BLM

Environmental Assessment

Authorization of Livestock Grazing: Dempsey Basin Allotment #21038

High Desert District - Kemmerer Field Office

June 2014

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BLM/WY/PL-14/023+1020

DOI-BLM-WY-D090-2012-158-EA

1.0 INTRODUCTION

Environmental Assessment	DOI-BLM-WY-D090-2012-158-EA
Title: Authorization of Livestock Grazing: Dempsey Basin Allotment (#21038)	
Allotment Category: Dempsey Basin Allotment: I – Intensive – The objective is to improve resource conditions on the allotment.	
Location: Lincoln County, Wyoming Dempsey Basin Allotment (#21038) T. 24 & 25 N., R. 116 & 117 W. Sections: 29,30,31,32,33,6,1,2,3,10,11,12,7,17,& 18 *(see maps in Appendix 2 for details)	**Environmental Assessment Prepared by:** Bureau of Land Management High Desert District Kemmerer Field Office 312 Highway 189 North Kemmerer, WY 83101

1.1 Background

The Dempsey Basin Allotment is located northwest of Kemmerer, Wyoming approximately 20 miles west of County Road 233, in Lincoln County, Wyoming; Townships 24 and 25 North, Range 116 and 117 West. Land ownership within the allotment is described in Table 1-1. Bureau of Land Management (BLM) records show that livestock grazing has been occurring on the allotment since the 1950's. However, it is likely that livestock grazing occurred in this area prior to the 1950's.

The area west of the Dempsey Basin Allotment is primarily public land with private land north and south of the allotment. The east side of the allotment consists primarily of state and private lands. Annual precipitation ranges from 12 – 16". Elevation on the allotment ranges from ~7,744 feet to ~8,800 feet. Most of the allotment is accessible to livestock except for a small portion on the eastside that has slopes greater than 25 percent that may limit access by livestock. The BLM manages livestock grazing on public land by issuing grazing permits with specified terms and conditions. These permits are issued to qualified applicants and contain stipulations that promote the principles of multiple use and sustained yield. This environmental assessment has been prepared to analyze potential impacts from prospective management actions on the Dempsey Basin Allotment. Most of the permits have been extended under the Appropriations Act or have a short term basis property lease. Permits have been renewed on a temporary basis until the BLM completes the environmental analysis for renewal of these permits or lease in accordance with applicable laws and regulations. After analysis, permits are renewed for a term of ten years.

Table 1-1. Ownership information for the Dempsey Basin Allotment

Allotment Name	Allotment Number	Public Acres	Private Acres	State Acres	Total Acres
Dempsey Basin	21038	11361	3861	640	15862
	Percent:	72%	24%	4%	100%

1.2 Purpose and Need for the Proposed Action

The purpose of the federal action is to respond to a request for a ten-year grazing permit renewal and apply appropriate terms and conditions to grazing permits for the Dempsey Basin Allotment (#21038).

The need for the federal action is established by the BLM's responsibility under the Taylor Grazing Act of 1934 (TGA) and the Federal Land Policy and Management Act (FLPMA) of 1976 to ensure progress towards meeting the Standards for Rangeland Health and to establish allotment specific objectives.

1.3 Decision to Be Made

The BLM will determine what (if any) changes need to be made to grazing management on the Dempsey Basin Allotment. These changes will be reflected on any grazing permits authorizing grazing on this allotment.

1.4 Scoping, Public Involvement and Issues

1.4.1 Internal Scoping

The following issues were identified during internal scoping:

- Will cultural resources be impacted with continued grazing?
- Will non-native or invasive plant species introduction and presence increase as a result of continued grazing?
- Will there be any new impacts to mountain plover or sage-grouse as a result of continued grazing?
- How will competition for forage and crucial deer winter range habitat (Wyoming Range

Herd, Unit 131) and crucial elk winter range habitat (West Green River Herd, Unit 428) be affected by the proposed action and alternatives?

- Will continued grazing increase impacts to wetlands, riparian areas and water quality without revising the terms and conditions of the permit?
- Will consideration of no grazing have an impact on socio-economics (sale and subdivision) of the area?
- How will continued grazing impact soils and vegetation?

1.4.2 External Scoping

On November 29, 2010 a scoping letter was sent to livestock operators and appropriate state organizations, and all other interested parties concerning the grazing permit renewals for the Dempsey Basin Allotment. One comment was received from the Wyoming Game and Fish Department on December 28, 2010 stating they had no terrestrial wildlife or aquatic concerns pertaining to the permit/lease renewal.

2.0 PROPOSED ACTION AND ALTERNATIVES

This environmental assessment (EA) will focus on the Proposed and No Grazing alternatives for grazing permit renewals on the Dempsey Basin Allotment (21038). Since no potential impacts have been identified, there are no issues to resolve through additional mitigation or other action alternatives. The No Grazing alternative is considered and analyzed to provide baseline for comparison of the impacts of the proposed action.

2.1 Alternative 1- No Action

The no action alternative is to renew six existing grazing permits on the Dempsey Basin Allotment (Dempsey Basin Allotment map Appendix 2, also see Table 2-1) for George and Julia Carollo (permittee #1), Aaron, Kristy or Dewayne Carollo (permittee #2), Nate Livestock, LLC (permittee #3) Nate Livestock, LLC (Kennedy lease, permittee #4), Nate Livestock, LLC (Home Place lease, permittee #5) and Nate Livestock, LLC (Zebre lease, permittee #6). Nate's permits are split up into four different permits as requested by the permittees and are in accordance with Orson Nate Trust and lease agreements. The grazing permits would be issued for a term of ten years with current terms and conditions which are allowing the rangeland to meet plant health and vigor.

Livestock grazing will continue as it has in the past with a four pasture rotation grazing system. The current management system is allowing for improvement within the pasture. Carollo's graze on the north portion of the allotment starting in the northeast pasture on May 25 and then move to the northwest pasture around mid-July. They graze in this pasture until livestock are moved

off the allotment on September 30. Nates' graze the north portion of the allotment starting in the southeast pasture and then around mid-July move into the southwest pasture until livestock are moved off the allotment on September 30. Snowloads and moisture prevent alternating pastures, requiring each permittee to start in the lower elevation pasture. Monitoring will continue at existing key areas throughout the allotment. New monitoring areas may be added if warranted. Grazing use within the allotment will meet the goal and objectives outlined in the Kemmerer RMP (BLM 2010) for riparian /wetland stubble heights (four to six inches, where five inch stubble height is the trigger point to start moving livestock into the next pasture and fifty percent utilization levels have been established for upland vegetation species). The KFO RMP also establishes buffer zones along segments of the Sublette Cutoff of the Oregon-California Trail and the Dempsey-Hochaday cutoff of the Oregon-California Trail. These stipulations are included in the terms and conditions of the grazing permit.

Table 2-1. Summary of Total Available Grazing Use by Allotment (see table explanation below)

Allotment	**Allotment #**	**Permit #**	**Season of Use**	**Maximum # of Livestock**	**Livestock Kind**	**Active AUMs**
Dempsey Basin (Nate's)	21038	4904116	5/25 to 9/30	34	Cattle	144
		4903845	5/25 to 9/30	65	Cattle	121
		4900209	5/25 to 9/30	23	Cattle	101
		4904188	5/25 to 9/30	242	Cattle	924
Dempsey Basin (Carollo's)	21038	4904025	5/25 to 9/30	140	Cattle	594
			7/14 to 9/30	16	Cattle	42
		4904026	5/25 to 9/30	76	Cattle	193
			7/15 to 9/30	5	Cattle	8

- **Season of Use**: Livestock will only be authorized to graze on the allotment during the season of use. Livestock may graze throughout the entire season of use, or for shorter periods of time within the season of use. Livestock will not be authorized to graze for any period of time outside the season of use. Dates given are month/day (mm/dd).
- **Maximum # of Livestock:** The maximum number of livestock allowed on the allotment at one time. Note that AUM limitations apply.
- **Livestock Kind**: Cattle will only be authorized to graze on the allotment. See Active AUMs for total number of AUMs allocated.
- **Active AUMs**: The total number of Animal Unit Months available for livestock use on public land within the allotment.

The following mandatory terms and conditions will be included in every grazing permit issued for this allotment:

- **Term:** The period of time during which the grazing permit will be valid. The terms will not exceed ten years.
- **Allotment:** Name and number of the allotment where livestock grazing is being authorized.
- **Number of Livestock:** The number of livestock authorized to graze on the allotment. For a given permit, this number may vary depending on the season of use, so long as the number of AUMs allocated to the permit is not exceeded. The maximum number of livestock on the allotment at one time shall not exceed the number given in Table 2-1 (Maximum # of Livestock).
- **Kind of Livestock:** The kind of livestock authorized to graze on the allotment.
- **Season of Use:** The time of year during which livestock will be authorized to graze on the allotment. This must be within the time frame specified in Table 2-1 (Season of Use).
- **AUMs:** Total forage authorized for livestock consumption. Total AUMs for the allotment shall not exceed the number given in Table 2-1 (Active AUMs).

Grazing permits for the Dempsey Basin Allotment will include all of the Standard Terms and Conditions.

2.2 Alternative 2- Proposed Action

The proposed action is to renew six existing grazing permits on the Dempsey Basin Allotment, as described in section 2.1, but with additional terms and conditions as outlined in sections 4.2 and 4.4.

New terms and conditions will include the ¼ mile buffer zone away from water sources, riparian wetland areas and aspen stands and along segments of the Sublette Cutoff of the Oregon-California Trail and the Dempsey-Hochaday cutoff of the Oregon-California, as outlined in the Kemmerer RMP (BLM 2010).

2.3 Alternative 3 – No Grazing

Under the No Grazing Alternative, livestock grazing would not be authorized on the Dempsey Basin Allotment (#21038). The Kemmerer RMP (BLM 2010) would be amended to exclude livestock grazing on this allotment. No grazing permits would be issued, and existing grazing permits would be cancelled. All AUMs associated within this allotment would be permanently retired. Livestock grazing would be excluded in order to enhance the other land uses in BLM's multiple use mandate (see Federal Land Policy and Management Act of 1976).

2.4 Alternatives Considered but not Analyzed in Detail

None of the issues raised required an additional alternative to avoid potentially significant effects or to meet Standards for Rangeland Health.

2.5 Conformance with LUP Relationship to Statutes, Regulations, Plans or Other Environmental Analyses

The Proposed Action is in conformance with the 2010 BLM Kemmerer Resource Management Plan (RMP) and Record of Decision (ROD). The Proposed Action allows livestock grazing within the Dempsey Basin Allotment and meets the following RMP goals and decisions:

- Management Goal Common to All Resources: Manage vegetation, soil, landform, water quality, and air quality to maintain, meet, or make substantial progress towards meeting the Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the State of Wyoming (Standards and Guidelines).
- Goal LR: 4 - Maintain and (or) enhance livestock grazing opportunities and rangeland heath.
- Decision 4001: Manage vegetative communities in accordance with Wyoming Standards for Healthy Rangelands.
- Decision 6014 - Develop and implement appropriate livestock grazing management actions to address rangeland health standards, improve forage for livestock and enhance rangeland health.
- Decision 6015 - Authorize current amounts, kinds and seasons of livestock grazing uses until rangeland health standards assessment results and (or) monitoring indicates a grazing use adjustment is necessary, or that a kind and (or) class of livestock or season of use modification can be accommodated.
- Decision 6016 - Maintain current allotment categories.
- Decision 6025 - Improve range conditions on I allotments and maintain M and C allotments. Design grazing systems and range improvements to achieve management objectives.
- Decision 7014: No salt licks or mineral supplements are allowed within ¼ mile of live water, sensitive wildlife areas (e.g., greater sage-grouse leks), special status plant locations, NHTs, and significant cultural sites.

The Proposed Action conforms to the Standards and Guidelines for Rangeland Health (43CFR§4180) and Wyoming's Standards and Guidelines for Rangeland Health. In addition, the

Proposed Action would comply with the following laws and/or regulations, other plans, and are consistent with Federal, State, and local laws, regulations:

- Taylor Grazing Act of June 30, 1934, as amended
- Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.)
- Public Rangelands Improvement Act of 1978
- Endangered Species Act of 1973 as amended
- 43 CFR § 4100 Grazing Administration-Exclusive of Alaska
- Clean Water Act Section 303d
- Section 106 of the National Historic Preservation Act of 1966 as amended
- National Environmental Policy Act of 1969
- Sikes Act of 1969, as amended (Habitat Improvement on Public Land)
- Fish and Wildlife Improvement Act of 1978
- Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds
- Record of Decision and Approved Kemmerer Resource Management Plan approved on May 24, 2010
- Grazing Regulations as codified in 43 CFR § 4100 as amended in 2005
  State of Wyoming Executive Order 2011-5 (replaces 2010-4 and 2008-2), Greater Sage Grouse Core Area Protection

3.0 AFFECTED ENVIRONMENT

The affected environment was considered and analyzed by an interdisciplinary team as documented in the Interdisciplinary Team Checklist. The checklist indicates which resources of concern are either not present in the project area or would not be impacted to a degree that requires detailed analysis (see IDT Checklist, Appendix 1).

The following are not present and will not be further analyzed:

Air Quality
Areas of Critical Environmental Concern (ACEC)
Environmental Justice
Prime or Unique Farmlands
Flood Plains
Hazardous or Solid Wastes
Native American Religious Concerns
Paleontology
Public Health and Safety
Traditional Cultural Properties
Visual Resource Management
Wild and Scenic Rivers

Wilderness Values

Resources that could be potentially impacted to a level requiring further analysis are described below.

3.1 Cultural Resources

A cultural resource data review (file search) of the Dempsey Basin Allotment was completed on February 25, 2014 by Doug Tingwall, BLM archaeologist using data available in the BLM KFO cultural resources files and the State Historic Preservation Office (SHPO) Wyoming Cultural Records Office (WYCRO) online-database.

Approximately 21 previous cultural resource inventories and related projects have been conducted within the sections analyzed for the file search between 1979 and the present day. Previous Class III cultural inventories were completed for: five access road projects; three reservoir projects; four oil and gas well pad and road projects; two spring development projects; two power line-related projects associated with the ongoing Gateway Transmission Line undertaking; one pipeline related project; one prescribed burn; a cattle guard project, an undifferentiated range improvement project; and a sample transect of the Overthrust Belt Class II inventory in which Class III standards were applied.

In accordance with section 106 of the National Historic Preservation Act, the BLM must consider impacts to historic properties [sites that are eligible for or listed on the National Register of Historic Places (NRHP)] that may occur within an undertaking's APE.

The Programmatic Agreement among the Bureau of Land Management, Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in which BLM will meet its Responsibilities under the National Preservation Act: State Protocol, (State Protocol), was ratified in 2006 as a supplement to the National Programmatic Agreement. The State Protocol establishes alternative agency procedures for how the BLM will meet its responsibilities under Sections 106, 110 (f) and 111 (a) of the National Historic Preservation Act (NHPA) as a substitute for following the 36 CFR 800 regulations. This allows the BLM to operate more effectively in a manner that works best for the State of Wyoming.

State Protocol Section IV.A.1, Appendix B.2 and B.27 expresses agreement among the partners that the following actions related to dispersed grazing are exempt from case-by-case review:

- Appendix B.2: Issuing leases, easements, rights-of-way, and permits that do not authorize or promote surface disturbance.

- Appendix B.27: Renewal of grazing leases/permits where type of animals and seasons of use do not change.

By precedent, "surface disturbance" has been understood to refer specifically to substantial modification or actual intrusion into the soil created by mechanized equipment or vehicles; this definition does not refer to any activity that occurs solely on top of the ground surface.

Because of these exemptions in the State Protocol, dispersed grazing activities have been determined to have no potential to adversely affect historic properties for the purposes of complying with Section 106 of the NHPA. However, the BLM does recognize that, under the terms of the National Environmental Policy Act (NEPA), cultural resources found on the surface have the potential to be impacted by livestock grazing.

The effects of livestock grazing on cultural resources generally consist of artifact breakage or abrasion, horizontal displacement, and vertical migration (Osborn and Hartley, no date; Osborn et al. 1987; Nielson, 1991). While materials such as bone, shell, and ceramic artifacts tend to suffer the most significant damage, experimental studies have shown that lithic artifacts, the most common material found on the surface of sites located in the KFO, can exhibit micro-chipping and flake scars along their edges. Archaeologists unfamiliar with the effects of grazing have incorrectly interpreted this breakage as evidence of human modification. Another effect of trampling is horizontal displacement, which can alter the spatial distribution of surface artifacts. Bulkier materials tend to move towards the margins of the trampled area while smaller items tend to remain in their original location. A third potential consequence of trampling is vertical migration of artifacts, which means that materials can move downward within the uppermost portion on the stratigraphic layer. However, according to Nielson's experimental results (1991), the maximum vertical migration was 1.5cm, which is insignificant for archaeological interpretation.

Most studies that have documented impacts due to trampling have tended to focus primarily on disturbances that occurred where groups of animals were concentrated rather than dispersed. Additionally, no studies have been reported in southwest Wyoming that document the effects of authorized, dispersed grazing use on historic properties.

Though the potential impacts of livestock grazing are acknowledged, we must also consider those impacts in comparison to other forms of natural disturbance. Natural processes that displace sediment can also alter the original distribution of artifacts, particularly those occurring on the surface, as well as the environmental context in which artifacts are found. These processes include: weathering, erosion, disturbance by animals and plants, and disturbance by freeze and thaw cycles. Furthermore, ungulates such as elk, deer, and antelope have undoubtedly trampled archaeological remains for thousands of years. These processes impact cultural resources from

the time they are created and contribute to the overall contextual record that archaeologists routinely interpret.

A total of 22 cultural resources have been documented within the data review area of which approximately 59% are prehistoric, 27% are historic, and 14% are multicomponent, having both prehistoric and historic elements. Of the 22 total cultural resources documented in the data review area, only three National Register of Historic Places (NRHP) eligible sites (historic properties) and nine unevaluated sites occur within the Area of Potential Effects (APE) defined by the boundaries of the Dempsey Basin Allotment. The three historic properties include: two NHTs, the Sublette Cutoff (48LN225) and the Dempsey-Hockaday Cutoff (48LN950); and one prehistoric camp (48LN2486). The previously mentioned prehistoric camp, exhibits a buried archaeological component and was determined eligible for inclusion in the NRHP based on Criterion D, as defined in 36 CFR 60.4, for the potential important information it has to contribute to understanding the region's prehistory. Although the site exhibits artifacts on the surface, the scientific value of this site that makes it NRHP-eligible, is primarily found in its buried assemblage, which is protected from potential impacts by livestock trampling. (For a more detailed description of historic properties and the criteria that determine their eligibility for inclusion in the NRHP, please see pages 3-94 and 3-95 of the 2008 Proposed RMP and Final EIS for the KFO Planning Area.)

A Class 1 segment of the Dempsey-Hockaday Cutoff of the Oregon-California NHT (48LN950) crosses the southern half of the grazing allotment. In addition, a Class 1 segment of the Sublette Cutoff of the Oregon-California NHT (48UT225) crosses portions of the southwest and western edges of the grazing allotment. The segments of NHTs within the APE were previously determined to be NRHP-eligible under Criterion A because they are associated with events that made significant contributions to broad patterns of American history. Under the Class I category, the trail traces and associated sites retain good to excellent integrity of location, setting, feeling, and association (BLM 2008). In other words, the trail traces readily convey the historic sense of the period of the trail's significant use and represent some of the best remaining segments of the NHT system in the state of Wyoming. A detailed historic narrative describing the significance of the Oregon-California NHT can be found in the 2008 Proposed RMP and Final EIS for the Kemmerer Field Office Planning Area (BLM 2008, 2010).

The remaining nine sites in the APE are unevaluated for NRHP eligibility and include: three prehistoric lithic scatters or locations where stone was flaked in the production of tools; two prehistoric camps; two sites where prehistoric camps or lithic scatters are overlain by historic period artifacts; one historic homestead; one historic cabin; and one historic cattle ranch (48LN1010) which will not be discussed further as it is not documented sufficiently to analyze potential effects. Historic ranches and their associated artifacts and features were often created to support livestock grazing operations in the area and, in some cases, are currently maintained for

that purpose; therefore, by definition, these sites cannot be negatively impacted by modern grazing activities.

Historic properties that derive their significance all, or in part, from their surface manifestations or the natural context and setting of the property require special consideration. These site types include, but are not limited to, segments of the National Historic Trails system, prehistoric or historic structures or structural remnants, prehistoric rock alignments, rock shelters, areas with known pictographs and/or petroglyphs, or sites or areas of known traditional significance to Native American or other recognized groups. In most cases, a dispersed grazing pattern, such as that associated with livestock pasture rotation, in the vicinity of these cultural property types will have no effect on these resources. However, additional protection of these resources can be accomplished by requiring stipulations such as restricting supplemental feed, salt/mineral blocks, or other measures that would artificially concentrate livestock in one place from these areas. The 2010 Record of Decision and Approved Kemmerer Resource Management Plan (Decision 5011) requires that historic trails' integrity of setting be maintained and that the trail traces be protected from visual intrusion and surface disturbance within a protective corridor that is a quarter mile from either side of the trail, where significant values are present.

In summary, domestic livestock have occupied southwestern Wyoming for over 100 years with no documented impacts to significant cultural resources in the area as a consequence of authorized, dispersed livestock grazing within allotment boundaries. The greatest potential for range and livestock grazing practices to impact historic properties in this area comes from unauthorized construction associated with range improvement and/or range management projects (e.g. bladed fence line routes, waterlines, spring & reservoir construction projects, redirecting natural drainage channels, etc.). Any such unauthorized development on federal lands within this allotment is a violation of applicable federal regulations and will be dealt with accordingly.

3.2 Non-native or Invasive Plant Species

Weeds known to grow on the allotment are black henbane (*Hyoscyamus niger),* cheat grass (*Bromus tectorum,)* Canada thistle *(Cirsium arvense),* musk thistle (*Carduus nutans L.)* and houndstongue *(Cynoglossum officinale L*.). Weeds are primarily absent in the uplands or are limited to roadways and other disturbed area within the allotment. Weed species, if not controlled, have been known to take over major portions of rangelands. This makes the area less desirable or unusable by livestock and wildlife species. It also makes the area less desirable for recreationists and hunters who like to experience the outdoors.

3.3 Biological Resources

3.3.1 Wildlife

The environmental impact statement (EIS) for the Kemmerer Resource Management Plan (RMP) describes in detail the habitats and life cycle requirements for wildlife species in the Kemmerer

planning area (USDI BLM 2008, pp. 3-59 - 3-89). Field observations suggest the plant communities within the Dempsey Basin allotment are capable of sustaining viable populations and diversity of native plant and animal species appropriate to the area. In addition, the BLM has conducted a field investigation of the project area to determine the potential impacts on identified wildlife species. The following section provides an overview of only those species that may be affected in the project area.

The following discussion is for species that are either known to occur or the habitat is present for the species to potentially occur within the entire project area.

General Wildlife and Fish

Additional wildlife and fish species, beyond those discussed below, are present in the project area but their population sizes are stable on average and do not currently exhibit negative density or distribution trends which would warrant additional protection under the Endangered Species Act (ESA). Mammals potentially occurring in the project area include: badger, red fox, coyote, desert cottontails, white-tailed jackrabbit, ground squirrels, chipmunks, mice, voles, shrews, northern pocket gopher and big game species. Additional information is provided below on big game species managed by the Wyoming Game and Fish Department (WGFD), migratory birds that may be present in the study area for brief periods, and Canada Lynx (*Lynx canadensis*) which is listed as an endangered species.

Big Game

Moose

Moose (*Alces alces shirasi*), the largest members of the deer family, are primarily browsers and depend upon a diet of shrubs and young deciduous trees for much of the year. They are often associated with river bottoms, ponds, and lakes with an abundance of shrubby and aquatic vegetation. Herd Unit 417 encompasses the entire project area. The herd unit begins where Interstate 80 crosses the Wyoming-Utah State line; northerly to the Wyoming-Idaho State line; northerly to the divide between the Salt River and Bear River; easterly to the divide between the Salt River and the Smiths' Fork; southeasterly to the divide between the Greys River and LaBarge Creek; easterly to the Lower Farson Cutoff Road (Sweetwater County Road 8); easterly to Wyoming Highway 28; easterly to the continuation of the Lower Farson Cutoff Road (Sweetwater County Road 8); southerly to the Blue Rim Road (Sweetwater County Road 5); southerly to I-80; westerly to the Wyoming Utah State Line (WGFD 2012). Herd Unit 417 is approximately 2.8 million acres, of which approximately 15,862 acres (0.54%) lies within the project area. The current estimated population is 580 individuals, which is 64.2% below the population objective of 1,620 (WGFD 2011). Winter observation flights for 2012-2013 were not completed by the WGFD. Flight data will be available for 2013-2014 in the fall 2014. The area

contains approximately 620 acres of crucial winter year-long habitat, approximately 1,080 acres of winter habitat, and 13,528 acres of winter year-long habitat.

Mule Deer

Mule Deer (*Odocoileus hemionus*) occur throughout western North America in a wide variety of habitats from deserts, riparian areas, broken grasslands, shrublands, foothills, and forests to tundra (Clark and Stromberg 1987). In Wyoming, mule deer provide recreational, aesthetic, and economic values to hunters, wildlife enthusiasts, and local business throughout the State (Olson 1992). More than 100,000 hunters annually pursue this species in Wyoming, spending an average of more than 336,000 days in the field to harvest more than 60,000 animals (Olson 1992). Based on hunter harvest reports, mule deer are the most frequently taken big game animal in Wyoming (Clark and Stromberg 1987).

The project area is located completely within Mule Deer Herd Unit 131. Herd Unit 131 (Wyoming Range mule deer herd) begins at the junction of US Highway 30 and Interstate 80; westerly along I-80 to Wyoming Highway 412; northwesterly to US Highway 189; southerly to Muddy Creek; westerly to the Amoco Sulfur Haul Road; southwesterly along the Sulfur Haul Road to the Whitney Canyon Road; westerly to the Uinta County Road 103; southerly to Wyoming Highway 89; northerly to the Wyoming-Utah State line; northerly to the Wyoming-Idaho State line; northerly to the Snake River; easterly to Bailey Creek; southerly to Dry Wash Draw; easterly to the top of Greyback Ridge; southerly to the head of the South Fork of South Cottonwood Creek; easterly to South Cottonwood Creek; easterly to Cottonwood Creek; easterly to the Green River; southeasterly to Fontenelle Dam and the Fontenelle Dam Road (Lincoln County Road 313); westerly to Lincoln County Road 316; southerly to Wyoming Highway 372; southeasterly to I-80; westerly to the US Highway 30 and I-90 junction (WGFD 2012). This herd unit encompasses approximately 3.6 million acres, of which 15,862 acres (0.42%) lie within the project area. The current estimated population for Herd Unit 131 is 34,000 individuals which is 32% below the population objective of 50,000 (WGFD 2012). The area contains approximately 15,862 acres of spring, summer, and fall range.

Pronghorn antelope

The pronghorn antelope (*Antelocarpa americana*) is the predominant ungulate of the high sagebrush-steppe ecosystems in western North America (Reeve 1984). Pronghorn populations were estimated at 45 million prior to European settlement (Clark and Stromberg 1987). By 1924, the population was approximately 14,000 (Clark and Stromberg 1987). Since then, their numbers have increased (Clark and Stromberg 1987), and today there are approximately 500,000 within Wyoming alone (WGFD 2009).

The project area is located within Antelope Herd Unit 419. This is a large area beginning where Interstate 80 crosses the Wyoming-Utah State line; easterly to the junction of I-80 and US

Highway 30; north, northwest to US Highway 189; north along US Highway 189 to the Hamsfork River; northerly along the Hamsfork River and Hamsfork Creek to Commissary River; southwesterly along the divide between the Salt River and Smith's Fork; westerly along the divide between the Bear River and Salt River along the Wyoming-Idaho State line; southerly along the Wyoming-Idaho State line to the Wyoming-Utah State line; southerly along the Wyoming-Utah State line to Interstate 80 (WGFD 2012). The entire herd unit encompasses approximately 1.7 million acres, of which all 15,862 acres (0.89%) lie within the project area.

The allotment contains only about 14,325 acres of spring, summer, and fall pronghorn range classified by the WGFD. According to the most recent WGFD Job Completion Report (JCR) (WGFD 2012), the herd contains 4,945 individuals and therefore, is about 17.6% under the population objective of 6,000. The area contains approximately 15,862 acres of spring, summer, and fall range.

Elk

Elk (*Cervus canadensis nelsoni*) once ranged from northern Canada southward along the California coastline, and throughout much of the United States (Clark and Stromberg 1987). Today, the range has been reduced, however, due to reintroduction efforts; the elk is being restored in many parts of the historical range. In Wyoming, they occur from deserts to timbered areas, and occupy habitats dominated by shrubs and grasses to high mountain meadows of grasses and forbs (Clark and Stromberg 1987).

The project area lies entirely within Elk Herd Unit 428. The herd unit begins where Interstate 80 crosses the Wyoming-Utah State line; northerly along the State line to the Wyoming-Idaho States line; northerly along said line to the divide between the Salt River and Smiths' fork; northeasterly along said divide between Smiths' Fork Creek and Greys River; southeasterly along said divide to Commissary Ridge; southerly along said ridge to the head of LaBarge Creek; southeasterly down said creek to the Green River; southerly down said river to U.S. Highway 28; southwesterly along said highway to Wyoming Highway 372; southerly along said highway to Interstate 80; westerly along said highway to the Wyoming-Utah State line (WGFD 2012). The herd unit encompasses approximately 2.6 million acres, of which 15,862 acres (5.86%) lie within the project area.

The herd unit has an estimated population of 4,746 individuals, which is approximately 53.1% above the current population objective of 3,100 (WGFD 2012). There is approximately 910 acres of elk crucial winter range and 14,318 acres of spring, summer, and fall range.

Migratory Birds

The Migratory Bird Treaty Act (MBTA), as amended, was implemented for the protection of migratory birds. Unless permitted by regulations, the MBTA makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including feathers or other

body parts, nests, eggs, or migratory bird products. In addition, Executive Order 13186 sets forth the responsibilities of Federal agencies to implement the provisions of the MBTA by integrating bird conservation principles and practices into agency activities and by ensuring that Federal actions evaluate the effects of actions and agency plans on migratory birds. Wyoming BLM non-sensitive migratory birds that could nest in the project area include: vesper sparrow, horned lark, black-billed magpie, common raven and various raptor species.

Raptors are protected under the MBTA. Although there are no known nest locations within the project area, suitable habitat is available. In addition to nesting habitat for raptor species, the project area provides foraging habitat for migratory raptor species, such as rough-legged hawks.

Special Status Species

Special Status Species (SSS) include those species federally listed under ESA by the US Fish and Wildlife Service (USFWS) and the Wyoming BLM Sensitive Species (WBSS) designated by the BLM Wyoming State Director.

In accordance with Section 7 of the ESA, as amended, the lead agency in coordination with USFWS must ensure that any Federal action to be authorized, funded, or implemented would not adversely affect a federally listed species, or its designated critical habitat. Within the Kemmerer Field Office boundaries, the USFWS required eight threatened or endangered animal species and two plant species to be analyzed for all proposed actions (USDI USFWS 2011a). Of those nine species, Canada lynx and Colorado River fishes would be potentially affected by the implementation of this Proposed Action. The other four species (Ute ladies'-tresses, blowout penstemon, black-footed ferrets, and grizzly bear) were not present within the project boundary; therefore, these four species will not be discussed further within this EA.

Special Status Species Management Policy 6840 requires the BLM not only to manage species listed under the ESA, but to also manage the WBSS to prevent the need for future listing under the ESA. A total of 41 WBSS animals potentially occur within the KFO, sixteen (16) are either known to occur or the habitat is present for the species to potentially occur within the action area (USDI BLM 2010a). The other twenty five (25) species will not be discussed further within this EA.

Table 3-1. Special Status Species potentially occurring within the Project Area.

Species	Scientific name	Status	Habitat	Habitat Type
Greater Sage-grouse	*Centrocercus urophasianus*	SSS[2]; Candidate[3]	habitat present	basin-prairie shrub and mountain-foothill shrub
Canada lynx	*Lynx canadensis*	Threatened[1]	potential habitat present	Forested areas; Lynx Analysis Units (LAUs)

ferruginous hawk	*Buteo regalis*	SSS[2]	habitat present	Basin-prairie shrub, grasslands and rock outcrops
sage thrasher	*Oreoscoptes montanus*	SSS[2]	habitat present	basin-prairie shrub and mountain-foothill shrub
Brewer's sparrow	*Spizella breweri*	SSS[2]	habitat present	basin-prairie shrub
sage sparrow	*Amphispiza belli*	SSS[2]	habitat present	basin-prairie shrub and mountain-foothill shrub
loggerhead shrike	*Lanius ludovicianus*	SSS[2]	habitat present	basin-prairie shrub and mountain-foothill shrub
pygmy rabbit	*Brachylagus idahoensis*	SSS[2]	habitat present	basin-prairie and riparian shrub
Idaho pocket gopher	*Thomomys idahoensis*	SSS[2]	habitat present	shallow stony soils
tufted twinpod	*Physaria condensata*	SSS[2]	habitat present	sparsely vegetated shale slopes
northern leopard frog	*Rana pipiens*	SSS[2]	habitat present	pond margins, wet meadows and riparian areas
Great Basin spadefoot toad	*Spea intermontana*	SSS[2]	habitat present	spring seeps, permanent and temporary water
Ute ladies'-tresses	*Spiranthes diluvialis*	SSS[2]; Threatened[1]	None - no habitat present	moist streambanks and wet meadows
bonytail chub	*Gila elegans*	SSS[2]; Threatened[1]	None - no habitat present	Colorado river drainages
Colorado pikeminnow	*Ptychocheilus lucius*	SSS[2]; Threatened[1]	None - no habitat present	Colorado river drainages
humpback chub	*Gila cypha*	SSS[2]; Threatened[1]	None - no habitat present	Colorado river drainages
razorback sucker	*Xyrauchen texanus*	SSS[2]; Threatened[1]	None - no habitat present	Colorado river drainages
white-tailed prairie dog	*Cynomys leucurus*	SSS[2]	habitat present	basin-prairie shrub and grasslands
black-footed ferret	*Mustela nigripes*	SSS[2]; Candidate[3]	None - no habitat present	grasslands and prairie dog towns
burrowing owl	*Athene cunicularia*	SSS[2]	habitat present	basin-prairie shrub and grasslands
whitebark pine	*Pinus albicaulis*	SSS[2]; Candidate[3]	habitat present	Montane forests and on thin, rocky cold soils at or near timberline at 1300-4700m

limber pine	*Pinus flexilis*	SSS[2]	habitat present	Timberline and at lower elevations with sagebrush. Associated species are Rocky Mountain Lodge pole pine, Engelmann spruce, white bark pine, Rocky Mountain Douglas-fir, subalpine fir, Rocky Mountain Juniper, Mountain Mahogany, and common juniper.
[1]USFWS ESA-listed species				
[2]Wyoming BLM Special Status Species				
[3]Proposed for listing as threatened under the ESA				

Greater Sage-grouse

Greater Sage-grouse (*Centrocercus urophasianus*) were originally proposed for protection under the endangered species list on July 2, 2002. Most recently, after several 90-day findings, the USFWS issued a proposed rule of "Warranted, but precluded by higher priority listing actions" (USDI USFWS 2010a). Due to this rule, the sage-grouse is not listed at this time; however, precautions should be taken to avoid listing. Several factors could move the species higher on the ranking list and closer to listing.

Currently Greater Sage-grouse distribution and sagebrush habitat encompasses parts of 11 states in the western United States and two Canadian provinces, occupying approximately 56% of their historical range (Schroeder et al. 2004). Sage-grouse distribution is strongly associated with distribution of sagebrush (*Artemisia* spp.), and in particular, big sagebrush (*A. tridentate*) (Schroeder et al. 2004). Sage-grouse show high fidelity to an area. During the breeding season (March-May), male sage-grouse gather together to perform courtship displays at known locations called "leks." Leks are generally areas of little or no vegetation or cushion plant communities. Leks can be formed opportunistically or near nesting habitat (USDI USFWS 2010a). Females have been documented to travel more than 12.5 miles to their nesting site after mating (Connelly et al. 2000), however, studies conducted in Wyoming indicate that 45% of sage-grouse hens nest within 1.86 miles of the lek, while 64% nest within 3.11 miles (Holloran and Anderson 2005). Sage-grouse nesting habitat is generally described as sagebrush that has a canopy cover between 15% and 30%, and heights between 11 and 32 inches (USDI BLM 2004). During the first 2-3 weeks, hens rear their broods in what is considered early brood-rearing habitat (within 1.2 miles of the nest in Wyoming, on average (Cagney et al. 2010)). Typically this area has sufficient cover and is adjacent to foraging areas containing forbs and insects.

By using information for Greater Sage-grouse Core Area Protection, as described in the State of Wyoming, Governor's Executive Order (EO 2011-5), the entire project area, 15, 228 acres, is within the "Sage" Sage-grouse Core Area (Appendix 2, Map 4). There are two known sage-

grouse leks within the project boundary, both of which are within the core area. Leks names, along with 10 year average attendance by males, are listed in the following Table 3-2.

Table 3-2 Lek name, attendance by ten year averages.

Lek Name	Lek attendance by males 10 year average (1991-2000)	Lek attendance by males 10 year average (2001-2010)
Dempsey Basin	33.2	18
North Fork Dempsey Creek*	-	93
Total	16.6	55.5
* indicates lek was discovered in 2004		

Canada lynx

The Canada lynx (*Lynx canadensis*) inhabits northern coniferous forests made up of a majority of aspen and mixed conifer stands in the project area. They exist mainly in the areas with high densities of snowshoe hare (*Lepus americanus*) which is the main prey species for the Canada lynx. The Canada lynx is commonly mistaken with the much more abundant bobcat (*Lynx rufus*) whose range is most of the continental United States. The Canada lynx differs in that it has long ear tufts; larger feet and a tufted tail that is entirely black tipped (Reid 2006). Approximately 2,508 acres of the project area is located within the Dempsey Ridge LAU. Currently, this area is considered unoccupied habitat but the BLM strives to keep connectivity habitat but maintaining multi-story canopy cover.

On July 8, 1998, the USFWS published a proposed rule to list the lynx as threatened under the ESA. On March 24, 2000, the USFWS published the final rule listing the contiguous United States Distinct Population Segment (DPS) as a threatened species (USDI USFWS 2000). Through analysis, the USFWS concluded that that the single factor threatening the contiguous US DPS of lynx was the inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx in the National Forest Land and Resource Management Plans and the BLM Land Use Plans (ILBT 2013).

Ferruginous hawk

Ferruginous hawks (*Buteo regalis*) prefer arid and semiarid grassland habitat with open, level or rolling prairies and foothills. Although there are no known nests in the area, the allotment has suitable foraging and nesting habitat for ferruginous hawks.

Sage obligate songbirds

Sage thrasher (*Oreoscoptes montanus*), Brewer's sparrow (*Spizella breweri*), sage sparrow (*Amphispiza belli*), and loggerhead shrike (*Lanius ludovicianus*) are considered sage-obligate species, meaning they require sagebrush ecosystems for reproduction and survival. Loggerhead shrikes are shrub-nesting sagebrush obligates meaning they require sagebrush for successful reproduction but not necessarily for food or other resources. Slight variation in habitat preference exists among these species. Even with slight variability, all of these species inhabit prairie and foothill shrublands where sagebrush is present, often using tall shrubs with low grass cover and clumped sagebrush in a patchy landscape. This type of habitat occurs throughout the action area.

Pygmy rabbit

Pygmy rabbits (*Brachylagus idahoensis*) depend upon stands of tall, dense sagebrush in conjunction with deep, friable soil, the combination of which provides cover, food, and burrows (Keinath and McGee 2004). Purcell (2006) found that pygmy rabbits occurred within areas mostly comprised of Wyoming big sagebrush, however, habitats dominated by mountain big sagebrush, shrub dominated riparian, black sage steppe, or desert shrub also had pygmy rabbit occurrences. The distribution of this species is not continuous but is patchy within this range, thus the distribution of pygmy rabbits likely shifts over time in response to disturbances such as fire, flooding, grazing, and crop production, as well as weather patterns (Keinath and McGee 2004). A small percentage of habitat occurs throughout the action area.

Idaho pocket gopher

There are several species of pocket gophers in Wyoming and the surrounding states. All look very similar, making it difficult to distinguish specimens to species. Reliable identification has to involve chromosomal analysis (i.e. karyotyping to count chromosome number), with supporting information from geographic location, pelage characters, and overall morphology (Beauvais and Dark-Smiley 2005). Idaho pocket gophers (*Thomomys idahoensis*) are very small, with yellowish to dark brown fur; they lack ear patches and contrasting cheeks, and dorsal regions are uniform in color (Clark and Stromberg 1987). *T. idahoensis*, along with other members of the pocket gopher family are highly adapted to fossorial (underground) living (Beauvais and Dark-Smiley 2005, Griscom et al. 2010).

T. idahoensis occurs from southwestern Montana, through eastern Idaho to southwestern Wyoming. Little is known about its habitat but its distribution suggests a preference for mountain foothill shrubland and a higher tolerance for rocky soils (Griscom et al. 2010). In Wyoming, the species occupies shallow, stony soils and has been documented in open sagebrush, grassland plains, and subalpine mountain meadow habitats in Wyoming (Beauvais and Dark-Smiley 2005). The Biotics database maintained by the Wyoming Natural Diversity Database (WYNDD) contains only 33 known occurrences of *T. idahoensis* in Wyoming, all falling within the sagebrush foothills zone of the Wyoming Range, Uinta, and Wind River Mountains

(Beauvais and Dark-Smiley 2005, Griscom et al. 2010). Very little is currently known about its biology and ecology (Griscom et al. 2010), but the species is assumed to be rare and has a limited distribution (Beauvais and Dark-Smiley 2005). Even though Idaho pocket gophers have not been observed, current habitat projections indicate that the species has the potential to occur throughout the project area.

Tufted twinpod

Prior to 1975, the tufted twinpod (*Physaria condensata*) was known to exist in only two locations, one of which was on the sloped of Bridger Butte in Uinta County, Wyoming (Fertig 2002). This prompted a recommendation of "threatened" under the ESA in 1975 (Fertig 2002). However, surveys conducted by Robert Dorn and Robert Lichvar from 1977-1982 demonstrated that *P. condensata* was more widespread and abundant in southwestern Wyoming than previously suspected, and the species was dropped as a candidate for Federal protection (Fertig 2002, USDI USFWS 1985). Due to its limited geographic range and high habitat specificity, *P. condensata* has remained a species of special concern in Wyoming and was listed as "Sensitive" by the Bureau of Land Management (BLM) Wyoming State Office in 2001 (USDI BLM 2001b, Fertig 2002).

Tufted twinpod occurs primarily on south, west, or east facing, semi-barren, wind-blasted upper slopes and rims of calcareous shale or sandstone desert mesas at elevations of 6,000-7,760 feet (Fertig 2002). Populations are typically found in cushion plant/bunchgrass communities dominated by shortstem buckwheat, rayless tansyaster, northern Indian parsnip, hood phlox, Sandberg bluegrass, bluebunch wheatgrass, and Indian ricegrass within openings in denser Utah juniper or big sagebrush communities (Fertig 2002). Occasionally, *P. condensata* may also occur in cushion plant communities with scattered black sagebrush, green rabbitbrush, Utah serviceberry, shadscale, antelope bitterbrush, or mountain mahogany (Fertig 2002). Tufted twinpod is usually found on convex or concave slopes of 10-15 degrees and becomes rare to absent on summit flats, even in areas with low vegetative cover and shallow, rocky soils (Fertig 2002).

Tufted twinpod is endemic to the southern Overthrust Belt and lower Green River Basin in Lincoln, Uinta, and Sublette counties, Wyoming (Fertig 2002). It is known from 17 occurrences consisting of at least 43 discrete subpopulations and occupying a minimum area of 160-175 acres (Fertig 2002). Based on modeling, 4,012 square kilometers of potential habitat is restricted to the desert mountains of the Overthrust Belt in southern Lincoln and western Uinta counties and the Little Colorado Desert of southern Sublette County and coincides with the known distribution of this species (Fertig 2002). Within the project area there are approximately 210, 055 acres of potential habitat and two known locations.

Herbivory of fruits and seeds is relatively common by rodents and ants (Fertig 2002). With the exception of fruits and seeds, the plant's low stature, dense covering of hairs, and presence of

inedible mustard oils prevents its foliage from being browsed by most native herbivores or livestock (Fertig 2002).

Northern leopard frog

On June 5, 2006, the USFWS received a petition to list the northern leopard frog (*Rana pipiens*) as threatened under the ESA (USDI USFWS 2009b). On July 1, 2009, the USFWS published a 90-day finding (UDSI USFWS 2009b), in which information for the status review was to be submitted to the USFWS by August 31, 2009. On October 28, 2009, the USFWS again published a 90-day finding extending the information soliciting period to November 27, 2009 (USDI USFWS 2009a). On October 5, 2011 the USFWS published the 12-month finding for this species which was "not warranted at this time" (USDI USFWS 2011b). "It is classified as a sensitive species by the Bureau of Land Management (BLM) in Wyoming due to recently observed declines in abundance and distribution across its range in the Rocky Mountains" (Smith and Keinath 2004, USDI BLM 2010b).

R. pipiens is a formerly abundant frog that has experienced dramatic declines across its range and is considered endangered in some parts of the range but still abundant in other parts of the range (Smith and Keinath 2004). The northern leopard frog is basically a species of cooler climates, with a range that encompasses most of the northern states of the United States and far north into Canada (Smith and Keniath 2004). The species ranges southwards only in the western United States, in the higher elevations of the Rocky Mountains (Smith and Keinath 2004).

Northern leopard frogs require a broad range of habitats in close proximity due to their complicated life histories (Smith and Keinath 2004). Northern leopard frogs breed and lay eggs in stock ponds, semi-permanent ponds, in the margin of larger lakes, and beaver ponds (Smith and Keinath 2004). However, when streams are used for reproduction, eggs are deposited in backwaters out of the main flow of the stream (Smith and Keinath 2004). Following reproduction adult northern leopard frogs move into upland habitat where they may feed for the summer (Smith and Keinath 2004). However, this portion of the life history for the northern leopard frogs has been frequently neglected (Smith and Keinath 2004). In the fall, subadult and adult frogs migrate to overwintering sites in order to hibernate under water in ponds (Smith and Keinath 2004).

Currently, there are no known occurrences of northern leopard frogs within the project area. However, habitat for the species occurs throughout the area due to the numerous riparian areas along Dempsey Creek and its tributaries, Wilkinson Creek, the West Fork of Beaver Creek, and the numerous natural springs/seeps that occur on the allotment.

Great Basin spadefoot toad

The Great Basin spadefoot toad (*Spea intermontana*) is currently recognized by some State agencies as a sensitive species, often because too little is known about it to provide evaluations

on population status and viability throughout its range (Buseck et al. 2005). The Wyoming BLM lists *S. intermontana* as a sensitive species (USDI BLM 2010a).

In Wyoming, *S. intermontana* distribution is patchy, with sightings recorded mostly west of the Continental Divide (Buseck et al. 2005). *S. intermontana* have been documented at 44 sites in Sweetwater County, six sites in Freemont County, and one site in Uinta, Lincoln, and Natrona Counties over the past 94 years (WYNDD 2005, Buseck et al. 2005). Little to no information exists on the abundance of *S. intermontana* across its range, in part, this lack of information is due to the behavior of *S. intermontana* during the non-breeding months (i.e., it is active nocturnally only on humid/rainy evenings and spends inactive periods within inconspicuous burrows; Buseck et al. 2005). Also, the naturally fluctuating populations and sporadic breeding habits of *S. intermontana* make it difficult to monitor populations (Buseck et al. 2005).

S. intermontana are a xeric-adapted amphibian (Buseck et al. 2005). They require a water source for breeding and larvae/tadpole development in the spring and summer months, and loose sandy soil within arid habitats during the non-breeding season with adequate vegetative cover to provide foraging sites and climate protection to retain soil moisture (Buseck et al. 2005). In Wyoming, *S. intermontana* are probably found within the soil orders Aridisols (a soil type with distinct horizons that occurs in desert basins and that has accumulations of clay, calcium carbonate, gypsum, and/or soluble salts) and Entisols (soils that are young and have little or no profile development, such as those that occur on eroding slopes and along ephemeral streams; (Knight 1994) based on associated vegetation (Buseck et al. 2005)).

S. intermontana use both ephemeral and permanent water sources, which is unique when compared to other spadefoot toads which breed in ephemeral sources (Buseck et al. 2005). For example, Hovingh (1985) reported that *S. intermontana* utilized every type of water source available in the Bonneville Basin (only 8% were entirely natural), as long as the total dissolved solids were less than 5000 mg/l. The most successful breeding sites (i.e., little or no dead tadpoles observed) were at water sources that desiccated during the summer, had large draw-downs of water, or had stream beds scoured by flash floods (i.e., lacked littoral vegetative growth).

At this time there are no known observations within the allotment. However, habitat for the species occurs throughout the area due to the numerous riparian areas along Dempsey Creek and its tributaries, Wilkinson Creek, the West Fork of Beaver Creek, and the numerous natural springs/seeps that occur on the allotment. In addition, there are numerous areas that collect rain water and moisture from runoff events that could provide habitat for this species.

Ute ladies' tresses

The Ute ladies' tresses (*Spiranthes diluvialis*) is an orchid that grows on moist sub-irrigated or seasonally flooded soils in valley bottoms, gravel bars, old oxbows, or floodplains bordering springs, lakes, rivers, or perennial streams at elevations between 1,780 and 6,800 feet (USDI

BLM 2010b). Populations have been documented from alkaline sedge meadows, riverine floodplains, flooded alkaline meadows adjacent to ponderosa pine-Douglas-fir woodlands, sagebrush steppe, and streamside floodplains (USDI BLM 2010b). The Ute ladies'-tresses is well adapted to disturbances from stream movement and is tolerant of other disturbances, such as light grazing, that are common to grassland riparian habitats and reduce competition between the orchid and other plants (USDI USFWS 1995).

Ute ladies'-tresses, a federally listed threatened species, has not yet been identified in western Wyoming, although potential habitat for the species does exist (USDI BLM 2010b). In Wyoming, *S. diluvialis* occurs at four locations on the Western Great Plains in Converse, Goshen, Laramie, and Niobrara counties (Fertig, 2000). The populations closest to the planning area are found in the Brown's Park area along the Green River in northeast Utah and along the Snake River in eastern Idaho.

Colorado River fishes

Four federally endangered fish species, the bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus Lucius*), humpback chub (*Gila cypha*), and razorback sucker (*Xyrauchen texanus*) occur downstream in the Green River. These fish were once abundant in the upper and lower Colorado River Basins (CRBs) but their distributions are currently limited to a small portion of their historic range. Habitat for these species include backwaters, sloughs, oxbow lakes, seasonally inundated flood plains, and reservoirs. The nearest habitat for the endangered Colorado River fishes occurs downstream of the project below Flaming Gorge Reservoir, Utah in the Green River and its associated 100-year floodplain; this area has been designated by the USFWS as critical habitat (USDI USFWS 1994). Even though these species do not occur within the project area, they are sensitive to water depletions and upstream degradation.

Of the eight big-river species once found in the CRB, Colorado pikeminnow, bonytail, humpback chub, and razorback sucker are rare and federally listed as endangered. Ongoing recovery efforts to restore populations of Colorado pikeminnow, razorback sucker, humpback chub, and bonytail seek to identify and correct factors limiting critical life-history stages.

The other four big-river species (roundtail chub, flannelmouth sucker, bluehead sucker, and speckled dace) occupy a greater proportion of historical habitat than the endangered fishes, but are also declining in many areas (Bezzerides and Bestgen 2002). Unfortunately, status and ecology of the roundtail chub, flannelmouth sucker, and bluehead sucker remain comparatively unstudied, so limiting factors are poorly understood (Bezzerides and Bestgen 2002).

Bluehead sucker

Bluehead suckers (*Catostomus discobolus*) are usually found in the main current of streams, although its streamlined body form indicated adaption to living in the strong currents of larger rivers (Baxter and Stone 1995). Bluehead suckers prefer turbid to muddy streams often with high

alkalinity and are rarely found in clear water (WGFD 2005). The BLM in Wyoming considers the bluehead sucker a sensitive species. The Wyoming Game and Fish Department (WGFD) has assigned this species a State rank of NSS1, suggesting that its presence is extremely isolated and its habitats are declining or vulnerable (Ptacek et al. 2005). According to Bezzerides and Bestgen (2002), bluehead suckers historically occurred in the CRB above the mouth of the Grand Canyon in mainstem and tributary habitats of Wyoming, Colorado, Utah, portions of New Black's Fork River flowing into Flaming Gorge Reservoir, and several small tributary streams and lakes of the upper Green River drainage (Bezzerides and Bestgen 2002). To date this species has not been documented within any of the allotments.

Whitebark pine

The whitebark pine (*Pinus albicaulis*) is a five needle pine species that grows at high elevations (5,000 ft-11,000 ft). They are found along ridge tops in the high mountains of the western U.S. and Canada. Whitebark pine is an important food source for various wildlife, primarily grizzly bears (*Ursus arctos horribilis*) and Clark's nutcrackers (*Nucifraga columbiana*) (McCaughey et al. 2009). It is being severely impacted by mountain pine beetle infestations, white pine blister rust infections, and by climate change. Whitebark pines are severely affected by the blister rust (WPBR) infection. Fortunately, some individual trees have appeared to have genes that resist the infection (Hoff et al. 2001).

On July 20, 2010, the USFWS issued a positive 90-day finding on a petition to list the whitebark pine as threatened or endangered under the ESA and to designate critical habitat (USDI BLM 2010a). The primary criterion for their inclusion was information that the species is undergoing a downward trend such that the species' viability or a distinct population segment of the species is at risk, in accordance with the BLM Manual 6840.

Limber pine

Limber pine (*Pinus flexilis*) is a long lived five needle pine species that can be found throughout various ecosystems of the western U.S. and Canada. It can be found along steep mountain sides and can be an important factor in snow catch. Limber pine can also be found at mesic sites and can help establish other conifer species and succession (Schoettle et al. 2014). Limber pine seeds are an important food source for a variety of wildlife. Limber pine is severely impacted by mountain pine beetle infestations, white pine blister rust infections, and by climate change. Just like other white pines in the western U.S., limber pines are severely affected by the WPBR infection. There are known occurrences of WPBR infecting limber pines in the northern portion of its range, although, there have been documented cases of trees that are resistant to the disease (Schoettle et al. 2014).

Species occurring or potentially occurring in limited portions of the project area.

White-tailed prairie dog

A formal petition was filed on July 11, 2002 by a collaborative group to list the white-tailed prairie dog (*Cynomys leucurus*) under the ESA. On November 9, 2004 the USFWS released a 90-day finding (USDI USFWS 2004) and a 12-month finding on Tuesday, June 1, 2010 (USDI USFWS 2010b) indicating that current information did not warrant listing of this species at this time.

White-tailed prairie dogs generally occur in shrub-steppe and grassland environments in cool intermountain basins at altitudes ranging between 5,000 and 10,000 feet. While they inhabit western Colorado, eastern Utah, and southern Montana, the largest remaining complexes (occupying more than 5,000 acres each) are found in western Wyoming. A prairie dog complex consists of two or more neighboring prairie dog towns less than seven km from one another. These highly social, colonial rodents dig their own burrows which contain extensive underground tunneling and multiple entrances. Many species reside in prairie dog burrows including black-footed ferrets, burrowing owls, snakes, lizards, mice, and a variety of insects. At this time, there is very limited suitable habitat within the project area. Mapping of all prairie dog towns within the BLM KFO is not complete at this time. Therefore, more prairie dog towns may be present than what is currently known.

Black-footed ferret

The black-footed ferret (*Mustela nigripes*) inhabits shortgrass and mid-grass prairie ranging from the mid-west to the western United States as well as semi-desert shrublands where prairie dogs are present. They only exist within high-density prairie dog complexes because they use prairie dog burrows to live in and rear their young. More than 90 percent of the ferrets' diet is made up of prairie dogs. In 2004, a letter was issue by the USFWS indicating that black-footed ferret surveys would no longer be required in all black-tailed prairie dog colonies statewide or in white-tailed prairie dog towns except those noted in an attachment (USDI USFWS 2004). The project area contains approximately 15,862 acres of potential black-footed ferret habitat within the non-block cleared area.

Burrowing owl

Burrowing owl (*Athene cunicularia*) habitat consists of open, dry, treeless areas on grasslands, shrublands, and desert floors. They prefer gentle slopes, short vegetation, high percentages of bare ground, and close proximity to other nesting burrowing owls. Although they are capable of digging their own burrows, they often use burrows dugs by other mammals such as prairie dogs and are therefore often found in areas that exhibit current burrowing mammal activity that contain a high density of burrows. These burrows can be several meters long, with numerous twists and turns, and may be lined with manure in order to attract insects. The project area

contains suitable habitat for burrowing owls, although there are no known nest burrows within the project area.

3.4 Water Quality, Drinking or Ground

There are five creeks and one reservoir used as water sources on the Dempsey Basin Allotment: West Beaver Creek, Wilkinson Creek, Dempsey Creek, North Fork of Dempsey Creek and South Fork of Dempsey Creek, of which portions of the creeks are on public land. None of the water sources are listed on the Wyoming Department of Environmental Quality's 303(d) list. This list describes water sources that do not currently meet state water quality standards. The creeks have intermittent water flow and depend on the snowpack the area receives each year. One other water source is the Pink Hills Reservoir that is approximately one acre in size in T24N R117W Section 28. The reservoirs and creeks listed above are primarily used for livestock grazing. Water within the Dempsey Basin Allotment would have to be treated if used for domestic use.

3.5 Wetlands/Riparian Zones

Approximately one mile of the West Beaver Creek runs through the eastern portion and western portion of the Dempsey Basin Allotment and is rated as being in Proper Functioning Condition (PFC). The one mile section consists of one half mile of creek on the west side of the allotment and this portion is the headwaters for the creek located in the forested area on the allotment. From there West Beaver Creek leaves pubic land and flows east until it splits into two very small intermittent streams fed by snow banks (surface water flows). The flow runs down onto private land, where the two streams converge. The lower one half mile of the West Beaver Creek is on public lands on the east side of the allotment. The system is intermittent and does not flow the entire year on the surface. This system has a different potential than a perennial system with sustained year-round surface flow, as portions of the creek go dry during the hot summer months.

Wilkinson Creek also runs through the eastern portion of the allotment and is rated as being in PFC. The southwest portion of the allotment contains Dempsey Creek and the north and south fork tributaries to Dempsey Creek. The main Dempsey Creek is 1.5 miles in length, the North Fork of Dempsey Creek is 1.5 miles in length and the South Fork of Dempsey Creek is two miles in length. All are rated as "functioning at risk with trend not apparent" except for a one mile section in the lower portion of the main Dempsey Creek, which is in an upward trend. The BLM has observed that the vegetative communities on the creeks are recovering and showing increased stability.

The primary source of water on the northern portion of the allotment is from snow banks. The flows in the creeks are intermittent. The creeks have some small scattered plant communities of sedge and rush mainly in the lower sections of the creeks. The creeks on the northeastern portion of the allotment are also primarily fed by snowmelt.

3.6 Social and Economic Resources

Livestock grazing is a substantial element of the agricultural industry in Wyoming. Moline *et al.* (April 1991) found that agriculture plays an important role in Wyoming's economy for several reasons:

- Agricultural expenditures tend to be consistent, even during periods of general economic instability.
- Many of the resources required for production in the agricultural industry are provided by the local resource pool.
- Most agricultural operations in the state are locally owned and operated, thereby providing more money and jobs within the state.

Lincoln County, Wyoming contains 535 active farms and ranches that span 342,630 acres (USDA 2009a). These ranching operations sustain 35,803 cattle and 43,256 sheep (USDA 2009a) currently valued at ~$94,050,008 based on values of $1,020 per head of cattle and $133 per head of sheep (USDA 2008). In 2007 these farms and ranches spent $30,065,000 on production costs, with the average operation spending $56,197 (USDA 2009a). As stated above, many of the resources required for production can be provided by the local resource pool (Moline *et al.* 1991), therefore it is likely that much of the capital spent on production costs went to local communities.

Many of these ranching operations utilize federal land in and around Lincoln County as part of their annual operation. Current grazing fees on public land are $1.35 per AUM, compared to $5.13/AUM on Wyoming State Land, and ~$15.70/AUM on private, non-irrigated grazing land (USDA 2009b). Grazing fees on the Dempsey Basin Allotment currently generate ~$2,734.15 annually. Money generated from public land grazing fees on the allotment is distributed as follows:

- 50% - Range Improvement Fund. This money is used to implement range improvements (i.e. water developments, fence construction, spring developments, etc.) in the area where the grazing fees were generated.
- 12.5% - State of Wyoming
- 37.5% - U.S. Treasury

3.7 Soils

The Dempsey Basin Allotment has a mixture of soils described as Aridic Haplustolls or fine-loamy soils. Rock outcrops occur mainly on the northwest portion of the allotment. Typic Flatifluvents or fine loamy over sandy or sandy skeletal soils, Ustic Halplangids or loamy soils and Ustic Haplocambids or coarse loamy soils, occur on the allotment. These soils are found in elevations ranging from 7,000 feet to 9,000 feet. Topography ranges from broken in the south and southwest to flat in the central to mountainous terrain to the west.

When the Standards for Healthy Rangelands assessment was conducted for the Dempsey Basin Allotment in September of 2009, it was determined that there was adequate vegetation present to protect and stabilize soils (BLM 2009). There were no signs of excessive erosion on the allotment.

Presence and abundance of biological soil crusts on the Dempsey Basin Allotment is unknown as no data has been collected for biological soil crusts on the allotment. However, while biological soil crusts play a crucial role in stabilizing soils and facilitating nutrient cycling in lower elevation desert environments (such as the Mojave Desert or the Great Basin), they are less abundant and less crucial in higher elevation ecosystems (such as the High Desert, where the Dempsey Basin Allotment resides). In these higher elevation environments, vegetation is more abundant and provides the same ecosystem benefits that biological soil crusts provide in lower elevation environments.

3.8 Vegetation

Sagebrush/grass is the major vegetative type of vegetation on the allotment with densities ranging from 25% in the north and northwest to 40% in the southwest. The public lands in the western portion of the allotment have forested cover of subalpine fur (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmanni*) and Douglas fir (*Pseudotsuga menziesii*). The timbered/forested areas have an appropriate understory of grasses and forbs. Some of the aspen stands on Dempsey Ridge are being supplanted by the conifer species. The allotment has a few aspen patches scattered throughout the north and southwest portions of the allotment and the west slopes are a mix of conifers and aspens (*Populus tremuloides*).

The non-timbered areas have plants appropriate to the sites. Most of the areas have a mix of sagebrush and mountain shrub community types. Mountain big sagebrush (*Artemisia tridentata*) is the primary vegetation on the allotment along with Wyoming big sagebrush (*Artemisia tridentata ssp Wyomingensis*). Upland habitats support a wide diversity of plant species. Non-timbered areas consist mostly of a mix of sagebrush and mountain shrub community types. Key grass species consists of Idaho fescue (*Fertuca idahoensis*), Letterman needlegrass (*Stipa lettermannni)* and Indian ricegrass (*Achnatherum hymenoides*).

Most key riparian species in the allotment are Nebraska sedge (*Carex nebraskenisis*), becked sedge *(Carex utriculata*) and tufted hairgrass (*Deschampsia caespitosa*).

3.9 Recreation

Federal lands within the allotment provide a broad spectrum of outdoor opportunities that afford visitors the freedom of recreational choice with minimal regulatory constraints. Recreation opportunities are offered to the public on all BLM administered lands within the allotment where legal access exists. Occurring in combination with other resource activities, dispersed recreation

includes, but is not limited to sightseeing, touring, photography, wildlife viewing, mountain biking, camping, fishing and hunting.

3.10 Oil and Gas

Federal lands within the allotment have not been impacted by oil and gas development and will not be addressed further for this allotment. “Oil and gas reserves in the Kemmerer planning area have been the focus of industry attention since commercial discoveries began around the year 1900.” Refer to KFO RMP 2010 BLM Kemmerer Resource Management Plan (RMP) and Record of Decision (ROD) for detailed information on mineral resources with the Kemmerer Field Office area.

4.0 ENVIRONMENTAL EFFECTS

This chapter describes the potential direct, indirect, and residual effects to resources that may result from the Proposed Action and No Grazing alternative, as well as identifies the potential monitoring needs associated with the specific resources. This chapter is organized by alternative.

4.1. Alternative 1 - No Action

Effects to this alternative are similar to those described in the proposed action alternative.

4.2. Alternative 2 - Proposed Action

4.2.1 Cultural Resources

Alternative 2, as described in this document, has the potential to impact historic properties located within the Dempsey Basin in the manner detailed above, to a greater or lesser extent depending on the numbers and types of livestock involved. However, the following stipulations are attached in order to prevent inadvertent adverse impacts to historic properties within the Dempsey Basin Grazing Allotment. These terms and conditions apply to all alternatives analyzed in this document.

- Authorization is for standard livestock grazing only. Any related projects (e.g., fence lines, water pipelines and troughs, spring developments, reservoirs, etc.) and locations for feed supplements (e.g. “crystalyx” & other mineral feed supplements, etc.) within the allotment boundaries require separate authorizations.

- All supplemental feed, salt/mineral blocks, or any other measures that would artificially concentrate livestock in one place should be kept a minimum of ¼ mile from the Dempsey-Hockaday Cutoff NHT and the Sublette Cutoff NHT segments located in the southern portion of this grazing allotment.

- If future grazing activity within the allotment boundaries should expose previously undetected cultural resources or if BLM determines that significant historic properties are being damaged by grazing activities within the allotment boundaries, the terms and conditions of this permit will be amended to protect any such historic properties until such time as protective barriers and/or mitigation of these adverse impacts can be conducted.

4.2.2 Invasive Species

The presence and abundance of invasive plants is expected to be a minor impact. Like birds and other wildlife, livestock can potentially transport invasive plant seeds on their coat and feet or in their digestive tract. Livestock may carry the seeds of invasive plants that are already present on an allotment, or they may carry seeds of invasive plants they were exposed to on private pastures. They have the potential, therefore, to disperse and introduce non-native or invasive plant species to an allotment. However, Stohlgren *et al* (1999) found that exotic species richness and frequency were basically the same on both grazed and ungrazed sites, suggesting that livestock grazing may not have a primary causal factor on the introduction and spread of exotic plant species at a landscape scale.

The BLM coordinates with county weed and pest agencies to treat invasive plant species and limit their spread and abundance, as well as to educate ranchers and the general public on precautions they can take to limit the spread of invasive plants. This effort has proven successful in limiting the abundance of invasive plants within the Dempsey Basin Allotment.

Because invasive plant species may be introduced and distributed in a variety of ways (including wind dispersion, water dispersion, animals (domestic and wild), vehicles, hikers and other recreationists), and because of the efforts the BLM and county agencies are taking to control invasive plant populations within the area, the presence, or absence, of livestock within the Dempsey Basin Allotment is not expected to have a substantial impact on the presence or abundance of invasive plant species.

4.2.3 Biological Resources

4.2.3.1 Wildlife

Mammals

Understanding the influence of domestic livestock upon native ecosystems is a problematic process. Ascertaining the potential natural vegetation of most Western ecosystems is difficult because ungrazed land is extremely rare (Fleischner 1994). Continuation of current grazing management would allow all species currently using the allotments to sustain current population

levels. For example, prairie dogs tend to prefer areas with short grass, or create these areas when establishing a colony. Areas with short grasses allow prairie dogs to observe and avoid potential predators. Livestock grazing in the area could reduce the overhead cover, allowing more prairie dogs to observe and consequently avoid predators. This would be beneficial by allowing more prairie dogs to survive. Renewal of the grazing permits with the proposed terms and conditions would allow the white-tailed prairie dog colonies to fluctuate in size based on normal population dynamics. Thus, the potential for black-footed ferrets and the prairie dog colony species (i.e. badger) would still persist along with habitat for burrowing owls and other small mammals. Livestock grazing could have beneficial impacts to plover, prairie dogs, potential black-footed ferret habitat, burrowing owls, and other wildlife species that live in and near prairie dog towns and short grass/cushion plant communities. These areas of short grass could also be beneficial to breeding sage-grouse. Within these areas of short grass, the proposed action is not expected to have any impacts greater than what are currently observed within the allotments.

Impacts to Canada lynx from grazing are expected to be minimal. Grazing doesn't have a major impact on lynx priority habitat which consists of old growth aspen and mixed conifer stands with thick understory which is ideal habitat for snowshoe hair (the Canada lynx main prey species). On November 20, 2013, the BLM initiated informal consultation with the USFWS discussing the BLM's determination of "implementation of livestock grazing management actions is not likely to adversely affect the lynx due to insignificant effects." On December 18, 2013, the BLM received a letter from the USFWS concurring with this determination.

Idaho pocket gophers are typically located within the sagebrush foothill zone of the Wyoming Range, Uinta, and Wind River Mountains (Beauvais and Dark-Smiley 2005, Griscom et al. 2010). It is also known to have a higher tolerance for rocky soils (Griscom et al. 2010). These habitat characteristics are located within the project area. Impacts from grazing could include tunnel/burrow collapsing from hoof action of grazing livestock or removal of vegetation and seeds that the pocket gopher feeds upon and stores for the winter months. However, implementing the new terms and conditions of the grazing permits would help minimize those impacts by forcing livestock to move differently within the project area in search of food, water, and mineral/salt supplements. In addition, distributing livestock across the lands helps to improve livestock and rangeland conditions and minimize impacts. Therefore, impacts to the habitat are not expected to increase above current conditions and the potential habitat would persist at the current rate.

Impacts to pygmy rabbit would be similar to those described for Idaho pocket gopher.

Sage-grouse and migratory birds

According to recent studies, the top three threats to sage-grouse are oil and gas, infrastructure, followed by invasive species. A total of 19 different aspects are analyzed, and of these, predation ranks in the middle while grazing is in the top five. Many of these rankings are uncontrollable, including weather and wildfire. From these ranking the Southwest Wyoming Local Sage-grouse

Working Group (SWLWG) has developed three major conservation goals, numerous issue-oriented sub-goals and RMPs and specific actions designed to meet the purpose and mission of the SWLWG (SWLWG 2007). The one issue that these all have in common is that of habitat conversion. This is the overall largest issue that is the direct result of many of the threats that are being analyzed. This is also why the main goal of the SWLWG is to maintain, enhance, and/or restore quality habitat for sage-grouse.

Monitoring results suggest sage-grouse populations in Wyoming were at their lowest levels ever recorded in the mind-1990s (WGFD 2007). Grouse numbers then increased during the late 1990's with some individual leks seeing three-fold increases in the number of males counted between 1997 and 1999 (WGFD 2007). This increase was synchronous with increased spring precipitation over the period (WGFD 2007). The return of drought conditions in the early 2000's appeared to have led to decreases in chick production and survival and therefore population declines, although the population did not decline to mid-1990s levels (WGFD 2007). Improved habitat conditions due to timely precipitation in 2004 are believed to have led to high chick production and survival (WGFD 2007). This resulted in 2006's counts and surveys having the highest recorded average males per lek since 1978. A return to dry spring and summer conditions in 2006 and 2007 reduced recruitment and the average males per lek declined in 2007 and 2008 (WGFD 2007).

Average number of grouse within the area is hard to predict due to normal fluctuations in the population. Average male attendance for all leks within the project area is listed in Chapter 3. It is difficult to determine a trend due to the little amount of information available and the fact that all leks were not observed each year. Thus, in any given year that a lek was not surveyed, a zero is entered as the default. Adding a zero would skew the numbers and lower the average; therefore those years were removed from the averages. Conversely, a lek that was discovered in 2004 could skew the results to artificially increase the averages. Therefore, none of these averages can be accurately compared. In addition, lek data must be interpreted with caution for several reasons: 1.) the survey effort and the number of lek surveys/counted has varied over time, 2.) not all leks have been located, 3.) sage-grouse populations often cycle over approximately a 10 year period, 4.) the effects of unlocated or unmonitored leks that have become inactive cannot be quantified or qualified, and 5.) lek locations may change over time (WGFD 2007).

Impacts to sage-grouse from livestock grazing could include a reduction in grass species. Removal of grasses could negatively impact grouse populations through reduced grass heights and potential litter on the ground. This could reduce the amount of nesting cover needed to hatch a brood. In addition, the reduction in grass height and litter could cause insect populations to decline, thus impacting the food source that sage-grouse nestlings rely upon. The reduced heights and potential for a reduction in insects and forbs could also occur in the riparian areas. From mid- to late-summer, wet meadows, springs and streams are the primary sites that produce the forbs and insects necessary for juvenile birds (SWLWG 2007). Although grazing can cause

varying stubble heights, these stay within the average required in the permit guidelines. These guidelines ensure there is enough grass left over for habitat to be suitable for wildlife.

An impact that could occur within the allotment is the potential for nest trampling by livestock. By grazing during the latter part of the nesting season, there is a potential that sage-grouse nests could be trampled by livestock movements. However, this is mitigated within the allotment through a rotational grazing system. Livestock are rotated through four pastures throughout the grazing season. By rotating livestock throughout the allotment, the chance of trampling a grouse nest is reduced. Impacts from grazing within this allotment are expected to be minimal and do not increase beyond current conditions.

Impacts to migratory birds (i.e., vesper sparrow, song sparrow, etc.) and sagebrush obligate bird species (i.e., sage thrasher, sage sparrow, Brewer's sparrow, and loggerhead shrike) would be similar to those discussed for sage-grouse. However, impacts to other migratory bird species (e.g., grasshopper sparrow) would be similar to those discussed for mountain plover.

Habitat for raptor species (i.e., ferruginous hawk, northern harrier) that use the allotment is not expected to decrease beyond current conditions. Douglass and Frisina (1993) found in their study that the rested treatment had the highest populations of montane voles and deer mice in the grazing system, but produces the smallest biomass of mice available for raptors. Over time the resting process allows mouse populations to recover and produce more prey during the grazing periods than would be produced under continuous grazing (Douglass and Frisina 1993). By using a pasture rotation grazing system in the Dempsey Basin Allotment, small mammal populations would be allowed to increase throughout the year until that pasture is grazed. Once the pasture is grazed, the prey base for raptors would be more exposed, thus increasing hunting success of raptors. However, as the grasses recover during times of rest, the prey base populations would also begin to increase again; therefore sustaining small mammal populations. There are no known raptor nests but suitable habitat is available. Issuing the grazing permits with the new terms and conditions is not expected to impact raptors or their prey base any more than what is currently observed.

Amphibians

Habitat for northern leopard frogs and Great Basin spadefoot toads could be impacted from loss of vegetative cover along stream banks and other riparian areas (for the frogs) or from soil compaction within playas or other low lying areas that collect water (for the toads). Removal of vegetative cover could reduce the amount of hiding cover and could lower the number of available insects that the frogs use as a food source. However, due to the standing vegetation that is left after moving from one pasture to the next, this impact would be minimized to the point that it could be negligible or even beneficial. By allowing the vegetation a chance to recover, the insect populations would also be allowed to recover; thus providing a food source for the frogs during different life stages. In addition, allowing the riparian vegetation a chance to recover would also allow riparian areas a chance to maintain the root structure needed to protect it for

other natural events (e.g. high water flow events). Spadefoot toads are a little harder to understand due to the behavior of the species during the non-breeding months. The protected vegetation would provide the spadefoot with adequate vegetative cover to provide foraging sites and climate protection to retain soil moisture during the non-breeding season (Buseck et al. 2005). This would be the case in areas where loose, sandy soils are available in arid environments. The soils throughout the project vary, but these soil types are located within the project area, even if relatively small in size. Overall, impacts to frogs and toads within the project area are expected to be minimal and not increase above current conditions.

Fish

Livestock grazing could indirectly impact fish species. When livestock graze, they will eventually need water. As livestock move into riparian areas to obtain water, they could impact the streambanks. When the streambanks are impacted through bank trample several things could occur. First, hoof impact could cause soil compaction. By increasing soil compaction, there is typically, a reduction in moisture infiltration from rain and/or snow melt. A reduction in soil moisture could reduce the amount and diversity of plant species, which, over time, could cause streambanks to lose stability and increase sedimentation. Second, when livestock are actually drinking or crossing streams there is a potential to cause hoof impacts. These types of hoof impacts can cause stream bank shearing. Shearing of the streambanks has the potential to heal, however, it typically will not heal (re-vegetate) during the same growing season in which it was sheared. Therefore, shearing of the streambanks could also increase sediment loads into the streams. Sediment in the water column of streams and rivers will eventually settle. As these sediments settle, there is a possibility that the sediment could silt in and cover spawning areas. Sediment could suffocate fish eggs, thus reducing productivity and potentially cause a reduction in population size. The Dempsey Basin Allotment and its water sources are located within the Colorado River watershed. Impacts to Colorado River fish species are expected to be minimal, mainly due to the Flaming Gorge Reservoir Dam. This reservoir would allow the majority of the sediment to settle out before the water passes through the dam and downstream to endangered Colorado River fish species habitat. These types of impacts could still be observed upstream of Flaming Gorge Reservoir, which could impact bluehead and flannelmouth suckers and roundtail chub spawning habitats. These same impacts would also be observed in the Bear River Divide watershed, which could impact northern leatherside chub spawning habitat. However, by implementing the new terms and conditions all of these impacts would be reduced.

4.2.3.2 Water Quality

Livestock tend to spend a disproportionate amount of time near riparian areas and other water sources, especially later in the grazing season when temperatures are warmer, and upland forage decreases in quantity and quality (McInnis & McIver 2001, Marlow & Pogacnik 1986, Belsky *et al* 1999). Spending more time near water sources means the cattle tend to urinate and defecate near those water sources more frequently. Cattle excrement contains nutrients and pathogens that could impact water quality. However, scientific evidence linking livestock grazing on

rangelands to impaired water quality is lacking (Nader *et al* 1998).

Although the allotment is relatively small (approximately 16,000 acres) mineral supplements will be placed a sufficient distance from water to prevent livestock from loitering near water sources. The primary water sources on the Dempsey Basin Allotment are West Beaver Creek and a stock pond reservoir. West Beaver Creek is affected by the amount of snow fall, as this creek is dependent on snow melt to supply water to the creek. Therefore, impacts to water quality under this alternative are expected to be minimal. Pink Hills Reservoir, the only reservoir on the allotment, is in the southeast portion of the allotment and it holds water year round.

4.2.3.3 Wetlands/Riparian Zones

Livestock (cattle) water on West Beaver Creek and then can move onto the uplands out of the riparian area which has allowed vegetation along the riparian area to continue to improve. The primary impacts along the creek occur when cattle water, which impacts the soils at the riparian area watering points. Impacts are more severe later in the grazing season when temperatures are warmer and upland forage decreases in quantity and quality (McInnis & McIver 2001, Marlow & Pogacnik 1986, Belsky *et al* 1999). Direct impacts to riparian systems from livestock grazing include: removal of riparian vegetation and soil disturbance from livestock hoof action which may lead to erosion. Some indirect effects livestock grazing may have on riparian systems include: impacts to channel morphology, change in shape and quality of the water column and alteration of streamside soil structure (Fleischner 1994). If conditions warrant, livestock will be herded away from the riparian areas once the utilization requirements are met, so that uplands are utilized. Supplements may be strategically placed in the uplands as an incentive for livestock to utilize upland vegetation.

The Proposed Action alternative is to continue grazing on the Dempsey Basin Allotment and alternate grazing areas between West Beaver Creek and the existing stock pond reservoir. Currently these are the only two locations available for watering on the allotment. Alternating the water locations will help the riparian areas to maintain stability and allow riparian vegetation to maintain vigor. This will also allow time for riparian areas to recover from the high grazing use near the water sources to minimize soil compaction and bank shearing.

The Proposed Action has little impact on soils on the Dempsey Basin Allotment. Spring grazing begins on the Dempsey Basin Allotment on May 25 and runs to September 30. As soils are mostly dry at this time, any impacts are minimized. Livestock may still tend to spend more time near riparian areas under this alternative than they would under the No Grazing alternative. In June and July, warmer temperatures and less palatable upland forage and dried residual matter may encourage livestock to make more use of succulent vegetation along the riparian areas. This may lead to greater utilization rates on riparian vegetation. The goals and objectives outlined in the Kemmerer RMP (BLM 2010) for riparian/wetland stubble heights is four to six inches (the five inch stubble height is the trigger point to start moving livestock into the next pasture). Fifty percent utilization levels have been established for upland vegetation species.

4.2.3.4 Soils

Livestock grazing can impact the soil profile by reducing above ground biomass, thereby exposing more of the soil surface to splash and wind erosion, and by compressing the soil surface (Holechek *et al* 2004, pp. 379). This has been shown to lead to lower infiltration rates (Taylor *et al* 1993) which leads to more surface runoff (Liacos 1962). Surface runoff can lead to increased sediment production (Pluhar *et al* 1987), indicating an increase in the amount of erosion occurring in the area. Soil compaction and erosion is likely to be most noticeable near fences, livestock trails and other areas of concentrated livestock use. As stated in the rangelands standards review, the soil types within the Dempsey Basin Allotment consist of Aridic Haploustolls; fine-loamy mixed frigid, Ustic Haplocambids; fine-loamy; mixed; frigid, Humic Dystrocryepts; loamy-skeltal; mixed, Lithic Cryorthents; loamy-skeltal; mixed and Typic Cryaquepts; fine-loamy over sandy or sandy-skeletal; mixed. In addition to the protective cover provided by vegetation, the soil surface in this area contains quite a bit of surface cobble, which provides further protection and stability for the soils on the allotment. Some minor erosion is present but minimal, and is limited to those areas where vehicle and equipment use is concentrated. The vegetative community is quite vigorous and adequate for protecting smaller particle soils from erosion.

Positive impacts on soils from livestock grazing include: improved nutrient recycling, improved availability of some nutrients, changes in carbohydrate fixation, integrating mulch into the soil, and increasing the rate of humus development (Holechek 1981). Livestock grazing may also improve carbon sequestration in some plant communities (Reeder & Schuman 2002).

4.2.3.5 Vegetation

Early season grazing can harm upland vegetation by defoliating the plant when it is trying to produce a seed crop. Plants are most vulnerable to defoliation early in the season. Most key upland vegetation (such as Indian ricegrass) reproduces solely by seed. Therefore, it is important for these plants to produce a seed crop regularly.

Most key riparian species in the allotment such as Nebraska sedge and tufted hairgrass reproduce vegetatively (via rhizomes or similar features) as well as by seed production. Given appropriate utilization levels and adequate rest periods, these species can recover from livestock grazing and still reproduce vegetatively. Livestock may impact vegetation by removing it, or trampling it. Some of the impacted plants may recover and still be able to set seed.

Grazing impacts will influence different plant species in different ways, depending on their resistance and tolerance to herbivores. Over time, plants that are resistant to grazing tend to become more dominant, while plants that are sensitive to grazing tend to become less abundant.

The interactions between grazers and grazed plants are complex and difficult to study and understand (Holechek 2004, pp. 140). Table 4-1 compares some of the ways livestock grazing may benefit vegetation, with some of the ways livestock grazing may be deleterious to vegetation.

Table 4-1. Ways in which livestock grazing may be beneficial or deleterious to vegetation resources.

Potentially Beneficial	Potentially Deleterious
Grazers reduce the amount of excess vegetation that can have a negative effect on net carbohydrate fixation (Holechek 2006).	Livestock grazing may alter species composition within vegetation communities (Fleischner 1994).
Grazers may help maintain an optimal leaf area index (Holechek 2006).	Livestock grazing may alter ecological succession (Fleischner 1994).
Livestock grazing may reduce water loss to transpiration (Holechek 2006).	Livestock grazing may change vegetation stratification (Fleischner 1994).
Grazing removes excess accumulations of dead material that may inhibit net growth (Holechek 2006, Holechek 1981).	Livestock grazing may decrease water availability for plants, by increasing soil compaction (Fleischner 1994).
Grazing may promote tillering in some grass species (Holechek 2006).	Forage removal may allow soil temperatures to rise, which could increase evaporation (Fleischner 1994).
Grazers may stimulate plant growth by inoculating plant parts with their saliva (Holechek 2006).	Livestock grazing alters the nutrient cycle (Fleischner 1994) which may affect nutrient availability for plants.
Livestock can help trample seeds into the ground, which may improve germination rates (Holechek 1981).	Herbivores modify the growth form of plants by consuming terminal buds thereby promoting lateral branching (Fleischner 1994).
Livestock grazing may reduce the frequency of wildfires (Holechek 1981). Note: may be beneficial or detrimental.	Livestock grazing may reduce the frequency of wildfires (Holechek 1981). Note: may be beneficial or detrimental.
Some plants increase the flow of growth hormones following herbivory (McNaughton 1979).	
Some plant species may be more productive and more fit as a result of being grazed (McNaughton 1979, Paige and Whitham 1987).	

When considering the impacts listed in Table 4-1, it is important to remember that the specific impacts, and the degree to which the plants are affected, are directly influenced by the intensity and season of grazing. For example, species composition may not be altered under a conservative stocking rate (~35% forage utilization), but may be altered under a heavy stocking

rate (forage utilization >50%).

Overall, response to herbivores is influenced by a number of factors, including (Holechek *et al* 2004, pp. 141, McNaughton 1979):

- Genetic potential of the plant
- Which plant tissues are removed
- Developmental stage of the plant at the time of defoliation
- Growth promoting features
- Intensity and frequency of herbivory
- Environmental constraints (i.e. light, nutrients, temperature, water availability, etc.)

The Proposed Action alternative will have a minimal impact on upland vegetation by allowing the key species (Idaho fescue (*Festuca idahoensis*), mountain bromegrass (*Bromus carinatus*), Basin wildrye (*Leymus cieereus*), Columbia needlegrass, (*Achnatherum nelsonii),* and slender wheatgrass (*Elymus trachycaulus*)) to be used for the 50 percent utilization level established in the RMP. The informal management plan utilization level is between 35 to 40 percent in the uplands. There is adequate upland forage to produce seed prior to grazing the following year. Based on the grazing management and pasture rotation, livestock are only in each pasture for two months. This has kept the riparian vegetation within the riparian stubble height objective of the 4-6 inch range allowing riparian vegetation to maintain its vigor and health within the riparian areas. If conditions should change, a requirement under the terms and conditions will be added that would requires herding away from the riparian areas once the utilization requirements are met, so that uplands are utilized more efficiently this may require placement of mineral supplements in the uplands to attract livestock off the riparian areas. .

4.2.4 Social and Economic Resources

Current grazing fees on public land are $1.35 per Animal Unit Month (AUM), compared to $5.13/AUM on Wyoming State Land, and ~$15.70/AUM on private, non-irrigated grazing land (USDA 2009b). Grazing fees on the Dempsey Basin Allotment currently generates ~$2,734.15 annually. Money generated from public land grazing fees on the allotment is distributed as follows:

- 50% - Range Improvement Fund. This money is used to implement range improvements (i.e. water developments, fence construction, spring developments, etc…) in the area where the grazing fees were generated.
- 12.5% - State of Wyoming
- 37.5% - U.S. Treasury

4.3 Alternative 3 - No Grazing

4.3.1 Cultural Resources

Implementation of the No Grazing alternative would not impact the cultural resources on the public land within the allotment. However, if the private landowners decide to fence their private land, cultural resources that exist on private land could be threatened by the construction process and by the potential concentration of livestock on those lands, rather than being dispersed across a greater area. In addition, if the private landowners bar the BLM from crossing their private land, it would make it difficult or impossible to conduct further inventories.

4.3.2 Invasive Species

This alternative would eliminate one of the potential mediums for transportation of invasive plant seeds on this allotment. However, Stohlgren *et al* (1999) found that exotic species richness and frequency were basically the same on both grazed and ungrazed sites, suggesting that livestock grazing may not have a significant impact on the abundance of exotic plant species at a landscape scale.

Because invasive plant species may be introduced and distributed in a variety of ways (including wind dispersion, water dispersion, animals (domestic and wild), vehicles, hikers and other recreationists), and because of the efforts the BLM and county agencies are taking to control invasive plant populations within the area, the presence, or absence, of livestock within this allotment is not expected to have a substantial impact on the presence or abundance of invasive plant species.

4.3.3 Biological Resources

4.3.3.1 Wildlife

If the No Grazing alternative was chosen, then there would not be any impacts from livestock grazing on BLM managed public lands. However, due to the PFC and greenline data, it is unlikely that there would be any significant differences between current grazing management and natural processes.

4.3.3.2 Endangered, Threatened, Proposed, Candidate and Sensitive Species

The No Grazing alternative would provide more protection to T&E and special status species within the Dempsey Basin allotment as compared to the Proposed Action alternative. The absence of livestock would eliminate or reduce deleterious impacts to sage-grouse from habitat alteration, reductions in cover and forage quality, and inadvertent nest destruction due to trampling.

4.3.3.3 Water Quality

By removing livestock from this allotment, this alternative would reduce the amount of animal waste deposited in or near water sources. Waste contains nutrients and pathogens that could

potentially impact water quality. Some nutrients found in animal waste stimulate algae growth and may lead to algal blooms (Belsky *et al* 1999). However, scientific evidence linking livestock grazing on rangelands to impaired water quality is lacking (Nader *et al* 1998).

The BLM expects that the No Grazing alternative would provide more water quality protection than the No Action/Proposed Action alternatives. Water quality would be expected to remain the same, or improve under this alternative.

4.3.3.4 Wetlands/Riparian Zones

Total rest is likely the best method for showing rapid improvements in riparian and wetland areas that are in need of improvement. Total absence of domestic herbivores eliminates many of the impacts that are detrimental to riparian systems.

4.3.3.5 Soils

The No Grazing alternative would provide the most protection to soils within the Dempsey Basin Allotment. The lack of large domestic herbivores would limit impacts to soils to those caused by wildlife and other natural events. Soil compaction would be minimized, as would loss of soils to wind and water erosion.

4.3.3.6 Vegetation

The No Grazing alternative would eliminate the impacts listed in Table 4-1 (both potentially beneficial and deleterious impacts). Vegetation would be entirely devoted to wildlife and ecosystem functions (such as nutrient cycling, sediment filtration, etc.). However, West *et al* (1984) found that total exclusion of livestock does not always lead to an improvement in forage production. Other studies have also shown that removal of livestock grazing can lead to lower forage production, an increase in shrub cover, and a decrease in species richness and plant diversity (Manier & Hobbs 2007, Patton *et al* 2007).

4.3.4 Social and Economic Resources

Current grazing fees on public land are $1.35 per Animal Unit Month (AUM), compared to $5.13/AUM on Wyoming State Land, and ~$15.70/AUM on private, non-irrigated grazing land (USDA 2009b). Grazing fees on the Dempsey Basin Allotment currently generate ~$2,734.15 annually. Money generated from public land grazing fees on the allotment is distributed as follows:

- 50% - Range Improvement Fund. This money is used to implement range improvements (i.e. water developments, fence construction, spring developments, etc…) in the area where the grazing fees were generated.
- 12.5% - State of Wyoming
- 37.5% - U.S. Treasury

The BLM expects that under the No Grazing alternative no grazing fees on public land would be collected and no funds would be generated from grazing fees and no distribution of funds would

be distributed as shown above. Operators would either have to sell their livestock, sell their land, or downsize their operation to graze only on private and state land, thereby reducing their revenues.

4.3 Cumulative Impacts to Resources

The Council on Environmental Quality (CEQ) regulations defines a cumulative impact as "an impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR1508.7). Cumulative effects need to be analyzed in terms of the specific resource, ecosystem and human community being affected for the identified resources with possible reasonably foreseeable future actions (RFFA).

The CEQ, in a guidance memorandum issued on June 24, 2005, states that "environmental analysis required under NEPA is forward-looking," and that review of past actions is required when identifiable present effects of past actions are relevant and useful when analyzing the RFFA. It must be determined if those past effects will continue to have an ongoing significant relationship to those effects. Generally, a strong description of the current state of the environment as identified in within this document will include the effects of past actions.

Agencies are not bound to analyze individual past actions unless that information is necessary to describe the cumulative effect of all past actions combined. CEQ states "Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." Proposed actions of limited scope and finalized with a finding of no significant impact, "usually involve only a limited cumulative impact statement to confirm that the effects of the proposed action do not reach a point of significant environmental impacts."

Each of the affected resources below must be analyzed to determine the resources' ability to accommodate additional effects which may be applied to the resource for future development needs. Focus will be provided within the analysis to ensure long-term productivity or sustainability of each resource listed.

Since the effects of the Proposed Action are expected to last ten years, this time frame is considered to be most appropriate for considering the incremental effect of RFFA. For the purpose of this analysis the cumulative impact assessment area is the Dempsey Basin Allotment. The provided list of resources identified below has been determined to be reasonable resources that have identified effects which may be evaluated meaningfully.

4.3.1 Cultural Resources

Domestic grazing has occurred for over 100 years in southwestern Wyoming. Undoubtedly, cultural resources have been affected by trampling over time in areas where groups of animals were concentrated, however no significant impacts to historic properties have been documented by or reported to BLM archaeologists within the APE as a result of dispersed livestock grazing. The most detrimental impacts to historic properties documented within the KFO were related to range improvements that have resulted from unauthorized construction projects. In some cases, cultural resources have been irrevocably damaged and valuable scientific data has been lost. However, these types of situations are rare.

Projects associated with industrial development and recreational activities have also occurred within the area over the years. Projects that occurred prior to the passage of the National Historic Preservation Act (NHPA) were likely conducted without much regard to cultural resources. It is not known how great of an impact these early developments had on the archaeological record. Since the passage of National Historic Preservation Act, all ground disturbing activities, including those related to range management, recreation, and other activities common in the allotment, have had to comply with Section 106 of the NHPA and all adverse impacts have thus been avoided or mitigated prior to construction. Therefore, the loss of important scientific data, which is considered one of the most substantial potential impacts to cultural sites, has been circumvented in most cases.

The greatest potential for range and livestock grazing to impact historic properties comes from unauthorized construction associated with range improvement and/or range management projects such as bladed fence line routes, waterlines, and spring and reservoir construction. Any other unauthorized developments, such as the creation of new roads by recreational users, would also be of concern. However, any such unauthorized development on Federal lands within the APE is a violation of applicable federal regulations.

All authorized future ground disturbing activities in the APE must comply with Section 106 of the NHPA and provisions 303(a) and 303(c)(2)(g) of FLPMA and are subject to appropriate cultural investigations prior to permit issuance, and will be analyzed under a separate and site specific NEPA document. The construction of new facilities, including fences or roads, would require a Class III cultural inventory. All adverse impacts would be mitigated prior to construction.

4.3.2 Non-Native and Invasive Plant Species/Upland Vegetation

The presence and abundance of invasive plants is not expected to be considerably different under the Proposed Action alternative, than under the No Action and No Grazing alternatives.

Like birds and other wildlife, livestock can potentially transport invasive plant seeds on their coat and feet or in their digestive tract. Livestock may carry the seeds of invasive plants that are already present on the allotment, or they may carry seeds of invasive plants they were exposed to

on private pastures. They have the potential, therefore, to disperse and introduce non-native or invasive plants species to an allotment. However, Stohlgren et al (1999) found that exotic species richness and frequency were basically the same on both grazed and ungrazed sites, which suggests that livestock may not have a significant impact on the abundance of exotic plant species at a landscape scale.

Minor landscape-level negative cumulative impacts to vegetation could occur from the combined influences of grazing and other past, present, and future land uses in this allotment, such as use by wildlife, construction of water developments, and vegetation treatments. However, implementation of the Proposed Action, in combination with these land uses, is expected to maintain the physical structure and ecological function of plant communities. For example, the allotment consists of a mixture of sagebrush with perennial grasses and forbs. These plant communities provide habitat for a variety of small mammals such as ground squirrels and various other rodents, rabbits, and burrowing species. Proper management of the multiple uses of BLM owned lands, including grazing, could improve the biodiversity of both plant and animal communities at the landscape level. Effects from vegetation treatments, such as prescribed burns, could increase grass and forb species and vegetation production from conversion of high-density sagebrush to sagebrush/grass communities.

Considering the current push for America to become more energy independent, it is likely that oil and gas development will continue around this allotment, and perhaps may be introduced in the allotment. This may produce invasive species adjacent to or in the allotment which could spread onto or increase in the allotment.

Current grazing would continue to occur at the same rate and the expectation would be that plants would continue to spread at the same rate, so there would be no cumulative effect.

4.3.3 Livestock Grazing

Under the No Action and Proposed Action alternatives, livestock would continue to graze as the allotment as they have in the past. The primary agricultural use of the assessment area has been livestock grazing. The primary type of livestock that graze the allotment is cattle. Few projects exist on the allotment except for a spring development and pasture boundary and interior pasture fences. Upon approval of the Proposed Action or No Action alternative, cattle would continue to graze the allotment. If the listing of the Greater Sage-grouse occurs as a threatened species this could foreseeably affect grazing management.

The primary agricultural use of the Dempsey Basin area has been livestock grazing. Livestock primarily graze this allotment, and few range improvements exist except for allotment boundary fences and interior pasture fences, plus one spring development. The area has been grazed in the past under a five pasture grazing system with no detrimental effects to the soils, vegetation, etc. and based on this observation it is not anticipated that any effects from grazing should be the

same as under the proposed action. The small fifth pasture was incorporated as one of the four pastures.

The No Grazing alternative may provide an incentive for the private land owner to sell their private lands. Studies have shown that as many as 45% of ranches are being sold every decade in the United States (Gosnell & Travis 2005 as cited in Brunson & Huntsinger 2008). When sold, private ranchland is often subdivided and used for housing developments, or their associated amenities. When this happens, the private ranchland loses most of its ecological values. Such developments not only eliminate habitat for plants and wildlife, but they also act to fragment the landscape, making it more difficult for wildlife to move from one block of suitable habitat to another.

The loss of habitat from development may combine with other impacts, such as landscape scale grazing, oil and gas development, recreational activities and other disturbances to have a cumulative impact on the human environment. The combination of these disturbances may further displace wildlife, impact water quality, degrade riparian habitat, and impact nutrient cycling and other important ecosystem functions. Some of these impacts may be offset, to some degree, by the removal of livestock grazing from the BLM land within the Dempsey Basin Allotment. However, as this allotment contains approximately 11,361 acres of BLM land, the potential offset is not expected to be substantial.

Overall, the cumulative effects of the No Grazing alternative are expected to be more substantial than the cumulative effects of the Proposed Action alternative.

4.3.4 Biological Resources

The majority of cumulative effects on wildlife habitat would result from surface disturbing and disruptive activities, such as mineral development and associated wells, roads, pipelines, and facilities; rangeland improvements; and other such activities (e.g., geophysical exploration). Effects would be in the form of habitat fragmentation and animal displacement. Vegetation treatments in the form of prescribed burns could also affect wildlife resources, particularly the Greater Sage-grouse. If private land currently used for grazing were sold for residential or commercial development, the loss of connectivity between habitats and the loss of vegetation could result in a reduction in the availability and quality of forage and could result in increasing competition among grazing animals. Habitats could be made unavailable to wildlife because of human disturbance factors such as traffic, noise, or increases in livestock during sensitive time periods such as winter, parturition, nesting, and early rearing of young. Impacts on wildlife could be significant if activities were concentrated in areas of sensitive wildlife habitat and/or if increased development and surface disturbance altered existing migration in the Dempsey Basin to the extent that access to important habitat areas was greatly reduced. Habitat fragmentation occurs when a contiguous habitat is broken up (fragmented) by disturbing activities, causing a reduction in usable ranges and the isolation of smaller, less mobile species; a loss of genetic integrity within species or populations; and an increase in the abundance of habitat generalists

that are characteristic of disturbed environments (i.e., competitors, predators, and parasites). The primary fragmentation factor affecting wildlife species (especially big game) is the reduction in usable habitat and the disruption of migration route within the Dempsey Basin Allotment. Transportation routes tend to fragment habitats and can act as barriers to some species, especially in severe winter conditions. Fragmentation factors affecting wildlife in this allotment analyzed in this EA may include county roads, rural roads, mineral development infrastructure, and rivers.

Livestock grazing is occurring throughout the area that surrounds this allotment. The combination of landscape scale grazing and other human activities that disturb soils and vegetation (such as roads, irrigation, recreational activities, etc.) may have a cumulative impact on the human environment. The combination of these disturbances may further displace wildlife, impact water quality, degrade riparian habitat, and impact nutrient cycling and other important ecosystem functions.

Minor landscape-level negative cumulative impacts to vegetation and wildlife could occur from the combined influences of grazing and other past, present, and future land uses in this allotment. However, implementation of the Proposed Action, in combination with other past, present, and future land uses, is expected to maintain the physical structure and ecological function of plant communities. For example, the allotment consists of a mixture of sagebrush with perennial grasses and forbs. These plant communities provide habitat for a variety of small mammals such as ground squirrels and various other rodents, rabbits, and burrowing species. In addition, a variety of small bird species, both migratory and year-round residents, may also occur in the area. These species are, in turn, preyed upon by larger carnivores such as fox, coyote, mountain lion, bear, badger, skunk, and by raptor species such as golden eagles and various hawks. Proper management of the multiple uses of BLM owned lands, including grazing, could improve the biodiversity of both plant and animal communities at the landscape level. Livestock grazing and in particular, water developments, could be beneficial to wildlife by opening areas for forage consumption that are currently not available due to lack of water or distance from water. Effects from vegetation treatments, such as prescribed burns, could benefit most wildlife species through an increase in grass and forb species and vegetation production from conversion of high-density sagebrush to sagebrush/grass communities.

Due to the sage-grouse leks within the project area, the potential for fence collisions would increase. It is unknown how many sage-grouse could be impacted, but, due to the current and future conservation need of this species, an increase in the number of fence collisions by sage-grouse could potentially contribute to the need for listing of the species under the ESA (USDI BLM 2008). The addition of fences could also influence big game movements. Elk that try to jump any new fence could potentially be entangled or get one leg caught. If only one leg were to be caught, the potential to have wire broken or removed from the fence posts and drug across the landscape increases. The same impacts would occur for moose. Pronghorn would typically find a low area and crawl under the bottom wire of the fence. If a movement barrier is encountered,

pronghorn will typically walk the length of the barrier until a crossing point is encountered. If a crossing point is not encountered, it is possible that the pronghorn would try to jump the fence (causing entanglement) or be removed from the population from starvation or other environmental conditions that otherwise could be avoided. Mule deer typically jump fences as well. However, during severe winters, most energy is used for survival. It is highly likely that in these instances, a new fence or series of fences could increase energy expenditure to the point that winter survival is infeasible. In addition, any new fence could potentially be a large movement barrier during spring and fall migration from summer/fawning habitat to crucial winter range and vice versa. As any new potential fence construction on public land would be "wildlife friendly" these impacts are expected to be minimal on public land.

Other impacts could include fence line effects in which livestock trail along the fences. Along these trails would be an increase in soil compaction. An increase in soil compaction could negatively influence fish and amphibian habitats due to increase overland flow events. Once fenced, livestock could potentially overgraze the area. If the area becomes overgrazed then the livestock will be pressuring the fences trying to reach better and more abundant forage. Even if all livestock were to be contained by fencing the private lands (No Grazing alternative), there could be increased pressure on the public lands from wildlife. Wildlife could potentially avoid the areas that are fenced. By avoiding these areas, there would be more wildlife competing for the same resources in a smaller area. This direct competition could lead to a reduction in population numbers and overall individual health. These impacts, in combination with all other past, present, and reasonably foreseeable actions could have negative impacts on wildlife species within the project area.

Cumulative impacts to big game would be directly impacted through competition by foraging livestock during grazing. This would impact big game in different ways. Pronghorn numbers are just below WGFD population levels, therefore the cumulative impact due to grazing is expected to be minimal.

The largest impact to other species beyond big game includes habitat loss and displacement. Livestock grazing could contribute to nest trampling or abandonment, burrow collapse impacting fossorial wildlife, forage competition between livestock and small mammals, a reduction in insect populations and reduced vigor in plant species. By implementing the proposed terms and conditions, the chances of nest loss through trampling or abandonment would be reduced.

Reducing the impacts to the water sources or riparian areas by spreading livestock across pastures within the allotment would allow the vegetation the ability to retain the vigor needed to withstand high flow precipitation events. In addition, there would be less grazing pressure on the vegetation which would allow insect populations to remain viable. Viable insect populations would help nourish young birds until they are able to forage themselves. These insect populations would also be valuable for amphibians during different life stages of their life cycle and would provide a food source for fish populations. By reducing the impacts through the proposed terms and conditions, overall impacts are not expected to increase beyond current

conditions.

4.3.5 Water Quality/Wetlands/Riparian Zones/Soils

Livestock grazing activities can impact wetlands and riparian areas primarily by removal of vegetation and soil disturbance. Potential impacts include grazing herbaceous and woody vegetation and damage resulting from livestock hoof action. Unchecked, these impacts could result in insufficient vegetation to protect streambanks thus increasing soil erosion and compaction.

Effects on water resources from past and present actions have been limited due to the lack of any concentrated development. The primary impact has been the generation of sediment and erosion from ground disturbing activities like grazing, off-road vehicle use, and recreation, etc. Impacts from livestock grazing have been the most prevalent due to animals' tendency to loiter in riparian areas resulting in channel instability, trampling, etc. The extent of these impacts is localized due to the dispersed nature of all of the activities.

Those impacts associated with the past and present actions will likely continue to occur. In particular, the reasonably foreseeable increase in off-road vehicles would result in increased instability and sedimentation.

4.3.6 Oil and Gas Development

Some oil and gas development has occurred within the allotment on private lands resulting in dry holes, but areas of more concentrated development are at least ten miles away. It is not expected that oil and gas will be a potential future action in this area.

4.4 Mitigation Measures Considered

All authorized future ground disturbing activities in the allotment must comply with Section 106 of the National Historic Preservation Act (NHPA) and provisions 303(a) and 303(c)(2)(g) of FLPMA. Proposed ground disturbing activities are subject to appropriate cultural investigations prior to permit issuance, and will be analyzed under a separate and site specific NEPA document. The construction of new facilities, including fences or roads, would require a Class III cultural inventory. All adverse impacts would be mitigated prior to construction. All adverse impacts would be mitigated prior to construction. See section 4.2.1.

Additional measures to aid with rangeland health include:

- If conditions warrant, livestock will be herded away from the riparian areas once the utilization requirements are met, so that uplands are utilized. Supplements may be strategically placed in the uplands as an incentive for livestock to utilize upland vegetation.

A number of studies have shown that strategic supplement placement can be used to manipulate livestock distribution, thereby reducing use and stress on riparian systems (Bailey & Welling 1999, Bailey et al 2001, McDougald et al 1989, McInnis & McIver 2001). This would likely lead to a reduction in the intensity of use in the riparian zones and an improvement in the condition of riparian systems within this allotment.

- Before livestock turn out, all fences must be functional, as maintained by the permittee. Permittee will inform the BLM when all maintenance activities have been completed.

These measures will be considered for incorporation into the Terms and Conditions of the permit under the proposed action.

5.0 TRIBES, INDIVIDUALS, ORGANIZATIONS, or AGENCIES CONSULTED

"A cultural resource data review was completed for the allotment and yielded no evidence of known, tribally-sensitive sites that would trigger Native American consultation under the provisions of Section 106 of the National Historic Preservation Act. In addition, no consultation was initiated with individuals, organizations, and agencies regarding the presence of significant sites because the proposed action has no potential to affect historic properties."

6.0 LIST OF PREPARERS

Preparers

- Carl Bezanson — KFO Rangeland Management Specialist
- Larry Ashton — KFO Wildlife Biologist
- Doug Tingwall — KFO Archeologist
- Wally Mierzejewski — KFO Outdoor Recreation Planner

Reviewers

- Basia Trout — KFO Assistant Field Manager – Resources
- Travis Chewing — KFO Planning and Environmental Coordinator

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Appendix 1

IDT Checklist

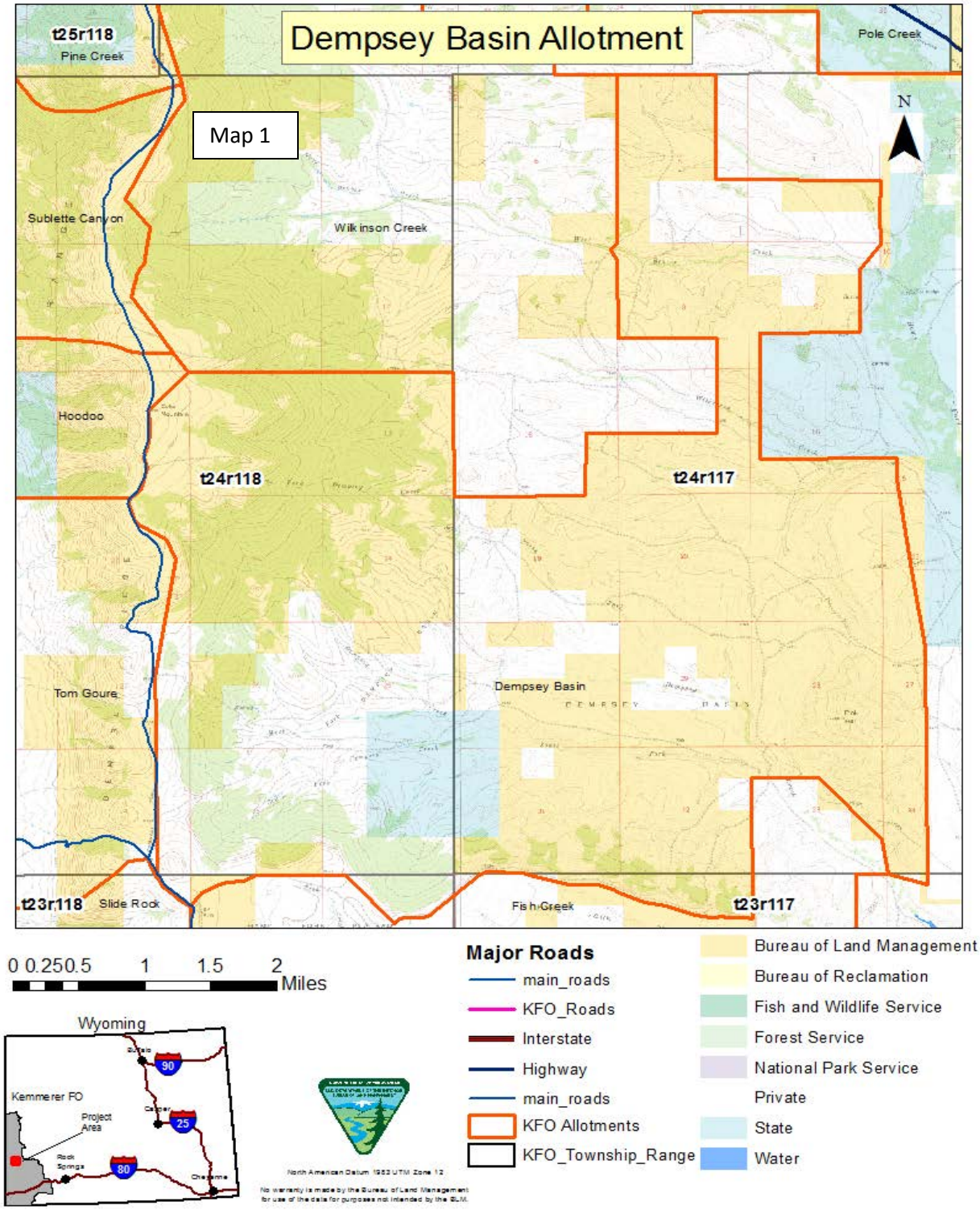
Critical elements of the human environment considered in this EA PI – Potential Impact. One or more of the alternative may have an impact on the element; NI – No Expected Impact. No impact on the element is expected from any of the alternatives; NP – Not Present. The element is not present within the allotment(s).				
PI	**NI**	**NP**	**Element**	**Information/Rationale**
	✓		Air Quality	"While there is limited ambient air quality-monitoring data available for the study area, air quality is generally considered good, with no regions designated as non-attainment for National Ambient Air Quality Standards (NAAQS) or Wyoming Ambient Air Quality Standards (WAAQS)." (BLM 2008, pgs. 3-5).
		✓	Areas of Critical Environmental Concern	There are no ACECs within or near the Dempsey Basin Allotment.
✓			Cultural Resources	A cultural resource reviews have been completed for the Dempsey Basin Allotment one on June 12, 2006 and another on January 23, 2008. The following is quoted from the review document: "This review found portions of three (3) Class III inventories and one (1) Class II cultural resource sampling surveys conducted between 1979 and 1996. Those inventories consisted of one (1) access road, one (1) land exchange, one (1) cattle guard project, and the sample survey. The total number of approximate acres within the allotment is 15,862, 11,361 acres are public land, 3,861 acres of private land and 640 acres of State land within the Dempsey Basin Allotment. No effects on any historic properties are documented as attributable to authorized grazing permit renewal. "Domestic livestock grazing has occurred for over 100 years in southwestern Wyoming. No impacts to significant cultural resources have been reported in the area as a result of authorized, dispersed livestock grazing within the allotment boundaries."
	✓		Environmental Justice	None of the alternatives would have a disproportionately adverse effect on persons of any race, color, national origin or income level.
		✓	Farmlands (Prime or Unique)	No Prime or Unique Farmlands (as defined by 7 CFR 657.5) are present on the Dempsey Basin Allotment.
		✓	Floodplains	No floodplains are present on the Dempsey Basin Allotment.
		✓	Native American Religious Concerns	No areas of Native American Religious Concern have been identified within or near the Dempsey Basin Allotment.

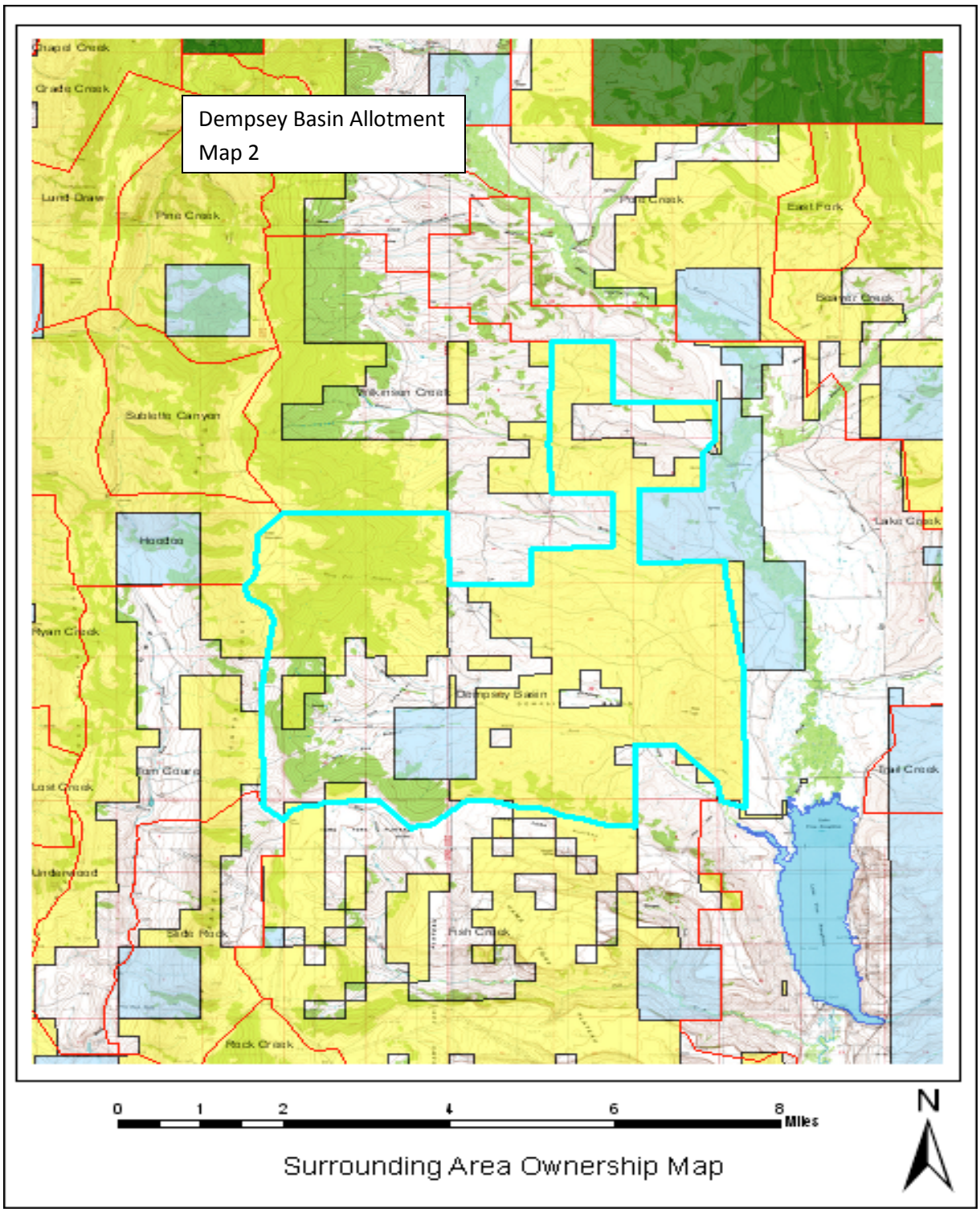
Critical elements of the human environment considered in this EA PI – Potential Impact. One or more of the alternative may have an impact on the element; NI – No Expected Impact. No impact on the element is expected from any of the alternatives; NP – Not Present. The element is not present within the allotment(s).				
PI	**NI**	**NP**	**Element**	**Information/Rationale**
✓			Non-native or Invasive Plant Species	When the Standards for Healthy Rangelands assessment was conducted on the Dempsey Basin Allotment, the following was found: "A few, individual musk thistle (*Carduus nutans*) and Canada thistle (*Cirsium arvense L.)* plants are present on the allotment. Black henbane (*Hyoscyamus niger*) was found in isolated spots along the roadway. None of these species appeared to be actively spreading through the allotment." Note that musk thistle is designated as a noxious weed by the Wyoming Weed and Pest Council.
✓			Threatened, Endangered, Proposed or Candidate Species	A wildlife clearance was completed for the Dempsey Basin Allotment on December 5, 2006 based on the BLM GIS database and a field visit, and was reviewed in 2014. This clearance identified that there are isolated patches of marginal habitat on the Dempsey Basin Allotment for the mountain plover (*Charadrius montanus*), a proposed species for the Endangered Species Act. There is no habitat present for the following Threatened or Endangered (T&E) species or candidate species: black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), Canada lynx (*Lynx Canadensis*), Colorado River fishes, bald eagle (*Haliaeetus leucocephalus*), grizzly bear (*Ursus arctos horribilis),* blowout penstemon, Ute ladies-tresses and yellow-billed cuckoo. Furthermore, there will not be any downstream effects to endangered Colorado River fishes as the allotment is within the Green River drainage. However, potential impacts may occur to sage-grouse as the entire allotment is located in a sage-grouse nesting and brood-rearing habitat. Lek nesting and brood rearing surface disturbing or disruptive activities are restricted within two miles of an occupied lek. The Dempsey Basin Allotment is within two miles of active leks. Winter area surface disturbing or disruptive activities in delineated winter concentration areas are also restricted but these areas are still in the process of being mapped.
		✓	Wastes, Hazardous or Solid	There are no known hazardous or solid wastes present on the Dempsey Basin Allotment. Livestock grazing is not expected to produce or contribute any hazardous or solid wastes.
✓			Water Quality, Drinking or Ground	There are five creeks and one reservoir used as water sources on the Dempsey Basin Allotment: West Beaver Creek, Wilkinson Creek, Dempsey Creek, North and South Fork of Dempsey Creek; portions of these creek are on public land None of the water sources are listed on the Wyoming Department of Environmental Quality's 303(d) list. This list describes water sources that do not currently meet state

Critical elements of the human environment considered in this EA PI – Potential Impact. One or more of the alternative may have an impact on the element; NI – No Expected Impact. No impact on the element is expected from any of the alternatives; NP – Not Present. The element is not present within the allotment(s).				
PI	**NI**	**NP**	**Element**	**Information/Rationale**
				water quality standards. The creeks have intermittent water flow and depend on the amount of snowpack the area receives each year. The other water source is Pink Hills Reservoir approximately one acre in size in T24N R117W Section 28.
✓			Wetlands/Riparian Zones	Approximately one mile of West Beaver Creek runs through the east portion and west portion of the Dempsey Basin Allotment and is rated as being in Proper Functioning Condition (PFC). The one mile section consists of one half mile of creek on the west side of the allotment and this portion is the headwaters for the creek located in the forested area on the allotment. From there West Beaver Creek leaves pubic land and flows east until it splits into two very small intermittent streams fed by snow banks (surface water flows). The flow runs down onto private land, where the two streams converge. The lower one half mile of the West Beaver Creek is on public lands east side of the allotment. The system is intermittent and does not flow the entire year on the surface. This system has a different potential than a perennial system with sustained year-round surface flow, as portions of the creek goes dry during the hot summer months. Wilkinson Creek also runs through the east portion of the allotment and is rated as being in PFC. The southwest portion of the allotment contains Dempsey Creek and the North and South Forks tributaries to Dempsey Creek. The main Dempsey Creek is one point five miles in length, the North Fork of Dempsey Creek one point five miles in length and the South Fork of Dempsey Creek two miles in length all are rated as functional at risk with trend not apparent, except for the lower portion of the main Dempsey Creek one mile which is in an upward trend. The creeks have indications of starting improve based on last observations by the BLM the vegetative communities are recovering and showing increased stability. The primary source of water on the north portion of the allotment is from snow banks. The flows in the creeks are intermittent and have different potentials than a perennial system with sustained year-round surface flow. The creeks have some small scattered plant communities of sedge and rush mainly in the lower sections of the creeks. The creeks on the northeast portion of the are also primarily fed by snowmelt but have enough flow from spring sources outside the allotment boundary to keep water flowing most of the year.
		✓	Wild and Scenic Rivers	No Wild and Scenic Rivers are present within the Dempsey Basin Allotment.
		✓	Wilderness	No designated wilderness areas are present within the Dempsey Basin Allotment.

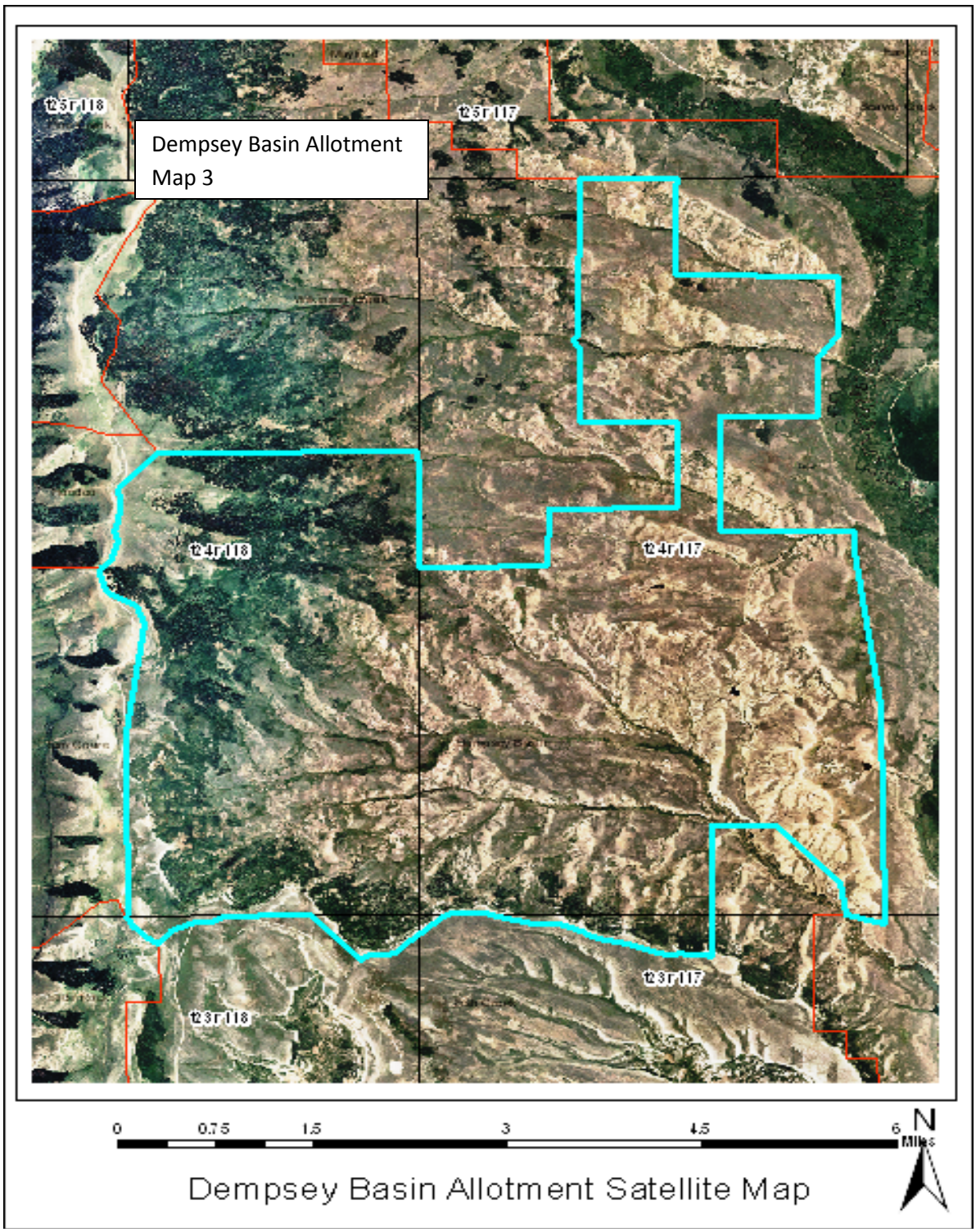
Appendix 2

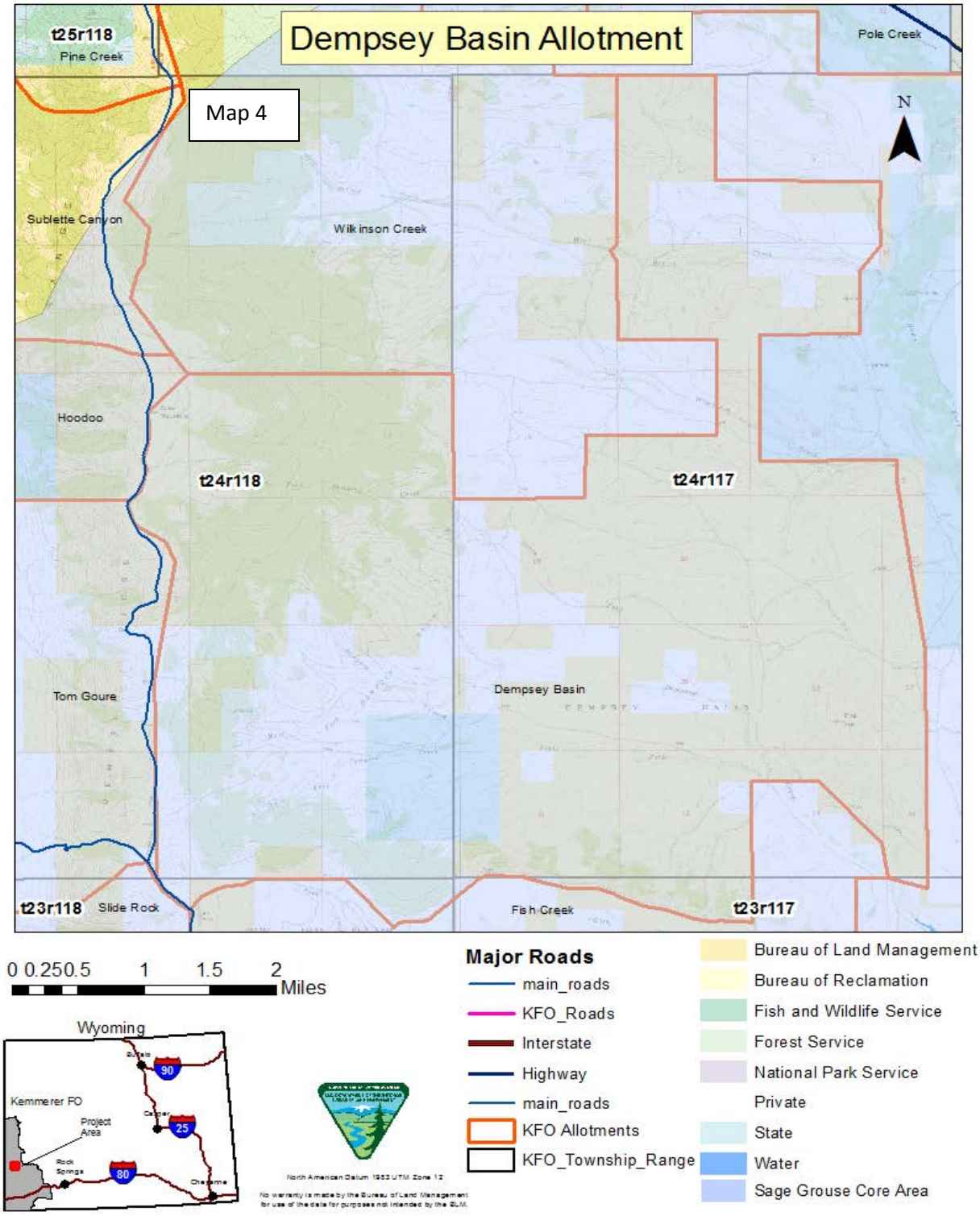
Maps

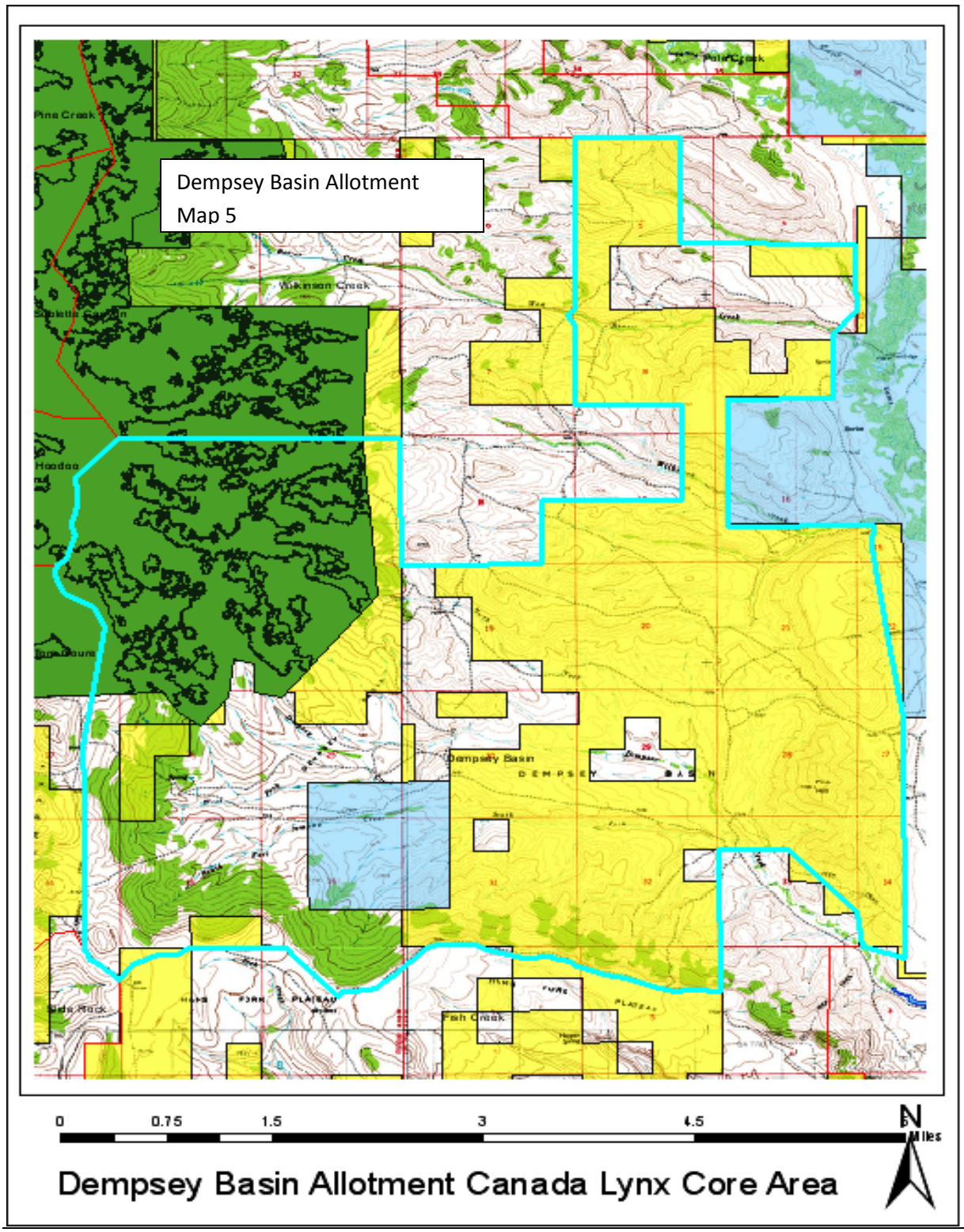

Dempsey Basin Allotment
Map 1
t25r118
Pine Creek
Pole Creek
N
Sublette Canyon
Wilkinson Creek
Hoodoo
t24r118
t24r117
Tom Goure
Dempsey Basin
t23r118
Slide Rock
Fish Creek
t23r117
0 0.250.5 1 1.5 2 Miles
Wyoming
Kemmerer FO
Project Area
Major Roads
main_roads
KFO_Roads
Interstate
Highway
main_roads
KFO Allotments
KFO_Township_Range
Bureau of Land Management
Bureau of Reclamation
Fish and Wildlife Service
Forest Service
National Park Service
Private
State
Water



Surrounding Area Ownership Map


Dempsey Basin Allotment
Map 3
t25r118
t25r117
t24r118
t24r117
t23r117
t23r118
0
0.75
1.5
3
4.5
6
Miles
N
Dempsey Basin Allotment Satellite Map


Dempsey Basin Allotment
Map 4
t25r118
Pine Creek
Pole Creek
N
Sublette Canyon
Wilkinson Creek
Hoodoo
t24r118
t24r117
Tom Goure
Dempsey Basin
t23r118
Slide Rock
Fish Creek
t23r117
0 0.250.5 1 1.5 2 Miles
Wyoming
Kemmerer FO
Project Area
Major Roads
main_roads
KFO_Roads
Interstate
Highway
main_roads
KFO Allotments
KFO_Township_Range
Bureau of Land Management
Bureau of Reclamation
Fish and Wildlife Service
Forest Service
National Park Service
Private
State
Water
Sage Grouse Core Area


Dempsey Basin Allotment
Map 5
Pine Creek
Wilkinson Creek
Hoodoo
Dempsey Basin
DEMPSEY BASIN
Fish Creek
0
0.75
1.5
3
4.5
Miles
N
Dempsey Basin Allotment Canada Lynx Core Area