al*. 2005) cavity nesters tend to be less affected by grazing, similarly it could be expected that grazing has little effect on snag roosting bats species. Townsend's big-eared bat summer roosts and wintering habitat have been observed in the adjacent lava flow.

Due to the low potential or lack of roosting/resting habitat in the2 allotments, none of the alternatives would likely have any measurable impacts to these bat species, and therefore, they are not carried forward for further analysis.

Greater Sage-Grouse

The Greater Sage-Grouse (*Centrocercus urophasianus*) is a Bird of Conservation Concern for the Great Basin Region and a USFWS candidate species. In March 2010, the U.S. Fish and Wildlife Service (USFWS) issued its 12-Month Findings which noted that that listing the greater sage-grouse range-wide is warranted, but precluded by higher priority listing actions.

Risk Factors

The major risk factors in the western portion of their range that are relevant to the area include habitat conversion due to fire, invasive plants such as cheatgrass, medusahead, and juniper, and West Nile virus. Grazing was evaluated as a risk factor in the 12-Month Findings with both positive and negative effects to sage-grouse being reported (USFWS 2010, p. 13939-13942). USFWS noted that "the impacts of livestock operations on sage-grouse depend upon stocking levels, season of use, and utilization levels" (USFWS 2010, p. 13941). The 12-Month Findings also determined that destruction, modification, or curtailment of habitat pose a major risk to sage-grouse across its range.

Additional risks to sage-grouse exist to a lesser extent including the risk of fence collisions under certain conditions, as identified by research conducted in Idaho by Stevens (2011). The Natural Resources Conservation Service (NRCS 2012) recently applied the Stevens' model to all sage-grouse habitat in Oregon creating a fence collision risk model for sage-grouse for the entire state. High risk as defined in the Stevens' model is equal to >1 sage-grouse collision per lek per year and is not dependent on the actual number of miles of fence occurring in the vicinity of the lek. Naturally some amount of fence must occur for a collision event to take place. The results of that modeling effort did not identify existing fences within or along the boundaries of the two allotments as a collision risk to sage-grouse.

Another risk factor identified in the Monograph, the Oregon Strategy, and the 12-Month Finding is West Nile virus spread by mosquitoes around standing water (Knick and Connelly 2011, ODFW 2011a, USFWS 2010). Sage-grouse are susceptible to West Nile Virus (Clark *et al*. 2006) and mortality may be as high as 100 percent (Naugle *et al*. 2004) in certain areas. The virus is primarily transmitted by infected mosquitoes, and was first detected in southeastern Oregon near Burns Junction in 2006, and then later near Crane and Jordan Valley that same year.

Across the species range, total mortalities attributable to West Nile Virus have markedly declined since 2003. The virus has not been detected near the allotments (DeBess 2009). From 2006-2010, ODFW provided each successful sage-grouse hunting permit applicant with 2 Nobuto strips to collect blood samples from each harvested grouse to be assayed for west nile virus. A total of 1,839 samples were assayed with 1 positive detection of the virus in the Beulah WMU harvest in 2008 (letter from ODFW dated August 6, 2014). In addition, the virus was reported in Klamath County in the summer of 2014.

Existing water troughs (Map 6) generally have been designed with float valves to minimize overflow and minimize potential for the production of mosquito habitat that could potentially lead to spread of West Nile Virus. For these reasons, the risk of virus spread or associated mortality would be low and virtually identical under all alternatives.

Sage-Grouse Habitat Assessment

BLM's sage-grouse interim management policy requires evaluating potential impacts to sage-grouse preliminary priority habitat (PPH) and preliminary general habitat (PGH) (BLM 2011a). PPH comprises areas that have been identified as having the highest conservation value to maintaining sustainable sage-grouse populations. PPH includes over 90% of Oregon's breeding sage-grouse populations and 84% of occupied leks. Low Density Areas reflect lek density strata, connectivity corridors, and winter use areas. Low Density Areas combined with the remaining Occupied Habitat outside of PPH are classified as PGH in Oregon.

The policy also states that site-specific information should be incorporated for PPH using the Habitat Assessment Framework (HAF; see Stiver *et al*. 2010), *when available,* to characterize sage-grouse habitat quality (BLM 2011a). HAF data represents third order (fine-scale) habitat suitability and indicators. Sage-grouse select seasonal habitats (third order) within their home ranges: breeding, summer, fall and winter periods (Connelly *et al*. 2004). Third order habitat selection at the fine scale describes the physical and geographic area within home ranges. At this level (third order) habitat descriptions (breeding, summer, and winter) map habitat indicators that influence use of, or movements between, seasonal ranges which can be examined to determine if limiting factors for habitat use exist.

The use and movement patterns typically observed of non-migratory sage-grouse indicate that large areas of sagebrush habitat in good condition are important to sage-grouse. In better habitat conditions, birds may not need to range as far to meet lek and seasonal use requirements. In a study conducted in the northwestern portion of Lake County, Hanf *et al.* (1994), found that sage-grouse showed non-migratory movement patterns. Connelly *et al.* (2004) found most sage-grouse nest within 4 miles of a lek. Females typically distribute their nests spatially in relation to the location of leks with >80% of nests located within a 6.4 km (4.0 mi) radius of lek sites.

Based on ODFW's most recent sage-grouse lek data, leks are not located within either allotment, but are located in adjacent allotments within the 4-mile proximity criterion (Table 18). In addition, the Squaw Butte Allotment contains both BLM PGH and ODFW Low Density habitat (Map 15).

Table 18. Greater Sage-Grouse Lek Locations Near the Allotments

Name	Status	Location
Button Spring (LA0805-01)	unoccupied-pending	1 mile north of 00915
Walker Butte (LA0804-01)	occupied	1 mile east of 00915
Walker Creek (LA0806-01)	occupied-pending	3 miles northeast of 00915

Environmental Consequences: Wildlife and Special Status Species

Alternative 1 (No Action)

Bald and Golden Eagle

Stable trends for vegetation on the allotments should continue to provide adequate forage for Bald and Golden Eagle prey species resulting in an adequate food supply for nestling and adult eagles.

Greater Sage-Grouse

Currently there is little direct evidence linking grazing practices to population levels of Greater Sage-Grouse. However, testing the effects of livestock grazing at large spatial scales is confounded by of the lack of control areas sufficiently large to include landscape testing of impacts of grazing important to sage-grouse (Knick *et al*. 2011). As noted by Stohlgren *et al*. 1999, ranching as a land use generally supported greater biodiversity, as measured by native plant species and shrub/grassland nesting birds than exurban (areas beyond suburbs) development or reserves. Stohlgren *et al*. (1999) research led to five generalizations regarding grazing impacts: (1) grazing probably has little effect on native species richness at landscape scales; (2) grazing probably has little effect on accelerated spread of most exotic plant species at landscape scales; (3) grazing affects local plant species and life-form composition and cover, but spatial variation is considerable; (4) soil fertility, climate, and other factors may have a greater effect on plant species diversity than does grazing; and (5) few plant species show consistent, directional responses to grazing or cessation of grazing.

Stohlgren *et al*. (1999) found no evidence that grazing led to a loss in plant species richness or diversity at landscape scales in the vegetation types and management areas that were studied. The continuation of rest rotation grazing systems in the allotments would promote healthy sagebrush communities and the production of native grasses, and thus would maintain suitable breeding and nesting habitat for sage-grouse. The timing of livestock turn out and trailing would not contribute to livestock concentrations on leks during the breeding season.

Nesting

Nesting sage-grouse consistently select areas with more sagebrush canopy cover and taller grasses compared to available habitats (Hagen *et al*. 2007); tall, dense herbaceous cover—including residual grasses—in selected dense sagebrush stands increases the probability of a successful hatch. Sage-grouse initiate nesting in April, prior to production of new herbaceous cover; thus, residual grasses left from the previous year represent the initial cover available for nesting sage-grouse (Hausleitner *et al*. 2005, Holloran *et al*. 2005).

Residual vegetation cover, especially grass and litter, has often been noted as essential for concealment during nesting and brood-rearing (Sveum *et al.* 1998a, Sveum *et al.* 1998b), suggesting opportunities to improve herbaceous cover (without sacrificing safety of sagebrush cover) may benefit fecundity. Nest predation has been linked to low herbaceous cover (Gregg *et al*. 1994; Delong *et al*. 1995, Braun 1998; Coates and Delehanty 2010, Hagen *et al.* 2011). Sage-grouse select nesting sites specifically based on the amount of grass and forb cover (Hagen *et al.* 2007) because it is needed to conceal the nest from predators. Reduction of grass height due to livestock grazing has been shown to negatively affect nest survival (Gregg *et al*. 1994). However, abundant cover has also been shown to facilitate badger predation because it attracts small mammals, the primary prey of badgers (Coates and Delehanty 2010). Adequate grass and forb cover provides valuable hiding cover for young chicks (Schroeder and Baydack 2001), a life stage during which mortality due to predation has been estimated to be highest, at 82% (Gregg *et al.* 2007). To support maintenance of suitable grass and forb cover and minimize associated predation risks, careful monitoring of grazing allotments within sage-grouse nesting habitat may be coupled with livestock management to ensure suitable grass and forb cover is reserved.

The deferred grazing system used in the Squaw Butte Allotment provides growing season rest 2 years out of three. Pyke (2011) found resting pastures from livestock grazing during periods of fastest growth of dominant grasses and forbs in intermountain sagebrush-steppe generally enhances herbaceous plant

growth and reproduction and increases culm height, long-term tiller production, and flower and seed production improving range conditions and habitat.

Brood Rearing/Breeding Behaviors

While sage-grouse use riparian areas during the brood rearing period, there are no wetlands, perennial or major intermittent streams, or associated riparian areas located in the Squaw Butte Allotment. Thermal cover, predator protection, and food availability are important for chick survival during the early brood-rearing period with tall grasses and sagebrush creating this habitat structure. Brood-rearing habitats having a wide diversity of plant species tend to provide an equivalent diversity of insects that are important chick foods.

Summer Habitat

According to Neel (1980), sage-grouse prefer grazed to ungrazed wet meadows where protective cover conditions were otherwise equal, and rest-rotation grazing provided the best effects on sage-grouse summer habitat through moderate stocking levels and a rest of a minimum of every 3 years. With few exceptions, ensuring adequate residual herbaceous cover through the nesting season (through June in most areas) will provide for long-term resilience with plant communities that include healthy bunchgrass understories and adequate residual grass cover and height to support annual objectives (Pyke 2011).

Winter Habitat

Hagen *et al*. (2011), found low sagebrush types are used equal to or in higher proportion than their availability, which suggests these areas are important wintering areas for sage-grouse and may also be important for other parts of sage-grouse life history. Spring grazing may benefit sage-grouse winter range because grass reductions can increase sagebrush densities (Wright 1970, Beck and Mitchell 2000) suggesting an opportunity to graze winter habitats in spring when brood-rearing habitats would be avoided, and vice versa. Winter diet of sage grouse consists almost exclusively of sagebrush, and winter habitat must provide adequate amounts of sagebrush exposed above snow level.

Pygmy Rabbits

The impacts of livestock grazing on pygmy rabbits and their habitats are poorly understood. In one study in Washington state, pygmy rabbits avoided grazed areas (Siegel-Thines *et al.* 2004), but in two south central Oregon studies they did not avoid grazed areas (Crawford *et al.* 2010, Lawes 2010). Based on these studies and the minimal amount known about pygmy rabbit habitat within the allotments, continued grazing under Alternative 1 would likely have very minor, if any impacts to pygmy rabbits or their habitat.

General Wildlife Habitat

Under the No Action Alternative there would be very little change in the existing quality of wildlife habitat for most wildlife species including big game, nongame bird and mammals, raptor, and migratory bird habitats over the short-term (5 years). Overall, the allotments would continue to provide adequate quality wildlife habitat that is capable of supporting an appropriate assemblage of sagebrush-dependent wildlife species. Rangeland Health Standards 3 and 5 would continue to be met in the allotments over the 10-year analysis timeframe.

Alternative 2 (Grazing Management Changes)

This alternative would remove an additional 101 AUMs of forage by livestock in the Ward Lake Allotment, making it unavailable for wildlife use. This would increase competition for forage by elk, mule deer, and pronghorn antelope. In addition, the Stratton FRF pasture would allocate an additional 19 AUMs on 40 acres of BLM land to livestock. This would also increase competition for forage between wildlife and livestock in this pasture. This additional forage removal would reduce the amount of herbaceous plants in the sagebrush understory, reduce habitat structure, and would likely have negative effects on ground-nesting wildlife species, including some migratory birds and small mammals.

Impacts to wildlife habitat, including big game, nongame bird and mammals, raptors, sage-grouse, and migratory birds within the Squaw Butte Allotment would be similar to Alternative 1.

For these reasons, it is likely that rangeland health standards 3 and 5 would continue to be met in the Squaw Butte Allotment, but would not be met in the Ward Lake Allotment over the long-term.

Alternative 3 (No Permits Issued)

Under this alternative, there would be very little change in the existing quality of wildlife habitat, including big game, nongame bird and mammals, raptors, migratory birds, or special status species habitat in the short-term (5 years) compared to Alternatives 1 or 2. The allotments would continue to provide wildlife habitat that is capable of supporting an appropriate assemblage of sagebrush-dependent wildlife species. The existing sagebrush habitat formerly impacted by livestock trailing and concentration near existing water sources would improve over the long-term. This would provide some increased forage availability for many wildlife species, as well as increased nesting habitat for ground nesting birds; however, these improvements would occur slowly and forage availability does not appear to be limiting these species populations at this time.

A previous review of literature discussed positive and negative impacts of grazing on sage-grouse habitats (Beck and Mitchell 2000) and indicated that simple modifications (such as removing livestock) may not have the desired consequences for habitat conditions. According to Lousia *et al.* (2013), models indicate that passive management, such as the removal of livestock grazing, would not restore cheatgrass-dominated or juniper-encroached sagebrush communities. Livestock removal does not necessarily result in large changes to sage-grouse populations. For example, livestock have been excluded at Hart Mountain National Antelope Refuge since 1995, where abundance of sage-grouse have fluctuated similarly as they have elsewhere in Oregon (Hagen *et al.* 2011). The effects of this alternative on sage-grouse habitat would be similar to Alternatives 1 and 2, as the allotments would continue to provide adequate habitat for sage-grouse over the short-term (5 years).

Stable trends for vegetation on the allotment should continue to provide forage for Bald and Golden Eagle prey species resulting in an adequate food supply for nestling and adult eagles over the short-term.

Overall, the allotments would continue to provide adequate quality wildlife habitat that is capable of supporting an appropriate assemblage of sagebrush-dependent wildlife species. Rangeland Health Standards 3 and 5 would continue to be met in the allotments over the 10-year analysis timeframe.

Native American Traditional Practices

Affected Environment:

The area within the two allotments fall within an area which was probably used by either The Klamath or Northern Paiute Indians. Within these areas places where plants could be collected, game could be hunted, or religious practices took place are important to native Americans. Often, tribal people do not reveal locations of religious areas to the BLM and there may be no indications of their presence on the landscape. For this reason, BLM does not have information of specific locations of sites/areas that are important to tribal people. In addition, some tribal people consider an entire landscape to be sacred.

Environmental Consequences:

Since there are no known or identified areas of religious or other importance that have been identified in the allotments, none of the alternatives would likely have an impact upon Native American Traditional Practice sites or related values.

Cultural Resources

Neither of the allotments has been comprehensively surveyed for the presence of cultural or historical resources. Surveys have been done on portions of the allotments around water developments, power line right-of-ways, fire rehab projects, and other ground-disturbing projects in the general area. This represents a resource for which there is "incomplete or unavailable information". According to the CEQ's NEPA regulations (40 CFR Part 1502.22), when an agency is evaluating impacts and there is incomplete or unavailable information the agency must make clear that such information is lacking. Further, if the information "*cannot be obtained because the cost of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include….* (1*) a statement that such information is incomplete or unavailable;* (2) *a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts….;* (3) *a summary of the existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant impacts… and* (4) *the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community…".*

The DOI NEPA regulations state that these costs are not just monetary, but can also include "*social costs, delays, opportunity costs, and non-fulfillment or non-timely fulfillment of statutory mandates"* (43 CFR Part 46.125). The costs of obtaining a comprehensive survey of cultural resources across the five allotments is estimated at $800 to $1080 per acre based upon current costs for contract survey work. Costs for surveying the entirety of the public lands on both allotments (21,000 acres) would cost approximately 16.8 to 22.7 million dollars and is considered to be exorbitant. Nevertheless, the following section describes what is known about existing cultural/historic resources in both allotments based on existing surveys, followed by a discussion of potential impacts to those resources.

Affected Environment: ***Ward Lake Allotment (00704)***

The allotment has had limited on the ground inspection for cultural resources. There are seven known archaeological or cultural sites in the area. Six of the sites are Native American and one is historic from the ranching/sheep-herding era. The historic site is a small can and refuse dump typical of those found in the desert from this time period. Of the Native American sites, 5 are small lithic scatters and one is a lithic scatter with a possible housepit. The allotment has several drainages and natural water sources (springs or lakes) where there is a higher likelyhood that cultural sites may be located.

Affected Environment: Squaw Butte Allotment (00915)

The allotment has had limited on the ground inspection for cultural resources. There are three known archaeological or cultural sites in the area at this time. All three known sites are historic from the ranching/sheep-herding era. One site is a small can and refuse dump typical of those found in the desert from this time period. The other two sites are historic sheep pens made by felling juniper trees in a circle and then limbing them to use the branches to fill in gaps between the trunks. . The allotment has several drainages and natural water sources (springs or lakes) where there is a higher likelyhood that cultural sites may be located.

Environmental Consequences: Common to Grazing Alternatives on Both Allotments

It is unknown to what extent livestock may currently be impacting cultural resource sites within the allotments. There have been few, if any, studies of livestock trampling impacts to cultural resources, but

based on field observations by BLM cultural resources staff, concentrated livestock use can impact cultural materials located in the upper soil profile. These effects could include ground cover removal, surface scuffing, and hoof shear. Cultural materials within the top 12 inches of soil are the most susceptible to exposure and trampling damage, potentially resulting in reduced site integrity. The deepest disturbance is typically seen at wet sites located in congregation areas (near water sources and trailing areas) where concentrated hoof shear and soil layer mixing is common. Artifacts can be mixed between layers of the soil profile, moved both vertically and horizontally, or broken and chipped. In addition, removal of vegetation, especially within concentration areas, can lead to erosion by wind and water, further exposing cultural materials near the surface. Dispersed grazing, on dry uplands away from natural water sources, may cause light hoof shear and surface scuffing over time.

It may be necessary conduct cultural survey(s) prior to maintenance of some existing range improvements in the allotments (if they were constructed prior to cultural resource protection laws being enacted). However, maintenance of existing range developments would have little or no additional impact on cultural resources at a given site (if any in fact exist) beyond those that may have occurred when the range improvement was originally constructed.

Environmental Consequences: Common to Alternative 3 on Both Allotments

This alternative would remove the potential for any grazing-related impacts to cultural and historic resources that may be present within the two allotments.

Environmental Consequences: Ward Lake Allotment (00704)

Alternative 1 (No Action)

This alternative would continue grazing at its present level and timing within the Ward Lake Allotment. The presence of livestock would continue to produce some trampling and surface disturbance (see also soils impact section) which could cause damage to cultural materials or mixing of materials within the soil profile if actually present, as described above.

Alternative 2 (Grazing Management Changes)

This alternative would increase grazing across the allotment. Generally, the impacts of livestock grazing on cultural sites would be similar to those describe for Alternative 1, but potentially higher in magnitude due to expanded areas of livestock concentration areas (see also soils impact section).

Environmental Consequences: Squaw Butte Allotment (00915)

Alternatives 1 and 2

These alternatives would continue grazing at its present level and timing within the Squaw Butte Allotment. The presence of livestock would continue to produce some trampling and surface disturbance (see also soils impact section) which could cause damage to cultural materials or mixing of materials within the soil profile if actually present, as described above.

Recreation

Affected Environment:

Ward Lake and Squaw Butte Allotments are part of the North Lake Special Recreation Management Area (SRMA), which focuses recreation management resources in an area with a greater concentration of recreation sites and associated demand for Off-Highway Vehicle (OHV) use, as compared to the rest of the Lakeview Resource Area. Use of motorized vehicles in the SRMA is limited to existing roads and trails and cross-country (off-road) travel is prohibited. Additionally, the Ward Lake Allotment is within the Mule Deer Winter Range Closure, which further restricts motor vehicles use seasonally to designated roads and trails between December 1st through March 31st (see Map R-7, BLM 2003b).

Recreation within the allotments is managed for Rural, Roaded Natural, Semi-Primitive Motorized, and Semi-Primitive Non-Motorized recreational activities, opportunities, and experiences (see Map R-3, BLM 2003b, and Table 19).

Table 19. Recreation Opportunity Spectrum for Ward Lake and Squaw Butte Allotments

Allotment	**Rural** (acres)	**Roaded Natural** (acres)	**Semi-Primitive Motorized** (acres)	**Semi-Primitive Non-Motorized** (acres)
Ward Lake	1,603 (12.5%)	0	10,838 (83%)	570 (4.5%)
Squaw Butte		1,859 (23%)	6,183 (76%)	120 (1%)

Pockets of vegetation and topographic screening provide opportunities for some degree of solitude within the allotments where a visitor could avoid the presence of others. Buck Creek Watchable Wildlife Area (hiking and day-use area) is currently the only developed recreation site within the allotments. The primary recreation activities in the allotments are upland game bird (e.g., chukar and quail) and big game (e.g., elk, mule deer, and pronghorn antelope) hunting. Other recreation activities that may occasionally occur in the allotments include: photography, horseback riding, ATV riding, and target shooting. In addition, the Squaw Butte Allotment contains a portion of the Squaw Ridge Lava Bed wilderness study area (WSA) which offers additional primitive recreation opportunities (refer to WSA section).

Environmental Consequences:

Alternative 1 (No Action)

Continuing current grazing management would continue to have minimal effects to recreation opportunities across the allotments. Current levels of recreation activities, opportunities, and experiences would remain relatively constant.

Alternative 2 (Grazing Management Changes)

The proposed AUM adjustments and the creation of an FRF Stratton Pasture in Ward Lake Allotment would have minimal to low impacts to recreation activities, opportunities, and experiences.

Alternative 3 (No Permits Issued)

This alternative would enhance some recreation activities, opportunities, and experiences in the allotments, while possibly diminishing others. Those seeking more natural or primitive recreation experiences in these areas would benefit by the removal of livestock grazing due to the permanent absence of the sights and sounds of cattle, the eventual improved ecological condition of the allotment (particularly associated with cattle trails and impacts around watering/gathering areas), and the potential for some livestock facilities to be deemphasized and begin to blend more into the landscape due to lack of use. Conversely, this alternative would reduce opportunities and experiences for wildlife viewers and hunters, as existing water developments become less effective at holding water and attracting wildlife due to lack of maintenance.

Visual Resources

Affected Environment:

The Ward Lake Allotment is dominated by the Buck Creek drainage in the southern portion, rising to a gently sloping plateau in the middle of the area with concessive rims and escarpments along the west and east boundaries. Views outside the allotment include Oatman Flat to the north, Antelope and Bald Mountains to the west, Yamsay and Hager Mountains to the south, and Paulina Marsh to the east. Observable developments/treatments in the area include 7 miles of paved County roads, 32 miles of BLM motorized routes, 5 miles of reclaiming motorized routes, 36.5 miles of fence, 500 feet of drift fence, 0.25 miles of minor distribution lines, 2,134 acres of past prescribed burns, 961 acres of past seedings, 20 acres of juniper treatment, 6 mineral pits (totaling 8 acres), 2 cattle guards, 13 waterholes, 7 reservoirs, and 1 Watchable Wildlife recreation site (559 acres; with 1,000 feet of trail, gravel parking area, 2 interpretive signs, and 1 picnic table).

Squaw Butte Allotment is dominated by Squaw Butte in the northwest portion, generally sloping to Squaw Flat to the east and to the edge of East Lava Field to the south. Views outside the allotment include Pyramid Mountain to the north, Squaw and Long Butte to the west, Squaw Ridge Lavabed WSA to the south, and Walker Butte to the east. Observable developments in the area include 22 miles of BLM motorized routes, 1.5 miles of closed routes, 15 miles of fence, 0.5 miles of pipelines, 251 acres of past prescribed burns, 725 acres of past seeding, 4 cattle guards, 3 waterholes, 1 reservoir, 1 well, 2 water tanks, and 5 troughs.

Although these areas experiences a short, wet green-up period in the early spring, most of the year the area is dry, comprised of the dark yellows, light tans to dark browns, blacks, greys, and greens of the grasses, sagebrush, shrubs, and juniper found across the allotments (see Upland Vegetation section for a more detailed description). The allotments are managed according to Visual Resource Management classes VRM I, III and IV. Approximately half of Ward Lake Allotment is also within the Oregon Outback National Scenic Byway corridor (Highway 31; Table 20).

Table 20. Visual Resource Management Classes and Scenic Corridors in the Allotments

Allotment	VRM I (acres)	VRM III (acres)	VRM IV (acres)	Scenic Corridor (acres)
Ward Lake	0	2,451 (19%)	10,458 (81%)	6,199 (48%)
Squaw Butte	4,665 (57%)	0	3,454 (43%)	0

- **VRM I** management objectives are to "preserve the existing character of the landscape … level of change should be very low and must not attract attention."
- **VRM III** is to "partially retain the existing character of the landscape, moderate levels of change are acceptable."
- **VRM IV** is managed to allow for "major modifications to the landscape," though "every effort should be made to … minimize disturbances and design projects to conform to the characteristic landscape" (BLM 2001, page 290).

Alternative 2 (Grazing Management Changes)

The proposed AUM adjustments and the creation of an FRF Stratton Pasture in Ward Lake Allotment would have minimal to low negative impacts to visual quality. Visual objectives for VRM Classes I, III, and IV, as well as the scenic corridor standards, would to be achieved over the life of the permit.

Alternative 3 (No Permits Issued)

This alternative would moderately enhance visual resources by eliminating livestock and improving esthetically pleasing upland plant communities in the allotments (e.g. naturally recovering cattle trails and trampled areas around water sources). However, the visual impacts of observable human developments (fences, water developments, etc.) scattered across these allotments would likely remain until such time that they either deteriorate or funds and resources are made available to facilitate their removal. In addition, some motorized routes (along fences, spurs to water developments, etc.) would likely receive less use and begin to reclaim over time. Visual objectives for VRM Classes I, III, and IV, as well as the scenic corridor standards, would continue to be achieved over the 10-year analysis timeframe.

Wilderness Study Areas

Affected Environment:

About 4,687 acres (about 57%) of the Squaw Butte Allotment overlaps with Squaw Ridge Lava Bed Wilderness Study Area (WSA) (Map 2). The 28,340 acre Squaw Ridge Lave Bed WSA (OR-1-3) was studied under section 603 of the FLPMA and was included in the *Final Oregon Wilderness Environmental Impact Statement* (BLM 1989). Squaw Ridge WSA is predominantly in a natural condition. Opportunities for solitude are outstanding due to the topography of the lava flow and abundant juniper, mountain mahogany, and shrub cover. Outstanding opportunities for primitive and unconfined recreation such as day hiking, backpacking, sightseeing, photography, and caving are present throughout the WSA. The WSA has several supplemental values including volcanic features ("aa" and pahoehoe lava flows, collapses, cinder cones, squeeze ups, and spires), uncommon endemic plants associated with lava flows (Desert-sweet), and kipukas (areas of relatively undisturbed native vegetation in lava fields. Additionally, the WSA is crucial deer and elk winter range (BLM 1989, 1991).

Existing WSAs must be managed in accordance with the *Management of Wilderness Study Areas* manual so as not to impair suitability for preservation as wilderness (BLM 2012b). Generally, wilderness values must be protected or enhanced in WSAs. Preservation of wilderness values is the primary consideration when evaluating a proposed action or use that may affect those values. To this

end, all proposals for uses and/or facilities within WSAs must be reviewed to determine whether the proposal meets the non-impairment criteria: (1) temporary (2) wilderness values must not be degraded so far as to significantly constrain the area's wilderness suitability for preservation as wilderness.

The only permitted exception to the non-impairment criteria are: (1) emergency (wildfire/search and rescue), (2) reclamation activities to minimize impacts created by violations and emergencies, (3) uses and facilities which are considered grandfathered or valid existing rights under the IMP, (4) uses or facilities that clearly protect and enhance the area's wilderness values, and (5) reclamation of pre-FLPMA impacts.

The manual specifically identifies grazing as a "grandfathered use" and permits this use to "continue in the same manner and degree as on that date (October 21, 1976), even if this impairs wilderness suitability". The "manner and degree" of grazing use is further defined as "the physical and visual impacts that use was having on the area on October 21, 1976" (BLM 2012b, Page 1-12). Grandfathered grazing use is further defined as the grazing management practices (e.g. level of use, season of use, etc.) authorized during the 1976 grazing fee year (BLM 2012b, Page 1-18).

Range records show a total of 1,000 AUMs were allocated to cattle use in the Squaw Butte Allotment in 1976. Season of use for the allotment at that time was May through August. Since approximately 57% of the allotment falls within Squaw Ridge Lava Bed WSA, the "grandfathered" or existing grazing use that occurred in this portion of the WSA is estimated at 57% of the total for the allotment or 570 AUMs of forage during the spring and summer grazing seasons. In 1985, an Allotment Management Plan extended the grazing season to the 15th of October, which allowed for flexibility in season of use.

Across the entire WSA there are 6 "grandfathered" livestock facilities constructed prior to 1976. Of these, the South and Steigleder waterholes, as well as the Squaw Butte water trough are within the Squaw Butte Allotment.

Environmental Consequences:

Alternative 1 (No Action)

Under Alternative 1, the season of use extension meets the non-impairment standard as the use is temporary (issued under a Temporary-Non-Renewable (TNR) authorization for 10 years), can be terminated at any time, and will not create any new surface disturbance. The season of use extension would marginally enhance naturalness or ecological processes by encouraging more use after the growing season. Less grazing during the growing season would promote increased native plant community vigor and health, although these benefits would likely go unnoticed by the casual observer. In addition, as this use has been occurring for 30 years, wilderness values, namely the experiential aspects of primitive and unconfined recreation, will not be degraded so far as to significantly constrain the area's wilderness suitability for preservation as Wilderness. Thus, continued grazing under the No-Action Alternative would have negligible negative impacts to wilderness values within the Squaw Ridge Lava Bed WSA and meets both the permitted exception for "grandfathered use" (type of livestock and forage allocation) and the non-impairment criteria for the extended season of use.

Alternative 2 (Grazing Management Changes)

Under Alternative 2, there would be no proposed management changes specifically in the Squaw Butte Allotment. Therefore, the impacts to wilderness values would be similar to Alternative 1.

Alternative 3 (No Permits Issued)

The No Grazing Alternative would moderately enhance naturalness and outstanding opportunities for solitude and primitive and unconfined recreation in this portion of the WSA by eliminating 570 AUMs of livestock use from the WSA. While the sights and sounds of cattle would be eliminated and cattle trails and trampled areas around livestock use areas would recover over time, the adverse visual impacts of observable human developments within the area would likely remain until such time as they deteriorate or funds and resources are made available to facilitate their removal. In addition, some motorized routes (along fences, spurs to water developments, etc.) would likely receive less use and begin to reclaim over time. Alternative 3 would result in the greatest degree of benefit to wilderness values of all the proposed alternatives and would meet the non-impairment criteria.

Social and Economic Values

Affected Environment:

The economy of Lake County is based primarily on agriculture, timber, livestock, and government sectors. Livestock grazing and associated feed production industries are major contributors to the economy of Lake County. The most common is the raising of cattle and calves for beef. In 2013, an estimated 56,750 cow/calves were in Lake County Oregon (Pete Schreder, Personal Communication, Lake County Agricultural Extension Agent, 09/25/2013). In 2013, Lake County ranchers sold an estimated $39,200,000 worth of cattle and calves or related beef products.

The permittees in the Ward Lake Allotment (00704) use a combined 416 AUMs for about 3 months of the year. To calculate the monetary value of these AUMs for comparison purposes, this number will be converted into 69 cows for 6 months (414 AUMS). The 69 cows would produce about 56 calves for market, assuming 3 bulls and an 85% calf crop.

The permittee on Squaw Butte uses 1,000 AUMs for about 6 months of the year. This calculates out to forage for about 167 cows for 6 months. The 167 cows would produce about 136 calves for market, assuming 7bulls and an 85% calf crop.

Environmental Consequences*:*

Alternative 1 (No Action)

Under this alternative, this commodity use of public lands would continue to generate revenues of about $1,886 for the BLM on an annual basis through the collection of grazing fees (1,397 AUMs @ $1.35/AUM).

The ranchers/permittees would continue to produce approximately 192 calves each year associated with Ward Lake and Squaw Butte Allotments, providing continued economic stability for the permittees and contributing approximately 0.3% to the total county-wide cattle production. Based on the current

price of a 600-pound stocker calf at $225/cwt (100 lbs. of live weight) (Stockman's Journal, 2014) the permittee would generate a gross annual income of approximately $259,200. This estimate would vary every year depending on the price of beef and the weight/condition of the calves at the time of sale.

Alternative 2 (Grazing Management Changes)

The BLM would collect increased grazing fees of about $2,048 (1,517 AUMs X $1.35) annually due to permitting additional AUMs in the Ward Lake Allotment.

The gross revenue for one permittee (Iverson) would increase in the short-term. By re-activating the 101 suspended AUMs the gross revenue would increase by about $14,850. The 101 additional AUMs would result in about 11 more calves to sell at $ 1,350 (600-pound stocker calf at $225/cwt (100 lbs. of live weight) (Stockman's Journal, 2014) per calf. This additional revenue would be earned by Iverson and would be short-term. The additional AUMs would exceed the pasture utilization levels and result in a decrease in available forage in the long-term. The loss of forage would result in a decrease in the available AUMs in the long term and therefore a loss in gross revenue in the long term. This is an estimate that would vary every year depending on the price of beef and the weight/condition of the calves at the time of sale.

Alternative 3 (No Permits Issued)

The BLM would no longer collect an estimated $1,886 on an annual basis (1,397 AUMs @ $1.35/AUM) due to the loss of grazing fees collected from the permittees.

This would also result in the loss of suitable grazing land for the local ranchers/permittees. The ranchers would then have to find suitable pasture to graze their livestock elsewhere in the surrounding region or feed additional hay, resulting in additional production costs. The current cost of hay is approximately $173/ton (Oregon-Washington weekly hay report, 2014) and assuming feeding 30lb/day/cow. This would result in approximately $108,756 in additional costs to feed the permittee's 1,397 AUMs, not including transportation costs of moving the hay to the ranch. The average pasture rate for private land forage in Oregon is $14.80 Per AUM. The additional annual cost to the rancher for renting private pasture land would be approximately $18,789.65 = ((1,397 AUMs * $14.80) - $1,885.95).

The permittee could potentially do a combination of private land leasing and feeding hay to make up for the lost forage on public lands, so the additional cost would be between $18,789.65 and $108,756.

If the permittee could not secure other suitable pasture land or could not afford these increased costs, then approximately 192 calves would no longer be produced in Lake County, resulting in a 0.4% annual reduction in county-wide cattle production. Based on the current price of a 600-pound stocker calf at $225/cwt (100 lbs. of live weight) (Stockmans Journal, 2014), this could result in an economic gross loss to the permittee and county's economy of about $259,200 per year.

In addition, one permittee would be responsible for the cost of fencing off private land in the Stratton FRF Allotment to keep cattle off of the public land. This cost would be about $7,000 (1.5 miles). If the permittee chose not to fence off the private land in the Stratton FRF Allotment, the additional costs to the permittee would be incurred for the 117 AUMs produced on private land or $9,101 for hay or $1,732 for private pasture leasing.

Cumulative Effects

Analysis Scale and Timeframe

For the purposes of this analysis, cumulative impacts are addressed at the collective allotment scale. The reasons for choosing this analysis scale include the fact that issuing a permit is a decision that affects both allotments, and BLM has a good idea of other potential reasonably foreseeable actions that may occur within the pastures due to management direction identified in the Lakeview RMP/ROD (Appendix E, BLM 2003b). The timeframe of analysis is defined as the same 15-20 year expected life of the *Lakeview RMP/ROD*. The reason for choosing this timeframe is because this represents the same analysis timeframe considered in the *Lakeview Proposed RMP/Final EIS* (BLM 2003a) and portions of that analysis may be appropriate for tiering purposes.

Known Past Activities

The Council on Environmental Quality (CEQ) issued cumulative impact guidance on June 24, 2005, that states the "environmental analysis required under NEPA is forward-looking," and review of past actions is required only "to the extent that this review informs agency decision-making regarding the proposed action." Use of information on the effects of past action may be useful in two ways: one is for consideration of the proposed action's cumulative effects, and secondly as a basis for identifying the proposed action's direct and indirect effects.

The CEQ stated that "[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." This is because a description of the current state of the environment (ie. affected environment section) inherently includes the effects of past actions. Further, the "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions." Information on the current environmental condition is more comprehensive and more accurate for establishing a useful starting point for a cumulative effects analysis than attempting to establish such a starting point by adding up the described effects of individual past actions to some environmental baseline condition in the past that, unlike current conditions, can no longer be verified by direct examination.

The second area in which the CEQ guidance states that information on past actions may be useful is in "illuminating or predicting the direct and indirect effects of a proposed action. The usefulness of such information is limited by the fact that it is anecdotal only, and extrapolation of data from such singular experiences is not generally accepted as a reliable predictor of effects".

The Department of Interior issued some additional guidance related to past actions which state, "when considering the effects of past actions as part of a cumulative effects analysis, the Responsible Official must analyze the effects in accordance with 40 CFR 1508.7 and in accordance with relevant guidance issued by the Council on Environmental Quality, such as ''The Council on Environmental Quality Guidance Memorandum on Consideration of Past Actions in Cumulative Effects Analysis'' dated June 24, 2005, or any superseding Council on Environmental Quality guidance (see 43 CFR 46.115)".

Based on this guidance, BLM has summarized known disturbances that have occurred within the allotments as part of past or on-going management activities. These include: livestock grazing and management, road construction and maintenance, operation of borrow pits associated with road

construction and maintenance prescribed fire, wildlife suppression, wildlife rehabilitation and seeding, juniper treatment, and range improvement project construction and maintenance.

The allotments have historically been grazed by cattle. Prior to the Taylor Grazing Act of 1935, grazing on public lands was essentially uncontrolled. After the Taylor Grazing Act, allotments were established, tied to private base property owned by a permittee, and were initially under the management responsibility of the Grazing Service. Under the Grazing Service and then under the new BLM in 1946, the number of grazing livestock was generally higher and the pattern of grazing use was generally more intense than what occurs today.

Based on a GIS analysis of current data, approximately 7 miles of paved, double-lane County roads, 54 miles of single-lane BLM motorized routes, 5 miles of reclaiming motorized routes, 1.5 miles of closed routes, 6 cattle guards, 0.5 miles of pipelines, 0.25 miles of minor utility distribution lines, 6 open mineral pits, 1 Watchable Wildlife recreation site, and areas of past prescribed burns, seedings, and juniper treatment. These represent an estimated total of about 4,747.6 acres of past, on-going, or recovering ground disturbance. In addition, an estimated 1,482 acres of concentrated livestock disturbance currently occurs across the allotments that is associated with trailing along fences and congregating near constructed water developments (Tables 10 and 21; Maps 5 and 6).

All of these past activities have affected or shaped the landscape within the allotment into what it is today. Current resource conditions are described further in the "Affected Environment" portions of Chapter 3, as well as in the Rangeland Health Assessments for the allotments (BLM 2004c, 2007d, 2014a, and 2014b).

Reasonably Foreseeable Future Actions

Foreseeable future actions in these allotments under all alternatives could include continued road maintenance activities (on routes located outside the WSA) on an as-needed basis comparable to what has gone on in the recent past. Hunting and other dispersed recreation activities may also occur seasonally (refer to recreation section). The seasonal deer winter range closure would continue to be implemented (Ward Lake Allotment only).

Weed treatments could occur under an on-going integrated weed treatment program (BLM 2004b, 2007b, 2007c, 2014c). Existing weed sites and new invaders could be treated using a variety of methods including cultural, physical/mechanical, biological, and chemical (herbicide). The allotments would continue to be inventoried to find the infestations while they are still small and manageable along with continuing invasive plant prevention measures.

Invasive juniper/fuel reduction treatments could also occur during the analysis timeframe though none are currently planned in the allotments at this time. Fuel and juniper treatment projects in these areas are currently a low priority compared to other areas within the Lakeview Resource Area (Appendix E3; BLM 2003b). For this reason, these types of projects are highly speculative and will not be analyzed further at this time. Should these types of projects like these be proposed in the future, additional NEPA analysis will be required prior to implementation.

Table 21. Estimated Ground Disturbance by Alternative

	Alternative 1 (No Action)	**Alternative 2** (Grazing Management Changes)	**Alternative 3** (No Permits Issued)
	Acres	**Acres**	**Acres**
Water Sources	1,450	1,662	0
Cattle Trails	32	32	0
Pipeline	0.5	0.5	0.5
Livestock Disturbance Subtotal	1,482.5	1,704.5	0.5
Utility Line	.25	.25	.25
Prescribed Burn	2,385	2,385	1,000
Seeding	1,686	1,686	1,686
Juniper Treatment	20	20	20
Mineral Pits	8	8	8
Paved County Roads	17	17	17
BLM Open Routes	65.5	65.5	65.5
BLM Reclaiming/Closed Routes	6.3	6.3	0
Developed Recreation Site	559	559	559
Other Disturbance Subtotal	4,747.1	4,747.1	3,355.8
Total Disturbance	**6,229.6**	**6,451.6**	**3,356.3**

While there is a risk of a future wildfire within the allotments, it is impossible to accurately predict how much area would likely burn, when an area would burn, how intensely the area would burn, how much fire suppression would be employed, and how much area may need to be actively rehabilitated after the fire. For this reason, wildfire disturbances are considered to be speculative at this time and will not be addressed further in this analysis. Fire rehabilitation proposals will also require additional NEPA analysis prior to implementation.

Environmental Consequences:

Alternatives 1–3

None of the alternatives would have any incremental cumulative effects on climate, greenhouse gas emissions, carbon storage, native American traditional practices, recreation, or visual quality, as the analysis revealed that there would be little or no direct or indirect effects on these values/issues.

For purposes of this analysis, total acres of concentrated ground disturbance or recovery served as the primary indicator of cumulative impacts on soils, BSCs, upland vegetation, wetland/riparian areas, cultural resources, and wildlife and special status species habitat.

The majority of the BLM routes in the area are not maintained on an annual basis, but for analytical purposes BLM assumes that approximately 3-5 miles could receive some spot maintenance or minimal level of re-grading annually. These activities would generally be limited to the existing roadbed prism and would not create any new ground disturbance. Further, such activities are considered to be so minor as to be categorically excluded from NEPA analysis (BLM 2008a).

The amount and location of future dispersed recreational activities are difficult to estimate, but are not expected to result in any additional, measurable long-term surface disturbance in the allotments.

Noxious weeds and invasive, non-native plants are present within the allotments (see Noxious Weed section). In addition, juniper expansion is occurring in both allotments and is expected to continue into the foreseeable future. Over the long-term (next ten years), juniper expansion would lead to less vigorous understory grasses and shrubs which would lead to a less weed-resistant landscape. This would likely lead to invasions of additional invasive species, especially annual grass species. These sites they would be treated in accordance with the most current Integrated Weed Treatment Plan(s) and related policies (BLM 2004b, 2007b, 2007c, 2014c). The impacts of such treatments have already been analyzed at multiple scales and these analyses are incorporated herein by reference in their entirety. Such impacts could include: short-term increases in surface disturbance and soil erosion, coupled with reduction in weed distribution, enhanced native vegetation recovery, protection or restoration of wildlife habitats, maintenance of recreation experiences, maintenance of livestock forage production, maintenance of visual quality, and minimal risk to human health over the long-term (BLM 2004b, 2014c). If existing weed sites are not treated in the near future, they could invade other areas of the allotments through seed and root fragments spread through wind, water, animals, and recreation activities. Removing livestock grazing (Alternative 3 only) would allow for native plant communities in previously disturbed areas to recover making them more resistant to invasive plants; however it could also increase fire danger and intense wildfires are one of the largest causes of noxious weed infestation on the Resource Area.

In the absence of juniper and weed treatments, a gradual decline in wildlife habitat diversity is expected. Rangeland Health Standards 3 and 5 would likely continue to be met over the 10-year analysis timeframe in the Ward Lake and Squaw Butte allotments; however, juniper encroachment may increase and result in substantial, negative impact on sagebrush obligate wildlife habitats within the allotments over the long-term (10 or more years) similar to Alternative 1. Juniper encroachment would suppress native shrub, grass and forb species that many sagebrush obligate wildlife species depend upon. In addition, even though integrated weed management actions would occur, invasive species would continue within the allotments and would likely expand over the long-term, and thus, could result in Rangeland Health Standards 3 and 5 not being met in the future.

The incremental cumulative effects of continued grazing 0 to 1,348 AUMs each year, when added to past, present, and reasonably foreseeable future actions would result in either: no change in total acres of concentrated ground disturbance (Alternative 1), a minor incremental increase in total acres of ground disturbance (Alternative 2), or a reduction in ground disturbance due to natural recovery (Alternative 3) (see Table 21).

CHAPTER 4 – CONSULTATION AND COORDINATION

REVIEW OPPORTUNITY

The EA and FONSI were made available for review on BLM's website. A legal notice was also published in the *Lake County Examiner* announcing the availability of the documents for review and the comment period end date. Agencies, native American Tribes, permitees, and members of the public with a known interest in grazing management activities within the allotments were notified by mail of the availability of the EA for review. This mailing list is contained in the project file.

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Map 1 - General Vicinity of Allotments

Lake County

Fort Rock

Christmas Valley

Silver Lake

Summer Lake

Paisley

Valley Falls

Plush

Lakeview

Adel

Klamath County

Lake County

Lake County

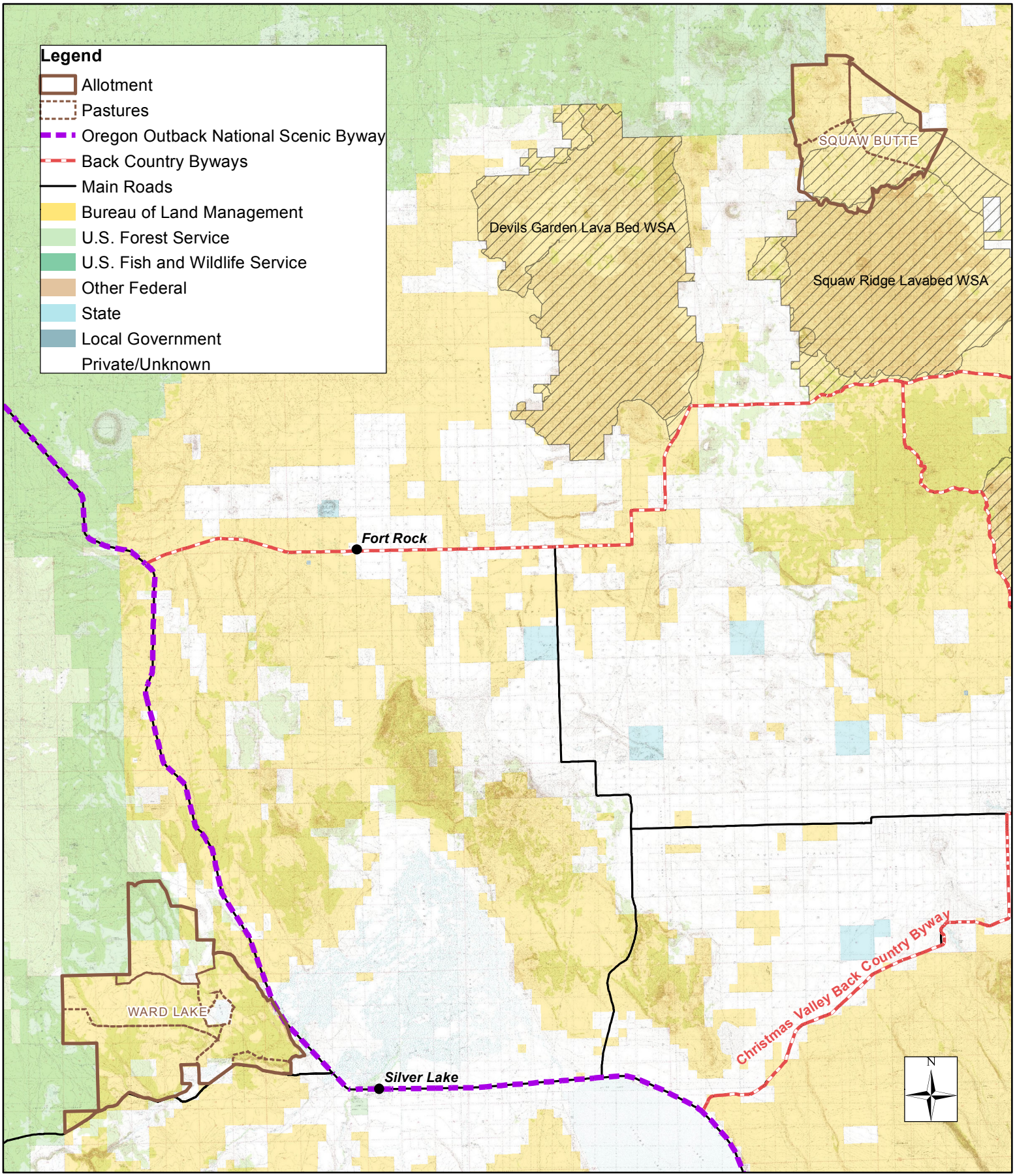
Harney County

Legend

- Lakeview Resource Area
- County Boundary
- Cities
- Major Roads
- Allotment Boundaries

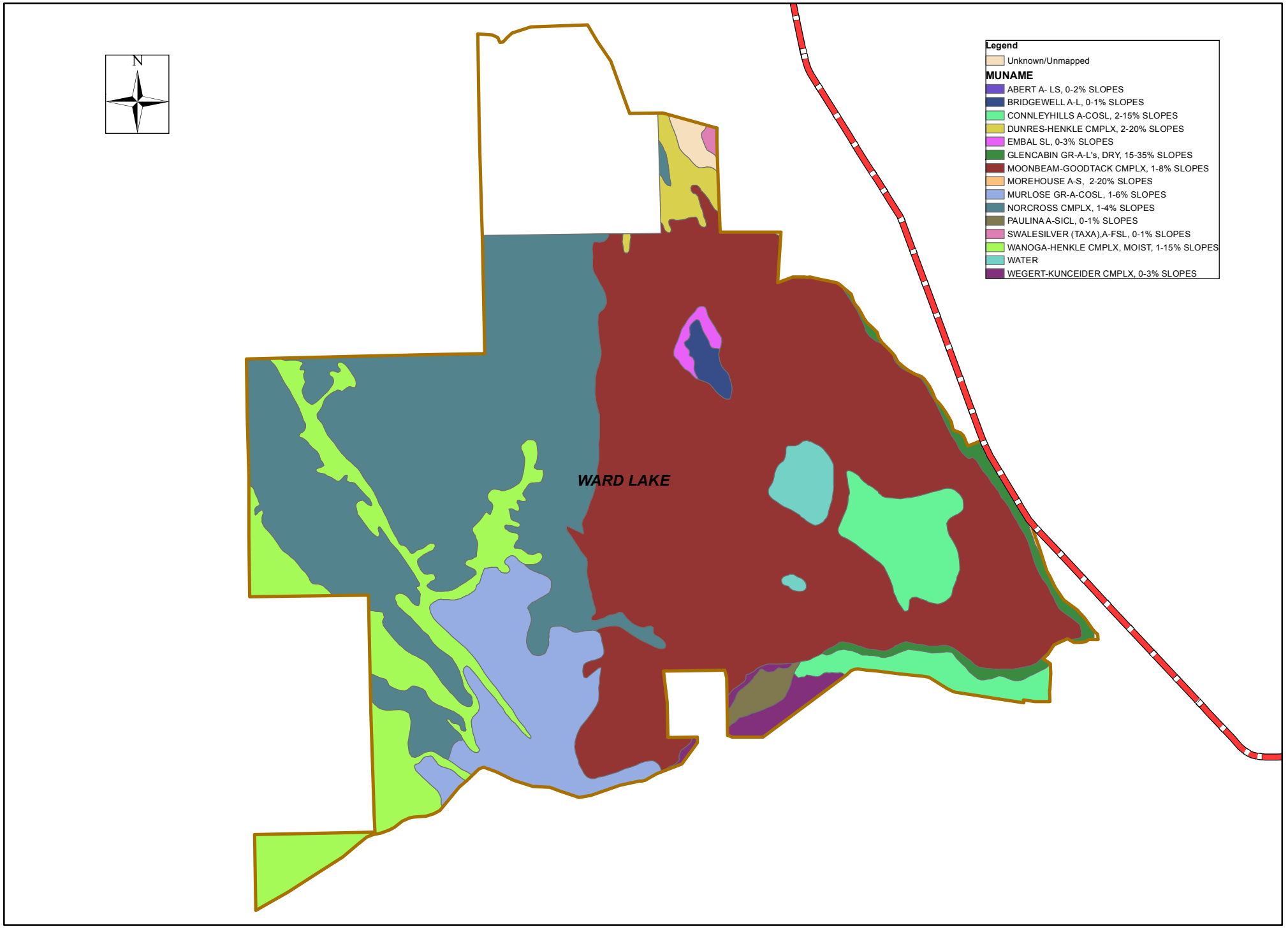
0 4.75 9.5 19 Miles

N
W E
S



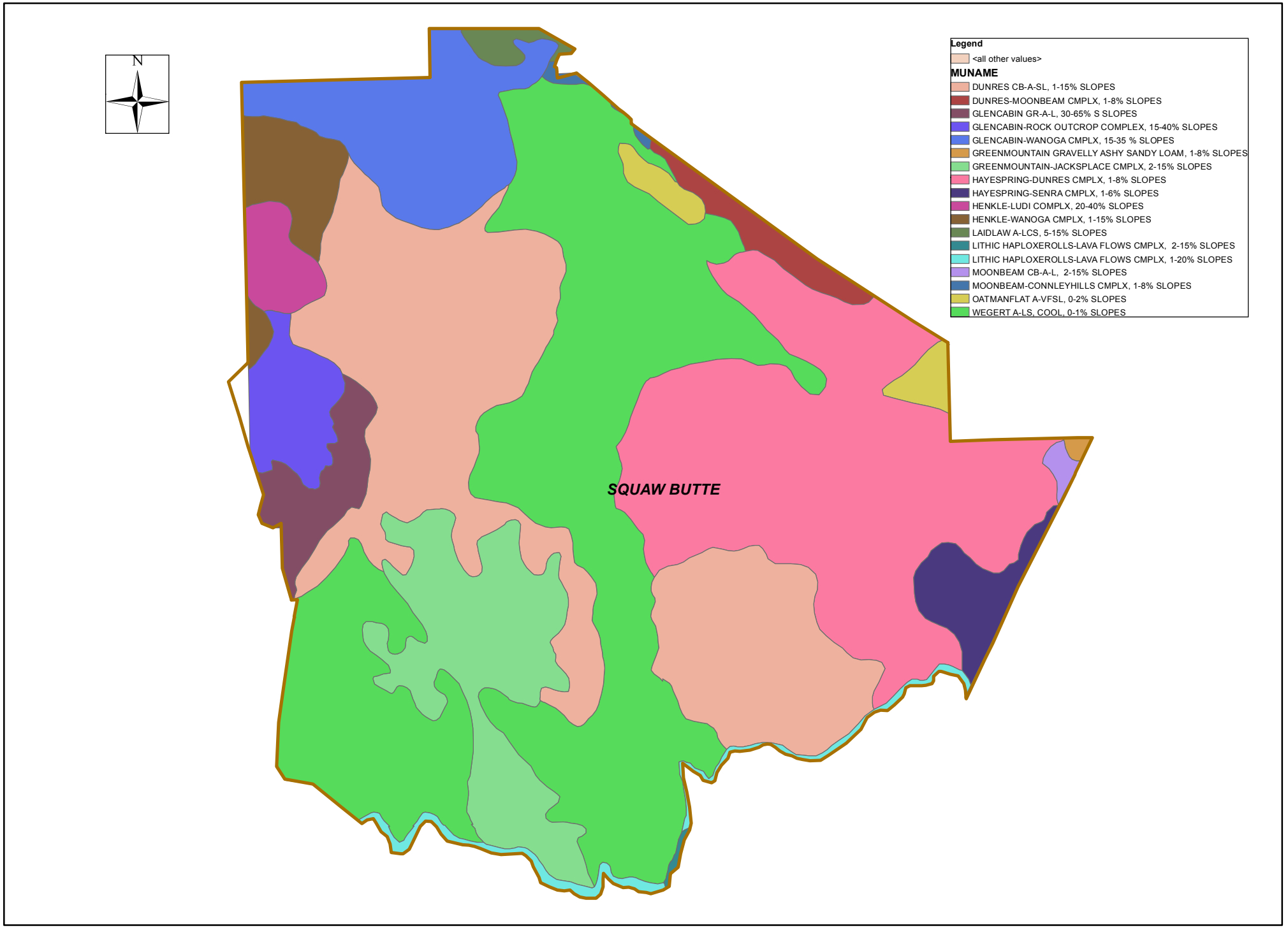
Map 2 - Land Status and Wilderness Study Areas

Miles
0 0.75 1.5 3 4.5 6



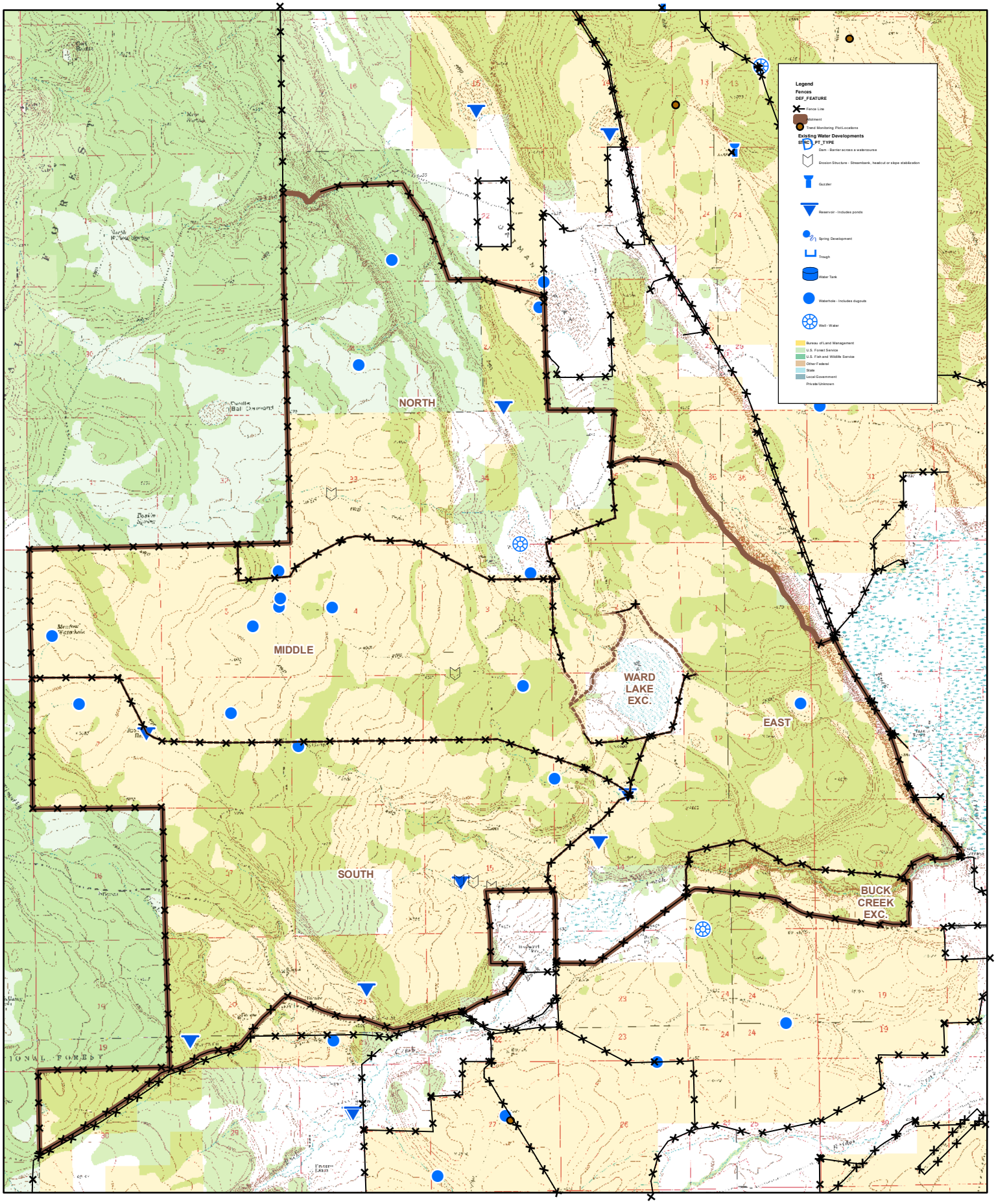
0 0.2 0.4 0.8 1.2 1.6 Miles

Map 3 - Ward Lake Soils



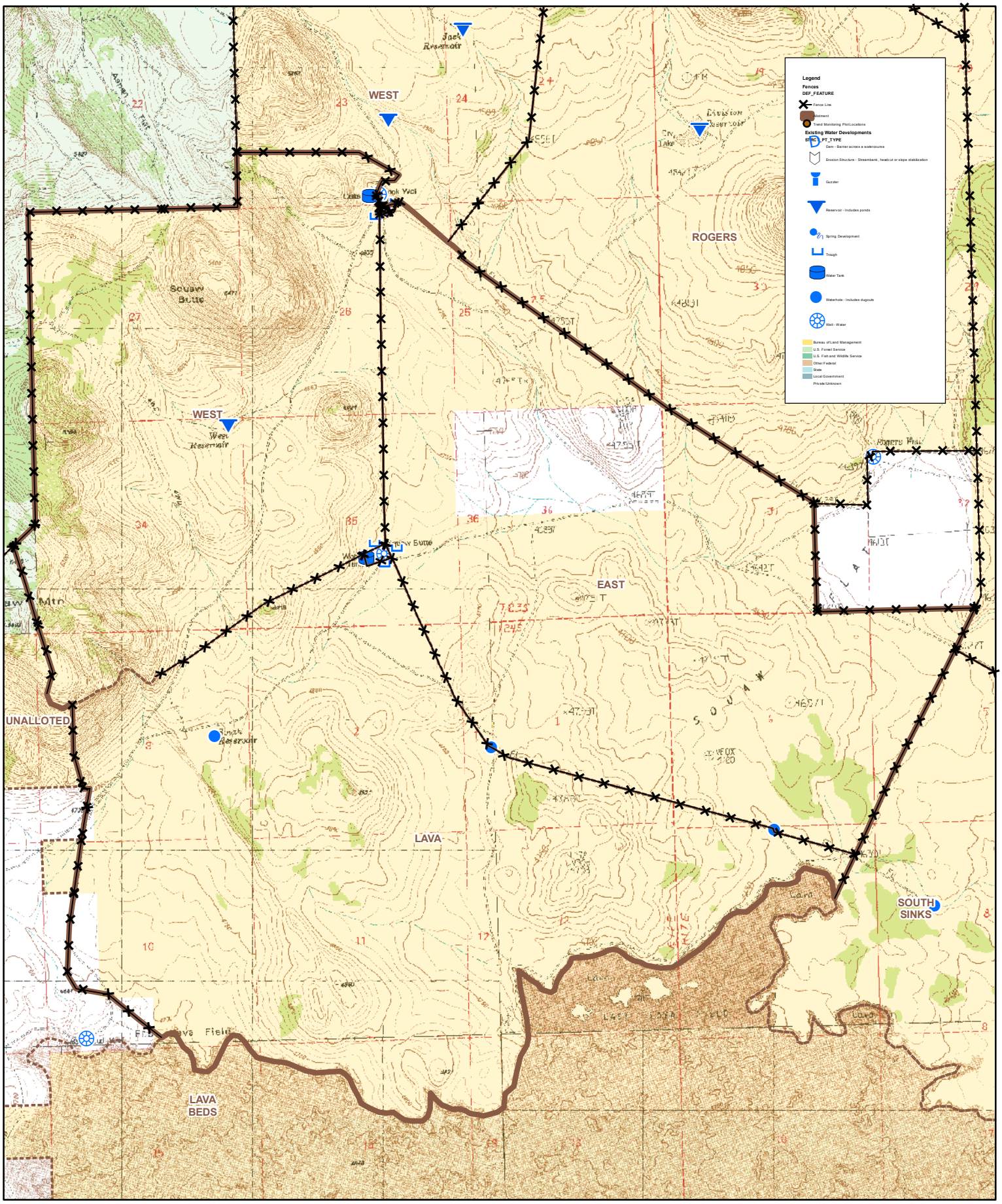
0 0.125 0.25 0.5 0.75 1 Miles

Map 4 - Squaw Butte Soils



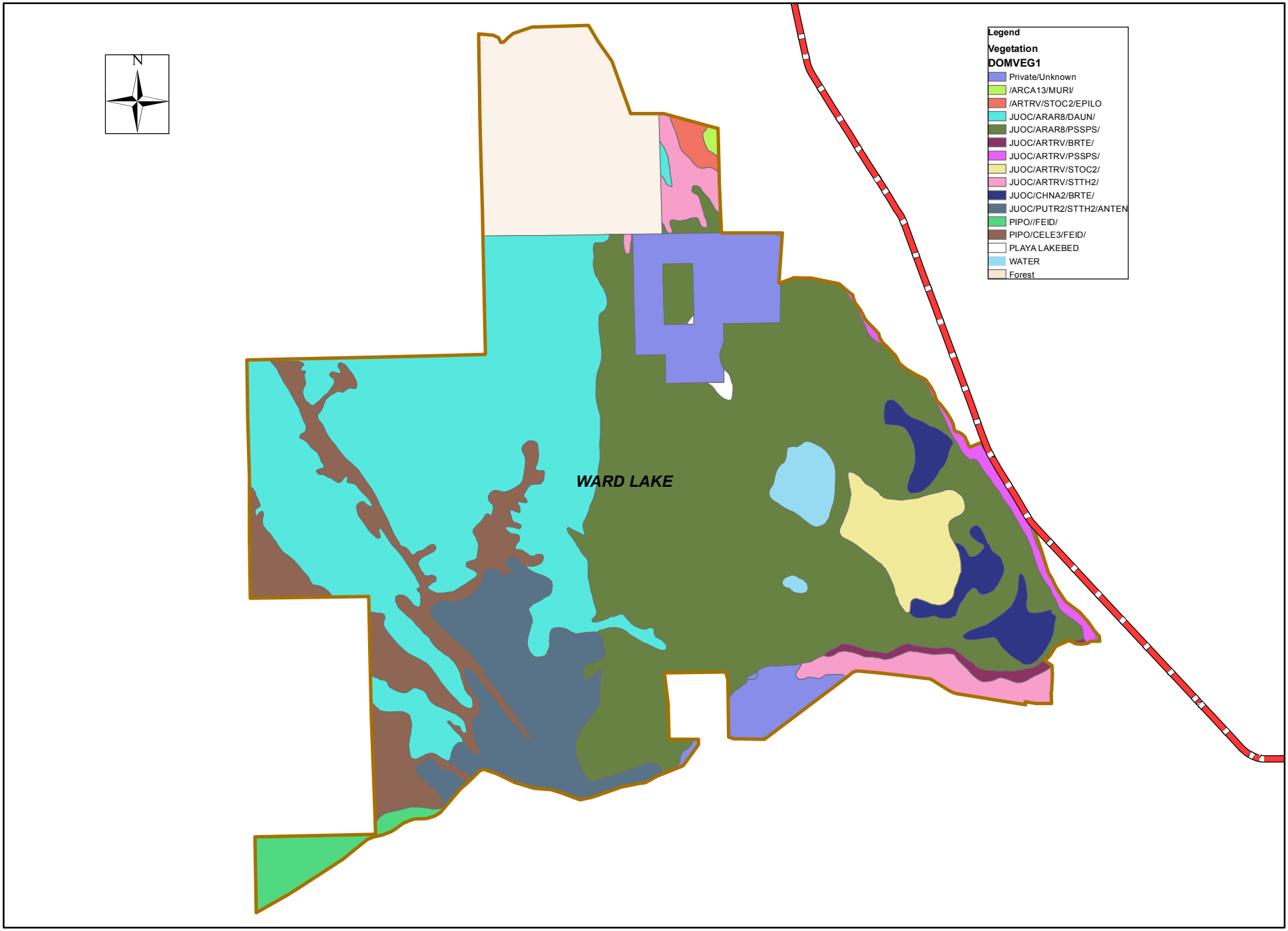
Map 5 - Range Improvements in Ward Lake Allotment

0 0.3 0.6 1.2 Miles



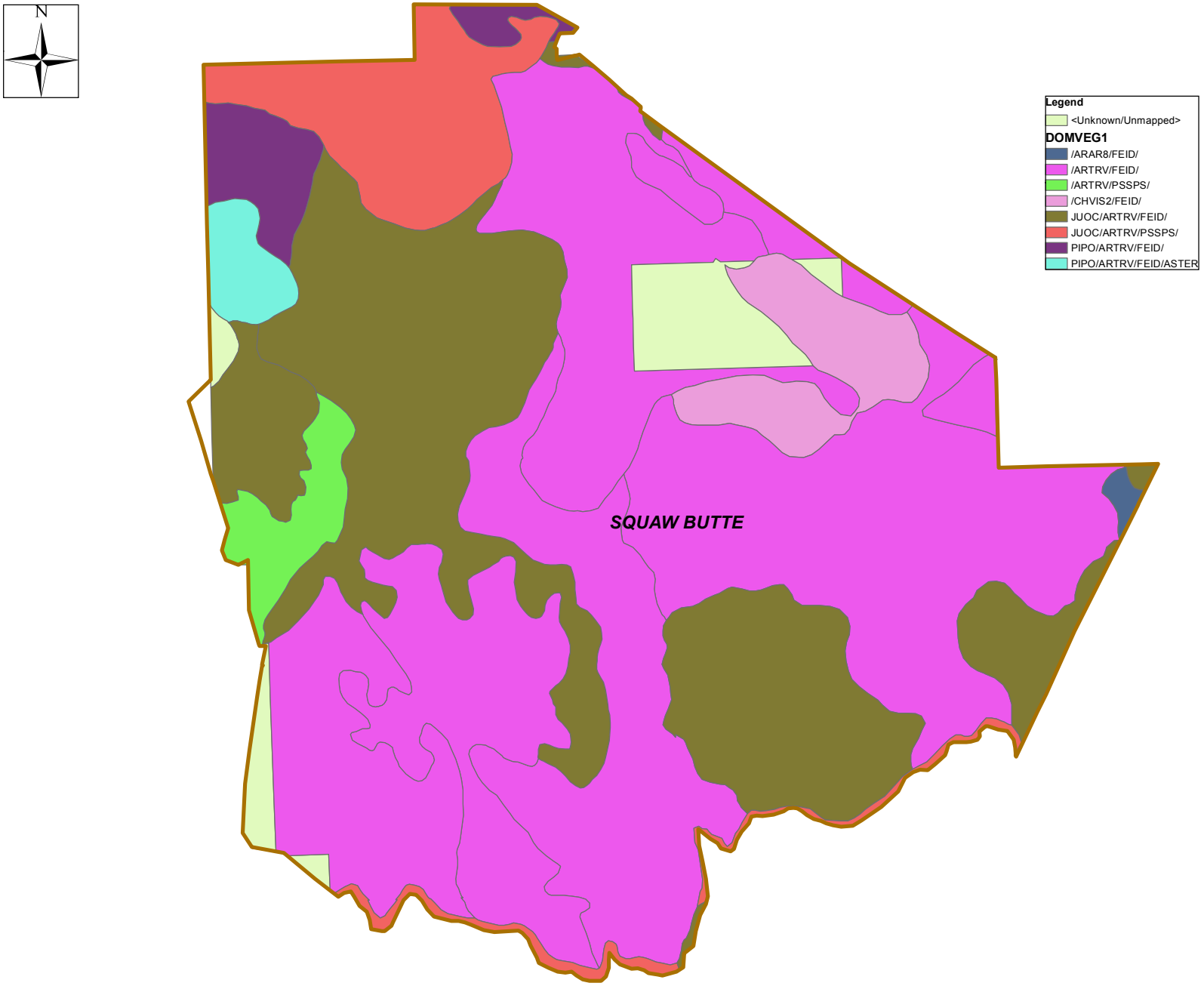
Map 6 - Range Improvements in Squaw Butte Allotment

0 0.175 0.35 0.7 Miles



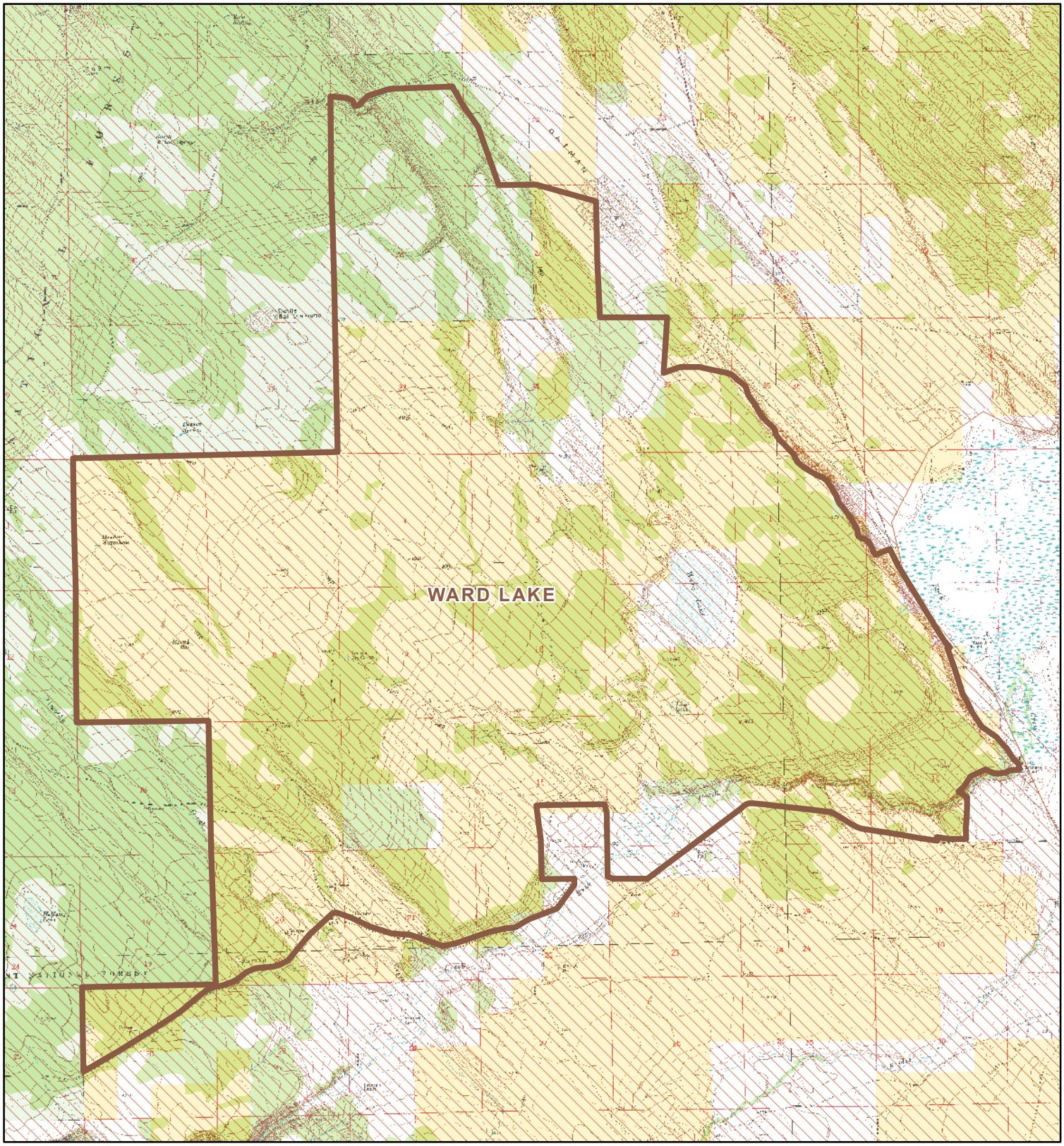
0 0.2 0.4 0.8 1.2 1.6 Miles

Map 7 - Ward Lake Dominant Vegetation



Miles
0 0.125 0.25 0.5 0.75 1

Map 8 - Squaw Butte Dominant Vegetation



N

0 0.375 0.75 1.5 Miles

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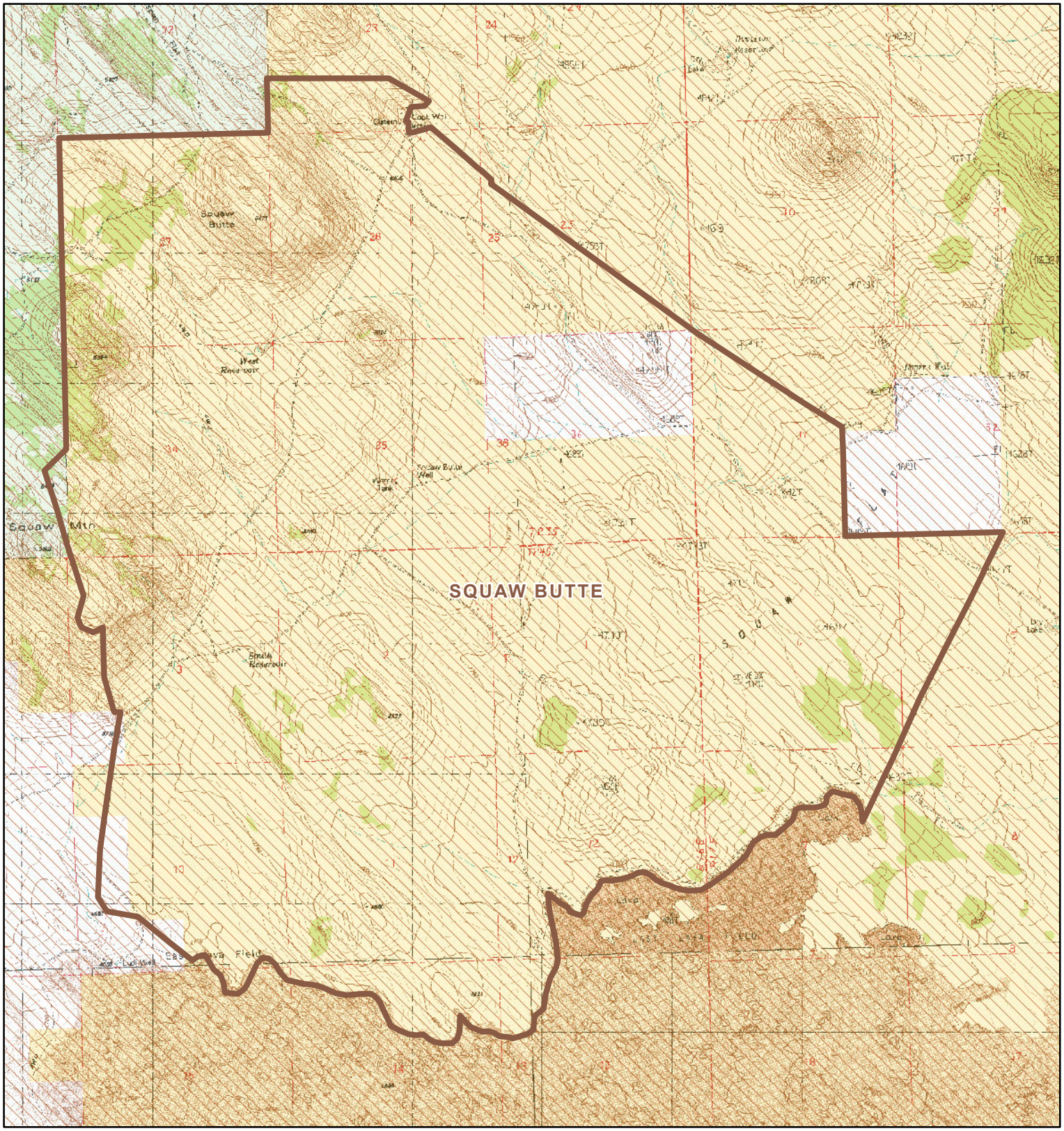
Legend

- Allotment
- Mule Deer Winter Range
- Bureau of Land Management
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- Other Federal
- State
- Local Government
- Private/Unknown

Map 9 - Mule Deer Winter Range in Ward Lake Allotment



N

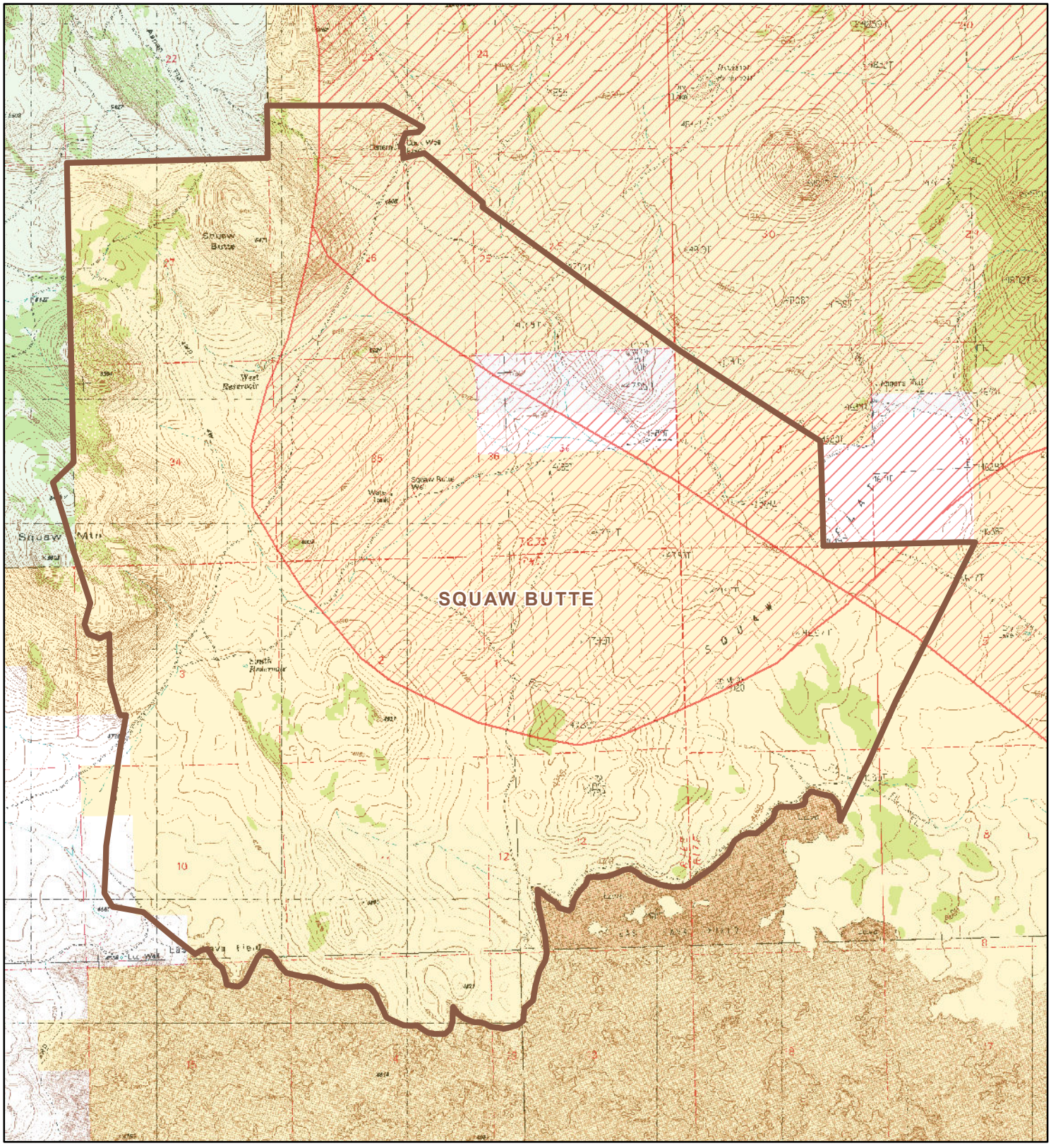
0 0.2 0.4 0.8 Miles

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Legend

- Allotment
- Mule Deer Winter Range
- Bureau of Land Management
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- Other Federal
- State
- Local Government
- Private/Unknown

Map 10 - Mule Deer Winter Range in Squaw Butte Allotment



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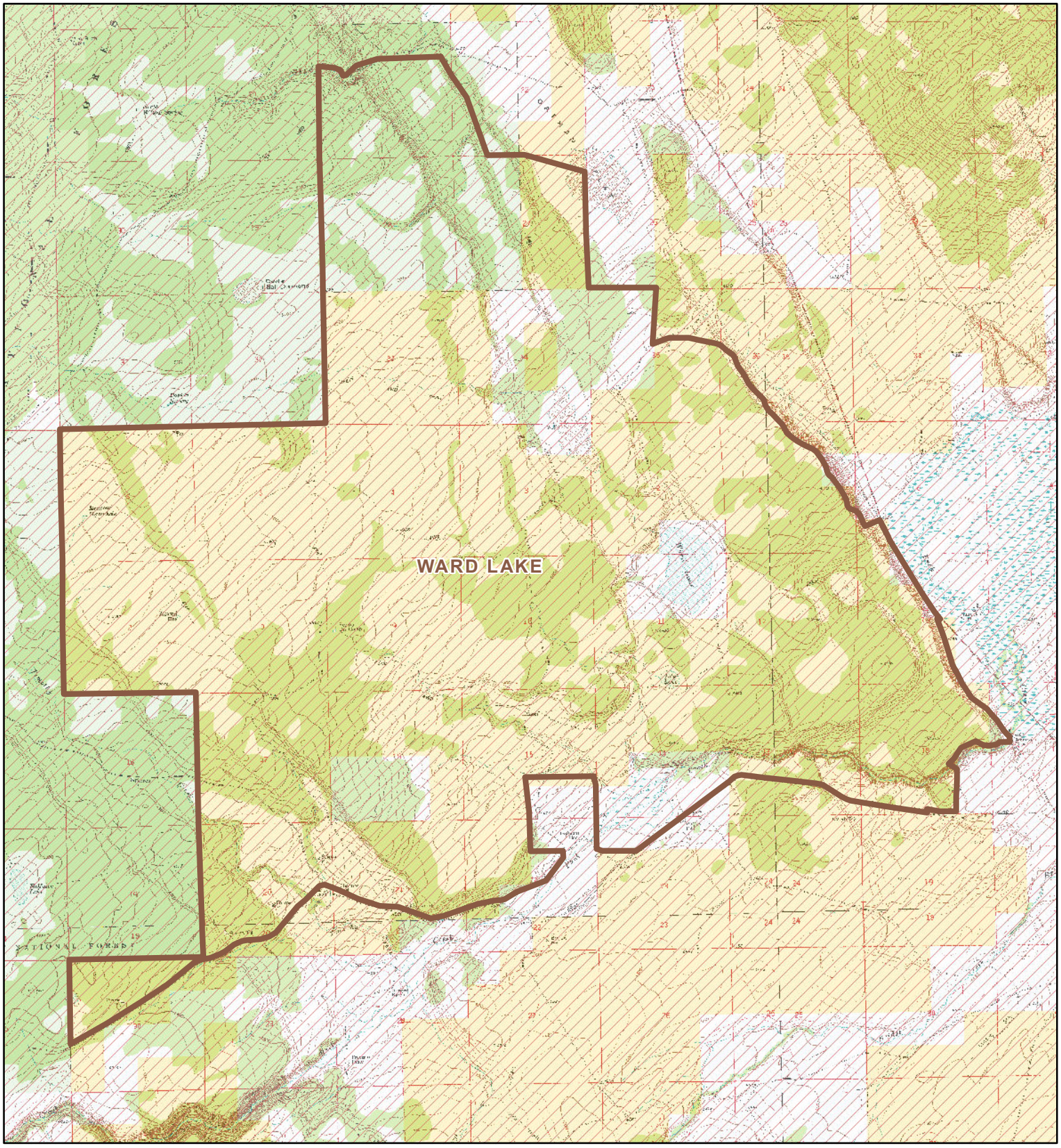
Map 11 - Pronghorn Antelope Habitat in Squaw Butte Allotment



N

0 0.275 0.55 1.1 Miles

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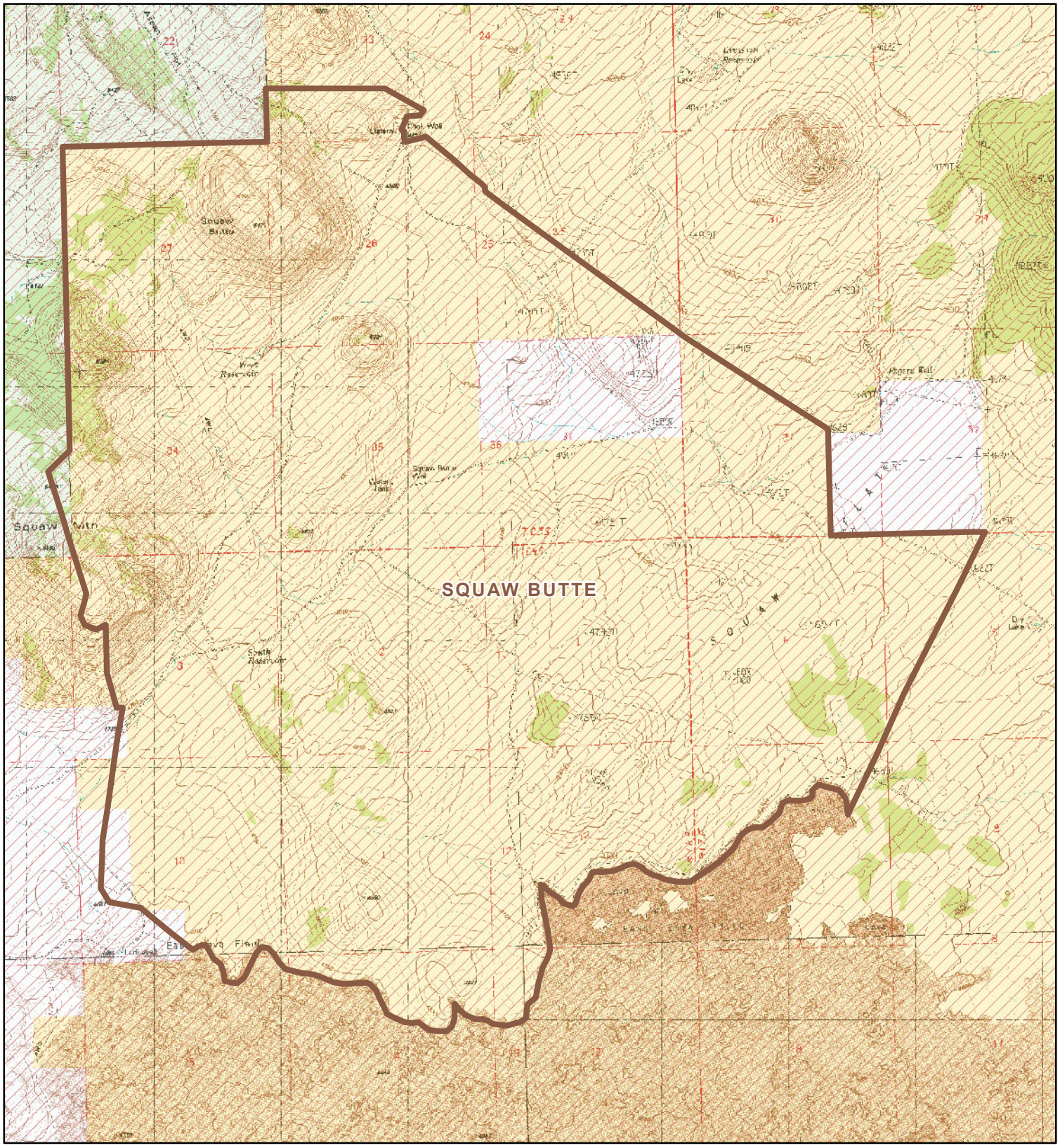
Legend

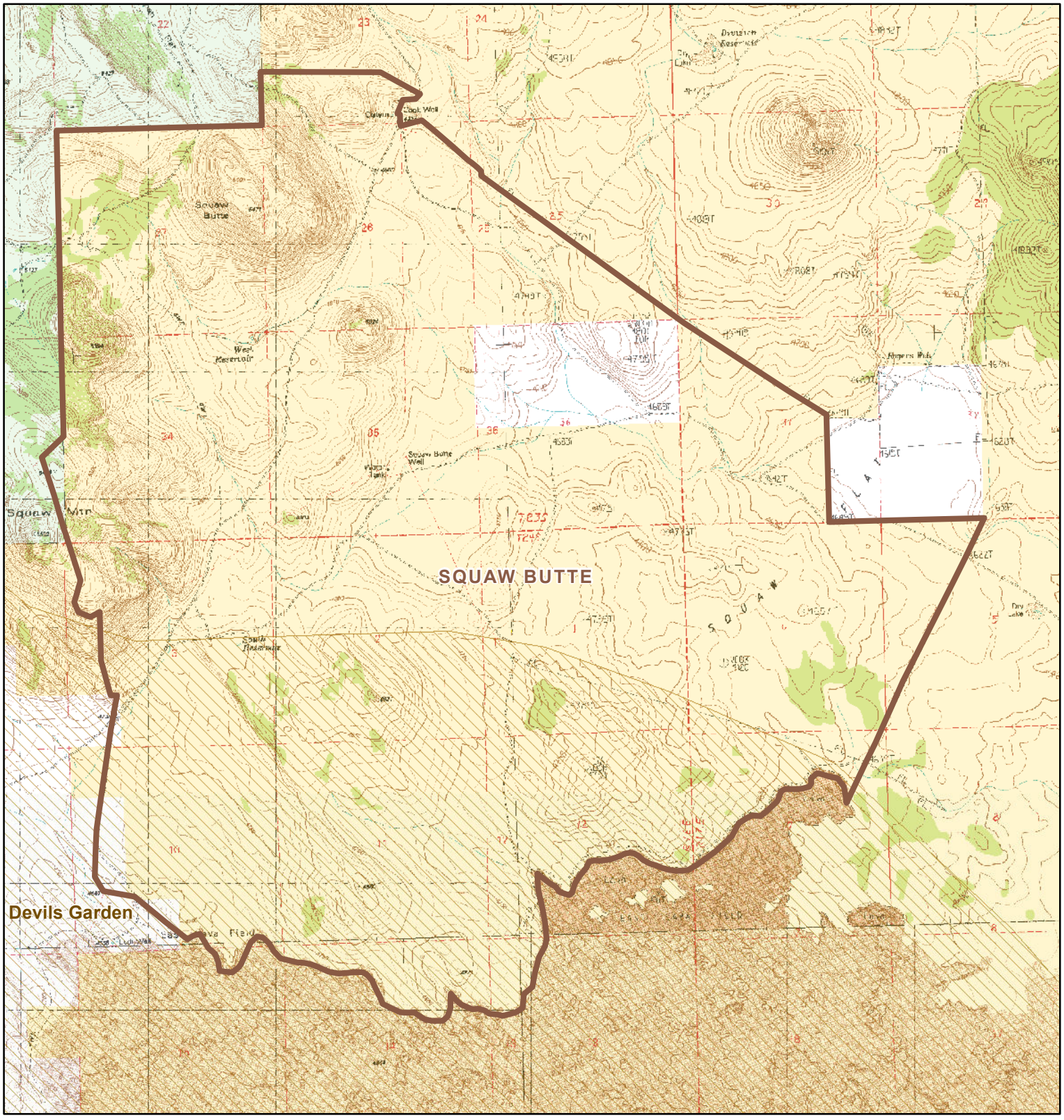
- Allotment
- Elk Winter Range
- Bureau of Land Management
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- Other Federal
- State
- Local Government
- Private/Unknown

Map 12 - Elk Winter Range in Ward Lake Allotment



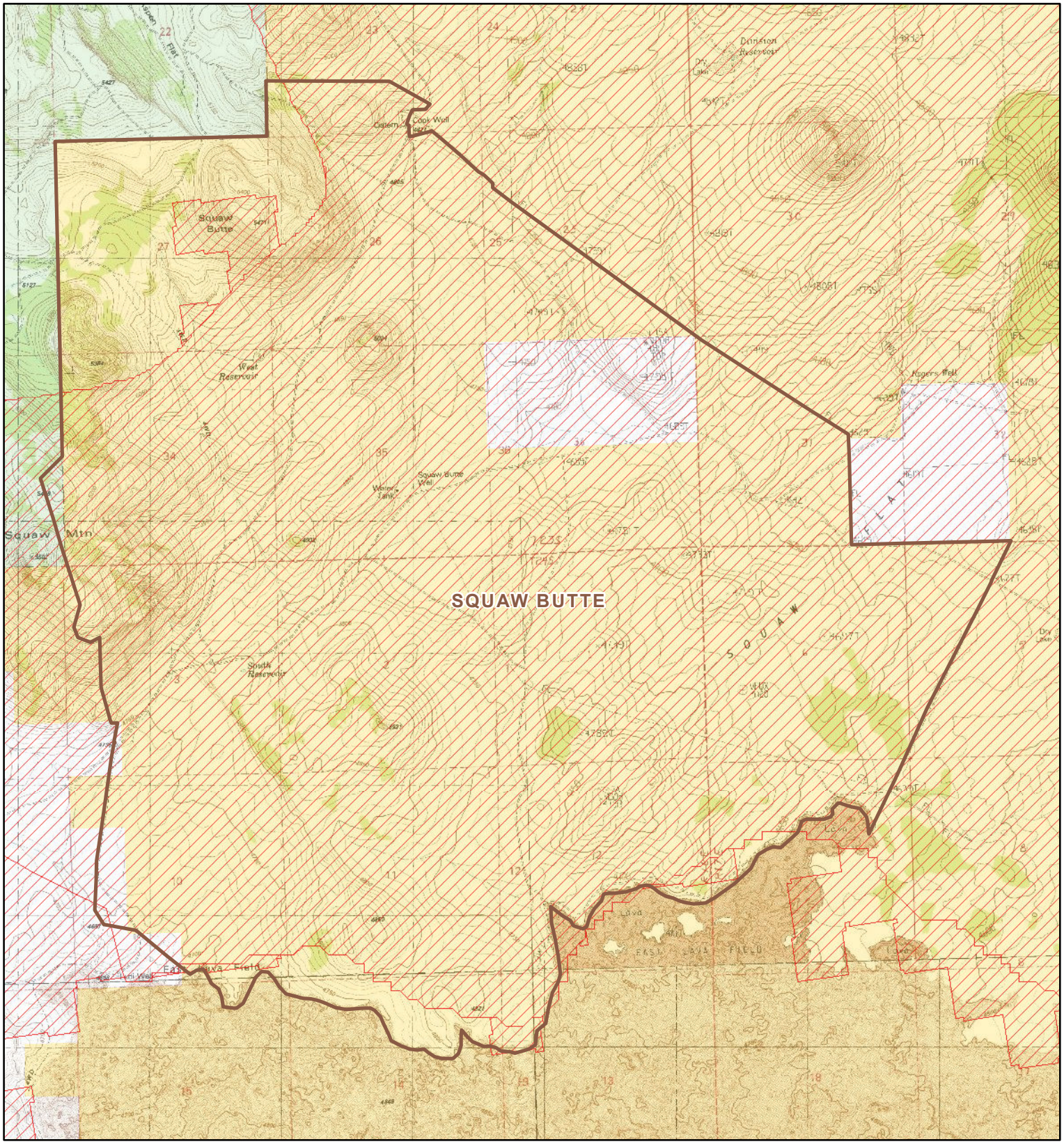
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Map 13 - Elk Winter Range in Squaw Butte Allotment



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Map 14 - Bighorn Sheep Habitat in Squaw Butte Allotment



N

0 0.2 0.4 0.8 Miles

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Legend

- Allotment
- Sage-Grouse Leks (ODFW)

Sage-Grouse Habitat (BLM)

BLM_SG_Habitat

- Preliminary General Habitat (PGH)
- Preliminary Priority Habitat (PPH)
- Bureau of Land Management
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- Other Federal
- State
- Local Government
- Private/Unknown

Map 15 - Greater Sage-Grouse Habitat in Squaw Butte Allotment