

CAPEHART LAKE
ALLOTMENT
MANAGEMENT PLAN

Environmental Assessment
OR-08-025-033

Three Rivers Resource Area
Bureau of Land Management
Burns District Office
28910 Hwy 20 West
Hines, Oregon 97738

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CHAPTER I. INTRODUCTION: PURPOSE OF AND NEED FOR ACTION

A. Background

Capehart Lake Allotment #07062 is located approximately 40 air miles southwest of Burns, Oregon, in the Three Rivers Resource Area in southwestern Harney County (Map A – Vicinity Map). The allotment contains approximately 35,555 acres of Bureau of Land Management (BLM) administered land, and private land acreage is 941 for the allotment. The allotment is divided into the following three pastures: Capehart Lake Pasture, Hiway Field Pasture, and the Little Seeding Pasture (Map B – Land Status Map). Capehart Lake Allotment is a category “I” (Improve) allotment. The BLM Selective Management Policy categorizes allotments according to the characteristics of natural resources within the allotment to determine how management objectives should be established to improve current unsatisfactory condition (I category) (H-1734-2 – Rangeland Monitoring Handbook).

One term grazing permit is currently authorized for this allotment. Permitted season of use for the allotment is from April 1 through September 30 with 1,500 Animal Unit Months (AUMs) of active use. Since Capehart Lake Allotment was originally part of East Wagontire Allotment, but was separated from it in 1995, there are currently no forage allocations for wildlife in the allotment. Forage allocations for wildlife in the original East Wagontire Allotment were 86 AUMs for deer and 7 AUMs for antelope. The Capehart Lake Allotment is made up of acreage that was originally two pastures, Capehart Lake and Little Seeding, within the East Wagontire Allotment. The 1995 Allotment Management Plan (AMP) was designed to implement a rotational grazing system. By constructing a fence, in the Capehart Lake Pasture, a third pasture was created. Prior to the construction of the fence, the AMP prescribed total use not to exceed 1,100 AUMs. The remaining 400 AUMs were to be voluntary nonuse until after construction of the fence; the voluntary nonuse AUMs would be returned in increments of 100 AUMs per year. After construction of the fence the two pastures were to be used under a graze/rest rotation system (April 1 to July 15), and the Little Seeding was to be deferred until after July 15 each year. This system was never implemented due to the lack of reliable water sources in the Capehart Lake and Hiway Field Pastures.

In 2006, resource management data from the Capehart Lake Allotment from 1994 to 2005 were analyzed through a formal Interdisciplinary Team (IDT) evaluation process. This evaluation identified resource objectives that were or were not being achieved as outlined in the *Rangeland Health Standards (Standards) and Guidelines for Livestock Grazing Management (Guidelines) for Public Lands in Oregon/Washington* (August 12, 1997), CFR 4180.2(c). The evaluation also included an analysis of grazing management in the allotment to determine if current management was in conformance with Guidelines. The Standards determinations from the 2006 evaluation are shown in Table 1.

Table 1: Standards for Rangeland Health Determinations

Standard	Achieved	Not Achieved	Causal Factors	Comments
1. Watershed Function – Uplands	Little Seeding Pasture	Capehart Lake and Hiway Field Pastures	Livestock Grazing Management	The percent of bare ground is relatively high in Capehart Lake and Hiway Field Pastures which reduces the amount of captured and stored water. Management providing periodic growing season rest would help maintain and eventually improve current vegetation.
2. Watershed Function – Riparian/Wetland Areas				Standard Not Applicable
3. Ecological Processes	Yes			Standard Achieved in All Pastures
4. Water Quality				Standard Not Applicable
5. Native, Threatened and Endangered (T&E), and Locally Important Species	Little Seeding Pasture for Sage-grouse	Capehart Lake and Hiway Field Pastures for Sage-grouse	Livestock Grazing Management	Essential habitat elements are present but not adequate. Adequate growing season rest has not been received promoting an unhealthy vegetative community for sage-grouse.

Results of the evaluation describe how Standard 1: Watershed Function – Uplands and Standard 5: Native, T&E, and Locally Important Species (sage-grouse) in the allotment were not being achieved in the Capehart Lake and Hiway Field Pastures of the Capehart Lake Allotment with livestock being a causal factor. These standards were not being achieved, particularly due to lack of adequate growing season rest as a result of timing of use in the two pastures. Standards achieved include Standard 1: Watershed Function – Uplands and Standard 5: Native, T&E, and Locally Important Species (sage-grouse) in the Little Seeding Pasture; Standard 3: Ecological Processes was achieved in all pastures; Standards 2: Watershed Function – Riparian/Wetland Areas and 4: Water Quality were not applicable within the allotment. The Capehart Lake and Hiway Field Pastures are not receiving adequate growing season rest and are not conforming to the Guidelines. Little Seeding Pasture is provided adequate growing season rest and is in conformance.

Since the 2006 evaluation, changes were recommended but not implemented in grazing management; there has continued to be an early/graze treatment from April 1 to June 1 in the Capehart Lake Pasture, a graze/defer treatment from June 2 to July 15 in the Hiway Field Pasture, and the Little Seeding Pasture has been deferred every year from July 16 to September 30. These changes were recommended after it was determined that the existing management was not allowing for all Standards to be achieved and not in conformance with Guidelines. The Capehart Lake and Hiway Field Pastures have generally been used at the same time each year since the 2006 evaluation.

Flexibility in the grazing rotation has been made available in cases of drought, this flexibility is dependent upon the demonstrated stewardship and cooperation of the permittee, and changes in rotation must meet resource objectives.

B. Purpose of and Need for Action

The purpose of the Proposed Action is:

To modify livestock grazing management on Capehart Lake Allotment to address timing and distribution of livestock to make significant progress¹ toward achieving the Watershed Function – Uplands, and Locally Important Species (sage-grouse) Standards that were not achieved within Capehart Lake and Hiway Field Pastures; to ensure grazing management continues to achieve those Standards currently being achieved; conforms to all applicable grazing management Guidelines; meets those Resource Objectives specific to Capehart Lake Allotment and the Three Rivers Resource Management Plan (RMP) listed in Part C; and consider a request to renew a 10-year grazing permit.

The need for the Action is:

To ensure that Standards and Guidelines currently being achieved continue to be achieved, and make significant progress toward achieving the Watershed Function – Uplands in the Capehart Lake and Hiway Field Pastures, and Locally Important Species Standards in the Capehart Lake and Hiway Field Pastures not currently achieved, and to meet Guidelines throughout the allotment.

Based on the 2006 rangeland health standard assessment, utilization records, and professional observation of BLM personnel, there exists a need to implement changes in livestock grazing management to make significant progress toward achieving Standards not currently achieved and conform to Guidelines.

¹ Significant Progress: Used in reference to achieving a standard as outlined in the Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the States of Oregon and Washington (1997). The use of the word “significant” in this document does not meet the Council on Environmental Quality’s definition of the word.

Current grazing management is not allowing for adequate growing season rest within the Capehart Lake and Hiway Field Pastures which is resulting in an unhealthy vegetative community, an increase in bare ground, decreased plant vigor, and poor quality nesting and early brood-rearing sage-grouse habitat.

The BLM has a responsibility to respond to an external request to renew a grazing permit associated with Capehart Lake Allotment, and consider issuance of a grazing permit within Capehart Lake Allotment consistent with grazing regulations at 43 CFR 4100, manage public lands for multiple-use and sustained yield under the Taylor Grazing Act (43 U.S.C 315, 1934), the *Federal Land Policy and Management Act of 1976*, and the *Public Rangelands Improvement Act of 1978*, and the Three Rivers RMP, 1992. Livestock grazing is identified as a use of the public land and is to be conducted in a manner which will meet multiple-use and sustained yield objectives.

This AMP/Environmental Assessment (EA) analyzes the recommended management actions developed through the allotment evaluation process, subsequent IDT recommendations, public comments, and through coordination with the livestock permittee to aid in accomplishing allotment resource and RMP objectives and achieving all Standards and conforming to Guidelines.

C. Resource Objectives

The following management objectives are from the September 1992 Three Rivers RMP/Record of Decision (ROD)/Rangeland Program Summary.

The following objectives were written when the current Capehart Lake Allotment was still included as part of the East Wagontire Allotment:

1. Incorporate playa management objectives into allotment management as such objectives are developed.
2. Protect Special Status Species (SSS) or its habitat from impact by BLM-authorized actions.
3. Maintain or improve rangeland condition and productivity through a change in management practices and/or reduction in active use. (Note: Upon completion of Ecological Site Inventory on the Three Rivers Resource Area, ecological status objectives will be developed.)

The following are general RMP Goals/Objectives:

1. Utilize rangeland improvements, as needed, to support achievement of multiple-use management objectives for each allotment as shown in Appendix 9 of the RMP. Range improvements will be constrained by the Standard Procedures and Design Elements shown in Appendix 12 (GM 1.3, pg. 2-36) of the RMP.

2. Adjust overall grazing management practices as necessary to protect SSS and to maintain or enhance their habitat (SSS 2.1, pg. 2-57). Currently, sage-grouse, or their habitat, are known to exist within the allotment.
3. Implement a rotation or deferred grazing system on all allotments within big game ranges (WL1.2, pg. 2-66).

The Capehart Lake Allotment was separated from the East Wagontire Allotment in 1995; the following resource objectives recommended in the 2006 Capehart Lake Allotment Evaluation were modified, by the current IDT, to more accurately determine changes in rangeland health and habitat conditions.

1. Promote an upward trend in upland plant communities currently in poor condition and maintain those communities in good to excellent condition over the next 5 years in order to protect and enhance the integrity of the overall watershed functions. Trend would be measured by relative frequency of occurrence of key forb, shrub, and perennial grass species as compared with total ground cover.
2. Increase the availability and production of upland forbs or sage-grouse from May to mid-July during the next 5 years.
3. Cause an upward trend in the mid-seral stage big sagebrush/Idaho fescue/Thurber's needlegrass range sites in the Capehart Lake and Little Seeding Pasture over the next 5 years, while maintaining those areas in a late-seral stage.

D. Decision Factors

Decision Factors are additional questions or statements used by the decision maker to choose between alternatives that best meet project goals and resource objectives. These factors generally do not include satisfying legal mandates, including requirements under the National Environmental Policy Act (NEPA), which must occur under all alternatives. Rather, decision factors assess, for example, the comparative cost, applicability, or adaptability of the alternatives considered.

The following Decision Factors will be relied upon by the authorized officer in selecting a course of action from the range of alternatives fully analyzed that best achieves the goals and objectives of the AMP.

Would the alternative:

1. Employ adaptive management strategies in order to assure success in achieving project objectives?
2. Improve livestock distribution across the allotment and encourage more uniform utilization patterns?

3. Promote social and economic stability for the local and rural economy dependent upon public land grazing and public lands uses?
4. Provide rangeland resources to grazing permittees, and other users of the public land?
5. Promote resistance to noxious weed invasion and establishment by encouraging diverse, productive, vigorous plant communities?

E. Decision to be Made

The authorized officer will determine whether or not to construct range improvements within the allotment, modify the grazing system, and accept, reject, or accept with modifications the permittee's request to issue a new 10-year grazing permit.

F. Compliance with Land Use Plans

The Proposed Action and alternatives are in conformance with the Three Rivers RMP/ROD, dated September 1992, even though they are not specifically provided for, because they are clearly consistent with the RMP goals and objectives outlined above under Section C. Resource Objectives.

G. Consistency with Other Authorities

The Proposed Action has been designed to conform to the following documents, which direct and provide the framework for management of BLM lands within Burns District:

- Taylor Grazing Act (43 U.S.C. 315), 1934
- NEPA (42 U.S.C. 4321-4347), 1970
- Federal Land Policy and Management Act (43 U.S.C. 1701), 1976
- Public Rangelands Improvement Act (43 U.S.C. 1901), 1978
- August 12, 1997 Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the States of Oregon and Washington
- 1998 Burns District Noxious Weed Management Program EA OR-020-98-05
- Greater Sage-grouse and Sagebrush-steppe Ecosystems Management Guidelines (BLM-2000)
- BLM National Sage-grouse Habitat Conservation Strategy (2004)
- Greater Sage-grouse Conservation Assessment and Strategy for Oregon, April 2011
- State and local regulations and land use plans

H. Issues Considered But Not Analyzed Further

1. Wilderness characteristics (or values) will not be analyzed fully in detail in this EA for the following reasons:

The proposed project area, Capehart Lake Allotment lies within the Lonesome Lake citizens' Proposed Wilderness Study Area (PWSA) submitted in September 2007.

The BLM's 1980 wilderness inventory decision found wilderness character not present on BLM-administered lands in the current Capehart Lake Allotment. When the inventory was completed, the current Capehart Lake Allotment was still a part of the East Wagontire Allotment. When the Capehart Lake Allotment was formed there was no change to existing range improvements.

A Wilderness Inventory Management (WIM) assessment was completed, 2007 through 2009, by a BLM IDT that covered the Capehart Lake Allotment. The IDT used current field data along with the citizens' PWSA data and determined that there were no wilderness characteristics present in the project area.

The Capehart Lake Allotment lies within six WIM units: West Warm Springs #1 (13,249 acres), Bald Butte (23,645 acres), Dusenberry Lake (6,309 acres), Hole-in-the-Ground (16,774 acres), Murphy Lake (11,685 acres), and Silver Lake (4,967 acres). All the WIM units met the size criteria, except Silver Lake WIM unit. All the WIM units met the naturalness criteria, except West Warm Springs #1. None of the units met the criteria for outstanding opportunities for solitude or outstanding opportunities for recreation.

2. Greenhouse Gas Emissions and Climate Change will not be analyzed in this EA for the following reason:

Livestock grazing results in methane emissions as a result of ruminant digestion. Methane emission rates from cattle vary widely and depend on many variables (Johnson and Johnson 1995; DeRamus et al. 2003). Estimates for grazing cattle typically range from 80 to 101 kilograms of methane per year per animal (Environmental Protection Agency (EPA), 2009) or 6.7-9.2 kilograms of methane per month. This analysis will assume a methane emission rate of 8 kilograms of methane per AUM. Assuming that methane has a global warming potential 21 times carbon dioxide (EPA 2009, p. ES-3), each AUM results in 0.168 metric tons of carbon dioxide equivalent. Continuing to permit grazing use at the authorized level of 1,500 AUMs per year within the Capehart Lake Allotment would result in methane emissions of 252 metric tons of carbon dioxide equivalent per year. Current U.S. emissions of methane from livestock total approximately 139 million metric tons of carbon dioxide equivalent per year (EPA 2009, p. 6-2); current U.S. emission of all greenhouse gases total approximately 7 billion metric tons of carbon dioxide equivalent (EPA 2009, p. 2-4); current global emissions of all greenhouse gases total 25 billion metric tons of carbon dioxide equivalent (Denman et al. 2007, p. 513). This emission would represent 0.0001 percent of the annual U.S. methane emissions from livestock, and 0.000002 percent of the annual U.S. emissions of all greenhouse gases. Since there are no alternatives that would authorize more than 1,500 AUMs, the emissions from any alternative would be at or

below these numbers. Greenhouse gas emissions from the Proposed Action and alternatives would be so small as to be negligible. This emission would be so small that its incremental contribution to global and national emissions would not be measurable at the level of precision of the global and national emissions. This emission would be so small that it would not merit reporting under the EPA rule on mandatory reporting of greenhouse gases, which presents a reporting threshold of 25,000 metric tons of carbon dioxide equivalent for several industrial and agricultural sectors (40 CFR 98.2).

Livestock grazing can affect rangeland carbon 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 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 are redistributions of carbon, for example, from aboveground vegetation to root biomass (Derner and Schuman 2007). Overall, changes in rangeland carbon storage as a result of changes in grazing practices are likely to be small and difficult to predict, especially where a rangeland health assessment has determined that the Standards for Rangeland Health and Guidelines for Livestock Grazing Management are being met. Therefore, this analysis will assume that changes in grazing practices on this allotment would not result in any change in total carbon storage.

Changes in greenhouse gas levels affect global climate. (Forster et al. 2007 pp. 129-234), which is incorporated here by reference, reviewed scientific information on greenhouse gas emissions and climate change and concluded that human-caused increases in greenhouse gas emissions are extremely likely to have exerted a substantial warming effect on global climate. The U.S. Geological Survey (USGS), in a May 14, 2008 memorandum to the U.S. Fish and Wildlife Service (USFWS), summarized the latest science on greenhouse gas emissions and concluded that it is currently beyond the scope of existing science to identify a specific source of greenhouse gas emissions or sequestration and designate it as the cause of specific climate impacts at a specific location. That memorandum is incorporated here by reference.

CHAPTER II. ALTERNATIVES INCLUDING THE PROPOSED ACTION

Alternatives A through E have been fully analyzed in Chapter III of this AMP/EA. Following the public review period for this document a proposed decision will be issued by the Field Manager that may choose to proceed with any one of the alternatives analyzed or a combination of portions of each alternative.

A. Actions Common to All Alternatives

1. Adaptive Management and Flexibility:

Adaptive management is a system of management practices based on clearly identified outcomes and monitoring to determine if management actions are meeting desired outcomes; and, if not, facilitating management changes that would best ensure outcomes are met or reevaluated. Adaptive management recognizes that knowledge about natural resource systems is sometimes uncertain and, in this context, adaptive management affords an opportunity for improved understanding. Knowing uncertainties exist in managing for sustainable ecosystems, changes to the proposal may be authorized for reasons such as, but not limited to:

- a. adjusting the rotation/timing of grazing based on previous year's monitoring and current year's climatic conditions, not to exceed total permitted AUMs or 15 days outside of the permitted season of use.
- b. drought causing lack of available water in certain areas originally scheduled to be used.
- c. changes in use periods to balance utilization levels per pasture.

Flexibility in grazing management would be authorized and changes in rotations would continue to meet resource objectives. Flexibility is dependent upon the demonstrated stewardship and cooperation of the permittee. Rangeland monitoring is a key component of adaptive management. As monitoring indicates changes in grazing management are needed to meet resource objectives, they are implemented annually working with the permittee.

2. Monitoring

Monitoring by BLM staff, in coordination with the livestock operator, of the success in meeting allotment-specific resource objectives and achieving Standards would take place following implementation. Pace 180° methodology 1984 Technical Reference (TR) 4400-4 and permanent photo points would be used to measure the relative frequency of occurrence of key forbs, shrubs, and perennial grass species to assess trend in rangeland condition.

Soil Surface Factor methodology would be used to measure soil stability and Observed Apparent Trend would be assessed at each upland trend plot. Upland trend would be collected and analyzed at 5-year intervals.

Annual utilization studies for each pasture grazed by livestock, along with multiple-use supervision reports on the allotment, would be collected by BLM

staff. The Key Forage Plant method would be used to measure utilization in each pasture. Target utilization levels for key forage species are shown in Table 2.

Table 2: Key Species Target Utilization Levels

Pasture	Acres	Key Species	Utilization Target
Capehart Lake	17,014	Bluebunch wheatgrass/Idaho fescue	50%
Hiway Field	16,667	Bluebunch wheatgrass/Idaho fescue	50%
Little Seeding	2,814	Crested Wheatgrass	60%

During each allotment visit monitoring for noxious weed establishment would occur, as well as observations of overall rangeland condition. Adjustments to timing of grazing, pasture use, and sequence to ensure progress toward achieving Standards and to meet resource objectives may be implemented based on this annual data. Any disturbance areas created by construction of proposed range improvement projects would be monitored closely, for at least 3 years after construction, for noxious weeds. All information would aid in determining if projects and implemented management are sufficient to achieve Standards and meet objectives.

B. Alternative A: No Action

The No Action Alternative would renew the existing livestock grazing permit on Capehart Lake Allotment for the current grazing permittee. A 10-year Term Grazing Permit would be issued that would continue the current livestock grazing management. The season of use is shown in Table 3. Total Permitted/Active Use would remain at 1,500 AUMs on public land as shown in Table 3. The permit would be issued with the same terms and conditions as the expiring permit.

Table 3: Current Stocking Levels (AUM)

Season of Use	Permitted Active Use	Voluntary Nonuse	Total Permitted Use	Suspended Use	Exchange-of-Use	Total Use
04/01-09/30	1,500	0	1,500	0	0	1,500

Under the No Action Alternative no range improvement projects to improve upland conditions or livestock distribution would be implemented. Water hauling to existing waterholes would continue on years that water dries up or does not fill the dirt tanks.

Current grazing management would continue not to provide adequate growing season rest, with use in the Capehart Lake Pasture occurring in April and May and use in the Hiway Field Pasture during June, July, and August. The Little Seeding Pasture would continue to be deferred until after July 1 each year.

C. Alternative B: Proposed Action – Management Changes and Project Development

The Proposed Action was designed by a BLM IDT with representatives from all affected resources. The Proposed Action was developed to address Standards determined as not achieved, with livestock as a causal factor, in the 2006 Capehart Lake Allotment Evaluation. It was also designed to meet Capehart Lake Allotment resource objectives brought forth and revised from the evaluation.

To achieve Standards, meet resource objectives and conform to Guidelines, the proposed management actions are described in detail as follows:

1. Livestock Grazing Management

Livestock grazing management was designed and would be authorized to provide periodic growing season rest to upland forage plant species. Use periods per pasture may vary annually in order to provide for the recommended rest periods. Grazing management would be on a 2-year cycle as shown in Table 4: Proposed Livestock Grazing Management.

Livestock numbers may vary annually as outlined under Adaptive Management (CH II, A. Actions Common to All Alternatives); however, total permitted AUMs will not exceed 1,500.

Grazing management in the Capehart Lake Allotment would continue to be from April 1 through September 30. Grazing treatments within each pasture during the permitted season of use would provide adequate growing season rest in Capehart Lake and Hiway Field Pastures every other year. Refer to Maps C and D for proposed Grazing Schematics and Appendix A for Grazing Treatment Descriptions.

Table 4: Proposed Livestock Grazing Management

Even Years		Odd Years	
Pasture	Dates	Pasture	Dates
Capehart Lake	04/01-07/15	Capehart Lake	Rest
Hiway Field	Rest	Hiway Field	04/01-07/15
Little Seeding	07/15-09/30	Little Seeding	07/15-09/30

The Proposed Action includes deferred use in the Little Seeding Pasture each year. The Capehart Lake and Hiway Field Pastures would be rested every other year and used early/graze every other year. Livestock would be turned into either the Capehart Lake or Hiway Field Pasture (depending on if it is an odd or even year) from April 1 to July 15 then approximately 25 percent would go into the Little Seeding Pasture from July 15 to September 30 (the remaining 75 percent would be gathered onto private property).

Carrying capacity from the 2006 allotment evaluation was calculated at 1,873 AUMs for all demands (Actual Yield data 1999-2005). Permitted Active Use would remain at 1,500 AUMs for livestock. See Table 3 for recommended stocking levels.

2. Permit Renewal

The Proposed Action also includes the renewal of the existing livestock grazing permit in Capehart Lake Allotment for the current permittee. A 10-year term livestock grazing permit would be issued to graze livestock on public land. The new term permit would be issued with the same terms and conditions as the expiring permit along with all changes identified under the Proposed Action.

Table 5: Proposed Permit

Season of Use	Permitted Active Use	Voluntary Nonuse	Total Permitted Use	Suspended Use	Exchange-of-Use	Total Use
04/01-09/30	1,500	0	1,500	0	0	1,500

3. Proposed Range Improvements

Rangeland improvement activities would include well development, water storage tank and associated pipeline, and existing waterhole maintenance. See Map E for the location of existing range improvements and refer to Map F for the Proposed Action Range Improvements. Upon affirmative final decision of this Proposed Action, cooperative agreements between the Capehart Lake Allotment permittee and Burns District BLM may be completed to address each partner’s responsibilities for construction, maintenance, and/or supplies.

a. Well Development:

The proposed well development location is described as follows: T. 25 S., R. 27 E., Sections 30, 31, and 32 (exact location is dependent on location of water source). Associated pump, storage tank, pipeline, water troughs with float valves and overflow ponds would be included in project design, as needed. Well drilling would be for typical water development; the well would be cased and sealed to prevent

cave-ins and contamination, all State of Oregon water well drilling regulations would be adhered to, a safety device would be installed on any new power source(s) to prevent electrocution of raptors, and a metal storage tank may be placed at the well site (painted to blend in with the surrounding landscape), and the well would be fenced and protected from livestock trampling. Grazing management in service areas associated with this development would be controlled through well operation.

Cooperative agreements between the BLM and grazing permittee would be developed to fill associated storage devices (i.e., troughs, storage tanks, overflow ponds) after livestock are removed, to provide water for wildlife. Heavy equipment (i.e., drill rigs and trenchers) and manual labor would be used during construction of these developments. The well pad would be leveled for the drilling rig, water trough installation, and storage tank. The disturbed area would measure approximately 100 feet in diameter.

Constructing new service roads would be required to access a proposed well site. Construction would be to allow the well rig and any well construction vehicles access to the site as well as use for future maintenance of the well. Road construction would be no more than 3 miles long in order to reach the well site from the existing road.

Construction would be the minimum necessary; this would include blading, with no crowning and removing any large rocks as needed to allow passage of vehicles. During pipeline installation, a ripper tooth mounted to a dozer would be used to trench up to 36 inches deep into the soil. Windmills, solar power, fuel type generators, or any combination of these would be used to power the pump for the well. The required design for the proper function of the water supply would vary to accommodate the associated storage tank(s) (1-2), capacity, number of water troughs (2-4), and size of outlet overflow ponds.

b. Coyote Butte Storage Tank and associated pipeline:

Water would be diverted from Bone Lake private well, located at T. 24 S., R. 26 E., Section 36, and piped southeast in Capehart Lake Pasture for approximately 1.75 miles to Coyote Butte where a storage tank would be placed. A pipeline would run from the above ground storage tank for approximately 1.5 miles and carry water to two 1,500 gallon aluminum livestock water troughs. Site location of the pipeline, storage tank, and troughs would be approximately T. 25 S., R. 27 E., Sections 5, 6, 7, 8, and 18 and T. 24 S., R. 27 E., Section 31. Construction would be as described above under 3.a. Well Development.

c. Waterhole Maintenance:

There are nine existing waterholes or dugouts documented in the Burns District Geographical Information System (GIS) database coverage as existing range improvements in the allotment. The Proposed Action

includes maintaining these water sources by cleaning or reconstructing them using heavy equipment. Bentonite would also be added to leaking waterholes. Burns District BLM and the grazing permittee would maintain these water sources. A cost share may be used for waterholes needing bentonite; BLM would purchase the bentonite and the permittee would apply it if a cost share was applied.

4. General Project Design Elements for Proposed Range Improvements
 - a. Proposed rangeland improvement sites would be surveyed for cultural values prior to implementation. If cultural resources are found, historic property documentation and evaluation would be completed. National Register eligible archaeological sites would be avoided and, if avoidance is not possible, mitigation plans would be developed in consultation with the State Historic Preservation Office if necessary. Mitigation measure can include protective fencing, surface collection and mapping of artifacts, subsurface testing and complete data recovery (full-scale excavation).
 - b. Proposed range improvement sites would be surveyed for Special Status plant species prior to implementation. If present, Special Status plant sites would be avoided.
 - c. No range improvement project sites would be constructed within 1.25-mile of known sage-grouse lek sites.
 - d. Proposed range improvement sites would be surveyed for noxious weed populations prior to implementation. Weed populations identified in or adjacent to the proposed projects would be treated using the most appropriate methods in accordance with the Burns District Noxious Weed Management Program EA/Decision Record (DR) OR-020-98-05.
 - e. The risk of noxious weed introduction would be minimized by ensuring all equipment (including all machinery, 4-wheelers, and vehicles) are cleaned prior to entry to the sites, minimizing disturbance activities, and completing follow-up monitoring (for at least 3 years after project construction), to ensure no new noxious weed establishment. Should noxious weeds be found, appropriate control treatments would be performed in conformance with the Burns District Noxious Weed Program Management EA/DR OR-020-98-05.
 - f. All watering troughs installed would be equipped with escape ramps for birds and small mammals.
 - g. Reseeding would take place in areas disturbed by implementation of range improvement projects. Soil displaced for pipeline installation would be pulled in and returned to original slope and grade then seeded with a

whirly bird seeder and drag. The seed mix used for these range improvement projects would be a mixture of native and nonnative seeds including, but not limited to: crested wheatgrass, bluebunch wheatgrass, squirreltail, and native forbs. Crested wheatgrass would be used in the seed mix because it is drought tolerant, competitive with invasive species, has a long seed viability period, and aggressive germination characteristics, therefore reducing the chance of noxious weed establishment.

- h. One to two-inch diameter plastic pipe is generally used for pipelines. The pipeline is buried with a pipe-laying device consisting of a modified ripper tooth mounted on a tractor. The pipe is generally laid as deeply as possible under the ground, but no deeper than 36 inches. Where obstructions (e.g., rock) prohibit burying, the pipe would be laid on the surface and covered with borrowed soil.

D. Alternative C: Proposed Action with No Range Improvements

This alternative would follow the Proposed Action, but would remove the construction of any range improvement projects. Under this alternative, the grazing management and permit renewal outlined in the Proposed Action would still occur, as would the maintenance of the nine existing waterholes. See Map E for the locations of the waterholes to be maintained under this alternative.

E. Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

Livestock grazing would no longer occur in the Capehart Lake and Hiway Field Pastures of the Capehart Lake Allotment under this alternative. This alternative would result in an approximate 70 percent reduction in permitted active grazing use AUMs authorized under permit #3602854. An estimated 450 AUMs of active use would remain in the Little Seeding Pasture, which would follow the grazing schedule outlined in the Proposed Action. No additional range improvement projects would be proposed under this alternative. Maintenance or improvement of existing range improvements and water sources within the Capehart Lake and Hiway Field Pastures of this allotment would occur as needed only to achieve resource objectives other than livestock management, as funding is available. Perimeter fences would be maintained by the grazing permittee adjacent to these pastures, or adjacent private landowners. According to the Code of Federal Regulations (CFR), published in August 1995 Subchapter D – Range Management (4000) Subpart 4100 -4110.3-3, Implementing Reductions in Permitted Use, the BLM would implement changes in active use after consultation, cooperation, and coordination with the affected permittee and through a documented agreement or by decision of the authorized officer. “When the authorized officer determines that the soil, vegetation, or other resources on the public lands require immediate protection because

of conditions such as drought, fire, flood, or insect infestation, or when continued grazing use poses significant risk of resource damage, after consultation with, or a reasonable attempt to consult with, affected permittees...the authorized officer shall close allotments or portions of allotments to grazing by any kind of livestock or modify authorized grazing use...”.

F. Alternatives Considered but Eliminated from Further Analysis

1. Conversion of Livestock Type and Removal of Fences

This alternative would convert the current livestock grazing permits from cattle to domestic sheep. Because sheep utilization is intensively managed by a herder, the internal allotment fences could be removed. This type of livestock use would intensively manage utilization levels and timing of use, therefore, improving rangeland condition. However, this alternative was eliminated from detailed analysis for the following reasons:

- a. Dietary overlap with greater sage-grouse – Capehart Lake Allotment contains extensive tracts of Wyoming big sagebrush plant communities which provide critical habitat for greater sage-grouse, an SSS. Rangeland Health Standard #5 focuses on retaining and restoring native plant and animal species, populations and communities (including SSS and species of local importance). To achieve this Standard, the 2006 Capehart Lake Allotment Evaluation stipulated a management objective to: “Increase the availability and production of upland forbs or sage-grouse from May to mid-July during the next 5 years.”

Research has shown cattle and sheep prefer to graze different plant species. Typically, cattle prefer to graze grass species, whereas sheep exhibit a preference for forbs (Blaisdell et al. 1982). Over time, sheep grazing can shift ranges toward grass dominance, whereas cattle grazing promotes increased forb composition (Beck and Mitchell 2000). Switching to domestic sheep grazing would likely decrease availability of perennial forbs to sage-grouse. Additionally, during fall and winter, sheep diets increase in browse, further exacerbating forage competition with sage-grouse. This would be contrary to allotment-specific objectives and would hinder achievement of the Standard for SSS. When the RMP was written the Capehart Lake Allotment was included in the East Wagonfire Allotment. Objectives for the allotment included protecting SSS or its habitat from impact by BLM-authorized actions.

- b. No demand for domestic sheep grazing – Capehart Lake Allotment has historically been a cattle grazing allotment. The permittee who holds the grazing permit on the allotment operates a ranch, which has been producing cattle for multiple generations. The infrastructure of this ranch (i.e., handling facilities, winter range, winter feed, and employees) is

designed for cattle production. Converting from cattle to a sheep business would require a complete change of their facilities including, but not limited to, rebuilding chutes, corrals, and fences and building lambing sheds. A change in management would also likely occur with hiring of shepherders, as experience varies between shepherders and wranglers; predator control would also need to occur. Considerable costs would be involved in making the above changes; therefore, this alternative is economically infeasible. There has been no demand by the affected permittee to switch to sheep production on this allotment nor has it been raised as an issue.

Based on the above rationale, this alternative was not analyzed in detail.

2. Herding Livestock, Removal of Internal Fences, with Range Improvements.

This alternative would remove the fence separating the Capehart Lake Pasture and the Hiway Field Pastures. All other fences would not be removed since they are not adjacent to any other pastures in this allotment. The permittee would attempt to herd cows under the same grazing rotation as the Proposed Action. This alternative was eliminated from detailed analysis for the following reasons:

- a. While fence removal would decrease the risk of entanglement of large animals and flying birds, the level of disturbance would be increased from herding activities. Disturbance to wildlife such as pronghorn antelope and mule deer would be frequent enough for animals to avoid the area during scheduled grazing. Disturbance to sage-grouse that may be nesting or foraging, and to ground nesting species and species nesting in low shrubs, would increase relative to other allotments.
- b. New trails would be formed where larger and tighter groups of cattle would be travelling when being herded which would have slightly greater impacts on soil compaction than adjacent areas and to some degree increase Biological Soil Crust (BSC) disturbance.
- c. While herding is a simple idea much is needed to successfully implement cattle herding as a livestock management strategy. In these two pastures one or two riders would have to work this area every day. It takes several years for cattle to get used to changes in management. Problems that often occur during this learning period include; small groups of cattle that get separated from the main bunches and end up spending long periods of time near water sources, bottlenecks of cattle use in one area, placement of cattle in areas where it is difficult to get them to stay, figuring out the good and poor cattle locations, and lost cattle. This puts stress on the cattle which results in reduced performance.

Combining strategic supplement placement with herding has shown synergistic benefits (Bailey 2004). Monitoring of intensive herding management in Idaho found that the program was successful when the herder showed a consistent daily presence on the allotment (Butler 2000). If the herder missed just one day, the cows became unsettled and often refused to be herded.

- d. This alternative would cost the permittee approximately \$10,600 each year to hire a rider to herd livestock each day livestock are in the Capehart Lake/Hiway Field Pastures of Capehart Lake Allotment (106 days @ \$100/day). If this alternative were unsuccessful, it would cost approximately \$52,000 to reconstruct the 6.5 miles of fence removed.

Based on the above rationale, this alternative was not analyzed in detail.

CHAPTER III. DESCRIPTION OF AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

An IDT has reviewed and identified issues and resources affected by the alternatives, the results are summarized in Table 6. Affected resources are in bold.

This environmental consequences section presents the potential changes to the environment resulting from implementation of the alternatives. This chapter describes all expected effects including direct, indirect, and cumulative on resources from enacting the proposed alternatives.

Direct and indirect effects plus past actions become part of the cumulative effects analysis; therefore, use of these words may not appear. The Reasonably Foreseeable Future Actions (RFFAs) for this site are continued livestock grazing, weed treatments, road maintenance, and recreation activities; these are also relevant to cumulative effects and are discussed under each resource as applicable.

Table 6: Resources/Issues

Resource/Issue	Status	If Not Affected, why? If Affected, Reference Applicable EA Section
Areas of Critical Environmental Concern (ACECs)	Not Present	There are no ACECs within this allotment.
Air Quality (Clean Air Act)	Not Affected	Dust produced from livestock movement, project construction, and vehicle use would not be measurable.
American Indian Traditional Practices	Not Present	No concerns have been disclosed.
Cultural Resources	Affected	See Chapter III

Environmental Justice (Executive Order 12898)	Not Affected	The Proposed Action and alternatives would not expect to have disproportionately high and adverse human health or environmental effects on minority populations and low income populations as such populations do not exist within the project area.	
Farmlands (prime or unique)	Not Present	No concerns have been disclosed.	
Fisheries	Not Present	There are no fish bearing streams within this allotment.	
Flood Plains (Executive Order 13112)	Not Present	No occupancy or modifications of flood plains, no risk of flood loss.	
Grazing Management	Affected	See Chapter III	
Hazardous or Solid Waste	Not Present	No concerns have been disclosed.	
Migratory Bird Treaty Act (Executive Order 13186)	Affected	See Chapter III	
Noxious Weeds	Affected	See Chapter III	
Paleontological Resources	Not Present	It is not likely any alternative would have an affect beyond what has occurred in the past.	
Recreation/Visual Resources	Affected	See Chapter III	
Social and Economic Values	Affected	See Chapter III	
Soils/Biological Crusts	Affected	See Chapter III	
SSS and Habitat	Fish	Not Present	No fish-bearing streams are present in the allotment.
	Wildlife	Affected	See Chapter III <i>Greater sage-grouse-nesting and brood rearing habitat</i> <i>Pygmy Rabbit – habitat</i>
	Plants	Affected	See Chapter III <i>Raven’s lomatium</i> <i>Cymopterus nivali</i>
Upland Vegetation	Affected	See Chapter III	
Wildlife/T&E Species	Fish	Not Present	No fish-bearing streams or tributaries to streams which support populations of T&E fish species are present on the allotment.
	Wildlife	Not Present	No Federal T&E animal species or critical habitat are known or suspected to occur in the allotment.

	Plants	Not Present	No Federal T&E plant species are known or suspected to occur in the allotment.
Water Quality (Surface and Ground)	Not Affected		No perennial streams or springs are present on the allotment.
Wetlands/Riparian Zones (Executive Order 11990)	Not Present		
Wild and Scenic Rivers	Not Present		
Wilderness/WSAs/Wilderness Characteristics	Not Present		No Wilderness or WSAs are present. See Chapter I, Part E, for a description regarding wilderness characteristics
Wildlife/Locally Important Species and Habitat	Affected		See Chapter III

A. Resources

1. Cultural Resources

Affected Environment

The allotment has a number of relatively large, ephemeral playa lakes within its boundaries. Archaeological sites are often associated with these playas and reflect the playas' resource offerings at times past. At various times over the last 13,000 years, these playas have contained water with associated marshland and faunal resources.

Over 467 acres of cultural resources inventory have occurred within Capehart Lake Allotment. Inventories have been completed for waterhole developments, fencelines and wildfire rehabilitation. This acreage is only about 1 percent of the allotment acreage.

A total of nine archaeological sites have been recorded in the Capehart Lake Allotment. They range from simple scatters of stone waste flakes to more complex prehistoric sites in dunes associated with playa lakes. Potential for finding National Register eligible prehistoric sites in this allotment is high.

Seventy eight percent of the sites (7 of 9) have been impacted by livestock grazing, according to observations in site records. Additional impacts listed at sites include Off-Highway Vehicle (OHV) damage, utility work, erosion, rodent burrowing and dispersed camping.

No paleontological localities or American Indian Traditional Practice areas are known to occur within the allotment.

The Capehart Lake Allotment has been grazed by sheep, cattle, and wild horses for up to 130 years. In former times, prior to the Taylor Grazing Act of 1935, grazing on public lands was essentially uncontrolled. After the Taylor Grazing Act, the allotments were tied to base property, essentially shutting out the former grazers without property and reducing the number of livestock on public lands. This situation exerted some control over grazing on public lands which continued to be the responsibility of the Grazing Service. Under the Grazing Service and then under the new BLM in 1946, the number of grazing managers was very low, the number of grazers was high and the pattern of grazing was undoubtedly more intense than today. Even as late as the early 1960s, grazing levels were considerably higher than today because the grazing management infrastructure and various land management acts and regulations had not been developed to the degree we have today. Cultural resources sites were affected more intensely and to a greater depth in the past than under the more refined, controlled grazing management practices of today.

Based on field observations by BLM cultural resource staff over the last 16 years, the estimated average grazing effects on cultural resource sites has occurred in the top 12 inches of sediment. These effects are seen as plant pedestalling, hoof shear and surface scuffing. The deepest disturbance is seen in congregation areas where concentrated hoof shear is most common. Generalized grazing, where light hoof shear and scuffing are the most common effects, has produced light (2 inches) to moderate (6 inches) damage. The logical conclusion leading from these observations is that most sites have sustained a certain amount of grazing effects over the years. What we see outside of congregation areas, is actually effects to previously disturbed portions of sites. As a result, current grazing practices have little effect on cultural resource sites except when sites fall within congregation areas.

Observation and geomorphological factors lead to the conclusion that congregation areas (either current or future) are the only location of on-going livestock grazing effects to cultural resource sites. The reoccurring cycle of ground disturbance, absence of vegetation cover along with water and wind erosion leads to continued loss of sediment. Cultural materials anywhere within the top 12 inches of the sediment column would eventually be exposed to surface trampling. When cultural materials are exposed to surface trampling, site integrity would be reduce.

New methods of spreading grazing impacts more evenly over the allotment are not likely to increase the effects on cultural resources except where new congregation areas could arise. New congregation areas could arise from new water pipelines feeding new water troughs. It is in these areas around new water troughs that new effects (particularly hoof shear) to cultural resources can be seen.

Environmental Consequences

Effects Common to All Alternatives

For the purposes of this analysis, the Cumulative Effects Analysis Area (CEAA) for cultural resources is at the allotment scale. All Action Alternatives and other ongoing and RFFAs would not lead to cumulative effects to cultural resources because proposed projects would be localized and the sites would be completely avoided. Potential direct and cumulative effects to cultural resources would be mitigated through project-specific cultural resource inventory and project design features prior to any project implementation.

Generalized grazing effects by livestock, except in congregation areas, are not measurable under each alternative.

Alternative A: No Action

Under the No Action Alternative, cultural resources would not be affected, except when they are located within existing congregation areas.

Alternative B: Proposed Action

Under the Proposed Action Alternative, cultural resources would not be affected by generalized grazing except in existing and new congregation areas that would arise near proposed livestock watering trough locations.

Well development, new pipeline and associated water troughs are the projects in the Proposed Action that would create new congregation areas where existing or undiscovered cultural resources would be affected by livestock (primarily hoof shear). All range developments would be inventoried prior to construction and the best method to minimize or eliminate effects to nearby cultural resources would be employed.

Reservoir clean-outs per se would not affect cultural resources as long as the operator stays within the reservoir or dugout footprint. However, livestock reservoirs are routinely located within ephemeral lakes, many of which contain archaeological sites on their perimeters. Livestock tend to use the ephemeral lake edges for resting in big sagebrush. Sites can be subjected to scuffing, hoof shear and wallowing at these locations. Any National Register eligible sites found in these locations would be protected from further trampling effects by either excluding the ephemeral lake from livestock except at water gaps or taking the reservoirs out of commission by filling them with sediment.

Alternative C: Proposed Action with No New Range Improvements

The effects of generalized grazing to cultural resources under Alternative C would be negligible as under the No Action Alternative. Livestock water reservoirs

would be maintained under Alternative C and the effects would be the same as described under Alternative B.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

Under Alternative D cultural resources would not be affected by grazing effects except in existing congregation areas in Little Seeding Pasture. Grazing effects at existing congregation areas in the Capehart Lake and Hiway Field Pastures would cease. No new congregation areas would be created in the allotment resulting in no new grazing effects in the allotment.

2. Grazing Management

Affected Environment

One livestock grazing permit exists in this allotment. The permitted active use is for 250 cattle from April 1 through September 30, which is equivalent of 1,500 AUMs. Cattle numbers can fluctuate annually as long as the 1,500 AUMs of active use are not exceeded. This allotment is intermixed with approximately 3 percent private land within the BLM-managed pastures. Calculated carrying capacity on public land is 1,873 AUMs (calculated in the 2006 allotment evaluation) of forage available for livestock. Recommendation in the Capehart Lake Allotment Evaluation was to allocate 5 AUMs for deer and 5 AUMs for antelope and may be considered in an RMP revision. This data can be found in the Capehart Lake Allotment file, evaluation section. These numbers were based upon calculations completed in 2006 from data collected between 1999 and 2006.

The grazing system stated in the 1995 AMP has never been followed in the Capehart Lake and Hiway Field Pastures since the fence was built in 1999, due to lack of water in both pastures. These two pastures have not received adequate growing season rest during the evaluation period. The majority of use in the Capehart Lake Pasture has occurred from as early as March 23 to as late as June 10. Hiway Field Pasture has been grazed from as early as June 1 to as late as October 20. There has only been 1-year since 1999 that use occurred after June 15.

This allotment has received few years of adequate growing season rest before and after this allotment was split from East Wagontire Allotment in 1995. Past and current grazing practices have affected key perennial grass species in Hiway Field and Capehart Lake Pastures. Little Seeding Pasture is being provided with deferred grazing and is meeting the requirements of providing adequate cover for infiltration, moisture storage, and maintaining plant communities.

Livestock continues to be a causal factor in the following two standards for rangeland health not being achieved in the Capehart Lake and Hiway Field

Pastures due to the lack of growing season rest: Standard 1: Watershed Function and Standard 5: Native, T&E, and Locally Important Species. The existing water sources in these pastures normally do not last throughout the summer, and heavier use occurs in these congregation areas with areas further from water receiving less use. Due to few water sources within the Capehart Lake and Hiway Field Pastures, which do not last the entire summer, grazing management has not been deferred therefore, the pastures have not received adequate growing season rest from livestock grazing.

Environmental Consequences

Effects Common to All Alternatives

For the purpose of this analysis, the CEAA for livestock grazing management consists of the allotment. Past and present actions, such as those described in Affected Environment, have influenced the existing environment within the CEAA. RFFAs in the CEAA that may contribute to cumulative effects to livestock grazing management include wildlife use, hunting and other recreational pursuits, and noxious weed treatments.

Alternatives analyzed in this document may incrementally affect livestock grazing management by providing more reliable water sources, improving utilization and distribution patterns. The Proposed Action, Alternatives C and E would likely contribute to cumulative effects to livestock grazing management, due to improved livestock distribution throughout the allotment. The No Action Alternative and Alternative D would not have cumulative effects to livestock grazing management.

Alternative A: No Action

Livestock grazing management would remain the same as current management with little flexibility to season of use in the Capehart Lake and Hiway Field Pastures. The two Standards not achieved for Capehart Lake and Hiway Field Pastures would remain unachieved. Capehart Lake and Hiway Field Pastures would continue to be grazed during the growing season with periods of growing season rest being infrequent. Upland condition would remain stable to upward across most of the allotment, but with the potential of conditions moving toward downward trend in Capehart Lake and Hiway Field Pastures.

No range improvement projects would be implemented that may aid in improved livestock distribution and more uniform utilization patterns. Graze and deferred-grazing treatments in Capehart Lake and Hiway Field Pastures would be dependent on how long the existing waterholes could hold water. Many years most water dries up by July or August, and some years there is no water in the dirt tanks at the beginning of the grazing season. Water hauling to existing waterholes is common to this allotment and would continue, which would not improve

distribution in the allotment. Upland conditions would remain static while continuing current management without additional range improvements.

Alternative B: Proposed Action

Effects of the Proposed Action would be centered on improved livestock grazing management. Under this action, grazing management would be adjusted to achieve Standards and conform to Guidelines by periodically providing critical growing season rest to key forage plants from livestock grazing in each pasture. With the proposed grazing management, upland health would be invigorated with native plant communities that have enhanced weed resistance due to their vigor and productivity. Capehart Lake and Hiway Field Pastures would receive growing season rest from livestock grazing every other year and the Little Seeding Pasture would be deferred every year.

Proposed water developments would relieve pressure on existing water sources and improve livestock distribution to provide more uniform utilization patterns. By developing these additional water sources, livestock use would be distributed more evenly across the allotment and may reduce the amount of forage competition occurring now due to limited watering sources.

Implementation of the proposed grazing management, and water developments would perpetuate healthy rangelands. Overall, changing grazing management and minimizing livestock congregation and trailing to water, would improve watershed stability and function. With improved range conditions, viable livestock grazing activities and management would be maintained for the future.

Alternative C: Proposed Action with No New Range Improvements

Proposed grazing management is the same as under the Proposed Action; however, the effects may not be the same. By not constructing any new range improvements, water within the allotment would continue to be unreliable and the proposed treatments within the allotment would not always be possible. Livestock would continue to utilize areas within 1 to 2 miles of reliable water more than other areas in the allotment; livestock distribution and utilization patterns would not be improved under this alternative. This alternative would allow conformance to Guidelines by providing periodic growing season rest to all pastures. Water availability in this allotment would not be improved; therefore, livestock distribution would not be improved.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

Under the Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures Alternative, the current livestock grazing permit would be reduced by 70 percent. The BLM would implement changes in active use after consultation,

cooperation, and coordination with the affected permittees and through a documented agreement or by decision of the authorized officer. When the authorized officer determines soil, vegetation, or other resources on public lands require immediate protection because of conditions such as drought, fire, flood, or insect infestation, or when continued grazing use poses a significant risk of resource damage, after consultation with, or a reasonable attempt to consult with, affected permittees by any kind of livestock or modify authorized grazing use (CFR Subchapter D (4000) Subpart 4110.3-3, 1995).

Under this alternative, no additional range improvements would be completed unless deemed necessary for management to move toward achieving Standards. Existing range improvements (i.e., internal pasture fences) in place for livestock grazing management would most likely fail with BLM responsible for their maintenance due to lack of funding for such activities.

3. Migratory Birds

Affected Environment

Migratory bird species are known to use the allotment for nesting, foraging, and resting as they pass through on their yearly migrations; however, no formal monitoring for migratory birds has been conducted. A Breeding Bird Survey route runs through similar habitat along the highway between the Little Seeding and Hiway Field Pastures, and documented 68 species. Most species are present in the area only during the spring and fall migration and summer nesting season, although some species, such as rough-legged hawk (*Buteo lagopus*), move into the area in the winter. Common species observed or expected to occur in the allotment include western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), and mourning dove (*Zenaida macroura*). Raptors potentially nesting in the sparse juniper within the allotment and adjacent areas include Swainson's hawk (*Buteo swainsoni*), and red-tailed hawk (*Buteo jamaicensis*). A nest platform was installed on a transmission tower, and golden eagles (*Aquila chrysaetos*) have occupied it over the last decade. Several Birds of Conservation Concern for the Great Basin Region inhabit the allotment and adjacent areas, including Brewer's sparrow (*Spizella brewerii*), sage sparrow (*Amphispiza belli*), loggerhead shrike (*Lanius ludovicianus*), western burrowing owl (*Athene cunicularia*), and ferruginous hawk (*Buteo regalis*) (USFWS 2008).

All habitat types in the allotment are used for nesting, foraging, and resting as they pass through on their yearly migrations. The allotment only receives around 9 to 11 inches of precipitation annually, and is dominated by open sagebrush steppe habitat. Brewer's sparrow, sage thrasher, and sage sparrow tend to be found in sagebrush-shrubland habitats, and occur in all pastures in the allotment (Reynolds 1981). Little Seeding Pasture contains a few small draws with juniper that may provide nesting habitat for American kestrels (*Falco sparverius*), northern flickers (*Colaptes auratus*), and other tree nesting species. Seven playas

in the Hiway Field and Capehart Lake Pastures contain waterholes dug into the low points, to extend the dates that open water is available during the summer. Six of the waterholes are in the Hiway Field Pasture or the west side of Capehart Lake Pasture, and these areas receive higher utilization than the east side of Capehart Lake Pasture. The smaller Little Seeding Pasture has two waterholes, one in the northwest corner and one in the southwest corner, which both hold water later into the season.

Since 1999, six areas within the Hiway and Capehart Lake Pastures were mowed to stimulate the understory herbaceous plants and increase the vigor of the sagebrush plants. The mowed areas ranged in size from 34 to 380 acres, for a total of 985 acres (2.7 percent) of the allotment. Restoration efforts initially increased the amount of grassland habitat in the area, but sagebrush seedlings have been observed growing in some of the interspaces in the mowed areas. An additional 120 acres was mowed along some of the roads to acts as a fuel break. Wildfires in 2001 and 2002 burned a total of 440 acres (1.2 percent) of the Capehart Lake Pasture.

Other past actions and facilities potentially affecting migratory birds or their habitat are road, fence, and transmission line construction. All of the roads in the allotment are natural surface roads with slow, infrequent traffic, and effects to migratory birds would be limited to birds flushing from the area as vehicles pass rather than collisions. There are 39 miles of road within the allotment for a ratio of less than 1-mile of road per square mile. Fences provide hunting and singing perches for migratory birds, but can also cause mortality to flying birds (Allen and Ramirez 1990). The ratio of 0.84-mile of fence per square mile in the allotment is low relative to other areas (Connelly et al. 2004). A large transmission line runs northeast to southwest across almost 6 miles of the southeast corner of the Capehart Lake Pasture, and may influence habitat for migratory birds in the area, especially for raptors that utilize towers for nesting and hunting. A Right-of-Way (ROW) for wind testing overlaps about 40 percent (1,115 acres) of the Little Seeding Pasture, but no wind testing or tower construction has been authorized in the pasture.

Environmental Consequences

Effects Common to All Alternatives

For the purpose of this analysis, the CEAA for migratory birds extends up to 10 miles beyond the allotment boundary to encompass regular movements of some wider ranging migratory birds, such as ferruginous hawk, that may be using the allotment. Vegetation communities present in the allotment are fairly representative of those across the CEAA. Past and present actions and events, such as those described in Affected Environment, have also influenced the existing environment in the CEAA. Sixty-three miles of power lines transect the CEAA, providing numerous structures for nesting and hunting for raptors that

may forage in the allotment. The BLM-managed land in the CEAA is relatively undisturbed as far as treatments, with sagebrush mowing (<0.02 percent of CEAA) and prescribed fire (<0.0005 percent of CEAA) accounting for less than 2 percent of the entire area. The effects of these two treatments diminish over time as herbaceous vegetation and shrubs recover. The Wagontire wind testing ROW encompasses 13,300 acres of the CEAA, and two METs (meteorological tower) were installed in the ROW at 2.3 and 3.2 miles from the northwest corner of the Little Seeding Pasture. These towers are too distant and too small to have a measurable influence on birds within the allotment.

RFFAs in the CEAA that may contribute to cumulative effects to migratory birds and habitat include livestock grazing, game hunting, and other recreational pursuits. Alternatives analyzed in this document may incrementally affect migratory birds through disturbance and temporary reductions of herbaceous and shrub plant cover. Direct disturbance from livestock grazing would be limited to the period when cattle occupy the allotment. The alternatives analyzed would not likely contribute to detectable cumulative effects to migratory birds, because loss of vegetative structure and cover to livestock grazing would be temporary (lasting until vegetation regrows seasonally), managed to maintain adequate forage and cover for birds, and not lead to irreversible loss or alteration of habitat.

Alternative A: No Action

There would be no disturbance to migratory birds from construction of range improvements. Lack of reliable late season water sources would continue to limit grazing flexibility in the rotation. If the current grazing schedule is maintained, range condition within Capehart Lake Pasture, and especially the Hiway Field Pasture, would continue to deteriorate due to lack of adequate growing season rest. Native herbaceous grasses and forbs would continue to decrease in frequency and cover, reducing the amount of forage for birds and their prey. Suitable habitat for ground nesting species would decrease, displacing species like the western meadowlark or leaving nests and young at higher risk from predation due to the decreased screening cover. Although noxious weeds do not appear to affect many acres (<20), continuous lack of growing season rest would weaken the native plant communities over time, increase bare ground and facilitate weed spread. As native plant cover declines, cheatgrass cover would increase, elevating the risk of wildfire and subsequent loss of Wyoming big sagebrush vegetation. Loss of sagebrush would displace many species from the allotment, including several USFWS Birds of Conservation Concern, such as Brewer's sparrow, sage sparrow and sage thrasher.

Alternative B: Proposed Action

The construction of reliable late season water sources would reduce livestock concentration at some areas within the allotment, and provide for more flexibility in the timing and rotation of livestock grazing in the Capehart Lake and Hiway

Field Pastures. Little Seeding Pasture would continue to be deferred until mid-July each year when most herbaceous plants have cured. The proposed schedule would allow for maximum potential growth of herbaceous vegetation and retention of residual ground cover on at least 53 percent of the allotment annually. No disturbance associated with livestock grazing would occur on at least 46 percent of the allotment annually. This grazing schedule would help maintain and improve foraging and nesting habitat quality for migratory birds by providing areas undisturbed by livestock, increasing the available forb and grass cover for birds and their insect prey. Cleaning out and refurbishing existing water sources would extend the availability of open water later into the summer, reducing the time birds spend traveling to and from water and decreasing the risk of predation.

Construction activity associated with range improvements may cause migratory birds to temporarily avoid or alter use near the construction sites. Work associated with all range improvements would occur during the day and be completed in less than a month. Migratory bird species are highly mobile and would avoid the construction activity. The distance from the construction activity at which a bird flushes varies greatly, and is dependent on several factors such as the size of the bird, condition of the bird, the type of activity, frequency of the activity, available habitat in the area (Ruddock and Whitfield 2007, Fernandez-Juricic et al. 2002). The disturbance effect decreases as the distance from the activity increases, and most birds in the allotment would not be measurably affected at distances beyond one-half mile.

The total ground disturbance from range improvements would be less than 1 percent of the allotment, and occur in sagebrush-grassland communities. Drilling a well and installing pipelines to distribute the water would directly affect less than 2 acres. The length of the proposed spur road accessing the well could be up to 2 miles long depending on the location of the well. The spur road would extend from the existing road through sagebrush-grassland vegetation, and up to 4 acres of vegetation would need to be cleared during construction. The road would be natural surface, and travel would be infrequent (similar to existing roads) following completion of construction. Ground disturbance also facilitates noxious weed establishment and spread, which decreases the habitat quality for sage-grouse (Hagen 2011) and pygmy rabbits. Monitoring and treatment of noxious weeds at these disturbed sites, in accordance with the District weed control strategy, would minimize the likelihood of spread.

The Proposed Action is designed to sustain and stimulate rangeland vegetation, promote better livestock distribution, improve water availability and provide more flexibility in timing of use. All these factors would improve habitat quality for migratory birds, while reducing conflicts/disturbances associated with livestock grazing.

Alternative C: Proposed Action with No New Range Improvements

The effects of this alternative would be essentially the same as Alternative A, because the lack of reliable water in the large pastures, especially Capehart Lake Pasture, does not allow for the proposed rotation under Alternative B in most years, due to arid conditions.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

The effects would be the same as the other alternatives for Little Seeding Pasture, but all disturbance associated with livestock grazing management would be eliminated in Capehart Lake and Hiway Field Pastures. Ground nesting species, such as horned lark, or species that nest in shrubs such as sage sparrow, would benefit the most as the potential for nest destruction by livestock would be eliminated, especially in Capehart Lake Pasture where livestock turn out currently overlaps more of the nesting season.

Herbaceous plant cover, especially grasses, would increase and be maintained throughout the nesting season within the first growing season without livestock grazing. This increase would provide more horizontal and vertical nesting and hiding cover for migratory birds and their young, which would potentially increase the survival and productivity of birds in these two pastures. Foraging opportunities would also improve as more seed is available. The increase in live and residual vegetative cover would also provide more habitat for insects, important food items for many adult birds and almost all nestlings and young birds. Approximately 9 miles of interior fences would not be maintained or would be removed, which would eliminate some singing or hunting perches, but would also reduce the risk of a collision to flying birds.

Over the long term, buildup of residual vegetation may increase the potential for a hotter, more severe wildfire occurring in the allotment. If a wildfire were to occur, the litter buildup may lead to higher mortality of perennial plants and facilitate the rapid spread of cheatgrass already present in the allotment (Davies et al. 2009). The replacement of perennial bunchgrasses with cheatgrass would create unsuitable habitat for most migratory birds.

4. Noxious Weeds

Affected Environment

There is currently five known noxious weed sites totaling 19.37 acres in the Capehart Lake Allotment. There have been two different noxious weed species documented in the allotment. The numbers and acreages associated with each are displayed in Table 7.

Table 7

Noxious Weed Species	Number of Sites	Acres
Canada Thistle	2	8.13
Whitetop	3	11.24
Total	5	19.37

A systematic weed inventory for this allotment has not been completed and weed presence within the allotment has only been casually documented. All of the recorded weed sites occur along roads. The Canada thistle occurs along the Dusenberry Lake road. The whitetop occurs in the Capehart Lake Pasture on an internal BLM road. None of these sites have been treated but they are on the list for 2011 treatment.

Environmental Consequences

Effects Common to All Alternatives

For the purpose of this analysis, the CEAA for noxious weeds is at the allotment scale. Since this allotment is bordered on its west side by Highway ROW, there will always be new introductions of weeds. The Highway ROWs are monitored and treated on an annual basis which helps reduce the likelihood of spread onto adjacent lands. There are 39 miles of BLM road network within the allotment. New weed introductions are likely to occur along roads. Capehart Lake Allotment does receive hunting activity and with the mobility of hunters and increased use of Off-Road Vehicles, the potential for weed introduction could be increasing.

Comprehensive weed surveys would be conducted prior to any projects that involve disturbance. Weed monitoring should be conducted for 2 to 3 years post-project completion. Any weeds found should be treated timely using the best available methods.

Management actions that encourage mid to late seral vegetation and good to excellent condition rangeland, managed to encourage vigor and productivity in those species would be helpful in occupying niches and slowing down potential movement of weeds into those areas.

Alternative A: No Action

While there would be no additional short-term (less than 3 years) disturbance to increase opportunities for new weed invasion, continuing the current management at the full permit level with the current seasons of use would maintain the status quo for the plant communities in the allotment. These plant communities are at risk for noxious weed introduction and spread in their present condition.

Continuing grazing management that does not improve livestock distribution and upland utilization patterns would maintain congregation areas with disturbed ground creating opportunities for noxious weed establishment. Noxious weeds that become established in any given area can greatly contribute to potential for spread across watersheds.

Alternative B: Proposed Action

While the Proposed Action involves an increase in short-term (less than 3 years) disturbances during pipeline, trough, and storage tank installation activities and well development, if Project Design Elements are followed and follow-up monitoring and treatments occur in a timely manner, over the long term (more than 3 years) the potential for persistent weed issues in the allotment would be considerably less than the No Action Alternative.

The water developments would lead to an increased number of watering locations which would assist in moderating disturbance from livestock congregation at watering sources. Lessening the level of concentrated livestock disturbance would lessen the vulnerability of those sites to weed invasion. Weed monitoring should occur in all concentration areas regularly. Any noxious weeds that are found would be treated as soon as possible using the most appropriate methods. The proposed grazing treatments should promote vigorous, productive plant communities, which would better utilize the resources of the site, lessening opportunities for noxious weed introduction and spread.

Alternative C: Proposed Action with No New Range Improvements

Impacts from this alternative are substantially the same as for the No Action Alternative but with additional short-term (less than 3 years) disturbance from waterhole maintenance. If project design elements for maintenance are followed and follow-up monitoring and treatments occur in a timely manner, over the long term (more than 3 years) the potential for persistent weed issues in the allotment would not be a problem.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

Removal of grazing would benefit desirable forage and forb species in the short term (less than 3 years) by allowing them to become maximally vigorous and productive, and therefore providing maximum resistance to introduction and competition with any weed species that do become established. Over the long term (more than 3 years), these desirable plants would become woody and their competitive, productive edge would decline.

In the absence of permitted grazing, visits by trained range staff would become less frequent. Other visitors (particularly recreationists) would continue to travel

into and around these pastures. Opportunities to detect noxious weeds early would happen less often. Weed introductions may grow to large infestations before being discovered and treated. Treatment costs could be higher and take longer to accomplish.

5. Recreation/Visual Resources

Affected Environment

Primary recreational opportunities within the allotment include big game hunting for deer and antelope, upland game bird hunting for sage-grouse and quail, camping, hiking, photography, OHV riding, and horseback riding.

The Capehart Lake Allotment is comprised of Visual Resource Management (VRM) Class IV, VRM Class III and VRM Class II. The VRM Class II is the portion most visible and closest to Highway 395.

VRM Class IV: Management objectives for this class allow for modifications to the existing character of the landscape. Management activities may dominate the view and be the major focus of viewer attention.

VRM Class III: Management objectives for this class are to partially retain the existing character of the landscape.

VRM Class II: Management objectives for this class are to largely retain the existing character of the landscape.

Environmental Consequences

Effects Common to All Alternatives

For the purpose of this document, the CEAA for recreation/visual resources encompasses the Capehart Lake Allotment. All alternatives and other ongoing and reasonably foreseeable future projects would not lead to cumulative effects to recreation/visual resources because impacts of proposed range improvements would be localized.

Alternative A: No Action

No new range improvements would be implemented to enhance control of livestock distribution and utilization patterns. Over time, a downward trend in rangeland condition would increase forage competition between livestock and wildlife which would result in reduced opportunities for such activities as hunting and wildlife viewing.

Alternative B: Proposed Action

The Proposed Action would implement livestock grazing rotations providing periodic growing season rest to key forage plant species on all pastures in Capehart Lake Allotment. The Proposed Action is designed to improve overall land health of the allotment while achieving multiple resource objectives. Visual intrusions created by development of range improvements are acceptable under VRM Class IV, “modification of the character of the landscape is allowed.” VRM Class III management objectives are to “partially retain the existing character of the landscape.” VRM Class II management objectives are to “largely retain the existing character of the landscape.” Overall, benefit to rangeland health initiated by the proposed range improvements would outweigh the attention they would attract by the casual observer.

The maintenance of the existing waterholes will not change the existing visual character of the VRM Class II landscape. While the equipment used to maintain the waterholes would be a change to the landscape this would be of a temporary (30 to 60 days) nature and not have an overall effect on the landscape.

The water wells and storage tanks are all located in VRM Class IV which allows for changes to the character of the landscape.

None of the proposed developments are adjacent to any known campsites or other features associated with prolonged visitor use. If any encounters with visitors occur during construction of the proposed developments, there would be some temporary and short term (days) loss of solitude and disturbance to recreational activities in the immediate area surrounding project locations. After construction, should any visitor encounters with developments occur, they would likely be limited to minutes as visitors pass by on foot, horseback, or vehicle. Overall, recreational opportunities would likely be enhanced by improvements in rangeland conditions. Recreational activities related to hunting would be enhanced as habitat function improves.

Alternative C: Proposed Action with No New Range Improvements

Proposed grazing management is the same as under the Proposed Action; however, the effects may not be the same, with no new range improvement distribution would remain unchanged and use would continue to be concentrated near existing water sources. Over time, a downward trend in rangeland condition would increase forage competition between livestock and wildlife which would likely result in reduced opportunities for such activities as hunting and wildlife viewing. Under this alternative, no new range improvements would be constructed; therefore, there would be no additional effects to visual resources.

The maintenance of the existing waterholes will not change the existing visual character of the VRM Class II landscape. While the equipment used to maintain the waterholes would be a change to the landscape this would be of a temporary (30 to 60 days) nature and not have an overall effect on the landscape.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

Under this alternative, livestock grazing would be deferred and occur only in the Little Seeding Pasture. This alternative would include no new range improvements and permit renewal of approximately 30 percent of the current permitted active AUMs. Effects to recreation/visual resources from grazing would be similar to the Proposed Action in the Little Seeding Pasture. This pasture is a VRM Class II and VRM Class IV. The VRM Class II is located in the area most visible from and along Highway 395 and the remaining pasture is VRM Class IV.

In the Hiway Field and Capehart Lake Pastures the VRM class is a VRM Class II along Highway 395, and VRM Class IV in the remainder of the pasture. In the Hiway Field and Capehart Lake Pastures there would be no conflict between livestock and hunters. With no new range improvements there would be no impact to the existing visual and recreation resource.

6. Social and Economic Values

Affected Environment

Livestock raising and associated feed production industries are major contributors to the economics of Harney County. The highest individual agricultural sales revenue in the county is derived from cattle production (65 percent), which is linked to the grazing of public rangelands. The cattle industry provided \$37,955,000 in sales in Harney County in 2009 compared to \$42,973,000 in 2008 (Oregon State University, Extension Service 2010).

Those engaged in ranching and forage production make up a strong component of the fabric of the local societies. Livestock grazing operations on public and private lands can have a stabilizing influence on local employment and standards of living. Hunting, hiking, and other types of dispersed outdoor recreation also contribute to the local economies on a seasonal basis. The undeveloped, open spaces in the county are a tourist attraction and contribute to a share of revenue for local business.

Environmental Consequences

Effects Common to All Alternatives

RFFAs such as grazing, recreational pursuits and noxious weed treatments would continue under all alternatives. Implementation of any of the alternatives in combination with RFFAs is not expected to measurably contribute to cumulative effects.

Alternative A: No Action

The value of livestock in the allotment would remain at current levels or decrease under the No Action Alternative should the condition of upland plant communities move toward downward trend in rangeland condition with no changes in grazing management. If the productivity of these rangelands declines this could lead to a reduction in permitted livestock numbers. Reducing livestock numbers could affect individuals who make their living from these ranches. At the same time, public lands in and around the allotment would continue to contribute environmental amenities such as open space, scenic quality and recreational opportunities (including hunting, bird watching, sightseeing, hiking, and OHV use). These amenities would remain but could be reduced if rangeland health is not maintained or improved to provide recreational opportunities such as wildlife viewing and hunting.

Renewing the current 10-year term grazing permit under the No Action Alternative would result in Standards and Guidelines remaining unachieved. The Federal government would continue to collect grazing permit fees from the permittee at approximately the current annual rate. This commodity use on public lands would continue to generate revenues for the Federal government and local economies. Under this alternative, no contracts for construction of range improvement projects would be granted and no supplies would be purchased from local vendors for the purpose of range improvement project implementation.

Alternative B: Proposed Action

The Proposed Action would likely utilize contracts to construct proposed range improvement projects within the allotment. Purchase of supplies and equipment necessary for implementation of the Proposed Action from merchants would constitute an additional economic effect.

The proposed grazing management and range improvement projects are designed to improve conditions for uplands, which could maintain or increase forage production for livestock and wildlife. Providing for sustainable grazing management that improves habitat conditions for wildlife would in turn increase economic opportunities for the livestock operation, help to sustain livelihoods for the ranch operation, and foster more desirable social opportunities.

Renewing the current 10-year term grazing permit with the Proposed Action of this AMP as a term and condition of this permit would result in a continued viable ranching livelihood for the livestock operator. Continuing a viable ranching

operation would also enhance the economy of Harney County through taxes and goods and services purchased by the ranch and people employed by the ranch. By maintaining a viable ranching operation and improving rangeland conditions in Capehart Lake Allotment, the traditions associated with the ranching communities of Harney County would be maintained.

The area's intrinsic values (i.e., open space, scenic quality, and recreational opportunities) would be maintained and likely enhanced under this alternative. Maintaining and improving rangeland health would improve wildlife habitat and abundance thus providing for additional viewing and hunting opportunities. However, some visitors may feel additional range improvements would detract from their recreational experience.

Alternative C: Proposed Action with No New Range Improvements

Effects to the ranching operation would be similar to the Proposed Action as well as effects to intrinsic values in the area. Under Alternative D, however, there would be no purchase of supplies and equipment and no contracts would be utilized as there would be no range improvements initiated.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

There would be an approximate 70 percent reduction in Federal revenues generated from collection of grazing fees under the livestock grazing permit as Capehart Lake and Hiway Field Pastures would be removed from the grazing permit. Little Seeding Pasture would be the only pasture grazed. This would result in the permittee having to find replacement forage for the estimated 1,050 AUMs lost equaling approximately \$14,910 (1,050 AUMs x \$14.20/average AUM). This additional expense to the permittee could affect quality of life. However, the expense of replacing the lost forage may benefit other citizens of Harney County. In addition, there would be no purchase of supplies and equipment and no contracts would be issued as there would be no range improvements installed in these two pastures.

7. Soils/Biological Crusts

Affected Environment

The allotment is predominately characterized by the Raz-Brace-Anawalt general soil series which is characterized by loamy soils on 2 to 20 percent slope hills and tablelands. Within the Raz-Brace-Anawalt series there are two represented specific soil series, Raz-Brace (dominates the allotment) and Morganhills sandy loam (limited representation on 2 to 12 percent slopes).

The Swaler-Swalesilver series occurs in the southern portion of the allotment on 0 to 2 percent slopes and has a ponded clay component while some Felcher-Rock outcrop occurs occasionally on 40 to 70 percent slopes primarily found in the northwest portion of the allotment.

Within the disjunct Little Seeding Pasture, soils are dominated by the Ninemile-Westbutte-Carryback general soil series with soil textures ranging from fine to gravelly silty loam. Specific soil series in this pasture include Pernty on 3 to 15 percent slopes within basin big sage plant communities; Teguro on 5 to 20 percent slopes where a low sage component occurs on tablelands; and Riddleranch-Lambring-Rock outcrop on 20 to 50 percent slope canyons and hillsides. A limited amount of Reallis-Vergas-Lawen occurs on alluvial fans and lake terraces with a 0 to 3 percent slope.

BSC genera potentially found in the Capehart Lake Allotment include, but are not limited to: Bryum, Cladonia, Collema, Didymodon, Lecanora, Megasporea, Peltigera, Psora, and Tortula. Identification of BSCs at the species level is often possible in the field due to the 2007 publication of *A Field Guide to Biological Soil Crusts of Western U.S. Drylands* (Rosentreter, Bowker & Belnap, 2007).

Soil surface micro-topography and aggregate stability are important contributions from BSCs as they increase the residence time of moisture and reduce erosional processes. The influence of BSCs on infiltration rates and hydraulic conductivity varies greatly. Generally speaking, infiltration rates increase in pinnacled crusts and decrease in flat crust micro-topographies. The northern Great Basin has rolling BSC micro-topography and infiltration rates are probably intermediate compared to flat or pinnacled crust systems. Factors influencing distribution of BSCs (TR-1730-2) include, but are not limited to: elevation, soils and topography, percent rock cover, timing of precipitation, and disturbance.

Possible disturbances that have occurred in the allotment include, but are not limited to: effects from livestock grazing, vehicles, human footprints, and short return interval fires (which can modify BSC communities). The specific contribution of these activities to current BSC condition and cover is not discernable from other historic disturbances.

Environmental Consequences

Effects Common to All Alternatives

For the purposes of this analysis, the CEAA for soils and BSCs is the allotment boundary. Past and present actions and events, such as those described in the Affected Environment, have influenced the existing environment within the CEAA. RFFAs in the CEAA that may contribute to cumulative effects to soils and BSCs include livestock grazing, hunting, and other recreational pursuits.

Alternative A: No Action

Current management would continue, resulting in a continuation of the observed trend in upland vegetation and consequently for soils and biological crusts. Without management changes and associated range improvements, erosional forces would have an increased opportunity to modify soil horizons and impact other dependent resources such as vascular and non-vascular vegetation.

Alternative B: Proposed Action

Livestock impacts would be reduced as a result of proposed changes in duration and timing of use. Effects to soils and soil compaction from hoof impact would be better distributed throughout the allotment and, as a result, reduced. Soils could be disturbed, and BSCs reduced, in localized areas from mechanized equipment used for implementation of the Proposed Action. However, rubber-tired vehicles would ease the amount of compaction disturbance, and this would not be expected to influence soils or BSC productivity or recruitment. Mechanical impacts would be primarily considered short term in nature (1 to 3 years), but cumulative with other impacts as overall recovery can be slow once mechanical disturbance subsides.

Long-term potential impacts (3 or more years) would be dependent upon the degree and constancy of the potential impacts. Due to the proposed grazing system changes, range improvements and maintenance, a greater control of cattle distribution and potential impacts would occur. This improved set of circumstances would allow for recovery of soils and BSCs in areas previously experiencing increased use. An exception to this rule would be areas immediately adjacent to new or improved water sources. Within these areas, increased livestock concentration would likely increase soil compaction and reduce BSC cover and limit recruitment for the duration of the increased use.

Alternative C: Proposed Action with No New Range Improvements

Alternative C allows for a rest period for both Capehart Lake and Hiway Field Pastures; however, without the additional range improvements, the benefits gained for soils and BSCs during the rest year for each pasture would be minimal. Livestock would continue to utilize areas within 1 to 2 miles of reliable water more than other areas in the allotment in non-rest years leading to the continued compaction of soils and loss of BSCs in these highly utilized areas.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

Removal of livestock would reduce the number of animals using existing range improvements. This reduction in usage could allow vegetation to reestablish in

current heavily used areas, including those areas around reliable water sources as well as the trailing routes to and from the water sources. Reestablishment of vegetation stabilizes soils in the heavily used areas making them more resistant to wind and water erosion. Where BSCs are present, removal of livestock allows soil crusts to reestablish in areas of currently high use. Wildlife would still have access to established range improvements, including water sources, and would continue to have an impact on soils and BSCs leading to continued soil compaction and the reduction and/or removal of BSCs, although at a reduced rate.

8. Special Status Species and Habitat

Affected Environment -Fauna

Sage-grouse are sagebrush obligates, and depend on sagebrush for food and cover. The vegetation in the allotment consists of a sagebrush dominated shrub overstory with an understory of perennial grasses and forbs, and 95 percent of the allotment is classified as probable habitat for sage-grouse (*Centrocercus urophasianus*). The remaining 5 percent is classified as not suitable for sage-grouse, primarily due to past fires and the large transmission line that transects the southeast corner of Capehart Lake Pasture. Cheatgrass (*Bromus tectorum*) is a prominent understory component on several thousand acres of the allotment. The leks closest to the allotment are the Juniper Ridge lek complex located 3.5 miles northwest of Hiway Field Pasture, and Shorty's Butte Waterhole lek is over 8 miles south of Hiway Field Pasture. No grouse have been observed at the Juniper Ridge complex since 2004.

The sagebrush communities within the allotment also contain suitable habitat for pygmy rabbit (*Brachylagus idahoensis*), a sagebrush obligate species. Pygmy rabbit diet is comprised of large percentages of sagebrush throughout the year, and virtually the entire winter diet is sagebrush. Pygmy rabbits are one of two species of rabbit that digs burrows, and require soil complexes that allow for ease of excavation and resistance to collapse (Weiss and Verts 1984). The Raz-Brace soil association occurs on 77 percent of the allotment, and would be suitable for pygmy rabbit burrowing. The remainder of the area is comprised of several different soil associations, with some suitable for pygmy rabbit burrows, while others, such as the Swaler-Swalesilver associations at playas, provide marginal or unsuitable conditions for burrowing. Pygmy rabbit surveys have only been conducted on a small portion of the northwest corner of the allotment. No sign of rabbits were reported during the surveys; however, sagebrush habitat directly adjacent to Hiway Field Pasture in Juniper Ridge Allotment was surveyed, and pygmy rabbits were confirmed within a mile of the northern boundary and 2 miles of the western boundary. Several active burrows have also been documented on

State-administered land approximately 6 miles south of the allotment (Hager and Lienkaemper 2007). The allotment is within dispersal distance for pygmy rabbit, and there are no barriers to their movement into the allotment (Estes-Zumpf and Rachlow 2009).

Five areas in this allotment were brushbeat (sagebrush mowing) between 1999 and 2001, covering 985 total acres (less than 3 percent of the allotment). These vegetation treatments were designed to promote a healthy sagebrush community and provide quality habitat for sage-grouse. Other past and present actions and events that likely influenced SSS include wildfires, livestock grazing, seeding, road and fence construction, and recreational activity. Two wildfires occurred in the past 30 years within the allotment, and burned 476 acres (less than 2 percent of the allotment), killing Wyoming big sagebrush in the southern portion of Capehart Lake Pasture. Approximately 39 miles of roads cross the allotment, but all are native surface, single lane roads that do not act as barriers to pygmy rabbit or sage-grouse movement. Fences may cause mortality to flying sage-grouse, and the fence density in the allotment is relatively low (0.84-mile of fence per square mile) compared to other areas (Connelly et al. 2004).

Environmental Consequences

Effects Common to All Alternatives

For the purposes of this analysis, the CEAA for pygmy rabbit and sage-grouse extends up to 10 miles beyond the allotment boundary to encompass regular movements of these species that may be using the allotment. The CEAA does not include the entire annual use area (sage-grouse) because this information is not available nor is it expected to change the analysis. Vegetation communities present in the allotment are representative of those within the CEAA.

The analysis of alternatives on sage-grouse and sage-grouse habitat considered information in the Greater Sage-grouse Conservation Assessment and Strategy for Oregon (Strategy) (Hagen 2011). The Strategy provides recommendations for long-term conservation of sage-grouse in Oregon based on the best available science. This document considered and incorporated, where appropriate, the USFWS 12-Month Finding on Greater Sage-grouse (Federal Register Vol. 75 No. 55), as well as the monograph Greater Sage-grouse: Ecology and Conservation of a Landscape Species and Its Habitat (Knick and Connelly, eds. 2011).

Past and present actions and events, such as those described in Affected Environment, have influenced the existing environment within the CEAA. Additionally, two wind testing towers (METs) have been installed at approximately 2 and 3 miles northwest of the Little Seeding Pasture. The two METs are far enough away and constructed using design features to minimize potential impacts to the extent they would have no measurable cumulative effect

with the proposed alternatives. RFFAs in the CEAA that may contribute to cumulative effects to SSS and their habitat include livestock grazing, sagebrush mowing (along roads), hunting, and other recreational pursuits. Alternatives analyzed in this document may incrementally affect wildlife through disturbance and temporary reductions of herbaceous plant and shrub cover and structure. Direct disturbance would be limited to the short period when cattle occupy the allotment and grazing at levels that achieve Rangeland Health Standards and conform to Guidelines is expected to maintain adequate habitat for greater sage-grouse and pygmy rabbit.

Alternative A: No Action

Sagebrush habitat would continue to be available in the allotment throughout the year, although the understory herbaceous plant community would continue to trend downward over the next decade. Range improvements promoting better distribution of livestock would not be implemented under this alternative, and cattle would continue to concentrate in areas adjacent to the playas and waterholes that consistently hold water latest in the season. Capehart Lake and Hiway Field Pastures would continue to receive grazing treatments each year, which does not allow adequate rest for plants. Perennial deep-rooted grasses would continue to decline, increasing opportunities for noxious weed and cheatgrass spread. Cheatgrass (*Bromus tectorum*) is already prominent in several areas of the allotment and would increase in dominance in the understory. Cheatgrass provides marginal habitat for sage-grouse and increases the potential loss of all sagebrush cover by facilitating the spread of fires. Sage-grouse and pygmy rabbit use would decline in sagebrush communities in poor condition, and elimination of sagebrush would result in the displacement of both species from the allotment.

Alternative B: Proposed Action

The construction of reliable late season water sources would reduce livestock concentration at some areas within the allotment and provide for more flexibility in the timing and rotation of livestock grazing in the Capehart Lake and Hiway Field Pastures. Little Seeding Pasture would continue to be deferred until mid-July each year when most herbaceous plants have cured and are not generally affected by moderate grazing. The proposed schedule would allow for maximum potential growth of herbaceous vegetation and retention of residual ground cover on at least 53 percent of the allotment annually. No disturbance associated with livestock grazing would occur on at least 46 percent of the allotment annually. Providing periodic growing season rest would improve the vigor of sagebrush-grassland communities, and these healthier communities would be less susceptible to invasion and displacement by cheatgrass and noxious weeds. This grazing schedule would help maintain and improve conditions for sage-grouse and pygmy rabbits by providing large areas undisturbed by livestock each year, increasing the available forbs and native grasses, and maintaining adequate residual vegetative carryover each year for nesting and hiding cover.

Construction activity associated with range improvements may cause sage-grouse and pygmy rabbits to temporarily avoid or alter use near the construction sites. Work associated with all range improvements would be completed in less than a month. Sage-grouse are wide ranging, highly mobile birds that would avoid the temporary disturbance associated with construction. Pygmy rabbits are also highly mobile, but typically occupy relatively small home ranges. Pygmy rabbits are most active at night (Larrucea and Brussard 2009) or in the morning and evening (Lee 2008), which essentially provides a temporal buffer from construction activity that would typically take place during daylight hours.

The total ground disturbance from range improvements would be less than 1 percent of the allotment, and occur in sagebrush-grassland communities. Drilling a well and installing pipelines to distribute the water would directly affect less than 2 acres. The length of the proposed spur road accessing the well could be up to 2 miles long depending on the location of the well. The spur road would extend from the existing road through sagebrush-grassland vegetation, and up to 4 acres of vegetation would need to be cleared during construction. The road would be natural surface, and travel would be infrequent (similar to existing roads) following completion of construction. Ground disturbance also facilitates noxious weed establishment and spread, which decreases the habitat quality for sage-grouse (Hagen 2011) and pygmy rabbits. Monitoring and treatment or noxious weeds at these disturbed sites, in accordance with the District weed control strategy, would minimize the likelihood of spread.

Alternative C: Proposed Action with No New Range Improvements

The effects of Alternative C would be essentially the same as Alternative A, because the lack of reliable water in the large pastures, especially Capehart Lake Pasture, does not allow for the proposed rotation under Alternative B in most years.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

The effects on SSS would be the same as the other alternatives for the Little Seeding Pasture, but all disturbance associated with livestock grazing management would be eliminated in Capehart Lake and Hiway Field Pastures. The potential risk of sage-grouse nest disturbance or damage to rabbit burrows from livestock would be eliminated in these two pastures.

Herbaceous plant cover, especially grasses, would increase and be maintained throughout the nesting season within the first growing season in the absence of livestock grazing. This increase would provide more horizontal and vertical nesting and hiding cover from predators for sage-grouse and their brood as well as pygmy rabbit, which would potentially increase the survival and productivity of these species. Foraging opportunities would also improve as herbaceous plant

cover, especially in the spring and summer when pygmy rabbit and adult sage-grouse diets include more herbaceous plants than sagebrush. The increase in live and residual vegetative cover would also provide more habitat for insects, important food items during the nestling and early brood-rearing phases for sage-grouse.

Approximately 9 miles of interior fences would not be maintained or would be removed, which would eliminate some singing or hunting perches, but would also reduce the risk of a collision to flying birds.

Over the long term, buildup of residual vegetation may increase the potential for a hotter, more severe wildfire occurring in the allotment. If a wildfire were to occur, the litter buildup may lead to higher mortality of perennial plants and facilitate the rapid spread of cheatgrass which is already present in the allotment (Davies et al. 2009). The replacement of perennial bunchgrasses with cheatgrass would create unsuitable habitat for both sage-grouse and pygmy rabbit. Cheatgrass also increases the risk of more frequent fires that would prevent the reestablishment of sagebrush on which these species depend.

Affected Environment- Flora

Raven's lomatium (*Lomatium ravenii*) is a rare member of the Apiaceae (carrot) Family that has been documented in the Burns District numerous times. Raven's lomatium is a classic example of a plant species with morphological plasticity (variation in character) which can lead to misidentification of the species from time to time. This plant species has an Oregon-Sensitive ISSSP status in January 2008 OR/WA State Director's SSS List.

The northern Great Basin is unusual for many reasons, but one of the most interesting is how the area functions as a cusp with regard to species of plants. Generally one can say plants common to northern regions are found in the Burns District, but not further south. Likewise, southern plant species often reach their northern range limit in the Burns District. This overlap in highly variant plant species coupled with unique environmental pressures lends itself to what are known as species complexes or groups of species that often overlap in their character and are hard to differentiate from one another.

Raven's lomatium seems to overlap in form with Nevada biscuitroot (*Lomatium nevadense*) in some areas of the District. Capehart Lake Allotment contains a population of Raven's lomatium in the southwest portions of Capehart Lake Pasture. These populations often exhibit Nevada biscuitroot character traits.

Monitoring of this species has not occurred in the past in the allotment, but is scheduled for 2011. Specific impacts to this species from past disturbance regimes in the allotment are not documented, but are likely to be minimal as the species is deep rooted and somewhat self-protected from mechanical or other disturbance types.

Environmental Consequences

For the purposes of this analysis, the CEAA for Raven's lomatium is the allotment boundary. Past and present actions and events, such as those described in Affected Environment, have influenced the existing environment within the CEAA. RFFAs in the CEAA that may contribute to cumulative effects to Raven's lomatium include grazing, hunting, and other recreational pursuits.

Alternative A: No Action

Some Raven's lomatium sites in the allotment may have been impacted by past livestock grazing practices. Impacts from many decades of grazing and other disturbances have not eliminated the plant from the allotment. A continuation of current management would result in no additional impacts to this species of plant.

Alternative B: Proposed Action

The proposed range improvements would better distribute livestock use across the allotment in order to better utilize available forage. Development of additional water sources would add to the distribution potential across the allotment, which would diminish trampling effects allotment-wide. Trampling effects on Raven's lomatium would be proportionately reduced in areas that have been grazed in the past, although this effect is not quantifiable. The opposite effect may occur where animals concentrate in new locations near water, impacting Raven's lomatium by increased trampling. Although trampling effects may increase in new locations there would not be an overall increase in trampling throughout the allotment as there would be a reduction of trampling in areas that have been grazed in the past.

Alternative C: Proposed Action No New Range Improvements

The effects of Alternative C would be similar to the No Action Alternative, Alternative A, with the exception that vegetation would get a one year rest period, alternating between Capehart Lake and Hiway Field Pastures every other year. Because range improvements would not be made, livestock would continue to utilize the current water sources creating vegetation loss and compacted soils, including the waterhole located directly north of the Raven's lomatium site. Any improvements made in the Capehart Lake and Hiway Field Pastures which would benefit the Raven's lomatium site during the rest periods would be lost during the rotation periods.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

Livestock and range improvements are not factors in the survivability of *Lomatium ravenii*. There would be no affects for this Special Status plant species or critical habitat associated with the complete removal of livestock from the Hiway Field and Capehart Lake Pastures, nor would there be any affects associated with not developing additional range improvements.

9. Upland Vegetation

Affected Environment

A low sagebrush (*Artemisia arbuscula*)/ Sandberg's bluegrass (*Poa sandbergii*) (*Poa secunda*)/Thurber's needlegrass (*Achnatherum therberianum*) community is the most common in the allotment. Low sagebrush plant communities contain a variety of perennial and annual forbs. Perennial forbs found include deep-rooted, shallow-rooted and mat-forming species such as larkspur (*Delphinium sp.*), phlox (*Phlox sp.*), milkvetch (*Astragalus sp.*), biscuitroot (*Lomatium sp.*), lupine (*Lupinus sp.*), wild onion (*Allium sp.*), and hawksbeard (*Crepis sp.*). Silver sagebrush (*Artemisia cana*) communities can also be found in association with playa areas.

The big sagebrush (*Artemisia tridentata* spp.) plant community is the second most common plant community. Big sagebrush occupies deeper, more productive sites than low sagebrush. Mountain big sagebrush (*Artemisia tridentata* spp. vaseyana) is the primary big sagebrush subspecies present at higher elevations while small patches of Wyoming big sagebrush (*Artemisia tridentata* spp. wyomingensis) and Basin big sagebrush (*Artemisia tridentata* spp. tridentata) occur in lower elevations. Big sagebrush occupies moderate to deep soil types. A number of other shrub species may be found in association with big sagebrush including both green and gray rabbitbrush (*Ericameria*) which are common. Perennial grasses commonly found are bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg's bluegrass, bottlebrush squirreltail (*Elymus elymoides*), basin wildrye (*Leymus cineris*), Idaho fescue (*Festuca idahoensis*), and Thurber's needlegrass (*Achnatherum thurberianum*).

Crested wheatgrass (*Agropyron cristatum*) is found in the seeded areas of the allotment. Cheatgrass (*Bromus tectorum*) can be found scattered across the allotment, especially in recently disturbed areas.

The 2006 Capehart Lake Allotment Evaluation analyzed the direction of trend in condition at six upland trend plots across the allotment. Plots one through four (located in the Capehart Lake and Hiway Field Pastures) were determined to be in downward trend in range condition; plots 107 and 108 (located in the Little Seeding Pasture) were determined to be in upward trend in range condition.

Photo analysis determined interspaces to be filling with cheatgrass and annual pepperweed, as well as showing an average of 54.5 percent bare ground in the allotment (based on calculations from the six upland trend transects across the allotment).

Environmental Consequences

Effects Common to All Alternatives

For the purposes of this analysis, the CEAA for upland vegetation consists of the allotment. Past and present actions, such as those described in Affected Environment, have influenced the existing environment within the CEAA. RFFAs in the CEAA that may contribute to cumulative effects to upland vegetation include livestock grazing, wildlife use, hunting, and other recreational pursuits.

Alternative A: No Action

Under the No Action Alternative, no new pipelines, fences or, water developments would be implemented to enhance utilization and distribution patterns. Service areas within 1 to 2 miles of existing waterholes would continue to receive continuous seasonal grazing by livestock and wildlife. Lack of growing season rest and limited change in timing and duration of grazing would result in reduced herbaceous plant vigor, density, and cover. The uplands across Capehart Lake and Hiway Field Pastures would continue to be in a downward trend in range condition and an upward trend across the Little Seeding Pasture with diverse, productive plant communities. In addition, fine fuels would continue to accumulate in areas with little livestock and wildlife use due to the large distance from water, which would increase fire risk within the allotment.

With the selection of the No Action Alternative improvements in rangeland condition would be minimal, at best, because there would be no change from current management.

Alternative B: Proposed Action

The Proposed Action should facilitate improvement to vegetative communities of uplands in the Hiway Field and Capehart Lake Pastures and would improve watershed stability and function. Overall health of rangelands within the allotment would be improved. The Proposed Action is designed to improve livestock grazing management and would also benefit multi-resource management. Key forage species would be provided periodic growing season rest from livestock use. Livestock distribution would be improved with the

development of additional reliable water throughout the grazing season. More uniform utilization patterns are expected with more water sources, reducing utilization levels on key forage species surrounding some of the areas where water is limited.

The Proposed Action would improve overall rangeland health by encouraging productivity, vigor and diversity of plant communities within the allotment. Current carrying capacity for all demands for wildlife and livestock would be maintained or improved as plant communities remain in stable to upward condition.

Alternative C: Proposed Action with No New Range Improvements

Under this alternative grazing management would be the same as in the Proposed Action however, with no new range improvements the effects would not be the same. Grazing management under this alternative would allow growing season rest in the Little Seeding Pasture each year and full rest every other year in the Capehart Lake and Hiway Field Pastures. This would allow upland forbs and grasses to complete their reproductive cycles. However, the rotation would be dependent on water availability at existing water sources, and with no new range improvements/water sources distribution and utilization would remain the same as with the No Action.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

Under this alternative lower utilization levels would occur on key forage plant species and less forage competition between wildlife and livestock would occur as livestock grazing would be removed. More frequent growing season rest and life cycle completion would be provided for key forage plant species if livestock were removed. Wildlife utilization would continue to be concentrated in service areas around reliable water sources. Allotment boundary and enclosure fence maintenance would become the responsibility of the BLM. Over time, these fences would become unserviceable as BLM does not have the budget to adequately maintain such improvements.

10. Wildlife

Affected Environment

No formal wildlife or wildlife habitat monitoring has occurred in the allotment with the exception of rangeland trend monitoring data. There is no winter range classified for deer, elk, or pronghorn in this allotment. This allotment does, however, receive use by pronghorn and deer during spring and summer. Nongame trapping efforts in similar habitat less than 8 miles away recorded Ord's kangaroo rat (*Dipodomys ordii*), Merriam's shrew (*Sorex merriami*), northern

pocket gopher (*Thomomys talpoides*), least chipmunk (*Neotamias Minimus*), short-horned lizard (*Phrynosoma douglassi*), sagebrush lizard (*Sceloporus gracilis*), and several other small animals. Other species typical of the area include American badgers (*Taxidea taxus*), coyotes (*Canis latrans*), black-tailed jackrabbits (*Lepus californicus*), and mountain cottontail (*Sylvilagus nuttalli*).

Capehart Lake Allotment was originally part of East Wagontire Allotment, but was separated from it in 1995. Forage allocations for big game in the original East Wagontire Allotment were 86 AUMs for deer and 7 AUMs for antelope, and new recommendations for Capehart Lake Allotment are 5 AUMs for deer and 5 AUMs for antelope.

Five areas in this allotment were brushbeat (sagebrush mowing) between 1999 and 2001, covering 985 total acres (less than 3 percent of the allotment). Other past and present actions and events that likely influenced SSS include wildfires, livestock grazing, seeding, road and fence construction, and recreational activity. Two wildfires occurred in the past 30 years within the allotment, and burned 476 acres (less than 2 percent of the allotment). The fires killed Wyoming big sagebrush in the southern portion of Capehart Lake Pasture. Approximately 39 miles of roads cross the allotment, but all are natural surface, single lane roads that do not act as barriers to most wildlife species. Vehicle traffic is infrequent and slow, and may cause animals to move away from the roads but not likely leading to collisions. Fences may impact small prey species by increasing the perching structures available for some predators, such as golden eagles (*Aquila chrysaetos*) and red-tailed hawk. Fences can also act as barriers to movement of big game species, especially in heavy snow years. Pasture fences were constructed to reduce the chances of entanglement for big game species, and all newer fences are constructed with steel posts rather than wood to reduce perching opportunities for raptors. The fence density in the allotment is relatively low (estimated at 0.84-mile of fence per square mile) compared to other areas (Connelly et al. 2004).

Environmental Consequences

Effects Common to All Alternatives

For the purpose of this analysis, CEAA for wildlife extends up to 10 miles beyond the allotment boundary to encompass regular movements of most animals that may be using the allotment. The CEAA does not incorporate the entire annual use area for some animals that migrate, such as elk and mule deer, because this information is not available nor is it expected to change the analysis. Vegetation communities present in the allotment are representative of those across the CEAA, although juniper expansion is more prominent in portions of the CEAA, such as north of Little Seeding pasture.

Past and present actions and events, such as those described in Affected Environment, have influenced the existing environment within the CEAA. Additionally, two wind testing towers (METs) have been installed at approximately 2 and 3 miles northwest of the Little Seeding Pasture. The two METs are far enough away, and were designed using design features to minimized potential impacts, that they would not have measurable cumulative effects with the proposed alternatives. RFFAs in the CEAA that may contribute to cumulative effects to wildlife and their habitat include livestock grazing, sagebrush mowing (along roads), hunting, and other recreational pursuits. Alternatives analyzed in this document may incrementally affect wildlife through disturbance and temporary reductions of herbaceous plant and shrub cover and structure. Disturbance limited to the short period when cattle occupy the allotment to meet Guidelines is expected to maintain adequate habitat for wildlife.

Alternative A: No Action

Range improvements would not be implemented under this alternative, and cattle would continue to concentrate in areas adjacent to the playas and waterholes that consistently hold water latest in the season. There would be no disturbance to wildlife from construction of range improvements. Capehart Lake and Hiway Field Pastures would continue to receive grazing treatments each year, which does not allow adequate rest for herbaceous plants. Forbs and perennial deep-rooted grasses, important forage for wildlife, would continue to decline and increase the opportunity for noxious weed and cheatgrass spread. Although noxious weeds do not appear to affect many acres, continuous lack of growing season rest would weaken the native plant communities and facilitate weed spread. Cheatgrass is currently prominent in several areas of the allotment and would become dominant in the understory, reducing the plant species and structural diversity critical for wildlife. Cheatgrass aggressively competes with herbaceous plants, and increases the risk of loss of all shrubs and fire intolerant herbaceous species by elevating the potential for large fires. Wildlife associated with sagebrush and other shrubs for food and cover would decline in the allotment, and displaced animals would have to move into adjacent habitat and compete with animals already established in those areas.

Alternative B: Proposed Action

The construction of reliable late season water sources would reduce livestock concentration at some areas within the allotment, and provide for more flexibility in the timing and rotation of livestock grazing in the Capehart Lake and Hiway Field Pastures. Little Seeding Pasture would continue to be deferred until mid-July each year when most herbaceous plants have cured. The proposed schedule would allow for maximum potential growth of herbaceous vegetation and retention of residual ground cover on at least 53 percent of the allotment annually. No disturbance associated with livestock grazing would occur on at least 46 percent of the allotment annually. This grazing schedule would help maintain

and improve foraging habitat for most wildlife species, from the larger big game species to the more numerous smaller animals within the allotment. The schedule would also eliminate any disturbance to wildlife on nearly half the allotment each year. Cleaning out and refurbishing existing water sources would extend the availability of open water later into the summer, and may increase wildlife use near these areas, especially in drier years.

Construction activity associated with range improvements may cause some wildlife species, especially larger more mobile species, to temporarily avoid or alter use near the construction sites. Less mobile species, such as chipmunks, would seek shelter in burrows or dense vegetative cover near construction activity until the activity in the immediate area ceases. Work associated with all range improvements would be completed in less than a month.

The total ground disturbance from range improvements would occur on less than 1 percent of the allotment, altering minimal wildlife habitat. Drilling a well and installing pipelines to distribute the water would directly affect less than 2 acres. The length of the proposed spur road accessing the well could be up to 2 miles long depending on the location of the well. The spur road would extend from the existing road through sagebrush-grassland vegetation, and up to 4 acres of vegetation would need to be cleared during construction. The road would be natural surface, and travel would be infrequent (similar to existing roads) following completion of construction. Ground disturbance from construction of range improvements may also facilitate noxious weed establishment and spread, which decreases the habitat quality for wildlife. Monitoring and treatment of noxious weeds at these disturbed sites, in accordance with the District weed control strategy, would minimize the likelihood of spread.

Alternative C: Proposed Action with No New Range Improvements

The effects of this alternative would be essentially the same as Alternative A, because the lack of reliable water in the large pastures, especially Capehart Lake Pasture, does not allow for the proposed rotation under Alternative B in most years.

Alternative D: Removal of Livestock Grazing from Capehart Lake and Hiway Field Pastures with No New Range Improvements

The effects on wildlife would be the same as the other alternatives for Little Seeding Pasture, but all disturbance associated with livestock grazing management would be eliminated in Capehart Lake and Hiway Field Pastures.

Small species, such as the short-horned lizard, that tends to seek refuge in shallow burrows or under plants would not be at risk of trampling by livestock in these two pastures.

Herbaceous plant cover, especially grasses, would increase and be maintained throughout the year within the first growing season in absence of livestock grazing. This increase would provide more horizontal and vertical hiding cover for wildlife, especially the smaller prey species like black-tailed jackrabbit, potentially increasing the survival and productivity of these animals. Foraging opportunities for many herbivorous wildlife species would also improve as more grasses, forbs, and seeds are available. The increase in live and residual vegetative cover would also provide more habitat for insects, important prey for some wildlife species.

Approximately 9 miles of interior fences would not be maintained and would fall into disrepair or these fences would be removed, reducing or eliminating the potential for entrapment or injury to wildlife species such as pronghorn and mule deer.

Over the long term (several years), buildup of residual vegetation may increase the potential for a hotter, more severe wildfire occurring in the allotment. If a wildfire were to occur, the litter buildup may lead to higher mortality of perennial plants and facilitate the rapid spread of cheatgrass already present in the allotment (Davies et al. 2009). The replacement of the sagebrush-bunchgrass community with a monoculture of cheatgrass would create and maintain unsuitable habitat for most wildlife species.

B. Discussion on Cumulative Effects

As the Council on Environmental Quality (CEQ), in guidance issued on June 24, 2005, points out, 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 on past action may be useful in two ways according to the CEQ guidance. One is for consideration of the Proposed Action’s cumulative effects, and secondly as a basis for identifying the Proposed Action’s effects.

The CEQ stated in this guidance that “[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into historical details of individual past actions.” This is because a description of the current state of the environment inherently includes the effects of past actions. The CEQ guidance specifies that the “CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions.” Our 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.

However, “experience with and information about past direct and indirect effects of individual past actions” have been found useful in “illuminating or predicting the direct and indirect effects” of the Proposed Action in the following instances: the basis for predicting the effects of the Proposed Action and its alternatives is based on the general accumulated experience of the resource professionals in the agency with similar actions. The environmental consequences discussion described all expected affects including direct, indirect and cumulative on resources from enacting the proposed alternatives. A distinction between direct and indirect effects is not made and in many cases cumulative effects are only described effects. In addition, the Introduction Section of this EA, specifically the Purpose and Need for Action, identifies past actions creating the current situation.

RFFAs, also relevant to cumulative effects, include those Federal and non-Federal activities not yet undertaken, but sufficiently likely to occur, that a Responsible Official of ordinary prudence would take such activities into account in reaching a decision. These Federal and non-Federal activities that must be taken into account in the analysis of cumulative impact include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified by the bureau. These RFFAs must fall within the geographic scope and timeframe of the analysis being prepared. Livestock grazing management, weed treatments, recreation activities, and proposed range improvements are known RFFAs. The cumulative effects of these actions were thoroughly addressed throughout Chapter III by resource as applicable.

CHAPTER IV: PERSONS, GROUPS, AND AGENCIES CONSULTED

A. Agencies and Individual Consulted

Grazing Permittee
Harney County Court
Oregon Department of Fish and Wildlife

B. Interdisciplinary Team

Rachel Beaubien – Rangeland Management Specialist – Lead Preparer (*Livestock Grazing, Upland Vegetation*)
John Bethea – Outdoor Recreation Planner (*Recreation, Visual Resources, Wilderness and WSAs*)
Jason Brewer – Wildlife Biologist (*Migratory Birds, Wildlife, SSS –Fauna: Terrestrial*)
Lindsay Davies – Fisheries/Riparian Specialist (*Fisheries, Water Quality, Wetlands/Riparian Zones, SSS –Aquatic*)
Caryn Meinicke – Botanist (*SSS –Flora, Soils, Biological Soil Crusts*)

Lesley Richman – Weed Coordinator (*Noxious Weeds*)
Scott Thomas – District Archaeologist (*American Indian Traditional Practices, Cultural Heritage, Paleontology*)

C. Advisory

Bill Dragt, Supervisory Natural Resource Specialist
Stacy Fenton, GIS Specialist
Rhonda Karges, District Planning/Environmental Coordinator
Richard Roy, Three Rivers Resource Area Field Manager

D. References

Allen, G.T. and P. Ramirez. 1990. *A review of bird deaths on barbed-wire fences*.
Wilson Bulletin. 102:553-558.

Beck, J.L. and D.L. Mitchell. 2000. Influences of livestock grazing on sage grouse
habitat. Wildlife Society Bulletin 28:993-1002.

Blaisdell, J.P., R.B. Murray, and E.D. McArthur. 1982. *Managing Intermountain
Rangelands-Sagebrush-Grass Ranges*. USDA Forest Service Intermountain
Forest and Range Experiment Station Gen. Tech. Report INT-134.

Connelly, J.W., S.T. Knick, M.A. Schroeder, and S.J. Stiver. 2004. Conservation
Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association
of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming.

Davies, K. et al. 2009, 'Interaction of historical and nonhistorical disturbances maintains
native plant communities'.

Denman, K. et al. 2007, 'Couplings Between Changes in the Climate System and
Biochemistry' in IPCC, *Climate Change 2007: The Physical Science Basis*,
Contribution of Working Group I to the Fourth Assessment Report of the
Intergovernmental Panel on Climate Change [Solomon, S., D. Gin, M. Manning,
Z. Chen, M. Marquis, K. Averyt, M. Tignor and H. Miller (eds.)], Cambridge
University Press, Cambridge, United Kingdom and United States.

DeRamus, H.A., T.C. Clement, D.D. Giampola, and P.C. Dickinson. 2003. Methane
emissions of beef cattle of forages: efficiency of grazing management systems.
Journal of Environmental Quality 32:269-277.

Derner, J.D. and G.E. Schuman. 2007. Carbon sequestration and rangelands: a synthesis
of land management and precipitation effects. Journal of Soil and Water
Conservation 62(2): 77.

- Environmental Protection Agency . 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007. U.S. EPA, Washington, D.C.
- Estes-Zumpf, W.A. and J.L. Rachlow. 2009. Natal dispersal by pygmy rabbits (*Brachylagus idahoensis*). *Journal of Mammalogy*. 90(2):363-372.
- Fernandez-Juricic, E., M.D. Jimenez, and E. Lucas. 2002. Factors affecting intra- and inter-specific variations in the difference between alert distances and flight distances for birds in forested habitats. *Canadian Journal of Zoology*. 80:1212-1220.
- Follet, R.F., J.M. Kimble, and R. Lal. 2001. The potential of U.S. grazing lands to sequester soil carbon. Chapter 16 in R.F. Follett, J.M. Kimble, and R. Lal, eds. *The Potential of U.S. Grazing Lands to Sequester Carbon and Mitigate the Greenhouse Effect*. CRC Press LLC. Boca Raton, Florida.
- Forster, P. et al. 2007. Changes in Atmospheric Constituents and in Radiative Forcing. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Hagar, J. and G. Lienkaemper. 2007. Pygmy rabbit surveys on state lands in Oregon, U.S. Geological Survey Open-File Report 2007-1015, 23 pp.
- Hagen, C.A. 2011. Greater sage-grouse conservation strategy assessment and strategy for Oregon: a plan to maintain and enhance populations and habitat. Oregon Department of Fish and Wildlife, Salem, USA.
- Johnson, K.A. and D.E. Johnson. 1995. Methane emissions from cattle. *Journal of Animal Science* 73(8):2483-2492.
- Knick, S.T., and J.W. Connelly (editors). 2011. *Greater Sage-Grouse: Ecology and conservation of a landscape species and its habitats*. Studies in Avian Biology Series (vol. 38), University of California Press, Berkeley, CA.
- Larrucea, E.S. and P.F. Brussard. 2009. Diel and seasonal activity patterns of pygmy rabbits (*Brachylagus idahoensis*). *Journal of Mammalogy*. 90(5):1176-1183.
- Lee, J.E. 2008. Pygmy rabbit (*Brachylagus idahoensis*) habitat use, activity patterns and conservation in relationship to habitat treatments. M.Sc. Thesis. Brigham Young University. 46 pp.
- Reynolds, T.D. 1981. Nesting of the sage thrasher, sage sparrow, and Brewer's sparrow in southeastern Idaho. *The Condor*. 83(1):61-64.

- Rosentreter, R., Bowker, M., and Belnap, J. 2007. *A Field Guide to Biological Soil Crusts of Western U.S. Drylands*. U.S. Government Printing Office, Denver, Colorado.
- Ruddock, M. and D.P. Whitfield. 2007. A review of disturbance distances in selected bird species. Natural Research Limited report. 181 pp.
- Schuman, G.E. et al. 2009. Influence of management on soil organic carbon dynamics in northern mixed-grass rangeland. Chapter 11 in *Soil Carbon Sequestration and the Greenhouse Effect*. 2nd Edition. SSSA Special Publication 57. Madison, Wisconsin.
- Weiss, N.T. and B.J. Verts. 1984. Habitat and distribution of pygmy rabbits (*Sylvilagus idahoensis*) in Oregon. *Great Basin Naturalist*. 44(4):563-571.
1934. Taylor Grazing Act 43 U.S.C. 315.
1976. Federal Land Policy and Management Act (43 U.S.C. 1701).
1978. Public Rangelands Improvement Act (43 U.S.C. 1901).
1984. BLM. TR-4400-4 –*Rangeland Monitoring: Trend Studies*. USDI, BLM Technical Reference.
1991. BLM. *Three Rivers Proposed Resource Management Plan and Final Environmental Impact Statement*. Burns District BLM.
1992. BLM. *Three Rivers Resource Management Plan, Record of Decision, and Rangeland Program Summary*. Burns District Bureau of Land Management.
1995. Code of Federal Regulations, Subchapter D –Range Management (4000) Subpart 4100.
1997. BLM. *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands in Oregon and Washington*.
1998. BLM. *Noxious Weed Management Program EA OR-020-98-05*. Burns District Office.
2001. BLM, USGS. TR-1730-2, 2001. *Biological Soil Crusts: Ecology and Management*. USDI, BLM Technical Reference.
2006. BLM. *Caphart Lake Allotment Evaluation*.
2008. USFWS. *Birds of Conservation Concern for the Great Basin Region*.

2009. <http://oain.oregonstate.edu>. Oregon Agricultural Information Network.

2010. <http://www.extension.oregonstate.edu>. Oregon State Extension Service.

Appendix A

Grazing Treatment Descriptions

Early – (Approximately March 1 to April 30) – This treatment provides the plants an opportunity to recover after utilization of early plant growth. By removing livestock before all spring and summer precipitation occurs, the plants would be able to store carbohydrates, set seed, and maintain their vigor. This "early" treatment can be used every year with little effect on the plant.

The dates of April 1 to April 30 are a guideline for the "early" treatment. Early use must take place before grass plants are in the boot stage. There must also be enough soil moisture in the ground to provide for regrowth after grazing. Therefore, flexibility in the early treatment would allow for use prior to April 1 but generally not after April 30, and will depend on climate.

Graze – (Approximately May 1 to July 1 to 15) – This treatment allows for grazing during the critical growth period of most plants. Carbohydrate reserves are continually being utilized because the green parts of the plant are continuously being removed by livestock. Pastures that are under the "graze" treatment will generally experience some other treatment the following year so as not to repeat graze treatments.

Defer – (Approximately July 1 to 15 to October 31) – Grazing during this treatment will not begin until after most plants have reached seed ripe and have stored adequate carbohydrate reserves. This treatment will assist in meeting the objectives by providing all plants an opportunity to complete their life cycles and produce the maximum amount of cover and forage.

Winter – Grazing during this treatment will occur when most plant species are dormant. Most plants will have completed their life cycles and stored maximum carbohydrates for the next growing season.

Rest – This treatment provides the plants a full year of growth in the absence of grazing. They are allowed to store maximum carbohydrate reserves, set seed, and provide carryover herbage for the following year's turnout.

These dates are approximations based on general plant phenology. Year-to-year variation in phenology will occur based on climatological phenomena.

Appendix B

Maps

Map A – Vicinity

Map B – Land Status

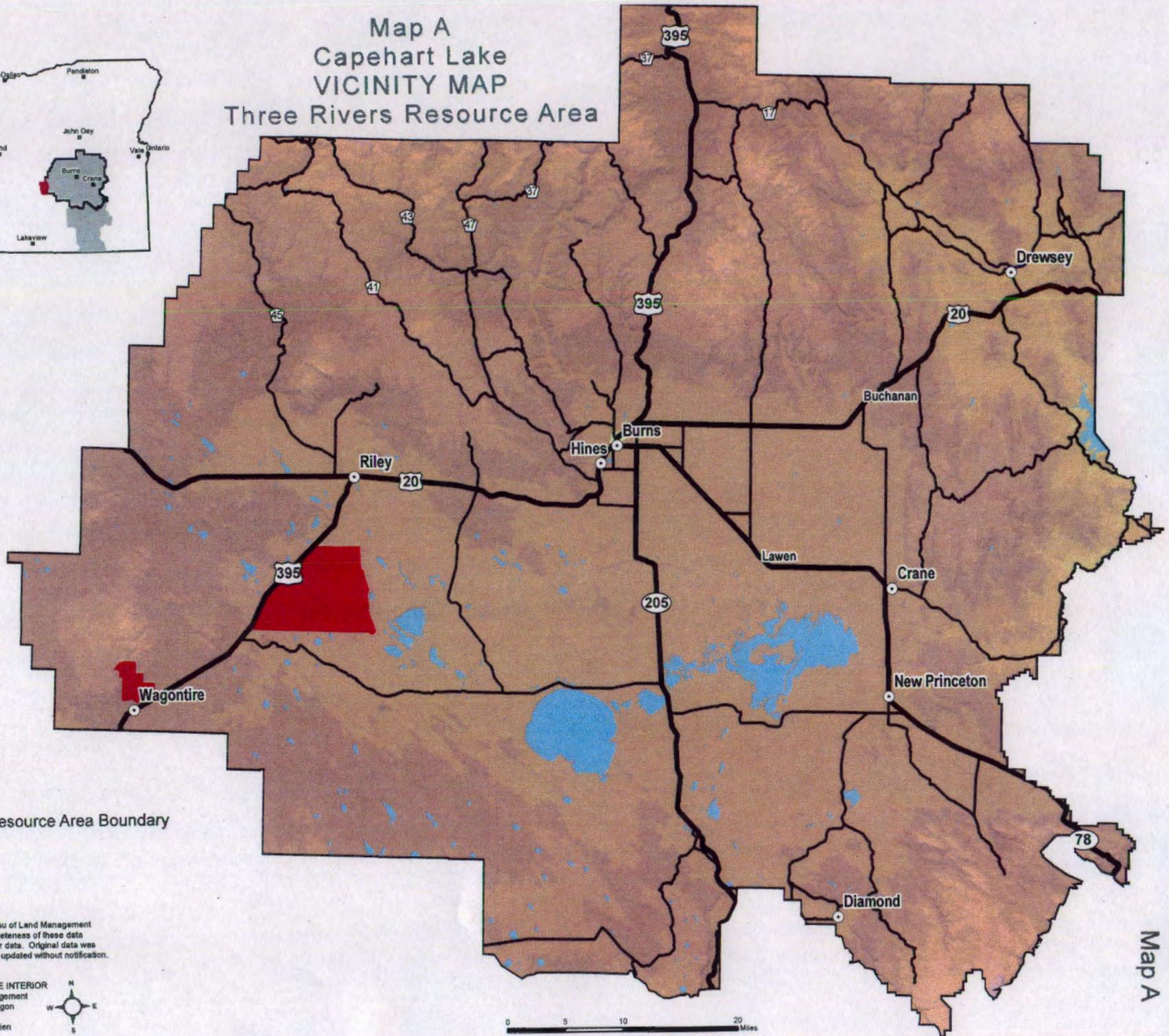
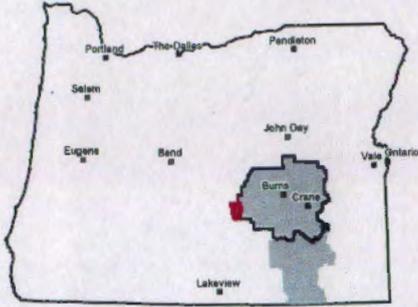
Map C – Proposed Grazing Odd Years

Map D – Proposed Grazing Even Years

Map E – Existing Range Improvements

Map F – Proposed Action Range Improvements

Map A Capehart Lake VICINITY MAP Three Rivers Resource Area



Legend

- Allotment
- Three Rivers Resource Area Boundary

Note: 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 was compiled from various sources and may be updated without notification.



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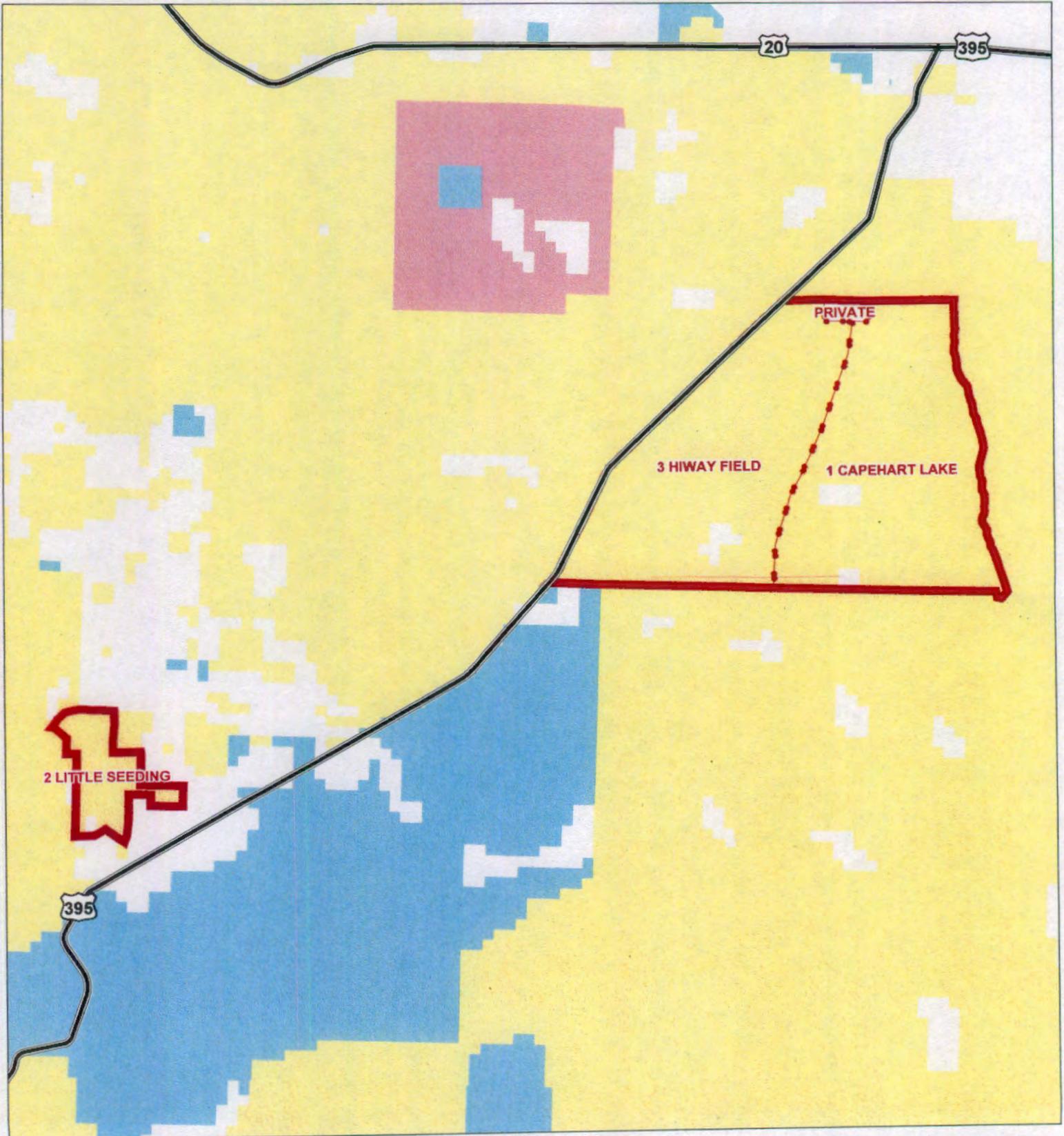
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0 5 10 20 Miles

Capehart Lake LAND STATUS

Map B



2 LITTLE SEEDING

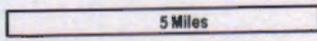
3 HIWAY FIELD

PRIVATE

1 CAPEHART LAKE

Legend

- Allotment Boundary
- Pasture Boundary
- Perennial Streams
- Intermittent Streams
- Bureau of Land Management
- State
- Other Federal Private/Unknown



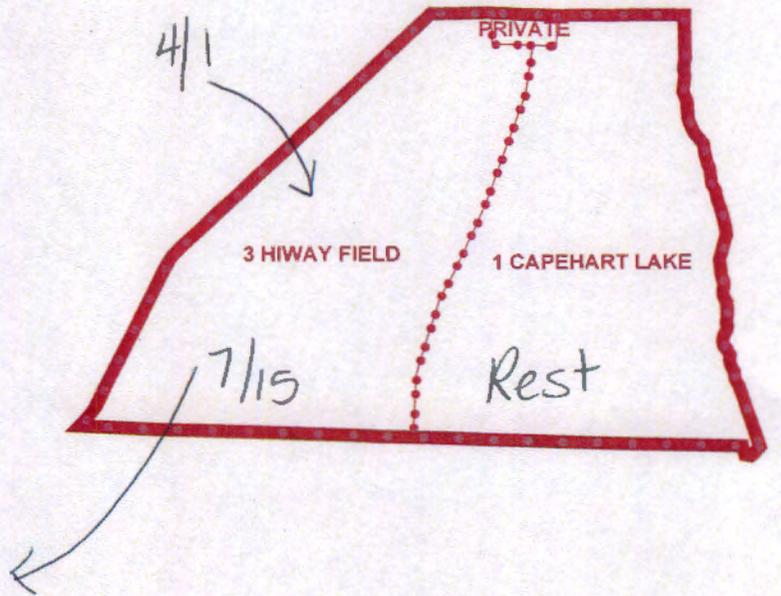
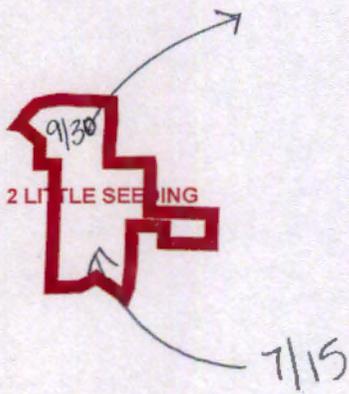
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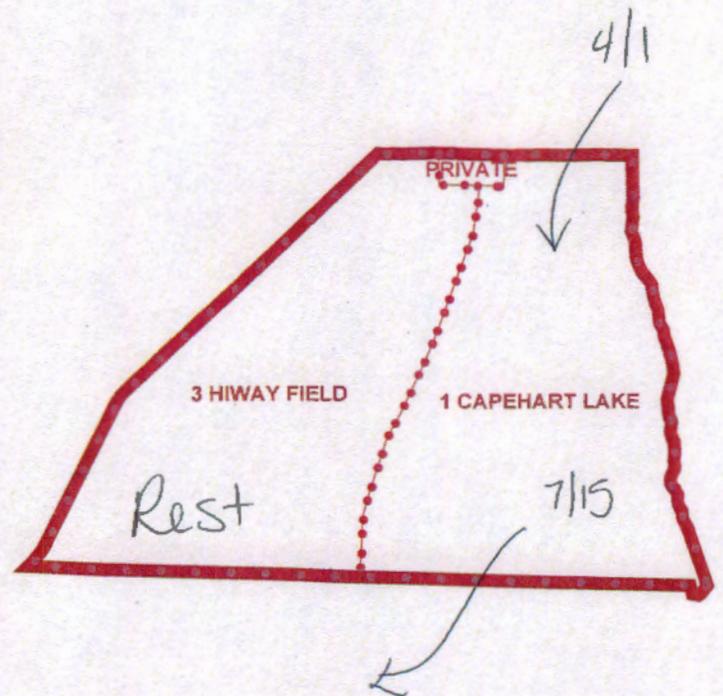
Map C Capehart Lake GRAZING SCHEMATIC



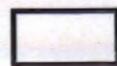
 Allotment Boundary
 Pasture Boundary

 Odd Years

Map D Capehart Lake GRAZING SCHEMATIC



 Allotment Boundary
 Pasture Boundary

 Even Years

Map E Capehart Lake Existing Range Improvements

Proposed Projects
Highlighted in Yellow

-  Allotments
-  Pastures
-  FENCE
-  PIPELINE
-  Bureau of Land Management
-  State
-  Other Federal
-  Private/Unknown

Range Improvement Points

PROJTYPE

-  RESERVOIR
-  WATERHOLE
-  WELL

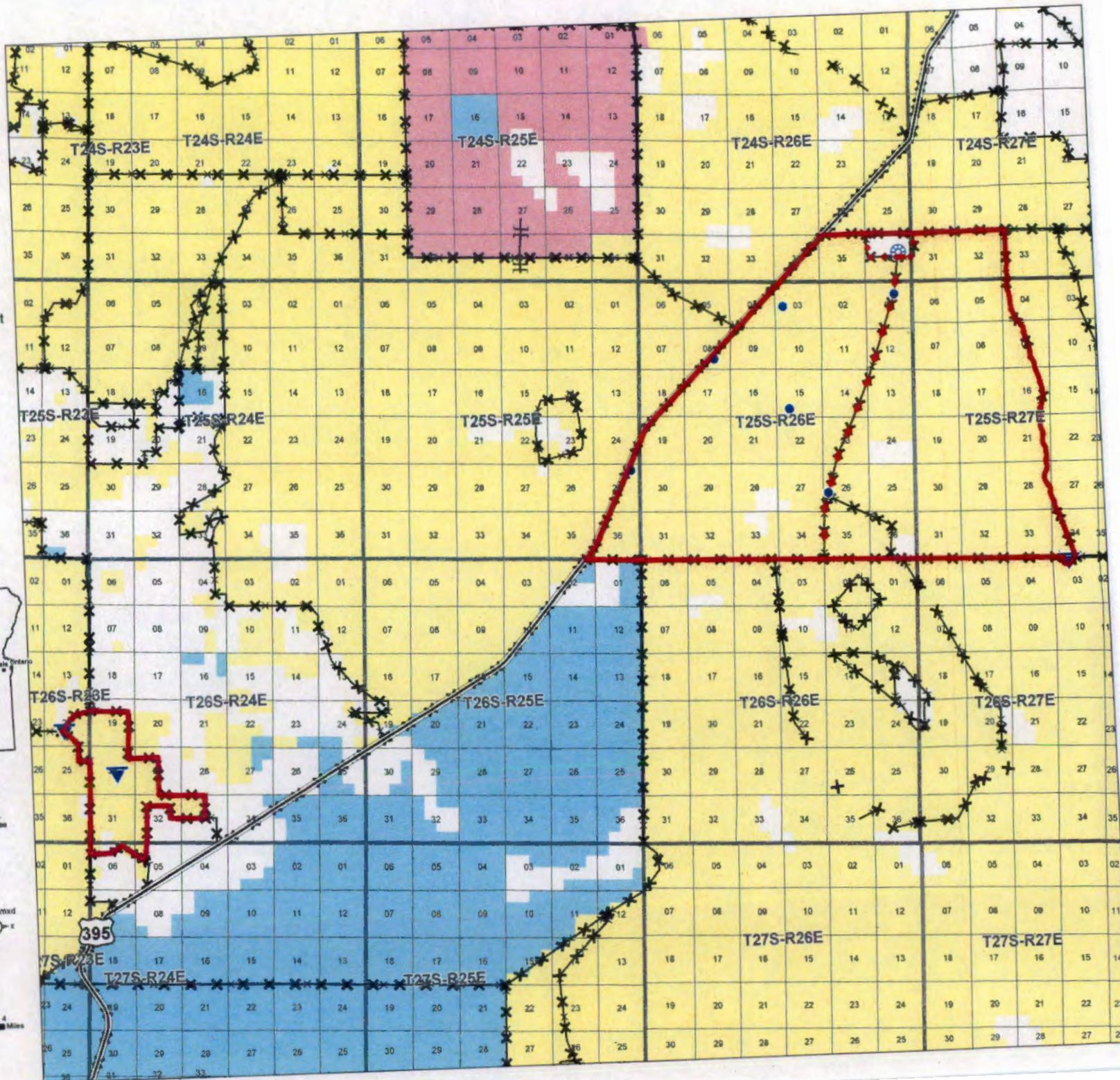
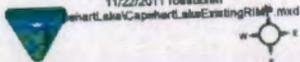


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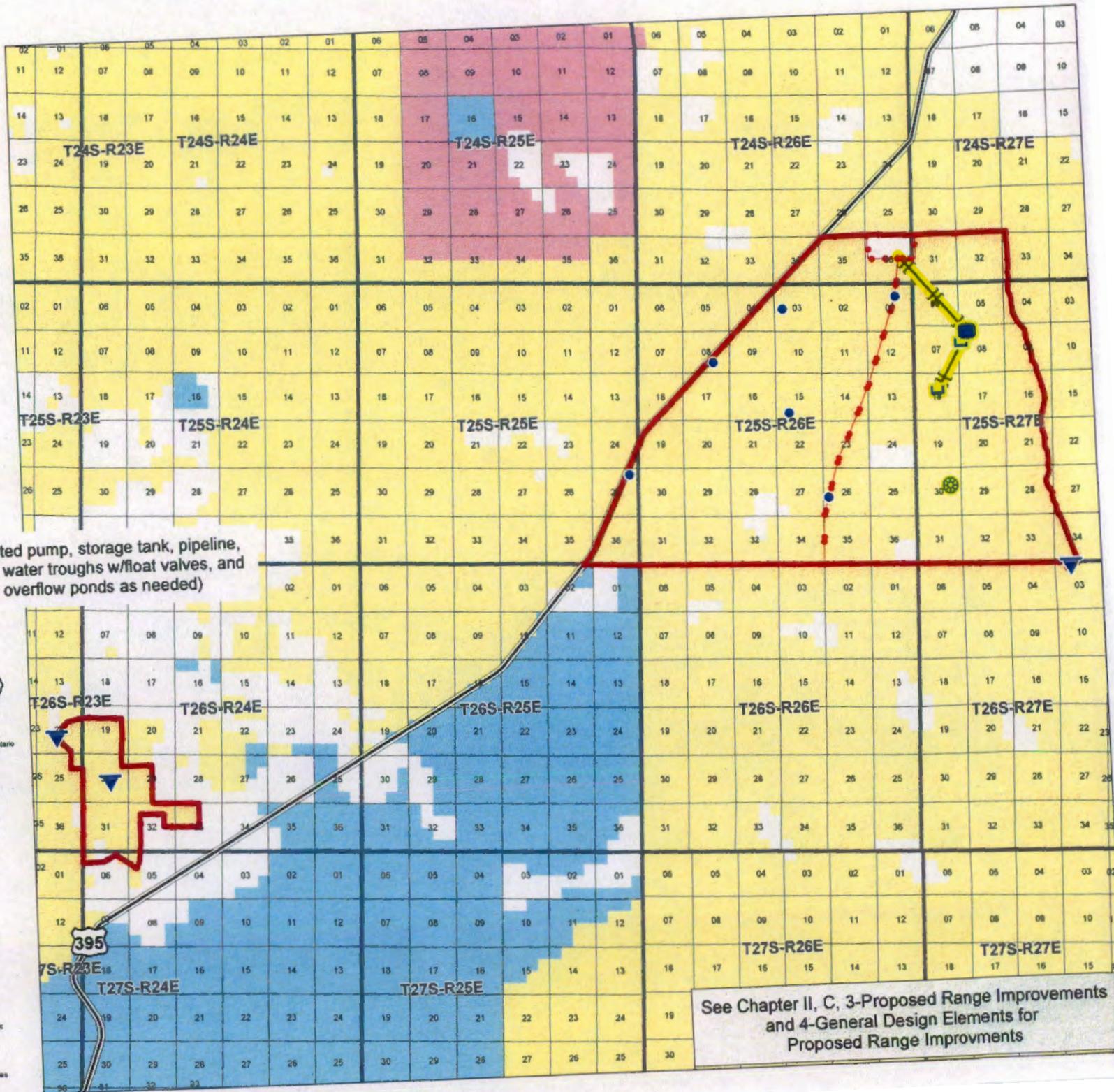
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Map F Capehart Lake Proposed Action Range Improvements

Proposed Projects
Highlighted in Yellow

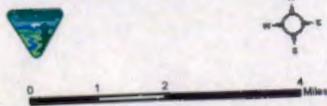
-  Allotments
-  Pastures
-  Bureau of Land Management
-  State
-  Other Federal
-  Private/Unknown
-  Reservoir
-  Waterhole
-  Proposed Pipeline
-  Proposed Tank
-  Proposed Trough
-  Proposed Well (and associated pump, storage tank, pipeline, water troughs w/float valves, and overflow ponds as needed)



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See Chapter II, C, 3-Proposed Range Improvements and 4-General Design Elements for Proposed Range Improvements